ZION SOLUTIONS LLC
An EnergySolutions Company

ZION STATION RESTORATION PROJECT
FINAL STATUS SURVEY RELEASE RECORD

AUXILIARY BUILDING BASEMENT
SURVEY UNIT 05100

PREPARED BY / DATE:  2019-09-01

R. Massengill, Radiological Engineer

REVIEWED BY / DATE:  2019-09-01

R. Decker, Radiological Engineer

APPROVED BY / DATE:  2019-09-01

D. Wojtkowiak, C/LT Manager

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ABEDCT	Auxiliary Building Equipment Drain Collection Tank
ALARA	As Low As Reasonably Achievable
AMCG	Average Member of the Critical Group
BAE	Boric Acid Evaporator
BcDCGL	Base Case Derived Concentration Guideline Level
BFM	Basement Fill Model
DQA	Data Quality Assessment
DQO	Data Quality Objective
DCGL	Derived Concentration Guideline Level
EMC	Elevated Measurement Comparison
FOV	Field of View
FSS	Final Status Survey
HTD	Hard-to-Detect
HUT	Hold Up Tank
IC	Insignificant Contributor
LTP	License Termination Plan
LBGR	Lower Bound of the Gray Region
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDC	Minimum Detectable Concentration
NaI	Sodium Iodide
NRC	Nuclear Regulatory Commission
OH	Overhead
OpDCGL	Operational Derived Concentration Guideline Level
QAPP	Quality Assurance Project Plan
QC	Quality Control
RE	Radiological Engineer
RHR	Residual Heat Removal

ROC	Radionuclides of Concern
SOF	Sum of Fractions
TEDE	Total Effective Dose Equivalent
UBGR	Upper Bound of the Gray Region
UCL	Upper Confidence Level
ZNPS	Zion Nuclear Power Station
ZSRP	Zion Station Restoration Project

1. EXECUTIVE SUMMARY

This Final Status Survey (FSS) Release Record for survey unit 05100, "Auxiliary Building Basement", has been generated for the Zion Station Restoration Project (ZSRP) in accordance with Zion*Solutions* procedure ZS-LT-300-001-005, *"Final Status Survey Data Reporting"* (Reference 1) and satisfies the requirements of Section 5.11 of the *"Zion Station Restoration Project License Termination Plan"* (LTP) (Reference 2). The FSS package for basement survey unit 05100, Auxiliary Building Basement includes FSS design and FSS results for the Auxiliary Building basement floor surfaces, wall surfaces, sumps and elevator pit on the 542 foot elevation and ledges on the 560 foot and 579 foot elevations.

The Final Status Survey (FSS) sample plan for this survey unit was developed in accordance with Zion*Solutions* procedure ZS-LT-300-001-001, *"Final Status Survey Package Development"* (Reference 3), the ZSRP LTP, and guidance from NUREG-1575, "*Multi-Agency Radiation Survey and Site Investigation Manual"* (MARSSIM) (Reference 4).

In accordance with ZSRP LTP Chapter 5, section 5.5.2.1 and Table 5-19, the Auxiliary Building basement survey unit has a MARSSIM classification of 1. A survey plan was designed based upon use of the Sign Test as the nonparametric statistical test for compliance. Both the Type I (α) and Type II (β) decision error rates were set at 0.05. The Canberra *In Situ* Object Counting System (ISOCS) was selected as the primary instrument used to perform FSS of the Auxiliary Building basement survey unit. The surface area of the Auxiliary Building Basement survey unit was determined to be 7,226 m^2. Based solely on the surface area covered by a single ISOCS measurement (a nominal Field of View [FOV] of 28 m^2) the minimum number of measurements necessary to cover the surface area was 233 measurements (see LTP Chapter 5, Table 5-18). However, due to physical structural anomalies, building corners/edges, and, to ensure 100% coverage of all surfaces, 425 systematic ISOCS measurements were actually collected. Some of the measurements represented an FOV less than 28 m^2. The additional measurements were added to conservatively ensure 100% coverage of every surface. When necessary, the grid dimensions or the field of view were modified to ensure 100% areal coverage was achieved.

LTP Chapter 6, section 6.4.5 states, "The dose from penetrations is summed with the dose from the wall and floor surfaces of both basements that the penetration interfaces." The Containment penetrations interfaced with the Auxiliary Building and the Turbine Building (through the Unit 1/Unit 2 East and West Main Steam Valve Houses). Consequently, the FSS design employed the Derived Concentration Guideline Levels (DCGLs) for the

Containment penetrations, which was the most limiting. The resultant dose was added to each Basement to ensure compliance with the LTP.

The results of ISOCS measurements taken in the Auxiliary Building basement survey unit indicate that 16 of the 425 systematic measurements had a Sum-of-Fraction (SOF) greater than 1.0 when considering the concentration of all applicable Radionuclides of Concern (ROC), and applying the respective Operational Derived Concentration Guideline Levels (OpDCGL) for the Auxiliary Building basement from Zion*Solutions* TSD 17-004, "*Operational Derived Concentration Guideline Levels for Final Status Survey*" (Reference 5). However, none of the ISOCS measurements were greater than Base Case Derived Concentration Guideline Levels (BcDCGL) from TSD 17-004 and the survey unit passed the Sign Test. Therefore the null hypothesis was rejected and the Auxiliary Building basement survey unit is acceptable for unrestricted release.

2. SURVEY UNIT DESCRIPTION

The Auxiliary Building footprint contained numerous systems and components including the following: Hold Up Tank (HUT) system components, Boric Acid Evaporator (BAE) feed pumps, drain collection tanks and piping, Safety Injection System, Residual Heat Removal (RHR) system components, Containment Spray, Chemical Drain, Blowdown Heat Exchanger, Waste Gas, charging pumps, Refuel Water Storage Tanks and Letdown Heat Exchanger.

The Auxiliary Building basement survey unit is a Class 1 basement FSS unit. The Auxiliary Building basement survey unit is comprised of the combined interior perimeter walls and floor surfaces of each remaining building basement from the 542 foot, 560 foot and 579 foot elevations, following demolition. This survey unit consists of the Auxiliary Building basement floor at the 542 foot elevation, the two horizontal surfaces beneath the Unit 1 and Unit 2 primary piping penetrations at the 560 foot elevation, the two horizontal surfaces above the Auxiliary Building Equipment Drain Collection Tank (ABEDCT) areas at the 579 foot elevation, and all the associated walls below the 588 foot elevation.

Figure 1 - Auxiliary Building 542 Foot Elevation

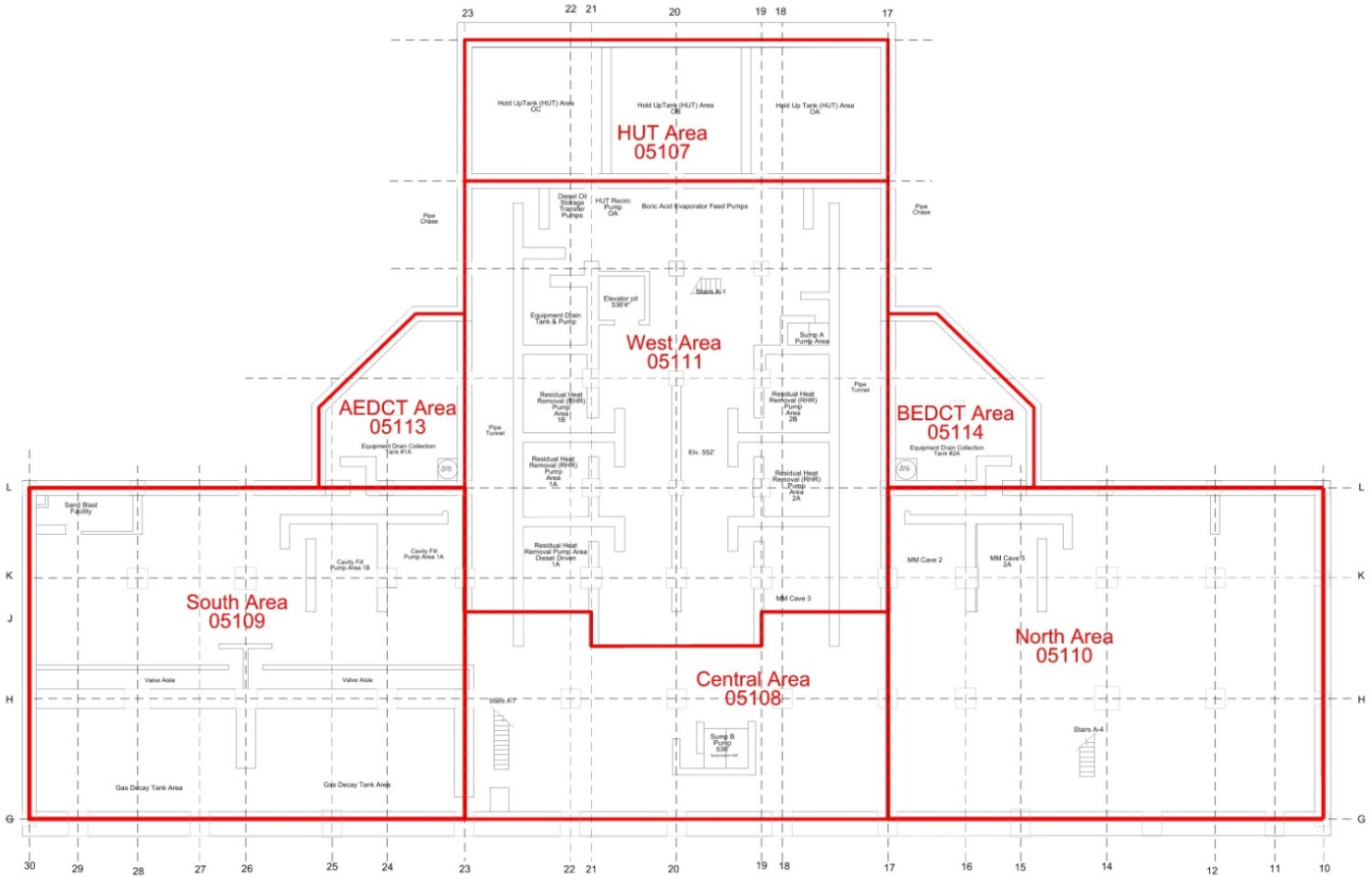
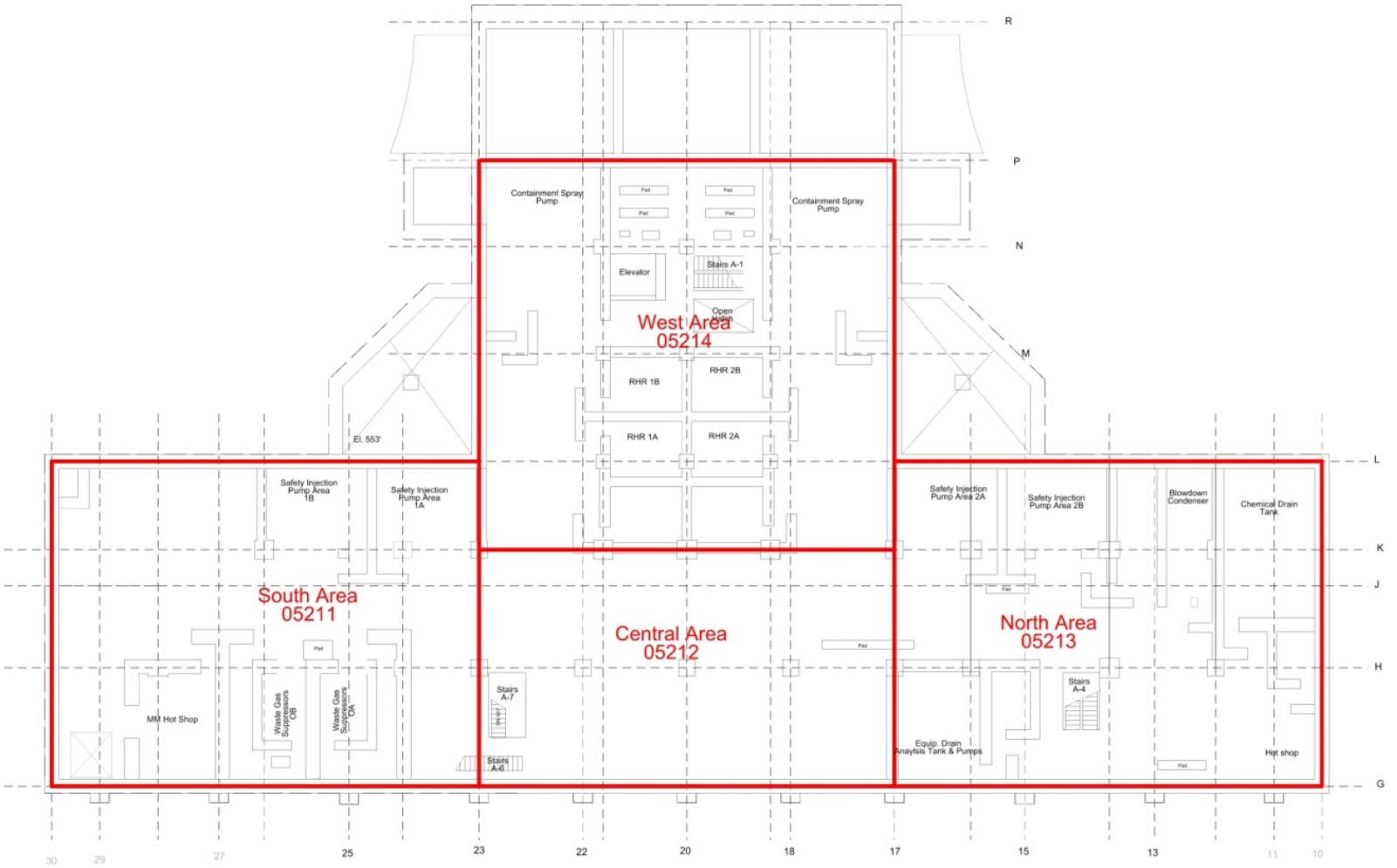
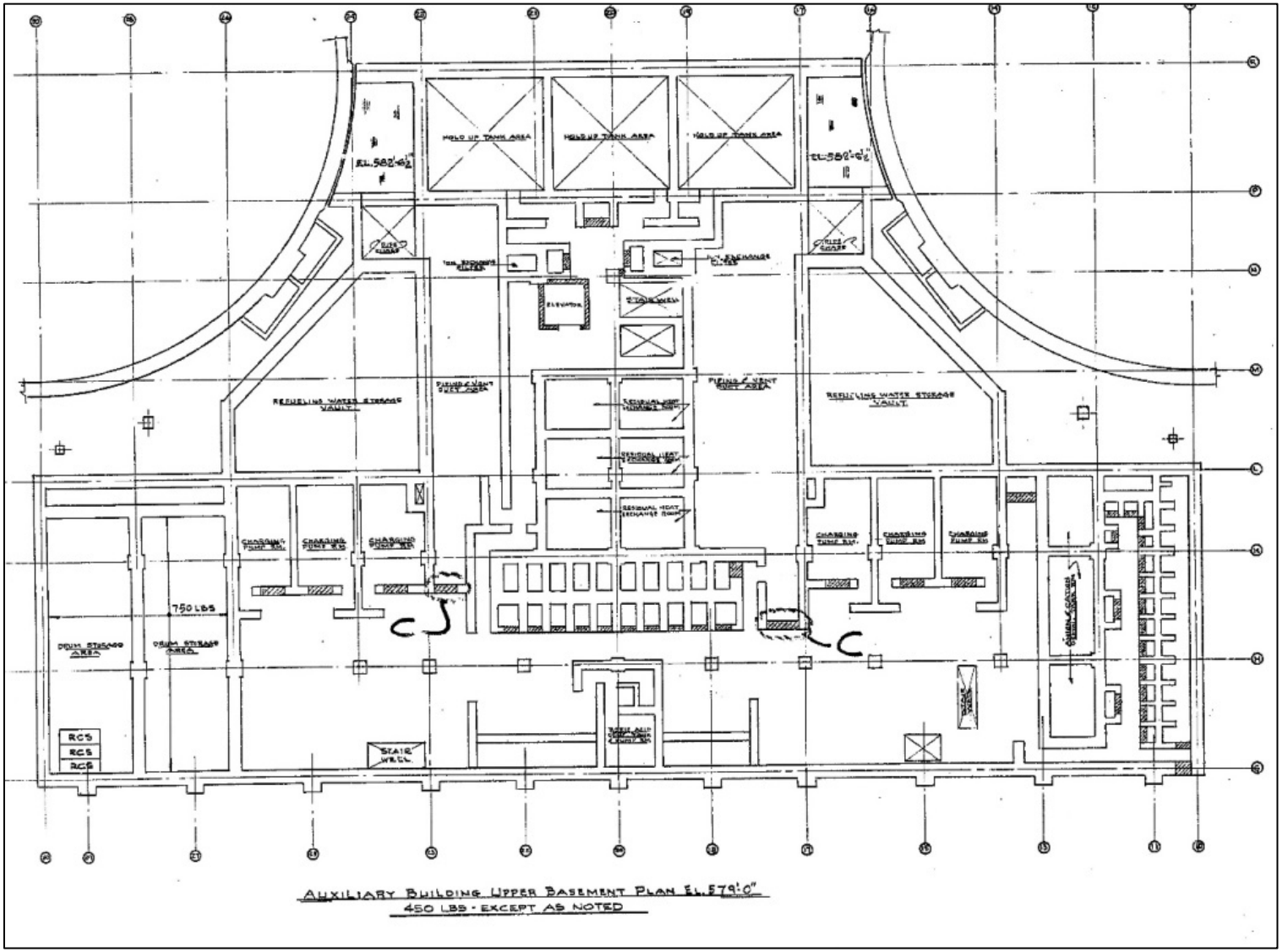


Figure 2 - Auxiliary Building 560 Foot Elevation



Auxiliary Building 560'
Prior to Demolition

Figure 3 - Auxiliary Building 579 Foot Elevation



Prior to demolition, the Auxiliary Building was located between the Unit 1 and Unit 2 Containments and the Turbine Building. The structure was designed to house support systems for the operation of both reactors. Major support systems that were located in the Auxiliary Building include Containment Spray, Residual Heat Removal, Reactor Water Cleanup, Reactor Water Charging and Safety Injection systems. In addition, the Auxiliary Building also contained various filters and tanks designed to batch and/or process gaseous, liquid and solid wastes resulting from reactor operation. With the exceptions of the service water, primary de-ionized water, control air, fire protection, nitrogen gas and service air, all the systems within the Auxiliary Building contained radioactive material. The structure itself was designed to contain and control leakage from these systems during normal operation as well as unusual events. System leakage and maintenance activities over the operating life of the facility had resulted in the radiological contamination of most of the interior surfaces of the Auxiliary Building. Most of the cubicles that contained major systems were posted as contaminated areas identifying removable radioactivity. Based on the building design-basis and the operating history, all internal survey units within the Auxiliary Building were considered to be Class 1 areas.

The basic decommissioning end-state for the Auxiliary Building consists of the concrete foundation, concrete walls below 588 foot elevation and the 542 foot elevation concrete floor. All systems and components contained within the Auxiliary Building were disassembled and/or demolished, packaged and properly dispositioned as either radioactive or non-radioactive waste.

After demolition was complete, structural surfaces of the Auxiliary Building above the 588 foot elevation were removed. Most of the 570 foot elevation and the 560 foot elevation were removed as well. The 542 foot elevation contained the floor (including sumps and pits) and the interior perimeter walls. No interior cubicle walls or commodities remained. The 560 foot elevation only contained each containment pipe tunnel floor and no walls or commodities. The 579 foot elevation only contained the floors above the ABEDCT areas southeast of Unit 2 Containment and northeast of Unit 1 Containment and no walls or commodities.

Engineering drawings indicated that the concrete walls of the remaining structure are 5 feet thick and the 542 foot elevation floor was up to 4 feet thick.

3. CLASSIFICATION BASIS

Based on the *"Zion Station Historical Site Assessment"* (HSA) (Reference 6), the 542 foot elevation of the Auxiliary Building was identified as Class 1 areas and contained the following survey units:

- 05100 - Auxiliary Building,
- 05101 - Unit 1A RHR Pump Room,
- 05102 - Unit 1B RHR Pump Room,
- 05103 - Unit 2A RHR Pump Room,
- 05102 - Unit 2B RHR Pump Room,
- 05105 - Unit 1 Pipe Chase,
- 05106 - Unit 2 Pipe Chase,
- 05107 - Hold Up Tanks,
- 05108 - Auxiliary Building Central,
- 05109 - Auxiliary Building South,
- 05110 - Auxiliary Building North,
- 05111 - Auxiliary Building West,
- 05112 - Gas Decay Tanks Area
- 05113 - Unit 1 Auxiliary Building Equipment Drain Collection Tank Room,
- 05114 - Unit 2 Auxiliary Building Equipment Drain Collection Tank Room,
- 05115 - HUT Recirculation and BAE Feed Pumps,
- 05116 - Auxiliary Building Equipment Drain Tank and Pumps,
- 05117 - Auxiliary Building Sump A, and
- 05118 - Auxiliary Building Sump B.

Based on the HSA, the 560 foot and 579 foot elevations of the Auxiliary Building were identified as Class 1 areas and contained the following survey units:

- 05217 - Unit 1 Vertical Pipe Chase,
- 05218 - Unit 2 Vertical Pipe Chase,
- 05313 - Unit 1 Horizontal Pipe Chase, and
- 05314 - Unit 2 Horizontal Pipe Chase.

The Basement Fill Model (BFM) applies to the steel and concrete walls and floor surfaces, below the 588 foot elevation of the Unit 1 Containment Building, Unit 2 Containment Building, Auxiliary Building, Turbine Building, WWTF, the lower portion of the SFP, Fuel Transfer Canals, Crib House and Forebay, Unit 1 and Unit 2 Steam Tunnels and the Circulating Water Intake Piping and Circulating Water Discharge Tunnels. The BFM source term also includes the end-state embedded piping and penetrations. The survey

units designated for structures below 588 foot elevation from the HSA that were presented in LTP Chapter 2, Table 2-2 were based on screening values and source term assumptions that are significantly different from the BFM and are therefore not applicable. The twenty-three (23) survey units identified in the HSA that remained in the end-state of the Auxiliary Building following demolition were combined into one FSS unit for basement structures.

In May and June of 2012, a characterization survey was performed of the Auxiliary Building 542 foot elevation and Auxiliary Building interior perimeter walls. The characterization survey consisted of surface scans and the acquisition of a series of concrete core samples taken in the 542 foot elevation concrete floor and lower interior perimeter walls. In March of 2013, two (2) additional concrete cores were taken in the Auxiliary Building elevator shaft and the HUT Cubicle floors as these areas became accessible. During the time that initial characterization was performed, all radioactive systems and components were still located inside the Auxiliary Building. Consequently, ambient radiation dose rates inside some of the cubicles on the 542 foot elevation prohibited the direct assessment of concrete surfaces by scanning or direct measurement.

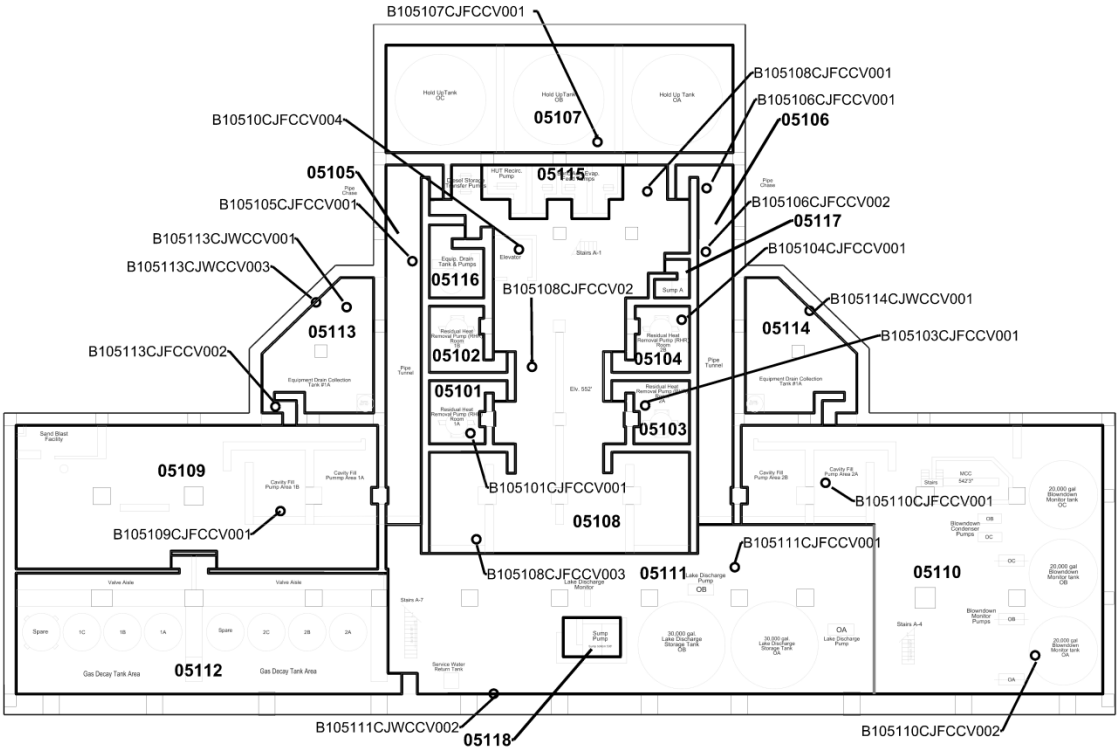
During the initial characterization of the Auxiliary Building basement, extensive beta/gamma scan surveys were performed on the floors and lower walls of the 542 foot elevation in an effort to determine the locations representing the worst-case radiological condition for concrete in each survey unit. These scans were performed of accessible walls surfaces to the extent practicable while standing on the 542 foot elevation, to a nominal elevation of approximately six feet up the wall from the floor. The scan surveys indicated that, for a majority of the lower wall surfaces on the Auxiliary Building 542 foot elevation, the residual radioactivity was indistinguishable from ambient background. This was particularly true for all the outer wall surfaces in the east portion of the Auxiliary Building 542 foot elevation, including the Waste Gas Decay Tank area, the Lake Discharge Tank area, the Blowdown Monitor Tank area and the areas adjacent to the Cavity Fill Pump cubicles. Residual contamination at concentrations greater than the ambient background was only detected on the outer walls of the Unit 1 and Unit 2 Pipe Chases, the Unit 1 and Unit 2 ABEDCT cubicles and the outer walls of the HUT cubicles. However, with the exception of the HUT cubicles, the contamination identified on the walls in the Pipe Chases and ABEDCT cubicles was not uniform. The contamination on the walls in these cubicles was primarily from valve leakage and gland seal spray from primary system pumps.

A total of 20 concrete core samples were collected. The locations selected were biased toward locations where physical or observed radiological measurements indicated the presence of fixed and/or volumetric contamination of the concrete media. When possible, locations were determined based upon elevated observed contact dose rates or count rates

from scans. In addition, visual observations of floor and wall surfaces, such as discoloration or standing water, were used to identify potential locations of surface contamination. The goal was to identify, to the extent possible, the locations that exhibited the highest potential of representing the worst-case radiological condition for concrete in each survey unit. This judgmental sampling approach also ensured that there was sufficient source term in the cores to achieve the sensitivities required to determine the radionuclide distributions of gamma emitters as well as Hard-to-Detect (HTD) radionuclides.

The locations where the core samples were taken are illustrated in Figure 4. The concrete cores, split into pucks, were analyzed on the on-site gamma spectroscopy system. A summary of the on-site gamma spectroscopy results for the analysis of the concrete cores taken from the 542 foot elevation of the Auxiliary Building is presented in Table 1.

Figure 4 - Characterization Concrete Core Sample Locations



Auxiliary Building 542'
Concrete Core Locations

Table 1 - Auxiliary Building 542 Foot Elevation Characterization Concrete Core Sample Analysis Summary (2012-2013)

Location	Sample ID#	Core Depth (inches)	Co-60		Cs-137	
			Surface Activity (1,3)	Avg. Subsurface Activity (2,3)	Surface Activity (1,3)	Avg. Subsurface Activity (2,3)
			(pC/g)	(pC/g)	(pC/g)	(pC/g)
1A RHR Pump Room	B105101-CJFCCV-001	5.5	**6.11E+01**	**1.06E+01**	**3.74E+03**	**3.06E+02**
2A RHR Pump Room	B105103-CJFCCV-001	4.0	**4.56E+02**	**2.04E+02**	**2.51E+04**	**4.92E+03**
2B RHR Pump Room	B105104-CJFCCV-001	1.0	**4.08E-01**	*4.20E-01*	**9.44E+00**	**1.79E+00**
Unit 1 Hot Pipe Chase	B105105-CJFCCV-001	5.0	**7.00E+00**	**8.89E-01**	**9.83E+03**	**2.65E+03**
Unit 2 Hot Pipe Chase	B105106-CJFCCV-001	4.5	**3.86E+00**	**1.51E+00**	**2.77E+03**	**1.05E+03**
Unit 2 Hot Pipe Chase	B105106-CJFCCV-002	1.0	**1.75E+01**	**3.60E+00**	**3.09E+03**	**4.14E+02**
Hold-up Tank Cubicles	B105107- CJFCCV-002	14.0	**1.18E+01**	**3.71E-01**	**1.17E+02**	**2.26E+00**
Central Common Area	B105108-CJFCCV-001	4.5	*4.32E-01*	*1.74E-01*	**1.92E+03**	**2.18E+02**
Central Common Area	B105108-CJFCCV-002	4.0	**2.80E+00**	**1.28E+00**	**1.13E+02**	**1.53E+01**
Central Common Area	B105108-CJFCCV-003	3.0	**3.03E+01**	**1.65E+00**	**1.67E+03**	**7.26E+01**
Central Common Area Elevator Shaft	B105108-CJFCCV-004	4.0	**4.05E+00**	**2.71E-01**	**1.51E+02**	**4.92E+00**
South Common Area	B105109-CJFCCV-001	1.0	**4.22E+00**	**8.22E-01**	**1.43E+03**	**2.13E+02**
North Common Area	B105110-CJFCCV-001	1.0	**8.09E+00**	**1.81E+00**	**2.11E+03**	**3.50E+02**
North Common Area	B105110-CJFCCV-002	1.5	*3.28E-01*	*7.85E-02*	**6.37E+01**	**5.17E+00**
East Common Area	B105111-CJFCCV-001	3.5	**2.06E+00**	**7.66E-01**	**1.13E+03**	**1.99E+02**
East Common Area Wall	B101111-CJWCCV-002	0.5	*1.94E-01*	*2.85E-01*	**9.52E-01**	**4.25E-01**
Unit 1 ABEDCT Room	B105113-CJFCCV-001	5.5	**1.96E+02**	**1.33E+01**	**5.69E+03**	**1.54E+02**
Unit 1 ABEDCT Room	B105113-CJFCCV-002	5.5	**3.76E+01**	**6.98E+00**	**1.79E+03**	**1.50E+02**
Unit 1 ABEDCT Room Wall	B105113-CJWCCV-003	1.0	**6.71E+02**	**1.69E+02**	**1.66E+04**	**3.77E+03**

(1) Represents surface activity of floor following removal of loose contamination (surface to depth of 0.5 inches)
(2) Represents average of activity over entire depth of core sample minus the surface activity (0.5 inches to depth of core)
(3) Bold values indicate concentration greater than MDC. Italicized values indicate MDC value.

Co-60, Cs-134 and Cs-137 were the only plant-derived gamma-emitting radionuclides identified. Zion*Solutions* TSD 14-028, *"Radiological Characterization Report"* (Reference 7) presents additional detail on the concrete sampling methodology and results of the radiological analysis of each concrete core sample obtained from the Auxiliary Building basement.

Analyses of the concrete core samples taken from the Auxiliary Building 542 foot elevation indicate that there was extensive radiological contamination at depth. This is most likely due to the fact that the 542 foot elevation was routinely flooded with contaminated water during operations. In the first ½-inch of floor, Co-60 concentrations averaged 46 pCi/g with a maximum concentration of 456 pCi/g, and Cs-137 concentrations averaged 3,352 pCi/g with a maximum concentration of 25,100 pCi/g. In both Unit 1 and Unit 2 Pipe Tunnel rooms, Cs-137 concentrations of 530 pCi/g and 1,740 pCi/g were observed at depths of 4 and 5 inches, respectively. In addition, sample analysis indicated a Cs-137 concentration of 56.80 pCi/g at a depth of 2 inches in the central common area, a Cs-137 concentration of 31.10 pCi/g at a depth of 3.5 inches in the east floor area and a Cs-137 concentration of 63.10 pCi/g at a depth of 2.5 inches in the Unit 1 Equipment Drain Collection Tank room.

The top ½-inch puck from six (6) of the 20 cores from the Auxiliary Building were sent to Eberline Laboratory for gamma spectroscopy and HTD analyses for radionuclides such as H-3, C-14, Tc-99, Ni-63, Sr-90, and alpha emitters. The results of the analyses are presented in Table 2. The mixture percentages for the initial suite of radionuclides for the Auxiliary Building basement concrete were developed in TSD 14-019, *"Radionuclides of Concern for Soil and Basement Fill Model Source Terms"* (Reference 8) using the results of all core sample analyses, including the cores sent to Eberline. Significant HTD radionuclides identified by the analysis of the concrete core samples include Ni-63 and H-3. The other radionuclides positively detected at concentrations greater than their respective Minimum Detectable Concentration (MDC) included C-14, Tc-99, Sr-90, Ag-108m, Pu-238, Pu-239/240, Am-241 and Am-243.

Table 2 - Auxiliary Building Characterization Concrete Core Samples (2012-2013) – Eberline Laboratory Analysis (1)

Radionuclide	B105101-CJFCCV-001 (pCi/g)	B105103-CJFCCV-001 (pCi/g)	B105105-CJFCCV-001 (pCi/g)	B105106-CJFCCV-002 (pCi/g)	B105108-CJFCCV-003 (pCi/g)	B105113-CJWCCV-003 (pCi/g)
H-3	**1.12E+01**	**1.68E+01**	**6.98E+00**	*2.96E+01*	**5.61E+00**	**4.71E+00**
C-14	*9.56E-01*	**4.88E+00**	*9.98E-01*	**1.48E+00**	**1.19E+00**	**3.10E+00**
Fe-55	*1.20E+01*	*3.16E+01*	*1.81E+01*	*1.12E+01*	*8.17E+00*	*1.73E+01*
Ni-59	*1.59E+01*	*2.08E+01*	*1.81E+01*	*1.74E+01*	*1.67E+01*	*1.75E+01*
Co-60	**2.62E+01**	**2.28E+02**	**3.20E+00**	**1.01E+01**	**1.83E+01**	**2.03E+02**
Ni-63	**1.52E+02**	**3.38E+03**	**2.91E+02**	**9.18E+01**	**8.59E+01**	**1.65E+03**
Sr-90	**1.07E+00**	**5.44E+00**	**1.52E+00**	**4.04E-01**	*3.29E-01*	**8.82E+00**
Nb-94	*2.29E-01*	*8.17E-01*	*6.19E-01*	*2.13E-01*	**3.02E-01**	*6.57E-01*
Tc-99	**1.45E+00**	**9.61E-01**	**6.70E-01**	**4.73E-01**	**9.09E-01**	**5.81E-01**
Ag-108m	*2.06E-01*	**1.66E+00**	*8.06E-01*	*2.53E-01*	*1.82E-01*	*5.96E-01*
Sb-125	*2.27E+00*	*7.79E+00*	*4.39E+00*	*2.46E+00*	*1.99E+00*	*4.57E+00*
Cs-134	**4.53E-01**	*1.47E+00*	*8.63E-01*	**8.11E-01**	*2.90E-01*	**1.23E+00**
Cs-137	**1.35E+03**	**1.33E+04**	**5.29E+03**	**1.88E+03**	**1.05E+03**	**4.19E+03**
Pm-147	**1.43E+01**	*8.17E-01*	*9.63E-01*	**5.30E+00**	**9.57E+00**	**7.19E+00**
Eu-152	*7.57E-01*	*2.58E+00*	*1.05E+00*	*6.75E-01*	*7.10E-01*	*1.80E+00*
Eu-154	*4.00E-01*	*1.38E+00*	*1.19E+00*	*3.95E-01*	*3.21E-01*	*1.05E+00*
Eu-155	*5.76E-01*	*1.76E+00*	*1.16E+00*	*6.33E-01*	*4.84E-01*	*1.05E+00*
Np-237	*2.04E-02*	*2.13E-02*	*2.39E-02*	*2.10E-01*	*1.92E-02*	*3.20E-02*
Pu-238	*1.77E-02*	**3.43E-01**	*1.32E-02*	*1.37E-02*	**1.78E-02**	*1.39E-02*
Pu-239/240	*1.77E-02*	**2.74E-01**	*1.06E-02*	*1.37E-02*	*1.33E-02*	*1.35E-02*
Pu-241	*2.48E+00*	*2.46E+00*	*1.79E+00*	*2.36E+00*	*1.73E+00*	*1.72E+00*
Am-241	*3.03E-02*	**2.29E-01**	*4.38E-02*	*2.72E-02*	*4.29E-02*	*3.17E-02*
Am-243	*2.89E-02*	**1.09E-01**	**6.01E-02**	**3.62E-02**	**3.36E-02**	**3.18E-02**
Cm-243/244	*3.91E-02*	*4.41E-02*	*3.95E-02*	*3.89E-02*	*4.02E-02*	*4.29E-02*

(1) Bold values indicate concentration greater than MDC. Italicized values indicate MDC value.

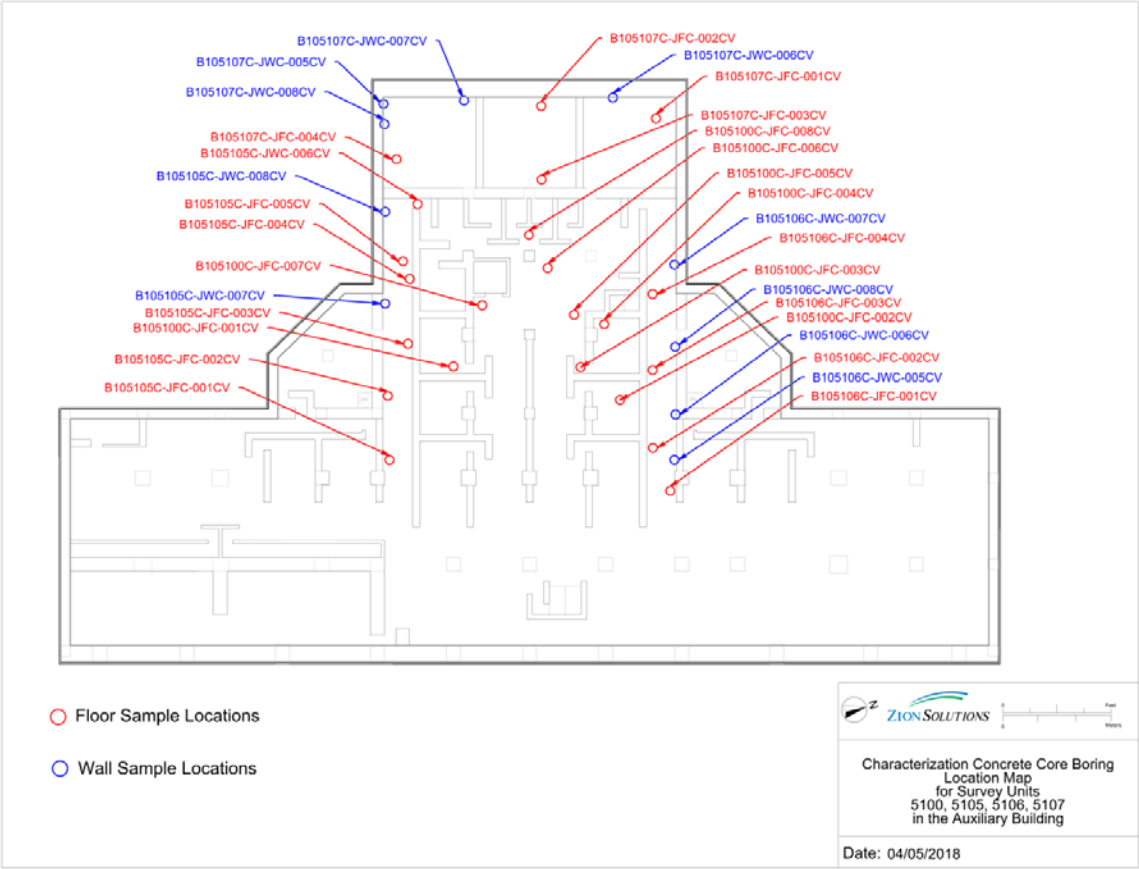
Radiological operations turnover surveys, conducted in 2016, identified numerous areas within the remaining structure that had elevated radiation levels. The elevated areas on the 542 foot elevation are as follows:

- Unit 1 "A" RHR pump room - 20 mr/hr on pipe in overhead (OH), 2-8 mr/hr on wall above trough, 1-22 mr/hr on the floor/trough.
- Unit 1 "B" RHR pump room - 1 to 40 mr/hr on floor/trough, 17 mr/hr on flush cut pipe in wall, 2.5 on wall.
- Unit 2 "A" RHR pump room - 32 mr/hr on the sides of pedestal, 1 to 18 mr/hr floor/trough, 2 mr/hr on wall.
- Unit 2 "B" RHR pump room - 14 mr/hr open pipe, 2-6 mr/hr on sides of pedestal, 1 to 2.8 of floor/trough.
- Unit 1 pipe chase - 12 mr/hr on rubble pile, 7 mr/hr on pipe, 1.5 to 3 mr/hr on sloped walls, 1 to 3 mr/hr on SW wall, 50 and 66 mr/hr on open pipes in OH, 1 to10 mr/hr on floor/pedestal,
- Unit 2 pipe chase - 2 to 16 mr/hr on open pipes in OH, 2 to 6 mr/hr on sloped walls, 2.5 mr/hr on drain, 2 mr/hr on pedestal.
- South Area - 1 to 6 mr/hr on floor, 2 to 8 on capped pipe ends in OH.
- North Area - 1 to 2.3 mr/hr on floor, 2 to 4.1 taped pipe ends in OH.
- Central Area - 1.6 to 4.8 mr/hr on floor, 2.1 to 2.2 mr/hr on drain.
- Gas Decay Tanks - 1 to 12.2 mr/hr on floor, 1.1 to 2.7 mr/hr on holes in floor.
- Unit 1 Equipment Drain Collection Tank - 225 on contact and 26 at 30 cm on capped pipe elbow in OH, 63, 67 and 141 mr/hr on open pipes in OH, 7.3 to 12 mr/hr on quartet of capped pipes in OH, 1 to 5 mr/hr on floor, 3.5 mr/hr on drain.
- Unit 2 Equipment Drain Collection Tank - 2 to 3 mr/hr on floor, 2.7 to 10 mr/hr on pipe ends in OH.
- HUT Recirculation and BAE Feed Pumps - 1.3 to 7.6 mr/hr on drain and floor.
- Auxiliary Building Drain Tank and pumps - 1 to 95 mr/hr on floor, 2 to 3 mr/hr on open pipes in OH.

In December of 2017, as part of continuing characterization activities, four (4) survey packages (B1-05100, B1-05105, B1-05106, and B1-05107) were implemented to collect and analyze a total of thirty-two (32) additional concrete cores throughout the Auxiliary Building basement 542 foot elevation for the purpose of determining the concentration profiles at depth and to develop a conservative ISOCS efficiency calibration for the Auxiliary Building basement. The first three (3) survey packages (B1-05100, B1-05105, and B1-05106) were located in the North, South and West portions of the Auxiliary Building basement. The fourth survey package (#B1-05107) was focused on the HUT

area, or the West end of the Auxiliary Building basement. A total of twenty-two (22) floor and ten (10) wall core locations were collected.

Figure 5 - Characterization Concrete Core Sample Locations (2017)



Cores were collected from the floor and lower walls to a depth of 6 inches, or refusal. The cores were cut into ½-inch thick pucks, and onsite gamma spectroscopic analysis was performed on both sides of each puck throughout the length of the core. Additionally, ½-inch pucks from eight (8) of the sample locations that exhibited the highest gamma activity were sent to an accredited off-site laboratory for HTD radionuclide analyses. A summary of the on-site gamma spectroscopy results for the analysis of the concrete cores taken from the Auxiliary Building basement floor and walls for continuing characterization is presented in Table 3. A summary of the analysis of continuing characterization concrete cores for the full suite of radionuclides by an off-site laboratory is presented in Table 4.

Table 3 - Summary of Auxiliary Building Continuing Characterization Concrete Core Samples (2017) - On-Site Analysis [1]

	B1-05105C-JFC-001-CV (542 foot U1 HPT)			B1-05105C-JFC -002-CV (542 foot U1 HPT)			B1-05105C-JFC-003-CV (542 foot U1 HPT)			B1-05105C-JFC-004-CV (542 foot U1 HPT)		
Depth	Co-60	Cs-134	Cs-137	Co-60	Cs-134	Cs-137	Co-60	Cs-134	Cs-137	Co-60	Cs-134	Cs-137
(in)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)
0	**2.44E+01**	*1.57E+00*	**5.58E+02**	**4.24E+00**	*0.00E+00*	**4.38E+01**	**1.85E-01**	*1.10E-02*	**6.95E-01**	**1.92E-01**	*0.00E+00*	**1.67E+00**
0.5	**2.34E+01**	*1.68E+00*	**4.70E+02**	**4.68E+00**	*3.58E+01*	**3.58E+01**	*5.10E-02*	*9.97E-02*	**3.33E-01**	*9.10E-02*	*1.44E-01*	**1.13E+00**
0.5	**1.06E+01**	*0.00E+00*	**1.06E+02**	**1.71E+00**	*9.87E-02*	**6.28E+00**	*0.00E+00*	*7.11E-02*	*2.11E-02*	*0.00E+00*	*1.52E-02*	*1.26E-01*
1	**9.40E+00**	*3.64E-01*	**9.04E+01**	**1.27E+00**	*1.28E-01*	**4.60E+00**	*6.60E-02*	*7.68E-02*	*1.03E-01*	*1.09E-01*	*1.14E-01*	*2.41E-02*
1	**2.43E+00**	*0.00E+00*	**8.03E+00**	**7.24E-01**	*0.00E+00*	**7.90E-01**	*8.08E-02*	*3.18E-02*	*7.84E-02*	*6.87E-03*	*6.75E-02*	*1.82E-01*
1.5	**2.31E+00**	*2.10E-02*	**6.68E+00**	**7.76E-01**	*0.00E+00*	**6.75E-01**	*6.19E-02*	*2.68E-02*	*0.00E+00*	*1.28E-01*	*1.92E-03*	*3.07E-02*
1.5	**6.12E-01**	*9.44E-02*	**6.28E-01**	**3.83E-01**	*5.82E-02*	**1.39E-01**	*8.84E-02*	*0.00E+00*	*1.49E-01*	*3.63E-02*	*4.06E-02*	*0.00E+00*
2	**3.93E-01**	*0.00E+00*	**4.05E-01**	**3.48E-01**	*3.06E-03*	**1.05E-01**	*1.13E-02*	*8.42E-02*	*0.00E+00*	*6.07E-02*	*0.00E+00*	*5.57E-02*
2	*1.27E-01*	*8.75E-02*	*2.38E-01*	*1.87E-01*	*0.00E+00*	*2.17E-01*	*8.72E-02*	*1.08E-01*	*1.21E-01*	*1.19E-01*	*0.00E+00*	*1.91E-01*
2.5	*1.86E-01*	*6.74E-02*	**1.23E-01**	*1.77E-01*	*9.27E-03*	*7.94E-02*	*1.69E-01*	*0.00E+00*	*5.24E-02*	*2.40E-01*	*3.64E-02*	*2.48E-01*
2.5	*6.32E-02*	*0.00E+00*	*1.81E-01*	*9.57E-02*	*6.95E-02*	*6.43E-02*	*1.45E-01*	*1.09E-01*	*6.77E-02*	*0.00E+00*	*1.43E-01*	*1.58E-01*
3	*1.38E-01*	*8.38E-02*	*1.52E-01*	*1.21E-02*	*1.69E-01*	*5.79E-02*	*1.06E-01*	*3.31E-02*	*0.00E+00*	*9.19E-02*	*0.00E+00*	*0.00E+00*
3	*6.63E-02*	*1.96E-03*	*9.58E-02*	*7.76E-02*	*1.10E-01*	*2.78E-03*	*7.20E-02*	*0.00E+00*	*4.35E-02*	*8.95E-02*	*0.00E+00*	*1.28E-01*
3.5	*0.00E+00*	*1.10E-01*	*1.41E-02*	*1.70E-02*	*3.40E-02*	*0.00E+00*	*6.59E-02*	*2.75E-03*	*0.00E+00*	*1.40E-02*	*2.54E-02*	*1.90E-01*
3.5	*5.94E-03*	*1.19E-01*	*9.02E-02*	*7.72E-02*	*0.00E+00*	*1.17E-01*	*2.92E-02*	*0.00E+00*	*4.11E-02*	*5.60E-02*	*5.55E-02*	*6.61E-02*
4	*0.00E+00*	*4.72E-02*	*0.00E+00*	*1.51E-01*	*3.28E-02*	*0.00E+00*	*7.63E-02*	*9.91E-02*	*1.08E-01*	*7.17E-02*	*0.00E+00*	*0.00E+00*
4	*6.76E-02*	*7.02E-02*	**7.84E-02**	*9.01E-02*	*3.80E-02*	*1.26E-01*	*1.22E-01*	*3.24E-02*	*1.43E-02*	*1.19E-01*	*1.52E-02*	*0.00E+00*
4.5	*4.50E-02*	*0.00E+00*	**1.25E-01**	*6.52E-02*	*5.35E-02*	*1.17E-01*	*1.73E-01*	*5.74E-02*	*1.78E-01*	*1.72E-01*	*1.44E-01*	*1.17E-01*
4.5	*1.74E-01*	*1.09E-01*	*1.96E-01*	*7.71E-02*	*4.24E-02*	*1.70E-01*	*9.93E-02*	*7.38E-02*	*3.63E-02*	*1.46E-01*	*0.00E+00*	*2.51E-01*
5	*1.38E-01*	*4.08E-02*	**1.73E-01**	*9.00E-02*	*8.03E-03*	*6.61E-02*	*8.64E-02*	*4.23E-02*	*6.46E-02*	*0.00E+00*	*2.05E-02*	*6.40E-02*
5	*1.08E-01*	*4.19E-02*	*1.64E-01*	*7.31E-03*	*0.00E+00*	*4.88E-02*	*0.00E+00*	*0.00E+00*	*6.71E-02*	*4.77E-02*	*4.81E-02*	*0.00E+00*
5.5	*1.85E-01*	*0.00E+00*	*3.92E-01*	*0.00E+00*	*0.00E+00*	*1.52E-01*	*7.82E-02*	*1.08E-01*	*1.14E-02*	*9.54E-02*	*0.00E+00*	*5.01E-02*
5.5	*5.26E-02*	*4.80E-02*	*1.27E-01*	*0.00E+00*	*0.00E+00*	*1.14E-01*				*4.49E-02*	*0.00E+00*	*0.00E+00*
6	*3.50E-02*	*3.75E-03*	**3.89E-01**	*0.00E+00*	*0.00E+00*	*1.10E-01*				*1.85E-02*	*3.21E-02*	*8.17E-02*
6				*1.39E-03*	*7.60E-02*	*1.44E-01*				*1.06E-01*	*3.91E-02*	*1.37E-01*
6.5				*1.25E-01*	*7.30E-02*	*0.00E+00*				*7.74E-02*	*1.01E-02*	*1.71E-01*
6.5				*0.00E+00*	*9.74E-02*	*0.00E+00*				*8.58E-02*	*0.00E+00*	*1.03E-01*
7				*0.00E+00*	*0.00E+00*	*2.25E-02*				*1.50E-01*	*5.89E-02*	*7.99E-02*

(1) Bold values indicate concentration greater than MDC. Italicized values indicate MDC value.

Table 3 (continued) - Summary of Auxiliary Building Continuing Characterization Concrete Core Samples (2017) - On-Site Analysis [(1)]

	B1-05105C-JFC-005-CV (542 foot U1 HPT)			B1-05105C-JFC-006-CV (542 foot U1 HPT)			B1-05105C-JWC-007-CV (542 foot U1 HPT)			B1-05105C-JWC-008-CV (542 foot U1 HPT)		
Depth	Co-60	Cs-134	Cs-137	Co-60	Cs-134	Cs-137	Co-60	Cs-134	Cs-137	Co-60	Cs-134	Cs-137
(in)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)
0	**2.08E+00**	*1.48E+00*	**9.06E+02**	**1.48E+00**	*1.09E-02*	**4.82E+02**	*1.31E-01*	*4.46E-03*	*5.29E-02*	**9.99E-01**	*1.19E-01*	**4.31E+00**
0.5	**1.90E+00**	*4.45E-01*	**6.95E+02**	**8.65E-01**	*3.49E-01*	**4.54E+02**	*1.86E-02*	*6.64E-02*	*7.18E-02*	**7.40E-01**	*0.00E+00*	**3.07E+00**
0.5	*6.49E-02*	*0.00E+00*	**1.53E+01**	*6.11E-02*	*0.00E+00*	**3.63E+00**	*0.00E+00*	*2.96E-02*	*2.27E-02*	*1.12E-01*	*0.00E+00*	*1.73E-02*
1	*1.72E-01*	*1.99E-01*	**1.17E+01**	*6.95E-02*	*7.74E-02*	**3.14E+00**	*1.98E-02*	*8.62E-02*	*0.00E+00*	*2.09E-02*	*2.05E-02*	*0.00E+00*
1	*4.66E-03*	*0.00E+00*	*2.19E-01*	*8.42E-02*	*0.00E+00*	**1.41E+00**	*5.91E-02*	*1.25E-01*	*0.00E+00*	*2.51E-02*	*7.14E-02*	*0.00E+00*
1.5	*9.33E-02*	*0.00E+00*	*1.99E-01*	*3.29E-03*	*9.91E-02*	**1.18E+00**	*0.00E+00*	*9.32E-02*	*6.54E-02*	*6.09E-02*	*5.64E-02*	*5.39E-02*
1.5	*0.00E+00*	*1.25E-01*	*1.93E-01*	*5.52E-02*	*0.00E+00*	**4.33E-01**	*1.10E-01*	*8.07E-03*	*0.00E+00*	*4.22E-02*	*5.32E-02*	*0.00E+00*
2	*7.48E-02*	*0.00E+00*	*7.33E-02*	*4.26E-03*	*3.76E-02*	**4.91E-01**	*0.00E+00*	*8.40E-02*	*0.00E+00*	*7.93E-02*	*4.04E-02*	*4.34E-02*
2	*9.07E-02*	*0.00E+00*	*2.78E-02*	*1.43E-02*	*4.59E-02*	*1.55E-01*	*9.81E-02*	*4.74E-02*	*0.00E+00*	*3.71E-02*	*8.01E-02*	*1.72E-01*
2.5	*5.18E-02*	*1.24E-02*	*0.00E+00*	*1.37E-01*	*8.99E-02*	2.34E-01	*4.49E-02*	*4.29E-02*	*1.74E-01*	*4.02E-02*	*0.00E+00*	*5.20E-02*
2.5	*6.97E-02*	*4.07E-03*	*4.04E-02*	*2.26E-02*	*0.00E+00*	**3.93E-01**	*9.73E-02*	*9.38E-02*	*0.00E+00*	*4.82E-02*	*6.24E-02*	*0.00E+00*
3	*3.85E-02*	*3.99E-02*	*1.67E-02*	*2.43E-02*	*5.66E-02*	**3.81E-01**	*4.29E-02*	*1.09E-01*	*1.52E-01*	*1.13E-01*	*1.17E-02*	*2.85E-02*
3	*6.06E-02*	*6.02E-02*	*8.84E-02*	*4.30E-02*	*0.00E+00*	*3.20E-01*	*6.94E-02*	*3.97E-02*	*1.80E-01*	*0.00E+00*	*4.53E-02*	*0.00E+00*
3.5	*1.51E-01*	*1.52E-01*	*1.41E-01*	*1.28E-01*	*1.07E-01*	*1.59E-01*	*9.48E-02*	*4.57E-01*	*6.50E-02*	*3.13E-02*	*1.16E-01*	*1.10E-01*
3.5	*1.42E-01*	*0.00E+00*	*1.86E-02*	*7.42E-02*	*3.45E-02*	**1.53E-01**	*2.73E-03*	*0.00E+00*	*2.48E-01*	*8.54E-02*	*3.03E-02*	*6.71E-02*
4	*4.24E-02*	*0.00E+00*	*0.00E+00*	*4.10E-02*	*0.00E+00*	**1.47E-01**	*1.31E-01*	*1.59E-01*	*2.17E-01*	*7.74E-02*	*7.97E-02*	*6.29E-02*
4	*3.02E-02*	*0.00E+00*	*4.27E-02*	*6.72E-02*	*0.00E+00*	**2.36E-01**	*1.85E-02*	*0.00E+00*	*0.00E+00*	*7.06E-03*	*3.73E-02*	*9.60E-02*
4.5	*8.49E-03*	*0.00E+00*	*0.00E+00*	*8.98E-02*	*5.20E-02*	**2.10E-01**	*1.77E-01*	*4.73E-02*	*1.57E-01*	*6.41E-02*	*1.55E-01*	*5.29E-02*
4.5	*2.25E-02*	*0.00E+00*	*0.00E+00*	*1.77E-01*	*8.71E-02*	**2.19E-01**	*1.09E-01*	*1.34E-01*	**9.14E-02**	*0.00E+00*	*0.00E+00*	*3.72E-03*
5	*0.00E+00*	*4.47E-02*	*1.09E-02*	*6.32E-02*	*1.21E-01*	*1.76E-01*	*5.09E-02*	*8.05E-02*	*9.22E-03*	*2.25E-02*	*0.00E+00*	*1.67E-01*
5	*1.44E-02*	*0.00E+00*	*4.36E-02*	*4.54E-02*	*2.61E-02*	**2.85E-01**	*7.98E-02*	*5.81E-02*	*2.16E-01*	*6.81E-02*	*2.66E-02*	*6.17E-02*
5.5	*5.50E-02*	*0.00E+00*	*9.01E-03*	*3.44E-02*	*0.00E+00*	**2.83E-01**	*1.20E-01*	*4.99E-02*	*0.00E+00*	*0.00E+00*	*8.11E-02*	*0.00E+00*
5.5				*1.18E-02*	*0.00E+00*	**9.37E-01**	*0.00E+00*	*1.91E-02*	*2.27E-02*			
6				*0.00E+00*	*0.00E+00*	**1.00E+00**	*6.28E-02*	*9.64E-02*	*0.00E+00*			
6				*6.57E-02*	*6.72E-03*	**8.72E+01**	**8.39E-01**	8.93E-02	**1.91E+00**			
6.5				*4.38E-02*	*0.00E+00*	**1.79E+02**	**1.52E+00**	6.67E-02	*5.29E-02*			
6.5												
7												

(1) Bold values indicate concentration greater than MDC. Italicized values indicate MDC value.

Table 3 (continued) - Summary of Auxiliary Building Continuing Characterization Concrete Core Samples (2017) - On-Site Analysis [(1)]

	B1-05106C-JFC-001-CV (542 foot U2 HPT)			B1-05106C-JFC-002-CV (542 foot U2 HPT)			B1-05106C-JFC-003-CV (542 foot U2 HPT)			B1-05106C-JFC-004-CV (542 foot U2 HPT)		
Depth (in)	Co-60 (pCi/g)	Cs-134 (pCi/g)	Cs-137 (pCi/g)	Co-60 (pCi/g)	Cs-134 (pCi/g)	Cs-137 (pCi/g)	Co-60 (pCi/g)	Cs-134 (pCi/g)	Cs-137 (pCi/g)	Co-60 (pCi/g)	Cs-134 (pCi/g)	Cs-137 (pCi/g)
0	*5.03E-02*	*0.00E+00*	**6.92E-01**	**6.02E-01**	*9.53E-02*	**8.85E+00**	**2.84E+01**	*4.39E-01*	**1.25E+03**	***2.36E+01***	*2.13E-02*	**1.01E+03**
0.5	*1.22E-01*	*1.47E-01*	**5.17E-01**	**5.07E-01**	*1.90E-02*	**5.94E+00**	**1.61E+01**	*1.12E-01*	**6.09E+02**	***1.54E+01***	*1.64E-01*	**6.09E+02**
0.5	*1.31E-01*	*0.00E+00*	*1.69E-01*	*1.96E-01*	*7.38E-02*	**3.98E-01**	*2.76E-01*	*2.28E-02*	**4.70E-01**	***5.27E-01***	*0.00E+00*	**1.04E+01**
1	*0.00E+00*	*1.65E-01*	*3.33E-01*	*2.01E-01*	*7.56E-02*	*3.58E-01*	*1.73E-01*	*1.76E-02*	**5.90E-01**	***5.08E-01***	*0.00E+00*	**8.97E+00**
1	*7.98E-02*	*9.99E-02*	**4.27E-01**	*0.00E+00*	*1.68E-01*	**1.78E-01**	*1.37E-01*	*3.96E-02*	**3.60E-01**	***3.87E-01***	*3.18E-02*	**6.76E+00**
1.5	*2.85E-02*	*9.17E-02*	**4.39E-01**	*1.95E-01*	*0.00E+00*	**1.53E-01**	*5.61E-02*	*0.00E+00*	*3.22E-01*	***5.37E-01***	*9.47E-02*	**6.53E+00**
1.5	*3.07E-02*	*0.00E+00*	**1.83E-01**	**5.59E-02**	*0.00E+00*	**2.15E-01**	*7.79E-02*	*0.00E+00*	**6.35E-02**	***1.74E+00***	*0.00E+00*	**2.81E+00**
2	*4.62E-02*	*2.20E-01*	**2.65E-01**	*6.38E-02*	*0.00E+00*	**3.58E-01**	*1.32E-01*	*0.00E+00*	**4.63E-02**	***2.37E-01***	*0.00E+00*	**2.55E+00**
2	*7.98E-02*	*0.00E+00*	*1.66E-01*	*7.48E-02*	*1.55E-01*	*1.55E-01*	*9.73E-02*	*8.10E-02*	*2.73E-01*	*2.29E-01*	*0.00E+00*	**8.22E-01**
2.5	*1.92E-01*	*0.00E+00*	*1.07E-02*	*1.46E-01*	*0.00E+00*	**2.18E-01**	*3.45E-02*	*8.22E-02*	*1.00E-01*	*1.76E-01*	*9.11E-02*	**6.38E-01**
2.5	*7.23E-02*	*0.00E+00*	**3.42E-01**	*8.28E-02*	*5.62E-02*	*2.74E-01*	*1.98E-01*	*2.05E-02*	*9.23E-02*	*1.07E-01*	*6.80E-03*	**1.62E-01**
3	*4.71E-02*	*5.77E-02*	*2.98E-01*	*1.18E-01*	*8.63E-03*	*0.00E+00*	*5.62E-02*	*0.00E+00*	*2.30E-01*	*7.88E-02*	*0.00E+00*	**1.44E-01**
3	*3.85E-02*	*2.26E-02*	*1.15E-01*	*1.11E-01*	*0.00E+00*	*1.13E-01*	*6.79E-02*	*2.91E-02*	*0.00E+00*	*4.17E-02*	*5.81E-02*	*1.30E-01*
3.5	*1.60E-02*	*2.22E-02*	**2.26E-01**	*1.35E-01*	*0.00E+00*	*1.03E-01*	*0.00E+00*	*0.00E+00*	*2.41E-02*	*1.11E-01*	*0.00E+00*	*0.00E+00*
3.5	*7.91E-03*	*0.00E+00*	*1.76E-01*	*1.68E-01*	*0.00E+00*	**1.03E-01**	*5.01E-02*	*2.18E-01*	*1.48E-01*	*9.53E-02*	*0.00E+00*	**1.17E-01**
4	*1.09E-01*	*9.82E-02*	**2.18E-01**	*9.66E-02*	*1.93E-02*	**2.27E-01**	*0.00E+00*	*1.85E-01*	**9.40E-02**	*1.54E-01*	*0.00E+00*	*1.14E-01*
4	*1.46E-02*	*0.00E+00*	*4.44E-01*	*8.47E-02*	*4.75E-02*	*3.15E-02*	*2.75E-02*	*3.33E-04*	*1.05E-01*	*9.44E-03*	*7.48E-02*	*1.76E-01*
4.5	*6.96E-02*	*2.84E-02*	*3.69E-01*	*8.46E-03*	*4.86E-02*	*0.00E+00*	*2.19E-02*	*6.02E-02*	*1.56E-01*	*6.04E-03*	*5.36E-02*	*2.08E-02*
4.5	*6.01E-03*	*1.51E-01*	*1.23E-01*	*6.98E-02*	*0.00E+00*	*3.16E-02*	*4.59E-02*	*0.00E+00*	*5.06E-02*	*4.94E-02*	*0.00E+00*	*0.00E+00*
5	*1.65E-01*	*1.51E-01*	*1.63E-01*	*1.91E-01*	*0.00E+00*	*9.85E-02*	*5.82E-02*	*0.00E+00*	*7.03E-02*	*1.70E-02*	*0.00E+00*	*2.23E-02*
5	*9.35E-02*	*1.20E-02*	*9.71E-02*	*0.00E+00*	*1.70E-02*	*1.66E-01*	*6.11E-02*	*0.00E+00*	*6.87E-02*	*7.43E-02*	*0.00E+00*	*6.14E-03*
5.5	*6.68E-02*	*0.00E+00*	*9.56E-02*	*2.79E-02*	*0.00E+00*	*7.39E-02*	*3.67E-02*	*0.00E+00*	*2.92E-02*	*8.92E-02*	*1.18E-01*	*1.73E-01*
5.5	*2.06E-02*	*0.00E+00*	**2.60E-01**	*1.07E-01*	*2.73E-01*	*2.36E-01*	*5.50E-02*	*0.00E+00*	*1.71E-02*	*1.56E-02*	*0.00E+00*	*1.42E-01*
6	*1.63E-03*	*2.99E-02*	**1.84E-01**	*1.65E-02*	*1.52E-01*	*6.63E-02*	*0.00E+00*	*0.00E+00*	*1.26E-02*	*8.66E-02*	*1.11E-02*	*1.45E-01*
6	*8.79E-02*	*6.38E-02*	*2.07E-01*				*2.46E-02*	*0.00E+00*	*4.82E-02*			
6.5	*1.06E-01*	*0.00E+00*	*1.27E-01*				*1.16E-01*	*0.00E+00*	*1.00E-01*			
6.5	*2.40E-01*	*0.00E+00*	**1.52E+00**				*6.12E-02*	*5.78E-03*	**1.08E-01**			
7	*2.00E-01*	*4.36E-02*	**1.20E+00**				*0.00E+00*	*8.26E-03*	*2.65E-01*			

(1) Bold values indicate concentration greater than MDC. Italicized values indicate MDC value.

Table 3 (continued) - Summary of Auxiliary Building Continuing Characterization Concrete Core Samples (2017) - On-Site Analysis [(1)]

	B1-05106C-JWC-005-CV (542 foot U2 HPT)			B1-05106C-JWC-006-CV (542 foot U2 HPT)			B1-05106C-JWC-007-CV (542 foot U2 HPT)			B1-05106C-JWC-008-CV (542 foot U2 HPT)		
Depth	Co-60	Cs-134	Cs-137	Co-60	Cs-134	Cs-137	Co-60	Cs-134	Cs-137	Co-60	Cs-134	Cs-137
(in)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)
0	**5.86E-01**	*0.00E+00*	**2.90E+00**	*3.25E-01*	*1.14E-01*	**9.83E-01**	**2.47E+01**	*3.67E-01*	**1.83E+02**	**2.28E+00**	*1.11E-01*	**1.52E+01**
0.5	**3.45E-01**	*0.00E+00*	**1.87E+00**	*1.60E-01*	*6.01E-02*	**6.94E-01**	**1.77E+01**	*2.10E-01*	**1.18E+02**	**1.51E+00**	*9.69E-02*	**8.15E+00**
0.5	*1.47E-01*	*2.21E-02*	*1.07E-01*	*1.15E-01*	*1.36E-01*	*8.83E-02*	*2.53E-01*	*1.71E-01*	**2.27E-01**	*1.07E-01*	*0.00E+00*	*1.15E-01*
1	*1.74E-01*	*0.00E+00*	*2.04E-03*	*1.63E-02*	*3.93E-02*	*4.38E-03*	*1.21E-01*	*1.41E-02*	*9.88E-02*	*1.58E-01*	*0.00E+00*	*1.18E-01*
1	*0.00E+00*	*5.70E-02*	*8.92E-02*	*8.27E-02*	*6.13E-02*	*0.00E+00*	*7.21E-02*	*4.61E-04*	**2.20E-01**	*4.51E-02*	*8.07E-02*	*1.12E-01*
1.5	*1.26E-01*	*8.64E-02*	*3.95E-02*	*6.22E-02*	*0.00E+00*	*2.60E-01*	*1.11E-01*	*0.00E+00*	*1.98E-01*	*1.45E-01*	*0.00E+00*	*9.95E-02*
1.5	*9.62E-02*	*1.14E-01*	**1.27E-01**	*4.63E-02*	*1.87E-01*	*1.52E-01*	*7.04E-02*	*0.00E+00*	**2.09E-01**	*3.03E-02*	*0.00E+00*	*9.35E-02*
2	*9.62E-02*	*7.57E-02*	**1.10E-01**	**1.16E-01**	*8.70E-02*	**1.06E-01**	*6.24E-02*	*1.75E-01*	**1.73E-01**	*7.41E-02*	*1.31E-02*	*6.67E-02*
2	*1.40E-01*	*1.13E-02*	*1.03E-01*	*1.48E-01*	*0.00E+00*	*1.35E-01*	*4.39E-02*	*0.00E+00*	**1.94E-01**	*6.43E-02*	*7.32E-02*	*8.46E-02*
2.5	*1.36E-01*	*0.00E+00*	*7.78E-02*	*1.31E-01*	*1.15E-03*	*1.72E-01*	*8.75E-02*	*3.75E-02*	**2.37E-01**	*0.00E+00*	*0.00E+00*	*1.03E-01*
2.5	*6.58E-02*	*3.04E-02*	*3.60E-02*	*1.03E-01*	*6.00E-02*	*1.17E-01*	*3.91E-02*	*6.80E-03*	*7.86E-03*	*1.32E-01*	*5.66E-02*	*2.34E-01*
3	*1.30E-02*	*3.98E-02*	*1.60E-01*	*1.72E-01*	*0.00E+00*	*1.90E-01*	*1.03E-01*	*5.16E-02*	*1.70E-01*	*1.14E-01*	*5.99E-03*	**1.30E-01**
3	*5.24E-02*	*0.00E+00*	*0.00E+00*	*5.03E-02*	*4.18E-02*	*1.94E-01*	*7.34E-02*	*9.22E-02*	*2.35E-01*	*1.56E-01*	*3.13E-02*	*1.59E-02*
3.5	*2.10E-02*	*2.65E-02*	*6.43E-02*	*8.56E-02*	*0.00E+00*	*1.94E-01*	*1.23E-01*	*4.61E-02*	*2.19E-01*	*3.72E-02*	*2.91E-02*	*2.19E-02*
3.5	*4.21E-02*	*5.84E-02*	*6.64E-02*	*9.82E-02*	*5.84E-02*	*0.00E+00*	*9.24E-02*	*1.68E-01*	**1.62E-01**	*1.39E-01*	*0.00E+00*	*1.41E-01*
4	*9.54E-02*	*0.00E+00*	*6.23E-02*	*3.25E-02*	*4.85E-02*	*1.53E-01*	*8.70E-02*	*2.03E-02*	**1.34E-01**	*8.55E-02*	*8.34E-02*	*0.00E+00*
4	*5.50E-02*	*2.12E-02*	*1.58E-01*	*0.00E+00*	*0.00E+00*	*0.00E+00*	*2.34E-02*	*1.64E-01*	*2.38E-01*	*0.00E+00*	*1.40E-01*	*1.57E-02*
4.5	*1.61E-01*	*0.00E+00*	*3.17E-02*	*2.11E-02*	*1.02E-01*	*8.96E-02*	*1.12E-01*	*1.04E-01*	*9.57E-02*	*5.47E-02*	*0.00E+00*	*7.45E-03*
4.5	*2.68E-02*	*0.00E+00*	*0.00E+00*	*6.72E-02*	*3.41E-02*	*2.33E-01*	*1.51E-01*	*8.68E-02*	*1.43E-01*	*0.00E+00*	*0.00E+00*	*3.48E-02*
5	*8.05E-03*	*7.66E-02*	*0.00E+00*	*2.03E-01*	*1.58E-01*	**1.55E-01**	*1.66E-01*	*1.22E-01*	*1.50E-01*	*1.78E-01*	*1.99E-01*	*0.00E+00*
5	*7.09E-02*	*5.49E-02*	*3.82E-02*	*1.96E-01*	*1.96E-01*	*1.58E-01*	*1.17E-01*	*0.00E+00*	*2.91E-01*	*1.02E-01*	*0.00E+00*	*9.94E-02*
5.5	*9.19E-02*	*4.68E-02*	*9.19E-02*	*1.81E-01*	*2.97E-03*	*2.47E-01*	*8.34E-02*	*9.92E-03*	**3.26E-01**	*1.02E-01*	*1.90E-01*	*1.23E-01*
5.5												
6												
6												
6.5												
6.5												
7												

(1) Bold values indicate concentration greater than MDC. Italicized values indicate MDC value.

Table 3 (continued) - Summary of Auxiliary Building Continuing Characterization Concrete Core Samples (2017) - On-Site Analysis [1]

	B1-05107C-JFC-001-CV (542 foot HUT)			B1-05107C-JFC-002-CV (542 foot HUT)			B1-05107C-JFC-003-CV (542 foot HUT)			B1-05107C-JFC-004-CV (542 foot HUT)		
Depth	Co-60	Cs-134	Cs-137	Co-60	Cs-134	Cs-137	Co-60	Cs-134	Cs-137	Co-60	Cs-134	Cs-137
(in)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)
0	*2.22E+01*	*1.81E-01*	*1.18E+03*	**1.07E+00**	*2.60E-02*	**1.83E+01**	**2.61E+01**	*2.52E-01*	**2.02E+02**	*3.44E+00*	*0.00E+00*	*2.55E+02*
0.5	*2.43E+01*	*3.09E-01*	*1.41E+03*	**5.97E-01**	*7.20E-03*	**7.71E+00**	**1.86E+01**	*2.40E-01*	**1.26E+02**	*2.64E+00*	*1.44E-01*	*1.38E+02*
0.5	*1.16E+01*	*2.52E-01*	*5.82E+02*	*2.25E-03*	*1.16E-01*	*6.49E-02*	*0.00E+00*	*1.13E-01*	*2.63E-01*	*4.92E-01*	*1.01E-02*	*8.26E-01*
1	*1.00E+01*	*1.95E-01*	*5.19E+02*	*8.65E-02*	*2.76E-02*	*2.55E-03*	*5.31E-02*	*0.00E+00*	**1.70E-01**	*4.53E-01*	*6.91E-02*	*5.45E-01*
1	*4.56E+00*	*0.00E+00*	*8.27E+01*	*1.26E-01*	*0.00E+00*	*0.00E+00*	*9.93E-02*	*6.73E-02*	**2.04E-01**	*1.87E-01*	*1.62E-01*	*6.37E-02*
1.5	*4.04E+00*	*5.22E-02*	*6.84E+01*	*3.29E-02*	*0.00E+00*	*8.93E-02*	*0.00E+00*	*1.26E-01*	**1.20E-01**	*2.38E-01*	*1.59E-02*	*9.56E-02*
1.5	*2.95E+00*	*0.00E+00*	*3.13E+01*	*7.40E-02*	*0.00E+00*	*0.00E+00*	*4.46E-02*	*0.00E+00*	**1.61E-01**	*2.37E-02*	*6.44E-02*	*5.76E-02*
2	*2.51E+00*	*2.79E-01*	*2.47E+01*	*1.15E-01*	*1.08E-01*	*1.70E-01*	*3.88E-02*	*0.00E+00*	**1.67E-01**	*9.14E-02*	*4.13E-02*	*9.69E-02*
2	*1.58E+00*	*0.00E+00*	*1.09E+01*	*1.16E-01*	*5.75E-02*	*1.13E-01*	*3.01E-02*	*3.16E-02*	*2.31E-01*	*6.56E-02*	*1.63E-02*	*1.66E-01*
2.5	*1.49E+00*	*1.74E-01*	*1.14E+01*	*0.00E+00*	*0.00E+00*	*1.02E-01*	*1.59E-01*	*0.00E+00*	*1.90E-01*	*1.43E-01*	*6.84E-02*	*1.33E-01*
2.5	*1.32E+00*	*1.10E-01*	*9.13E+00*	*1.20E-01*	*0.00E+00*	*4.99E-02*	*9.55E-02*	*8.96E-02*	*1.34E-01*	*1.74E-01*	*1.64E-01*	*2.71E-01*
3	*1.24E+00*	*4.33E-02*	*9.85E+00*	*0.00E+00*	*1.30E-02*	*6.42E-02*	*1.16E-01*	*0.00E+00*	*1.18E-01*	*1.59E-01*	*6.27E-02*	*9.70E-02*
3	*7.37E-01*	*8.93E-03*	*7.42E+00*	*6.55E-02*	*0.00E+00*	*8.34E-02*	*1.71E-02*	*0.00E+00*	*4.40E-02*	*7.88E-02*	*7.90E-03*	*9.80E-02*
3.5	*8.46E-01*	*2.57E-02*	*6.43E+00*	*9.30E-03*	*9.36E-02*	*5.72E-02*	*7.25E-02*	*0.00E+00*	*1.69E-01*	*9.61E-02*	*9.91E-03*	*9.85E-03*
3.5	*4.50E-01*	*8.63E-02*	*5.60E+00*	*6.74E-02*	*7.92E-02*	*0.00E+00*	*6.57E-02*	*3.96E-02*	**1.92E-01**	*1.43E-02*	*6.16E-02*	*4.53E-02*
4	*5.24E-01*	*4.39E-02*	*6.08E+00*	*4.90E-02*	*1.56E-01*	*6.21E-02*	*5.76E-04*	*9.89E-02*	**1.32E-01**	*9.65E-02*	*0.00E+00*	*0.00E+00*
4	*7.40E-01*	*1.29E-02*	*6.27E+00*	*1.04E-01*	*2.26E-03*	*1.20E-01*	*1.07E-01*	*1.11E-03*	*2.66E-02*	*1.18E-01*	*1.35E-01*	*0.00E+00*
4.5				*8.25E-02*	*1.14E-02*	*1.13E-01*	*6.40E-02*	*1.39E-02*	**1.60E-01**	*7.99E-02*	*1.18E-01*	*2.14E-01*
4.5				*4.08E-03*	*1.30E-01*	*1.89E-01*	*1.67E-01*	*4.78E-02*	*1.32E-01*	*7.42E-02*	*0.00E+00*	*2.61E-02*
5	*6.04E-01*	*1.89E-02*	*5.30E+00*	*6.99E-02*	*1.40E-02*	*0.00E+00*	*4.15E-02*	*0.00E+00*	**1.45E-01**	*4.52E-02*	*0.00E+00*	*0.00E+00*
5	*2.51E-01*	*8.88E-02*	*2.12E+00*	*3.49E-02*	*8.78E-02*	*3.66E-02*	*8.07E-02*	*7.38E-02*	*1.41E-01*	*4.10E-02*	*2.96E-02*	*1.17E-01*
5.5	*3.72E-01*	*6.98E-02*	*2.04E+00*	*1.07E-01*	*1.20E-01*	*0.00E+00*	*6.72E-02*	*0.00E+00*	*2.11E-01*	*6.84E-02*	*2.32E-03*	*4.37E-02*
5.5	*2.03E-01*	*0.00E+00*	*9.12E-01*	*0.00E+00*	*1.10E-01*	*1.34E-01*				*2.98E-02*	*9.90E-02*	*3.27E-02*
6	*1.41E-02*	*4.42E-02*	*7.58E-01*	*4.27E-03*	*4.31E-03*	*1.20E-01*				*4.38E-02*	*1.46E-01*	*1.19E-01*
6				*2.35E-02*	*0.00E+00*	*1.23E-01*						
6.5				*1.51E-02*	*5.20E-02*	*8.39E-02*						
6.5												
7												

(1) Bold values indicate concentration greater than MDC. Italicized values indicate MDC value.

Table 3 (continued) - Summary of Auxiliary Building Continuing Characterization Concrete Core Samples (2017) - On-Site Analysis [1]

	B1-05107C-JWC-005-CV (542 foot HUT)			B1-05107C-JWC-006-CV (542 foot HUT)			B1-05107C-JWC-007-CV (542 foot HUT)			B1-05107C-JWC-008-CV (542 foot HUT)		
Depth (in)	Co-60 (pCi/g)	Cs-134 (pCi/g)	Cs-137 (pCi/g)	Co-60 (pCi/g)	Cs-134 (pCi/g)	Cs-137 (pCi/g)	Co-60 (pCi/g)	Cs-134 (pCi/g)	Cs-137 (pCi/g)	Co-60 (pCi/g)	Cs-134 (pCi/g)	Cs-137 (pCi/g)
0	**4.74E-01**	*4.52E-01*	**2.43E+03**	***2.86E+01***	*1.80E+00*	**1.36E+04**	*1.84E+01*	*4.48E-01*	*3.79E+02*	**2.56E+00**	*0.00E+00*	**1.14E+04**
0.5	*4.84E-01*	*5.05E-01*	**1.67E+03**	***2.11E+01***	*3.72E+00*	**1.24E+04**	*1.44E+01*	*6.94E-01*	*2.86E+02*	**1.46E+00**	*0.00E+00*	**7.97E+03**
0.5	*1.34E-01*	*3.77E-02*	**8.67E-01**	*3.69E-02*	*9.06E-02*	**1.64E+03**	*1.48E+00*	*8.30E-02*	*2.77E+01*	**3.17E-01**	*1.62E-01*	**2.02E+03**
1	*2.01E-01*	*1.23E-01*	**7.04E-01**	*7.93E-01*	*8.03E-02*	**6.11E+03**	*1.67E+00*	*2.37E-02*	*2.39E+01*	**2.89E-01**	*5.12E-01*	**1.79E+03**
1	*2.48E-02*	*6.59E-02*	**8.90E-01**	*1.37E-01*	*9.62E-02*	**3.06E+03**	*1.46E+00*	*1.57E-02*	*2.23E+01*	*2.51E-01*	*1.81E-01*	**7.60E+02**
1.5	*1.31E-01*	*5.84E-02*	**5.40E-01**	*1.87E-01*	*2.72E-02*	**8.03E+02**	*1.21E+00*	*0.00E+00*	*1.78E+01*	*5.68E-02*	*1.40E-01*	**8.87E+02**
1.5	*1.47E-03*	*1.24E-04*	**9.19E-01**	***1.28E-01***	*0.00E+00*	**2.60E+02**	*9.70E-01*	*0.00E+00*	*4.16E+00*	*4.19E-02*	*3.17E-03*	**3.01E+02**
2	*1.08E+00*	*6.99E-02*	**1.08E+00**	***1.12E-01***	*4.06E-01*	**1.79E+02**	*7.81E-01*	*2.73E-01*	*3.98E+00*	*1.15E-01*	*0.00E+00*	**3.42E+02**
2	*7.68E-02*	*2.40E-02*	**5.22E-01**	*2.39E-01*	*0.00E+00*	**2.82E+01**	*2.45E-01*	*3.16E-02*	*8.60E-01*	*1.17E-01*	*1.04E-02*	**9.89E+01**
2.5	*1.11E-01*	*5.70E-02*	**5.48E-01**	*2.05E-01*	*1.82E-02*	**2.52E+01**	*2.47E-01*	*1.78E-02*	*2.32E-01*	*4.06E-02*	*0.00E+00*	**7.46E+01**
2.5	*1.21E-01*	*1.40E-02*	**3.44E-01**	*1.74E-01*	*2.67E-01*	**1.12E+01**	*3.75E-01*	*1.66E-01*	*2.53E-01*	*2.08E-02*	*8.68E-02*	**6.84E-01**
3	*7.30E-02*	*2.38E-03*	**3.36E-01**	*1.17E-01*	*0.00E+00*	**8.30E+00**	*5.36E-01*	*2.35E-01*	*2.15E-01*	*1.04E-01*	*8.72E-02*	**7.15E-01**
3	*3.64E-02*	*3.67E-02*	**5.13E-01**	*4.04E-02*	*0.00E+00*	**1.59E+00**	*1.88E-01*	*7.32E-02*	*1.52E-01*	*9.61E-02*	*8.04E-02*	**1.23E+00**
3.5	*3.40E-02*	*0.00E+00*	**3.52E-01**				*4.96E-02*	*3.90E-02*	*1.80E-01*	*8.41E-02*	*1.10E-01*	**5.91E-01**
3.5	*1.31E-01*	*2.61E-02*	**6.51E-01**				*1.46E-01*	*0.00E+00*	*1.29E-01*	*1.25E-02*	*0.00E+00*	**2.59E-01**
4	*0.00E+00*	*1.23E-01*	**3.73E-01**	*3.26E-02*	*0.00E+00*	**7.20E-01**	*0.00E+00*	*0.00E+00*	*1.54E-01*	*2.39E-02*	*0.00E+00*	**1.93E-01**
4	*6.22E-02*	*1.79E-02*	**6.96E-01**	*4.85E-02*	*0.00E+00*	**4.91E-01**	*1.01E-01*	*4.39E-02*	*1.82E-01*	*1.84E-01*	*4.36E-02*	**5.69E-01**
4.5	*1.22E-01*	*0.00E+00*	**5.54E-01**	*7.02E-02*	*0.00E+00*	**5.90E-01**	*1.75E-01*	*1.22E-02*	*1.61E-01*	*5.81E-02*	*2.26E-02*	**7.31E-01**
4.5	*7.46E-02*	*2.87E-02*	*0.00E+00*	*8.33E-02*	*7.48E-03*	**2.73E-01**	*6.30E-02*	*5.15E-02*	*1.09E-01*	*1.24E-01*	*0.00E+00*	**4.15E-01**
5	*6.44E-03*	*4.25E-02*	*3.43E-02*	*1.20E-01*	*0.00E+00*	**2.13E-01**	*8.05E-02*	*3.75E-02*	*1.35E-01*	*5.53E-02*	*1.09E-01*	**4.31E-01**
5	*9.50E-02*	*0.00E+00*	**1.80E-01**	*1.34E-01*	*0.00E+00*	*1.95E-01*	*1.16E-01*	*0.00E+00*	*0.00E+00*	*3.38E-02*	*0.00E+00*	**2.32E-01**
5.5	*8.32E-02*	*0.00E+00*	*1.62E-01*	*1.63E-02*	*7.46E-02*	*2.21E-01*	*1.33E-01*	*0.00E+00*	*9.93E-02*	*0.00E+00*	*1.11E-01*	*2.04E-01*
5.5	*6.72E-02*	*7.53E-03*	**8.71E-02**	*4.95E-02*	*1.41E-02*	**5.29E-01**	*5.80E-02*	*0.00E+00*	*9.18E-02*	*8.11E-02*	*4.37E-02*	*1.61E-01*
6	*1.16E-02*	*2.26E-01*	*2.47E-02*	*9.01E-02*	*1.26E-02*	**5.07E-01**	*1.05E-01*	*5.10E-03*	*1.89E-01*	*7.71E-02*	*3.35E-02*	**1.69E-01**
6	*1.62E-01*	*4.54E-02*	*1.67E-01*	*1.24E-01*	*0.00E+00*	**1.61E-01**	*1.30E-02*	*5.39E-03*	*1.25E-01*	*2.19E-02*	*7.36E-03*	**1.77E-01**
6.5	*7.35E-03*	*0.00E+00*	*0.00E+00*	*4.40E-02*	*9.35E-02*	**2.00E-01**	*4.31E-02*	*2.98E-02*	*3.46E-02*	*4.23E-02*	*1.77E-02*	**3.41E-01**
6.5	*3.02E-03*	*1.16E-02*	*8.90E-02*	*8.71E-02*	*4.53E-02*	**8.62E-01**	*1.84E+01*	*4.48E-01*	*3.79E+02*	*1.09E-01*	*1.28E-01*	*2.45E-01*
7	*1.59E-01*	*4.33E-02*	*1.33E-01*	*5.05E-02*	*8.64E-03*	**8.66E-01**	*1.44E+01*	*6.94E-01*	*2.86E+02*	*6.56E-02*	*0.00E+00*	*1.75E-01*
7	*3.09E-02*	*3.24E-03*	*2.40E-01*	*1.18E-01*	*5.88E-02*	*2.43E-02*				*3.78E-02*	*4.04E-02*	*1.64E-01*
7.5	*1.08E-01*	*0.00E+00*	*6.32E-02*	*3.02E-02*	*9.40E-03*	*3.45E-01*				*8.01E-02*	*8.93E-02*	*1.70E-01*

(1) Bold values indicate concentration greater than MDC. Italicized values indicate MDC value.

Table 3 (continued) - Summary of Auxiliary Building Continuing Characterization Concrete Core Samples (2017) - On-Site Analysis [(1)]

	B1-05100C-JFC-001-CV (542 foot Floor)			B1-05100C-JFC-002-CV (542 foot Floor)			B1-05100C-JFC-003-CV (542 foot Floor)			B1-05100C-JFC-004-CV (542 foot Floor)		
Depth (in)	Co-60 (pCi/g)	Cs-134 (pCi/g)	Cs-137 (pCi/g)	Co-60 (pCi/g)	Cs-134 (pCi/g)	Cs-137 (pCi/g)	Co-60 (pCi/g)	Cs-134 (pCi/g)	Cs-137 (pCi/g)	Co-60 (pCi/g)	Cs-134 (pCi/g)	Cs-137 (pCi/g)
0	**6.88E+00**	*0.00E+00*	**1.02E+03**	**4.35E+00**	*1.89E-01*	**8.63E+01**	*2.33E+01*	*3.89E-01*	*2.12E+03*	**1.11E+01**	*0.00E+00*	**3.12E+01**
0.5	**8.17E+00**	*2.08E-01*	**1.10E+03**	**4.02E+00**	*1.99E-01*	**4.39E+01**	*2.81E+01*	*2.23E-01*	*2.52E+03*	**1.02E+01**	*1.31E-01*	**2.17E+01**
0.5	**7.87E+00**	*2.90E-01*	**5.31E+02**	*1.13E-01*	*0.00E+00*	**5.44E-01**	*9.65E+00*	*2.07E-01*	*3.64E+02*	**2.17E+00**	*1.16E-03*	**2.03E+00**
1	**7.04E+00**	*9.82E-02*	**4.41E+02**	*9.23E-03*	*1.41E-01*	**5.48E-01**	*1.11E+01*	*1.35E-01*	*4.45E+02*	**2.48E+00**	*1.70E-01*	**2.60E+00**
1	**3.21E+00**	*2.75E-01*	**1.38E+02**	*7.75E-02*	*0.00E+00*	**4.34E-01**	*4.59E+00*	*3.38E-01*	*2.67E+02*	**1.07E+00**	*3.73E-02*	**2.46E+00**
1.5	**3.07E+00**	*1.94E-01*	**1.57E+02**	*4.44E-01*	*0.00E+00*	**4.44E-01**	*9.35E+00*	*5.39E-02*	*5.42E+02*	**8.64E-01**	*0.00E+00*	**1.98E+00**
1.5	**2.82E-01**	*0.00E+00*	**1.24E+01**	*5.01E-02*	*1.42E-02*	**2.29E-01**	*5.30E-01*	*3.41E-01*	*2.50E+01*	**1.33E-01**	*0.00E+00*	**1.14E+00**
2	**3.60E-01**	*0.00E+00*	**1.89E+01**	*2.45E-02*	*1.83E-03*	**2.05E-01**	*8.24E-01*	*5.39E-02*	*3.25E+01*	*9.48E-02*	*0.00E+00*	**1.21E+00**
2	**8.52E-01**	*0.00E+00*	**4.91E+01**	*1.76E-01*	*0.00E+00*	*2.58E-01*	*1.65E+00*	*0.00E+00*	*6.81E+01*	*2.04E-01*	*2.04E-01*	**1.87E+00**
2.5	**6.40E-01**	*2.16E-02*	**3.64E+01**	*1.89E-01*	*2.54E-02*	**1.32E-01**	*1.43E+00*	*0.00E+00*	*5.56E+01*	*3.32E-01*	*0.00E+00*	**1.83E+00**
2.5	*1.68E-02*	*5.44E-02*	**3.76E-01**	*5.47E-02*	*5.78E-02*	*3.08E-01*	*6.81E+00*	*4.61E-01*	*1.57E+02*	*1.10E-01*	*5.04E-02*	**9.25E-01**
3	*1.62E-01*	*3.86E-03*	*2.63E-01*	*0.00E+00*	*1.55E-01*	*2.08E-01*	*9.14E+00*	*1.46E-02*	*2.00E+02*	*1.09E-01*	*2.60E-02*	**7.33E-01**
3	*2.49E-02*	*5.32E-02*	*5.97E-02*	*9.28E-02*	*0.00E+00*	*3.33E-01*	*1.12E+01*	*6.51E-02*	*1.48E+02*	*8.66E-02*	*0.00E+00*	*1.16E-01*
3.5	*6.85E-02*	*7.79E-03*	*1.50E-01*	*1.86E-02*	*0.00E+00*	*3.65E-01*	*1.00E+01*	*2.35E-01*	*1.36E+02*	*4.06E-02*	*0.00E+00*	*2.13E-01*
3.5	*0.00E+00*	*1.42E-02*	*5.74E-02*	*6.11E-02*	*1.51E-02*	**2.31E-01**	*5.93E+00*	*0.00E+00*	*9.51E+01*	*1.62E-02*	*5.08E-02*	**6.86E-02**
4	*3.89E-02*	*5.17E-02*	*1.21E-01*	*1.04E-01*	*6.89E-02*	**2.65E-01**	*5.23E+00*	*5.84E-01*	*7.06E+01*	*0.00E+00*	*0.00E+00*	**4.94E-02**
4	*1.47E-01*	*4.17E-02*	*2.45E-02*	*1.95E-02*	*0.00E+00*	**2.31E-01**	*2.03E+00*	*8.95E-03*	*2.27E+01*	*2.53E-01*	*0.00E+00*	**3.67E+00**
4.5	*8.77E-02*	*7.23E-02*	*1.25E-01*	*3.17E-02*	*1.18E-01*	*2.84E-01*	*1.44E+00*	*7.31E-02*	*1.97E+01*	*2.87E-01*	*2.72E-02*	**4.74E+00**
4.5	*1.02E-01*	*3.68E-02*	*1.18E-01*	**5.78E+01**	*0.00E+00*	**3.83E+02**	*1.14E-01*	*9.99E-03*	*4.00E+00*	**3.27E+00**	*2.04E-01*	**1.06E+01**
5	*6.99E-02*	*5.83E-02*	*1.19E-01*	**5.73E+01**	*7.50E-01*	**3.75E+02**	*4.88E-02*	*0.00E+00*	*6.27E+00*	**1.84E+00**	*0.00E+00*	**7.26E+00**
5	*4.36E-02*	*1.59E-01*	*2.78E-03*	*1.83E-01*	*0.00E+00*	**1.65E+01**	*1.14E-01*	*1.30E-01*	*2.45E+00*	*5.81E-02*	*1.02E-01*	**6.96E-01**
5.5	*0.00E+00*	*9.21E-03*	*5.84E-02*	*2.69E-01*	*1.08E-01*	**1.65E+01**	*5.68E-02*	*8.38E-03*	*3.21E+00*	*0.00E+00*	*3.10E-02*	**6.44E-01**
5.5				*4.72E-02*	*7.32E-02*	**6.04E-01**	*1.06E-01*	*1.85E-03*	*2.92E+00*	*1.86E-02*	*1.30E-01*	*1.04E-01*
6				*1.70E-02*	*1.07E-01*	**5.87E-01**	*1.05E-01*	*2.47E-02*	*3.29E+00*	*0.00E+00*	*1.08E-02*	**8.65E-02**
6				*1.01E-01*	*7.99E-02*	**6.15E-01**	*5.04E-01*	*5.03E-02*	*1.26E+01*			
6.5				*0.00E+00*	*6.07E-02*	**5.34E-01**	*4.41E-01*	*1.62E-02*	*1.04E+01*			
6.5				*1.46E-01*	*0.00E+00*	**5.13E-01**	*1.05E-01*	*4.91E-02*	*5.01E+00*			
7				*1.60E-01*	*0.00E+00*	**5.12E-01**	*1.70E-01*	*1.56E-01*	*5.01E+00*			
7							*5.79E+00*	*1.18E-01*	*3.35E+02*			
7.5							*1.15E+01*	*4.35E-01*	*7.66E+02*			

(1) Bold values indicate concentration greater than MDC. Italicized values indicate MDC value.

Table 3 (continued) - Summary of Auxiliary Building Continuing Characterization Concrete Core Samples (2017) - On-Site Analysis [(1)]

	B1-05100C-JFC-005-CV (542 foot Floor)			B1-05100C-JFC-006-CV (542 foot Floor)			B1-05100C-JFC-007-CV (542 foot Floor)			B1-05100C-JFC-008-CV (542 foot Floor)		
Depth (in)	Co-60 (pCi/g)	Cs-134 (pCi/g)	Cs-137 (pCi/g)	Co-60 (pCi/g)	Cs-134 (pCi/g)	Cs-137 (pCi/g)	Co-60 (pCi/g)	Cs-134 (pCi/g)	Cs-137 (pCi/g)	Co-60 (pCi/g)	Cs-134 (pCi/g)	Cs-137 (pCi/g)
0	**3.50E+00**	*2.28E-02*	**1.50E+01**	*9.96E-02*	*3.20E-02*	**6.15E+00**	*2.34E+00*	*1.16E-02*	*2.62E+01*	*2.55E-01*	*1.64E-01*	**2.12E+00**
0.5	**2.20E+00**	*5.40E-02*	**8.90E+00**	*8.43E-02*	*0.00E+00*	**3.52E+00**	*2.21E+00*	*1.52E-01*	*1.48E+01*	*1.37E-01*	*1.07E-01*	**1.23E+00**
0.5	*2.14E-01*	*6.02E-02*	**4.14E-01**	*0.00E+00*	*3.95E-02*	*7.92E-02*	*5.56E-01*	*4.51E-02*	*2.18E-01*	*0.00E+00*	*0.00E+00*	*7.16E-03*
1	*2.59E-01*	*6.13E-02*	*4.60E-01*	*4.94E-03*	*0.00E+00*	*0.00E+00*	*5.38E-01*	*0.00E+00*	*1.67E-01*	*9.26E-02*	*6.77E-02*	*0.00E+00*
1	*7.95E-01*	*5.58E-02*	*1.16E+02*	*4.37E-02*	*1.05E-01*	*0.00E+00*	*1.89E-01*	*0.00E+00*	*0.00E+00*	*1.40E-01*	*7.61E-02*	*7.32E-02*
1.5	*8.81E-01*	*5.31E-02*	*1.13E+02*	*4.77E-02*	*7.75E-02*	*0.00E+00*	*2.47E-01*	*0.00E+00*	*0.00E+00*	*6.36E-02*	*0.00E+00*	*9.26E-02*
1.5	*8.11E+00*	*2.91E-01*	*2.82E+02*	*0.00E+00*	*0.00E+00*	*1.57E-01*	*0.00E+00*	*0.00E+00*	*0.00E+00*	*1.99E-02*	*3.55E-02*	*5.44E-02*
2	*8.08E+00*	*0.00E+00*	*3.02E+02*	*0.00E+00*	*0.00E+00*	*1.91E-03*	*2.62E-02*	*2.09E-02*	*0.00E+00*	*1.05E-01*	*0.00E+00*	*8.17E-02*
2	*6.13E+00*	*0.00E+00*	*2.67E+02*	*3.86E-02*	*0.00E+00*	*1.49E-01*	*2.65E-02*	*1.36E-01*	*1.05E-01*	*2.12E-01*	*3.95E-02*	*1.38E-01*
2.5	*5.16E+00*	*7.04E-02*	*2.03E+02*	*1.18E-01*	*0.00E+00*	*3.34E-02*	*0.00E+00*	*8.95E-02*	*0.00E+00*	*1.02E-01*	*8.90E-02*	*0.00E+00*
2.5	*5.78E-01*	*2.30E-01*	*1.56E+01*	*4.35E-02*	*1.69E-01*	*1.36E-01*	*8.85E-02*	*1.14E-01*	*0.00E+00*	*9.99E-02*	*0.00E+00*	**9.57E-01**
3	*6.36E-01*	*4.55E-04*	*1.52E+01*	*4.35E-02*	*4.03E-02*	*8.35E-02*	*1.33E-01*	*7.09E-02*	*7.68E-03*	*1.38E-01*	*0.00E+00*	**1.21E+00**
3	*1.21E+00*	*8.83E-02*	*3.24E+01*	*7.55E-02*	*1.39E-01*	*1.70E-01*	*6.01E-02*	*0.00E+00*	*1.39E-01*	*1.80E-01*	*0.00E+00*	**7.51E-01**
3.5	*1.58E+00*	*2.14E-01*	*4.04E+01*	*3.83E-02*	*0.00E+00*	*1.47E-01*	*0.00E+00*	*0.00E+00*	*1.17E-01*	*2.67E-01*	*0.00E+00*	**6.28E-01**
3.5	*2.16E+00*	*4.87E-02*	*1.67E+02*	*0.00E+00*	*0.00E+00*	*1.89E-01*	*1.22E-01*	*2.78E-03*	*9.85E-02*	*1.95E-01*	*0.00E+00*	**2.23E-01**
4	*1.97E+00*	*4.82E-02*	*1.47E+02*	*3.77E-02*	*0.00E+00*	**1.01E-01**	*4.75E-04*	*2.18E-01*	*0.00E+00*	**7.96E-02**	*4.62E-02*	**1.20E-01**
4	*3.59E+00*	*1.78E-01*	*4.60E+01*	*4.59E-02*	*1.61E-02*	*7.20E-02*	*2.65E-02*	*5.43E-02*	*0.00E+00*	*9.72E-02*	*4.21E-02*	*7.17E-02*
4.5	*3.17E+00*	*4.76E-02*	*3.74E+01*	*5.12E-02*	*2.53E-02*	*1.11E-01*	*0.00E+00*	*1.03E-01*	*1.19E-01*	*4.90E-02*	*1.19E-02*	*1.74E-01*
4.5	*4.79E+00*	*0.00E+00*	*4.20E+01*	*1.05E-01*	*6.60E-03*	*1.08E-01*	*1.12E-01*	*2.16E-01*	*7.20E-02*	*1.35E-01*	*3.11E-02*	*6.71E-04*
5	*4.40E+00*	*9.93E-02*	*3.84E+01*	*9.23E-02*	*7.71E-03*	*0.00E+00*	*1.54E-01*	*0.00E+00*	*5.23E-02*	*7.44E-02*	*0.00E+00*	*1.39E-01*
5	*5.59E+00*	*1.85E-01*	*1.38E+02*	*1.33E-01*	*2.40E-02*	*1.52E-01*	*5.47E-02*	*1.29E-01*	*1.45E-02*	*7.43E-02*	*0.00E+00*	*0.00E+00*
5.5	*4.50E+00*	*2.30E-01*	*1.21E+02*	*0.00E+00*	*7.56E-02*	*9.78E-02*	*4.10E-02*	*2.65E-02*	*8.72E-02*	*0.00E+00*	*0.00E+00*	*1.44E-02*
5.5				*7.44E-02*	*0.00E+00*	*1.46E-01*	*0.00E+00*	*4.91E-02*	*2.83E-02*	*0.00E+00*	*2.29E-02*	*0.00E+00*
6				*1.29E-01*	*8.00E-03*	*8.66E-02*	*9.71E-02*	*0.00E+00*	*0.00E+00*	*3.91E-02*	*1.15E-01*	*3.29E-02*
6				*4.24E-02*	*0.00E+00*	**1.12E+00**	*2.76E-01*	*1.77E-02*	*9.43E-02*	*0.00E+00*	*1.61E-02*	**5.89E-02**
6.5				*3.63E-02*	*0.00E+00*	**1.14E+00**	*8.67E-02*	*8.88E-02*	*2.56E-01*	*2.20E-02*	*2.45E-02*	**5.63E-02**
6.5												
7												
7												
7.5												

(1) Bold values indicate concentration greater than MDC. Italicized values indicate MDC value.

Table 4 - Auxiliary Building Continuing Characterization Concrete Core Samples (2017) - Eberline Laboratory Analysis [1]

Radionuclide	B1-05105C-JFC-005-CV (pCi/g)	B1-05105C-JFC-006-CV (pCi/g)	B1-05106C-JFC-003-CV (pCi/g)	B1-05106C-JFC-004-CV (pCi/g)	B1-05107C-JWC-006-CV (pCi/g)	B1-05107C-JWC-008-CV (pCi/g)	B1-05100C-JFC-003-CV (pCi/g)	B1-05100C-JFC-005-CV (pCi/g)
H-3	*5.07E+00*	*2.23E+01*	**3.86E+01**	*2.35E+01*	*9.23E+00*	*-7.73E+00*	**4.70E+01**	*1.22E+01*
C-14	*2.30E+00*	*1.57E-01*	*8.52E-01*	*1.60E+00*	*1.11E+01*	**2.87E+01**	*8.06E-01*	*2.04E+00*
Fe-55	*-9.50E-02*	*1.18E+01*	*9.84E-01*	*-1.79E+00*	*-8.22E+00*	*-1.27E+01*	*-5.92E-01*	*-3.74E-01*
Ni-59	*-1.19E+00*	*8.73E+00*	*6.32E+00*	*9.28E+00*	*1.51E+01*	*-8.80E+00*	*8.60E-01*	*1.76E+00*
Co-60	**2.45E+00**	**1.20E+00**	*3.43E-01*	**2.67E+01**	**5.53E+01**	**3.37E+00**	**1.57E+00**	**4.63E+00**
Ni-63	**3.99E+01**	**8.15E+01**	**6.88E+02**	**7.58E+02**	**2.76E+03**	**3.14E+02**	**1.80E+01**	**1.38E+02**
Sr-90	*0.00E+00*	*4.72E-01*	*1.64E-01*	*5.42E-01*	*-1.34E-01*	*2.57E+00*	*4.05E-01*	**8.69E-01**
Nb-94	*-2.65E-02*	*-1.24E-01*	*1.87E-02*	*1.71E-01*	*2.32E+00*	*-6.22E-02*	*1.25E-01*	*-1.02E-01*
Tc-99	*9.74E-01*	*2.86E-01*	*8.47E-01*	*1.18E+00*	**6.15E+00**	*4.02E+00*	**9.09E-01**	*6.29E-01*
Ag-108m	*-9.28E-02*	*-1.73E-02*	*-5.39E-02*	*-1.95E-01*	*1.65E+00*	*-1.85E-01*	*-5.35E-02*	*-2.03E-01*
Sb-125	*-1.00E+00*	*-1.44E-01*	*-1.79E-02*	*-5.25E+00*	*1.25E+01*	*-5.38E+00*	*-1.27E+00*	*4.76E-02*
Cs-134	*-5.11E-01*	*2.62E-02*	*0.00E+00*	*-1.14E+00*	*3.72E+00*	**2.72E+00**	*-6.34E-01*	*2.84E-02*
Cs-137	**1.15E+03**	**4.52E+01**	**2.05E+01**	**1.00E+03**	**3.32E+04**	**1.56E+04**	**2.78E+02**	**1.22E+01**
Pm-147	*8.20E-01*	*9.12E-01*	*1.03E+00*	**3.22E+00**	*1.24E+00*	**2.93E+01**	*5.47E-01*	*8.61E-01*
Eu-152	**3.20E+00**	*-8.61E-01*	**1.55E+00**	*2.71E-01*	*-1.42E+01*	**5.87E+00**	*-1.62E-01*	*-5.43E-01*
Eu-154	*-1.92E-01*	*8.13E-02*	*5.42E-02*	*4.35E-01*	*8.60E-01*	*8.03E-01*	*5.32E-02*	**3.43E-01**
Eu-155	*-1.66E-01*	*2.65E-01*	*-5.77E-04*	*2.41E-01*	*-3.93E+00*	*2.23E+00*	*-3.52E-01*	*5.81E-02*
Np-237	**1.27E-01**	*-3.08E-03*	*2.51E-03*	*-3.32E-02*	*4.47E-02*	*-1.17E-01*	*4.13E-02*	**2.11E-01**
Pu-238	*3.64E-02*	*-6.34E-03*	*7.45E-02*	*1.21E-02*	*0.00E+00*	*-9.63E-02*	*-2.08E-02*	*-4.46E-04*
Pu-239/240	*1.65E-02*	*8.27E-03*	*-2.38E-02*	*1.21E-02*	*-4.30E-02*	*3.23E-01*	*-1.25E-02*	*-1.55E-02*
Pu-241	*-1.69E+00*	*2.41E+00*	*-4.93E+00*	*1.50E+00*	*1.49E+01*	*-2.23E+01*	*-1.22E+00*	*-2.06E+00*
Am-241	*-2.49E-02*	*2.07E-02*	*-3.53E-04*	*3.25E-02*	*2.49E-02*	*5.94E-02*	*6.37E-02*	*6.78E-02*
Am-243	*7.16E-02*	*4.18E-03*	*7.37E-02*	**1.67E-01**	*3.85E-01*	*2.62E-01*	*6.50E-02*	**1.59E-01**
Cm-243/244	*-6.54E-03*	*2.45E-02*	*-1.21E-02*	*-1.93E-02*	*4.52E-02*	*9.06E-02*	*7.68E-02*	**1.09E-01**

(1) Bold values indicate concentration greater than MDC. Italicized values indicate MDC value.

The results of the on-site gamma spectroscopic analysis of the ½-inch pucks indicated that the activity concentrations correspond to an SOF of less than 0.1 for twenty-nine (29) of the thirty-two (32) sample locations below a depth of 2 inches, illustrating that the majority of the source term was surficial and not at depth.

The FSS unit for the Auxiliary Building 542 foot elevation floor and walls was designated as Class 1, and the FSS areal coverage was set at 100% which is consistent with MARSSIM, Table 5.9.

A Radiological Engineer (RE) performed a visual inspection and walk-down of the survey unit on December 4, 2017, prior to performing FSS. The purpose of the walk-down was to assess the physical condition of the survey unit, evaluate access points and travel paths and identify potentially hazardous conditions. A final classification assessment was performed in accordance with procedure ZS-LT-300-001-002, "*Survey Unit Classification*" (Reference 9) as part of the survey design for FSS.

Based upon completion of Survey Unit Classification Basis for final classification, which included a review of the historical information, the results of the Characterization Survey data and completion of a final Survey Unit Classification Worksheet, the correct final classification of survey unit 05100 was determined to be Class 1.

4. DATA QUALITY OBJECTIVES (DQO)

Final Status Survey planning and design hinges on coherence with the Data Quality Objective (DQO) process to ensure, through compliance with explicitly defined inputs and boundaries, that the primary objective of the survey is satisfied. The DQO process is described in the ZSRP LTP in accordance with MARSSIM. The appropriate design for a given survey was developed using the DQO process as outlined in Appendix D of MARSSIM.

The DQO process incorporated hypothesis testing and probabilistic sampling distributions to control decision errors during data analysis. Hypothesis testing is a process based on the scientific method that compares a baseline condition to an alternate condition. The baseline condition is technically known as the null hypothesis. Hypothesis testing rests on the premise that the null hypothesis is true and that sufficient evidence must be provided for rejection. In designing the survey plan, the underlying assumption, or null hypothesis, was that residual activity in the survey unit exceeded the release criteria. Rejection of the null hypothesis would indicate that residual activity within the survey unit does not exceed the release criteria. Therefore, the survey unit would satisfy the primary objective of the FSS sample plan.

The primary objective of the FSS sample plan is to demonstrate that the level of residual radioactivity in survey unit 05100 did not exceed the release criteria specified in the LTP

and that the potential dose from residual radioactivity is As Low As Reasonably Achievable (ALARA).

Zion*Solutions* TSD 11-001, *"Technical Support Document for Potential Radionuclides of Concern during the Decommissioning of the Zion Station"* (Reference 10) established the basis for an initial suite of potential ROC for the decommissioning of the Zion Nuclear Power Station (ZNPS). LTP Chapter 2 provides detailed characterization data that described contamination levels in the basements. The survey data for basements is based on core samples obtained at biased locations with elevated contact dose rates and/or evidence of leaks/spills and analyzed for the presence of plant-derived radionuclides. Zion*Solutions* TSD 14-019 evaluates the results of the concrete core analysis data from the Containments and Auxiliary Building and refines the initial suite of potential ROC by evaluating the dose significance of each radionuclide.

LTP Chapter 6, section 6.5.2 discusses the process used to derive the ROC for the decommissioning of ZNPS, including the elimination of Insignificant Contributors (IC) from the initial suite. Based upon the analysis of the mixture, it was determined that Co-60, Ni-63, Sr-90, Cs-134 and Cs-137 accounted for 99.5% of all dose in the non-activated contaminated concrete mixes.

Table 5 presents the ROC for the decommissioning of Auxiliary Building structural surfaces and the normalized mixture fractions based on the radionuclide mixture.

Table 5 - Dose Significant Radionuclides and Mixture

Radionuclide	% of Total Activity (normalized)[(1)(2)]
Co-60	0.92
Cs-134	0.01
Cs-137	75.32
Ni-63	23.71
Sr-90	0.05

(1) Based on maximum percent of total activity from Table 20 of TSD 14-019, normalized to one for the dose significant radionuclides.

(2) Does not include dose significant radionuclides for activated concrete (H-3, Eu-152, Eu-154).

A fundamental precursor to survey design is to establish a relationship between the release criteria and some measurable quantity. This is done through the development of DCGLs. The DCGLs represent average levels of radioactivity above background levels and are presented in terms of surface or mass activity concentrations. Chapter 6 of the LTP describes in detail the modeling used to develop the DCGLs for structures.

The end-state basements will be comprised of steel and/or concrete structures that will be covered by at least three feet of clean soil and physically altered to a condition where it would not realistically allow the remaining structures, if excavated, to be occupied. The exposure pathways in the BFM are associated with residual radioactivity in floors and walls that is released through leaching into water contained in the interstitial spaces of the fill material. The BFM assumes that the inventory of residual radioactivity in a given building is released either instantly or over time by diffusion, depending on whether the activity is surficial or volumetric, respectively. The activity released into the fill water will adsorb onto the clean fill, as a function of the radionuclide-specific distribution coefficients, resulting in equilibrium concentrations between the fill and the water. Consequently, the only potential exposure pathways after backfill, assuming the as-left geometry, are associated with the residual radioactivity in the water contained in the fill.

The final outputs of the BFM are the Basement DCGLs, which are calculated using the BFM Groundwater (GW) and BFM Drilling Spoils Dose Factors. DCGLs are calculated separately for the GW and Drilling Spoils scenarios and for the summation of both scenarios. The summation DCGL is designated as the Base Case DCGL (BcDCGL) and is used during FSS to demonstrate compliance (analogous to the $DCGL_W$ as defined in MARSSIM). The BcDCGLs are radionuclide-specific concentrations that represent the 10 CFR 20.1402 dose criterion of 25 mrem/year and are calculated for each ROC and each backfilled basement. Additional information pertaining to the calculation of DCGLs for basement surfaces is provided in LTP Chapter 6, section 6.6.8.

When applied to structures, the DCGLs are expressed in units of activity per unit of area (pCi/m^2). The "unity rule" is applied when there is more than one ROC. The measurement results for each singular ROC present in the mixture are compared against their respective DCGL to derive a dose fraction.

The BcDCGLs for the unrestricted release of the Auxiliary Building basement survey unit are provided in Table 6. The IC dose percentage of 5% was used to adjust the Auxiliary Building basement DCGLs to account for the dose from the eliminated IC radionuclides.

Table 6 - Base Case DCGLs for Auxiliary Building Basement Survey Unit ($BcDCGL_B$)
LTP Chapter 5, Table 5-3

Radionuclide	Base Case DCGL (pCi/m^2)
Co-60	3.04E+08
Cs-134	2.11E+08
Cs-137	1.11E+08
Ni-63	1.15E+10
Sr-90	9.98E+06

Each radionuclide-specific BcDCGL is equivalent to the level of residual radioactivity (above background levels) that could, when considered independently, result in a Total Effective Dose EquivalentTEDE of 25 mrem/year to an Average Member of the Critical Group (AMCG). To ensure that the summation of dose from each source term is 25 mrem/year or less after all FSS is completed, the BcDCGLs are reduced based on an expected, or *a priori*, fraction of the 25 mrem/year dose limit from each source term. The reduced DCGLs, or "Operational" DCGLs can be related to the BcDCGLs as an expected fraction of dose based on an *a priori* assessment of what the expected dose should be based on the results of site characterization, process knowledge and the extent of planned remediation. The OpDCGL is then used as the DCGL for the FSS design of the survey unit (calculation of surrogate DCGLs, investigations levels, etc.). Details of the OpDCGLs derived for each dose component and the basis for the applied *a priori* dose fractions are provided in TSD 17-004, "*Operational Derived Concentration Guideline Levels for Final Status Survey."* The OpDCGLs for the unrestricted release of the Auxiliary Building basement survey unit are provided in Table 7.

Table 7 - Operational DCGLs for Auxiliary Building Basement Survey Unit ($OpDCGL_B$)
LTP Chapter 5, Table 5-4

Radionuclide	Operational DCGL (pCi/m^2)
Co-60	9.81E+07
Cs-134	6.81E+07
Cs-137	3.58E+07
Ni-63	3.71E+09
Sr-90	3.22E+06

Instrument DQOs included a verification of the ability of the survey instrument to detect the radiation(s) of interest relative to the OpDCGL. The Canberra ISOCS was selected as the primary instrument used to perform FSS of basement surfaces. Response checks were required prior to issuance and after use. Control and accountability of ISOCS units was required to assure data quality.

As part of the DQOs applied to laboratory processes, analysis results were reported as actual calculated results. The actual recorded value was used as the recorded FSS result for measurement and/or sample values that are less than MDC. Negative values were recorded as "zero." For radionuclides less than MDC, the value representing the highest abundance was selected. Results were not reported as less than MDC. Sample report summaries included unique sample identification, analytical method, radionuclide, result, uncertainty, laboratory data qualifiers, units, and the observed MDC.

In accordance with the LTP, for laboratory analysis, MDCs less than 10% of the OpDCGL were preferable while MDCs up to 50% of the OpDCGL were acceptable. The maximum acceptable MDC for measurements obtained using field instruments was 50% of the applicable OpDCGL.

5. SURVEY DESIGN

The level of effort associated with planning a survey is based on the complexity of the survey unit and nature of the hazards. Guidance for preparing FSS plans was provided in procedure ZS-LT-300-001-001 "*Final Status Survey Package Development*." The FSS plan uses an integrated sample design that combines direct measurements (by ISOCS) and sampling (concrete cores).

The Canberra ISOCS was selected as the primary instrument for performing FSS of basement surfaces. The ISOCS was selected as the instrument of choice to perform FSS of basement surfaces due to the fact that an ISOCS measurement will provide results that can be used directly to determine total activity with depth in concrete and, the surface area covered by a single ISOCS measurement is large (a nominal FOV of 10-30 m^2) which essentially eliminates the need for scan surveys. In addition, after an ISOCS measurement is collected, it can be tested against a variety of geometry assumptions to address uncertainty in the source term geometry if necessary.

The DQO process determined that Co-60, Ni-63, Sr-90, Cs-134 and Cs-137 would be the ROC in Survey Unit 05100. During FSS, concentrations for HTD ROC Ni-63 and Sr-90 were inferred using a surrogate approach. Cs-137 is the principle surrogate radionuclide for Sr-90 and Co-60 is the principle surrogate radionuclide for Ni-63. The mean, maximum and 95% Upper Confidence Level (UCL) of the surrogate ratios for concrete core samples taken in the Auxiliary Building were calculated in TSD 14-019 and are

presented in LTP Table 5-15 and Table 8 below. The maximum ratios are used to infer HTD concentrations during FSS unless area specific ratios were determined.

Table 8 - Surrogate Ratios

Ratios	Auxiliary Building		
	Mean	Max	95%UCL
Ni-63/Co-60	44.143	180.450	154.632
Sr-90/Cs-137	0.001	0.002	0.002

The equation for calculating a surrogate DCGL is as follows:

Equation 1

$$Surrogate_{DCGL} = \frac{1}{\left[\left(\frac{1}{DCGL_{Sur}}\right) + \left(\frac{R_2}{DCGL_2}\right) + \left(\frac{R_3}{DCGL_3}\right) + \cdots \left(\frac{R_n}{DCGL_n}\right)\right]}$$

Where: $DCGL_{Sur}$ = Surrogate radionuclide DCGL

$DCGL_{2,3\ldots n}$ = DCGL for radionuclides to be represented by the surrogate

R_n = Ratio of concentration (or nuclide mixture fraction) of radionuclide "n" to surrogate radionuclide

Using the OpDCGLs presented in Table 7 and the maximum ratios from Table 8, the following surrogate calculations were performed:

Equation 2

$$Surrogate_{DCGL\,(Cs-137)} = \frac{1}{\left[\left(\frac{1}{3.58E+07_{(Cs-137)}}\right) + \left(\frac{0.002}{3.22E+06_{(Sr-90)}}\right)\right]} = 3.50E+07\ pCi/m^2$$

The surrogate OpDCGL that was used for Cs-137 in this survey unit for direct comparison of sample results to demonstrate compliance is 3.50E+07 ρCi/m^2.

Equation 3

$$Surrogate_{DCGL\,(Co-60)} = \frac{1}{\left[\left(\frac{1}{9.81E+07_{(Co-60)}}\right) + \left(\frac{180.45}{3.71E+09_{(Ni-63)}}\right)\right]} = 1.70E+07\ pCi/m^2$$

The surrogate OpDCGL that was used for Co-60 in this survey unit for direct comparison of sample results to demonstrate compliance is 1.70E+07 ρCi/m^2.

The action level for investigation in a Class 1 basement structure survey unit is the OpDCGL. The surrogate DCGL for Co-60 while inferring Ni-63 is 1.70E+07 ρCi/m^2 and

the surrogate DCGL for Cs-137 while inferring Sr-90 is 3.50E+07 ρCi/m^2. The action levels for survey unit 05100 are presented in Table 9.

Table 9 - Action Levels for Survey Unit 05100

ROC	DCGL (pCi/m^2)
Co-60 (1)	1.70E+07
Cs-134 (2)	6.81E+07
Cs-137 (3)	3.50E+07

(1) Based on the surrogate adjusted DCGL of 1.70E+07 ρCi/m^2 for Co-60 while inferring Ni-63
(2) Based on the Operational DCGL
(3) Based on the surrogate adjusted DCGL of 3.50E+07 ρCi/m^2 for Cs-137 while inferring Sr-90

The Sign Test was selected as the non-parametric statistical test. The use of the Sign Test did not require the selection or use of a background reference area, which simplified survey design and implementation. This approach was conservative since it included background Cs-137 as part of the sample set.

The Elevated Measurement Comparison (EMC) does not apply to this survey unit. At ZSRP, EMC only applies to soils. All other media (structural surfaces, embedded pipe, buried pipe and penetrations) will be remediated to their applicable BcDCGL.

To ensure that the number of ISOCS measurements based on the necessary areal coverage in a basement surface FSS unit was sufficient to satisfy a statistically based sample design, a calculation was performed and documented in LTP section 5.5.2.2 to determine sample size using the standard method as presented in MARSSIM. If the sample size based on the statistical design required more ISOCS measurements than the number of ISOCS measurement required by the areal coverage, then the number of ISOCS measurements was adjusted to meet the larger sample size.

Following the guidance in MARSSIM, the Type I decision error that was used for this calculation was set at 0.05 and the Type II decision error was set at 0.05. The Upper Bound of the Gray Region (UBGR) was set at the $OpDCGL_B$. The Lower Bound of the Gray Region (LBGR) was set at the 0.5 of the $OpDCGL_B$.

The relative shift (Δ/σ) was calculated as discussed in LTP Chapter 5, section 5.6.4.1.6. The relative shift (Δ/σ) for the survey unit data set is defined as shift (Δ), which is the UBGR, or the $OpDCGL_B$ (SOF of 1) minus the LBGR (SOF of 0.5), divided by sigma (σ), which is the observed standard deviation relative to the associated DCGL. The optimal value for Δ/σ should range between 1 and 3. The largest value the Δ/σ can have is 3. If the Δ/σ exceeds 3, then the value of 3 will be used for Δ/σ.

For the Auxiliary Building basement, a Class 1 survey unit, the standard deviation of the concrete cores analyzed for the full initial suite was used for sigma (σ). The relative shift (Δ/σ) was calculated as discussed in LTP, section 5.6.4.1.6. The Δ/σ calculations were confirmed and documented as part of the FSS design process, including the evaluation of any additional data from continuing characterization. The value of Δ/σ exceeded 3, consequently a value of 3 was used as the adjusted relative shift (Δ/σ) for the Auxiliary Building basement FSS survey unit. From Table 5-5 of MARSSIM, the required number of measurements (N) for use with the Sign Test, using a value of 0.05 for the Type I and Type II decision errors, is 14 measurements for a Δ/σ value of 3.

The required areal coverage for a Class 1 basement survey unit is 100%. The LTP requires that sufficient measurements be taken in a Class 1 FSS unit to ensure that 100% of the surface area was surveyed (ISOCS FOV overlapped to ensure that there were no un-surveyed corners and gaps). In cases where the physical configuration or measurement geometry makes the acquisition of a 28 m^2 FOV difficult or prohibitive, then the FOV for the ISOCS measurement was reduced provided that the adjusted number of samples remained constant and the minimum areal coverage represented by the FSS unit classification was achieved. To ensure that were no un-surveyed corners and gaps, the number of measurements that were taken in the Auxiliary Building FSS unit was adjusted by overlaying the center-point of the ISOCS measurement on a 4 m x 4 m (16 m^2) grid system.

Table 10, which is reproduced from LTP Table 5-19, presents the Auxiliary Building FSS unit and the adjusted number of ISOCS measurements that will be taken for FSS.

Table 10 - Adjusted Minimum Number of ISOCS Measurements

FSS Unit	Classification	Required Areal Coverage (m^2)	Adjusted # of ISOCS Measurements (FOV-28 m^2)	Adjusted Areal Coverage (m^2)	Adjusted Areal Coverage (% of Area)
Aux Bldg. 542 foot Floor & Walls	Class 1	6,503	407(1)	6,503	100%

(1) Adjusted to ensure number of measurements that will be taken in Class 1 FSS units will ensure 100% areal coverage, including overlap to ensure that there are no un-surveyed corners and gaps (FOV based on a 4 m x 4 m grid system).

When the survey grids were established on the walls and floor of the Auxiliary Building structural surfaces, obstacles and physical constraints were encountered that prompted further adjustments to the number of samples and the FOV. Some measurements were not feasible and other measurement locations were added.

Four hundred and seven (407) systematic ISOCS measurements were originally planned for the Auxiliary Building FSS unit (FSS unit 05100), based on a source to detector

distance of 3 meters for the ISOCS detector. Additional measurements were required due to adjustments for obstacles and physical constraints, which increased the total number of ISOCS measurements necessary to achieve 100% areal coverage to four hundred and twenty five (425) systematic ISOCS measurements.

The areal coverage requirements for FSS of structures as specified in the LTP is commensurate with the probability that a small area of elevated activity could exist within a FSS unit in a concentration exceeding the BcDCGL and the likelihood that such an area would not be detected by the FSS ISOCS measurements. It is highly unlikely that the ISOCS, with a nominal FOV of approximately 28 m^2 would not detect and account for elevated areas. The primary basis used to determine reasonable areal coverage for the ISOCS measurements is the potential for the OpDCGL to be exceeded. The criterion for selecting reasonable and risk-informed areal coverage is based on a graded approach similar to the guidance for scan surveys during FSS provided in MARSSIM, where the coverage is based on the expected fraction of the DCGL (in this case the OpDCGL). All ISOCS measurement locations collected for survey unit 05100, the Auxiliary Building basement floor and walls, are provided on maps in Attachment 1 of this document.

ZSRP LTP Chapter 5, section 5.1 states that concrete core samples will be collected during FSS at 10% of the locations where an ISOCS measurement was collected with the locations selected at random to confirm the HTD to surrogate radionuclide ratios. Only HTD radionuclides included as ROC (Ni-63, Sr-90, for the Auxiliary Building) were analyzed in the FSS confirmatory samples. The concrete core locations were selected from the floor and lower walls in the survey unit to alleviate safety concerns from working at heights and to focus on the areas expected to contain the majority of residual radioactivity. For FSS unit 05100, the initial survey design required a minimum of 407 ISOCS measurements and consequently, forty-two (42) additional concrete core samples were acquired for assessment of HTD ROC. Due to additional adjustment during implementation, the number of concrete core samples were increased to a total of forty-six (46) concrete core samples to accommodate the increased sample size in accordance with LTP section 5.1.

The coordinates for all of the ISOCS measurement locations were conspicuously marked to designate where to position the survey rig to the center-point of the instrument FOV. The ISOCS detector was then positioned either vertically or horizontally and adjacent to the surface at the center-point of each designated floor or wall measurement location. Each survey measurement location would then be reproducible utilizing permanent markings on the Auxiliary Building floor and walls and annotated on the survey map.

The implementation of quality control measures as referenced by LTP Chapter 5, section 5.9 and Zion*Solutions* ZS-LT-01, "*Quality Assurance Project Plan (for Characterization*

and FSS)" (QAPP) (Reference 11) includes the collection of a replicate measurement at 5% of the measurements taken in a survey unit with the locations selected at random. Twenty-three (23) ISOCS measurements were selected randomly for the replicate measurements for this survey unit.

To achieve 100% areal coverage for the 6,503 m^2 of floor and wall surfaces that constitute this survey unit, along with the minimum of 10% replicate measurements, four hundred and fifty-three (453) ISOCS measurements (425 systematic, 23 replicate, and 5 investigational) were taken at 425 locations.

The source term geometry for ISOCS efficiency calibration, i.e., concentration depth profile and areal distribution of the residual radioactivity in structures, is required to generate efficiency curves (i.e., efficiency as a function of energy) for the ISOCS gamma spectroscopy measurements. The concrete cores obtained during characterization, continuing characterization and FSS provided the requisite information regarding the distribution of activity with depth for the Auxiliary Building basement concrete. The basis for the chosen ISOCS efficiency calibrations for the FSS of the Auxiliary Building basement concrete are documented in Zion*Solutions* TSD 14-022, *"Use of In-Situ Gamma Spectroscopy for Final Status Survey of End State Structures"* (Reference 12). A majority of the ISOCS measurements were collected using the circular plane geometry. The varied geometries were necessary due to the structural anomalies encountered within the survey unit. The elevator pit, located on the west side of the Auxiliary Building basement floor, is a poured concrete box (pit) that required a different geometry. The "rectangular plane" geometry was used for the elevator pit. The second location with a varied geometry is sump "B." The sump is a metal lined (intact) space on the Auxiliary Building basement floor near the east wall ("G" wall). The "Room" geometry was used for the sump. ISOCS geometries specifically employed within this survey unit are provided in Attachment 2 of this report. Maps of the surface area scanned by the ISOCS FOV are provided in Attachment 1.

For this Class 1 basement structure survey unit, the "Investigation Levels" for ISOCS measurement results are those levels specified in LTP Chapter 5, Table 5-25 and are reproduced below in Table 11.

Table 11 - Investigation Levels

Classification	Direct Measurement
Class 1	>Operational DCGL

Table 12 provides a synopsis of the survey design for survey unit 05100.

Table 12 - Synopsis of Survey Design

FEATURE	DESIGN CRITERIA	BASIS
Survey Unit Surface Area	7,226 m^2	LTP Ch. 5, Table 5-23
Number of Measurements (N)	425 (systematic adjusted)	• UBGR = SOF of 1 • LBGR = SOF of 0.5 • Type I error = 0.05 • Type II error = 0.05 • Δ/σ = 3 (adjusted) MARSSIM Table 5.5
Grid Spacing	L = Square Root (A/N), Square Root (7,226 m^2) = 16 m^2 or 4 m by 4 m systematic grids	(LTP Chapter 5, section 5.6.4.5.2)
DCGLs	• Co-60 – 9.81E+07 pCi/m^2 • Cs-134 – 6.81E+07 pCi/m^2 • Cs-137 – 3.58E+07 pCi/m^2 • Ni-63 – 3.71E+09 pCi/m^2 • Sr-90 – 3.22E+06 pCi/m^2	OpDCGLs for Auxiliary Building Basement, (LTP Chapter 5, Table 5-4)
Investigation Level	>Operational DCGL	(LTP Chapter 5, Table 5-25)
Scan Areal Coverage	7,226 m^2 or 100% areal coverage	Class 1 100% areal coverage, (LTP Chapter 5, Table 5-19)
Quality Control (QC)	21 measurements selected randomly for replicate measurement analysis (23 measurements were collected)	(LTP Chapter 5, section 5.9)
Concrete Core Samples	Forty-six (46) concrete core samples	(LTP Chapter 5, section 5.1)

6. SURVEY IMPLEMENTATION

For survey unit 05100, compliance with the unrestricted release criteria was demonstrated through a combination of direct measurements using the ISOCS and the analysis of concrete core samples.

A walkdown and turnover survey was satisfactorily performed in the Auxiliary Building basement in accordance with the Isolation and Control requirements of procedure ZS-LT-300-001-003, "*Isolation and Control for Final Status Survey*" (Reference 13). The turnover surveys consisted of surveys for loose surface contamination as well as the acquisition of several ISOCS measurements. All smear results were less than 1,000 dpm/100 cm^2 and all ISOCS measurements taken for turnover indicated a SOF of less than one for all ROC. The Auxiliary Building basement was deemed acceptable for turnover and FSS commenced on February 2, 2018, under FSS Sample Plan #B1-05100A-F, which included DQOs, survey design, detailed FSS instructions, job safety analysis, and related procedures for reference. A "Field Log" (ZS-LT-300-001-001 Attachment 14) was used to document field activities and other information pertaining to the performance of the FSS.

FSS field activities were projected to take eighteen (18) working days to complete. Daily briefings were conducted to discuss the expectations for job performance and to review safety aspects of the job. The survey required field activities were performed during normal working hours and concluded on March 22, 2018.

Zion*Solutions* TSD 17-003, "*Evaluation of Efficiency Calibration Geometries for In-Situ Gamma Spectrometry During Final Status Surveys*" (Reference 14) was generated to address the Request for Additional Information (RAI) (HP RAI 6) from the Nuclear Regulatory Commission (NRC) pertaining to discrepancies between the LTP and TSD 14-022 with regard to the acquisition of additional concrete core samples to validate that the proper geometries were applied to ISOCS measurements. In resolution, LTP section 5.3.4.4 details several commitments to acquire additional concrete core samples in the Auxiliary Building as continuing characterization. Thirty-two (32) additional core samples were collected throughout the Auxiliary Building basement. Addendum 1 to TSD 14-022 provides the justification for the selection of reasonably conservative geometries for efficiency calibrations for the ISOCS based on the physical conditions of the remediated surface and the anticipated depth and distribution of activity.

Prior to implementing the sample plan for the FSS of the Auxiliary Building basement structure, the physical condition of the concrete surfaces to be surveyed were assessed to ensure that the geometry was not significantly changed from that assumed in TSD 14-022. ISOCS measurements were acquired using the geometry labeled as "3M90D_CP_2IN," or similar, which assumed a circular plane source with a contaminant depth of 2 inches.

With the 90-degree collimation shield installed and a source to detector distance of 3 meters, this orientation corresponded to a nominal FOV of 28 m^2. A guide attached to the detector assembly in the form of a plumb-bob or wooden stud was used to establish a consistent source to detector distance and center the detector over the selected measurement location.

The ISOCS measurement locations specified in FSS package #B1-05100A-F were marked based on the grid coordinates provided in the survey package. During the implementation of the survey unit requirements, it was observed that several locations, identified for ISOCS measurements, no longer existed. Additionally, to ensure 100% areal coverage, several ISOCS measurement locations were added. Finally, the geometries employed for several ISOCS measurements required slight modification due to obstructions that made the original source to detector distance impossible. A total of four hundred and twenty-five (425) ISOCS measurements were collected for survey package #B1-05100A-F. Two (2) additional locations, the elevator pit and the B Sump, had specific geometries established to better define the levels of contamination present. Twenty-three (23) replicate measurements were also acquired in the Auxiliary Building basement at the locations specified in FSS survey package #B1-05100A-F. The ISOCS detector face was oriented perpendicular to the surface of interest represented by the grid coordinate. See Photograph 1 for an example of an ISOCS measurement being conducted.

Photograph 1 – ISOCS Systematic Measurements of Auxiliary Building 542 Foot Elevation

7. SURVEY RESULTS

The SOF or "unity rule" is applied to the data used for the survey planning, and data evaluation and statistical tests for basement surfaces since multiple radionuclide-specific measurements were performed and the concentrations inferred based on known relationships. The "unity rule" is the mathematical test used to evaluate compliance with radiological criteria for license termination when more than one radionuclide has been determined to be potentially present.

The equation for the unity rule is:

Equation 4

$$\frac{C_1}{DCGL_1} + \frac{C_2}{DCGL_2} + \ldots\ldots\ldots \frac{C_n}{DCGL_n} \leq 1$$

Where: C_n = concentration of radionuclide *n*

$DCGL_n$ = DCGL of radionuclide *n*.

The application of the unity rule serves to normalize the data to allow for an accurate comparison of the various data measurements to the release criteria. When the unity rule is applied, the $DCGL_W$ (used for the nonparametric statistical test) becomes one (1). The $BcDCGL_B$ are directly analogous to the $DCGL_W$ as defined in MARSSIM. The use and application of the unity rule was performed in accordance with section 4.3.3 of MARSSIM.

As described in LTP Chapter 5, section 5.10.3.2, the Sign Test was used to evaluate the measured residual radioactivity against the dose criterion. The Operational SOF (OpSOF) for each measurement was used as the sum value for the Sign Test. The Sign Test then demonstrated that the mean activity for each ROC was less than the $OpDCGL_B$ at a Type 1 decision error of 0.05 (see Attachment 3).

For building surfaces, areas of elevated activity were defined as any area identified by measurement (systematic or judgmental) that exceeded the OpDCGL but was less than the BcDCGL. Any area that exceeded the BcDCGL would have required remediation. The OpSOF for a systematic or a judgmental measurement/sample(s) can exceed one without remediation as long as the survey unit passes the Sign Test and, the mean OpSOF for the survey unit does not exceed one. Once the survey data set passes the Sign Test (using OpDCGLs), then the mean radionuclide activity (pCi/m^2) for each ROC from systematic measurements along with any identified elevated areas from systematic and judgmental samples can be used with the BcDCGLs to perform a mean Base Case SOF (BcSOF) calculation. The dose from residual radioactivity assigned to the FSS unit is the mean $BcSOF_B$ multiplied by 25 mrem/yr.

Direct measurement locations were denoted on the concrete walls and floor of the Auxiliary Building basement by marking a 4 meter by 4 meter grid pattern using a random start point that was overlaid over the exposed surface, providing sufficient overlap between locations to ensure 100% areal coverage. See Attachment 1, Figures 1 through 15 for a depiction of all measurement locations.

The systematic sample population consisted of four hundred and twenty-five (425) direct measurements that were acquired using the ISOCS. A summary of the results of the 425 ISOCS measurements taken for non-parametric statistical testing results when compared to the $OpDCGL_B$ is provided in Table 13. The complete ISOCS measurement and gamma spectroscopy reports are presented in Attachment 7. The concentrations for Ni-63 and Sr-90 are inferred based on the maximum ratios as specified in Table 8.

Table 13 – Auxilairy Building Surfaces – Statistical Quantities - Systematic Population

Individual Measurement Metrics

Total Number of Systematic Measurements	=	425
Number of Quality Control Measurements	=	23
Number of Judgmental/Investigational Measurements	=	5
Total Number of Measurements	=	453
Mean Systematic Measurement OpSOF	=	0.143
Max Individual Systematic Measurement OpSOF	=	2.189
Number of Systematic Measurements with OpSOF >1	=	16

Statistical Quantities - Systematic Measurement Population

ROC	MEAN (pCi/m^2)	MEDIAN (pCi/m^2)	MAX (pCi/m^2)	MIN (pCi/m^2)	ST. DEV. (pCi/m^2)	BcDCGL (pCi/m^2)	Avg BcSOF per ROC	Avg Dose per ROC (mrem/yr)
Co-60	8.88E+05	9.21E+04	2.46E+07	0.00E+00	3.17E+06	3.04E+08	0.003	0.073
Ni-63	1.60E+08	1.66E+07	4.44E+09	0.00E+00	5.72E+08	1.15E+10	0.014	0.348
Sr-90	6.28E+03	1.61E+03	1.49E+05	4.12E+00	1.37E+04	9.98E+06	0.001	0.016
Cs-134	5.22E+04	4.18E+04	7.29E+05	0.00E+00	5.69E+04	2.11E+08	0.000	0.006
Cs-137	3.15E+06	8.10E+05	7.46E+07	2.06E+03	6.86E+06	1.11E+08	0.028	0.708

ZionSolutions procedure ZS-LT-300-001-004, "*Final Status Survey Data Assessment*," section 5.3.3 states that "only samples, or measurements, taken as part of the systematic sample population for the survey unit are used to derive statistical data." Since the sixteen (16) measurements provided in Table 14 were evaluated independently, they were not included in the statistical data presented in Table 13. The total SOF for the Auxiliary Building basement structural FSS unit based on the mean concentration for each ROC as

measured by the systematic sample population when compared against the BcDCGLs is 0.046.

During the FSS of the Auxiliary Building basement, sixteen (16) measurements were identified where the result exceeded the $OpDCGL_B$ but was less than the $BcDCGL_B$. As previously stated, the OpSOF for a systematic or a judgmental measurement/sample(s) may exceed one without remediation as long as the survey unit passes the Sign Test and, the mean OpSOF for the survey unit does not exceed one. Once the survey data set passes the Sign Test (using $OpDCGL_B$), the mean radionuclide activity (pCi/m^2) for each ROC from systematic measurements along with any identified elevated areas from systematic and judgmental samples will be used with the $BcDCGL_B$ to perform a BcSOF calculation for each surface FSS unit in a basement in accordance with the following equation (from LTP Chapter 5, Section 5.5.4, Equation 5-5). The mean BcSOF for the survey unit will then be adjusted by adding the BcSOF from the elevated areas to the mean to account for the additional dose attributed to the elevated areas.

Equation 5

$$BcSOF_B = \sum_{i=1}^{n} \frac{Mean\ Conc_{B\,ROC_i}}{BcDCGL_{B\,ROC_i}} + \frac{\left(Elev\ Conc_{B\,ROC_i} - Mean\ Conc_{B\,ROC_i}\right)}{\left[BcDCGL_{B\,ROC_i} \times \left(\frac{SA_{SU}}{SA_{Elev}}\right)\right]}$$

where:

$BcSOF_B$	=	SOF for structural surface survey unit within a basement using BcDCGLs
$Mean\ Conc_{B\,ROCi}$	=	Mean concentration for the systematic measurements taken during the FSS of structural surface in survey unit for each ROC_i
$BcDCGL_{B\,ROCi}$	=	BcDCGL for structural surfaces ($DCGL_B$) for each ROC_i
$Elev\ Conc_{B\,ROCi}$	=	Concentration for ROC_i in any identified elevated area (systematic or judgmental)
SA_{Elev}	=	surface area of the elevated area
SA_{SU}	=	adjusted surface area of FSS unit for DCGL calculation

The adjusted surface area of the Auxiliary Building FSS unit (SA_{SU}) is 7,226 m^2. The surface area of each of the elevated areas is 28 m^2, equating to the FOV of the individual ISOCS measurement. Table 14 presents the elevated concentration and the calculated BcSOF for each ROC in each of the sixteen (16) identified elevated areas. The individual elevated BcSOF for each elevated ROC were than summed to provide a total BcSOF adjustment to the mean BcSOF for the survey unit.

Table 14 - Elevated Measurement ROC Concentrations and SOFs

Elevated Area #1 - B1-05100AF-SWC-204-GD				
Elev Conc $_{1\ Co\text{-}60}$ =	1.22E+07	pCi/m^2	SOF $_{1\ Co\text{-}60}$ =	0.000
Elev Conc $_{1\ Ni\text{-}63}$ =	2.20E+09	pCi/m^2	SOF $_{1\ Ni\text{-}63}$ =	0.001
Elev Conc $_{1\ Sr\text{-}90}$ =	2.52E+04	pCi/m^2	SOF $_{1\ Sr\text{-}90}$ =	0.000
Elev Conc $_{1\ Cs\text{-}134}$ =	2.84E+05	pCi/m^2	SOF $_{1\ Cs\text{-}134}$ =	0.000
Elev Conc $_{1\ Cs\text{-}137}$ =	1.26E+07	pCi/m^2	SOF $_{1\ Cs\text{-}137}$ =	0.000
			SOF $_{1\ TOTAL}$ =	0.001
Elevated Area #2 - B1-05100AF-SWC-205-GD				
Elev Conc $_{2\ Co\text{-}60}$ =	1.46E+07	pCi/m^2	SOF $_{2\ Co\text{-}60}$ =	0.000
Elev Conc $_{2\ Ni\text{-}63}$ =	2.63E+09	pCi/m^2	SOF $_{2\ Ni\text{-}63}$ =	0.001
Elev Conc $_{2\ Sr\text{-}90}$ =	2.74E+04	pCi/m^2	SOF $_{2\ Sr\text{-}90}$ =	0.000
Elev Conc $_{2\ Cs\text{-}134}$ =	0.00E+00	pCi/m^2	SOF $_{2\ Cs\text{-}134}$ =	0.000
Elev Conc $_{2\ Cs\text{-}137}$ =	1.37E+07	pCi/m^2	SOF $_{2\ Cs\text{-}137}$ =	0.000
			SOF $_{2\ TOTAL}$ =	0.001
Elevated Area #3 - B1-05100AF-SWC-206-GD				
Elev Conc $_{3\ Co\text{-}60}$ =	1.30E+07	pCi/m^2	SOF $_{3\ Co\text{-}60}$ =	0.000
Elev Conc $_{3\ Ni\text{-}63}$ =	2.35E+09	pCi/m^2	SOF $_{3\ Ni\text{-}63}$ =	0.001
Elev Conc $_{3\ Sr\text{-}90}$ =	2.46E+04	pCi/m^2	SOF $_{3\ Sr\text{-}90}$ =	0.000
Elev Conc $_{3\ Cs\text{-}134}$ =	8.72E+04	pCi/m^2	SOF $_{3\ Cs\text{-}134}$ =	0.000
Elev Conc $_{3\ Cs\text{-}137}$ =	1.23E+07	pCi/m^2	SOF $_{3\ Cs\text{-}137}$ =	0.000
			SOF $_{3\ TOTAL}$ =	0.001
Elevated Area #4 - B1-05100AF-SWC-212-GD				
Elev Conc $_{4\ Co\text{-}60}$ =	1.29E+07	pCi/m^2	SOF $_{4\ Co\text{-}60}$ =	0.000
Elev Conc $_{4\ Ni\text{-}63}$ =	2.33E+09	pCi/m^2	SOF $_{4\ Ni\text{-}63}$ =	0.001
Elev Conc $_{4\ Sr\text{-}90}$ =	1.69E+04	pCi/m^2	SOF $_{4\ Sr\text{-}90}$ =	0.000
Elev Conc $_{4\ Cs\text{-}134}$ =	2.27E+05	pCi/m^2	SOF $_{4\ Cs\text{-}134}$ =	0.000
Elev Conc $_{4\ Cs\text{-}137}$ =	8.46E+06	pCi/m^2	SOF $_{4\ Cs\text{-}137}$ =	0.000
			SOF $_{4\ TOTAL}$ =	0.001

Table 14 (continued) - Elevated Measurement ROC Concentrations and SOFs

Elevated Area #5 - B1-05100AF-SFC-256-GD

Elev Conc $_{5\ Co-60}$ =	2.24E+07	pCi/m^2	SOF $_{5\ Co-60}$ =	0.000
Elev Conc $_{5\ Ni-63}$ =	4.04E+09	pCi/m^2	SOF $_{5\ Ni-63}$ =	0.001
Elev Conc $_{5\ Sr-90}$ =	3.20E+04	pCi/m^2	SOF $_{5\ Sr-90}$ =	0.000
Elev Conc $_{5\ Cs-134}$ =	6.63E+04	pCi/m^2	SOF $_{5\ Cs-134}$ =	0.000
Elev Conc $_{5\ Cs-137}$ =	1.60E+07	pCi/m^2	SOF $_{5\ Cs-137}$ =	0.000
			SOF $_{5\ TOTAL}$ =	0.002

Elevated Area #6 - B1-05100AF-SFC-257-GD

Elev Conc $_{6\ Co-60}$ =	1.82E+07	pCi/m^2	SOF $_{6\ Co-60}$ =	0.000
Elev Conc $_{6\ Ni-63}$ =	3.28E+09	pCi/m^2	SOF $_{6\ Ni-63}$ =	0.001
Elev Conc $_{6\ Sr-90}$ =	3.50E+04	pCi/m^2	SOF $_{6\ Sr-90}$ =	0.000
Elev Conc $_{6\ Cs-134}$ =	3.72E+05	pCi/m^2	SOF $_{6\ Cs-134}$ =	0.000
Elev Conc $_{6\ Cs-137}$ =	1.75E+07	pCi/m^2	SOF $_{6\ Cs-137}$ =	0.001
			SOF $_{6\ TOTAL}$ =	0.002

Elevated Area #7 - B1-05100AF-SFC-258-GD

Elev Conc $_{7\ Co-60}$ =	1.88E+07	pCi/m^2	SOF $_{7\ Co-60}$ =	0.000
Elev Conc $_{7\ Ni-63}$ =	3.39E+09	pCi/m^2	SOF $_{7\ Ni-63}$ =	0.001
Elev Conc $_{7\ Sr-90}$ =	3.24E+04	pCi/m^2	SOF $_{7\ Sr-90}$ =	0.000
Elev Conc $_{7\ Cs-134}$ =	1.32E+05	pCi/m^2	SOF $_{7\ Cs-134}$ =	0.000
Elev Conc $_{7\ Cs-137}$ =	1.62E+07	pCi/m^2	SOF $_{7\ Cs-137}$ =	0.000
			SOF $_{7\ TOTAL}$ =	0.002

Elevated Area #8 - B1-05100AF-SFC-259-GD

Elev Conc $_{8\ Co-60}$ =	2.01E+07	pCi/m^2	SOF $_{8\ Co-60}$ =	0.000
Elev Conc $_{8\ Ni-63}$ =	3.63E+09	pCi/m^2	SOF $_{8\ Ni-63}$ =	0.001
Elev Conc $_{8\ Sr-90}$ =	5.94E+04	pCi/m^2	SOF $_{8\ Sr-90}$ =	0.000
Elev Conc $_{8\ Cs-134}$ =	1.98E+05	pCi/m^2	SOF $_{8\ Cs-134}$ =	0.000
Elev Conc $_{8\ Cs-137}$ =	2.97E+07	pCi/m^2	SOF $_{8\ Cs-137}$ =	0.001
			SOF $_{8\ TOTAL}$ =	0.002

Elevated Area #9 - B1-05100AF-SFC-260-GD

Elev Conc $_{9\ Co-60}$ =	1.81E+07	pCi/m^2	SOF $_{9\ Co-60}$ =	0.000
Elev Conc $_{9\ Ni-63}$ =	3.27E+09	pCi/m^2	SOF $_{9\ Ni-63}$ =	0.001
Elev Conc $_{9\ Sr-90}$ =	5.90E+04	pCi/m^2	SOF $_{9\ Sr-90}$ =	0.000
Elev Conc $_{9\ Cs-134}$ =	1.12E+05	pCi/m^2	SOF $_{9\ Cs-134}$ =	0.000
Elev Conc $_{9\ Cs-137}$ =	2.95E+07	pCi/m^2	SOF $_{9\ Cs-137}$ =	0.001
			SOF $_{9\ TOTAL}$ =	0.002

Table 14 (continued) - Elevated Measurement ROC Concentrations and SOFs

Elevated Area #10 - B1-05100AF-SFC-273-GD

Elev Conc $_{10\ Co-60}$ =	2.29E+07	pCi/m^2	SOF $_{10\ Co-60}$ =	0.000
Elev Conc $_{10\ Ni-63}$ =	4.13E+09	pCi/m^2	SOF $_{10\ Ni-63}$ =	0.001
Elev Conc $_{10\ Sr-90}$ =	5.62E+04	pCi/m^2	SOF $_{10\ Sr-90}$ =	0.000
Elev Conc $_{10\ Cs-134}$ =	7.29E+05	pCi/m^2	SOF $_{10\ Cs-134}$ =	0.000
Elev Conc $_{10\ Cs-137}$ =	2.81E+07	pCi/m^2	SOF $_{10\ Cs-137}$ =	0.001
			SOF $_{10\ TOTAL}$ =	0.003

Elevated Area #11 - B1-05100AF-SFC-274-GD

Elev Conc $_{11\ Co-60}$ =	2.46E+07	pCi/m^2	SOF $_{11\ Co-60}$ =	0.000
Elev Conc $_{11\ Ni-63}$ =	4.44E+09	pCi/m^2	SOF $_{11\ Ni-63}$ =	0.001
Elev Conc $_{11\ Sr-90}$ =	5.06E+04	pCi/m^2	SOF $_{11\ Sr-90}$ =	0.000
Elev Conc $_{11\ Cs-134}$ =	1.93E+05	pCi/m^2	SOF $_{11\ Cs-134}$ =	0.000
Elev Conc $_{11\ Cs-137}$ =	2.53E+07	pCi/m^2	SOF $_{11\ Cs-137}$ =	0.001
			SOF $_{11\ TOTAL}$ =	0.003

Elevated Area #12 - B1-05100AF-SFC-295-GD

Elev Conc $_{12\ Co-60}$ =	4.31E+05	pCi/m^2	SOF $_{12\ Co-60}$ =	0.000
Elev Conc $_{12\ Ni-63}$ =	7.78E+07	pCi/m^2	SOF $_{12\ Ni-63}$ =	0.000
Elev Conc $_{12\ Sr-90}$ =	8.58E+04	pCi/m^2	SOF $_{12\ Sr-90}$ =	0.000
Elev Conc $_{12\ Cs-134}$ =	4.70E+04	pCi/m^2	SOF $_{12\ Cs-134}$ =	0.000
Elev Conc $_{12\ Cs-137}$ =	4.29E+07	pCi/m^2	SOF $_{12\ Cs-137}$ =	0.001
			SOF $_{12\ TOTAL}$ =	0.001

Elevated Area #13 - B1-05100AF-SFC-350-GD

Elev Conc $_{13\ Co-60}$ =	7.50E+05	pCi/m^2	SOF $_{13\ Co-60}$ =	0.000
Elev Conc $_{13\ Ni-63}$ =	1.35E+08	pCi/m^2	SOF $_{13\ Ni-63}$ =	0.000
Elev Conc $_{13\ Sr-90}$ =	6.90E+04	pCi/m^2	SOF $_{13\ Sr-90}$ =	0.000
Elev Conc $_{13\ Cs-134}$ =	8.58E+04	pCi/m^2	SOF $_{13\ Cs-134}$ =	0.000
Elev Conc $_{13\ Cs-137}$ =	3.45E+07	pCi/m^2	SOF $_{13\ Cs-137}$ =	0.001
			SOF $_{13\ TOTAL}$ =	0.001

Elevated Area #14 - B1-05100AF-SFC-351-GD

Elev Conc $_{14\ Co-60}$ =	9.66E+05	pCi/m^2	SOF $_{14\ Co-60}$ =	0.000
Elev Conc $_{14\ Ni-63}$ =	1.74E+08	pCi/m^2	SOF $_{14\ Ni-63}$ =	0.000
Elev Conc $_{14\ Sr-90}$ =	1.49E+05	pCi/m^2	SOF $_{14\ Sr-90}$ =	0.000
Elev Conc $_{14\ Cs-134}$ =	1.49E+05	pCi/m^2	SOF $_{14\ Cs-134}$ =	0.000
Elev Conc $_{14\ Cs-137}$ =	7.46E+07	pCi/m^2	SOF $_{14\ Cs-137}$ =	0.002
			SOF $_{14\ TOTAL}$ =	0.003

Table 14 (continued) - Elevated Measurement ROC Concentrations and SOFs

Elevated Area #15 - B1-05100AF-SFC-352-GD

Elev Conc $_{15\ Co-60}$ =	1.08E+06	pCi/m^2	SOF $_{15\ Co-60}$ =	0.000
Elev Conc $_{15\ Ni-63}$ =	1.95E+08	pCi/m^2	SOF $_{15\ Ni-63}$ =	0.000
Elev Conc $_{15\ Sr-90}$ =	9.98E+04	pCi/m^2	SOF $_{15\ Sr-90}$ =	0.000
Elev Conc $_{15\ Cs-134}$ =	0.00E+00	pCi/m^2	SOF $_{15\ Cs-134}$ =	0.000
Elev Conc $_{15\ Cs-137}$ =	4.99E+07	pCi/m^2	SOF $_{15\ Cs-137}$ =	0.002
			SOF $_{15\ TOTAL}$ =	0.002

Elevated Area #16 - B1-05100AF-SFC-466-GD

Elev Conc $_{16\ Co-60}$ =	1.92E+07	pCi/m^2	SOF $_{16\ Co-60}$ =	0.000
Elev Conc $_{16\ Ni-63}$ =	3.46E+09	pCi/m^2	SOF $_{16\ Ni-63}$ =	0.001
Elev Conc $_{16\ Sr-90}$ =	3.36E+04	pCi/m^2	SOF $_{16\ Sr-90}$ =	0.000
Elev Conc $_{16\ Cs-134}$ =	1.86E+05	pCi/m^2	SOF $_{16\ Cs-134}$ =	0.000
Elev Conc $_{16\ Cs-137}$ =	1.68E+07	pCi/m^2	SOF $_{16\ Cs-137}$ =	0.000
			SOF $_{16\ TOTAL}$ =	0.002

The sum of the $BcSOF_{TOTAL}$ for each of the sixteen (16) elevated measurements equals 0.029. This value is then added to the mean BcSOF for the Auxiliary Building basement structural FSS unit of 0.046 resulting in an adjusted total BcSOF for the Auxiliary Building basement of 0.075. This SOF equates to a dose of 1.868 mrem/yr. This value is the dose assigned to the survey unit based on the average of the systematic measurements adjusted for the dose contribution of elevated areas.

The implementation of required QC measures included the collection of twenty-three (23) ISOCS measurements at locations throughout the Auxiliary Building for "replicate measurement" analysis. The replicate ISOCS measurement results are provided in Table 15. The concentrations for Ni-63 and Sr-90 are inferred based on the maximum ratios as specified in Table 8.

Table 15 - Summary of ISOCS Replicate Measurements for QC

MEASUREMENT ID	Co-60 (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	Ni-63 (pCi/m^2)	Sr-90 (pCi/m^2)
B1-05100AF-QWC-006-GD	0.00E+00	0.00E+00	2.98E+02	5.39E+04	1.49E+05
B1-05100AF-QWC-024-GD	4.79E+04	8.64E+06	3.26E+02	1.08E+04	1.63E+05
B1-05100AF-QWC-074-GD	5.93E+03	1.07E+06	1.61E+02	2.33E+04	8.03E+04
B1-05100AF-QWC-102-GD	2.84E+04	5.12E+06	1.47E+03	3.94E+04	7.33E+05
B1-05100AF-QWC-116-GD	8.55E+04	1.54E+07	8.06E+02	4.22E+04	4.03E+05
B1-05100AF-QWC-131-GD	1.19E+05	2.15E+07	3.51E+05	0.00E+00	3.51E+05
B1-05100AF-QWC-132-GD	5.18E+05	9.35E+07	7.20E+03	0.00E+00	3.60E+06
B1-05100AF-QWC-156-GD	2.13E+05	3.84E+07	2.40E+04	1.44E+04	1.20E+07
B1-05100AF-QWC-167-GD	9.21E+04	1.66E+07	2.62E+03	3.32E+04	1.31E+06
B1-05100AF-QWC-208-GD	2.20E+06	3.97E+08	9.50E+03	7.03E+04	4.75E+06
B1-05100AF-QWC-218-GD	3.40E+04	6.14E+06	8.48E+02	7.85E+04	4.24E+05
B1-05100AF-QWC-230-GD	3.55E+04	6.41E+06	1.07E+02	3.79E+04	5.36E+04
B1-05100AF-QFC-243-GD	3.28E+04	5.92E+06	3.06E+01	0.00E+00	1.53E+04
B1-05100AF-QFC-272-GD	6.81E+06	1.23E+09	1.01E+04	7.14E+04	5.06E+06
B1-05100AF-QWC-292-GD	1.46E+06	2.63E+08	3.38E+04	4.56E+03	1.69E+07
B1-05100AF-QFC-331-GD	1.19E+05	2.15E+07	1.64E+03	5.51E+04	8.21E+05
B1-05100AF-QFC-333-GD	8.06E+04	1.45E+07	1.00E+03	1.30E+04	5.01E+05
B1-05100AF-QFC-334-GD	1.42E+06	2.56E+08	3.28E+03	1.07E+05	1.64E+06
B1-05100AF-QFC-341-GD	6.07E+05	1.10E+08	4.18E+04	1.48E+05	2.09E+07
B1-05100AF-QFC-373-GD	4.69E+05	8.46E+07	4.10E+03	2.60E+04	2.05E+06
B1-05100AF-QFC-395-GD	6.70E+04	1.21E+07	8.82E+02	8.11E+04	4.41E+05
B1-05100AF-QFC-405-GD	1.83E+05	3.30E+07	1.72E+03	8.26E+04	8.61E+05
B1-05100AF-QFC-409-GD	1.92E+05	3.46E+07	3.22E+03	1.69E+04	1.61E+06

The complete ISOCS gamma spectroscopy reports are presented in Attachment 7.

Investigational ISOCS measurements were taken when the surface being measured had irregular surfaces. Generally, locations with trenches or holes were resurveyed with the source to detector distance reduced to account for the uneven surface. Five (5) investigational measurements were taken within the Auxiliary Building basement and the results are provided in Table 16 with additional detail in Attachment 5. Each measurement represents the gamma result at that location in units of pCi/m^2. The concentrations for Ni-63 and Sr-90 were inferred based on the maximum ratios as specified in Table 8. The SOF for each individual investigation measurement when compared against the OpDCGL was less that one.

Table 16 - Summary of Results for Judgmental/Investigational Measurements Taken in the Auxiliary Building

MEASUREMENT ID	Co-60 (pCi/m^2)	Ni-63 (pCi/m^2)	Sr-90 (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	OpSOF
B1-05100A-FIFC-278-GD	4.88E+06	8.81E+08	7.02E+03	2.11E+05	3.51E+06	0.390
B1-05100A-FIWC-005-GD	3.69E+04	6.66E+06	2.74E+02	3.44E+04	1.37E+05	0.007
B1-05100A-FIFC-365-GD	9.16E+04	1.65E+07	2.70E+03	2.05E+04	1.35E+06	0.044
B1-05100A-FIFC-369-GD	1.66E+06	3.00E+08	7.48E+03	3.37E+02	3.74E+06	0.204
B1-05100A-FIFC-404-GD	3.19E+05	5.76E+07	2.46E+03	3.51E+04	1.23E+06	0.054

Forty-six (46) concrete core samples were acquired as part of the FSS of survey unit 05100. The concrete core samples were acquired at 10% of the locations where an ISOCS measurement was collected with the locations selected at random. Only HTD radionuclides included as ROC (Ni-63 and Sr-90) were analyzed in the FSS confirmatory samples. The top ½-inch puck from each of the FSS confirmatory concrete core samples, representing the concrete from the exposed surface to a depth of ½ inch, were sent to Eberline Laboratory for analysis of the ROC, including Ni-63 and Sr-90. The analysis results indicated detectable concentrations of Co-60 and Ni-63 in several samples at ratios less than the maximum ratio from Table 8. Cs-137 was positively detected in 29 of the 46 samples however, Sr-90 was detected in only one sample. The Sr-90 result, while greater than the MDC was within the range of uncertainty and believed to be a "false-positive" result. The sample was re-analyzed and the results indicated that Sr-90 was no longer positively identified. No further action or analysis was performed. The results are presented in Table 17 below.

Table 17 - Summary of FSS Concrete Core Analysis by Eberline

B1-05100AF-SWC-017-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	-1.74E-02	5.47E-02	1.75E-01
Ni-63	-1.70E-01	1.25E+00	2.15E+00
Sr-90	1.23E-01	3.99E-01	7.01E-01
Cs-134	3.71E-01	1.92E-01	3.06E-01
Cs-137	1.97E-01	2.39E-01	3.94E-01

B1-05100AF-SWC-041-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	-1.63E-02	7.61E-02	1.18E-01
Ni-63	6.00E-01	9.97E-01	1.68E+00
Sr-90	1.77E-01	3.59E-01	6.21E-01
Cs-134	-4.05E-03	3.55E-02	1.19E-01
Cs-137	2.52E+00	3.75E-01	2.61E-01

B1-05100AF-SWC-057-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	-1.68E-02	6.83E-02	1.36E-01
Ni-63	5.74E-01	9.53E-01	1.61E+00
Sr-90	1.42E-01	2.99E-01	5.19E-01
Cs-134	-3.23E-02	7.61E-02	2.02E-01
Cs-137	2.19E-01	1.52E-01	2.37E-01

B1-05100AF-SWC-088-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	3.40E-02	1.04E-01	1.51E-01
Ni-63	1.91E+00	1.01E+00	1.66E+00
Sr-90	2.52E-01	3.22E-01	5.45E-01
Cs-134	-4.04E-01	2.18E-01	1.65E-01
Cs-137	1.95E-01	1.15E-01	2.24E-01

B1-05100AF-SWC-101-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	-3.10E-02	1.63E-01	2.16E-01
Ni-63	1.18E-01	8.69E-01	1.48E+00
Sr-90	2.42E-01	2.73E-01	4.59E-01
Cs-134	3.95E-02	1.28E-01	2.26E-01
Cs-137	5.87E-01	2.08E-01	2.59E-01

Table 18(continued) - Summary of FSS Concrete Core Analysis by Eberline

B1-05100AF-SWC-115-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	1.71E-01	1.02E-01	1.85E-01
Ni-63	2.96E+00	9.73E-01	1.56E+00
Sr-90	1.59E-01	2.94E-01	5.08E-01
Cs-134	-3.63E-03	7.41E-02	1.88E-01
Cs-137	1.32E+00	4.61E-01	6.85E-01

B1-05100AF-SWC-116-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	1.37E-01	1.32E-01	2.33E-01
Ni-63	0.00E+00	1.22E+00	2.08E+00
Sr-90	6.89E-02	4.53E-01	8.04E-01
Cs-134	2.63E-02	7.32E-02	1.81E-01
Cs-137	5.50E-01	2.06E-01	2.77E-01

B1-05100AF-SWC-150-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	2.02E-01	1.19E-01	2.48E-01
Ni-63	1.14E+00	1.23E+00	2.06E+00
Sr-90	-2.66E-01	4.07E-01	7.67E-01
Cs-134	-1.71E-01	1.20E-01	1.58E-01
Cs-137	6.46E+00	7.81E-01	2.64E-01

B1-05100AF-SWC-151-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	2.92E+01	1.94E+00	8.73E-01
Ni-63	4.55E+02	4.43E+00	1.63E+00
Sr-90	2.22E-01	3.46E-01	5.92E-01
Cs-134	-3.81E-01	8.29E-01	1.05E+00
Cs-137	3.64E+02	3.74E+01	2.15E+00

B1-05100AF-SWC-156-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	1.26E+01	8.81E-01	5.12E-01
Ni-63	1.15E+02	2.38E+00	1.63E+00
Sr-90	1.52E-01	3.87E-01	6.73E-01
Cs-134	-1.80E-01	2.26E-01	4.28E-01
Cs-137	2.55E+02	2.67E+01	1.19E+00

Table 19(continued) - Summary of FSS Concrete Core Analysis by Eberline

B1-05100AF-SWC-162-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	8.61E-02	1.74E-01	3.02E-01
Ni-63	3.15E+00	1.29E+00	2.09E+00
Sr-90	3.83E-01	3.96E-01	6.61E-01
Cs-134	4.38E-02	8.92E-02	1.87E-01
Cs-137	8.89E+00	1.04E+00	4.00E-01

B1-05100AF-SWC-163-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	-5.68E-02	1.73E-01	2.53E-01
Ni-63	1.30E-01	9.64E-01	1.65E+00
Sr-90	5.62E-01	3.84E-01	6.16E-01
Cs-134	2.99E-01	2.15E-01	2.77E-01
Cs-137	-1.07E-01	2.23E-01	3.13E-01

B1-05100AF-SWC-179-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	5.60E-01	1.60E-01	3.57E-01
Ni-63	7.13E+00	1.20E+00	1.80E+00
Sr-90	3.43E-01	4.61E-01	7.83E-01
Cs-134	8.61E-03	5.00E-02	2.11E-01
Cs-137	5.14E+00	6.88E-01	4.14E-01

B1-05100AF-SWC-190-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	-4.00E-02	1.09E-01	1.73E-01
Ni-63	2.61E-01	9.67E-01	1.65E+00
Sr-90	2.35E-01	3.21E-01	5.45E-01
Cs-134	1.65E-02	7.63E-02	1.73E-01
Cs-137	1.97E-01	1.33E-01	2.02E-01

B1-05100AF-SWC-201-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	2.65E-01	1.29E-01	2.48E-01
Ni-63	1.69E+00	1.22E+00	2.03E+00
Sr-90	3.38E-01	4.88E-01	8.31E-01
Cs-134	-7.75E-03	5.26E-02	1.60E-01
Cs-137	1.87E+00	3.42E-01	2.98E-01

Table 20(continued) - Summary of FSS Concrete Core Analysis by Eberline

B1-05100AF-SWC-210-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	2.48E-01	1.04E-01	1.64E-01
Ni-63	1.29E+00	1.21E+00	2.03E+00
Sr-90	4.75E-01	4.47E-01	7.40E-01
Cs-134	4.51E-03	6.04E-02	3.04E-01
Cs-137	2.13E+00	4.17E-01	4.48E-01

B1-05100AF-SWC-231-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	6.04E-02	1.25E-01	2.14E-01
Ni-63	9.24E-01	1.16E+00	1.94E+00
Sr-90	5.23E-01	3.82E-01	6.17E-01
Cs-134	-3.49E-01	2.49E-01	2.17E-01
Cs-137	2.87E-01	2.47E-01	3.99E-01

B1-05100AF-SFC-239-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	1.68E-02	5.26E-02	7.33E-02
Ni-63	5.15E-01	1.28E+00	2.18E+00
Sr-90	-9.07E-02	3.77E-01	6.90E-01
Cs-134	-4.80E-04	3.10E-02	9.19E-02
Cs-137	2.04E-02	5.38E-02	9.06E-02

B1-05100AF-SFC-250-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	1.38E-01	1.21E-01	1.91E-01
Ni-63	3.06E-01	9.14E-01	1.55E+00
Sr-90	-1.90E-01	3.13E-01	5.83E-01
Cs-134	-4.33E-02	5.17E-02	1.15E-01
Cs-137	7.02E-01	1.63E-01	2.90E-01

B1-05100AF-SFC-255-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	1.17E-01	1.36E-01	1.56E-01
Ni-63	-6.42E-01	1.18E+00	2.04E+00
Sr-90	1.18E-01	3.68E-01	6.47E-01
Cs-134	-2.73E-02	7.96E-02	2.02E-01
Cs-137	3.13E-01	1.95E-01	3.03E-01

Table 21(continued) - Summary of FSS Concrete Core Analysis by Eberline

B1-05100AF-SFC-263-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	9.66E-02	1.17E-01	1.95E-01
Ni-63	2.71E-01	8.11E-01	1.38E+00
Sr-90	1.29E-01	2.69E-01	4.66E-01
Cs-134	-2.35E-02	5.74E-02	1.32E-01
Cs-137	4.88E-01	2.04E-01	2.91E-01

B1-05100AF-SFC-276-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	-1.44E-02	1.48E-01	1.73E-01
Ni-63	-1.01E+00	1.05E+00	1.83E+00
Sr-90	4.44E-01	3.45E-01	5.60E-01
Cs-134	-2.86E-02	4.07E-02	2.72E-01
Cs-137	-1.74E-02	1.95E-01	2.88E-01

B1-05100AF-SFC-282-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	1.11E-01	1.50E-01	2.70E-01
Ni-63	6.00E-01	1.00E+00	1.69E+00
Sr-90	3.22E-01	3.22E-01	5.36E-01
Cs-134	9.71E-03	7.67E-02	2.64E-01
Cs-137	3.85E-01	2.72E-01	4.28E-01

B1-05100AF-SFC-289-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	2.56E-01	8.54E-02	1.44E-01
Ni-63	2.42E+00	1.25E+00	2.05E+00
Sr-90	2.74E-01	4.16E-01	7.11E-01
Cs-134	2.20E-03	5.64E-02	1.49E-01
Cs-137	1.08E+00	2.45E-01	2.76E-01

B1-05100AF-SFC-293-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	-4.19E-02	1.68E-01	2.25E-01
Ni-63	-1.51E-01	1.12E+00	1.92E+00
Sr-90	-1.22E-01	3.39E-01	6.25E-01
Cs-134	-6.79E-03	1.28E-01	2.28E-01
Cs-137	6.79E+01	8.26E+00	6.37E-01

Table 22(continued) - Summary of FSS Concrete Core Analysis by Eberline

B1-05100AF-SFC-300-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	5.98E-02	1.52E-01	1.89E-01
Ni-63	2.11E+00	1.16E+00	1.92E+00
Sr-90	2.14E-01	3.34E-01	5.71E-01
Cs-134	6.93E-02	8.40E-02	2.14E-01
Cs-137	9.37E-01	2.45E-01	2.56E-01

B1-05100AF-SFC-316-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	1.78E-02	7.91E-02	2.89E-01
Ni-63	2.21E-01	1.10E+00	1.87E+00
Sr-90	2.90E-01	4.36E-01	7.45E-01
Cs-134	-1.30E-01	1.36E-01	2.79E-01
Cs-137	1.22E+00	3.07E-01	3.55E-01

B1-05100AF-SFC-321-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	1.59E-02	1.51E-01	2.20E-01
Ni-63	1.39E-01	1.04E+00	1.77E+00
Sr-90	2.76E-01	3.29E-01	5.55E-01
Cs-134	8.07E-03	1.06E-01	2.19E-01
Cs-137	1.49E-01	1.20E-01	1.85E-01

B1-05100AF-SFC-326-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	2.12E-02	1.41E-01	1.71E-01
Ni-63	4.04E-01	1.21E+00	2.05E+00
Sr-90	7.69E-01	4.72E-01	7.47E-01
Cs-134	-7.73E-03	4.68E-02	2.47E-01
Cs-137	6.98E-02	1.64E-01	2.60E-01

B1-05100AF-SFC-329-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	1.17E-01	1.35E-01	2.37E-01
Ni-63	1.09E+00	1.27E+00	2.13E+00
Sr-90	8.94E-01	5.55E-01	8.80E-01
Cs-134	1.38E-02	6.18E-02	1.55E-01
Cs-137	3.97E+00	5.20E-01	2.64E-01

Table 23(continued) - Summary of FSS Concrete Core Analysis by Eberline

B1-05100AF-SFC-332-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	7.43E-02	8.48E-02	1.59E-01
Ni-63	2.62E-01	9.78E-01	1.66E+00
Sr-90	2.15E-01	3.26E-01	5.57E-01
Cs-134	2.55E-02	5.65E-02	1.52E-01
Cs-137	1.99E+00	2.98E-01	3.23E-01

B1-05100AF-SFC-345-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	2.70E-02	7.95E-02	1.23E-01
Ni-63	-2.04E-01	1.00E+00	1.72E+00
Sr-90	7.83E-02	3.83E-01	6.73E-01
Cs-134	-5.06E-01	2.41E-01	1.60E-01
Cs-137	1.02E-01	7.76E-02	2.35E-01

B1-05100AF-SFC-347-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	8.11E-02	8.80E-02	1.96E-01
Ni-63	3.03E+00	1.28E+00	2.08E+00
Sr-90	2.80E-01	3.97E-01	6.77E-01
Cs-134	-7.02E-02	1.20E-01	1.69E-01
Cs-137	2.95E+00	4.56E-01	3.15E-01

B1-05100AF-SFC-348-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	4.33E-02	2.46E-01	2.68E-01
Ni-63	-3.06E-01	1.13E+00	1.94E+00
Sr-90	5.41E-01	3.60E-01	5.75E-01
Cs-134	2.53E-01	2.20E-01	3.73E-01
Cs-137	2.16E-01	2.23E-01	3.66E-01

B1-05100AF-SFC-354-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	5.04E-02	9.01E-02	1.56E-01
Ni-63	6.35E-01	1.13E+00	1.91E+00
Sr-90	2.57E-01	3.96E-01	6.78E-01
Cs-134	-2.39E-02	5.44E-02	1.73E-01
Cs-137	1.31E-01	1.00E-01	1.93E-01

Table 24(continued) - Summary of FSS Concrete Core Analysis by Eberline

B1-05100AF-SFC-363-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	4.27E-01	1.30E-01	1.95E-01
Ni-63	3.43E+00	1.12E+00	1.79E+00
Sr-90	4.53E-01	4.38E-01	7.29E-01
Cs-134	1.42E-01	1.55E-01	2.59E-01
Cs-137	9.38E+01	9.26E+00	7.20E-01

B1-05100AF-SFC-369-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	9.59E-03	1.12E-01	1.70E-01
Ni-63	4.12E-01	9.75E-01	1.65E+00
Sr-90	3.07E-01	4.03E-01	6.83E-01
Cs-134	-8.66E-04	4.38E-02	2.10E-01
Cs-137	-3.82E-02	1.50E-01	2.17E-01

B1-05100AF-SFC-375-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	2.21E-02	1.06E-01	1.32E-01
Ni-63	2.01E+00	1.13E+00	1.86E+00
Sr-90	8.41E-02	3.62E-01	6.40E-01
Cs-134	-3.48E-03	5.86E-02	1.33E-01
Cs-137	3.31E-01	1.32E-01	2.11E-01

B1-05100AF-SFC-379-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	8.73E-02	1.51E-01	2.49E-01
Ni-63	1.84E+00	1.08E+00	1.77E+00
Sr-90	-9.43E-02	3.63E-01	6.61E-01
Cs-134	2.96E-03	6.64E-02	2.46E-01
Cs-137	7.51E-01	2.80E-01	3.81E-01

B1-05100AF-SFC-383-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	2.48E-02	1.35E-01	2.11E-01
Ni-63	7.14E-01	9.28E-01	1.56E+00
Sr-90	7.80E-02	3.22E-01	5.70E-01
Cs-134	-3.64E-02	6.92E-02	2.34E-01
Cs-137	7.00E-01	2.07E-01	2.39E-01

Table 25(continued) - Summary of FSS Concrete Core Analysis by Eberline

B1-05100AF-SFC-411-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	-1.26E-02	3.61E-02	2.06E-01
Ni-63	1.30E+00	1.04E+00	1.74E+00
Sr-90	3.61E-01	3.89E-01	6.51E-01
Cs-134	-6.83E-01	3.11E-01	1.93E-01
Cs-137	5.42E-01	2.10E-01	2.86E-01

B1-05100AF-SFC-433-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	1.43E+01	9.42E-01	4.16E-01
Ni-63	5.91E+02	5.52E+00	1.86E+00
Sr-90	4.24E-01	3.83E-01	6.31E-01
Cs-134	-2.75E-01	2.33E-01	3.04E-01
Cs-137	5.46E+01	5.78E+00	8.27E-01

B1-05100AF-SFC-434-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	1.24E+01	8.39E-01	3.44E-01
Ni-63	8.26E+01	2.17E+00	1.70E+00
Sr-90	9.17E-02	3.34E-01	5.88E-01
Cs-134	-1.17E-01	1.73E-01	2.68E-01
Cs-137	8.57E+01	8.41E+00	6.18E-01

B1-05100AF-SFC-435-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	3.68E-02	1.22E-01	1.63E-01
Ni-63	5.00E-01	1.01E+00	1.72E+00
Sr-90	3.87E-01	4.00E-01	6.68E-01
Cs-134	1.01E-03	4.22E-02	1.94E-01
Cs-137	1.37E-01	1.46E-01	2.45E-01

B1-05100AF-SFC-436-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	-5.21E-02	1.28E-01	2.44E-01
Ni-63	9.96E-01	1.19E+00	2.00E+00
Sr-90	-1.92E-01	3.97E-01	7.39E-01
Cs-134	-3.55E-01	2.55E-01	2.24E-01
Cs-137	7.93E-02	1.93E-01	2.96E-01

Table 26(continued) - Summary of FSS Concrete Core Analysis by Eberline

B1-05100AF-SFC-438-CV			
ROC	**Result (pCi/g)**	**Uncertainty (pCi/g)**	**MDC (pCi/g)**
Co-60	2.07E+00	2.22E-01	2.05E-01
Ni-63	3.82E+00	1.13E+00	1.80E+00
Sr-90	5.40E-02	3.45E-01	6.13E-01
Cs-134	-4.11E-01	3.12E-01	2.02E-01
Cs-137	1.95E+02	2.04E+01	8.88E-01

8. QUALITY CONTROL

Twenty-three (23) replicate measurements were taken during the FSS of this basement structure. The measurement results were evaluated using NRC acceptance criteria specified in Inspection Procedure No. 84750, *"Radioactive Waste Treatment, and Effluent and Environmental Monitoring"* (Reference 15). Twenty-one (21) of the replicate measurements had an acceptable difference when compared to the original measurement at that location. Two (2) replicate measurements at wall locations 74 & 116 did not have acceptable difference for Cs-137 when compared to the original measurement.

ISOCS measurement location 74 (B1-05100AF-SWC-074-GD) identified Cs-137 activity at 1.72E+04 pCi/m^2, which was less than the MDC (3.09E+04 pCi/m^2) and only 0.048% of the OpDCGL for Cs-137. However, when comparing K-40 results, there was an acceptable agreement between the standard and comparison samples.

ISOCS measurement location 116 (B1-05100AF-SWC-116-GD) identified Cs-137 activity at 4.57E+04 pCi/m^2, which was greater than the MDC (5.32E+03 pCi/m^2) but only 0.128% of the OpDCGL for Cs-137. There is not acceptable agreement between the standard and comparison measurements. K-40 was also used to determine whether the measurement was acceptable. However, K-40 in the aforementioned sample was also less than the MDC and also did not have an acceptable agreement between the standard measurement and the QC measurement. Pre and post use operational checks of the ISOCS did not indicate any issues with the instrument or the quality of the data. In addition, other replicate measurements taken at several other locations were in agreement. Consequently, it was decided that no further action was necessary. Refer to Attachment 4 for data and quality control analysis results.

9. INVESTIGATIONS AND RESULTS

During FSS activities, five (5) investigation ISOCS measurements were taken within the Auxiliary Building, one (1) wall location and four (4) floor locations. These measurements were taken due to uneven surfaces (ruts, trenches, holes, etc.). The results

of these measurements are summarized in Table 16 of this report. These five (5) investigative measurements employed the same ISOCS geometry but the detector to source distance was reduced by 1 foot to account for the uneven surface being measured while not accounting for this in the ISOCS efficiency model to ensure that the measurement results are conservative.

In each of the five (5) investigation ISOCS measurements taken, the reduced source to detector distance did not appreciably change the original measurement result. The OpSOF for each individual investigation measurement when compared against the OpDCGL was less that one. Refer to Attachment 5 for Investigation sample results. See Photograph 2 for an example of an investigative ISOCS measurement location.

Photograph 2 - Example of Auxiliary Building Investigative ISOCS Measurement Location

10. REMEDIATION AND RESULTS

Chapter 4 of the ZSRP LTP states that remediation beyond that required to meet the release criteria is unnecessary and that the remaining residual radioactivity in structures was ALARA.

Once the area was turned over for FSS, no remedial activities were performed within the Auxiliary Building. However, during the FSS survey of the Unit 1 Containment penetrations numbers T123 & T124 in April of 2018, debris fell out of the penetrations and onto the Auxiliary Building basement floor. The floor and adjacent wall were surveyed and indicated 15,000 dpm/100 cm^2 direct frisk and <1,000 dpm/100 cm^2 removable. A direct reading on the adjacent wall indicated 1.4 mR/hr (fixed). The debris was removed and follow-up surveys indicated <1,000 dpm/100 cm^2 (direct frisk) and

<1,000 dpm/100 cm^2 (removable). This incident was captured and documented on April 9, 2018 through the generation of Condition Report ES-ZION-CR-2018-0510.

In May of 2018, remediation work was performed on the Spent Fuel Pool (SFP) pad, which was located adjacent to the west boundary of the Auxiliary Building. The potential for the remedial activities to radiologically impact the Auxiliary Building basement floor and walls existed. Therefore, Remedial Action Support Survey (RASS) B1-05100ZF was developed to verify that the events described in the CR and the SFP remediation did not change the radionuclide inventory identified in the Auxiliary Building basement FSS survey.

The results of the RASS indicated that neither the CR events nor the SFP remedial activities adversely affected the Auxiliary Building basement FSS.

Twenty-five (25) ISOCS measurement locations on the floor and walls were re-assessed using ISOCS direct measurements at the same locations that were analyzed previously. The re-survey results were compared to the original (FSS) measurements. The comparison indicated the following:

- Five (5) locations exhibited Cs-134 levels >20% more than the original levels identified during FSS. However, all five (5) measurements were less than the OpSOF and therefore of minimal dose significance.
- Three (3) locations exhibited Cs-137 levels >20% more than the original levels identified during FSS, with the maximum being a 50.5% increase.
- Eight (8) locations exhibited Co-60 levels >20% more than the original levels identified during FSS, with the maximum being a 203% increase.

The ISOCS RASS results are summarized in Attachment 6 of this document. The average difference between the twenty-five (25) original ISOCS measurements and the corresponding RASS measurements for Co-60 was +12.3%. The average difference between the twenty-five (25) original ISOCS measurements and the corresponding RASS measurements for Cs-137 was -14.3%. Since Cs-137 has a much greater abundance in the isotopic mix identified in Table 5, the lower readings for Cs-137 had a much greater effect on the OpSOF than Co-60. The mean OpSOF for the 25 sample results for the RASS was 0.13, as compared to the OpSOF for the original FSS results which was 0.17.

Therefore, neither the event described in CR ES-ZION-ACT-2018-0510 nor the SFP remediation had any measurable effect on survey unit 05100 FSS data.

11. CHANGES FROM THE SURVEY PLAN

Although the survey plan was not changed, the methodology for accepting control of the area and performing the FSS survey was modified due to weather considerations. Ice and

snow removal as well as water management of the entire surface area that encompasses survey unit 05100 was not feasible. Therefore, a segmented approach was used to allow segments of the Auxiliary Building basement to be turned over to FSS. Prior to the onset of the inclement weather, a series of three comprehensive surveys were performed in the Auxiliary Building basement on December 20, 2017, and December 21, 2017, in support of the demolition contractor's effort to prepare the basement for turnover to the C/LT group for FSS. During this time, several items were identified for remediation and any identified loose surface contamination was cleaned. A follow up survey was performed to determine the effectiveness of cleanup effort throughout the Auxiliary Building basement which included sixty-five (65) smear samples. All sixty-five (65) smears were less than 1,000 dpm/100 cm^2. These surveys provided sufficient assurance that the source term in the Auxiliary Building was fixed and any movement of water or ice would not transport source term from its end state location. The Auxiliary Building basement surface area was separated into seven (7) segments. Each segment was prepared for FSS individually (segment 1, segment 2,…). When a segment was ready for FSS, isolation and controls were established in accordance with Zion*Solutions* procedure ZS-LT-300-001-003. Once FSS was performed on a segment of the basement, the area was placed under isolation and control by FSS to ensure that preparatory functions within other areas of the Auxiliary Building basement would not impact previously completed segments of the Auxiliary Building.

Several minor changes were made to the FSS plan. The changes were as follows:

- The number of Hard to Detect (HTD) sample locations were increased from forty-two (42) to forty-six (46) to ensure the minimum number of 10% required by the LTP.
- The HTD core bore sample locations were changed from every 10^{th} ISOCS location to random locations (totaling 10% of the total number of ISOCS measurements). The forty-six (46) locations were selected from floor and lower wall ISOCS locations, per the LTP, to allow for safe sample collection.
- Some sample locations were eliminated due to differences in the FSS survey package and the actual conditions observed in the field.
- Some measurement locations were added to ensure 100% areal coverage within the survey unit.

12. FINAL STATUS SURVEY PLAN

There were no addendums to the FSS plan.

13. DATA QUALITY ASSESSMENT (DQA)

The DQO sample design and data were reviewed in accordance with Zion*Solutions* procedure ZS-LT-300-001-004, *"Final Status Survey Data Assessment"* (Reference 16) for completeness and consistency. Documentation was complete and legible. Surveys and the collection of measurements were consistent with the DQOs and were sufficient to ensure that the survey unit was properly designated as Class 1. The survey design had adequate power as indicated by the Retrospective Power Curve (see Attachment 6).

The analytical results indicated four hundred and nine (409) out of four hundred and twenty-five (425) measurements were less than a SOF of one (1). Sixteen (16) locations were identified with a SOF > one (1). An analysis of each of the aforementioned measurements is provided in Attachment 6.

Forty-six (46) concrete core samples were analyzed off site for HTD radionuclides as part of the FSS of survey unit 05100. The results indicated that Cs-137 was positively detected in twenty-nine (29) of the forty six (46) samples, twenty (20) out of the forty six (46) samples had positive results for both Ni-63 and Co-60 and one (1) sample had positive results for both Sr-90 and Cs-137. The maximum Ni-63 to Co-60 ratio for the positive samples was for sample location B1-05100AF-SFC-433-CV which exhibited a Ni-63/Co-60 ratio of 41.46, which is less than the maximum ratio from LTP Chapter 5, Table 5-15. The maximum Sr-90 to Cs-137 ratio was for sample location B1-05100AF-SFC-329-CV. In that sample, a ratio of 0.2 was derived for Sr-90/Cs-137. The Sr-90 result, while greater than the MDC was within the range of uncertainty and believed to be a "false-positive" result. The sample was re-analyzed and the results indicated that Sr-90 was no longer positively identified.

The Sign Test (Attachment 3) was performed on the data and compared to the original assumptions of the DQOs. The evaluation of the Sign Test results clearly demonstrates that the survey unit passed the unrestricted release criteria, thus, the null hypothesis was rejected.

The preliminary data review consisted of calculating basic statistical quantities (e.g., mean, median, standard deviation). All data was considered valid including negative values, zeros, values reported below the MDC, and values with uncertainties that exceeded two standard deviations. The mean and median values for each ROC were well below the respective OpDCGLs. Also, the retrospective power curve showed that a sufficient number of samples were collected to achieve the desired power. Therefore, the survey unit meets the unrestricted release criteria with adequate power as required by the DQOs.

The data for Co-60 and Cs-137 is represented graphically through a frequency plot and a quantile plot. All graphical representations are provided in Attachment 6.

14. ANOMALIES

No anomalies were observed during the performance or analyses of the survey.

15. COMPLIANCE EQUATION

There are four distinct source terms for the end-state at Zion: backfilled basements, soil, buried piping and groundwater. Demonstrating compliance with the dose criterion requires the summation of dose from the four source terms (see Equation 6-11 from LTP Chapter 6, section 6-17).

The final compliance dose will be calculated using LTP Equation 6-11 after FSS has been completed in all survey units. The results of the FSS performed for each FSS unit will be reviewed to determine the maximum dose from each of the four source terms (e.g., basement, soil, buried pipe and existing groundwater if applicable) using the mean BcSOF of FSS systematic results plus the dose from any identified elevated areas. The compliance dose must be less than 25 mrem/yr. The dose contribution from each ROC is accounted for using the BcSOF to ensure that the total dose from all ROC does not exceed the dose criterion.

The term for each basement includes the dose contributions from wall and floor surfaces within the basement, the dose contribution from embedded pipe within the basement, the dose contribution from penetrations within the basement and the dose contribution from concrete fill in the basement when clean concrete debris was used as fill. Each (structural surfaces, embedded pipe and penetrations) are surveyed separately during FSS. The dose from clean concrete fill is predetermined in accordance with LTP Chapter 5, Table 5-16, which is conservatively based on a maximum allowable MDC of 5,000 dpm/100cm^2. The dose from fill assigned to the Auxiliary Building basement is 0.99 mrem/yr, which equates to a SOF of 0.0396.

LTP Chapter 6, section 6.4.5 requires that the dose from penetrations be added to each Basement that the penetrations interfaces with. The penetrations in the Auxiliary Building interface with both with the Unit 1 and Unit 2 Containment Buildings and with the Turbine Building. The dose from penetrations interfacing between the Auxiliary Building and both Unit 1 and Unit 2 Containments is derived in the Release Records for both Unit 1 Containment Penetrations and Unit 2 Containment penetrations. The dose from penetrations interfacing between the Auxiliary Building and the Turbine Building is derived in the Release Record for the Auxiliary Building Penetrations.

After the FSS of all dose components in a given basement is complete and all dose component survey units pass the Sign Test, the SOF for each dose component is calculated using Equations 5-5 or 5-6 as applicable from LTP Chapter 5, section 5.5.4. For the

Auxiliary Building structural surfaces, sixteen (16) elevated areas were identified by the compliance survey (elevated areas are defined as areas exceeding the OpDCGL but less than the BcDCGL). The mean BcSOF for the Auxiliary Building structural surfaces, adjusted for the elevated measurements is 0.075, which equates to a dose of 1.868 mrem/yr.

Basement surface area adjustments (i.e., increases) were applied to the DCGL calculation for certain basements to ensure that the DCGLs accounted for the contribution of residual radioactivity from basements/structures that cannot, on their own, support a water supply well but, were hydraulically connected to a basement that could support a well. In accordance with LTP section 5.5.6.1, this adjustment must be made to the Auxiliary Building structural BcSOF due to its hydraulic conductivity with the SFP/Transfer Canal FSS unit. Area weighting using Equation 5-8 from LTP Chapter 5, section 5.5.6.1 was used to sum the residual activity in the Auxiliary Building structure and the SFP/Transfer Canal structure on an area-weighted basis. The BcSOF for the SFP/Transfer Canal is 0.039. The derivation of this value is documented in the Release Record for the SFP/Transfer Canal structure. LTP Chapter 5, section 5.5.6.1, Table 5-23 states that the total area for the Auxiliary Building plus the area of the SFP/Transfer Canal is 7,226 m^2 and the stand-alone area of the SFP/Transfer Canal is 723 m^2. The result is provided in Equation 7.

Equation 7

$$\left\{\left(\frac{723}{7226}\right)(0.039)\right\} = 0.004$$

The SOF of 0.004 is added to the adjusted mean BcSOF of 0.075 for the Auxiliary Building to derive the adjusted BcSOF of 0.079 for the Auxiliary Building basement structure. This equates to a dose of 1.966 mrem/yr. The adjusted BcSOF for the Auxiliary Building structure is then used in the following equation to calculate $BcSOF_{BASEMENT}$ for the Auxiliary Building.

Equation 8

$$\text{Bc}SOF_{BASEMENT} = SOF_B + SOF_{EP} + SOF_{PN} + SOF_{CF}$$

where:

$BcSOF_{BASEMENT}$	=	BcSOF (mean of FSS systematic results plus the dose from any identified elevated areas) for backfilled basements
$BcSOF_B$	=	BcSOF for structural survey unit(s) within the basement (mean of FSS systematic results plus the dose from any identified elevated areas)

$BcSOF_{EP}$	=	BcSOF for embedded pipe survey unit(s) within the basement (mean of FSS systematic results plus the dose from any identified elevated areas)
$BcSOF_{PN}$	=	BcSOF for penetration survey unit(s) within the basement (mean of FSS systematic results plus the dose from any identified elevated areas) and connected basements
SOF_{CF}	=	SOF for clean concrete fill (if applicable) based on maximum MDC during URS

The variable for $BcSOF_{PN}$ for the Auxiliary Building penetrations shared with the Turbine Building is 0.002. The derivation of this value is documented for the Auxiliary Building Penetrations Release Record (B1-05120A).

The adjusted mean $BcSOF_{PN}$ value for the Unit 1 Containment/Auxiliary Building shared penetrations is 0.059. The derivation of this value is documented in the Unit 1 Containment Penetration Release Record (B1-01112A).

The mean $BcSOF_{PN}$ value for the Unit 2 Containment/Auxiliary Building shared penetrations is 0.008. The derivation of this value is documented in the Unit 2 Containment Penetration Release Record (B1-02112A). The total $BcSOF_{PN}$ value, combining the shared penetrations from Unit 1 Containment, Unit 2 Containment and the Turbine Building is 0.069.

The value for embedded pipe in the Auxiliary Building is from the floor drain pipe embedded in the concrete floor of the 542 foot elevation. From the Release Record for the Auxiliary Building Embedded Floor Drain Pipe, the $BcSOF_{EP}$ value is 0.007.

The $BcSOF_{BASEMENT}$ value for the Unit 2 Containment is then derived as follows;

Equation 9

$$BcSOF_{BASEMENT} = 0.079 + 0.069 + 0.007 + 0.040 = 0.195$$

The $BcSOF_{BASEMENT}$ for the Auxiliary Building basement is 0.195. This SOF equates to a dose of 4.865 mrem/yr TEDE to an AMCG from residual radioactivity in the Auxiliary Building basement.

16. CONCLUSION

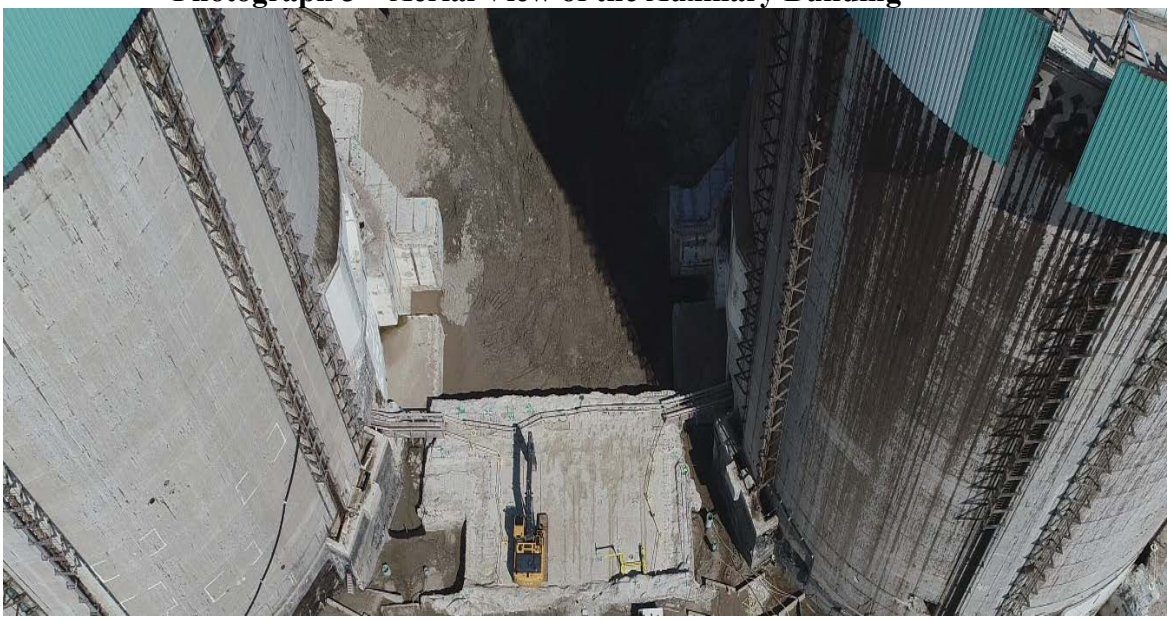
Survey unit 05100 has met the DQOs of the FSS plan. The ALARA criteria as specified in Chapter 4 of the LTP were achieved. The EMC is not applicable to structural surfaces.

All identified ROC were used for statistical testing to determine the adequacy of the survey unit for FSS. Evaluation of the data shows that sixteen (16) of the ROC concentration values exceeded the OpDCGL. However, none of the values exceeded the BcDCGLs for the ROC. Additionally, the sixteen (16) elevated locations were evaluated, (see Table 14) and the dose was included in the total dose for the survey unit.

The total mean BcSOF for the Auxiliary Building basement structure is 0.079, which is the sum of mean BcSOF from the Auxiliary Building adjusted to account for elevated measurements and residual radioactivity in the SFP/Transfer Canal on an area-weighted basis. The total dose contribution from the Auxiliary Building basement structure, including dose from penetrations, embedded pipe and fill is 4.865 mrem/yr TEDE ($BcSOF_{BASEMENT}$ = 0.195).

The sample data passed the Sign Test. The null hypothesis was rejected. The Retrospective Power Curve showed that adequate power was achieved. The survey unit is properly classified as Class 1. Therefore, in accordance with the LTP Section 5.10, the survey unit meets the release criterion. Survey unit 05100 is acceptable for unrestricted release. See Photograph 3 for aerial view of Auxiliary Building.

Photograph 3 – Aerial View of the Auxiliary Building



17. REFERENCES

1. Zion*Solutions* procedure ZS-LT-300-001-005, "Final Status Survey Data Reporting"
2. "Zion Station Restoration Project License Termination Plan"
3. Zion*Solutions* procedure ZS-LT-300-001-001, "Final Status Survey Package Development"
4. NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual"
5. Zion*Solutions* TSD 17-004, "Operational Derived Concentration Guideline Levels for Final Status Survey"
6. "Zion Station Historical Site Assessment"
7. Zion*Solutions* TSD 14-028, "Radiological Characterization Report"
8. Zion*Solutions* TSD 14-019, "Radionuclides of Concern for Soil and Basement Fill Model Source Terms"
9. Zion*Solutions* procedure ZS-LT-300-001-002, "Survey Unit Classification"
10. Zion*Solutions* TSD 11-001, "Technical Support Document for Potential Radionuclides of Concern During the Decommissioning of the Zion Station"
11. Zion*Solutions* ZS-LT-01, "Quality Assurance Project Plan (for Characterization and FSS)"
12. Zion*Solutions* TSD 14-022, "Use of In-Situ Gamma Spectroscopy for Final Status Survey of End State Structures"
13. Zion*Solutions* procedure ZS-LT-300-001-003, "Isolation and Control for Final Status Survey"
14. Zion*Solutions* TSD 17-003, "Evaluation of Efficiency Calibration Geometries for In-Situ Gamma Spectrometry During Final Status Surveys"
15. U.S. NRC Inspection Procedure No. 84750, "Radioactive Waste Treatment, and Effluent and Environmental Monitoring"
16. Zion*Solutions* procedure ZS-LT-300-001-004, "Final Status Survey Data Assessment"

18. ATTACHMENTS

Attachment 1 - Figures and Maps

Attachment 2 - ISOCS Geometries

Attachment 3 - Sign Test

Attachment 4 - QA Information and Charts/QC Replicate Measurement Assessments

Attachment 5 - Auxiliary Building ISOCS Measurements

Attachment 6 - Graphical Presentations and Supplemental Information

Attachment 7 - ISOCS Reports

Attachment 8 - Eberline Reports

ATTACHMENT 1
FIGURES AND MAPS

Figure 1 – Auxiliary Building Basement ISOCS Measurement Locations

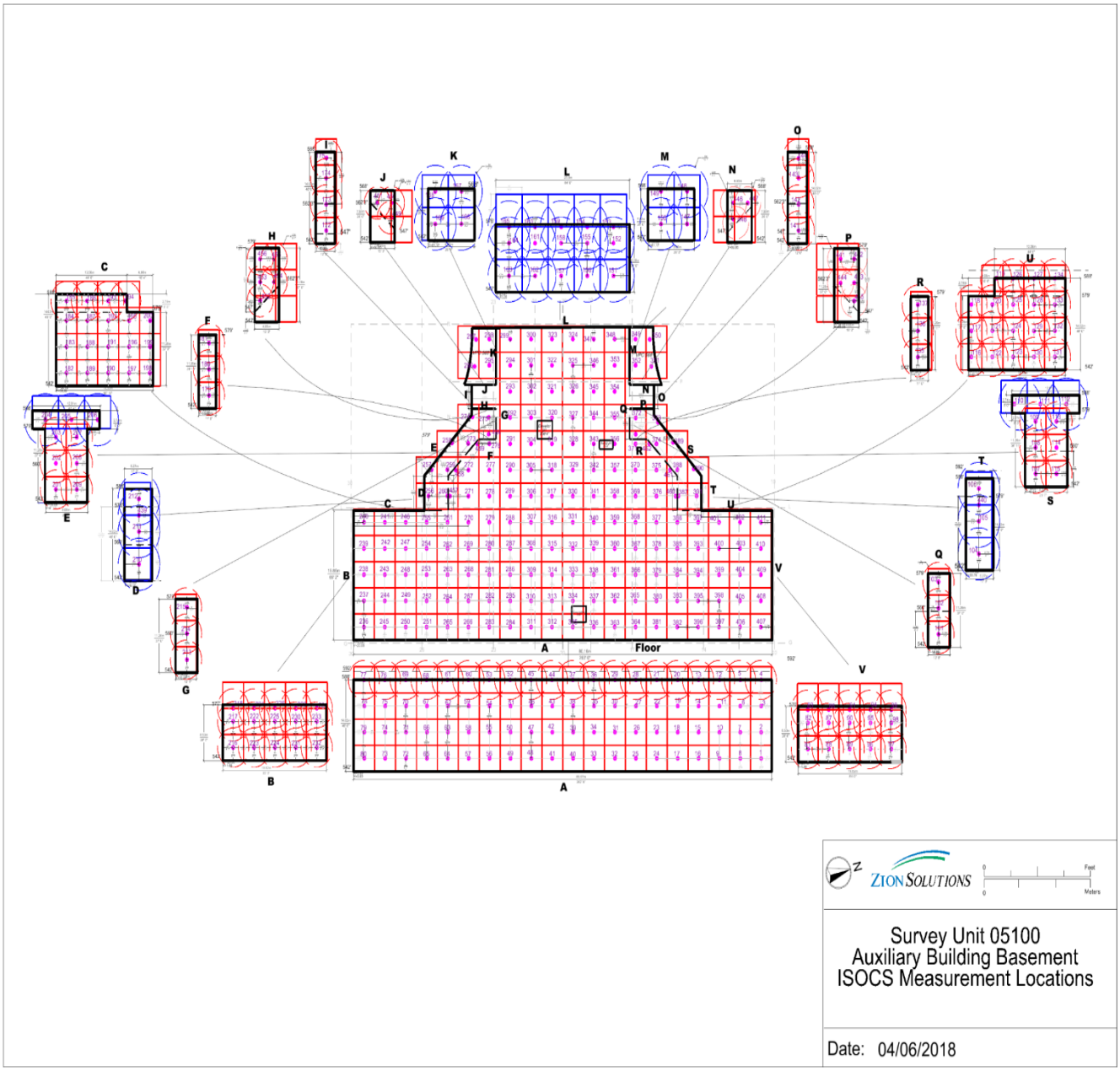


Figure 2 – Auxiliary Building Basement Floor ISOCS Measurement Locations

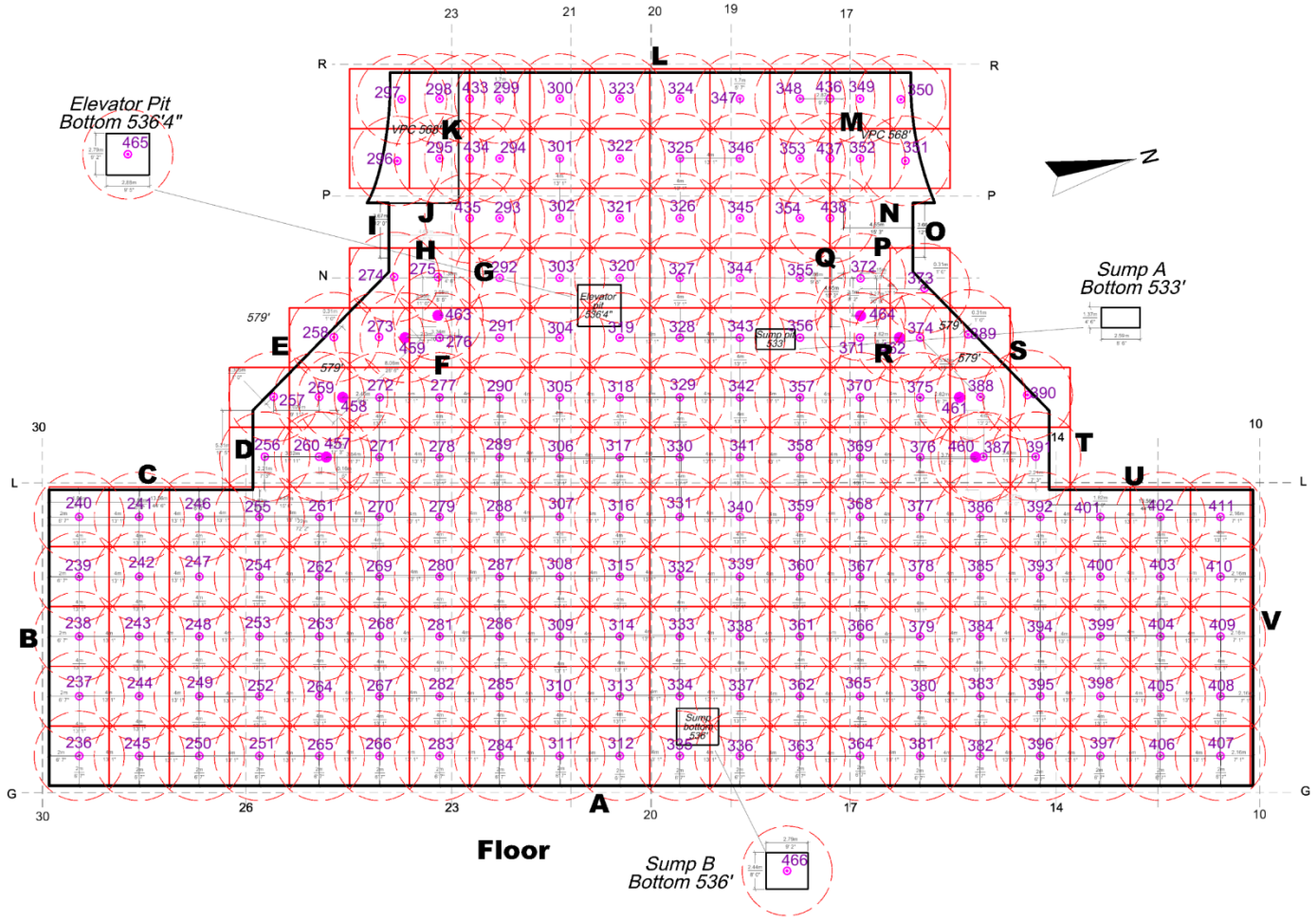


Figure 3 – Auxiliary Building Basement FSS ISOCS Measurement Locations – Wall A

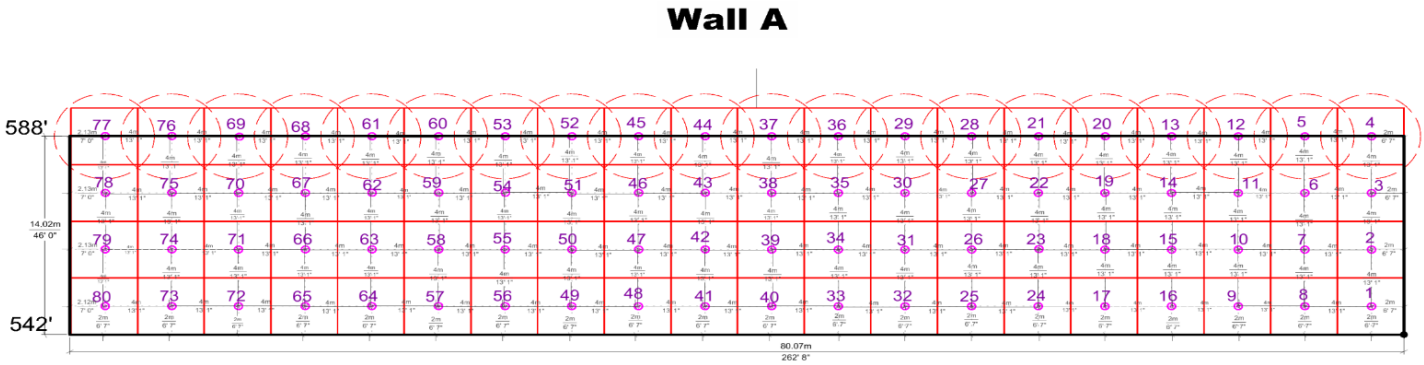


Figure 4 – Auxiliary Building Basement FSS Measurement Locations –Wall B

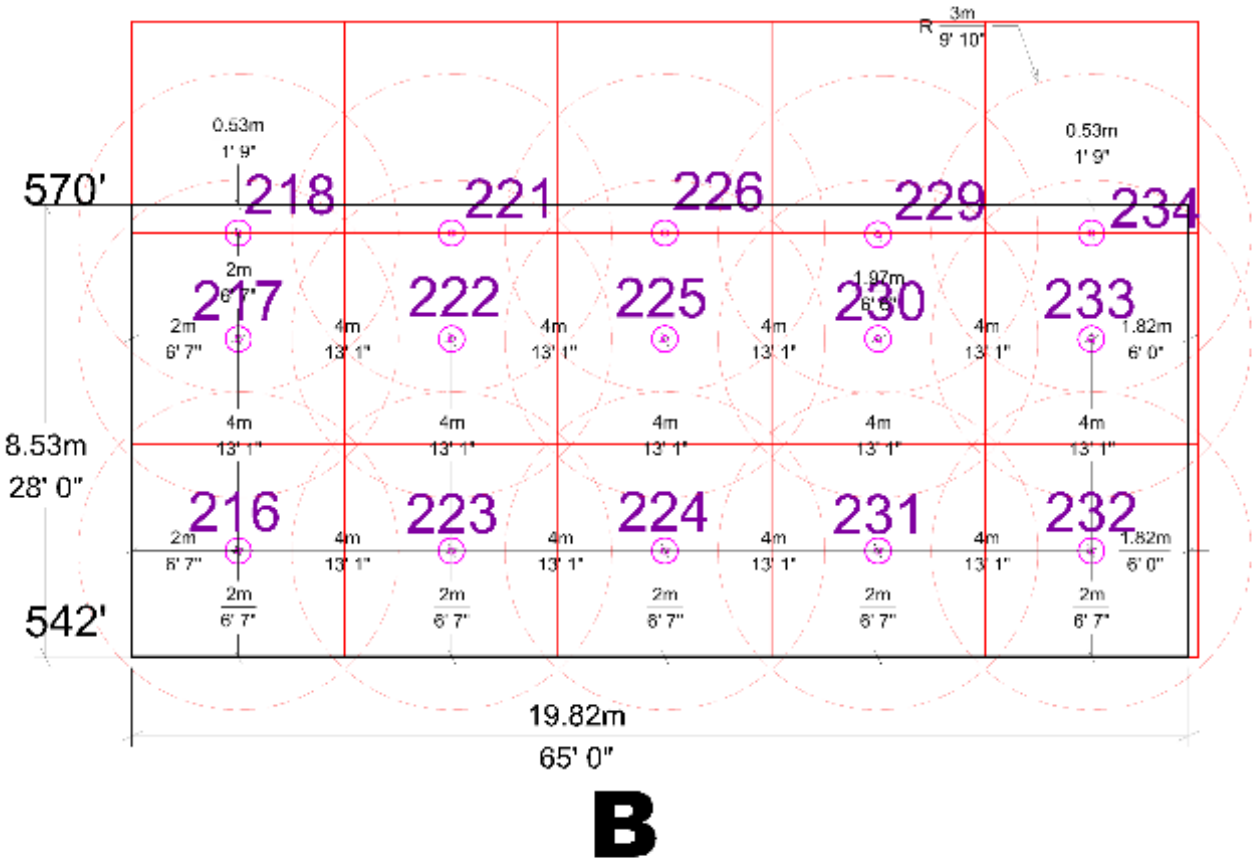


Figure 5 – Auxiliary Building Basement FSS Measurement Locations – Wall C

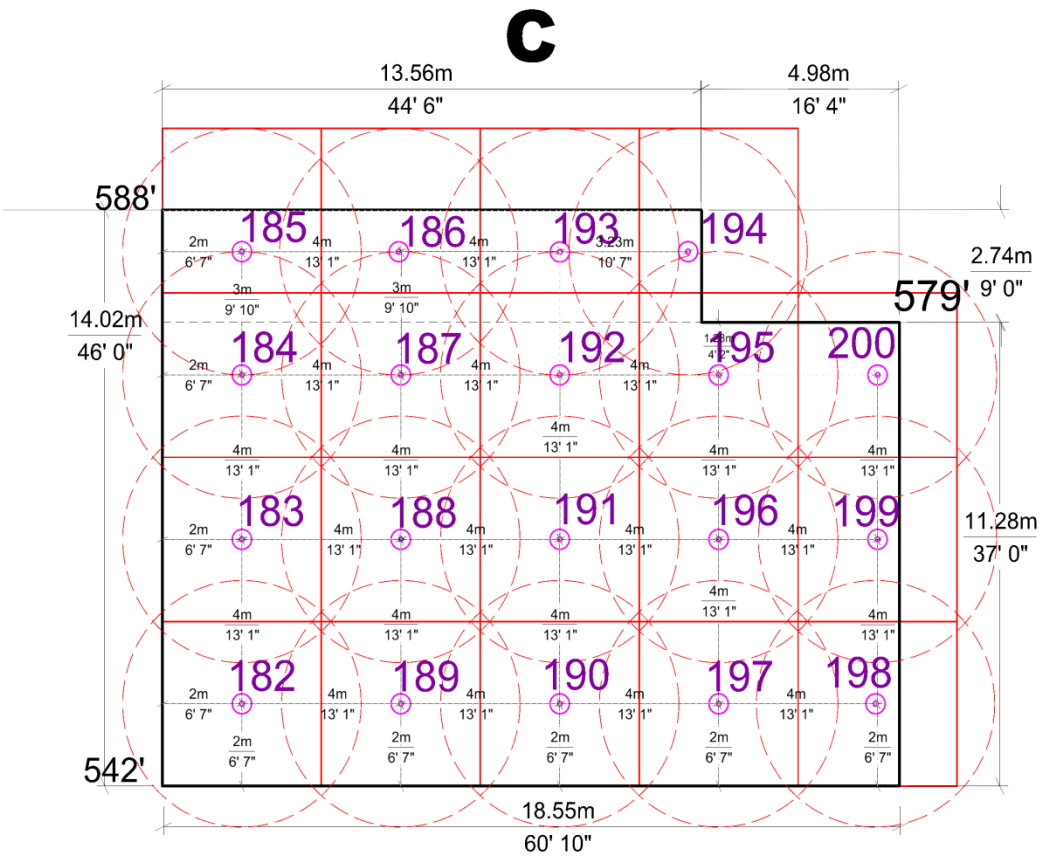


Figure 6 – Auxiliary Building Basement FSS Measurement Locations – Walls D & E

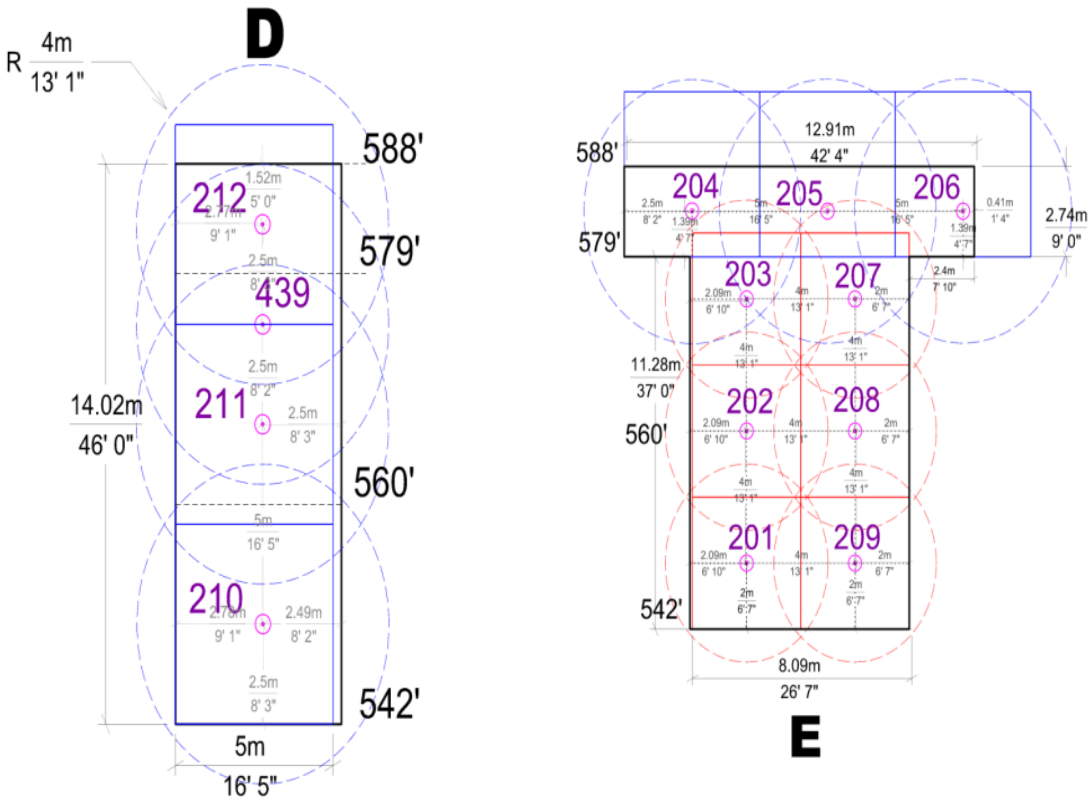


Figure 7 – Auxiliary Building Basement FSS Measurement Locations – Walls F & G

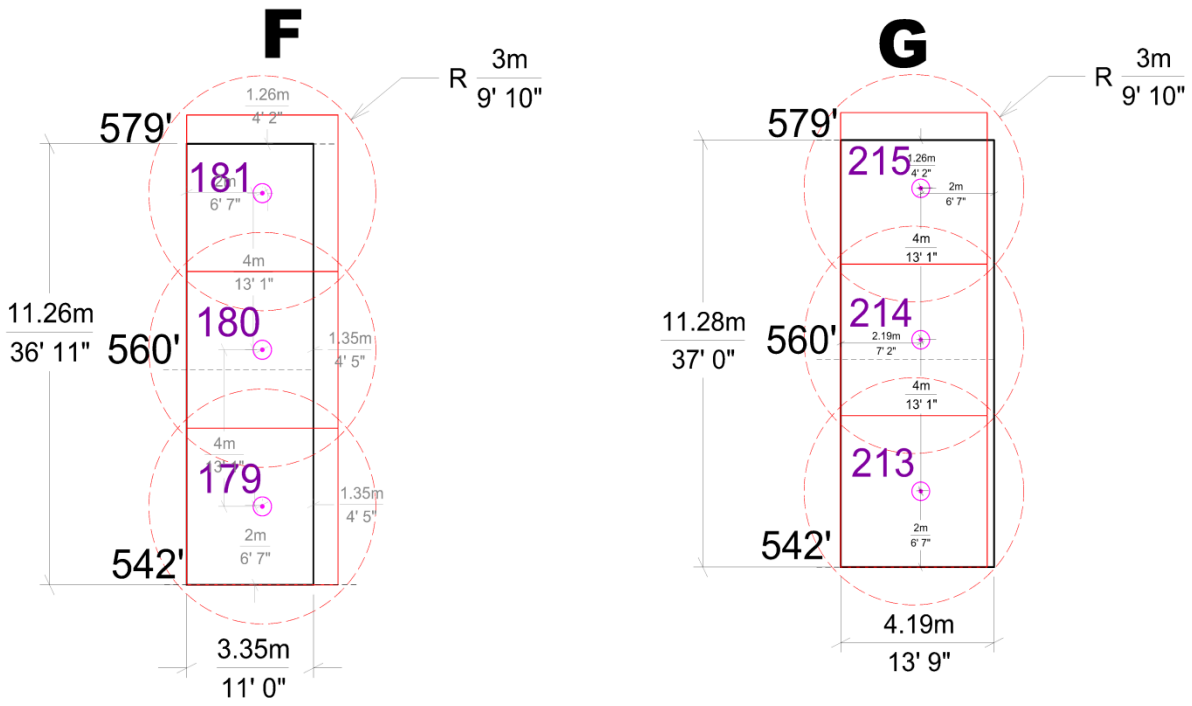


Figure 8 – Auxiliary Building Basement FSS Measurement Locations – Walls H & I

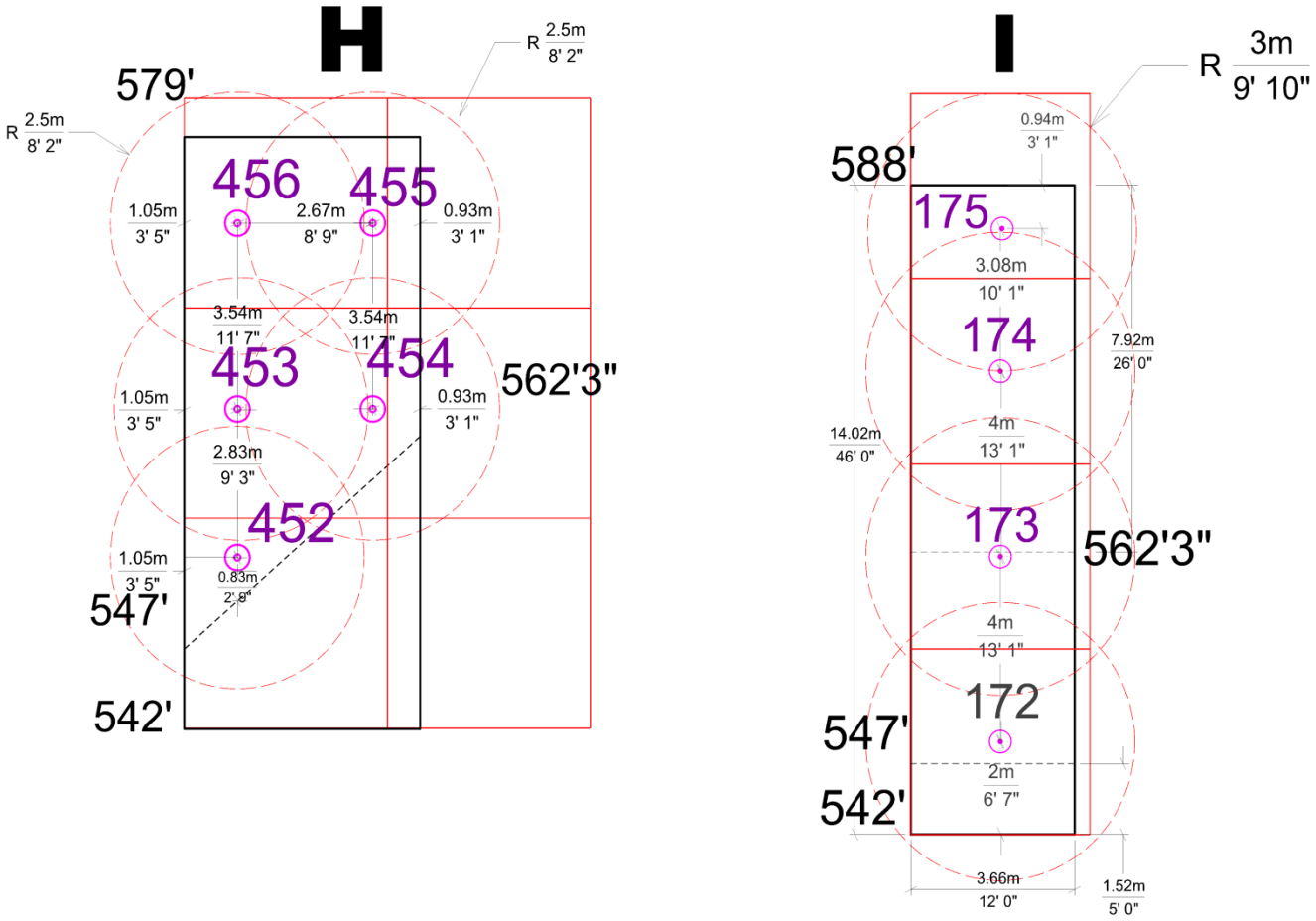


Figure 9 – Auxiliary Building Basement FSS Measurement Locations – Walls J & K

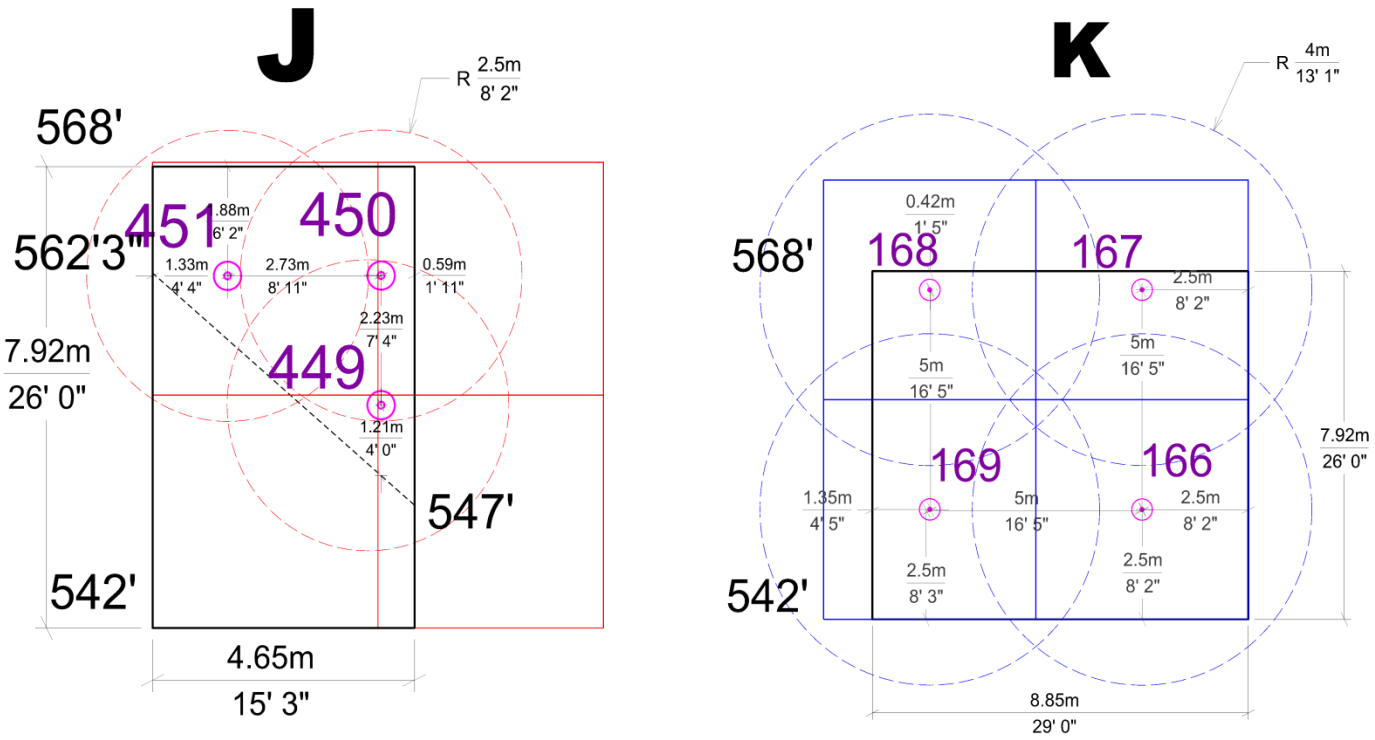


Figure 10 – Auxiliary Building Basement FSS Measurement Locations – Wall L

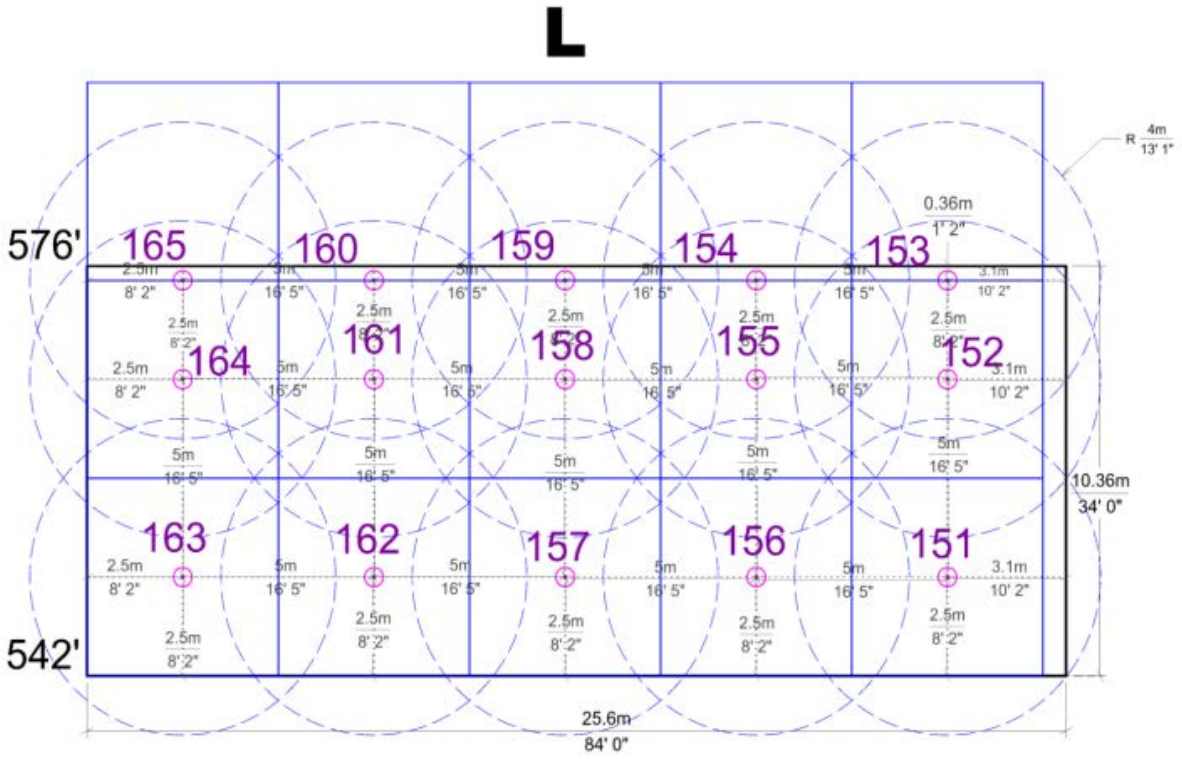


Figure 11 – Auxiliary Building Basement FSS Measurement Locations – Walls M & N

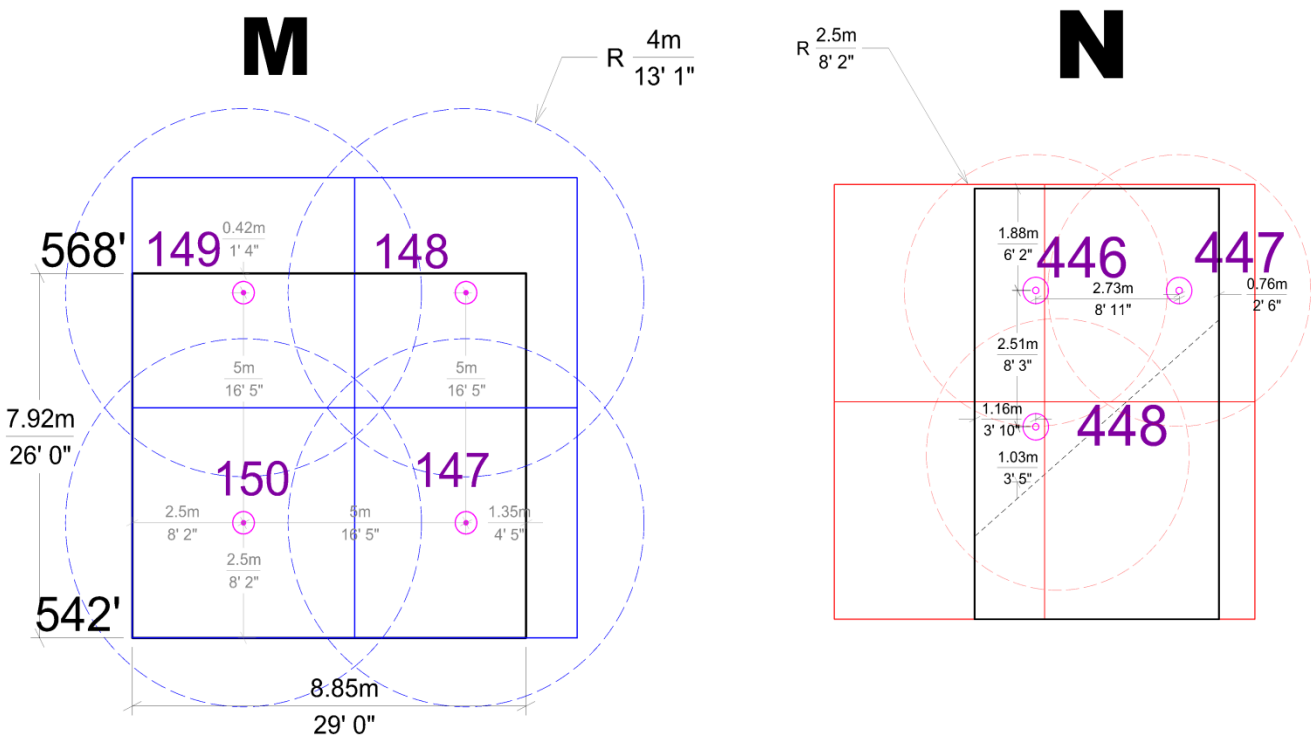


Figure 11 – Auxiliary Building Basement FSS Measurement Locations – Walls O & P

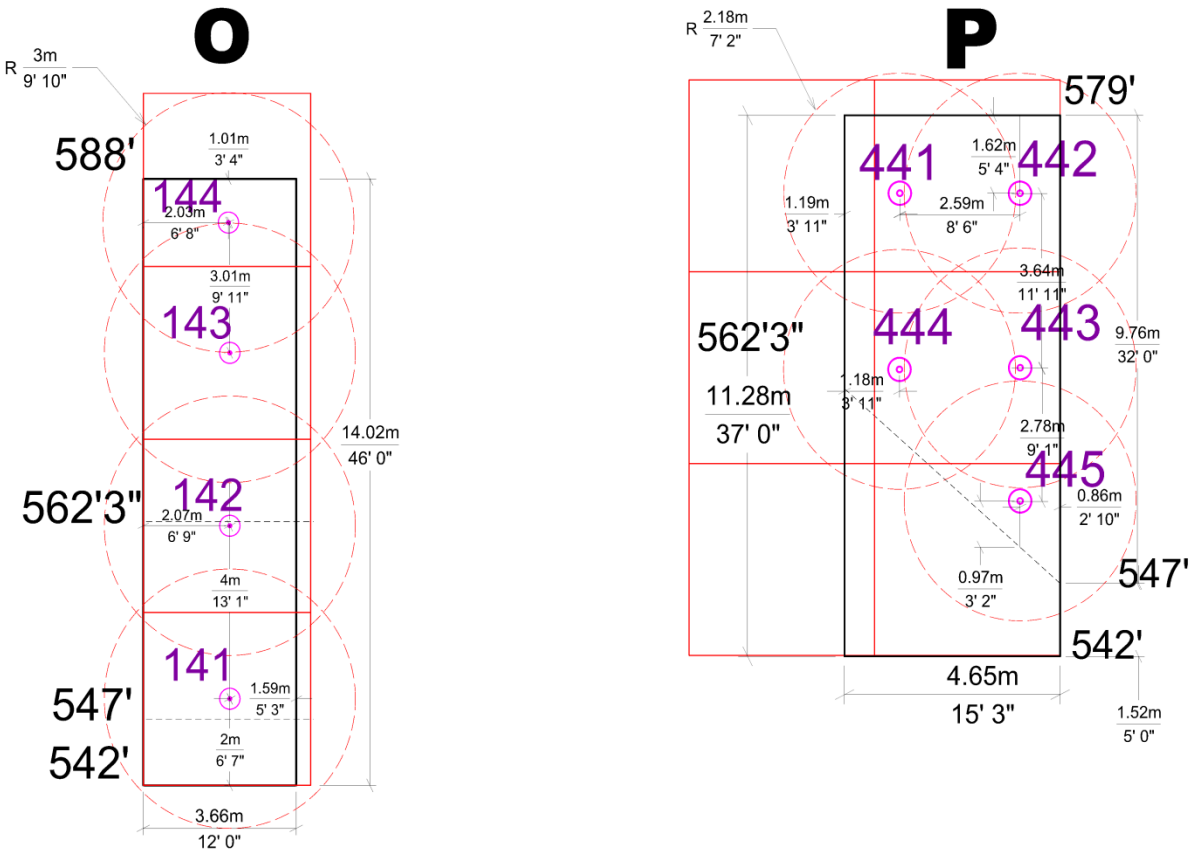


Figure 12 – Auxiliary Building Basement FSS Measurement Locations – Walls Q & R

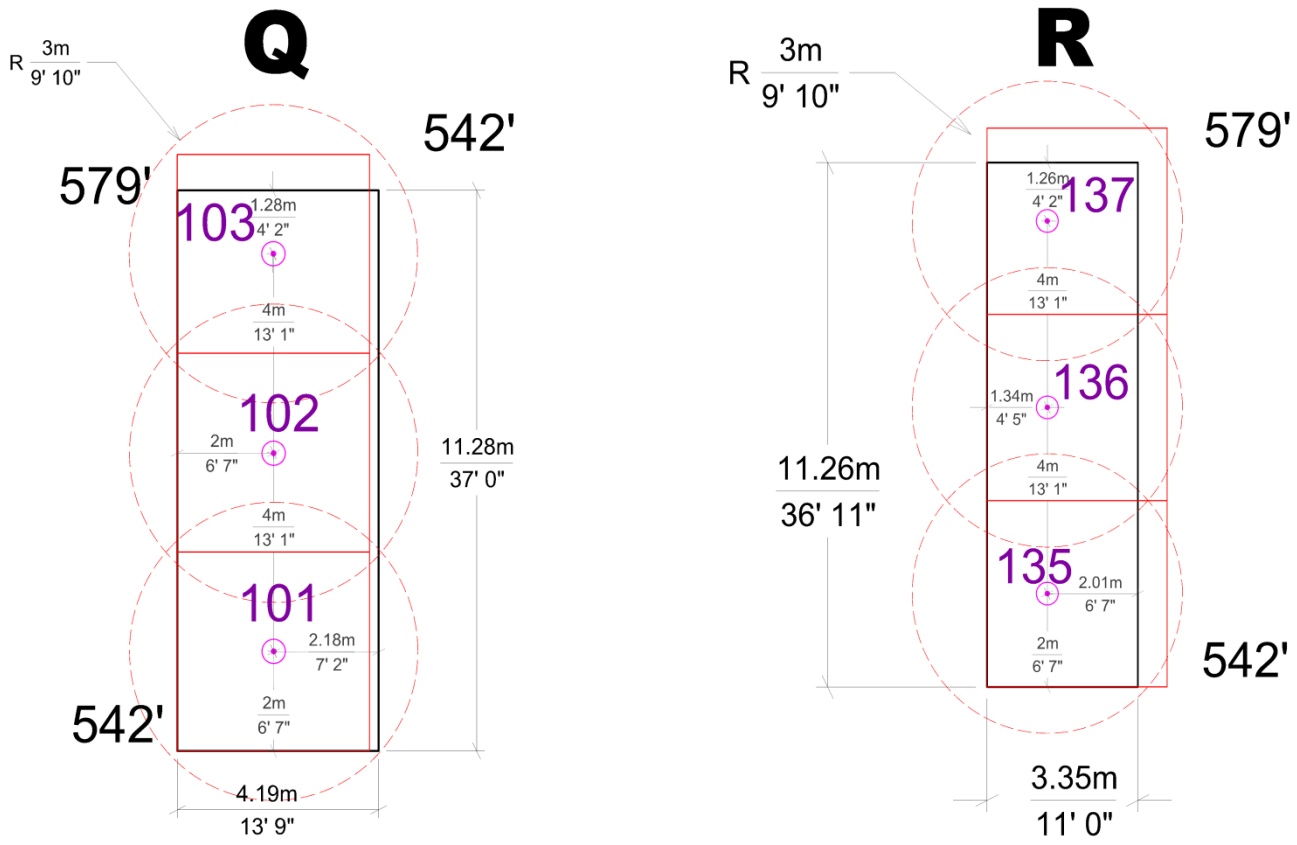


Figure 13 – Auxiliary Building Basement FSS Measurement Locations – Walls S & T

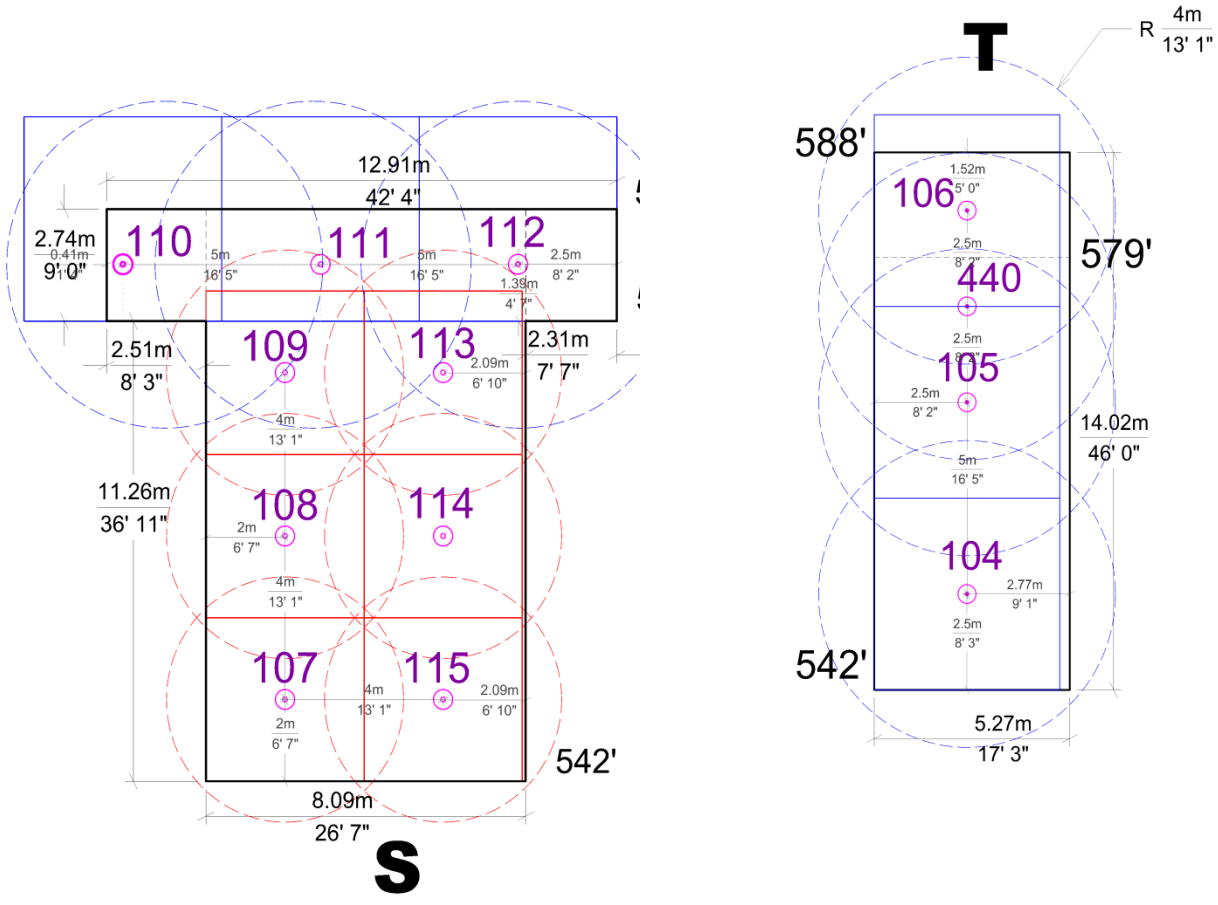


Figure 14 – Auxiliary Building Basement Measurement Locations – Wall U

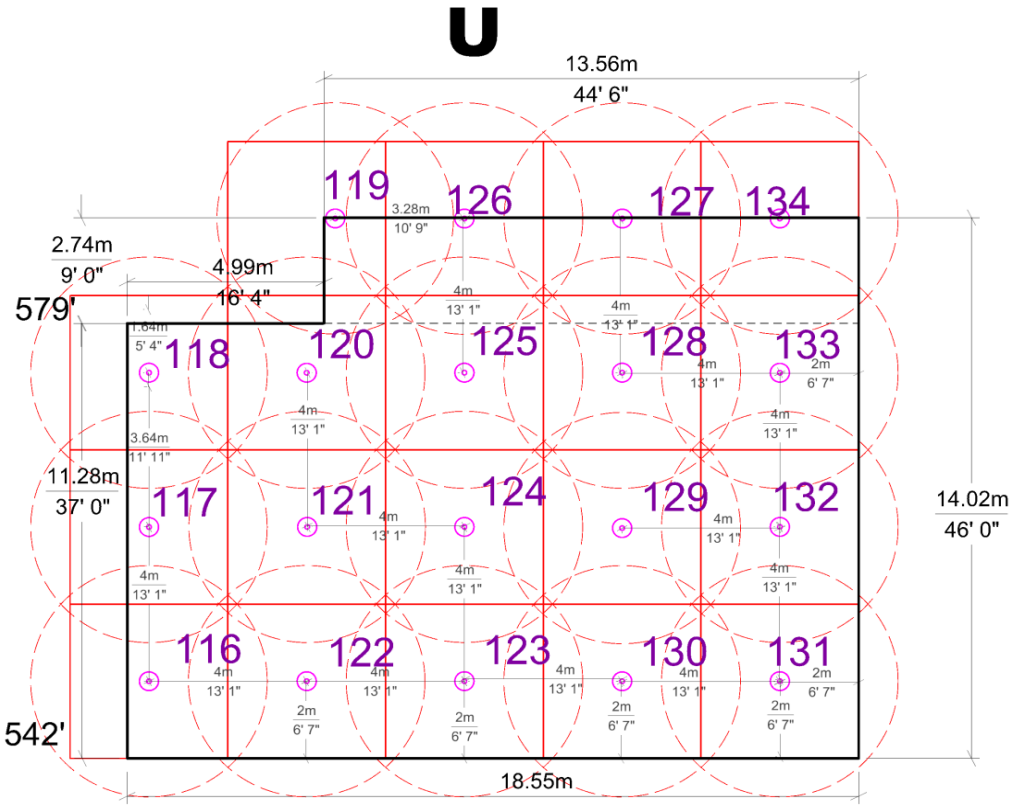


Figure 15 – Auxiliary Building Basement Measurement Locations – Wall V

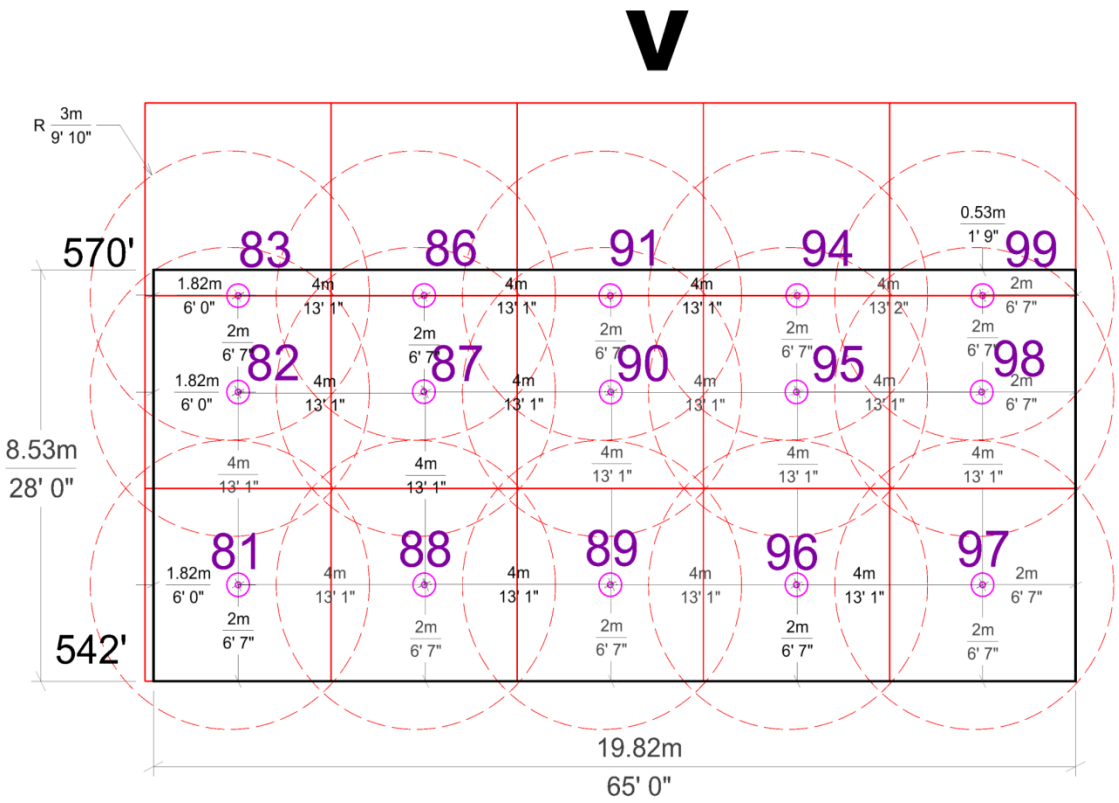
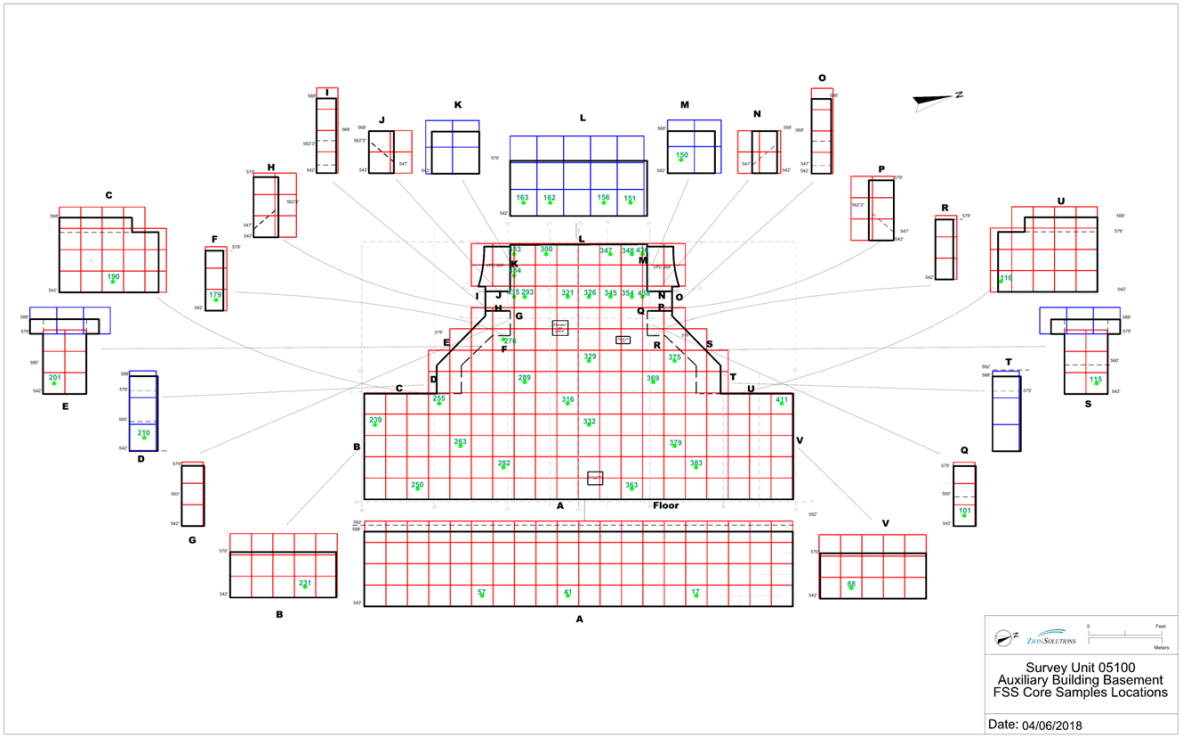


Figure 16 – Concrete Core Sample Locations for FSS



ATTACHMENT 2
ISOCS Geometries

AUXILIARY BUILDING ISOCS GEOMETRIES

The CP template applies to surface volumes which contain levels of contamination that are subject to variations in activity over depth. This source term geometry can be conservatively modeled by single or multiple contaminated source term layers from the surface to a given depth (in this case, 2.0 inches that correspond to the observed contamination depth from the characterization data).

Additional Geometries

Two locations within the Auxiliary Building Basement footprint were identified based on their unique physical characteristics. The first location was the "Elevator Pit", which is a poured concrete box in the floor of the 542 foot elevation of the Auxiliary Building. The pit is approximately 9 feet long by 9 feet wide by 5 feet 8 inches deep. The second location identified was "Sump B", which is also on the Auxiliary Building floor on the 542 foot elevation adjacent to the "G" wall. Sump B is a steel lined pit (liner is intact) that is approximately 9 feet long by 8 feet wide by 6 feet deep. Note that there was a second sump in the Auxiliary Building Basement denoted as "Sump A". This sump was previously filled to the floor elevation with grout.

Auxiliary Building Geometries

The results of the gamma spectroscopic analysis of the ½ inch pucks indicated that twenty-nine (29) of the thirty-two (32) sample locations did not exhibit activity greater than 0.1 SOF below a depth of 2 inches (see Tables 1 through 4).

As a result of this analysis, the geometries selected for the floor and lower walls were as follows:

- 4M 90D_CP_2in - Which corresponds to a 4 meter source to detector distance, 90^0 circular plane, 2.0 inch concrete depth
- 3M 90D_CP_2in - Which corresponds to a 3 meter source to detector distance, 90^0 circular plane, 2.0 inch concrete depth
- 2.5M 90D_CP_2in wall - Which corresponds to a 2.5 meter source to detector distance, 90^0 circular plane, 2.0 inch concrete depth

The varied source to detector distance was necessary to ensure 100% areal coverage in some areas.

Two (2) additional geometries were utilized within the Auxiliary Building basement. These geometries were used because they would provide a more accurate representation of the activity present in those areas based on the physical geometry and/or construction. These special geometries were as follows:

- Elevator Pit - Based on the configuration and construction of the pit, a "Rectangular Plane" geometry template was used to determine the activity present from the concrete floor and walls of the Elevator Pit.

- Sump B - Based on the configuration and construction of the sump, a "Room/Box" geometry template was used to determine the activity present on the floor and wall surfaces of Sump B. The sump floor was modeled to contain 60% of the activity and each of the four (4) walls modeled to contain 10% of the activity present within the sump.

Sump A was previously grouted to floor level. Therefore, a special geometry was not necessary for this sump.

Auxiliary Building Geometries: 4M90D CP_2in

Geometry Composer Report

CANBERRA

Date: Monday, August 06, 2018 - 07:19:21
Description: 4M90D_CP_2in
Comment: 4M90D_CP_2in
File Name: C:\GENIE2K\GENIE2K 6279\isocs\data\GEOMETRY\In-Situ\CIRCULAR_PLANE\4M90D_CP_2in.geo
Software: ISOCS
Template: CIRCULAR_PLANE, Version: (default)
Detector: 6279
Collimator: 50mm-90d new (newISOCS 50mm side 90deg collimation [large hole collimator])
Environment: Temperature = 22 °C, Pressure = 760 mm Hg, Relative Humidity = 30%
Integration: Convergence = 1.00%, MDRPN = 2^4 (16), CRPN = 2^4 (16)

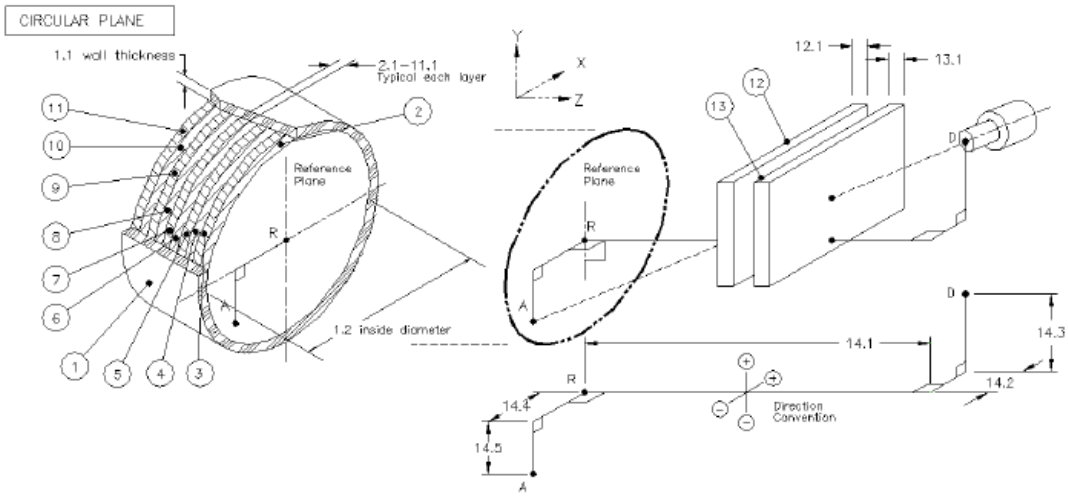
Dimensions (m)

No.	Description	d.1	d.2	d.3	d.4	d.5	d.6	Material	Density	Rel. Conc.
1	Side Walls	0	8					none		
2	Layer 1	0.0508						concrete	2.3	1.00
3	Layer 2	0						<none>		
4	Layer 3	0						<none>		
5	Layer 4	0						<none>		
6	Layer 5	0						<none>		
7	Layer 6	0						<none>		
8	Layer 7	0						<none>		
9	Layer 8	0						<none>		
10	Layer 9	0						<none>		
11	Layer 10	0						<none>		
12	Absorber1									
13	Absorber2									
14	Source-Detector	4	0	0	0	0				

List of energies for efficiency curve generation

45.0 60.0 80.0 100.0 150.0 200.0 300.0 500.0
700.0 1000.0 1400.0 2000.0

Auxiliary Building Geometries: 4M90D CP_2in (continued)



Geometry Composer Report

CANBERRA

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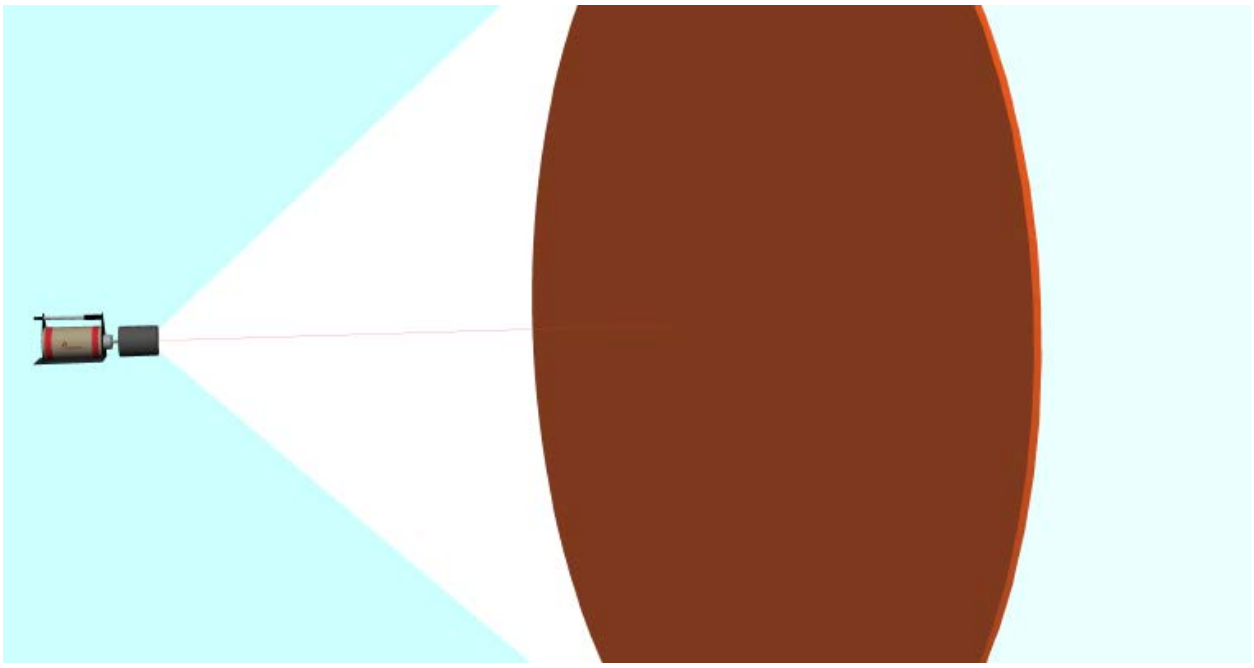
Software:	ISOCS
Template:	CIRCULAR_PLANE, Version: (default)

Auxiliary Building Geometries: 4M90D CP_2in (continued)



ISOCS/LABSOCS RESULTS

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Geom Description: 4M90D_CP_2IN
Comment: ISOCS:4M90D_CP_2IN
Detector: 6279
Collimator: 50MM-90D_NEW
Convergence: 1.00 %
Area [Sq Meters]: 5.0266e+001 (C)
Mass [Grams]: 6.0007e+006 (C)
Length [Meters]: not used
(C) = Value calculated by ISOCS
(U) = Value modified by user

Energy	Efficiency	%Uncertainty	%Convergence	Final # of Voxels
45.00	6.29733e-007	15.0	-0.220427	16356
60.00	1.11051e-006	10.0	-0.178319	16356
80.00	1.56532e-006	10.0	-0.143940	16356
100.00	1.75902e-006	10.0	-0.137561	16356
150.00	1.82092e-006	10.0	-0.106231	16356
200.00	1.66598e-006	8.0	-0.083406	16356
300.00	1.35754e-006	8.0	-0.055867	16356
500.00	1.02185e-006	6.0	-0.066917	16356
700.00	8.59166e-007	6.0	-0.086840	16356
1000.00	7.21901e-007	4.0	-0.103222	16356
1400.00	6.10957e-007	4.0	-0.110780	16356
2000.00	4.88240e-007	4.0	-0.112263	16356

Auxiliary Building Geometries: 3M90D CP_2in

Geometry Composer Report

CANBERRA

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Software: ISOCS
Template: CIRCULAR_PLANE, Version: (default)
Detector: 6279
Collimator: 50mm-90d new (newISOCS 50mm side 90deg collimation [large hole collimator])
Environment: Temperature = 22 °C, Pressure = 760 mm Hg, Relative Humidity = 30%
Integration: Convergence = 1.00%, MDRPN = 2^4 (16), CRPN = 2^4 (16)

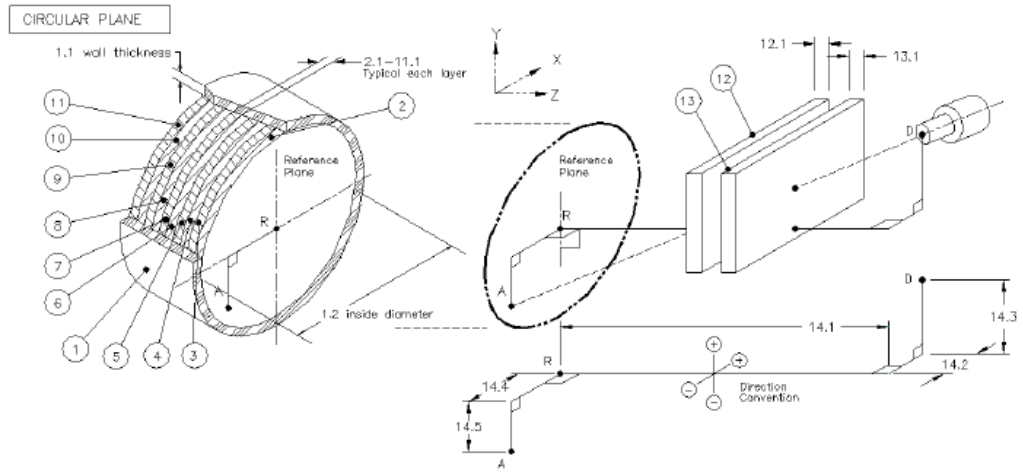
Dimensions (m)

No.	Description	d.1	d.2	d.3	d.4	d.5	d.6	Material	Density	Rel. Conc.
1	Side Walls	0	6					none		
2	Layer 1	0.0508						concrete	2.3	1.00
3	Layer 2	0						<none>		
4	Layer 3	0						<none>		
5	Layer 4	0						<none>		
6	Layer 5	0						<none>		
7	Layer 6	0						<none>		
8	Layer 7	0						<none>		
9	Layer 8	0						<none>		
10	Layer 9	0						<none>		
11	Layer 10	0						<none>		
12	Absorber1									
13	Absorber2									
14	Source-Detector	3	0	0	0	0				

List of energies for efficiency curve generation

45.0 60.0 80.0 100.0 150.0 200.0 300.0 500.0
700.0 1000.0 1400.0 2000.0

Auxiliary Building Geometries: 3M90D CP_2in (continued)



Geometry Composer Report

CANBERRA

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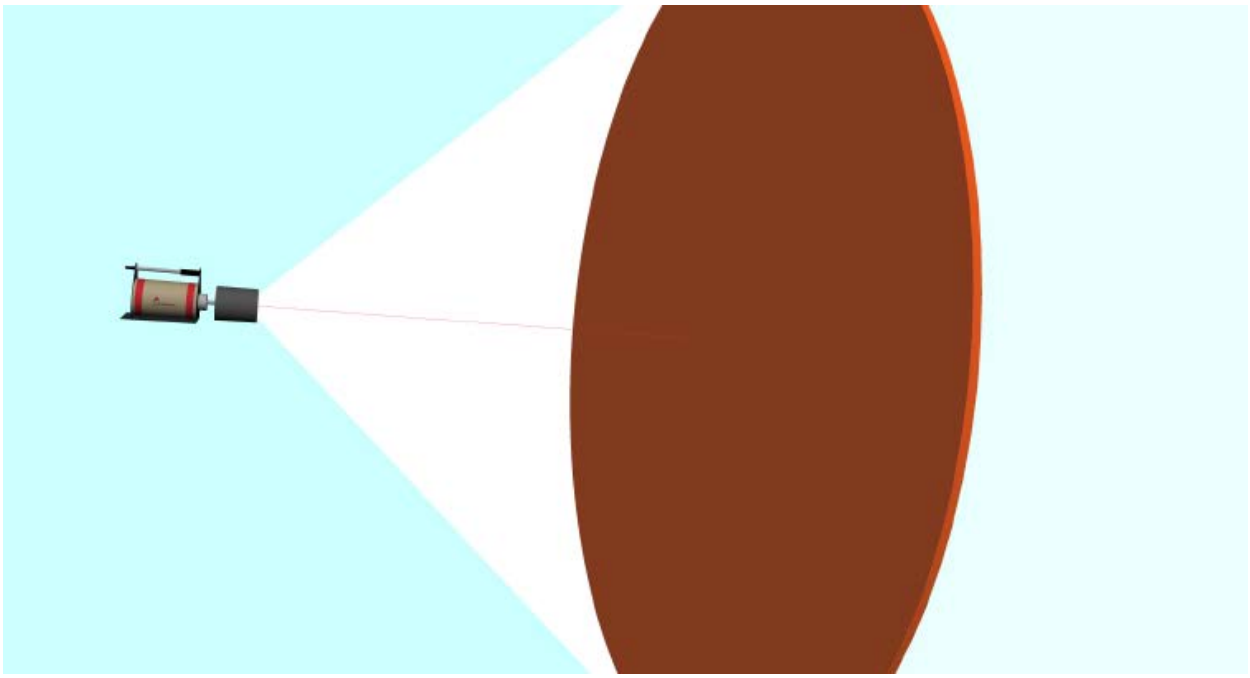
Template:	CIRCULAR_PLANE, Version: (default)

Auxiliary Building Geometries: 3M90D CP_2in (continued)



ISOCS/LABSOCS RESULTS

ISOCS/LabSOCS File: C:\GENIE2K\GENIE2K 6279\isocs\data\GEOMETRY\In-Situ\CIRCULAR_PLA
ISOCS/LabSOCS Time: 02/01/18 15:39:20
Template: CIRCULAR_PLANE
Geom Description: 3M90D_CP_2IN
Comment: ISOCS:3M90D_CP_2IN
Detector: 6279
Collimator: 50MM-90D_NEW
Convergence: 1.00 %
Area [Sq Meters]: 2.8274e+001 (C)
Mass [Grams]: 3.3754e+006 (C)
Length [Meters]: not used
(C) = Value calculated by ISOCS
(U) = Value modified by user

Energy	Efficiency	%Uncertainty	%Convergence	Final # of Voxels
45.00	1.14591e-006	15.0	-0.626085	16370
60.00	2.01464e-006	10.0	-0.484620	16370
80.00	2.83495e-006	10.0	-0.405412	16370
100.00	3.18353e-006	10.0	-0.385577	16370
150.00	3.29044e-006	10.0	-0.347269	16370
200.00	3.00483e-006	8.0	-0.314720	16370
300.00	2.44314e-006	8.0	-0.263555	16370
500.00	1.83624e-006	6.0	-0.207017	16370
700.00	1.54187e-006	6.0	-0.182104	16370
1000.00	1.29479e-006	4.0	-0.164646	16370
1400.00	1.09318e-006	4.0	-0.155201	16370
2000.00	8.73162e-007	4.0	-0.147414	16370

Auxiliary Building Geometries: 2.5M90D CP_2in

Geometry Composer Report

CANBERRA

Date: Monday, August 06, 2018 - 07:20:57
Description: 2.5M90D_CP_2in
Comment: 2.5M90D_CP_2in
File Name: C:\GENIE2K\GENIE2K 6279\isocs\data\GEOMETRY\In-Situ\CIRCULAR_PLANE\2.5M90D_CP_2in.geo
Software: ISOCS
Template: CIRCULAR_PLANE, Version: (default)
Detector: 6279
Collimator: 50mm-90d new (newISOCS 50mm side 90deg collimation [large hole collimator])
Environment: Temperature = 22 °C, Pressure = 760 mm Hg, Relative Humidity = 30%
Integration: Convergence = 1.00%, MDRPN = 2^4 (16), CRPN = 2^4 (16)

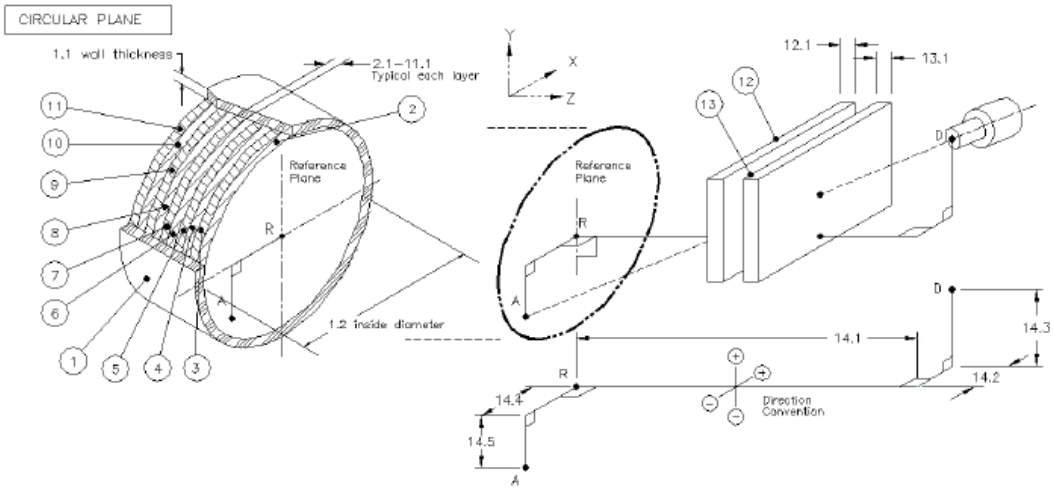
Dimensions (m)

No.	Description	d.1	d.2	d.3	d.4	d.5	d.6	Material	Density	Rel. Conc.
1	Side Walls	0	5					none		
2	Layer 1	0.0508						concrete	2.3	1.00
3	Layer 2	0						<none>		
4	Layer 3	0						<none>		
5	Layer 4	0						<none>		
6	Layer 5	0						<none>		
7	Layer 6	0						<none>		
8	Layer 7	0						<none>		
9	Layer 8	0						<none>		
10	Layer 9	0						<none>		
11	Layer 10	0						<none>		
12	Absorber1									
13	Absorber2									
14	Source-Detector	2.5	0	0	0	0				

List of energies for efficiency curve generation

45.0 60.0 80.0 100.0 150.0 200.0 300.0 500.0
700.0 1000.0 1400.0 2000.0

Auxiliary Building Geometries: 2.5M90D CP_2in (continued)

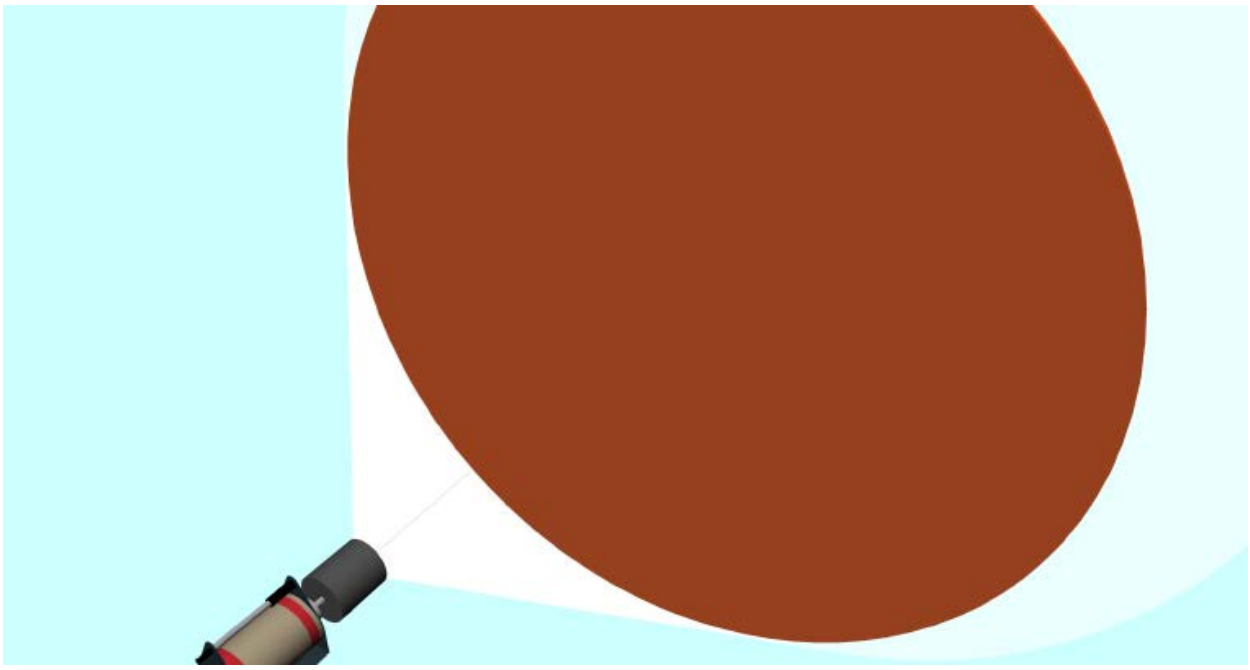


Geometry Composer Report

CANBERRA

Date:	Monday, August 06, 2018 - 07:20:57
Description:	2.5M90D_CP_2in
Comment:	2.5M90D_CP_2in
File Name:	C:\GENIE2K\GENIE2K 6279\isocs\data\GEOMETRY\In-Situ\CIRCULAR_PLANE\2.5M90D_CP_2in.geo
Software:	ISOCS
Template:	CIRCULAR_PLANE, Version: (default)

Auxiliary Building Geometries: 2.5M90D CP_2in (continued)



ISOCS/LABSOCS RESULTS

ISOCS/LabSOCS File: C:\GENIE2K\isocs\data\GEOMETRY\In-Situ\CIRCULAR_PLANE\2.5M90D_CP
ISOCS/LabSOCS Time: 04/06/18 17:04:36
Template: CIRCULAR_PLANE
Geom Description: 2.5M90D_CP_2IN
Comment: ISOCS:2.5M90D_CP_2IN
Detector: 6279
Collimator: 50MM-90D_NEW
Convergence: 1.00 %
Area [Sq Meters]: 1.9635e+001 (C)
Mass [Grams]: 2.3440e+006 (C)
Length [Meters]: not used
(C) = Value calculated by ISOCS
(U) = Value modified by user

Energy	Efficiency	%Uncertainty	%Convergence	Final # of Voxels
45.00	1.67781e-006	15.0	-0.114419	16392
60.00	2.94273e-006	10.0	-0.128780	16392
80.00	4.13604e-006	10.0	-0.124054	16392
100.00	4.63702e-006	10.0	-0.129213	16392
150.00	4.78589e-006	10.0	-0.130581	16392
200.00	4.36668e-006	8.0	-0.126556	16392
300.00	3.54434e-006	8.0	-0.115092	16392
500.00	2.65929e-006	6.0	-0.100798	16392
700.00	2.23079e-006	6.0	-0.105954	16392
1000.00	1.87100e-006	4.0	-0.115706	16392
1400.00	1.57757e-006	4.0	-0.122387	16392
2000.00	1.25970e-006	4.0	-0.123766	16392

Auxiliary Building Geometries: Elevator Pit

Geometry Composer Report

CANBERRA

Date: Monday, August 06, 2018 - 07:24:43
Description: Aux Bldg Elevator Pit
Comment: Aux Bldg Elevator Pit
File Name: C:\GENIE2K\GENIE2K 6279\isocs\data\GEOMETRY\In-Situ\RECTANGULAR_P...\Aux Bldg Elevator Pit.geo
Software: ISOCS
Template: RECTANGULAR_PLANE, Version: (default)
Detector: 6279
Collimator: 50mm-180d new (newISOCS 50mm side 180deg collimation [no collimator])
Environment: Temperature = 22 °C, Pressure = 760 mm Hg, Relative Humidity = 30%
Integration: Convergence = 1.00%, MDRPN = 2^4 (16), CRPN = 2^4 (16)

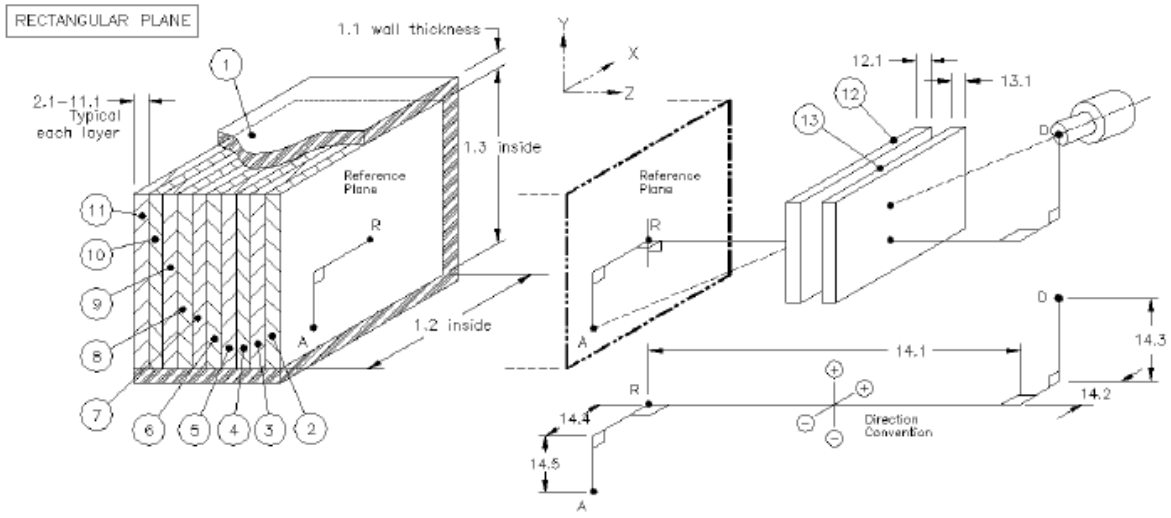
Dimensions (feet)

No.	Description	d.1	d.2	d.3	d.4	d.5	d.6	Material	Density	Rel. Conc.
1	Side Walls	0	12	12				none		
2	Layer 1	0.17						concrete	2.3	1.00
3	Layer 2	0						<none>		
4	Layer 3	0						<none>		
5	Layer 4	0						<none>		
6	Layer 5	0						<none>		
7	Layer 6	0						<none>		
8	Layer 7	0						<none>		
9	Layer 8	0						<none>		
10	Layer 9	0						<none>		
11	Layer 10	0						<none>		
12	Absorber1									
13	Absorber2									
14	Source-Detector	5.7	0	0	0	0				

List of energies for efficiency curve generation

45.0 60.0 80.0 100.0 150.0 200.0 300.0 500.0
700.0 1000.0 1400.0 2000.0

Auxiliary Building Geometries: Elevator Pit (continued)

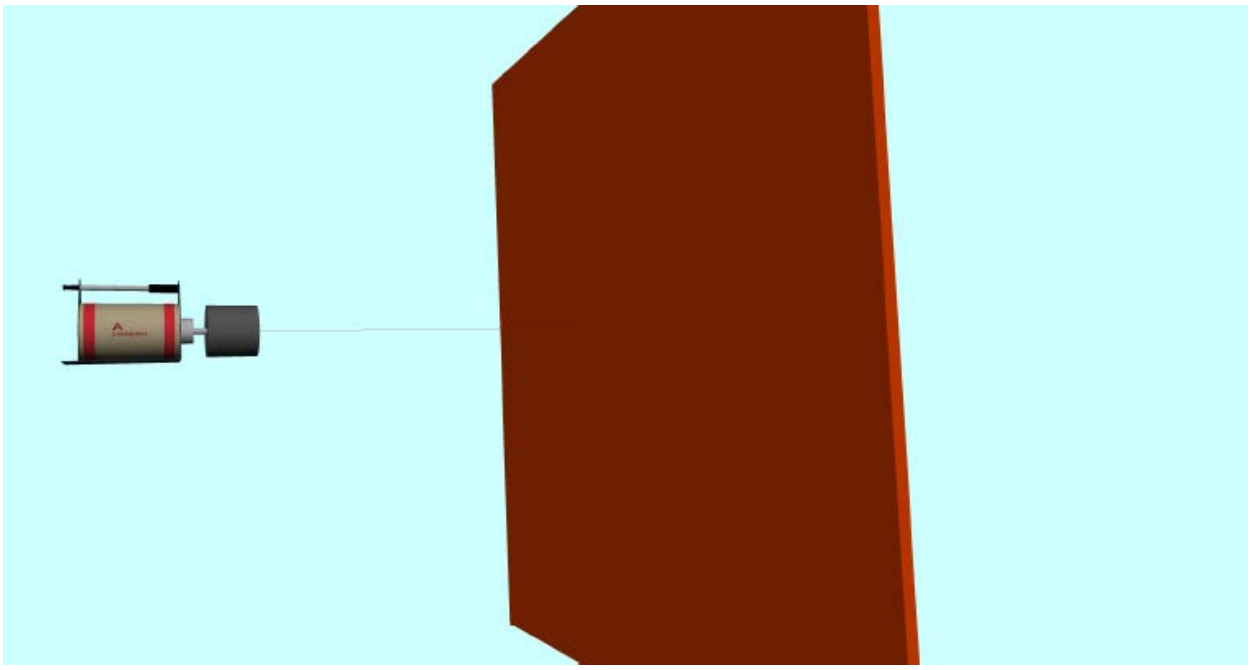


Geometry Composer Report

CANBERRA

Date:	Monday, August 06, 2018 - 07:24:43
Description:	Aux Bldg Elevator Pit
Comment:	Aux Bldg Elevator Pit
File Name:	C:\GENIE2K\GENIE2K 6279\isocs\data\GEOMETRY\In-Situ\RECTANGULAR_PLANE\Aux Bldg Elevator Pit.gec
Software:	ISOCS
Template:	RECTANGULAR_PLANE, Version: (default)

Auxiliary Building Geometries: Elevator Pit (continued)



ISOCS/LABSOCS RESULTS

ISOCS/LabSOCS File: C:\GENIE2K\GENIE2K 6279\isocs\data\GEOMETRY\In-Situ\RECTANGULAR_
ISOCS/LabSOCS Time: 03/23/18 06:57:18
Template: RECTANGULAR_PLANE
Geom Description: LDG_ELEVATOR_PIT
Comment: ISOCS:AUX_BLDG_ELEVATOR_PIT
Detector: 6279
Collimator: 50MM-180D_NEW
Convergence: 1.00 %
Area [Sq Meters]: 1.3378e+001 (C)
Mass [Grams]: 1.6290e+006 (C)
Length [Meters]: not used
(C) = Value calculated by ISOCS
(U) = Value modified by user

Energy	Efficiency	%Uncertainty	%Convergence	Final # of Voxels
45.00	4.68875e-006	15.0	-0.149534	5110
60.00	8.62303e-006	10.0	-0.172607	5110
80.00	1.23813e-005	10.0	-0.156610	5110
100.00	1.42275e-005	10.0	-0.173777	5110
150.00	1.48263e-005	10.0	-0.178889	5110
200.00	1.35176e-005	8.0	-0.165279	5110
300.00	1.07999e-005	8.0	-0.151143	5110
500.00	7.80933e-006	6.0	-0.124922	5110
700.00	6.40917e-006	6.0	-0.114279	5110
1000.00	5.22153e-006	4.0	-0.113499	5110
1400.00	4.31062e-006	4.0	-0.106368	5110
2000.00	3.40141e-006	4.0	-0.112173	5110

Auxiliary Building Geometries: Sump B

Geometry Composer Report

CANBERRA

Date: Monday, August 06, 2018 - 07:23:40
Description: Aux Bldg Sump B
Comment: Aux Bldg Sump B
File Name: C:\GENIE2K\GENIE2K 6279\isocs\data\GEOMETRY\In-Situ\ROOM\Aux Bldg Sump B.geo
Software: ISOCS
Template: ROOM, Version: (default)
Detector: 6279
Collimator: 50mm-180d new (newISOCS 50mm side 180deg collimation [no collimator])
Environment: Temperature = 22 °C, Pressure = 760 mm Hg, Relative Humidity = 30%
Integration: Convergence = 1.00%, MDRPN = 2^4 (16), CRPN = 2^4 (16)

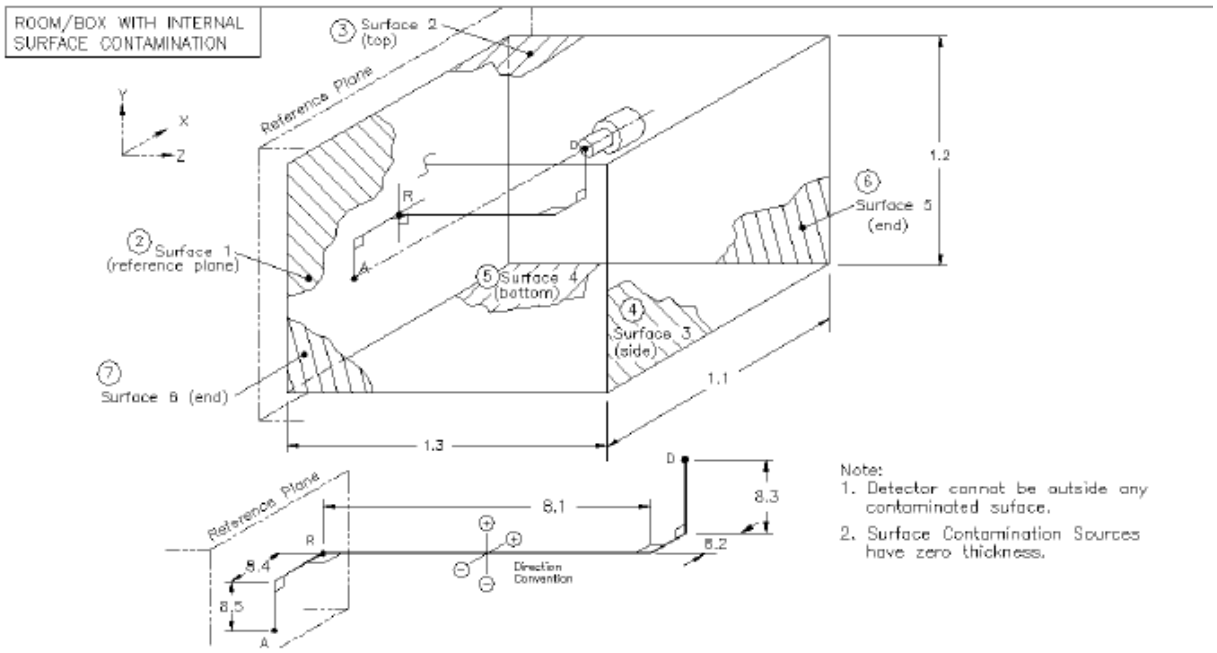
Dimensions (feet)

No.	Description	d.1	d.2	d.3	d.4	d.5	d.6	Material	Density	Rel. Conc.
1	Room/Box	8	9	6						
2	Surface 1									0.60
3	Surface 2									0.10
4	Surface 3									
5	Surface 4									0.10
6	Surface 5									0.10
7	Surface 6									0.10
8	Source-Detector	6	0	0	0	0				

List of energies for efficiency curve generation

45.0 60.0 80.0 100.0 150.0 200.0 300.0 500.0
700.0 1000.0 1400.0 2000.0

Auxiliary Building Geometries: Sump B (continued)

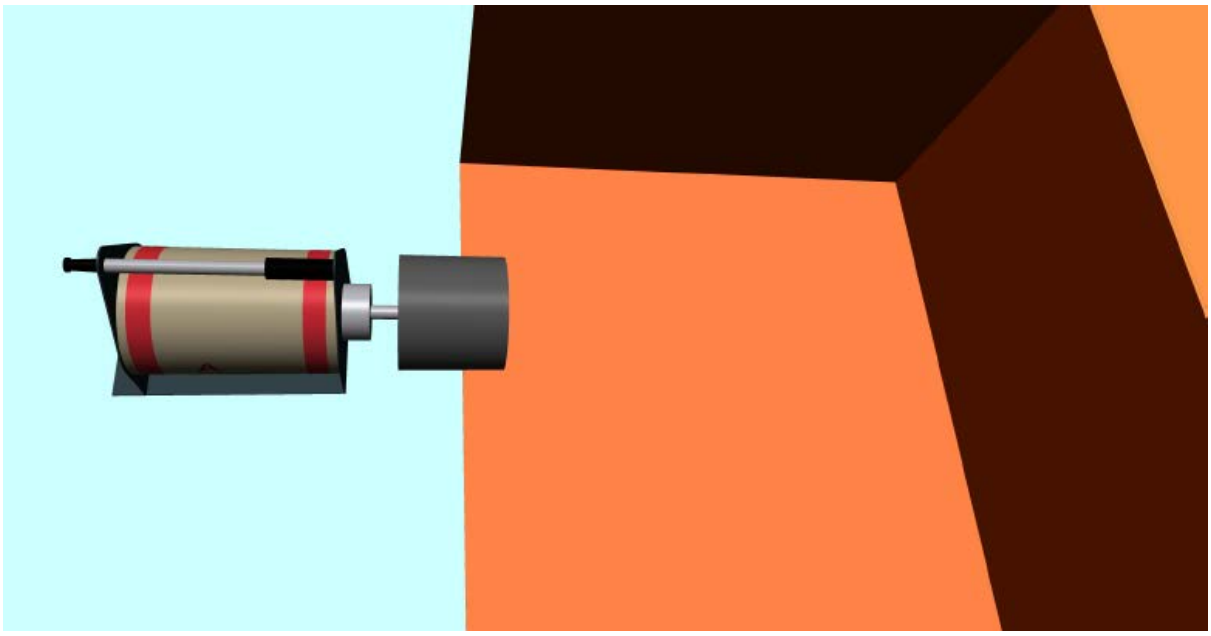


Geometry Composer Report

CANBERRA

Date: Monday, August 06, 2018 - 07:23:40
Description: Aux Bldg Sump B
Comment: Aux Bldg Sump B
File Name: C:\GENIE2K\GENIE2K 6279\isocs\data\GEOMETRY\In-Situ\ROOM\Aux Bldg Sump B.geo
Software: ISOCS
Template: ROOM, Version: (default)

Auxiliary Building Geometries: Sump B (continued)



ISOCS/LABSOCS RESULTS

ISOCS/LabSOCS File: C:\GENIE2K\isocs\data\GEOMETRY\In-Situ\ROOM\Aux Bldg Sump B.ecc
ISOCS/LabSOCS Time: 04/09/18 14:13:28
Template: ROOM
Geom Description: AUX_BLDG_SUMP_B
Comment: ISOCS:AUX_BLDG_SUMP_B
Detector: 6279
Collimator: 50MM-180D_NEW
Convergence: 1.00 %
Area [Sq Meters]: 2.5641e+001 (C)
Mass [Grams]: 0.0000e+000 (C)
Length [Meters]: not used
(C) = Value calculated by ISOCS
(U) = Value modified by user

Energy	Efficiency	%Uncertainty	%Convergence	Final # of Voxels
45.00	3.99155e-005	15.0	0.007717	40955
60.00	4.30807e-005	10.0	0.006646	40955
80.00	4.41777e-005	10.0	0.005228	40955
100.00	4.34483e-005	10.0	0.001740	40955
150.00	3.83137e-005	10.0	0.002441	40955
200.00	3.22315e-005	8.0	0.006444	40955
300.00	2.33581e-005	8.0	0.010758	40955
500.00	1.50808e-005	6.0	0.007073	40955
700.00	1.15164e-005	6.0	0.005169	40955
1000.00	8.76924e-006	4.0	0.003293	40955
1400.00	6.83874e-006	4.0	0.001863	40955
2000.00	5.10534e-006	4.0	0.001748	40955

ATTACHMENT 3
SIGN TEST

SIGN TEST

Survey Area 05100 Description Auxiliary Building

Survey Unit B1-05100A-F Description Auxiliary Building

Classification 1 Type I Error 0.05 Number of Measurements 425

#	SOF (W_S)	1-W_S	Sign	#	SOF (W_S)	1-W_S	Sign
1	0.0095	0.99	+1	33	0.0134	0.99	+1
2	0.0066	0.99	+1	34	0.0313	0.97	+1
3	0.0090	0.99	+1	35	0.0536	0.95	+1
4	0.0042	1.00	+1	36	0.2406	0.76	+1
5	0.0059	0.99	+1	37	0.1381	0.86	+1
6	0.0067	0.99	+1	38	0.0644	0.94	+1
7	0.0035	1.00	+1	39	0.0194	0.98	+1
8	0.0033	1.00	+1	40	0.0109	0.99	+1
9	0.0027	1.00	+1	41	0.0078	0.99	+1
10	0.0028	1.00	+1	42	0.0089	0.99	+1
11	0.0032	1.00	+1	43	0.1134	0.89	+1
12	0.0091	0.99	+1	44	0.1593	0.84	+1
13	0.0038	1.00	+1	45	0.0608	0.94	+1
14	0.0026	1.00	+1	46	0.0168	0.98	+1
15	0.0014	1.00	+1	47	0.0114	0.99	+1
16	0.0025	1.00	+1	48	0.0107	0.99	+1
17	0.0055	0.99	+1	49	0.0758	0.92	+1
18	0.0018	1.00	+1	50	0.1306	0.87	+1
19	0.0044	1.00	+1	51	0.1255	0.87	+1
20	0.0042	1.00	+1	52	0.2405	0.76	+1
21	0.0059	0.99	+1	53	0.0549	0.95	+1
22	0.0065	0.99	+1	54	0.0383	0.96	+1
23	0.0028	1.00	+1	55	0.0759	0.92	+1
24	0.0075	0.99	+1	56	0.0582	0.94	+1
25	0.0052	0.99	+1	57	0.0069	0.99	+1
26	0.0023	1.00	+1	58	0.0197	0.98	+1
27	0.0040	1.00	+1	59	0.0179	0.98	+1
28	0.0046	1.00	+1	60	0.0332	0.97	+1
29	0.0078	0.99	+1	61	0.0022	1.00	+1
30	0.0183	0.98	+1	62	0.0038	1.00	+1
31	0.0087	0.99	+1	63	0.0016	1.00	+1
32	0.0052	0.99	+1	64	0.0047	1.00	+1

SIGN TEST (Continued)

#	SOF (W_S)	1-W_S	Sign
65	0.0061	0.99	+1
66	0.0024	1.00	+1
67	0.0023	1.00	+1
68	0.0035	1.00	+1
69	0.0041	1.00	+1
70	0.0047	1.00	+1
71	0.0037	1.00	+1
72	0.0072	0.99	+1
73	0.0067	0.99	+1
74	0.0026	1.00	+1
75	0.0033	1.00	+1
76	0.0033	1.00	+1
77	0.0035	1.00	+1
78	0.0030	1.00	+1
79	0.0020	1.00	+1
80	0.0011	1.00	+1
81	0.0285	0.97	+1
82	0.0612	0.94	+1
83	0.0473	0.95	+1
84	0.0240	0.98	+1
85	0.0229	0.98	+1
86	0.0275	0.97	+1
87	0.0209	0.98	+1
88	0.0370	0.96	+1
89	0.0311	0.97	+1
90	0.0112	0.99	+1
91	0.0058	0.99	+1
92	0.0304	0.97	+1
93	0.0239	0.98	+1
94	0.0029	1.00	+1
95	0.0047	1.00	+1
96	0.0720	0.93	+1
97	0.0256	0.97	+1
98	0.0748	0.93	+1
99	0.0100	0.99	+1
100	0.0038	1.00	+1
101	0.2739	0.73	+1
102	0.0257	0.97	+1
103	0.0043	1.00	+1
104	0.0070	0.99	+1
105	0.0707	0.93	+1
106	0.0721	0.93	+1
107	0.0858	0.91	+1
108	0.0044	1.00	+1
109	0.0049	1.00	+1
110	0.0102	0.99	+1
111	0.0020	1.00	+1
112	0.0157	0.98	+1
113	0.0079	0.99	+1
114	0.0240	0.98	+1
115	0.0020	1.00	+1
116	0.0108	0.99	+1
117	0.0005	1.00	+1
118	0.0006	1.00	+1
119	0.0036	1.00	+1
120	0.0037	1.00	+1
121	0.0026	1.00	+1
122	0.0041	1.00	+1
123	0.0030	1.00	+1
124	0.0307	0.97	+1
125	0.0014	1.00	+1
126	0.0195	0.98	+1
127	0.1336	0.87	+1
128	0.0253	0.97	+1
129	0.0040	1.00	+1
130	0.0561	0.94	+1
131	0.0230	0.98	+1
132	0.0083	0.99	+1
133	0.0762	0.92	+1
134	0.1212	0.88	+1
135	0.0923	0.91	+1
136	0.0871	0.91	+1
137	0.0492	0.95	+1
138	0.0316	0.97	+1
139	0.1277	0.87	+1
140	0.2253	0.77	+1
141	0.5791	0.42	+1
142	0.1876	0.81	+1

SIGN TEST (Continued)

#	SOF (W_S)	1-W_S	Sign
143	0.0703	0.93	+1
144	0.0581	0.94	+1
145	0.1732	0.83	+1
146	0.3478	0.65	+1
147	0.0259	0.97	+1
148	0.0160	0.98	+1
149	0.0083	0.99	+1
150	0.0167	0.98	+1
151	0.0110	0.99	+1
152	0.0729	0.93	+1
153	0.1386	0.86	+1
154	0.0180	0.98	+1
155	0.0913	0.91	+1
156	0.0983	0.90	+1
157	0.0399	0.96	+1
158	0.0341	0.97	+1
159	0.0667	0.93	+1
160	0.0835	0.92	+1
161	0.0363	0.96	+1
162	0.0390	0.96	+1
163	0.0677	0.93	+1
164	0.1836	0.82	+1
165	0.0561	0.94	+1
166	0.0253	0.97	+1
167	0.0089	0.99	+1
168	0.0089	0.99	+1
169	0.0389	0.96	+1
170	0.0662	0.93	+1
171	0.0087	0.99	+1
172	0.0076	0.99	+1
173	0.0056	0.99	+1
174	0.0026	1.00	+1
175	0.0035	1.00	+1
176	0.0057	0.99	+1
177	0.0059	0.99	+1
178	0.0061	0.99	+1
179	0.2598	0.74	+1
180	0.0042	1.00	+1
181	0.0047	1.00	+1

#	SOF (W_S)	1-W_S	Sign
182	0.0058	0.99	+1
183	0.1817	0.82	+1
184	0.0664	0.93	+1
185	0.0308	0.97	+1
186	0.1802	0.82	+1
187	0.0265	0.97	+1
188	0.0253	0.97	+1
189	1.0817	(0.08)	-1
190	1.2501	(0.25)	-1
191	1.1173	(0.12)	-1
192	0.0236	0.98	+1
193	0.2413	0.76	+1
194	0.2084	0.79	+1
195	0.1163	0.88	+1
196	0.0132	0.99	+1
197	1.0038	(0.00)	-1
198	0.0754	0.92	+1
199	0.0309	0.97	+1
200	0.0284	0.97	+1
201	0.0110	0.99	+1
202	0.0169	0.98	+1
203	0.0151	0.98	+1
204	0.0334	0.97	+1
205	0.0326	0.97	+1
206	0.0047	1.00	+1
207	0.0054	0.99	+1
208	0.0073	0.99	+1
209	0.0081	0.99	+1
210	0.0042	1.00	+1
211	0.0042	1.00	+1
212	0.0062	0.99	+1
213	0.0127	0.99	+1
214	0.0113	0.99	+1
215	0.0060	0.99	+1
216	0.0108	0.99	+1
217	0.0084	0.99	+1
218	0.0061	0.99	+1
219	0.0085	0.99	+1
220	0.0155	0.98	+1

SIGN TEST (Continued)

#	SOF (W_S)	1-W_S	Sign
221	0.0079	0.99	+1
222	0.0092	0.99	+1
223	0.0070	0.99	+1
224	0.0063	0.99	+1
225	0.0074	0.99	+1
226	0.0116	0.99	+1
227	0.0127	0.99	+1
228	0.0065	0.99	+1
229	0.0070	0.99	+1
230	0.0087	0.99	+1
231	0.0040	1.00	+1
232	0.0075	0.99	+1
233	0.0113	0.99	+1
234	0.0115	0.99	+1
235	0.0159	0.98	+1
236	1.7757	(0.78)	-1
237	1.5759	(0.58)	-1
238	1.5706	(0.57)	-1
239	2.0335	(1.03)	-1
240	1.9089	(0.91)	-1
241	0.1171	0.88	+1
242	0.0880	0.91	+1
243	0.0126	0.99	+1
244	0.0099	0.99	+1
245	0.0106	0.99	+1
246	0.0137	0.99	+1
247	0.0118	0.99	+1
248	0.0243	0.98	+1
249	0.1801	0.82	+1
250	0.2015	0.80	+1
251	0.3483	0.65	+1
252	0.5965	0.40	+1
253	2.1603	(1.16)	-1
254	2.1725	(1.17)	-1
255	0.7498	0.25	+1
256	0.2408	0.76	+1
257	0.2753	0.72	+1
258	0.3562	0.64	+1
259	0.1176	0.88	+1

#	SOF (W_S)	1-W_S	Sign
260	0.0919	0.91	+1
261	0.0275	0.97	+1
262	0.0128	0.99	+1
263	0.0114	0.99	+1
264	0.0079	0.99	+1
265	0.0132	0.99	+1
266	0.1212	0.88	+1
267	0.2014	0.80	+1
268	0.1638	0.84	+1
269	0.2443	0.76	+1
270	0.4853	0.51	+1
271	0.3870	0.61	+1
272	0.5651	0.43	+1
273	0.4060	0.59	+1
274	0.0501	0.95	+1
275	1.2510	(0.25)	-1
276	0.5873	0.41	+1
277	0.5921	0.41	+1
278	0.9200	0.08	+1
279	0.0737	0.93	+1
280	0.0596	0.94	+1
281	0.0499	0.95	+1
282	0.0826	0.92	+1
283	0.0883	0.91	+1
284	0.1885	0.81	+1
285	0.2399	0.76	+1
286	0.1711	0.83	+1
287	0.2845	0.72	+1
288	0.3423	0.66	+1
289	0.2425	0.76	+1
290	0.0079	0.99	+1
291	0.0103	0.99	+1
292	0.0128	0.99	+1
293	0.0121	0.99	+1
294	0.0223	0.98	+1
295	0.0503	0.95	+1
296	0.0240	0.98	+1
297	0.0176	0.98	+1
298	0.0393	0.96	+1

SIGN TEST (Continued)

#	SOF (W_S)	1-W_S	Sign
299	0.1286	0.87	+1
300	0.1504	0.85	+1
301	0.3841	0.62	+1
302	0.0396	0.96	+1
303	0.0244	0.98	+1
304	0.0822	0.92	+1
305	0.0844	0.92	+1
306	0.5466	0.45	+1
307	0.1222	0.88	+1
308	0.0376	0.96	+1
309	0.0478	0.95	+1
310	0.0180	0.98	+1
311	0.0288	0.97	+1
312	0.0708	0.93	+1
313	0.0195	0.98	+1
314	0.1289	0.87	+1
315	0.0627	0.94	+1
316	0.0609	0.94	+1
317	0.0665	0.93	+1
318	0.0656	0.93	+1
319	0.0761	0.92	+1
320	0.5054	0.49	+1
321	0.6064	0.39	+1
322	0.4017	0.60	+1
323	0.1830	0.82	+1
324	0.0891	0.91	+1
325	0.2089	0.79	+1
326	0.0708	0.93	+1
327	0.1754	0.82	+1
328	0.1245	0.88	+1
329	0.7068	0.29	+1
330	1.0305	(0.03)	-1
331	2.1892	(1.19)	-1
332	1.4884	(0.49)	-1
333	0.0535	0.95	+1
334	0.1972	0.80	+1
335	0.1405	0.86	+1
336	0.3454	0.65	+1
337	0.6169	0.38	+1
338	0.5505	0.45	+1
339	0.2373	0.76	+1
340	0.0601	0.94	+1
341	0.0608	0.94	+1
342	0.0470	0.95	+1
343	0.0662	0.93	+1
344	0.0538	0.95	+1
345	0.0510	0.95	+1
346	0.0441	0.96	+1
347	0.1360	0.86	+1
348	0.0899	0.91	+1
349	0.1900	0.81	+1
350	0.1122	0.89	+1
351	0.0999	0.90	+1
352	0.3299	0.67	+1
353	0.0836	0.92	+1
354	0.0917	0.91	+1
355	0.0509	0.95	+1
356	0.0510	0.95	+1
357	0.1436	0.86	+1
358	0.1757	0.82	+1
359	0.0391	0.96	+1
360	0.0421	0.96	+1
361	0.0366	0.96	+1
362	0.0152	0.98	+1
363	0.0194	0.98	+1
364	0.0252	0.97	+1
365	0.1992	0.80	+1
366	0.1576	0.84	+1
367	0.1253	0.87	+1
368	0.1266	0.87	+1
369	0.1055	0.89	+1
370	0.1377	0.86	+1
371	0.4458	0.55	+1
372	0.0164	0.98	+1
373	0.0284	0.97	+1
374	0.0116	0.99	+1
375	0.0156	0.98	+1
376	0.0123	0.99	+1

SIGN TEST (Continued)

#	SOF (W_S)	1-W_S	Sign
377	0.0181	0.98	+1
378	0.0198	0.98	+1
379	0.0269	0.97	+1
380	0.0324	0.97	+1
381	0.0217	0.98	+1
382	0.0386	0.96	+1
383	0.0541	0.95	+1
384	0.0593	0.94	+1
385	0.0390	0.96	+1
386	0.0353	0.96	+1
387	0.0623	0.94	+1
388	0.0920	0.91	+1
389	0.0665	0.93	+1
390	0.0777	0.92	+1
391	0.0434	0.96	+1
392	0.1231	0.88	+1
393	0.1093	0.89	+1
394	0.2839	0.72	+1
395	0.1625	0.84	+1
396	0.0513	0.95	+1
397	0.1623	0.84	+1
398	0.0178	0.98	+1
399	0.0082	0.99	+1
400	0.0163	0.98	+1
401	0.0370	0.96	+1

#	SOF (W_S)	1-W_S	Sign
402	0.0553	0.94	+1
403	0.0295	0.97	+1
404	0.0544	0.95	+1
405	0.0952	0.90	+1
406	0.3149	0.69	+1
407	0.1078	0.89	+1
408	0.1983	0.80	+1
409	0.1470	0.85	+1
410	0.0772	0.92	+1
411	0.0718	0.93	+1
412	0.0342	0.97	+1
413	0.0203	0.98	+1
414	0.0112	0.99	+1
415	0.0157	0.98	+1
416	0.4187	0.58	+1
417	0.5157	0.48	+1
418	0.5508	0.45	+1
419	0.0524	0.95	+1
420	0.0186	0.98	+1
421	0.0295	0.97	+1
422	0.5810	0.42	+1
423	0.1514	0.85	+1
424	0.0519	0.95	+1
425	1.6120	(0.61)	-1

Number of positive differences (S+) 409

Critical Value 229

Survey Unit MEETS the Acceptance Criteria

ATTACHMENT 4
QA INFORMATION AND CHARTS/QC REPLICATE MEASUREMENT ASSESSMENTS

ISOCS QA Letter to File

Dates 02/02/2018 to 03/22/2018
Location Auxiliary Building
ISOCS Detector 6279

This letter documents the Quality Control of ISOCS 6279 during the Auxiliary Building FSS. The attached files are the Full QA reports/graphs for the referenced ISOCS unit. The control limits and parameters are located in Procedure ZS-RP-108-006-004, Rev. 4, Section 4.3.5. The reports will show the date and times collected for the Peak Position (Energy channel), Peak resolution or Full Width at Half Maximum (FWHM), and Peak activity (after correction for radioactive decay).

Measurements rejected will be signified with an "R" preceding the date. These were rejected for various reasons, i.e. (run time did not meet the 300 seconds, wrong dates that were used for the assay of source, days the ISOCS was not used for FSS/turnover surveys, or multiple runs made during adjusting gains during the pre-check). Measurements with flags will be listed below with comments.

Peak energy-1274.53 kev

Measurement Time	Sample ID	Analyst	Value (keV)	Flags LU:SD:UD:BS
2/2/18 10:09:37 AM			1.2713E+03	Be:

No historical QA data to compare. Moved from Truck Monitor to Aux Bldg. Basement, unit not completely settled. Spectrum evaluated and deemed acceptable to continue. All data collected during FSS are inspected to verify peaks are in proper channels and FWHM are acceptable.

Peak energy-86.54 kev

Measurement Time	Sample ID	Analyst	Value (keV)	Flags LU:SD:UD:BS
2/23/18 3:45:57 AM	PM Post		1.2761E+03	Ab:

Drifting occurred from initial QC. Spectrum evaluated and deemed acceptable to continue, all other parameters were within limits. All data collected during FSS are inspected to verify peaks are in proper channels and FWHM are acceptable.

FWHM-86.54 kev

Measurement Time	Sample ID	Analyst	Value (keV)	Flags LU:SD:UD:BS
2/3/18 2:22:16 PM			3.6291E+00	Ac:
2/15/18 2:20:20 PM	Post		3.8897E+00	Ac:
2/24/18 10:03:34 AM	Post		4.0707E+00	Ac:
2/24/18 4:08:02 PM	Post		3.7642E+00	Ac:
3/2/18 8:11:33 AM	Pre		3.1328E+00	In:
3/2/18 12:32:28 PM	Pre		3.2411E+00	In:
3/2/18 3:40:55 PM	Post		2.9409E+00	In:
3/3/18 7:19:21 AM	Pre		3.6120E+00	Ac:
3/3/18 3:41:53 PM	Post		3.5435E+00	Ac:
3/5/18 8:38:31 AM	Pre		3.4333E+00	Ac:
3/5/18 10:30:17 AM	Post		3.4950E+00	Ac:
3/5/18 3:40:58 PM	Post		3.7141E+00	Ac:
3/6/18 7:27:28 AM	Pre		3.6852E+00	Ac:

These measurements are grouped together for the same reason; the environmental conditions were the majority of the flags, snow moving into the area, rising humidity, all causing issues with the MCA/Pre- amp/detector. Spectrums were evaluated because of the higher than normal FWHM, all others parameters were within limits. All data collected during FSS are inspected to verify peaks are in proper channels and FWHM are acceptable.

FWHM-1274.53 kev

Measurement Time	Sample ID	Analyst	Value (keV)	Flags LU:SD:UD:BS
2/3/18 2:22:16 PM			3.6223E+00	Ac:
2/15/18 2:20:20 PM	Post		4.0730E+00	Ac:
2/24/18 10:03:34 AM	Post		4.3218E+00	Ac:
2/24/18 4:08:02 PM	Post		3.5368E+00	Ac:
2/28/18 8:32:14 AM	Pre		3.1417E+00	In:
2/28/18 3:49:56 PM	Post		3.0854E+00	In:
3/2/18 8:11:33AM	Pre		3.2623E+00	In:
3/2/18 12:32:28 PM	Pre		3.3938E+00	In:
3/2/18 3:40:55 PM	Post		3.6057E+00	Ac:
3/3/18 7:19:21AM	Pre		3.9100E+00	Ac:
3/3/18 3:41:53 PM	Post		3.3874E+00	In:
3/5/18 8:38:31 AM	Pre		3.7302E+00	Ac:
3/5/18 10:30:17 AM	Post		3.5300E+00	Ac:
3/5/18 3:40:58 PM	Post		3.8723E+00	Ac:
3/6/18 7:27:28AM	Pre		3.7929E+00	Ac:

These measurements (same as 86.5 keV FWMH) are grouped together for the same reason; the environmental conditions were the majority of the flags, snow moving into the area, rising humidity, causing issues with the MCS/Pre-amp/detector. Spectrums were evaluated because of the higher than normal FWHM, all other parameters were within limits. All data collected during FSS was inspected to verify peaks were in proper channels and FWHM were acceptable.

Decay Corrected - 86.54 kev

Measurement Time	Sample ID	Analyst	Value (keV)	Flags LU:SD:UD:BS
2/7/18 10:15:30 AM	Pre		7.2217E-01	In:
2/7/18 4:01:41 PM	Post		6.9156E-01	In:

Spectrum evaluated and deemed acceptable to continue, all other parameters were within limits. All data collected during FSS are inspected to verify peaks are in proper channels and FWHM are acceptable.

Decay Corrected - 86.54 kev

Measurement Time	Sample ID	Analyst	Value (keV)	Flags LU:SD:UD:BS
2/15/18 7:45:40 AM	Pre		7.0404E-01	In:

Environmental conditions contributed to the other flags on this date, causing issues with the MCA/Pre- amp/detector. Spectrums were evaluated because of the higher than normal FWHM, all others parameters were within limits. The activity was deemed acceptable. All data collected during FSS are inspected to verify peaks are in proper channels and FWHM are acceptable.

Decay Corrected - 86.54 kev

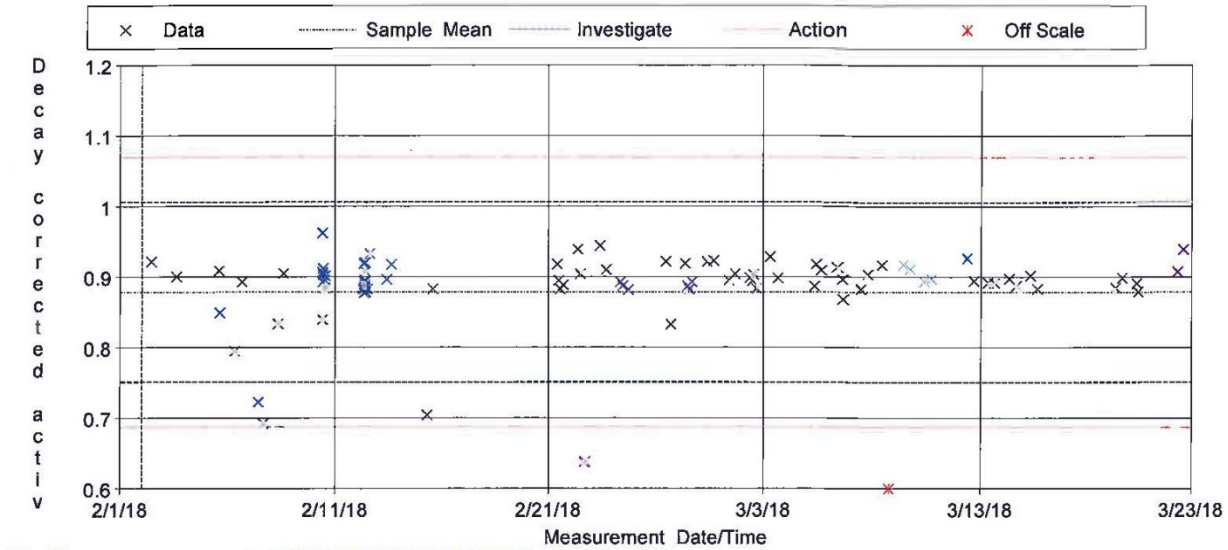
Measurement Time	Sample ID	Analyst	Value (keV)	Flags LU:SD:UD:BS
2/22/18 3:48:24 PM	Post		6.3727E-01	Ac:
3/8/18 3:40:40 PM	Post		6.3967E-01	Ac:

Decay Corrected - 1274.53 kev

Measurement Time	Sample ID	Analyst	Value (keV)	Flags LU:SD:UD:BS
2/22/18 3:48:24 PM	Post		6.9423E-01	Ac:
3/8/18 3:40:40 PM	Post		6.5819E-01	Ac:

These measurements are grouped together for the same reason; a different ISOCS source was used. The sources are identical in all aspects except assay date. The correct assay date for the 6279 unit was 6/13/2011. The source that best fits the activity here is assay date 6/03/2009 used for 6278. All other parameters were within limits. All data collected during FSS was inspected to verify peaks were in proper channels and FWHM was acceptable.

No other flags were identified.



QA Filename : C:\GENIE2K\CAMFILES\6279_Daily_QA.QAF
Parameter Description : Decay corrected activity-86.54 (uCi/unit)
Selection Dates : 2/02/18 12:00:00 AM - 3/23/18 12:00:00 AM
Sample Mean +/- Std Dev : 0.878 +/- 0.064

Full Q.A. Report 5/16/18 9:44:52 AM Page 1

****
***** GENIE QUALITY ASSURANCE *****
****

Full Parameter Results Report
5/16/18 9:44:52 AM

QA File: C:\GENIE2K\CAMFILES\6279_Daily_Q
Description: Decay corrected activity-86.54
Parameter Units: uCi/unit
Parameter Type: Energy line

Sample Start Date:
Sample End Date:
Sample Mean: 8.7821E-001
Sample Std. Deviation: 6.3710E-002

	Measurement Time	Sample ID	Analyst	Value (uCi/unit)	Flags LU	SD	UD	ES
	2/2/18 10:09:37 AM			9.2107E-001				
	2/3/18 2:22:16 PM			8.9981E-001				
	2/5/18 2:15:05 PM	pre		9.0815E-001				
	2/5/18 3:36:37 PM	POST		8.4840E-001				
	2/6/18 7:54:07 AM	pre		7.9407E-001				
	2/6/18 4:06:46 PM	POST		8.9224E-001				
	2/7/18 10:15:30 AM	pre		7.2217E-001	:In			
	2/7/18 4:01:41 PM	Post		6.9156E-001	:In			
	2/8/18 8:31:16 AM	pre		8.3290E-001				
	2/8/18 2:19:23 PM	POST		9.0413E-001				
R	2/9/18 12:42:14 PM	pre		8.7799E-001				
	2/10/18 9:54:44 AM	001		8.3901E-001				
	2/10/18 10:02:05 AM	002		9.0617E-001				
	2/10/18 10:07:52 AM	003		9.6207E-001				
	2/10/18 10:14:34 AM	004		8.9199E-001				
	2/10/18 10:23:13 AM	005		9.0477E-001				
	2/10/18 10:33:40 AM	006		9.0248E-001				
	2/10/18 10:46:21 AM	007		9.1113E-001				
	2/10/18 10:58:09 AM	008		9.1157E-001				
	2/10/18 12:22:18 PM	009		8.9544E-001				
	2/10/18 12:28:38 PM	010		8.8362E-001				
	2/10/18 1:20:42 PM	test run		9.0081E-001				
	2/12/18 7:37:54 AM			8.8187E-001				
R	2/12/18 8:36:06 AM	Pre		9.0076E-001				
	2/12/18 8:41:26 AM	Pre		9.1812E-001				
	2/12/18 8:49:39 AM	Pre		8.7669E-001				
	2/12/18 8:57:12 AM	Pre		8.8439E-001				
	2/12/18 9:03:16 AM	Pre		9.1921E-001				
	2/12/18 9:11:41 AM	Pre		8.9200E-001				
	2/12/18 9:19:22 AM	Pre		9.1994E-001				
	2/12/18 9:31:04 AM	Pre		8.8396E-001				
	2/12/18 9:38:22 AM	Pre		8.9498E-001				
	2/12/18 9:45:30 AM	Pre		9.0759E-001				
	2/12/18 9:56:54 AM	Pre		8.8504E-001				
	2/12/18 10:03:38 AM	Pre		8.8776E-001				

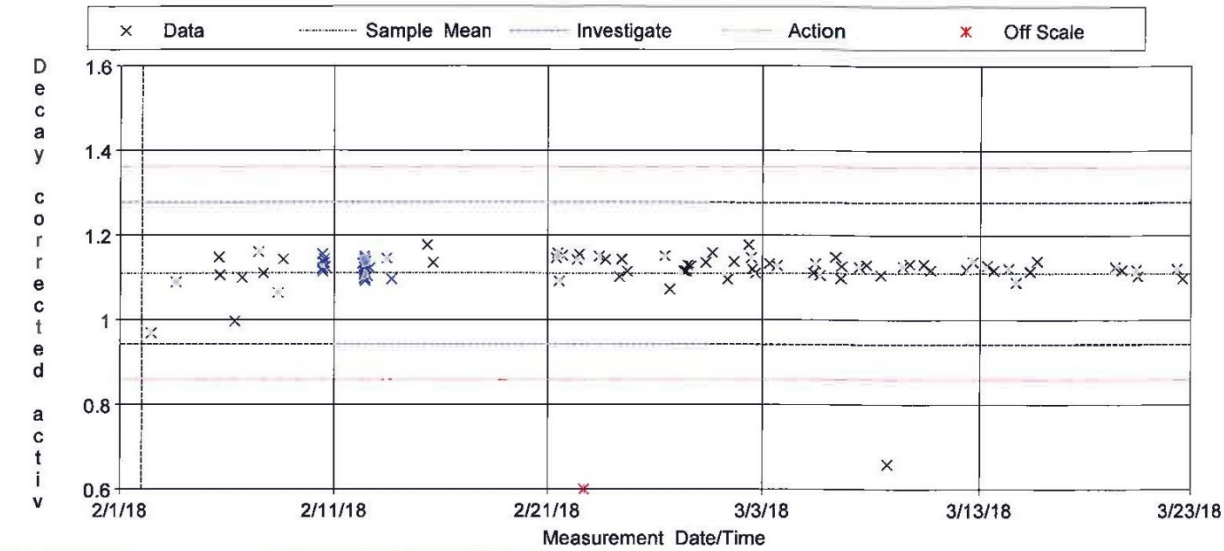
Full Q.A. Report 5/16/18 9:44:52 AM Page 2

	Measurement Time	Sample ID	Analyst	Value (uCi/unit)	LU	Flags SD	UD	BS
	2/12/18 10:10:43 AM	Pre		8.8353E-001				
	2/12/18 10:17:44 AM	Pre		9.1960E-001				
	2/12/18 10:24:21 AM	Pre		8.7789E-001				
	2/12/18 12:35:25 PM	Pre		8.8231E-001				
	2/12/18 3:18:02 PM	Post		9.3249E-001				
	2/13/18 10:18:49 AM	Pre		8.9570E-001				
	2/13/18 3:38:31 PM	Post		9.1712E-001				
R	2/15/18 7:33:31 AM	Pre		8.9537E-001				
	2/15/18 7:45:40 AM	Pre		7.0404E-001		In		
R	2/15/18 2:19:33 PM	Post		8.8039E-001				
	2/15/18 2:20:20 PM	Post		8.8251E-001				
R	2/16/18 10:48:18 AM			8.8984E-001				
R	2/16/18 10:58:01 AM			8.8108E-001				
R	2/16/18 11:11:27 AM			8.7551E-001				
R	2/19/18 9:34:11 AM			9.1059E-001				
R	2/20/18 7:36:48 AM			9.2212E-001				
R	2/20/18 1:02:50 PM	Pre		9.0539E-001				
R	2/21/18 8:38:30 AM			8.2995E-001				
R	2/21/18 8:39:58 AM	Pre		8.9402E-001				
R	2/21/18 9:06:38 AM	Pre		8.8461E-001				
	2/21/18 9:19:06 AM	Pre		9.1714E-001				
	2/21/18 10:45:26 AM	Post		8.9431E-001				
	2/21/18 12:36:04 PM			8.8206E-001				
	2/21/18 4:08:43 PM	Post		8.8803E-001				
	2/22/18 8:17:47 AM	Pre		9.3855E-001				
	2/22/18 10:47:12 AM	Post		9.0354E-001				
	2/22/18 3:48:24 PM	Post		6.3727E-001		Ac:		
R	2/23/18 8:21:28 AM	Pre		9.0911E-001				
R	2/23/18 8:37:23 AM	Pre		9.4337E-001				
	2/23/18 8:41:50 AM	Pre		9.4368E-001				
	2/23/18 3:45:57 PM	Post		9.0948E-001				
	2/24/18 7:26:44 AM	Pre		8.9244E-001				
	2/24/18 10:03:34 AM	Post		8.8679E-001				
	2/24/18 4:08:02 PM	POST		8.8134E-001				
	2/26/18 10:19:17 AM	Pre		9.2085E-001				
	2/26/18 3:50:27 PM	Post		8.5204E-001				
	2/27/18 8:03:00 AM	Pre		9.1833E-001				
	2/27/18 10:34:34 AM	Post		8.8629E-001				
	2/27/18 12:27:42 PM	Pre		8.8186E-001				
	2/27/18 3:40:56 PM	Post		8.9239E-001				
R	2/28/18 8:22:17 AM	Pre		9.0749E-001				
	2/28/18 8:32:14 AM	Pre		9.2091E-001				
	2/28/18 3:49:56 PM	Post		9.2250E-001				
	3/1/18 8:54:57 AM	Pre		8.9457E-001				
	3/1/18 3:50:56 PM	Post		9.0341E-001				
	3/2/18 8:11:33 AM	Pre		8.9851E-001				
	3/2/18 10:53:40 AM	Post		8.9397E-001				
	3/2/18 12:32:28 PM	Pre		9.0286E-001				
	3/2/18 3:40:55 PM	Post		8.8259E-001				
	3/3/18 7:19:21 AM	Pre		9.2809E-001				
	3/3/18 3:41:53 PM	Post		8.9746E-001				
R	3/5/18 8:20:59 AM	Pre		9.0991E-001				
	3/5/18 8:38:31 AM	Pre		8.8629E-001				
R	3/5/18 8:49:35 AM	Pre		0.0000E+000		Ac:		

Full Q.A. Report 5/16/18 9:44:52 AM Page 3

	Measurement Time	Sample ID	Analyst	Value (uCi/unit)	Flags LU	SD	UD	BS
R	3/5/18 10:28:19 AM	Post		1.3259E+003		Ac:		
	3/5/18 10:30:17 AM	Post		9.1763E-001				
	3/5/18 3:40:58 PM	Post		9.0916E-001				
	3/6/18 7:27:28 AM	Pre		9.1301E-001				
	3/6/18 12:48:42 PM	Post		8.9623E-001				
	3/6/18 1:18:35 PM	Post		8.6794E-001				
R	3/6/18 1:29:03 PM	Post		0.0000E+000		Ac:		
R	3/7/18 8:00:21 AM	Pre		9.2562E-001				
	3/7/18 8:09:11 AM	Pre		8.8251E-001				
	3/7/18 3:39:18 PM	Post		9.0311E-001				
	3/8/18 7:42:58 AM	Pre		9.1656E-001				
	3/8/18 3:40:40 PM	Post		5.3967E-001		Ac:		
	3/9/18 7:55:36 AM	Pre		9.1702E-001				
	3/9/18 3:33:22 PM	Post		9.1046E-001				
	3/10/18 7:24:23 AM	Pre		8.9311E-001				
	3/10/18 3:21:36 PM	Post		8.9668E-001				
	3/12/18 8:06:21 AM	Pre		9.2620E-001				
	3/12/18 3:30:32 PM	Post		8.9430E-001				
	3/13/18 7:44:47 AM	Pre		8.9182E-001				
	3/13/18 3:00:35 PM	Post		8.9123E-001				
	3/14/18 7:30:16 AM	Pre		8.9711E-001				
	3/14/18 3:49:54 PM	Post		8.8712E-001				
	3/15/18 7:27:24 AM	Pre		9.0164E-001				
	3/15/18 3:07:24 PM	Post		8.8259E-001				
R	3/19/18 7:09:50 AM	PRE QC		0.0000E+000		Ac:		
R	3/19/18 7:11:48 AM	PRE QC		8.6894E-001				
	3/19/18 7:20:10 AM	PRE QC 2		8.8430E-001				
	3/19/18 3:29:40 PM	POST QC		8.9847E-001				
	3/20/18 8:48:21 AM	Pre		8.9059E-001				
	3/20/18 10:35:12 AM	Post		8.7877E-001				
	3/22/18 7:41:21 AM	Pre QC		9.0703E-001				
	3/22/18 2:02:05 PM	QC		9.3836E-001				

Flags Key: LU = Lower/Upper Bounds Test (Ab = Above, Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)



QA Filename : C:\GENIE2K\CAMFILES\6279_Daily_QA.QAF
Parameter Description : Decay corrected activity-1274.53 (uCi/unit)
Selection Dates : 2/02/18 12:00:00 AM - 3/23/18 12:00:00 AM
Sample Mean +/- Std Dev : 1.110 +/- 0.084

Full Q.A. Report 5/16/18 9:45:45 AM Page 1

****
***** GENIE QUALITY ASSURANCE *****
****

Full Parameter Results Report
5/16/18 9:45:45 AM

QA File: C:\GENIE2K\CAMFILES\6279_Daily_Q
Description: Decay corrected activity-1274.53
Parameter Units: uCi/unit
Parameter Type: Energy line

Sample Start Date:
Sample End Date:
Sample Mean: 1.1096E+000
Sample Std. Deviation: 8.3643E-002

	Measurement Time	Sample ID	Analyst	Value (uCi/unit)	LU	Flags SD	UD	BS
	2/2/18 10:09:37 AM			9.6835E-001				
	2/3/18 2:22:16 PM			1.0889E+000				
	2/5/18 2:15:05 PM	pre		1.1472E+000				
	2/5/18 3:36:37 PM	POST		1.1047E+000				
	2/6/18 7:54:07 AM	pre		9.9517E-001				
	2/6/18 4:06:46 PM	POST		1.0987E+000				
	2/7/18 10:15:30 AM	pre		1.1598E+000				
	2/7/18 4:01:41 PM	Post		1.1102E+000				
	2/8/18 8:31:16 AM	pre		1.0636E+000				
	2/8/18 2:19:23 PM	POST		1.1430E+000				
R	2/9/18 12:42:14 PM	pre		1.1155E+000				
	2/10/18 9:54:44 AM	001		1.1542E+000				
	2/10/18 10:02:05 AM	002		1.1161E+000				
	2/10/18 10:07:52 AM	003		1.1184E+000				
	2/10/18 10:14:34 AM	004		1.1353E+000				
	2/10/18 10:23:13 AM	005		1.1549E+000				
	2/10/18 10:33:40 AM	006		1.1215E+000				
	2/10/18 10:46:21 AM	007		1.1138E+000				
	2/10/18 10:58:09 AM	008		1.1341E+000				
	2/10/18 12:22:18 PM	009		1.1431E+000				
	2/10/18 12:28:38 PM	010		1.1339E+000				
	2/10/18 1:20:42 PM	test run		1.1253E+000				
	2/12/18 7:37:54 AM			1.1327E+000				
R	2/12/18 8:36:06 AM	Pre		1.0918E+000				
	2/12/18 8:41:26 AM	Pre		1.0963E+000				
	2/12/18 8:49:39 AM	Pre		1.1054E+000				
	2/12/18 8:57:12 AM	Pre		1.1242E+000				
	2/12/18 9:03:16 AM	Pre		1.1231E+000				
	2/12/18 9:11:41 AM	Pre		1.1117E+000				
	2/12/18 9:19:22 AM	Pre		1.1409E+000				
	2/12/18 9:31:04 AM	Pre		1.1262E+000				
	2/12/18 9:38:22 AM	Pre		1.1440E+000				
	2/12/18 9:45:30 AM	Pre		1.1215E+000				
	2/12/18 9:56:54 AM	Pre		1.0915E+000				
	2/12/18 10:03:38 AM	Pre		1.0976E+000				

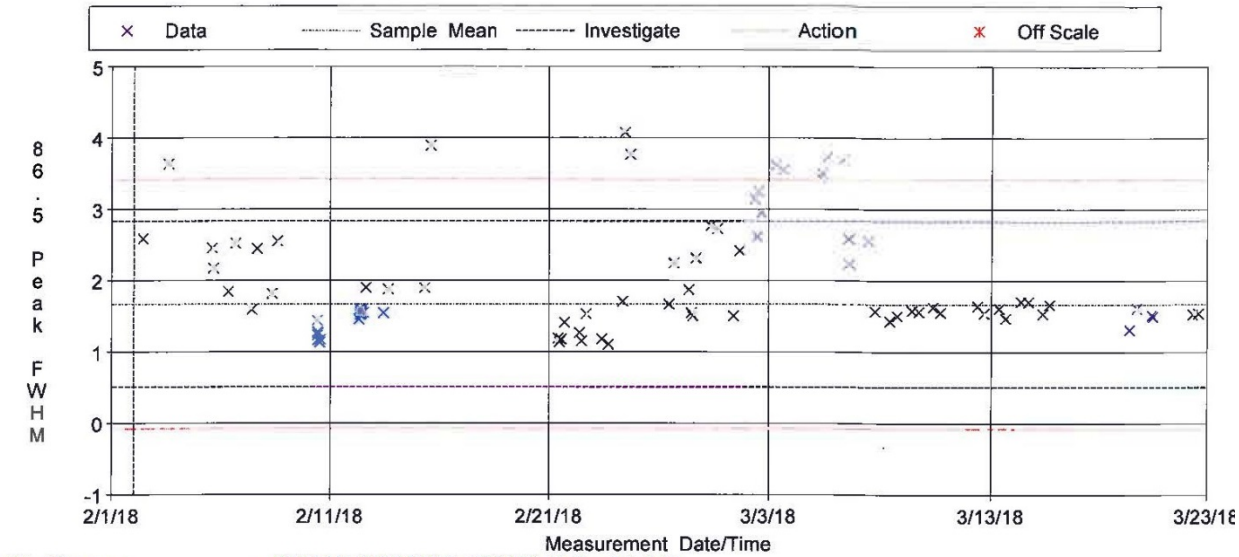
Full Q.A. Report 5/16/18 9:45:45 AM Page 2

	Measurement Time	Sample ID	Analyst	Value (uCi/unit)	Flags LU	SD	UD	BS
	2/12/18 10:10:43 AM	Pre		1.1324E+000				
	2/12/18 10:17:44 AM	Pre		1.1376E+000				
	2/12/18 10:24:21 AM	Pre		1.1356E+000				
	2/12/18 12:35:25 PM	Pre		1.1032E+000				
	2/12/18 3:18:02 PM	Post		1.1214E+000				
	2/13/18 10:18:49 AM	Pre		1.1443E+000				
	2/13/18 3:36:51 PM	Post		1.0956E+000				
R	2/15/18 7:33:31 AM	Pre		1.1291E+000				
	2/15/18 7:45:40 AM	Pre		1.1759E+000				
R	2/15/18 2:19:53 PM	Post		1.1565E+000				
	2/15/18 2:20:20 PM	Post		1.1348E+000				
R	2/16/18 10:48:18 AM			1.1211E+000				
R	2/16/18 10:58:01 AM			1.1469E+000				
R	2/16/18 11:11:27 AM			1.1044E+000				
R	2/19/18 9:34:11 AM			1.1320E+000				
R	2/20/18 7:36:43 AM			1.1049E+000				
R	2/20/18 1:02:50 PM	Pre		1.1373E+000				
R	2/21/18 8:38:30 AM			9.1981E-001	In			
R	2/21/18 8:39:38 AM	Pre		1.1494E+000				
R	2/21/18 9:06:33 AM	Pre		1.1661E+000				
	2/21/18 9:19:06 AM	Pre		1.1453E+000				
	2/21/18 10:45:26 AM	Post		1.1572E+000				
	2/21/18 12:36:04 PM			1.0906E+000				
	2/21/18 4:08:48 PM	Post		1.1515E+000				
	2/22/18 8:17:47 AM	Pre		1.1417E+000				
	2/22/18 10:47:12 AM	Post		1.1539E+000				
	2/22/18 3:48:24 PM	Post		5.9423E-001		Ac:		
R	2/23/18 8:21:28 AM	Pre		1.1271E+000				
R	2/23/18 8:37:23 AM	Pre		1.1060E+000				
	2/23/18 8:41:50 AM	Pre		1.1491E+000				
	2/23/18 3:45:57 PM	Post		1.1417E+000				
	2/24/18 7:26:44 AM	Pre		1.1006E+000				
	2/24/18 10:03:34 AM	Post		1.1421E+000				
	2/24/18 4:08:02 PM	POST		1.1136E+000				
	2/26/18 10:19:17 AM	Pre		1.1499E+000				
	2/26/18 3:50:27 PM	Post		1.0717E+000				
	2/27/18 8:03:00 AM	Pre		1.1149E+000				
	2/27/18 10:34:34 AM	Post		1.1145E+000				
	2/27/18 12:27:42 PM	Pre		1.1282E+000				
	2/27/18 3:46:56 PM	Post		1.1265E+000				
R	2/28/18 8:22:17 AM	Pre		1.1241E+000				
	2/28/18 8:32:14 AM	Pre		1.1344E+000				
	2/28/18 3:49:56 PM	Post		1.1579E+000				
	3/1/18 8:54:57 AM	Pre		1.0951E+000				
	3/1/18 3:50:56 PM	Post		1.1370E+000				
	3/2/18 8:11:33 AM	Pre		1.1766E+000				
	3/2/18 10:53:40 AM	Post		1.1465E+000				
	3/2/18 12:32:28 PM	Pre		1.1191E+000				
	3/2/18 3:40:55 PM	Post		1.1102E+000				
	3/3/18 7:19:21 AM	Pre		1.1328E+000				
	3/3/18 3:41:53 PM	Post		1.1279E+000				
R	3/5/18 8:20:59 AM	Pre		1.1182E+000				
	3/5/18 8:38:31 AM	Pre		1.1107E+000				
R	3/5/18 8:49:35 AM	Pre		0.0000E+000		Ac:		

Full Q.A. Report 5/16/18 9:45:45 AM Page 3

	Measurement Time	Sample ID	Analyst	Value (uCi/unit)	LU	Flags SD	UD	BS
R	3/5/18 10:28:19 AM	Post		2.8615E+002		Ac:		
	3/5/18 10:30:17 AM	Post		1.1323E+000				
	3/5/18 3:40:58 PM	Post		1.1048E+000				
	3/6/18 7:27:28 AM	Pre		1.1476E+000				
	3/6/18 12:48:42 PM	Post		1.0973E+000				
	3/6/18 1:18:35 PM	Post		1.1260E+000				
R	3/6/18 1:29:03 PM	Post		0.0000E+000		Ac:		
R	3/7/18 8:00:21 AM	Pre		1.1362E+000				
	3/7/18 8:09:11 AM	Pre		1.1248E+000				
	3/7/18 3:39:18 PM	Post		1.1300E+000				
	3/8/18 7:42:58 AM	Pre		1.1048E+000				
	3/8/18 3:40:40 PM	Post		6.5819E-001		Ac:		
	3/9/18 7:55:36 AM	Pre		1.1253E+000				
	3/9/18 3:33:22 PM	Post		1.1315E+000				
	3/10/18 7:24:23 AM	Pre		1.1304E+000				
	3/10/18 3:21:36 PM	Post		1.1168E+000				
	3/12/18 8:06:21 AM	Pre		1.1189E+000				
	3/12/18 3:30:32 PM	Post		1.1363E+000				
	3/13/18 7:44:47 AM	Pre		1.1279E+000				
	3/13/18 3:00:35 PM	Post		1.1164E+000				
	3/14/18 7:30:16 AM	Pre		1.1202E+000				
	3/14/18 3:49:54 PM	Post		1.0877E+000				
	3/15/18 7:27:24 AM	Pre		1.1138E+000				
	3/15/18 3:07:24 PM	Post		1.1385E+000				
R	3/19/18 7:09:50 AM	PRE QC		0.0000E+000		Ac:		
R	3/19/18 7:11:48 AM	PRE QC		1.1280E+000				
	3/19/18 7:20:10 AM	PRE QC 2		1.1239E+000				
	3/19/18 3:29:40 PM	POST QC		1.1173E+000				
	3/20/18 6:48:21 AM	Pre		1.1176E+000				
	3/20/18 10:36:12 AM	Post		1.1025E+000				
	3/22/18 7:41:21 AM	Pre QC		1.1195E+000				
	3/22/18 2:02:05 PM	QC		1.0972E+000				

Flags Key: LU = Lower/Upper Bounds Test (Ab = Above, Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)



QA Filename : C:\GENIE2K\CAMFILES\6279_Daily_QA.QAF
Parameter Description : 86.5 Peak FWHM (keV)
Selection Dates : 2/02/18 12:00:00 AM - 3/23/18 12:00:00 AM
Sample Mean +/- Std Dev : 1.669 +/- 0.581

Full Q.A. Report 5/16/18 9:42:56 AM Page 1

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*****************************************************************************
*****        G E N I E   Q U A L I T Y   A S S U R A N C E        *****
*****************************************************************************
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Full Parameter Results Report
5/16/18 9:42:56 AM

QA File: C:\GENIE2K\CAMFILES\6279_Daily_Q
Description: 86.5 Peak FWHM
Parameter Units: keV
Parameter Type: Peak Search

Sample Start Date:
Sample End Date:
Sample Mean: 1.6687E+000
Sample Std. Deviation: 5.8132E-001

Measurement Time		Sample ID	Analyst	Value (keV)	Flags LU	SD	UD	BS
2/2/18	10:09:37 AM			2.5834E+000				
2/3/18	2:22:16 PM			3.6291E+000		Ac		
2/5/18	2:15:05 PM	pre		2.4507E+000				
2/5/18	3:36:37 PM	POST		2.1686E+000				
2/6/18	7:54:07 AM	pre		1.8404E+000				
2/6/18	4:06:46 PM	POST		2.5179E+000				
2/7/18	10:15:30 AM	pre		1.5874E+000				
2/7/18	4:01:41 PM	Post		2.4431E+000				
2/8/18	8:31:16 AM	pre		1.8121E+000				
2/8/18	2:19:23 PM	POST		2.5528E+000				
R 2/9/18	12:42:14 PM	pre		2.2866E+000				
2/10/18	9:54:44 AM	001		1.4378E+000				
2/10/18	10:02:05 AM	002		1.1584E+000				
2/10/18	10:07:52 AM	003		1.2324E+000				
2/10/18	10:14:34 AM	004		1.2620E+000				
2/10/18	10:23:13 AM	005		1.2632E+000				
2/10/18	10:33:40 AM	006		1.2815E+000				
2/10/18	10:46:21 AM	007		1.2583E+000				
2/10/18	10:58:09 AM	008		1.1616E+000				
2/10/18	12:22:18 PM	009		1.1342E+000				
2/10/18	12:28:38 PM	010		1.1253E+000				
2/10/18	1:20:42 PM	test run		1.1697E+000				
2/12/18	7:37:54 AM			1.4551E+000				
2/12/18	8:36:06 AM	Pre		1.5916E+000				
2/12/18	8:41:26 AM	Pre		1.5169E+000				
2/12/18	8:49:39 AM	Pre		1.6073E+000				
2/12/18	8:57:12 AM	Pre		1.5481E+000				
2/12/18	9:03:16 AM	Pre		1.5543E+000				
2/12/18	9:11:41 AM	Pre		1.5642E+000				
2/12/18	9:19:22 AM	Pre		1.5142E+000				
2/12/18	9:31:04 AM	Pre		1.5542E+000				
2/12/18	9:38:22 AM	Pre		1.5528E+000				
2/12/18	9:45:30 AM	Pre		1.5905E+000				
2/12/18	9:56:54 AM	Pre		1.5654E+000				
2/12/18	10:03:38 AM	Pre		1.5818E+000				

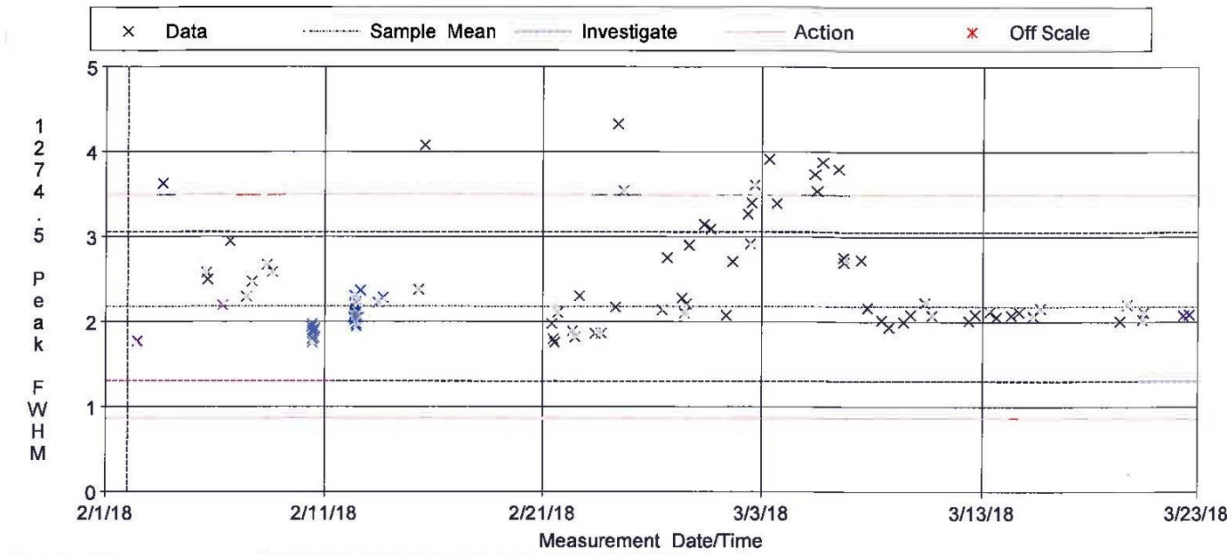
Full Q.A. Report 5/16/18 9:42:56 AM Page 2

	Measurement Time	Sample ID	Analyst	Value (keV)	Flags LU	SD	UD	BS
	2/12/18 10:10:43 AM	Pre		1.5929E+000				
	2/12/18 10:17:44 AM	Pre		1.5310E+000				
	2/12/18 10:24:21 AM	Pre		1.5459E+000				
	2/12/18 12:35:25 PM	Pre		1.5475E+000				
	2/12/18 3:18:02 PM	Post		1.3953E+000				
	2/13/18 10:16:49 AM	Pre		1.5446E+000				
	2/13/18 3:38:31 PM	Post		1.2772E+000				
R	2/15/18 7:33:31 AM	Pre		1.5604E+000				
	2/15/18 7:45:40 AM	Pre		1.8938E+000				
R	2/15/18 2:19:33 PM	Post		3.8793E+000		Ac:		
	2/15/18 2:20:20 PM	Post		3.8897E+000		Ac:		
R	2/16/18 10:48:18 AM			1.0424E+000				
R	2/16/18 10:58:01 AM			1.0329E+000				
R	2/16/18 11:11:27 AM			1.0994E+000				
R	2/19/18 9:34:11 AM			1.1543E+000				
R	2/20/18 7:36:43 AM			1.8437E+000				
R	2/20/18 1:02:50 PM	Pre		1.1396E+000				
R	2/21/18 8:38:30 AM			1.0332E+000				
R	2/21/18 8:39:38 AM	Pre		1.1230E+000				
R	2/21/18 9:06:38 AM	Pre		1.1329E+000				
	2/21/18 9:19:06 AM	Pre		1.1868E+000				
	2/21/18 10:45:26 AM	Post		1.1367E+000				
	2/21/18 12:36:04 PM			1.1718E+000				
	2/21/18 4:08:46 PM	Post		1.4089E+000				
	2/22/18 8:17:47 AM	Pre		1.2652E+000				
	2/22/18 10:47:12 AM	Post		1.1523E+000				
	2/22/18 3:48:24 PM	Post		1.5293E+000				
R	2/23/18 8:21:28 AM	Pre		1.0292E+000				
R	2/23/18 8:37:23 AM	Pre		1.0821E+000				
	2/23/18 8:41:50 AM	Pre		1.1758E+000				
	2/23/18 3:45:57 PM	Post		1.1013E+000				
	2/24/18 7:26:44 AM	Pre		1.7044E+000				
	2/24/18 10:03:34 AM	Post		4.0707E+000		Ac:		
	2/24/18 4:08:02 PM	POST		3.7642E+000		Ac:		
	2/26/18 10:19:17 AM	Pre		1.6644E+000				
	2/26/18 3:50:27 PM	Post		2.2391E+000				
	2/27/18 8:03:00 AM	Pre		1.8689E+000				
	2/27/18 10:34:34 AM	Post		1.5397E+000				
	2/27/18 12:27:42 PM	Pre		1.4997E+000				
	2/27/18 3:46:56 PM	Post		2.3103E+000				
R	2/28/18 8:22:17 AM	Pre		3.1418E+000	In			
	2/28/18 8:32:14 AM	Pre		2.7632E+000				
	2/28/18 3:49:56 PM	Post		2.7242E+000				
	3/1/18 8:54:57 AM	Pre		1.5018E+000				
	3/1/18 3:50:56 PM	Post		2.4138E+000				
	3/2/18 8:11:33 AM	Pre		3.1328E+000	In			
	3/2/18 10:53:40 AM	Post		2.6067E+000				
	3/2/18 12:32:28 PM	Pre		3.2411E+000	In			
	3/2/18 3:40:55 PM	Post		2.9409E+000	In			
	3/3/18 7:19:21 AM	Pre		3.6120E+000		Ac:		
	3/3/18 3:41:53 PM	Post		3.5435E+000		Ac:		
R	3/5/18 8:20:59 AM	Pre		3.5642E+000		Ac:		
	3/5/18 8:38:31 AM	Pre		3.4333E+000		Ac:		
R	3/5/18 10:28:19 AM	Post		1.9292E+000				

Full Q.A. Report 5/16/18 9:42:55 AM Page 3

	Measurement Time	Sample ID	Analyst	Value (keV)	LU	Flags SD	UD	BS
	3/5/18 10:30:17 AM	Post		3.4950E+000		Ac:		
	3/5/18 3:40:58 PM	Post		3.7141E+000		Ac:		
	3/6/18 7:27:28 AM	Pre		3.6852E+000		Ac:		
	3/6/18 12:48:42 PM	Post		2.5788E+000				
	3/6/18 1:18:35 PM	Post		2.2285E+000				
R	3/7/18 8:00:21 AM	Pre		2.5439E+000				
	3/7/18 8:09:11 AM	Pre		2.5529E+000				
	3/7/18 3:39:18 PM	Post		1.5676E+000				
	3/8/18 7:42:58 AM	Pre		1.4301E+000				
	3/8/18 3:40:40 PM	Post		1.5047E+000				
	3/9/18 7:55:36 AM	Pre		1.5779E+000				
	3/9/18 3:33:22 PM	Post		1.5649E+000				
	3/10/18 7:24:23 AM	Pre		1.6255E+000				
	3/10/18 3:21:36 PM	Post		1.5515E+000				
	3/12/18 8:06:21 AM	Pre		1.6412E+000				
	3/12/18 3:30:32 PM	Post		1.5413E+000				
	3/13/18 7:44:47 AM	Pre		1.6081E+000				
	3/13/18 3:00:35 PM	Post		1.4696E+000				
	3/14/18 7:30:16 AM	Pre		1.7057E+000				
	3/14/18 3:49:54 PM	Post		1.6994E+000				
	3/15/18 7:27:24 AM	Pre		1.5339E+000				
	3/15/18 3:07:24 PM	Post		1.6644E+000				
R	3/19/18 7:11:48 AM	PRE QC		1.3680E+000				
	3/19/18 7:20:10 AM	PRE QC 2		1.3100E+000				
	3/19/18 3:29:40 PM	POST QC		1.6107E+000				
	3/20/18 8:48:21 AM	Pre		1.5113E+000				
	3/20/18 10:36:12 AM	Post		1.4953E+000				
	3/22/18 7:41:21 AM	Pre QC		1.5227E+000				
	3/22/18 2:02:05 PM	QC		1.5371E+000				

Flags Key: LU = Lower/Upper Bounds Test (Ab = Above, Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)



QA Filename : C:\GENIE2K\CAMFILES\6279_Daily_QA.QAF
Parameter Description : 1274.5 Peak FWHM (keV)
Selection Dates : 2/02/18 12:00:00 AM - 3/23/18 12:00:00 AM
Sample Mean +/- Std Dev : 2.177 +/- 0.438

Full Q.A. Report 5/16/18 9:43:59 AM Page 1

****
***** GENIE QUALITY ASSURANCE *****
****

Full Parameter Results Report
5/16/18 9:43:59 AM

QA File: C:\GENIE2K\CAMFILES\6279_Daily_Q
Description: 1274.5 Peak FWHM
Parameter Units: keV
Parameter Type: Peak Search

Sample Start Date:
Sample End Date:
Sample Mean: 2.1765E+000
Sample Std. Deviation: 4.3827E-001

	Measurement Time	Sample ID	Analyst	Value (keV)	LU	Flags SD	UD	BS
	2/2/18 10:09:37 AM			1.7678E+000				
	2/3/18 2:22:16 PM			3.6223E+000		Ac:		
	2/5/18 2:15:05 PM	pre		2.5748E+000				
	2/5/18 3:36:37 PM	POST		2.4912E+000				
	2/6/18 7:54:07 AM	pre		2.1915E+000				
	2/6/18 4:06:46 PM	POST		2.9464E+000				
	2/7/18 10:15:30 AM	pre		2.2899E+000				
	2/7/18 4:01:41 PM	Post		2.4702E+000				
	2/8/18 8:31:16 AM	pre		2.6668E+000				
	2/8/18 2:19:23 PM	POST		2.5808E+000				
R	2/9/18 12:42:14 PM	pre		2.5422E+000				
	2/10/18 9:54:44 AM	001		1.9391E+000				
	2/10/18 10:02:05 AM	002		1.9362E+000				
	2/10/18 10:07:52 AM	003		1.7510E+000				
	2/10/18 10:14:34 AM	004		1.9706E+000				
	2/10/18 10:23:13 AM	005		1.8952E+000				
	2/10/18 10:33:40 AM	006		1.7900E+000				
	2/10/18 10:46:21 AM	007		1.7976E+000				
	2/10/18 10:58:09 AM	008		1.8706E+000				
	2/10/18 12:22:18 PM	009		1.8907E+000				
	2/10/18 12:28:38 PM	010		1.8099E+000				
	2/10/18 1:20:42 PM	test run		1.9212E+000				
	2/12/18 7:37:54 AM			2.0491E+000				
R	2/12/18 8:36:06 AM	Pre		1.9232E+000				
	2/12/18 8:41:26 AM	Pre		2.3019E+000				
	2/12/18 8:49:39 AM	Pre		2.0187E+000				
	2/12/18 8:57:12 AM	Pre		2.2182E+000				
	2/12/18 9:03:16 AM	Pre		2.0475E+000				
	2/12/18 9:11:41 AM	Pre		2.0864E+000				
	2/12/18 9:19:22 AM	Pre		2.0816E+000				
	2/12/18 9:31:04 AM	Pre		2.1125E+000				
	2/12/18 9:38:22 AM	Pre		2.0410E+000				
	2/12/18 9:45:30 AM	Pre		2.1036E+000				
	2/12/18 9:50:54 AM	Pre		1.9709E+000				
	2/12/18 10:03:38 AM	Pre		2.1444E+000				

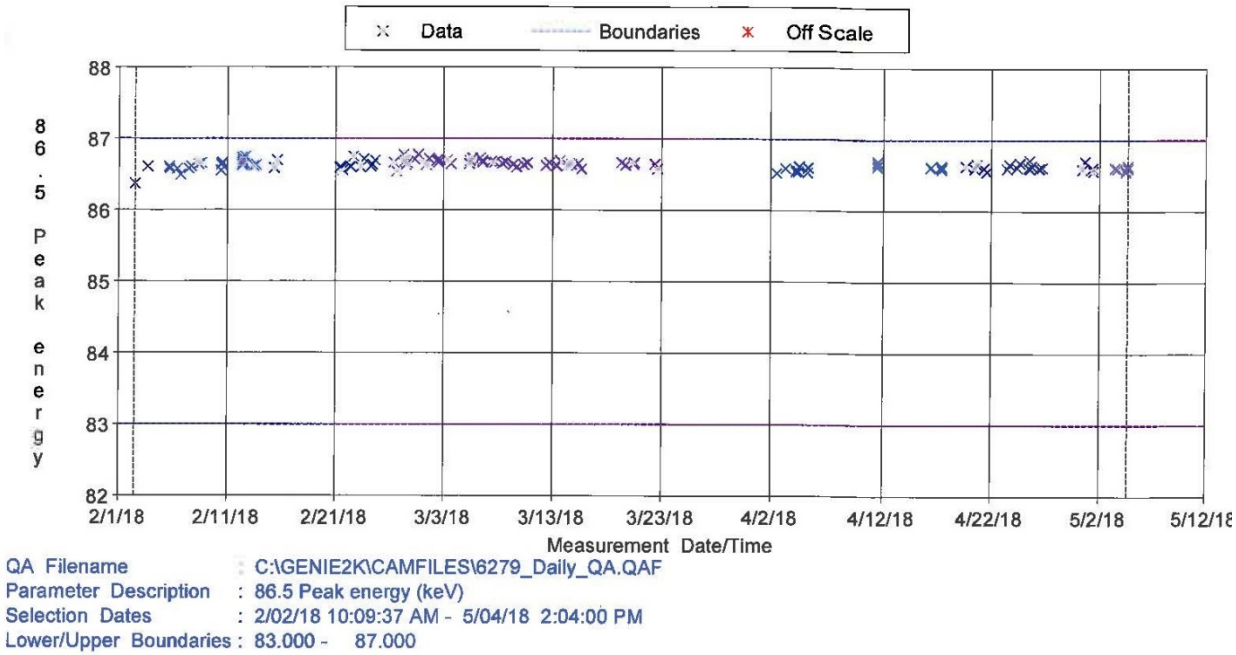
Full Q.A. Report 5/16/18 9:43:59 AM Page 2

	Measurement Time	Sample ID	Analyst	Value (keV)	Flags LU	SD	UD	BS
	2/12/18 10:10:43 AM	Pre		2.2309E+000				
	2/12/18 10:17:44 AM	Pre		2.1416E+000				
	2/12/18 10:24:21 AM	Pre		1.9423E+000				
	2/12/18 12:35:25 PM	Pre		2.0447E+000				
	2/12/18 3:18:02 PM	Post		2.3645E+000				
	2/13/18 10:18:49 AM	Pre		2.2226E+000				
	2/13/18 3:38:31 PM	Post		2.2802E+000				
R	2/15/18 7:33:31 AM	Pre		2.0876E+000				
	2/15/18 7:45:40 AM	Pre		2.3728E+000				
R	2/15/18 2:19:33 PM	Post		1.8585E+000				
	2/15/18 2:20:20 PM	Post		4.0730E+000		Ac:		
R	2/16/18 10:48:18 AM			1.8300E+000				
R	2/16/18 10:58:01 AM			1.7100E+000				
R	2/16/18 11:11:27 AM			1.9503E+000				
R	2/19/18 9:34:11 AM			1.9143E+000				
R	2/20/18 7:36:48 AM			2.4418E+000				
R	2/20/18 1:02:50 PM	Pre		1.7515E+000				
R	2/21/18 8:38:30 AM			5.6735E-001		Ac:		
R	2/21/18 8:39:38 AM	Pre		1.8803E+000				
R	2/21/18 9:06:38 AM	Pre		1.8666E+000				
	2/21/18 9:19:06 AM	Pre		1.9732E+000				
	2/21/18 10:45:26 AM	Post		1.7934E+000				
	2/21/18 12:36:04 PM			1.7538E+000				
	2/21/18 4:08:48 PM	Post		2.1042E+000				
	2/22/18 8:17:47 AM	Pre		1.8874E+000				
	2/22/18 10:47:12 AM	Post		1.8152E+000				
	2/22/18 3:48:24 PM	Post		2.2993E+000				
R	2/23/18 8:21:28 AM	Pre		1.3099E+000				
R	2/23/18 8:37:23 AM	Pre		1.8769E+000				
	2/23/18 8:41:50 AM	Pre		1.8576E+000				
	2/23/18 3:45:57 PM	Post		1.8612E+000				
	2/24/18 7:26:44 AM	Pre		2.1679E+000				
	2/24/18 10:03:34 AM	Post		4.3218E+000		Ac:		
	2/24/18 4:08:02 PM	POST		3.5368E+000		Ac:		
	2/26/18 10:19:17 AM	Pre		2.1337E+000				
	2/26/18 3:50:27 PM	Post		2.7468E+000				
	2/27/18 8:03:00 AM	Pre		2.2743E+000				
	2/27/18 10:34:34 AM	Post		2.1019E+000				
	2/27/18 12:27:42 PM	Pre		2.2062E+000				
	2/27/18 3:46:56 PM	Post		2.8958E+000				
R	2/28/18 8:22:17 AM	Pre		3.0572E+000	In			
	2/28/18 8:32:14 AM	Pre		3.1417E+000	In			
	2/28/18 3:49:56 PM	Post		3.0854E+000	In			
	3/1/18 8:54:57 AM	Pre		2.0697E+000				
	3/1/18 3:50:56 PM	Post		2.7020E+000				
	3/2/18 8:11:33 AM	Pre		3.2623E+000	In			
	3/2/18 10:53:40 AM	Post		2.9128E+000				
	3/2/18 12:32:28 PM	Pre		3.3938E+000	In			
	3/2/18 3:40:55 PM	Post		3.6057E+000		Ac:		
	3/3/18 7:19:21 AM	Pre		3.9100E+000		Ac:		
	3/3/18 3:41:53 PM	Post		3.3874E+000	In			
R	3/5/18 8:20:59 AM	Pre		3.7351E+000		Ac:		
	3/5/18 8:38:31 AM	Pre		3.7302E+000		Ac:		
R	3/5/18 10:28:19 AM	Post		3.9558E-001		Ac:		

Full Q.A. Report 5/16/18 9:43:59 AM Page 3

	Measurement Time	Sample ID	Analyst	Value (keV)	Flags LU	SD	UD	BS
	3/5/18 10:30:17 AM	Post		3.5300E+000		Ac:		
	3/5/18 3:40:58 PM	Post		3.8723E+000		Ac:		
	3/6/18 7:27:28 AM	Pre		3.7929E+000		Ac:		
	3/6/18 12:48:42 PM	Post		2.7522E+000				
	3/6/18 1:18:35 PM	Post		2.6965E+000				
R	3/7/18 8:00:21 AM	Pre		2.6105E+000				
	3/7/18 8:09:11 AM	Pre		2.7217E+000				
	3/7/18 3:39:18 PM	Post		2.1584E+000				
	3/8/18 7:42:58 AM	Pre		2.0126E+000				
	3/8/18 3:40:40 PM	Post		1.9309E+000				
	3/9/18 7:55:36 AM	Pre		1.9912E+000				
	3/9/18 3:33:22 PM	Post		2.0747E+000				
	3/10/18 7:24:23 AM	Pre		2.2180E+000				
	3/10/18 3:21:36 PM	Post		2.0694E+000				
	3/12/18 8:06:21 AM	Pre		2.0066E+000				
	3/12/18 3:30:32 PM	Post		2.0790E+000				
	3/13/18 7:44:47 AM	Pre		2.1159E+000				
	3/13/18 3:00:35 PM	Post		2.0509E+000				
	3/14/18 7:30:16 AM	Pre		2.0719E+000				
	3/14/18 3:49:54 PM	Post		2.1084E+000				
	3/15/18 7:27:24 AM	Pre		2.0509E+000				
	3/15/18 3:07:24 PM	Post		2.1555E+000				
R	3/19/18 7:11:48 AM	PRE QC		2.0520E+000				
	3/19/18 7:20:10 AM	PRE QC 2		2.0034E+000				
	3/19/18 3:29:40 PM	POST QC		2.1966E+000				
	3/20/18 8:48:21 AM	Pre		2.0230E+000				
	3/20/18 10:36:12 AM	Post		2.1069E+000				
	3/22/18 7:41:21 AM	Pre QC		2.0737E+000				
	3/22/18 2:02:05 PM	QC		2.0832E+000				

Flags Key: LU = Lower/Upper Bounds Test (Ab = Above, Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)


Data
Boundaries
Off Scale
86.5 Peak energy
88
87
86
85
84
83
82
2/1/18
2/11/18
2/21/18
3/3/18
3/13/18
3/23/18
4/2/18
4/12/18
4/22/18
5/2/18
5/12/18
Measurement Date/Time
QA Filename : C:\GENIE2K\CAMFILES\6279_Daily_QA.QAF
Parameter Description : 86.5 Peak energy (keV)
Selection Dates : 2/02/18 10:09:37 AM - 5/04/18 2:04:00 PM
Lower/Upper Boundaries : 83.000 - 87.000

Full Q.A. Report 5/16/18 9:40:59 AM Page 1

***** G E N I E Q U A L I T Y A S S U R A N C E *****

Full Parameter Results Report
5/16/18 9:40:59 AM

QA File: C:\GENIE2K\CAMFILES\0279_Daily_Q
Description: 86.5 Peak energy
Parameter Units: keV
Parameter Type: Peak Search

Lower Boundary: 8.3000E+001
Upper Boundary: 8.7000E+001

	Measurement Time	Sample ID	Analyst	Value (keV)	LU	Flags SD	UD	BS
	2/2/18 10:09:37 AM			8.6365E+001				
	2/3/18 2:22:16 PM			8.6605E+001				
	2/5/18 2:15:05 PM	pre		8.6604E+001				
	2/5/18 3:36:37 PM	POST		8.6573E+001				
	2/6/18 7:54:07 AM	pre		8.6572E+001				
	2/6/18 4:06:46 PM	POST		8.6489E+001				
	2/7/18 10:15:30 AM	pre		8.6574E+001				
	2/7/18 4:01:41 PM	Post		8.6605E+001				
	2/8/18 9:31:16 AM	pre		8.6634E+001				
	2/8/18 2:19:23 PM	POST		8.6653E+001				
R	2/9/18 12:42:14 PM	pre		8.6587E+001				
	2/10/18 9:54:44 AM	001		8.6547E+001				
	2/10/18 10:02:05 AM	002		8.6633E+001				
	2/10/18 10:07:52 AM	003		8.6633E+001				
	2/10/18 10:14:34 AM	004		8.6628E+001				
	2/10/18 10:23:13 AM	005		8.6630E+001				
	2/10/18 10:33:40 AM	006		8.6629E+001				
	2/10/18 10:46:21 AM	007		8.6634E+001				
	2/10/18 10:58:09 AM	008		8.6646E+001				
	2/10/18 12:22:18 PM	009		8.6659E+001				
	2/10/18 12:28:38 PM	010		8.6657E+001				
	2/10/18 1:20:42 PM	test run		8.6649E+001				
	2/12/18 7:37:54 AM			8.6622E+001				
R	2/12/18 8:36:06 AM	Pre		8.3675E+001				
	2/12/18 8:41:26 AM	Pre		8.6651E+001				
	2/12/18 8:49:39 AM	Pre		8.6620E+001				
	2/12/18 8:57:12 AM	Pre		8.6668E+001				
	2/12/18 9:03:16 AM	Pre		8.6686E+001				
	2/12/18 9:11:41 AM	Pre		8.6697E+001				
	2/12/18 9:19:22 AM	Pre		8.6731E+001				
	2/12/18 9:31:04 AM	Pre		8.6656E+001				
	2/12/18 9:38:22 AM	Pre		8.6653E+001				
	2/12/18 9:45:30 AM	Pre		8.6627E+001				
	2/12/18 9:56:54 AM	Pre		8.6646E+001				
	2/12/18 10:03:38 AM	Pre		8.6635E+001				
	2/12/18 10:10:43 AM	Pre		8.6652E+001				
	2/12/18 10:17:44 AM	Pre		8.6653E+001				

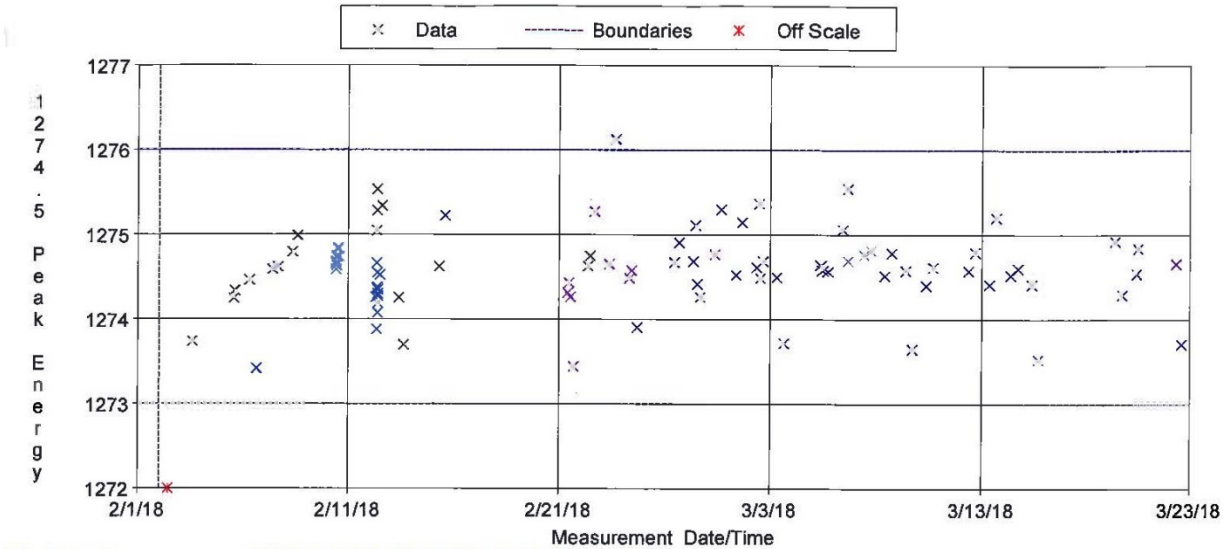
Full Q.A. Report 5/16/18 9:40:59 AM Page 2

	Measurement Time	Sample ID	Analyst	Value (keV)	Flags LU	SD	UD	BS
	2/12/18 10:24:21 AM	Pre		8.6663E+001				
	2/12/18 12:35:25 PM	Pre		8.6645E+001				
	2/12/18 3:18:02 PM	Post		8.6741E+001				
	2/13/18 10:18:49 AM	Pre		8.6612E+001				
	2/13/18 3:38:31 PM	Post		8.6628E+001				
R	2/15/18 7:33:31 AM	Pre		8.6611E+001				
	2/15/18 7:45:40 AM	Pre		8.6585E+001				
R	2/15/18 2:19:33 PM	Post		8.6530E+001				
	2/15/18 2:20:20 PM	Post		8.6695E+001				
R	2/16/18 10:48:18 AM			8.6640E+001				
R	2/16/18 10:58:01 AM			8.6659E+001				
R	2/16/18 11:11:27 AM			8.6520E+001				
R	2/19/18 9:34:11 AM			8.6628E+001				
R	2/20/18 7:36:48 AM			8.6631E+001				
R	2/20/18 1:02:50 PM	Pre		8.6594E+001				
R	2/21/18 8:38:30 AM			8.6659E+001				
R	2/21/18 8:39:38 AM	Pre		8.6629E+001				
R	2/21/18 9:06:38 AM	Pre		8.6574E+001				
	2/21/18 9:19:06 AM	Pre		8.6594E+001				
	2/21/18 10:45:26 AM	Post		8.6596E+001				
	2/21/18 12:36:04 PM			8.6577E+001				
	2/21/18 4:08:48 PM	Post		8.6553E+001				
	2/22/18 8:17:47 AM	Pre		8.6603E+001				
	2/22/18 10:47:12 AM	Post		8.6600E+001				
	2/22/18 3:48:24 PM	Post		8.6745E+001				
R	2/23/18 8:21:28 AM	Pre		8.6606E+001				
R	2/23/18 8:37:23 AM	Pre		8.6625E+001				
	2/23/18 8:41:50 AM	Pre		8.6594E+001				
	2/23/18 3:45:57 PM	Post		8.6708E+001				
	2/24/18 7:26:44 AM	Pre		8.6609E+001				
	2/24/18 10:03:34 AM	Post		8.6629E+001				
	2/24/18 4:08:02 PM	POST		8.6690E+001				
	2/26/18 10:19:17 AM	Pre		8.6659E+001				
	2/26/18 3:50:27 PM	Post		8.6536E+001				
	2/27/18 6:03:00 AM	Pre		8.6772E+001				
	2/27/18 10:34:34 AM	Post		8.6684E+001				
	2/27/18 12:27:42 PM	Pre		8.6630E+001				
	2/27/18 3:46:56 PM	Post		8.6652E+001				
R	2/28/18 8:22:17 AM	Pre		8.6572E+001				
	2/28/18 8:32:14 AM	Pre		8.6703E+001				
	2/28/18 3:49:56 PM	Post		8.6771E+001				
	3/1/18 8:54:57 AM	Pre		8.6627E+001				
	3/1/18 3:50:56 PM	Post		8.6717E+001				
	3/2/18 8:11:33 AM	Pre		8.6685E+001				
	3/2/18 10:53:40 AM	Post		8.6700E+001				
	3/2/18 12:32:28 PM	Pre		8.6665E+001				
	3/2/18 3:40:55 PM	Post		8.6693E+001				
	3/3/18 7:19:21 AM	Pre		8.6693E+001				
	3/3/18 3:41:53 PM	Post		8.6640E+001				
R	3/5/18 8:20:59 AM	Pre		8.6643E+001				
	3/5/18 8:38:31 AM	Pre		8.6647E+001				
R	3/5/18 10:28:19 AM	Post		8.6775E+001				
	3/5/18 10:30:17 AM	Post		8.6686E+001				
	3/5/18 3:40:58 PM	Post		8.6724E+001				

Full Q.A. Report 5/16/18 9:40:59 AM Page 3

	Measurement Time	Sample ID	Analyst	Value (keV)	Flags LU	SD	UD	BS
	3/6/18 7:27:28 AM	Pre		8.6723E+001	:	:	:	
	3/6/18 12:48:42 PM	Post		8.6685E+001	:	:	:	
	3/6/18 1:18:35 PM	Post		8.6661E+001	:	:	:	
R	3/7/18 8:00:21 AM	Pre		8.6620E+001	:	:	:	
	3/7/18 8:09:11 AM	Pre		8.6675E+001	:	:	:	
	3/7/18 3:59:18 PM	Post		8.6603E+001	:	:	:	
	3/8/18 7:42:58 AM	Pre		8.6647E+001	:	:	:	
	3/8/18 3:40:40 PM	Post		8.6672E+001	:	:	:	
	3/9/18 7:55:36 AM	Pre		8.6632E+001	:	:	:	
	3/9/18 3:33:22 PM	Post		8.6595E+001	:	:	:	
	3/10/18 7:24:23 AM	Pre		8.6627E+001	:	:	:	
	3/10/18 3:21:36 PM	Post		8.6656E+001	:	:	:	
	3/12/18 8:06:21 AM	Pre		8.6615E+001	:	:	:	
	3/12/18 3:30:32 PM	Post		8.6655E+001	:	:	:	
	3/13/18 7:44:47 AM	Pre		8.6611E+001	:	:	:	
	3/13/18 3:00:35 PM	Post		8.6684E+001	:	:	:	
	3/14/18 7:30:16 AM	Pre		8.6623E+001	:	:	:	
	3/14/18 3:49:54 PM	Post		8.6633E+001	:	:	:	
	3/15/18 7:27:24 AM	Pre		8.6646E+001	:	:	:	
	3/15/18 3:07:24 PM	Post		8.6570E+001	:	:	:	
R	3/19/18 7:11:48 AM	PRE QC		8.6684E+001	:	:	:	
	3/19/18 7:20:10 AM	PRE QC 2		8.6665E+001	:	:	:	
	3/19/18 3:29:40 PM	POST QC		8.6624E+001	:	:	:	
	3/20/18 8:48:21 AM	Pre		8.6637E+001	:	:	:	
	3/20/18 10:36:12 AM	Post		8.6660E+001	:	:	:	
	3/22/18 7:41:21 AM	Pre QC		8.6641E+001	:	:	:	
	3/22/18 2:02:05 PM	QC		8.6575E+001	:	:	:	

Flags Key: LU = Lower/Upper Bounds Test (Ab = Above, Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)



QA Filename : C:\GENIE2K\CAMFILES\6279_Daily_QA.QAF
Parameter Description : 1274.5 Peak Energy (keV)
Selection Dates : 2/02/18 12:00:00 AM - 3/23/18 12:00:00 AM
Lower/Upper Boundaries : 1273.000 - 1276.000

Full Q.A. Report 5/16/18 9:42:01 AM Page 1

****

***** G E N I E Q U A L I T Y A S S U R A N C E *****

****

Full Parameter Results Report
5/16/18 9:42:01 AM

QA File: C:\GENIE2K\CAMFILES\6279_Daily_Q
Description: 1274.5 Peak Energy
Parameter Units: keV
Parameter Type: Peak Search

Lower Boundary: 1.2730E+003
Upper Boundary: 1.2760E+003

	Measurement Time		Sample ID	Analyst	Value (keV)	Flags LU	SD	UD	BS
	2/2/18	10:09:37 AM			1.2713E+003	Be:	:	:	
	2/3/18	2:22:16 PM			1.2737E+003	:	:	:	
	2/5/18	2:15:05 PM	pre		1.2742E+003	:	:	:	
	2/5/18	3:36:37 PM	POST		1.2743E+003	:	:	:	
	2/6/18	7:54:07 AM	pre		1.2745E+003	:	:	:	
	2/6/18	4:06:46 PM	POST		1.2734E+003	:	:	:	
	2/7/18	10:15:30 AM	pre		1.2746E+003	:	:	:	
	2/7/18	4:01:41 PM	Post		1.2746E+003	:	:	:	
	2/8/18	8:31:16 AM	pre		1.2748E+003	:	:	:	
	2/8/18	2:19:23 PM	POST		1.2750E+003	:	:	:	
R	2/9/18	12:42:14 PM	pre		1.2741E+003	:	:	:	
	2/10/18	9:54:44 AM	001		1.2746E+003	:	:	:	
	2/10/18	10:02:05 AM	002		1.2746E+003	:	:	:	
	2/10/18	10:07:52 AM	003		1.2747E+003	:	:	:	
	2/10/18	10:14:34 AM	004		1.2747E+003	:	:	:	
	2/10/18	10:23:13 AM	005		1.2746E+003	:	:	:	
	2/10/18	10:33:40 AM	006		1.2747E+003	:	:	:	
	2/10/18	10:46:21 AM	007		1.2747E+003	:	:	:	
	2/10/18	10:58:09 AM	008		1.2747E+003	:	:	:	
	2/10/18	12:22:18 PM	009		1.2748E+003	:	:	:	
	2/10/18	12:28:38 PM	010		1.2748E+003	:	:	:	
	2/10/18	1:20:42 PM	test run		1.2747E+003	:	:	:	
	2/12/18	7:37:54 AM			1.2743E+003	:	:	:	
R	2/12/18	8:36:06 AM	Pre		1.2723E+003	Be:	:	:	
	2/12/18	8:41:26 AM	Pre		1.2744E+003	:	:	:	
	2/12/18	8:49:39 AM	Pre		1.2739E+003	:	:	:	
	2/12/18	8:57:12 AM	Pre		1.2747E+003	:	:	:	
	2/12/18	9:03:16 AM	Pre		1.2750E+003	:	:	:	
	2/12/18	9:11:41 AM	Pre		1.2753E+003	:	:	:	
	2/12/18	9:19:22 AM	Pre		1.2755E+003	:	:	:	
	2/12/18	9:31:04 AM	Pre		1.2745E+003	:	:	:	
	2/12/18	9:38:22 AM	Pre		1.2744E+003	:	:	:	
	2/12/18	9:45:30 AM	Pre		1.2741E+003	:	:	:	
	2/12/18	9:56:54 AM	Pre		1.2742E+003	:	:	:	
	2/12/18	10:03:38 AM	Pre		1.2743E+003	:	:	:	
	2/12/18	10:10:43 AM	Pre		1.2743E+003	:	:	:	
	2/12/18	10:17:44 AM	Pre		1.2743E+003	:	:	:	

Full Q.A. Report 5/16/18 9:42:01 AM Page 2

	Measurement Time	Sample ID	Analyst	Value (keV)	LU	Flags SD	UD	BS
	2/12/18 10:24:21 AM	Pre		1.2744E+003				
	2/12/18 12:35:25 PM	Pre		1.2745E+003				
	2/12/18 3:18:02 PM	Post		1.2753E+003				
	2/13/18 10:13:49 AM	Pre		1.2742E+003				
	2/13/18 3:38:31 PM	Post		1.2737E+003				
R	2/15/18 7:33:31 AM	Pre		1.2741E+003				
	2/15/18 7:45:40 AM	Pre		1.2746E+003				
R	2/15/18 2:19:35 PM	Post		1.2750E+003				
	2/15/18 2:20:20 PM	Post		1.2752E+003				
R	2/16/18 10:48:18 AM			1.2748E+003				
R	2/16/18 10:58:01 AM			1.2752E+003				
R	2/16/18 11:11:27 AM			1.2748E+003				
R	2/19/18 8:34:11 AM			1.2747E+003				
R	2/20/18 7:36:48 AM			1.2743E+003				
R	2/20/18 1:02:50 PM	Pre		1.2744E+003				
R	2/21/18 8:38:30 AM			1.2746E+003				
R	2/21/18 8:39:38 AM	Pre		1.2747E+003				
R	2/21/18 9:06:38 AM	Pre		1.2740E+003				
	2/21/18 9:19:06 AM	Pre		1.2743E+003				
	2/21/18 10:45:26 AM	Post		1.2744E+003				
	2/21/18 12:36:04 PM			1.2743E+003				
	2/21/18 4:08:48 PM	Post		1.2734E+003				
	2/22/18 8:17:47 AM	Pre		1.2746E+003				
	2/22/18 10:47:12 AM	Post		1.2747E+003				
	2/22/18 3:48:24 PM	Post		1.2753E+003				
R	2/23/18 8:21:28 AM	Pre		1.2746E+003				
R	2/23/18 8:37:23 AM	Pre		1.2750E+003				
	2/23/18 8:41:50 AM	Pre		1.2746E+003				
	2/23/18 3:45:57 PM	Post		1.2761E+003	Ab			
	2/24/18 7:26:44 AM	Pre		1.2745E+003				
	2/24/18 10:03:34 AM	Post		1.2746E+003				
	2/24/18 4:08:02 PM	POST		1.2739E+003				
	2/26/18 10:19:17 AM	Pre		1.2747E+003				
	2/26/18 3:50:27 PM	Post		1.2749E+003				
	2/27/18 9:03:00 AM	Pre		1.2747E+003				
	2/27/18 10:34:34 AM	Post		1.2751E+003				
	2/27/18 12:27:42 PM	Pre		1.2744E+003				
	2/27/18 3:46:56 PM	Post		1.2743E+003				
R	2/28/18 8:22:17 AM	Pre		1.2730E+003	Be			
	2/28/18 8:32:14 AM	Pre		1.2748E+003				
	2/28/18 3:49:56 PM	Post		1.2753E+003				
	3/1/18 8:54:57 AM	Pre		1.2745E+003				
	3/1/18 3:50:56 PM	Post		1.2751E+003				
	3/2/18 8:11:33 AM	Pre		1.2746E+003				
	3/2/18 10:53:40 AM	Post		1.2754E+003				
	3/2/18 12:32:28 PM	Pre		1.2745E+003				
	3/2/18 3:40:55 PM	Post		1.2747E+003				
	3/3/18 7:19:21 AM	Pre		1.2745E+003				
	3/3/18 3:41:53 PM	Post		1.2737E+003				
R	3/5/18 8:20:59 AM	Pre		1.2746E+003				
	3/5/18 8:38:31 AM	Pre		1.2746E+003				
R	3/5/18 10:28:19 AM	Post		1.2745E+003				
	3/5/18 10:30:17 AM	Post		1.2746E+003				
	3/5/18 3:40:58 PM	Post		1.2746E+003				

Full Q.A. Report 5/16/18 9:42:01 AM Page 3

	Measurement Time	Sample ID	Analyst	Value (keV)	Flags LU	SD	UD	BS
	3/6/18 7:27:28 AM	Pre		1.2751E+003				
	3/6/18 12:48:42 PM	Post		1.2755E+003				
	3/6/18 1:18:35 PM	Post		1.2747E+003				
R	3/7/18 8:00:21 AM	Pre		1.2747E+003				
	3/7/18 8:09:11 AM	Pre		1.2748E+003				
	3/7/18 3:39:18 PM	Post		1.2746E+003				
	3/8/18 7:42:58 AM	Pre		1.2745E+003				
	3/8/18 3:40:40 PM	Post		1.2748E+003				
	3/9/18 7:55:36 AM	Pre		1.2746E+003				
	3/9/18 3:33:22 PM	Post		1.2736E+003				
	3/10/18 7:24:23 AM	Pre		1.2744E+003				
	3/10/18 3:21:36 PM	Post		1.2746E+003				
	3/12/18 6:06:21 AM	Pre		1.2746E+003				
	3/12/18 3:30:32 PM	Post		1.2748E+003				
	3/13/18 7:44:47 AM	Pre		1.2744E+003				
	3/13/18 3:00:35 PM	Post		1.2752E+003				
	3/14/18 7:30:16 AM	Pre		1.2745E+003				
	3/14/18 3:49:54 PM	Post		1.2746E+003				
	3/15/18 7:27:24 AM	Pre		1.2744E+003				
	3/15/18 3:07:24 PM	Post		1.2735E+003				
R	3/19/18 7:11:48 AM	PRE QC		1.2754E+003				
	3/19/18 7:20:10 AM	PRE QC 2		1.2749E+003				
	3/19/18 3:29:40 PM	POST QC		1.2743E+003				
	3/20/18 8:48:21 AM	Pre		1.2745E+003				
	3/20/18 10:36:12 AM	Post		1.2748E+003				
	3/22/18 7:41:21 AM	Pre QC		1.2747E+003				
	3/22/18 2:02:05 PM	QC		1.2737E+003				

Flags Key: LU = Lower/Upper Bounds Test (Ab = Above, Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Replicate Measurement Assessment

Survey Unit # 05100 Survey Unit Name Auxiliary Building Basement

Sample Plan # B1-05100A-F

Sample Description: Comparison of systematic and QC ISOCS measurements of concrete wall at GRID #6, #24, #74, #102, #116, #131, #132, #156, #167, #208, #218, #230, #243, #272, #292, #331, #333, #334, #341, #373, #395, #405, and #409

STANDARD					COMPARISON			
ROC	Activity Value	Standard Error	Resolution	Agreement Range	Activity Value	Standard Error	Comparison Ratio	Acceptable (Y/N)
B1-05100AF-SWC-006-GD					B1-05100AF-QWC-006-GD			
Cs-137	1.61E+05	3.62E+04	4	0.5-2.0	1.49E+05	3.60E+04	1.1	Y
B1-05100AF-SWC-024-GD					B1-05100AF-QWC-024-GD			
Cs-137	1.70E+05	4.03E+04	4	0.5-2.0	1.63E+05	4.19E+04	1.0	Y
B1-05100AF-SWC-074-GD					B1-05100AF-QWC-074-GD			
Cs-137	1.72E+04	1.92E+04	1	0.1-2.5	8.03E+04	1.30E+04	0.2	Y
B1-05100AF-SWC-102-GD					B1-05100AF-QWC-102-GD			
Cs-137	7.39E+05	1.08E+05	7	0.5-2.0	7.33E+05	1.08E+05	1.0	Y
B1-05100AF-SWC-116-GD					B1-05100AF-QWC-116-GD			
Cs-137	4.57E+04	7.54E+03	6	0.5-2.0	4.03E+05	6.96E+04	0.1	N
K-40	4.05E+04	3.07E+04	1	0.4-2.5	7.90E+05	2.38E+05	0.05	N
B1-05100AF-SWC-131-GD					B1-05100AF-QWC-131-GD			
Cs-137	3.87E+05	6.45E+04	6	0.5-2.0	3.51E+05	5.93E+04	1.1	Y
B1-05100AF-SWC-132-GD					B1-05100AF-QWC-132-GD			
Cs-137	3.58E+06	4.51E+05	8	0.6-1.66	3.60E+06	5.54E+05	1.0	Y
B1-05100AF-SWC-156-GD					B1-05100AF-QWC-156-GD			
Cs-137	1.17E+07	1.43E+06	8	0.6-1.66	1.20E+07	1.46E+06	1.0	Y
B1-05100AF-SWC-167-GD					B1-05100AF-QWC-167-GD			
Cs-137	1.18E+06	1.65E+05	7	0.5-2.0	1.31E+06	1.79E+05	0.9	Y
B1-05100AF-SWC-208-GD					B1-05100AF-QWC-208-GD			
Cs-137	4.76E+06	5.95E+05	8	0.6-1.66	4.75E+06	5.95E+05	1.0	Y
B1-05100AF-SWC-218-GD					B1-05100AF-QWC-218-GD			
Cs-137	4.80E+05	7.85E+04	6	0.5-2.0	4.24E+05	7.27E+04	1.1	Y
B1-05100AF-SWC-230-GD					B1-05100AF-QWC-230-GD			
Cs-137	5.36E+04	3.15E+04	2	0.4-2.5	5.36E+04	3.16E+04	1.0	Y
B1-05100AF-SWC-243-GD					B1-05100AF-QWC-243-GD			
Cs-137	1.28E+05	3.90E+04	3	0.5-2.0	1.53E+05	2.05E+06	0.8	Y
B1-05100AF-SWC-272-GD					B1-05100AF-QWC-272-GD			
Cs-137	4.84E+06	6.15E+05	8	0.6-1.66	5.06E+06	6.44E+05	1.0	Y
B1-05100AF-SWC-292-GD					B1-05100AF-QWC-292-GD			
Cs-137	1.69E+07	2.05E+06	8	0.6-1.66	1.69E+07	2.05E+06	1.0	Y
B1-05100AF-SWC-331-GD					B1-05100AF-QWC-331-GD			
Cs-137	8.07E+05	1.19E+05	7	0.5-2.0	8.21E+05	1.21E+05	1.0	Y
B1-05100AF-SWC-333-GD					B1-05100AF-QWC-333-GD			
Cs-137	4.57E+05	8.13E+04	6	0.5-2.0	5.01E+05	8.57E+04	0.9	Y
B1-05100AF-SWC-334-GD					B1-05100AF-QWC-334-GD			
Cs-137	1.62E+06	2.26E+05	7	0.5-2.0	1.64E+06	2.29E+05	1.0	Y
B1-05100AF-SWC-341-GD					B1-05100AF-QWC-341-GD			
Cs-137	1.99E+07	2.42E+06	8	0.6-1.66	2.09E+07	2.53E+06	1.0	Y
B1-05100AF-SWC-373-GD					B1-05100AF-QWC-373-GD			
Cs-137	1.93E+06	2.54E+05	8	0.6-1.66	2.05E+06	2.68E+05	0.9	Y
B1-05100AF-SWC-395-GD					B1-05100AF-QWC-395-GD			
Cs-137	3.89E+05	6.99E+04	6	0.5-2.0	4.41E+05	7.40E+04	0.9	Y
B1-05100AF-SWC-405-GD					B1-05100AF-QWC-405-GD			
Cs-137	9.12E+05	1.33E+05	7	0.5-2.0	8.61E+05	1.29E+05	1.1	Y
B1-05100AF-SWC-409-GD					B1-05100AF-QWC-409-GD			
Cs-137	1.76E+06	2.35E+05	7	0.5-2.0	1.61E+06	2.15E+05	1.1	Y

Replicate Measurement Assessment (continued)

Survey Unit # 05100 Survey Unit Name Auxiliary Building Basement

Sample Plan # B1-05100A-F

Comments/Corrective Actions: With the exception of the replicate measurement at grid #116, there was acceptable agreement between the standard measurement and the replicate measurement. ISOCS measurement location 116 (B1-05100AF-SWC-116-GD) identified Cs-137 activity at 4.57E+04 pCi/m^2, which was greater than the MDC (5.32E+03 pCi/m^2) but only 0.128% of the OpDCGL for Cs-137. There is not acceptable agreement between the standard and comparison measurements. K-40 was also used to determine whether the measurement was acceptable. However, K-40 in the aforementioned sample was also less than the MDC and also did not have an acceptable agreement between the standard measurement and the QC measurement. Pre and post use operational checks of the ISOCS did not indicate any issues with the instrument or the quality of the data. In addition, other replicate measurements taken at several other locations were in agreement. Consequently, it was decided that no further action was necessary.	Table is provided to show acceptance criteria used to assess split samples. Resolution / Agreement Range 4 - 7 / 0.5 - 2.0 8 - 15 / 0.6 - 1.66 16 - 50 / 0.75 - 1.33 51 - 200 / 0.80 - 1.25 >200 / 0.85 - 1.18

ATTACHMENT 5
AUXILIARY BUILDING ISOCS MEASUREMENTS

Auxiliary Building Basement - Measured Concentrations for Systematic FSS ISOCS Measurements

MEASUREMENT ID	Co-60 (pCi/m^2)	Ni-63 (1) (pCi/m^2)	Sr-90 (1) (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	OpSOF
B1-05100AF-SWC-001-GD	2.04E+04	3.68E+06	5.28E+02	5.44E+04	2.64E+05	0.0095
B1-05100AF-SWC-002-GD	3.41E+04	6.15E+06	2.68E+02	4.89E+04	1.34E+05	0.0066
B1-05100AF-SWC-003-GD	4.12E+04	7.43E+06	3.84E+02	7.23E+04	1.92E+05	0.0090
B1-05100AF-SWC-004-GD	2.56E+04	4.62E+06	1.77E+02	9.27E+03	8.87E+04	0.0042
B1-05100AF-SWC-005-GD	2.83E+04	5.11E+06	2.40E+02	5.71E+04	1.20E+05	0.0059
B1-05100AF-SWC-006-GD	1.98E+04	3.57E+06	3.22E+02	6.34E+04	1.61E+05	0.0067
B1-05100AF-SWC-007-GD	2.62E+04	4.73E+06	1.09E+02	3.02E+04	5.46E+04	0.0035
B1-05100AF-SWC-008-GD	1.98E+04	3.57E+06	7.08E+01	7.74E+04	3.54E+04	0.0033
B1-05100AF-SWC-009-GD	7.39E+03	1.33E+06	1.02E+02	5.58E+04	5.10E+04	0.0027
B1-05100AF-SWC-010-GD	3.33E+04	6.01E+06	2.04E+01	3.59E+04	1.02E+04	0.0028
B1-05100AF-SWC-011-GD	9.06E+03	1.63E+06	1.63E+02	2.60E+04	8.13E+04	0.0032
B1-05100AF-SWC-012-GD	6.83E+04	1.23E+07	3.30E+02	2.40E+04	1.65E+05	0.0091
B1-05100AF-SWC-013-GD	2.37E+04	4.28E+06	1.50E+02	2.08E+04	7.49E+04	0.0038
B1-05100AF-SWC-014-GD	1.01E+04	1.82E+06	1.07E+02	3.21E+04	5.37E+04	0.0026
B1-05100AF-SWC-015-GD	0.00E+00	0.00E+00	4.78E+01	4.56E+04	2.39E+04	0.0014
B1-05100AF-SWC-016-GD	9.59E+03	1.73E+06	1.06E+02	2.98E+04	5.31E+04	0.0025
B1-05100AF-SWC-017-GD	3.23E+04	5.83E+06	1.70E+02	7.76E+04	8.49E+04	0.0055
B1-05100AF-SWC-018-GD	2.49E+03	4.49E+05	6.22E+01	5.41E+04	3.11E+04	0.0018
B1-05100AF-SWC-019-GD	3.10E+04	5.59E+06	1.22E+02	5.92E+04	6.11E+04	0.0044
B1-05100AF-SWC-020-GD	3.88E+04	7.00E+06	1.11E+02	2.53E+04	5.54E+04	0.0042
B1-05100AF-SWC-021-GD	2.90E+04	5.23E+06	2.32E+02	6.28E+04	1.16E+05	0.0059
B1-05100AF-SWC-022-GD	4.40E+04	7.94E+06	2.14E+02	5.93E+04	1.07E+05	0.0065
B1-05100AF-SWC-023-GD	3.04E+04	5.49E+06	5.18E+01	2.05E+04	2.59E+04	0.0028

(1) Concentrations inferred based on maximum ratios from LTP Chapter 5, Table 5-15

Auxiliary Building Basement - Measured Concentrations for Systematic FSS ISOCS Measurements (continued)

MEASUREMENT ID	Co-60 (pCi/m^2)	Ni-63 (1) (pCi/m^2)	Sr-90 (1) (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	OpSOF
B1-05100AF-SWC-024-GD	4.51E+04	8.14E+06	3.40E+02	0.00E+00	1.70E+05	0.0075
B1-05100AF-SWC-025-GD	3.38E+04	6.10E+06	1.89E+02	3.59E+04	9.44E+04	0.0052
B1-05100AF-SWC-026-GD	2.49E+03	4.49E+05	1.12E+02	3.64E+04	5.60E+04	0.0023
B1-05100AF-SWC-027-GD	4.73E+03	8.54E+05	1.81E+02	7.69E+04	9.07E+04	0.0040
B1-05100AF-SWC-028-GD	1.06E+04	1.91E+06	2.82E+02	0.00E+00	1.41E+05	0.0046
B1-05100AF-SWC-029-GD	3.00E+04	5.41E+06	4.16E+02	6.82E+03	2.08E+05	0.0078
B1-05100AF-SWC-030-GD	1.10E+04	1.98E+06	1.20E+03	3.28E+04	6.01E+05	0.0183
B1-05100AF-SWC-031-GD	4.12E+04	7.43E+06	3.86E+02	5.51E+04	1.93E+05	0.0087
B1-05100AF-SWC-032-GD	1.10E+04	1.98E+06	3.00E+02	1.58E+04	1.50E+05	0.0052
B1-05100AF-SWC-033-GD	7.30E+03	1.32E+06	8.54E+02	5.28E+04	4.27E+05	0.0134
B1-05100AF-SWC-034-GD	1.73E+04	3.12E+06	2.10E+03	1.98E+04	1.05E+06	0.0313
B1-05100AF-SWC-035-GD	3.85E+04	6.95E+06	3.54E+03	5.18E+04	1.77E+06	0.0536
B1-05100AF-SWC-036-GD	3.40E+04	6.14E+06	1.67E+04	2.84E+04	8.34E+06	0.2406
B1-05100AF-SWC-037-GD	8.17E+03	1.47E+06	9.62E+03	1.99E+04	4.81E+06	0.1381
B1-05100AF-SWC-038-GD	3.13E+04	5.65E+06	4.36E+03	2.27E+04	2.18E+06	0.0644
B1-05100AF-SWC-039-GD	4.03E+04	7.27E+06	1.11E+03	8.05E+04	5.54E+05	0.0194
B1-05100AF-SWC-040-GD	3.11E+04	5.61E+06	6.34E+02	0.00E+00	3.17E+05	0.0109
B1-05100AF-SWC-041-GD	2.20E+04	3.97E+06	4.08E+02	4.37E+04	2.04E+05	0.0078
B1-05100AF-SWC-042-GD	5.40E+04	9.74E+06	3.80E+02	1.90E+04	1.90E+05	0.0089
B1-05100AF-SWC-043-GD	3.49E+04	6.30E+06	7.72E+03	7.58E+04	3.86E+06	0.1134
B1-05100AF-SWC-044-GD	1.61E+03	2.91E+05	1.11E+04	2.89E+04	5.56E+06	0.1593
B1-05100AF-SWC-045-GD	2.54E+04	4.58E+06	4.12E+03	3.19E+04	2.06E+06	0.0608
B1-05100AF-SWC-046-GD	2.54E+04	4.58E+06	1.07E+03	3.69E+03	5.34E+05	0.0168
B1-05100AF-SWC-047-GD	4.26E+04	7.69E+06	5.94E+02	2.73E+04	2.97E+05	0.0114

(1) Concentrations inferred based on maximum ratios from LTP Chapter 5, Table 5-15

Auxiliary Building Basement - Measured Concentrations for Systematic FSS ISOCS Measurements (continued)

MEASUREMENT ID	Co-60 (pCi/m^2)	Ni-63 (1) (pCi/m^2)	Sr-90 (1) (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	OpSOF
B1-05100AF-SWC-048-GD	6.25E+04	1.13E+07	4.30E+02	5.71E+04	2.15E+05	0.0107
B1-05100AF-SWC-049-GD	2.13E+03	3.84E+05	5.26E+03	4.18E+04	2.63E+06	0.0758
B1-05100AF-SWC-050-GD	4.40E+04	7.94E+06	8.80E+03	1.65E+05	4.40E+06	0.1306
B1-05100AF-SWC-051-GD	3.44E+04	6.21E+06	8.58E+03	6.82E+04	4.29E+06	0.1255
B1-05100AF-SWC-052-GD	5.82E+04	1.05E+07	1.66E+04	2.50E+04	8.29E+06	0.2405
B1-05100AF-SWC-053-GD	2.85E+05	5.14E+07	2.66E+03	1.27E+04	1.33E+06	0.0549
B1-05100AF-SWC-054-GD	4.26E+05	7.69E+07	9.28E+02	1.23E+03	4.64E+05	0.0383
B1-05100AF-SWC-055-GD	6.70E+05	1.21E+08	2.48E+03	7.34E+04	1.24E+06	0.0759
B1-05100AF-SWC-056-GD	4.72E+05	8.52E+07	2.10E+03	3.06E+04	1.05E+06	0.0582
B1-05100AF-SWC-057-GD	5.68E+04	1.02E+07	1.98E+02	5.32E+04	9.89E+04	0.0069
B1-05100AF-SWC-058-GD	2.58E+05	4.66E+07	2.86E+02	2.72E+04	1.43E+05	0.0197
B1-05100AF-SWC-059-GD	1.94E+05	3.50E+07	4.04E+02	5.04E+04	2.02E+05	0.0179
B1-05100AF-SWC-060-GD	1.24E+05	2.24E+07	1.81E+03	3.39E+03	9.04E+05	0.0332
B1-05100AF-SWC-061-GD	3.00E+04	5.41E+06	1.11E+01	1.85E+04	5.54E+03	0.0022
B1-05100AF-SWC-062-GD	3.83E+04	6.91E+06	3.66E+01	6.71E+04	1.83E+04	0.0038
B1-05100AF-SWC-063-GD	0.00E+00	0.00E+00	6.46E+01	4.40E+04	3.23E+04	0.0016
B1-05100AF-SWC-064-GD	2.28E+04	4.11E+06	1.81E+02	5.52E+04	9.07E+04	0.0047
B1-05100AF-SWC-065-GD	6.11E+04	1.10E+07	1.71E+02	6.35E+03	8.53E+04	0.0061
B1-05100AF-SWC-066-GD	2.48E+04	4.48E+06	4.12E+00	5.87E+04	2.06E+03	0.0024
B1-05100AF-SWC-067-GD	1.98E+04	3.57E+06	4.16E+01	4.00E+04	2.08E+04	0.0023
B1-05100AF-SWC-068-GD	1.88E+04	3.39E+06	1.51E+02	1.90E+04	7.54E+04	0.0035
B1-05100AF-SWC-069-GD	3.84E+04	6.93E+06	4.94E+01	7.84E+04	2.47E+04	0.0041
B1-05100AF-SWC-070-GD	5.62E+04	1.01E+07	6.14E+01	3.77E+04	3.07E+04	0.0047
B1-05100AF-SWC-071-GD	3.10E+04	5.59E+06	6.48E+01	6.44E+04	3.24E+04	0.0037
B1-05100AF-SWC-072-GD	5.31E+04	9.58E+06	2.44E+02	4.26E+04	1.22E+05	0.0072

(1) Concentrations inferred based on maximum ratios from LTP Chapter 5, Table 5-15

Auxiliary Building Basement - Measured Concentrations for Systematic FSS ISOCS Measurements (continued)

MEASUREMENT ID	Co-60 (pCi/m^2)	Ni-63 (1) (pCi/m^2)	Sr-90 (1) (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	OpSOF
B1-05100AF-SWC-073-GD	4.12E+04	7.43E+06	2.98E+02	4.83E+03	1.49E+05	0.0067
B1-05100AF-SWC-074-GD	3.27E+04	5.90E+06	3.44E+01	1.04E+04	1.72E+04	0.0026
B1-05100AF-SWC-075-GD	3.13E+04	5.65E+06	3.68E+01	6.60E+04	1.84E+04	0.0033
B1-05100AF-SWC-076-GD	3.55E+04	6.41E+06	4.02E+01	4.38E+04	2.01E+04	0.0033
B1-05100AF-SWC-077-GD	3.34E+04	6.03E+06	9.00E+01	1.56E+04	4.50E+04	0.0035
B1-05100AF-SWC-078-GD	3.19E+04	5.76E+06	2.80E+01	4.59E+04	1.40E+04	0.0030
B1-05100AF-SWC-079-GD	2.39E+04	4.31E+06	1.05E+01	2.82E+04	5.26E+03	0.0020
B1-05100AF-SWC-080-GD	7.62E+03	1.38E+06	4.12E+01	4.20E+03	2.06E+04	0.0011
B1-05100AF-SWC-081-GD	2.55E+05	4.60E+07	9.30E+02	1.38E+04	4.65E+05	0.0285
B1-05100AF-SWC-082-GD	3.06E+05	5.52E+07	2.98E+03	4.23E+04	1.49E+06	0.0612
B1-05100AF-SWC-083-GD	1.83E+05	3.30E+07	2.56E+03	0.00E+00	1.28E+06	0.0473
B1-05100AF-SWC-086-GD	1.47E+05	2.65E+07	1.06E+03	1.25E+04	5.30E+05	0.0240
B1-05100AF-SWC-087-GD	1.05E+05	1.89E+07	1.14E+03	3.02E+04	5.69E+05	0.0229
B1-05100AF-SWC-088-GD	2.10E+05	3.79E+07	9.92E+02	6.41E+04	4.96E+05	0.0275
B1-05100AF-SWC-089-GD	9.91E+04	1.79E+07	1.05E+03	5.55E+02	5.27E+05	0.0209
B1-05100AF-SWC-090-GD	6.04E+04	1.09E+07	2.32E+03	1.94E+04	1.16E+06	0.0370
B1-05100AF-SWC-091-GD	1.14E+05	2.06E+07	1.65E+03	5.91E+04	8.25E+05	0.0311
B1-05100AF-SWC-094-GD	9.88E+04	1.78E+07	3.16E+02	5.84E+04	1.58E+05	0.0112
B1-05100AF-SWC-095-GD	4.07E+04	7.34E+06	2.06E+02	2.86E+04	1.03E+05	0.0058
B1-05100AF-SWC-096-GD	2.47E+05	4.46E+07	1.07E+03	4.25E+04	5.35E+05	0.0304
B1-05100AF-SWC-097-GD	1.14E+05	2.06E+07	1.20E+03	4.41E+03	6.01E+05	0.0239
B1-05100AF-SWC-098-GD	1.06E+04	1.91E+06	1.05E+02	5.55E+04	5.24E+04	0.0029
B1-05100AF-SWC-099-GD	3.68E+04	6.64E+06	1.10E+02	6.40E+04	5.51E+04	0.0047
B1-05100AF-SWC-101-GD	1.46E+05	2.63E+07	4.40E+03	4.12E+04	2.20E+06	0.0720
B1-05100AF-SWC-102-GD	5.36E+04	9.67E+06	1.48E+03	9.06E+04	7.39E+05	0.0256

(1) Concentrations inferred based on maximum ratios from LTP Chapter 5, Table 5-15

Auxiliary Building Basement - Measured Concentrations for Systematic FSS ISOCS Measurements (continued)

MEASUREMENT ID	Co-60 (pCi/m^2)	Ni-63 (1) (pCi/m^2)	Sr-90 (1) (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	OpSOF
B1-05100AF-SWC-103-GD	7.45E+04	1.34E+07	4.86E+03	6.69E+04	2.43E+06	0.0748
B1-05100AF-SWC-104-GD	6.83E+04	1.23E+07	4.08E+02	1.31E+04	2.04E+05	0.0100
B1-05100AF-SWC-105-GD	3.25E+04	5.86E+06	1.20E+02	1.20E+04	6.01E+04	0.0038
B1-05100AF-SWC-106-GD	3.59E+06	6.48E+08	4.32E+03	7.12E+04	2.16E+06	0.2739
B1-05100AF-SWC-107-GD	1.45E+05	2.62E+07	1.20E+03	5.39E+03	6.00E+05	0.0257
B1-05100AF-SWC-108-GD	2.30E+04	4.15E+06	1.22E+02	8.46E+04	6.08E+04	0.0043
B1-05100AF-SWC-109-GD	6.30E+04	1.14E+07	1.97E+02	3.07E+04	9.83E+04	0.0070
B1-05100AF-SWC-110-GD	3.53E+05	6.37E+07	3.42E+03	7.41E+04	1.71E+06	0.0707
B1-05100AF-SWC-111-GD	6.96E+05	1.26E+08	2.14E+03	3.94E+04	1.07E+06	0.0721
B1-05100AF-SWC-112-GD	9.59E+05	1.73E+08	2.06E+03	0.00E+00	1.03E+06	0.0858
B1-05100AF-SWC-113-GD	4.05E+04	7.31E+06	1.14E+02	2.79E+04	5.69E+04	0.0044
B1-05100AF-SWC-114-GD	4.70E+04	8.48E+06	1.18E+02	2.90E+04	5.92E+04	0.0049
B1-05100AF-SWC-115-GD	4.68E+04	8.45E+06	4.46E+02	7.66E+04	2.23E+05	0.0102
B1-05100AF-SWC-116-GD	1.09E+04	1.97E+06	9.14E+01	3.08E+03	4.57E+04	0.0020
B1-05100AF-SWC-117-GD	6.23E+04	1.12E+07	8.28E+02	1.41E+04	4.14E+05	0.0157
B1-05100AF-SWC-118-GD	4.50E+04	8.12E+06	3.56E+02	1.33E+04	1.78E+05	0.0079
B1-05100AF-SWC-119-GD	1.86E+05	3.36E+07	8.54E+02	5.64E+04	4.27E+05	0.0240
B1-05100AF-SWC-120-GD	1.18E+03	2.13E+05	7.28E+01	6.00E+04	3.64E+04	0.0020
B1-05100AF-SWC-121-GD	2.48E+04	4.48E+06	6.22E+02	2.84E+04	3.11E+05	0.0108
B1-05100AF-SWC-122-GD	3.52E+03	6.35E+05	1.95E+01	3.42E+03	9.74E+03	0.0005
B1-05100AF-SWC-123-GD	5.47E+03	9.87E+05	2.04E+01	5.78E+02	1.02E+04	0.0006
B1-05100AF-SWC-124-GD	1.39E+04	2.51E+06	1.57E+02	4.00E+04	7.83E+04	0.0036
B1-05100AF-SWC-125-GD	3.32E+04	5.99E+06	6.70E+01	5.64E+04	3.35E+04	0.0037
B1-05100AF-SWC-126-GD	1.24E+04	2.24E+06	7.46E+01	5.24E+04	3.73E+04	0.0026
B1-05100AF-SWC-127-GD	3.64E+04	6.57E+06	1.18E+02	1.93E+04	5.89E+04	0.0041

(1) Concentrations inferred based on maximum ratios from LTP Chapter 5, Table 5-15

Auxiliary Building Basement - Measured Concentrations for Systematic FSS ISOCS Measurements (continued)

MEASUREMENT ID	Co-60 (pCi/m^2)	Ni-63 (1) (pCi/m^2)	Sr-90 (1) (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	OpSOF
B1-05100AF-SWC-128-GD	3.09E+04	5.58E+06	1.62E+01	6.40E+04	8.11E+03	0.0030
B1-05100AF-SWC-129-GD	3.18E+05	5.74E+07	7.80E+02	5.88E+04	3.90E+05	0.0307
B1-05100AF-SWC-130-GD	9.24E+03	1.67E+06	5.60E+01	4.55E+03	2.80E+04	0.0014
B1-05100AF-SWC-131-GD	1.43E+05	2.58E+07	7.74E+02	1.59E+03	3.87E+05	0.0195
B1-05100AF-SWC-132-GD	5.33E+05	9.62E+07	7.16E+03	0.00E+00	3.58E+06	0.1336
B1-05100AF-SWC-133-GD	9.14E+04	1.65E+07	1.39E+03	6.36E+03	6.94E+05	0.0253
B1-05100AF-SWC-134-GD	5.18E+04	9.35E+06	6.12E+01	5.76E+03	3.06E+04	0.0040
B1-05100AF-SWC-135-GD	3.19E+05	5.76E+07	2.56E+03	5.41E+04	1.28E+06	0.0561
B1-05100AF-SWC-136-GD	5.55E+04	1.00E+07	1.36E+03	1.58E+04	6.82E+05	0.0230
B1-05100AF-SWC-137-GD	3.88E+04	7.00E+06	4.08E+02	1.30E+04	2.04E+05	0.0083
B1-05100AF-SWC-141-GD	8.66E+04	1.56E+07	4.96E+03	2.32E+04	2.48E+06	0.0762
B1-05100AF-SWC-142-GD	1.92E+05	3.46E+07	7.66E+03	3.59E+04	3.83E+06	0.1212
B1-05100AF-SWC-143-GD	1.06E+05	1.91E+07	6.00E+03	2.51E+04	3.00E+06	0.0923
B1-05100AF-SWC-144-GD	1.25E+05	2.26E+07	5.50E+03	8.11E+04	2.75E+06	0.0871
B1-05100AF-SWC-147-GD	4.40E+04	7.94E+06	3.22E+03	4.51E+04	1.61E+06	0.0492
B1-05100AF-SWC-148-GD	1.80E+04	3.25E+06	2.10E+03	3.89E+04	1.05E+06	0.0316
B1-05100AF-SWC-149-GD	8.91E+04	1.61E+07	8.56E+03	1.38E+04	4.28E+06	0.1277
B1-05100AF-SWC-150-GD	6.33E+04	1.14E+07	1.55E+04	5.53E+04	7.73E+06	0.2253
B1-05100AF-SWC-151-GD	2.03E+05	3.66E+07	3.96E+04	1.19E+05	1.98E+07	0.5791
B1-05100AF-SWC-152-GD	1.10E+05	1.98E+07	1.26E+04	6.67E+04	6.31E+06	0.1876
B1-05100AF-SWC-153-GD	2.56E+05	4.62E+07	3.86E+03	1.09E+04	1.93E+06	0.0703
B1-05100AF-SWC-154-GD	8.42E+04	1.52E+07	3.68E+03	4.32E+04	1.84E+06	0.0581
B1-05100AF-SWC-155-GD	8.16E+04	1.47E+07	1.17E+04	7.21E+04	5.86E+06	0.1732
B1-05100AF-SWC-156-GD	2.22E+05	4.01E+07	2.34E+04	4.52E+04	1.17E+07	0.3478
B1-05100AF-SWC-157-GD	7.91E+04	1.43E+07	1.47E+03	1.76E+04	7.36E+05	0.0259

(1) Concentrations inferred based on maximum ratios from LTP Chapter 5, Table 5-15

Auxiliary Building Basement - Measured Concentrations for Systematic FSS ISOCS Measurements (continued)

MEASUREMENT ID	Co-60 (pCi/m^2)	Ni-63 (1) (pCi/m^2)	Sr-90 (1) (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	OpSOF
B1-05100AF-SWC-158-GD	7.59E+04	1.37E+07	7.58E+02	4.86E+04	3.79E+05	0.0160
B1-05100AF-SWC-159-GD	5.45E+04	9.83E+06	3.46E+02	9.50E+03	1.73E+05	0.0083
B1-05100AF-SWC-160-GD	2.34E+05	4.22E+07	1.99E+02	6.18E+03	9.93E+04	0.0167
B1-05100AF-SWC-161-GD	5.43E+04	9.80E+06	5.04E+02	3.93E+04	2.52E+05	0.0110
B1-05100AF-SWC-162-GD	7.34E+04	1.32E+07	4.76E+03	4.48E+04	2.38E+06	0.0729
B1-05100AF-SWC-163-GD	6.84E+04	1.23E+07	9.40E+03	2.81E+04	4.70E+06	0.1386
B1-05100AF-SWC-164-GD	7.13E+04	1.29E+07	8.88E+02	7.63E+04	4.44E+05	0.0180
B1-05100AF-SWC-165-GD	1.26E+06	2.27E+08	1.14E+03	5.75E+04	5.71E+05	0.0913
B1-05100AF-SWC-166-GD	1.83E+04	3.30E+06	6.70E+03	1.09E+05	3.35E+06	0.0983
B1-05100AF-SWC-167-GD	9.80E+04	1.77E+07	2.36E+03	3.08E+04	1.18E+06	0.0399
B1-05100AF-SWC-168-GD	1.01E+05	1.82E+07	1.95E+03	2.51E+04	9.73E+05	0.0341
B1-05100AF-SWC-169-GD	5.94E+04	1.07E+07	2.14E+02	3.78E+04	2.20E+06	0.0667
B1-05100AF-SWC-172-GD	1.07E+05	1.93E+07	5.40E+03	8.41E+03	2.70E+06	0.0835
B1-05100AF-SWC-173-GD	3.11E+05	5.61E+07	1.19E+03	7.57E+04	5.93E+05	0.0363
B1-05100AF-SWC-174-GD	3.07E+05	5.54E+07	1.38E+03	8.23E+04	6.91E+05	0.0390
B1-05100AF-SWC-175-GD	7.88E+05	1.42E+08	1.42E+03	7.22E+04	7.10E+05	0.0677
B1-05100AF-SWC-179-GD	1.30E+06	2.35E+08	7.30E+03	1.96E+05	3.65E+06	0.1836
B1-05100AF-SWC-180-GD	4.57E+05	8.25E+07	1.92E+03	1.20E+05	9.60E+05	0.0561
B1-05100AF-SWC-181-GD	2.64E+05	4.76E+07	6.54E+02	2.76E+04	3.27E+05	0.0253
B1-05100AF-SWC-182-GD	5.71E+04	1.03E+07	3.52E+02	3.70E+04	1.76E+05	0.0089
B1-05100AF-SWC-183-GD	4.97E+04	8.97E+06	3.42E+02	7.61E+04	1.71E+05	0.0089
B1-05100AF-SWC-184-GD	5.26E+04	9.49E+06	2.46E+03	4.91E+04	1.23E+06	0.0389
B1-05100AF-SWC-185-GD	6.48E+04	1.17E+07	4.36E+03	1.20E+04	2.18E+06	0.0662
B1-05100AF-SWC-186-GD	2.17E+04	3.92E+06	5.10E+02	8.54E+03	2.55E+05	0.0087

(1) Concentrations inferred based on maximum ratios from LTP Chapter 5, Table 5-15

Auxiliary Building Basement - Measured Concentrations for Systematic FSS ISOCS Measurements (continued)

MEASUREMENT ID	Co-60 (pCi/m^2)	Ni-63 (1) (pCi/m^2)	Sr-90 (1) (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	OpSOF
B1-05100AF-SWC-187-GD	2.28E+04	4.11E+06	3.70E+02	6.84E+04	1.85E+05	0.0076
B1-05100AF-SWC-188-GD	0.00E+00	0.00E+00	3.72E+02	2.05E+04	1.86E+05	0.0056
B1-05100AF-SWC-189-GD	8.29E+03	1.50E+06	9.48E+01	5.25E+04	4.74E+04	0.0026
B1-05100AF-SWC-190-GD	1.53E+04	2.76E+06	1.63E+02	2.05E+04	8.13E+04	0.0035
B1-05100AF-SWC-191-GD	2.04E+04	3.68E+06	2.96E+02	2.18E+04	1.48E+05	0.0057
B1-05100AF-SWC-192-GD	4.69E+04	8.46E+06	2.02E+02	1.67E+04	1.01E+05	0.0059
B1-05100AF-SWC-193-GD	4.81E+04	8.68E+06	2.16E+02	1.08E+04	1.08E+05	0.0061
B1-05100AF-SWC-194-GD	3.27E+06	5.90E+08	4.72E+03	0.00E+00	2.36E+06	0.2598
B1-05100AF-SWC-195-GD	4.24E+04	7.65E+06	9.60E+01	2.61E+04	4.80E+04	0.0042
B1-05100AF-SWC-196-GD	4.85E+04	8.75E+06	1.17E+02	1.23E+04	5.84E+04	0.0047
B1-05100AF-SWC-197-GD	5.20E+04	9.38E+06	1.69E+02	2.31E+04	8.46E+04	0.0058
B1-05100AF-SWC-198-GD	2.23E+06	4.02E+08	3.48E+03	5.91E+04	1.74E+06	0.1817
B1-05100AF-SWC-199-GD	6.76E+05	1.22E+08	1.84E+03	2.76E+04	9.20E+05	0.0664
B1-05100AF-SWC-200-GD	2.67E+05	4.82E+07	1.06E+03	0.00E+00	5.28E+05	0.0308
B1-05100AF-SWC-201-GD	2.47E+06	4.46E+08	2.44E+03	0.00E+00	1.22E+06	0.1802
B1-05100AF-SWC-202-GD	2.75E+05	4.96E+07	7.10E+02	1.31E+04	3.55E+05	0.0265
B1-05100AF-SWC-203-GD	2.70E+05	4.87E+07	6.06E+02	5.24E+04	3.03E+05	0.0253
B1-05100AF-SWC-204-GD	1.22E+07	2.20E+09	2.52E+04	2.84E+05	1.26E+07	1.0817
B1-05100AF-SWC-205-GD	1.46E+07	2.63E+09	2.74E+04	0.00E+00	1.37E+07	1.2501
B1-05100AF-SWC-206-GD	1.30E+07	2.35E+09	2.46E+04	8.72E+04	1.23E+07	1.1173
B1-05100AF-SWC-207-GD	2.71E+05	4.89E+07	4.96E+02	3.74E+04	2.48E+05	0.0236
B1-05100AF-SWC-208-GD	1.78E+06	3.21E+08	9.52E+03	4.70E+04	4.76E+06	0.2413
B1-05100AF-SWC-209-GD	1.19E+06	2.15E+08	9.66E+03	3.11E+04	4.83E+06	0.2084
B1-05100AF-SWC-210-GD	1.50E+06	2.71E+08	1.94E+03	3.02E+04	9.68E+05	0.1163

(1) Concentrations inferred based on maximum ratios from LTP Chapter 5, Table 5-15

Auxiliary Building Basement - Measured Concentrations for Systematic FSS ISOCS Measurements (continued)

MEASUREMENT ID	Co-60 (pCi/m^2)	Ni-63 (1) (pCi/m^2)	Sr-90 (1) (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	OpSOF
B1-05100AF-SWC-211-GD	1.51E+05	2.72E+07	2.82E+02	2.21E+04	1.41E+05	0.0132
B1-05100AF-SWC-212-GD	1.29E+07	2.33E+09	1.69E+04	2.27E+05	8.46E+06	1.0038
B1-05100AF-SWC-213-GD	2.29E+05	4.13E+07	4.32E+03	1.85E+04	2.16E+06	0.0754
B1-05100AF-SWC-214-GD	1.94E+05	3.50E+07	1.34E+03	1.70E+04	6.72E+05	0.0309
B1-05100AF-SWC-215-GD	9.76E+04	1.76E+07	1.51E+03	7.35E+04	7.54E+05	0.0284
B1-05100AF-SWC-216-GD	4.22E+04	7.61E+06	5.14E+02	8.29E+04	2.57E+05	0.0110
B1-05100AF-SWC-217-GD	3.12E+04	5.63E+06	1.02E+03	2.80E+04	5.12E+05	0.0169
B1-05100AF-SWC-218-GD	1.46E+04	2.63E+06	9.60E+02	3.82E+04	4.80E+05	0.0151
B1-05100AF-SWC-221-GD	4.89E+04	8.82E+06	2.10E+03	3.77E+04	1.05E+06	0.0334
B1-05100AF-SWC-222-GD	4.15E+04	7.49E+06	2.06E+03	5.10E+04	1.03E+06	0.0326
B1-05100AF-SWC-223-GD	2.51E+04	4.53E+06	1.66E+02	5.47E+04	8.31E+04	0.0047
B1-05100AF-SWC-224-GD	1.30E+04	2.35E+06	2.82E+02	4.48E+04	1.41E+05	0.0054
B1-05100AF-SWC-225-GD	1.17E+04	2.11E+06	4.32E+02	2.75E+04	2.16E+05	0.0073
B1-05100AF-SWC-226-GD	2.51E+04	4.53E+06	4.24E+02	4.09E+04	2.12E+05	0.0081
B1-05100AF-SWC-229-GD	2.19E+04	3.95E+06	1.79E+02	2.14E+04	8.94E+04	0.0042
B1-05100AF-SWC-230-GD	3.55E+04	6.41E+06	1.07E+02	3.79E+04	5.36E+04	0.0042
B1-05100AF-SWC-231-GD	3.98E+04	7.18E+06	2.10E+02	5.83E+04	1.05E+05	0.0062
B1-05100AF-SWC-232-GD	6.71E+04	1.21E+07	6.10E+02	0.00E+00	3.05E+05	0.0127
B1-05100AF-SWC-233-GD	5.76E+04	1.04E+07	5.14E+02	4.23E+04	2.57E+05	0.0113
B1-05100AF-SWC-234-GD	3.41E+04	6.15E+06	2.56E+02	2.48E+04	1.28E+05	0.0060
B1-05100AF-SFC-236-GD	1.05E+04	1.89E+06	6.86E+02	2.82E+04	3.43E+05	0.0108
B1-05100AF-SFC-237-GD	4.55E+04	8.21E+06	3.34E+02	6.42E+04	1.67E+05	0.0084
B1-05100AF-SFC-238-GD	3.84E+04	6.93E+06	2.18E+02	4.95E+04	1.09E+05	0.0061
B1-05100AF-SFC-239-GD	4.83E+04	8.72E+06	3.48E+02	4.73E+04	1.74E+05	0.0085

(1) Concentrations inferred based on maximum ratios from LTP Chapter 5, Table 5-15

Auxiliary Building Basement - Measured Concentrations for Systematic FSS ISOCS Measurements (continued)

MEASUREMENT ID	Co-60 (pCi/m^2)	Ni-63 (1) (pCi/m^2)	Sr-90 (1) (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	OpSOF
B1-05100AF-SFC-240-GD	8.22E+04	1.48E+07	7.36E+02	9.60E+03	3.68E+05	0.0155
B1-05100AF-SFC-241-GD	5.48E+04	9.89E+06	2.96E+02	2.80E+04	1.48E+05	0.0079
B1-05100AF-SFC-242-GD	4.71E+04	8.50E+06	3.48E+02	1.02E+05	1.74E+05	0.0092
B1-05100AF-SFC-243-GD	4.04E+04	7.29E+06	2.56E+02	6.28E+04	1.28E+05	0.0070
B1-05100AF-SFC-244-GD	1.85E+04	3.34E+06	3.02E+02	6.09E+04	1.51E+05	0.0063
B1-05100AF-SFC-245-GD	2.63E+04	4.75E+06	3.42E+02	6.91E+04	1.71E+05	0.0074
B1-05100AF-SFC-246-GD	9.35E+04	1.69E+07	4.00E+02	2.90E+04	2.00E+05	0.0116
B1-05100AF-SFC-247-GD	8.43E+04	1.52E+07	4.98E+02	4.15E+04	2.49E+05	0.0127
B1-05100AF-SFC-248-GD	1.61E+04	2.91E+06	3.50E+02	3.49E+04	1.75E+05	0.0065
B1-05100AF-SFC-249-GD	3.80E+04	6.86E+06	3.34E+02	0.00E+00	1.67E+05	0.0070
B1-05100AF-SFC-250-GD	4.75E+04	8.57E+06	3.90E+02	2.29E+04	1.95E+05	0.0087
B1-05100AF-SFC-251-GD	3.88E+04	7.00E+06	1.15E+02	5.59E+03	5.75E+04	0.0040
B1-05100AF-SFC-252-GD	3.98E+04	7.18E+06	2.84E+02	7.54E+04	1.42E+05	0.0075
B1-05100AF-SFC-253-GD	6.97E+04	1.26E+07	4.82E+02	2.35E+04	2.41E+05	0.0113
B1-05100AF-SFC-254-GD	7.55E+04	1.36E+07	4.52E+02	3.89E+04	2.26E+05	0.0115
B1-05100AF-SFC-255-GD	1.42E+05	2.56E+07	5.12E+02	1.93E+04	2.56E+05	0.0159
B1-05100AF-SFC-256-GD	2.24E+07	4.04E+09	3.20E+04	6.63E+04	1.60E+07	1.7757
B1-05100AF-SFC-257-GD	1.82E+07	3.28E+09	3.50E+04	3.72E+05	1.75E+07	1.5759
B1-05100AF-SFC-258-GD	1.88E+07	3.39E+09	3.24E+04	1.32E+05	1.62E+07	1.5706
B1-05100AF-SFC-259-GD	2.01E+07	3.63E+09	5.94E+04	1.98E+05	2.97E+07	2.0335
B1-05100AF-SFC-260-GD	1.81E+07	3.27E+09	5.90E+04	1.12E+05	2.95E+07	1.9089
B1-05100AF-SFC-261-GD	6.10E+05	1.10E+08	5.62E+03	6.34E+04	2.81E+06	0.1171
B1-05100AF-SFC-262-GD	1.60E+05	2.89E+07	5.46E+03	4.42E+04	2.73E+06	0.0880
B1-05100AF-SFC-263-GD	6.78E+04	1.22E+07	5.78E+02	2.64E+04	2.89E+05	0.0126

(1) Concentrations inferred based on maximum ratios from LTP Chapter 5, Table 5-15

Auxiliary Building Basement - Measured Concentrations for Systematic FSS ISOCS Measurements (continued)

MEASUREMENT ID	Co-60 (pCi/m^2)	Ni-63 (1) (pCi/m^2)	Sr-90 (1) (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	OpSOF
B1-05100AF-SFC-264-GD	7.39E+04	1.33E+07	3.76E+02	1.10E+04	1.88E+05	0.0099
B1-05100AF-SFC-265-GD	7.78E+04	1.40E+07	3.60E+02	5.91E+04	1.80E+05	0.0106
B1-05100AF-SFC-266-GD	7.76E+04	1.40E+07	5.80E+02	5.49E+04	2.90E+05	0.0137
B1-05100AF-SFC-267-GD	9.40E+04	1.70E+07	3.80E+02	5.81E+04	1.90E+05	0.0118
B1-05100AF-SFC-268-GD	9.80E+04	1.77E+07	1.22E+03	7.68E+04	6.11E+05	0.0243
B1-05100AF-SFC-269-GD	3.41E+05	6.15E+07	1.12E+04	4.91E+04	5.58E+06	0.1801
B1-05100AF-SFC-270-GD	1.28E+06	2.31E+08	8.76E+03	7.44E+04	4.38E+06	0.2015
B1-05100AF-SFC-271-GD	4.62E+06	8.34E+08	5.28E+03	7.55E+04	2.64E+06	0.3483
B1-05100AF-SFC-272-GD	7.77E+06	1.40E+09	9.68E+03	8.26E+04	4.84E+06	0.5965
B1-05100AF-SFC-273-GD	2.29E+07	4.13E+09	5.62E+04	7.29E+05	2.81E+07	2.1603
B1-05100AF-SFC-274-GD	2.46E+07	4.44E+09	5.06E+04	1.93E+05	2.53E+07	2.1725
B1-05100AF-SFC-275-GD	8.35E+06	1.51E+09	1.79E+04	1.81E+05	8.96E+06	0.7498
B1-05100AF-SFC-276-GD	2.22E+06	4.01E+08	7.62E+03	9.81E+04	3.81E+06	0.2408
B1-05100AF-SFC-277-GD	2.86E+06	5.16E+08	7.46E+03	3.50E+04	3.73E+06	0.2753
B1-05100AF-SFC-278-GD	4.38E+06	7.90E+08	6.86E+03	4.24E+04	3.43E+06	0.3562
B1-05100AF-SFC-279-GD	8.22E+05	1.48E+08	4.78E+03	6.89E+04	2.39E+06	0.1176
B1-05100AF-SFC-280-GD	4.39E+05	7.92E+07	4.50E+03	1.22E+05	2.25E+06	0.0919
B1-05100AF-SFC-281-GD	1.38E+05	2.49E+07	1.34E+03	1.88E+04	6.69E+05	0.0275
B1-05100AF-SFC-282-GD	1.01E+05	1.82E+07	4.32E+02	4.62E+04	2.16E+05	0.0128
B1-05100AF-SFC-283-GD	7.53E+04	1.36E+07	3.88E+02	9.78E+04	1.94E+05	0.0114
B1-05100AF-SFC-284-GD	5.08E+04	9.17E+06	3.10E+02	3.04E+04	1.55E+05	0.0079
B1-05100AF-SFC-285-GD	9.62E+04	1.74E+07	4.16E+02	1.12E+05	2.08E+05	0.0132
B1-05100AF-SFC-286-GD	3.92E+05	7.07E+07	6.70E+03	1.66E+05	3.35E+06	0.1212
B1-05100AF-SFC-287-GD	1.11E+06	2.00E+08	9.44E+03	9.19E+04	4.72E+06	0.2014

(1) Concentrations inferred based on maximum ratios from LTP Chapter 5, Table 5-15

Auxiliary Building Basement - Measured Concentrations for Systematic FSS ISOCS Measurements (continued)

MEASUREMENT ID	Co-60 (pCi/m^2)	Ni-63 (1) (pCi/m^2)	Sr-90 (1) (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	OpSOF
B1-05100AF-SFC-288-GD	5.92E+05	1.07E+08	8.96E+03	6.87E+04	4.48E+06	0.1638
B1-05100AF-SFC-289-GD	1.37E+06	2.47E+08	1.14E+04	4.18E+04	5.71E+06	0.2443
B1-05100AF-SFC-290-GD	5.87E+06	1.06E+09	9.58E+03	2.14E+05	4.79E+06	0.4853
B1-05100AF-SFC-291-GD	3.20E+06	5.77E+08	1.39E+04	5.97E+04	6.93E+06	0.3870
B1-05100AF-SFC-292-GD	1.40E+06	2.53E+08	3.38E+04	1.40E+04	1.69E+07	0.5651
B1-05100AF-SFC-293-GD	1.54E+05	2.78E+07	2.78E+04	0.00E+00	1.39E+07	0.4060
B1-05100AF-SFC-294-GD	1.00E+05	1.80E+07	3.10E+03	0.00E+00	1.55E+06	0.0501
B1-05100AF-SFC-295-GD	4.31E+05	7.78E+07	8.58E+04	4.70E+04	4.29E+07	1.2510
B1-05100AF-SFC-296-GD	8.21E+04	1.48E+07	4.08E+04	0.00E+00	2.04E+07	0.5873
B1-05100AF-SFC-297-GD	2.30E+05	4.15E+07	4.04E+04	1.23E+05	2.02E+07	0.5921
B1-05100AF-SFC-298-GD	9.28E+05	1.67E+08	6.04E+04	2.12E+05	3.02E+07	0.9200
B1-05100AF-SFC-299-GD	1.01E+05	1.82E+07	4.72E+03	2.73E+04	2.36E+06	0.0737
B1-05100AF-SFC-300-GD	1.28E+05	2.31E+07	3.60E+03	4.83E+04	1.80E+06	0.0596
B1-05100AF-SFC-301-GD	8.62E+04	1.56E+07	3.12E+03	1.91E+04	1.56E+06	0.0499
B1-05100AF-SFC-302-GD	1.17E+05	2.11E+07	5.28E+03	2.24E+04	2.64E+06	0.0826
B1-05100AF-SFC-303-GD	3.28E+05	5.92E+07	4.80E+03	3.29E+04	2.40E+06	0.0883
B1-05100AF-SFC-304-GD	1.17E+06	2.11E+08	8.38E+03	0.00E+00	4.19E+06	0.1885
B1-05100AF-SFC-305-GD	2.02E+06	3.65E+08	8.48E+03	0.00E+00	4.24E+06	0.2399
B1-05100AF-SFC-306-GD	5.73E+05	1.03E+08	9.52E+03	1.00E+05	4.76E+06	0.1711
B1-05100AF-SFC-307-GD	3.10E+05	5.59E+07	1.86E+04	8.72E+04	9.28E+06	0.2845
B1-05100AF-SFC-308-GD	7.85E+04	1.42E+07	2.36E+04	4.78E+04	1.18E+07	0.3423
B1-05100AF-SFC-309-GD	8.64E+04	1.56E+07	1.65E+04	8.67E+04	8.27E+06	0.2425
B1-05100AF-SFC-310-GD	2.89E+04	5.22E+06	3.70E+02	6.49E+04	1.85E+05	0.0079
B1-05100AF-SFC-311-GD	6.25E+04	1.13E+07	4.48E+02	1.68E+04	2.24E+05	0.0103

(1) Concentrations inferred based on maximum ratios from LTP Chapter 5, Table 5-15

Auxiliary Building Basement - Measured Concentrations for Systematic FSS ISOCS Measurements (continued)

MEASUREMENT ID	Co-60 (pCi/m^2)	Ni-63 (1) (pCi/m^2)	Sr-90 (1) (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	OpSOF
B1-05100AF-SFC-312-GD	6.76E+04	1.22E+07	5.68E+02	5.10E+04	2.84E+05	0.0128
B1-05100AF-SFC-313-GD	9.52E+04	1.72E+07	3.72E+02	7.81E+04	1.86E+05	0.0121
B1-05100AF-SFC-314-GD	7.00E+04	1.26E+07	1.17E+03	1.00E+05	5.86E+05	0.0223
B1-05100AF-SFC-315-GD	3.13E+05	5.65E+07	2.14E+03	9.06E+04	1.07E+06	0.0503
B1-05100AF-SFC-316-GD	1.31E+05	2.36E+07	1.10E+03	4.21E+04	5.49E+05	0.0240
B1-05100AF-SFC-317-GD	8.90E+04	1.61E+07	8.18E+02	4.52E+04	4.09E+05	0.0176
B1-05100AF-SFC-318-GD	1.32E+05	2.38E+07	2.16E+03	5.07E+04	1.08E+06	0.0393
B1-05100AF-SFC-319-GD	6.01E+05	1.08E+08	6.44E+03	8.54E+04	3.22E+06	0.1286
B1-05100AF-SFC-320-GD	5.90E+05	1.06E+08	8.10E+03	0.00E+00	4.05E+06	0.1504
B1-05100AF-SFC-321-GD	2.51E+05	4.53E+07	2.58E+04	6.62E+04	1.29E+07	0.3841
B1-05100AF-SFC-322-GD	7.63E+04	1.38E+07	2.42E+03	4.12E+04	1.21E+06	0.0396
B1-05100AF-SFC-323-GD	1.02E+05	1.84E+07	1.26E+03	2.18E+04	6.32E+05	0.0244
B1-05100AF-SFC-324-GD	6.07E+04	1.10E+07	5.46E+03	4.38E+04	2.73E+06	0.0822
B1-05100AF-SFC-325-GD	1.35E+05	2.44E+07	5.32E+03	3.43E+04	2.66E+06	0.0844
B1-05100AF-SFC-326-GD	3.10E+05	5.59E+07	3.68E+04	2.02E+05	1.84E+07	0.5466
B1-05100AF-SFC-327-GD	2.30E+05	4.15E+07	7.60E+03	1.15E+04	3.80E+06	0.1222
B1-05100AF-SFC-328-GD	1.11E+05	2.00E+07	2.14E+03	3.69E+04	1.07E+06	0.0376
B1-05100AF-SFC-329-GD	9.91E+04	1.79E+07	2.84E+03	9.98E+04	1.42E+06	0.0478
B1-05100AF-SFC-330-GD	3.71E+04	6.69E+06	1.07E+03	3.98E+04	5.35E+05	0.0180
B1-05100AF-SFC-331-GD	9.21E+04	1.66E+07	1.61E+03	2.43E+04	8.07E+05	0.0288
B1-05100AF-SFC-332-GD	8.10E+05	1.46E+08	1.62E+03	0.00E+00	8.10E+05	0.0708
B1-05100AF-SFC-333-GD	8.56E+04	1.54E+07	9.14E+02	9.78E+04	4.57E+05	0.0195
B1-05100AF-SFC-334-GD	1.37E+06	2.47E+08	3.24E+03	1.38E+05	1.62E+06	0.1289
B1-05100AF-SFC-335-GD	1.82E+00	3.28E+02	4.38E+03	1.40E+04	2.19E+06	0.0627

(1) Concentrations inferred based on maximum ratios from LTP Chapter 5, Table 5-15

Auxiliary Building Basement - Measured Concentrations for Systematic FSS ISOCS Measurements (continued)

MEASUREMENT ID	Co-60 (pCi/m^2)	Ni-63 (1) (pCi/m^2)	Sr-90 (1) (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	OpSOF
B1-05100AF-SFC-336-GD	3.61E+05	6.51E+07	2.70E+03	7.54E+04	1.35E+06	0.0609
B1-05100AF-SFC-337-GD	6.15E+05	1.11E+08	2.04E+03	8.36E+04	1.02E+06	0.0665
B1-05100AF-SFC-338-GD	1.23E+05	2.22E+07	4.02E+03	6.28E+04	2.01E+06	0.0656
B1-05100AF-SFC-339-GD	7.21E+04	1.30E+07	4.96E+03	7.12E+04	2.48E+06	0.0761
B1-05100AF-SFC-340-GD	5.16E+05	9.31E+07	3.32E+04	7.16E+04	1.66E+07	0.5054
B1-05100AF-SFC-341-GD	6.10E+05	1.10E+08	3.98E+04	1.56E+05	1.99E+07	0.6064
B1-05100AF-SFC-342-GD	5.13E+04	9.26E+06	2.78E+04	1.18E+05	1.39E+07	0.4017
B1-05100AF-SFC-343-GD	4.05E+05	7.31E+07	1.11E+04	1.20E+04	5.57E+06	0.1830
B1-05100AF-SFC-344-GD	1.18E+05	2.13E+07	5.68E+03	7.55E+04	2.84E+06	0.0891
B1-05100AF-SFC-345-GD	1.02E+05	1.84E+07	1.42E+04	1.09E+04	7.10E+06	0.2089
B1-05100AF-SFC-346-GD	8.89E+04	1.60E+07	4.58E+03	1.02E+04	2.29E+06	0.0708
B1-05100AF-SFC-347-GD	2.10E+05	3.79E+07	1.14E+04	6.09E+04	5.68E+06	0.1754
B1-05100AF-SFC-348-GD	2.06E+05	3.72E+07	7.84E+03	2.94E+04	3.92E+06	0.1245
B1-05100AF-SFC-349-GD	1.42E+06	2.56E+08	4.36E+04	5.51E+04	2.18E+07	0.7068
B1-05100AF-SFC-350-GD	7.50E+05	1.35E+08	6.90E+04	8.58E+04	3.45E+07	1.0305
B1-05100AF-SFC-351-GD	9.66E+05	1.74E+08	1.49E+05	1.49E+05	7.46E+07	2.1892
B1-05100AF-SFC-352-GD	1.08E+06	1.95E+08	9.98E+04	0.00E+00	4.99E+07	1.4884
B1-05100AF-SFC-353-GD	9.94E+04	1.79E+07	3.28E+03	5.82E+04	1.64E+06	0.0535
B1-05100AF-SFC-354-GD	1.09E+05	1.97E+07	1.33E+04	2.19E+04	6.67E+06	0.1972
B1-05100AF-SFC-355-GD	2.51E+05	4.53E+07	8.72E+03	8.57E+04	4.36E+06	0.1405
B1-05100AF-SFC-356-GD	9.16E+05	1.65E+08	2.04E+04	1.92E+04	1.02E+07	0.3454
B1-05100AF-SFC-357-GD	8.66E+05	1.56E+08	3.96E+04	4.04E+04	1.98E+07	0.6169
B1-05100AF-SFC-358-GD	1.11E+06	2.00E+08	3.38E+04	1.81E+05	1.69E+07	0.5505
B1-05100AF-SFC-359-GD	2.44E+05	4.40E+07	1.55E+04	1.31E+05	7.74E+06	0.2373

(1) Concentrations inferred based on maximum ratios from LTP Chapter 5, Table 5-15

Auxiliary Building Basement - Measured Concentrations for Systematic FSS ISOCS Measurements (continued)

MEASUREMENT ID	Co-60 (pCi/m^2)	Ni-63 (1) (pCi/m^2)	Sr-90 (1) (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	OpSOF
B1-05100AF-SFC-360-GD	4.43E+04	7.99E+06	3.98E+03	4.70E+04	1.99E+06	0.0601
B1-05100AF-SFC-361-GD	7.21E+04	1.30E+07	3.92E+03	3.92E+04	1.96E+06	0.0608
B1-05100AF-SFC-362-GD	1.15E+05	2.08E+07	2.80E+03	1.79E+04	1.40E+06	0.0470
B1-05100AF-SFC-363-GD	7.68E+04	1.39E+07	4.28E+03	4.06E+04	2.14E+06	0.0662
B1-05100AF-SFC-364-GD	1.12E+05	2.02E+07	3.30E+03	6.30E+03	1.65E+06	0.0538
B1-05100AF-SFC-365-GD	1.69E+05	3.05E+07	2.84E+03	3.65E+04	1.42E+06	0.0510
B1-05100AF-SFC-366-GD	6.05E+04	1.09E+07	2.74E+03	9.43E+04	1.37E+06	0.0441
B1-05100AF-SFC-367-GD	1.01E+05	1.82E+07	9.08E+03	3.13E+04	4.54E+06	0.1360
B1-05100AF-SFC-368-GD	3.56E+05	6.42E+07	4.82E+03	9.16E+03	2.41E+06	0.0899
B1-05100AF-SFC-369-GD	1.41E+06	2.54E+08	7.50E+03	0.00E+00	3.75E+06	0.1900
B1-05100AF-SFC-370-GD	8.74E+05	1.58E+08	4.22E+03	3.70E+04	2.11E+06	0.1122
B1-05100AF-SFC-371-GD	8.90E+05	1.61E+08	3.32E+03	1.26E+04	1.66E+06	0.0999
B1-05100AF-SFC-372-GD	5.11E+05	9.22E+07	2.10E+04	0.00E+00	1.05E+07	0.3299
B1-05100AF-SFC-373-GD	4.53E+05	8.17E+07	3.86E+03	1.24E+05	1.93E+06	0.0836
B1-05100AF-SFC-374-GD	6.58E+05	1.19E+08	3.70E+03	7.88E+03	1.85E+06	0.0917
B1-05100AF-SFC-375-GD	4.07E+05	7.34E+07	1.80E+03	9.00E+04	8.99E+05	0.0509
B1-05100AF-SFC-376-GD	3.85E+05	6.95E+07	1.89E+03	9.35E+04	9.45E+05	0.0510
B1-05100AF-SFC-377-GD	3.81E+05	6.88E+07	8.46E+03	2.91E+04	4.23E+06	0.1436
B1-05100AF-SFC-378-GD	1.61E+05	2.91E+07	1.16E+04	3.96E+04	5.80E+06	0.1757
B1-05100AF-SFC-379-GD	9.56E+04	1.73E+07	2.24E+03	1.01E+05	1.12E+06	0.0391
B1-05100AF-SFC-380-GD	1.78E+05	3.21E+07	2.18E+03	3.68E+04	1.09E+06	0.0421
B1-05100AF-SFC-381-GD	8.78E+04	1.58E+07	2.16E+03	3.79E+04	1.08E+06	0.0366
B1-05100AF-SFC-382-GD	8.81E+04	1.59E+07	6.54E+02	4.55E+04	3.27E+05	0.0152

(1) Concentrations inferred based on maximum ratios from LTP Chapter 5, Table 5-15

Auxiliary Building Basement - Measured Concentrations for Systematic FSS ISOCS Measurements (continued)

MEASUREMENT ID	Co-60 (pCi/m^2)	Ni-63 (1) (pCi/m^2)	Sr-90 (1) (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	OpSOF
B1-05100AF-SFC-383-GD	1.04E+05	1.88E+07	9.04E+02	2.33E+04	4.52E+05	0.0194
B1-05100AF-SFC-384-GD	6.99E+04	1.26E+07	1.38E+03	9.14E+04	6.92E+05	0.0252
B1-05100AF-SFC-385-GD	1.76E+05	3.18E+07	1.31E+04	1.07E+05	6.56E+06	0.1992
B1-05100AF-SFC-386-GD	2.08E+05	3.75E+07	1.02E+04	0.00E+00	5.09E+06	0.1576
B1-05100AF-SFC-387-GD	6.95E+05	1.25E+08	5.84E+03	7.15E+04	2.92E+06	0.1253
B1-05100AF-SFC-388-GD	1.05E+06	1.89E+08	4.54E+03	0.00E+00	2.27E+06	0.1266
B1-05100AF-SFC-389-GD	9.54E+05	1.72E+08	3.44E+03	1.52E+04	1.72E+06	0.1055
B1-05100AF-SFC-390-GD	1.53E+06	2.76E+08	3.24E+03	9.69E+04	1.62E+06	0.1377
B1-05100AF-SFC-391-GD	5.89E+06	1.06E+09	6.90E+03	5.33E+04	3.45E+06	0.4458
B1-05100AF-SFC-392-GD	5.63E+04	1.02E+07	8.86E+02	3.11E+04	4.43E+05	0.0164
B1-05100AF-SFC-393-GD	1.65E+05	2.98E+07	1.28E+03	2.79E+04	6.41E+05	0.0284
B1-05100AF-SFC-394-GD	2.10E+04	3.79E+06	6.18E+02	1.07E+05	3.09E+05	0.0116
B1-05100AF-SFC-395-GD	7.57E+04	1.37E+07	7.78E+02	3.76E+03	3.89E+05	0.0156
B1-05100AF-SFC-396-GD	4.27E+04	7.71E+06	6.58E+02	2.57E+04	3.29E+05	0.0123
B1-05100AF-SFC-397-GD	9.62E+04	1.74E+07	8.06E+02	6.40E+04	4.03E+05	0.0181
B1-05100AF-SFC-398-GD	7.93E+04	1.43E+07	1.04E+03	1.27E+04	5.22E+05	0.0198
B1-05100AF-SFC-399-GD	1.38E+05	2.49E+07	1.18E+03	1.30E+05	5.91E+05	0.0269
B1-05100AF-SFC-400-GD	2.60E+05	4.69E+07	1.12E+03	7.91E+04	5.58E+05	0.0324
B1-05100AF-SFC-401-GD	1.14E+05	2.06E+07	9.94E+02	5.50E+04	4.97E+05	0.0217
B1-05100AF-SFC-402-GD	2.30E+05	4.15E+07	1.68E+03	7.56E+04	8.40E+05	0.0386
B1-05100AF-SFC-403-GD	3.08E+05	5.56E+07	2.44E+03	7.91E+04	1.22E+06	0.0541
B1-05100AF-SFC-404-GD	3.47E+05	6.26E+07	2.64E+03	8.24E+04	1.32E+06	0.0593
B1-05100AF-SFC-405-GD	1.91E+05	3.45E+07	1.82E+03	1.20E+05	9.12E+05	0.0390
B1-05100AF-SFC-406-GD	1.06E+05	1.91E+07	1.94E+03	9.61E+04	9.69E+05	0.0353

(1) Concentrations inferred based on maximum ratios from LTP Chapter 5, Table 5-15

Auxiliary Building Basement - Measured Concentrations for Systematic FSS ISOCS Measurements (continued)

MEASUREMENT ID	Co-60 (pCi/m^2)	Ni-63 (1) (pCi/m^2)	Sr-90 (1) (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	OpSOF
B1-05100AF-SFC-407-GD	1.47E+05	2.65E+07	3.70E+03	5.88E+04	1.85E+06	0.0623
B1-05100AF-SFC-408-GD	4.61E+05	8.32E+07	4.54E+03	4.71E+03	2.27E+06	0.0920
B1-05100AF-SFC-409-GD	2.48E+05	4.48E+07	3.52E+03	1.12E+05	1.76E+06	0.0665
B1-05100AF-SFC-410-GD	2.65E+05	4.78E+07	4.26E+03	8.80E+04	2.13E+06	0.0777
B1-05100AF-SFC-411-GD	2.58E+05	4.66E+07	1.94E+03	3.10E+04	9.71E+05	0.0434
B1-05100AF-SFC-433-GD	1.27E+05	2.29E+07	8.10E+03	7.49E+02	4.05E+06	0.1231
B1-05100AF-SFC-434-GD	1.97E+05	3.55E+07	6.84E+03	5.39E+03	3.42E+06	0.1093
B1-05100AF-SFC-435-GD	2.19E+05	3.95E+07	1.89E+04	9.92E+04	9.44E+06	0.2839
B1-05100AF-SFC-436-GD	2.02E+05	3.65E+07	1.05E+04	4.89E+04	5.25E+06	0.1625
B1-05100AF-SFC-437-GD	1.15E+05	2.08E+07	3.12E+03	0.00E+00	1.56E+06	0.0513
B1-05100AF-SFC-438-GD	1.64E+05	2.96E+07	1.07E+04	3.26E+04	5.33E+06	0.1623
B1-05100AF-SWC-439-GD	2.11E+05	3.81E+07	3.28E+02	4.55E+04	1.64E+05	0.0178
B1-05100AF-SWC-440-GD	6.32E+04	1.14E+07	3.14E+02	0.00E+00	1.57E+05	0.0082
B1-05100AF-SFC-441-GD	7.48E+04	1.35E+07	7.82E+02	4.98E+04	3.91E+05	0.0163
B1-05100AF-SFC-442-GD	8.55E+04	1.54E+07	2.18E+03	5.95E+04	1.09E+06	0.0370
B1-05100AF-SWC-443-GD	9.47E+04	1.71E+07	3.48E+03	1.25E+03	1.74E+06	0.0553
B1-05100AF-SWC-444-GD	8.95E+04	1.62E+07	1.68E+03	1.28E+04	8.42E+05	0.0295
B1-05100AF-SWC-445-GD	7.33E+04	1.32E+07	3.44E+03	6.33E+04	1.72E+06	0.0544
B1-05100AF-SWC-446-GD	6.37E+04	1.15E+07	6.30E+03	1.03E+05	3.15E+06	0.0952
B1-05100AF-SWC-447-GD	4.33E+05	7.81E+07	2.02E+04	6.71E+04	1.01E+07	0.3149
B1-05100AF-SWC-448-GD	1.33E+05	2.40E+07	7.00E+03	0.00E+00	3.50E+06	0.1078
B1-05100AF-SWC-449-GD	7.51E+04	1.36E+07	1.36E+04	2.00E+04	6.78E+06	0.1983
B1-05100AF-SWC-450-GD	1.31E+05	2.36E+07	9.64E+03	1.12E+05	4.82E+06	0.1470
B1-05100AF-SWC-451-GD	8.91E+04	1.61E+07	4.94E+03	9.78E+04	2.47E+06	0.0772

(1) Concentrations inferred based on maximum ratios from LTP Chapter 5, Table 5-15

Auxiliary Building Basement - Measured Concentrations for Systematic FSS ISOCS Measurements (continued)

MEASUREMENT ID	Co-60 (pCi/m^2)	Ni-63 [1] (pCi/m^2)	Sr-90 [1] (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	OpSOF
B1-05100AF-SWC-452-GD	4.31E+05	7.78E+07	3.20E+03	4.94E+04	1.60E+06	0.0718
B1-05100AF-SWC-453-GD	2.72E+05	4.91E+07	1.23E+03	4.02E+04	6.15E+05	0.0342
B1-05100AF-SWC-454-GD	2.74E+05	4.94E+07	2.22E+02	6.71E+04	1.11E+05	0.0203
B1-05100AF-SWC-455-GD	1.42E+05	2.56E+07	1.51E+02	4.76E+04	7.54E+04	0.0112
B1-05100AF-SWC-456-GD	9.81E+04	1.77E+07	6.76E+02	2.12E+04	3.38E+05	0.0157
B1-05100AF-SFC-457-GD	4.98E+06	8.99E+08	8.76E+03	4.59E+04	4.38E+06	0.4187
B1-05100AF-SFC-458-GD	7.32E+06	1.32E+09	5.96E+03	0.00E+00	2.98E+06	0.5157
B1-05100AF-SFC-459-GD	2.81E+06	5.07E+08	2.70E+04	0.00E+00	1.35E+07	0.5508
B1-05100AF-SFC-460-GD	2.60E+05	4.69E+07	2.32E+03	2.69E+05	1.16E+06	0.0524
B1-05100AF-SFC-461-GD	7.14E+04	1.29E+07	9.80E+02	2.83E+04	4.90E+05	0.0186
B1-05100AF-SFC-462-GD	2.05E+05	3.70E+07	1.21E+03	1.59E+04	6.03E+05	0.0295
B1-05100AF-SFC-463-GD	6.36E+06	1.15E+09	1.43E+04	1.83E+05	7.15E+06	0.5810
B1-05100AF-SFC-464-GD	3.49E+05	6.30E+07	9.10E+03	6.62E+04	4.55E+06	0.1514
B1-05100AF-SFC-465-GD [2]	6.30E+04	1.14E+07	3.34E+03	3.49E+04	1.67E+06	0.0519
B1-05100AF-SFC-466-GD [3]	1.92E+07	3.46E+09	3.36E+04	1.86E+05	1.68E+07	1.6120

(1) Concentrations inferred based on maximum ratios from LTP Chapter 5, Table 5-15
(2) Measurement taken in Elevator Pit
(3) Measurement taken in Sump B

Auxiliary Building Basement - Measured Concentrations for Judgmental/Investigation ISOCS Measurements

MEASUREMENT ID	Co-60 (pCi/m^2)	Ni-63 [1] (pCi/m^2)	Sr-90 [1] (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	OpSOF
B1-05100AF-IFC-278-GD [2]	4.88E+06	8.81E+08	7.02E+03	2.11E+05	3.51E+06	0.3904
B1-05100AF-IWC-005-GD [2]	3.69E+04	6.66E+06	2.74E+02	3.44E+04	1.37E+05	0.0066
B1-05100AF-IFC-365-GD [2]	9.16E+04	1.65E+07	2.70E+03	2.05E+04	1.35E+06	0.0442
B1-05100AF-IFC-369-GD [2]	1.66E+06	3.00E+08	7.48E+03	3.37E+02	3.74E+06	0.2045
B1-05100AF-IFC-404-GD [2]	3.19E+05	5.76E+07	2.46E+03	3.51E+04	1.23E+06	0.0544

(1) Concentrations inferred based on maximum ratios from LTP Chapter 5, Table 5-15

(2) Investigation measurement due to uneven surfaces. Offset reduced by 1 foot.

Auxiliary Building Basement - QC Replicate ISOCS Measurements

MEASUREMENT ID	Co-60 (pCi/m^2)	Ni-63 (1) (pCi/m^2)	Sr-90 (1) (pCi/m^2)	Cs-134 (pCi/m^2)	Cs-137 (pCi/m^2)	OpSOF
B1-05100AF-QWC-006-GD	0.00E+00	0.00E+00	2.98E+02	5.39E+04	1.49E+05	0.0050
B1-05100AF-QWC-024-GD	4.79E+04	8.64E+06	3.26E+02	1.08E+04	1.63E+05	0.0076
B1-05100AF-QWC-074-GD	5.93E+03	1.07E+06	1.61E+02	2.33E+04	8.03E+04	0.0030
B1-05100AF-QWC-102-GD	2.84E+04	5.12E+06	1.47E+03	3.94E+04	7.33E+05	0.0232
B1-05100AF-QWC-116-GD	8.55E+04	1.54E+07	8.06E+02	4.22E+04	4.03E+05	0.0172
B1-05100AF-QWC-131-GD	1.19E+05	2.15E+07	7.02E+02	0.00E+00	3.51E+05	0.0170
B1-05100AF-QWC-132-GD	5.18E+05	9.35E+07	7.20E+03	0.00E+00	3.60E+06	0.1333
B1-05100AF-QWC-156-GD	2.13E+05	3.84E+07	2.40E+04	1.44E+04	1.20E+07	0.3554
B1-05100AF-QWC-167-GD	9.21E+04	1.66E+07	2.62E+03	3.32E+04	1.31E+06	0.0433
B1-05100AF-QWC-208-GD	2.20E+06	3.97E+08	9.50E+03	7.03E+04	4.75E+06	0.2661
B1-05100AF-QWC-218-GD	3.40E+04	6.14E+06	8.48E+02	7.85E+04	4.24E+05	0.0153
B1-05100AF-QWC-230-GD	3.55E+04	6.41E+06	1.07E+02	3.79E+04	5.36E+04	0.0042
B1-05100AF-QFC-243-GD	3.28E+04	5.92E+06	3.06E+01	0.00E+00	1.53E+04	0.0024
B1-05100AF-QFC-272-GD	6.81E+06	1.23E+09	1.01E+04	7.14E+04	5.06E+06	0.5462
B1-05100AF-QWC-292-GD	1.46E+06	2.63E+08	3.38E+04	4.56E+03	1.69E+07	0.5685
B1-05100AF-QFC-331-GD	1.19E+05	2.15E+07	1.64E+03	5.51E+04	8.21E+05	0.0313
B1-05100AF-QFC-333-GD	8.06E+04	1.45E+07	1.00E+03	1.30E+04	5.01E+05	0.0192
B1-05100AF-QFC-334-GD	1.42E+06	2.56E+08	3.28E+03	1.07E+05	1.64E+06	0.1319
B1-05100AF-QFC-341-GD	6.07E+05	1.10E+08	4.18E+04	1.48E+05	2.09E+07	0.6347
B1-05100AF-QFC-373-GD	4.69E+05	8.46E+07	4.10E+03	2.60E+04	2.05E+06	0.0865
B1-05100AF-QFC-395-GD	6.70E+04	1.21E+07	8.82E+02	8.11E+04	4.41E+05	0.0177
B1-05100AF-QFC-405-GD	1.83E+05	3.30E+07	1.72E+03	8.26E+04	8.61E+05	0.0366
B1-05100AF-QFC-409-GD	1.92E+05	3.46E+07	3.22E+03	1.69E+04	1.61E+06	0.0575

(1) Concentrations inferred based on maximum ratios from LTP Chapter 5, Table 5-15

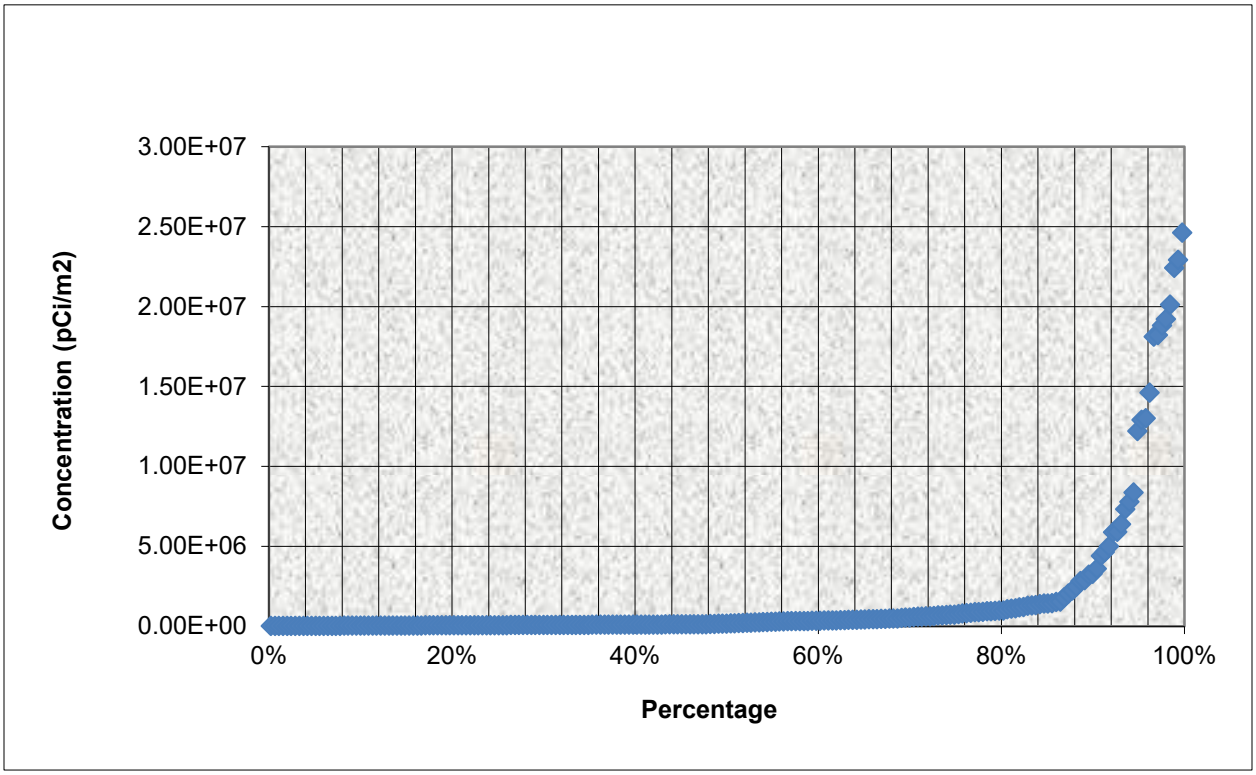
ATTACHMENT 6
GRAPHICAL PRESENTATIONS AND SUPPLEMENTAL INFORMATION

Quantile Plot for Co-60

Survey Unit: 05100

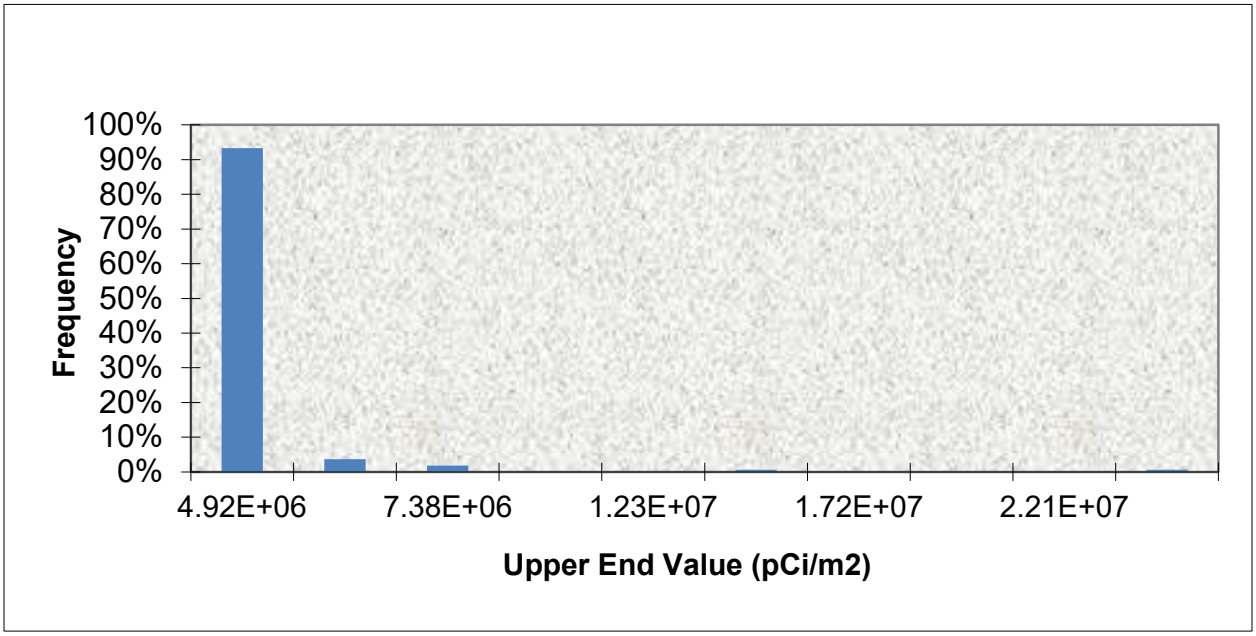
Description: Auxiliary Building Basement

Mean: 3.85E+05 pCi/m^2



Histogram for Co-60

Survey Unit: 05100
Description: Auxiliary Building Basement
Mean: 3.85E+05 pCi/m^2
Median: 8.78E+04 pCi/m^2
ST Dev.: 1.01E+06
Skew: 5.37



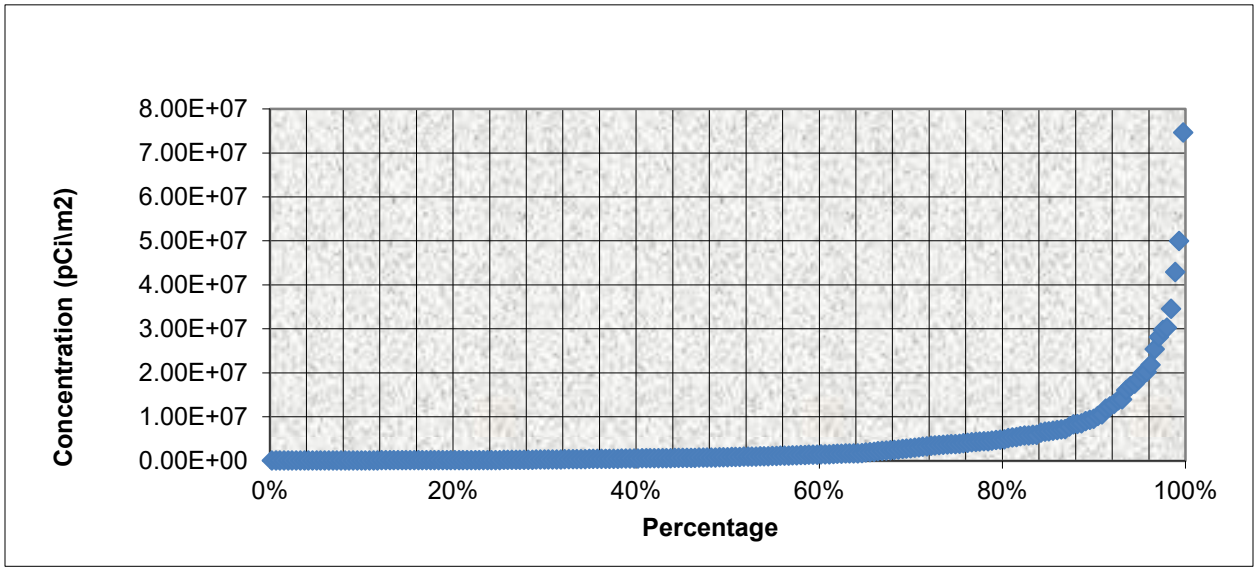
Upper Value	Observation Frequency	Observation %
4.92E+06	398	93%
4.92E+06	8	4%
7.38E+06	5	2%
9.84E+06	3	0%
1.23E+07	1	0%
1.48E+07	3	1%
1.72E+07	0	0%
1.97E+07	4	0%
2.21E+07	1	0%
2.46E+07	3	1%
TOTAL	426	100%

Quantile Plot for Cs-137

Survey Unit: 05100

Description: Auxiliary Building Basement

Mean: 2.22E+06 pCi/m^2



Histogram for Cs-137

Survey Unit: B1-05100A-F

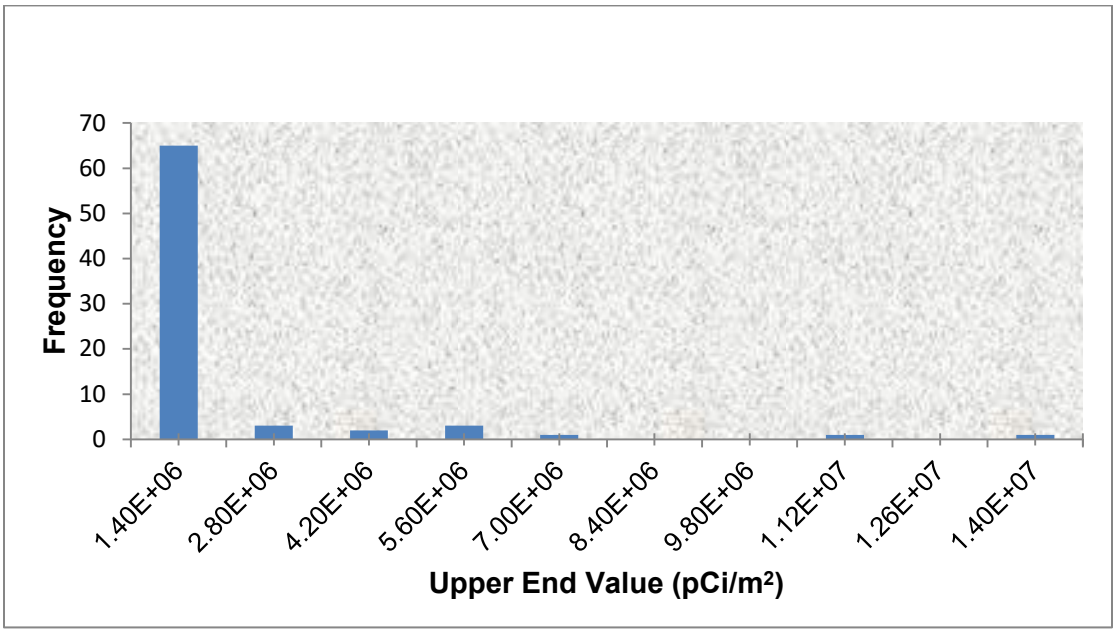
Description: Auxiliary Building Basement

Mean: 2.22E+06 pCi/m^2

Median: 6.91E+05pCi/m^2

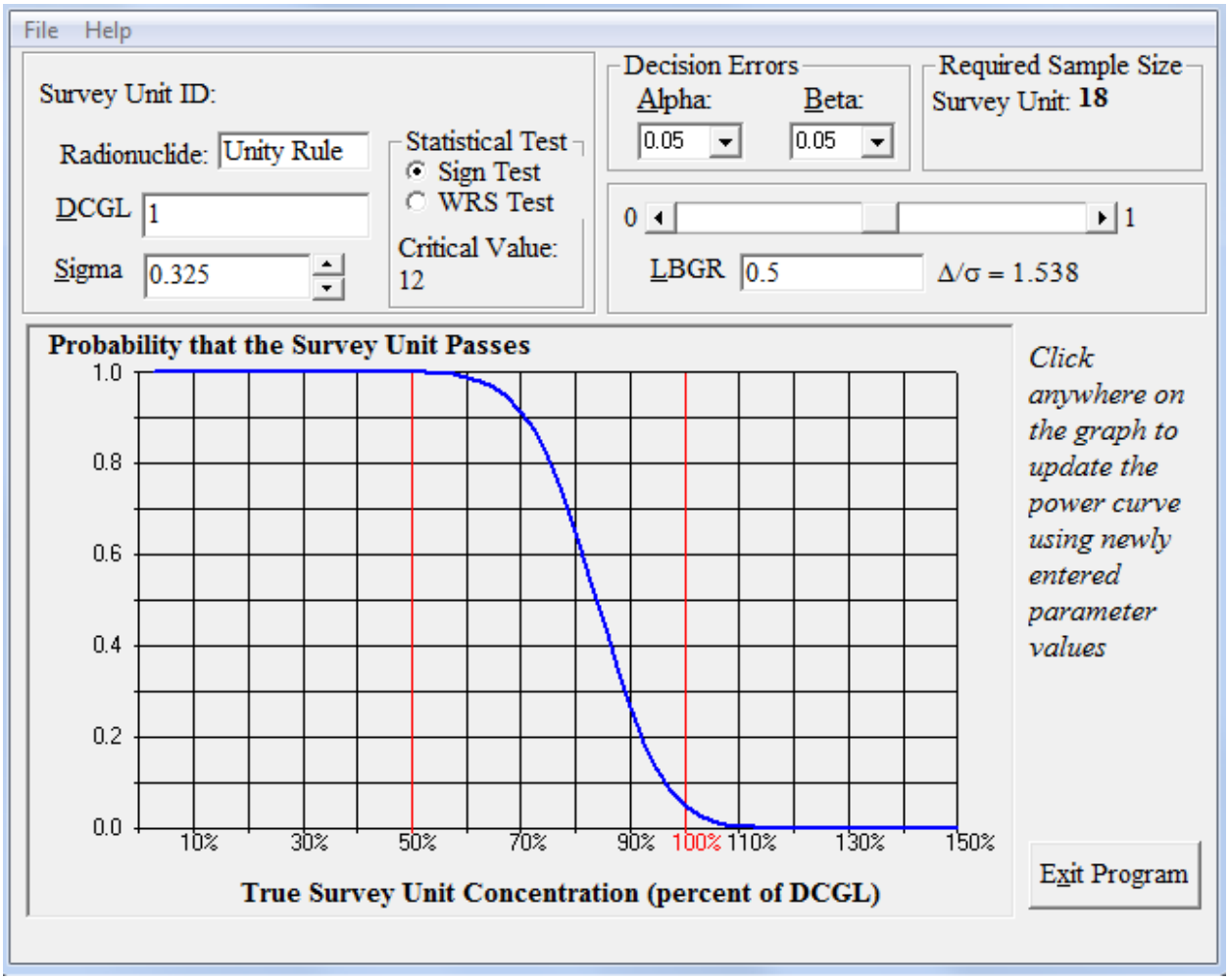
ST Dev.: 3.89E+06

Skew: 5.16



Upper Value	Observation Frequency	Observation %
7.46E+06	382	76%
1.49E+07	21	14%
2.24E+07	14	3%
2.98E+07	3	4%
3.73E+07	3	1%
4.48E+07	1	0%
5.22E+07	1	1%
5.97E+07	0	0%
6.71E+07	0	0%
7.46E+07	1	1%
TOTAL	426	100%

Retrospective Power Curve for Survey Unit 05100



ATTACHMENT 7
ISOCS REPORTS

(SEE SEPARATE FILES FOR ISOCS)

ATTACHMENT 8
EBERLINE REPORTS

EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD
OAK RIDGE, TENNESSEE 37830
PHONE (865) 481-0683
FAX (865) 483-4621

EBS-OR-43652

April 30, 2018

Patricia Giza
Zion Solutions, LLC
101 Shiloh Blvd
Zion, IL 60099

CASE NARRATIVE
Work Order # 18-04022-OR

SAMPLE RECEIPT

This work order contains seventeen solid samples received 04/05/2018. Samples were analyzed for Total Strontium, Tritium, Nickel-63 and by Gamma Spectroscopy.

CLIENT ID	LAB ID	CLIENT ID	LAB ID
B105100AFSWC017CV	18-04022-04	B105100AFSWC156CV	18-04022-13
B105100AFSWC041CV	18-04022-05	B105100AFSWC162CV	18-04022-14
B105100AFSWC057CV	18-04022-06	B105100AFSWC163CV	18-04022-15
B105100AFSWC088CV	18-04022-07	B105100AFSWC179CV	18-04022-16
B105100AFSWC101CV	18-04022-08	B105100AFSWC190CV	18-04022-17
B105100AFSWC115CV	18-04022-09	B105100AFSWC201CV	18-04022-18
B105100AFSWC116CV	18-04022-10	B105100AFSWC210CV	18-04022-19
B105100AFSWC150CV	18-04022-11	B105100AFSWC231CV	18-04022-20
B105100AFSWC151CV	18-04022-12		

ANALYTICAL METHODS

Total Strontium was analyzed using EIChroM Method SRW01 Modified. Tritium was performed using Method LANL ER-210 Modified. Nickel-63 was performed using Method ASTM 3500-Ni Modified. Gamma Spectroscopy was performed using EPA Method 901.1 Modified.

Laboratory qualifiers are as follows:

U - Result is less than the MDA.

ANALYTICAL RESULTS

Combined Standard Uncertainty is reported at 1-sigma value.

Minimum Detectable Activity (MDA) values for data represented in this report are sample-specific. MDA measurements are determined based on factors and conditions including instrument settings, aliquot size and matrix type.

ANALYTICAL RESULTS CONTINUED

TOTAL STRONTIUM

Samples were prepared by acid digestion as appropriate for the matrix. Digested samples were acidified and were selectively extracted and precipitated. Precipitates were then mounted on 47mm filters. Filter was reweighed to determine aliquot size. Sample activities were determined by gas flow proportional counting.

Samples demonstrated acceptable results for all Total Strontium analyses. Strontium-90 results are reported from Total Strontium. Chemical recovery was acceptable for all samples. The Total Strontium method blank demonstrated an acceptable result. Results for the Total Strontium duplicate demonstrated a high relative percent difference; however, normalized difference is within acceptable limits for the analytical technique. Results for the Total Strontium laboratory control sample demonstrated an acceptable percent recovery.

TRITIUM

A representative aliquot of each sample was equilibrated with tritium free water. Equilibrates were transferred into a round-bottomed distillation flask and attached to a single stage still. A portion of each middle distillation fraction was transferred to a liquid scintillation vial and cocktail was added. Samples were then counted by beta liquid scintillation.

Samples demonstrated acceptable results for all Tritium analyses. All results demonstrated slightly high method detection limits. The Tritium method blank demonstrated an acceptable result. Results for the Tritium duplicate demonstrated an acceptable relative percent difference and normalized difference. Results for the Tritium laboratory control sample demonstrated an acceptable percent recovery.

NICKEL-63

A representative aliquot of each sample was placed into an appropriately sized beaker. Stable elemental Nickel carrier was added to each sample prior to digestion. Samples were digested in concentrated Nitric acid. After digestion, sample pH was adjusted and Nickel-63 was precipitated selectively with Dimethylglyoxime. Precipitates were selectively separated, redissolved, and residual acid was effectively neutralized. Sample residuals were placed into scintillation vials, scintillation cocktail was added and Nickel-63 activity was determined by beta liquid scintillation.

Samples demonstrated acceptable results for all Nickel-63 analyses. The Nickel-63 method blank demonstrated an acceptable result. Results for the Nickel-63 duplicate demonstrated a high relative percent difference; however, normalized difference is within acceptable limits for the analytical technique. Results for the Nickel-63 laboratory control sample demonstrated an acceptable percent recovery.

GAMMA SPECTROSCOPY

Samples for Gamma Spectroscopy analysis were prepared by transferring a known mass/aliquot of each homogenized sample to a standard geometry container. Samples were counted on High Purity Germanium (HPGe) gamma ray detectors.

ANALYTICAL RESULTS CONTINUED

GAMMA SPECTROSCOPY CONTINUED

Samples demonstrated acceptable results for all gamma-emitting radionuclides as reported. Most Cobalt-60 and Cesium-137 results demonstrated slightly high method detection limits. Some samples demonstrated results that are greater than the method detection limit. These results are reported from the Canberra Gamma Apex "Nuclide MDA Report" and are not positive. These results are qualified as non-detect (U). The method blank demonstrated acceptable results for all radionuclides as reported. Results for the Bismuth-214 and Cesium-137 replicate demonstrated a high relative percent difference; however, normalized difference is within acceptable limits for the analytical technique. Results for the Potassium-40 replicate demonstrated an acceptable relative percent difference and normalized difference. Results for the Cobalt-60 and Cesium-137 laboratory control sample demonstrated an acceptable percent recovery.

CERTIFICATION OF ACCURACY

I certify that this data report is in compliance with the terms and conditions of the Purchase Order, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the cognizant project manager or his/her designee to be accurate as verified by the following signature.

M.R. McDougall
Laboratory Manager

Date: 4/30/2018

Eberline Analytical wants and encourages your feedback regarding our performance providing radioanalytical services. Please visit http://eberlineanalytical.com/ to provide us with feedback on our services.

Eberline Analytical
Final Report of Analysis

Report To:
Patricia Giza
Zion Solutions, LLC
101 Shiloh Blvd
Zion, IL 60099

Work Order Details:
SDG: 18-04022
Purchase Order: 677118
Analysis Category: ENVIRONMENTAL
Sample Matrix: SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-01	LCS	KNOWN	04/05/18 00:00	4/5/2018	4/11/2018	18-04022	Tritium	LANL ER-210 Modified	2.22E+02	8.00E+00				pCi/g
18-04022-01	LCS	SPIKE	04/05/18 00:00	4/5/2018	4/11/2018	18-04022	Tritium	LANL ER-210 Modified	2.24E+02	5.58E+00	1.37E+01	3.64E+00		pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/11/2018	18-04022	Tritium	LANL ER-210 Modified	4.88E+00	2.27E+00	2.28E+00	3.67E+00		pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/11/2018	18-04022	Tritium	LANL ER-210 Modified	6.66E+00	1.28E+01	1.28E+01	2.17E+01	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/11/2018	18-04022	Tritium	LANL ER-210 Modified	6.70E+00	1.29E+01	1.29E+01	2.19E+01	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/11/2018	18-04022	Tritium	LANL ER-210 Modified	-4.89E+00	1.84E+01	1.84E+01	3.19E+01	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/11/2018	18-04022	Tritium	LANL ER-210 Modified	2.32E+00	8.86E+00	8.86E+00	1.51E+01	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/11/2018	18-04022	Tritium	LANL ER-210 Modified	0.00E+00	1.83E+00	1.83E+00	3.15E+00	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/11/2018	18-04022	Tritium	LANL ER-210 Modified	9.34E-01	9.91E-01	9.93E-01	1.66E+00	U	pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/11/2018	18-04022	Tritium	LANL ER-210 Modified	2.14E+00	1.93E+00	1.93E+00	3.22E+00	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/11/2018	18-04022	Tritium	LANL ER-210 Modified	-6.66E-01	1.50E+00	1.50E+00	2.61E+00	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/11/2018	18-04022	Tritium	LANL ER-210 Modified	6.72E-01	7.83E-01	7.84E-01	1.32E+00	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/11/2018	18-04022	Tritium	LANL ER-210 Modified	5.43E-01	1.25E+00	1.25E+00	2.13E+00	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/11/2018	18-04022	Tritium	LANL ER-210 Modified	2.85E-01	1.09E+00	1.09E+00	1.86E+00	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/11/2018	18-04022	Tritium	LANL ER-210 Modified	2.44E-01	1.39E+00	1.39E+00	2.39E+00	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/11/2018	18-04022	Tritium	LANL ER-210 Modified	-6.94E-01	1.30E+00	1.30E+00	2.26E+00	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/12/2018	18-04022	Tritium	LANL ER-210 Modified	-8.43E-01	1.89E+00	1.90E+00	3.30E+00	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/12/2018	18-04022	Tritium	LANL ER-210 Modified	2.04E+00	1.06E+00	1.07E+00	1.73E+00		pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/12/2018	18-04022	Tritium	LANL ER-210 Modified	-1.01E+00	1.25E+00	1.25E+00	2.19E+00	U	pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/12/2018	18-04022	Tritium	LANL ER-210 Modified	0.00E+00	1.09E+00	1.09E+00	1.88E+00	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/12/2018	18-04022	Tritium	LANL ER-210 Modified	-2.53E-01	1.43E+00	1.43E+00	2.48E+00	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:		Work Order Details:	
Patricia Giza		SDG:	18-04022
Zion Solutions, LLC		Purchase Order:	677118
101 Shiloh Blvd		Analysis Category:	ENVIRONMENTAL
Zion, IL 60099		Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-01	LCS	KNOWN	04/05/18 00:00	4/5/2018	4/9/2018	18-04022	Nickel-63	ASTM 3500-Ni Modified	1.50E+03	4.50E+01				pCi/g
18-04022-01	LCS	SPIKE	04/05/18 00:00	4/5/2018	4/9/2018	18-04022	Nickel-63	ASTM 3500-Ni Modified	1.48E+03	8.98E+00	8.75E+01	2.11E+00		pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/9/2018	18-04022	Nickel-63	ASTM 3500-Ni Modified	0.00E+00	1.21E+00	1.21E+00	2.08E+00	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/9/2018	18-04022	Nickel-63	ASTM 3500-Ni Modified	3.41E-01	1.26E+00	1.26E+00	2.15E+00	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/9/2018	18-04022	Nickel-63	ASTM 3500-Ni Modified	-1.70E-01	1.25E+00	1.25E+00	2.15E+00	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/9/2018	18-04022	Nickel-63	ASTM 3500-Ni Modified	6.00E-01	9.97E-01	9.98E-01	1.68E+00	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/9/2018	18-04022	Nickel-63	ASTM 3500-Ni Modified	5.74E-01	9.53E-01	9.53E-01	1.61E+00	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/9/2018	18-04022	Nickel-63	ASTM 3500-Ni Modified	1.91E+00	1.01E+00	1.02E+00	1.66E+00		pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/9/2018	18-04022	Nickel-63	ASTM 3500-Ni Modified	1.18E-01	8.69E-01	8.69E-01	1.48E+00	U	pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/9/2018	18-04022	Nickel-63	ASTM 3500-Ni Modified	2.96E+00	9.73E-01	9.89E-01	1.56E+00		pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/9/2018	18-04022	Nickel-63	ASTM 3500-Ni Modified	0.00E+00	1.22E+00	1.22E+00	2.08E+00	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/9/2018	18-04022	Nickel-63	ASTM 3500-Ni Modified	1.14E+00	1.23E+00	1.23E+00	2.06E+00	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/9/2018	18-04022	Nickel-63	ASTM 3500-Ni Modified	4.55E+02	4.43E+00	2.71E+01	1.63E+00		pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/9/2018	18-04022	Nickel-63	ASTM 3500-Ni Modified	1.15E+02	2.38E+00	7.14E+00	1.63E+00		pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/9/2018	18-04022	Nickel-63	ASTM 3500-Ni Modified	3.15E+00	1.29E+00	1.30E+00	2.09E+00		pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/10/2018	18-04022	Nickel-63	ASTM 3500-Ni Modified	1.30E-01	9.64E-01	9.64E-01	1.65E+00	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/10/2018	18-04022	Nickel-63	ASTM 3500-Ni Modified	7.13E+00	1.20E+00	1.27E+00	1.80E+00		pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/10/2018	18-04022	Nickel-63	ASTM 3500-Ni Modified	2.61E-01	9.67E-01	9.68E-01	1.65E+00	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/10/2018	18-04022	Nickel-63	ASTM 3500-Ni Modified	1.69E+00	1.22E+00	1.23E+00	2.03E+00	U	pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/10/2018	18-04022	Nickel-63	ASTM 3500-Ni Modified	1.29E+00	1.21E+00	1.22E+00	2.03E+00	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/10/2018	18-04022	Nickel-63	ASTM 3500-Ni Modified	9.24E-01	1.16E+00	1.16E+00	1.94E+00	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04022
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-01	LCS	KNOWN	04/05/18 00:00	4/5/2018	4/11/2018	18-04022	Strontium-90	ElChroM SRW01 Modified	5.00E+01	2.80E-01				pCi/g
18-04022-01	LCS	SPIKE	04/05/18 00:00	4/5/2018	4/11/2018	18-04022	Strontium-90	ElChroM SRW01 Modified	4.35E+01	1.78E+00	1.52E+01	7.99E-01		pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/11/2018	18-04022	Strontium-90	ElChroM SRW01 Modified	9.27E-02	4.89E-01	4.90E-01	8.65E-01	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/11/2018	18-04022	Strontium-90	ElChroM SRW01 Modified	3.42E-01	4.70E-01	4.85E-01	7.99E-01	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/11/2018	18-04022	Strontium-90	ElChroM SRW01 Modified	1.23E-01	3.99E-01	4.02E-01	7.01E-01	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/11/2018	18-04022	Strontium-90	ElChroM SRW01 Modified	1.77E-01	3.59E-01	3.65E-01	6.21E-01	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/11/2018	18-04022	Strontium-90	ElChroM SRW01 Modified	1.42E-01	2.99E-01	3.03E-01	5.19E-01	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/11/2018	18-04022	Strontium-90	ElChroM SRW01 Modified	2.52E-01	3.22E-01	3.34E-01	5.45E-01	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/11/2018	18-04022	Strontium-90	ElChroM SRW01 Modified	2.42E-01	2.73E-01	2.86E-01	4.59E-01	U	pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/11/2018	18-04022	Strontium-90	ElChroM SRW01 Modified	1.59E-01	2.94E-01	3.00E-01	5.08E-01	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/11/2018	18-04022	Strontium-90	ElChroM SRW01 Modified	6.89E-02	4.53E-01	4.54E-01	8.04E-01	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/11/2018	18-04022	Strontium-90	ElChroM SRW01 Modified	-2.66E-01	4.07E-01	4.17E-01	7.67E-01	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/11/2018	18-04022	Strontium-90	ElChroM SRW01 Modified	2.22E-01	3.46E-01	3.55E-01	5.92E-01	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/11/2018	18-04022	Strontium-90	ElChroM SRW01 Modified	1.52E-01	3.87E-01	3.90E-01	6.73E-01	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/11/2018	18-04022	Strontium-90	ElChroM SRW01 Modified	3.83E-01	3.96E-01	4.18E-01	6.61E-01	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/11/2018	18-04022	Strontium-90	ElChroM SRW01 Modified	5.62E-01	3.84E-01	4.31E-01	6.16E-01	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/11/2018	18-04022	Strontium-90	ElChroM SRW01 Modified	3.43E-01	4.61E-01	4.76E-01	7.83E-01	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/11/2018	18-04022	Strontium-90	ElChroM SRW01 Modified	2.35E-01	3.21E-01	3.31E-01	5.45E-01	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/11/2018	18-04022	Strontium-90	ElChroM SRW01 Modified	3.38E-01	4.86E-01	5.02E-01	8.31E-01	U	pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/11/2018	18-04022	Strontium-90	ElChroM SRW01 Modified	4.75E-01	4.47E-01	4.76E-01	7.40E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/11/2018	18-04022	Strontium-90	ElChroM SRW01 Modified	5.23E-01	3.82E-01	4.23E-01	6.17E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:
Patricia Giza
Zion Solutions, LLC
101 Shiloh Blvd
Zion, IL 60099

Work Order Details:
SDG: 18-04022
Purchase Order: 677118
Analysis Category: ENVIRONMENTAL
Sample Matrix: SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-01	LCS	KNOWN	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Cobalt-60	EPA 901.1 Modified	2.71E+02	1.06E+01				pCi/g
18-04022-01	LCS	KNOWN	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Cesium-137	EPA 901.1 Modified	1.69E+02	6.75E+00				pCi/g
18-04022-01	LCS	SPIKE	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Cobalt-60	EPA 901.1 Modified	2.69E+02	1.54E+01	2.07E+01	1.78E+00		pCi/g
18-04022-01	LCS	SPIKE	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Cesium-137	EPA 901.1 Modified	1.89E+02	2.27E+01	2.47E+01	2.71E+00		pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Actinium-228	EPA 901.1 Modified	2.04E-03	6.37E-02	6.37E-02	2.30E-01	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Silver-108m	EPA 901.1 Modified	-3.05E-02	4.63E-02	4.63E-02	5.46E-02	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Americium-241	EPA 901.1 Modified	1.62E-03	1.95E-02	1.95E-02	5.97E-02	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Barium-133	EPA 901.1 Modified	2.04E-02	5.15E-02	5.16E-02	6.23E-02	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Bismuth-214	EPA 901.1 Modified	-1.09E-01	1.16E-01	1.16E-01	1.27E-01	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Cobalt-60	EPA 901.1 Modified	5.81E-03	4.18E-02	4.18E-02	6.05E-02	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Cesium-134	EPA 901.1 Modified	1.43E-02	4.59E-02	4.59E-02	6.94E-02	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Cesium-137	EPA 901.1 Modified	4.32E-02	3.97E-02	3.97E-02	7.62E-02	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Europium-152	EPA 901.1 Modified	-3.97E-02	1.28E-01	1.28E-01	1.05E-01	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Europium-154	EPA 901.1 Modified	1.04E-03	7.59E-02	7.59E-02	5.34E-02	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Europium-155	EPA 901.1 Modified	-3.33E-03	4.16E-02	4.16E-02	6.17E-02	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Holmium-166m	EPA 901.1 Modified	5.63E-03	8.06E-02	8.06E-02	3.97E-02	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Iodine-129	EPA 901.1 Modified	8.19E-03	2.01E-02	2.01E-02	3.09E-02	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Potassium-40	EPA 901.1 Modified	1.95E-01	2.91E-01	2.91E-01	6.68E-01	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Manganese-54	EPA 901.1 Modified	8.56E-03	2.35E-02	2.35E-02	8.51E-02	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Niobium-94	EPA 901.1 Modified	-1.31E-02	3.87E-02	3.87E-02	5.19E-02	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Lead-210	EPA 901.1 Modified	3.59E-01	3.18E-01	3.18E-01	5.37E-01	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Lead-212	EPA 901.1 Modified	2.07E-02	4.49E-02	4.49E-02	7.20E-02	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Lead-214	EPA 901.1 Modified	4.80E-02	6.67E-02	6.67E-02	1.15E-01	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Promethium-145	EPA 901.1 Modified	-1.35E-02	3.50E-02	3.50E-02	5.07E-02	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Radium-226	EPA 901.1 Modified	-1.09E-01	1.16E-01	1.16E-01	1.27E-01	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Antimony-125	EPA 901.1 Modified	1.13E-02	7.28E-02	7.28E-02	1.71E-01	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Thorium-234	EPA 901.1 Modified	6.43E-01	3.80E-01	3.81E-01	6.57E-01	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Thallium-208	EPA 901.1 Modified	-5.43E-03	1.51E-01	1.51E-01	2.08E-01	U	pCi/g
18-04022-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04022	Uranium-235	EPA 901.1 Modified	-1.95E-01	3.69E-01	3.69E-01	2.39E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:		Work Order Details:	
Patricia Giza		SDG:	18-04022
Zion Solutions, LLC		Purchase Order:	677118
101 Shiloh Blvd		Analysis Category:	ENVIRONMENTAL
Zion, IL 60099		Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Actinium-228	EPA 901.1 Modified	5.77E-01	6.20E-01	6.21E-01	1.13E+00	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Silver-108m	EPA 901.1 Modified	1.33E-01	1.54E-01	1.54E-01	2.76E-01	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Americium-241	EPA 901.1 Modified	-3.40E-01	1.36E-01	1.37E-01	4.24E-01	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Barium-133	EPA 901.1 Modified	-3.86E-02	1.10E-01	1.10E-01	4.45E-01	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Bismuth-214	EPA 901.1 Modified	8.29E-01	4.60E-01	4.62E-01	8.75E-01	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Cobalt-60	EPA 901.1 Modified	-1.74E-02	5.47E-02	5.47E-02	1.75E-01	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Cesium-134	EPA 901.1 Modified	3.71E-01	1.92E-01	1.93E-01	3.06E-01	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Cesium-137	EPA 901.1 Modified	1.97E-01	2.39E-01	2.40E-01	3.94E-01	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Europium-152	EPA 901.1 Modified	1.30E+00	9.09E-01	9.11E-01	6.98E-01	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Europium-154	EPA 901.1 Modified	2.90E-01	4.01E-01	4.02E-01	3.57E-01	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Europium-155	EPA 901.1 Modified	-5.52E-02	8.62E-02	8.62E-02	5.21E-01	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Holmium-166m	EPA 901.1 Modified	5.30E-02	2.80E-01	2.80E-01	2.61E-01	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Iodine-129	EPA 901.1 Modified	-1.96E+00	1.61E+00	1.62E+00	1.95E+00	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Potassium-40	EPA 901.1 Modified	7.31E+00	2.46E+00	2.49E+00	2.68E+00		pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Manganese-54	EPA 901.1 Modified	-9.97E-02	1.58E-01	1.59E-01	2.21E-01	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Niobium-94	EPA 901.1 Modified	8.88E-02	1.41E-01	1.41E-01	2.29E-01	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Lead-210	EPA 901.1 Modified	-7.90E+00	3.87E+00	3.89E+00	5.32E+00	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Lead-212	EPA 901.1 Modified	-2.20E-02	6.27E-02	6.27E-02	5.77E-01	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Lead-214	EPA 901.1 Modified	-6.51E-02	7.86E-02	7.87E-02	7.02E-01	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Promethium-145	EPA 901.1 Modified	1.38E+00	7.46E-01	7.49E-01	1.12E+00	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Radium-226	EPA 901.1 Modified	8.29E-01	4.60E-01	4.62E-01	8.75E-01	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Antimony-125	EPA 901.1 Modified	-3.57E-02	5.58E-01	5.58E-01	8.51E-01	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Thorium-234	EPA 901.1 Modified	5.44E+00	2.14E+00	2.16E+00	5.71E+00	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Thallium-208	EPA 901.1 Modified	-1.32E-02	1.75E-01	1.75E-01	8.05E-01	U	pCi/g
18-04022-03	DUP	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Uranium-235	EPA 901.1 Modified	-2.74E-01	2.60E+00	2.60E+00	1.44E+00	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04022
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Actinium-228	EPA 901.1 Modified	3.27E-01	6.99E-01	6.99E-01	1.18E+00	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Silver-108m	EPA 901.1 Modified	-2.06E-02	3.71E-02	3.71E-02	2.42E-01	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Americium-241	EPA 901.1 Modified	-1.17E-01	9.61E-02	9.63E-02	4.49E-01	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Barium-133	EPA 901.1 Modified	3.63E-01	3.04E-01	3.05E-01	4.67E-01	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Bismuth-214	EPA 901.1 Modified	6.20E-01	3.69E-01	3.71E-01	5.47E-01		pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Cobalt-60	EPA 901.1 Modified	8.30E-02	1.81E-01	1.81E-01	2.84E-01	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Cesium-134	EPA 901.1 Modified	-1.09E-01	1.14E-01	1.15E-01	2.93E-01	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Cesium-137	EPA 901.1 Modified	2.76E-01	2.00E-01	2.00E-01	3.58E-01	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Europium-152	EPA 901.1 Modified	-9.64E-03	3.30E-01	3.30E-01	6.69E-01	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Europium-154	EPA 901.1 Modified	2.05E-01	3.67E-01	3.67E-01	3.39E-01	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Europium-155	EPA 901.1 Modified	2.35E-01	2.34E-01	2.34E-01	5.10E-01	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Holmium-166m	EPA 901.1 Modified	-3.78E-02	2.68E-01	2.68E-01	2.64E-01	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Iodine-129	EPA 901.1 Modified	-1.85E+00	1.53E+00	1.54E+00	1.87E+00	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Potassium-40	EPA 901.1 Modified	7.47E+00	2.13E+00	2.16E+00	1.20E+00		pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Manganese-54	EPA 901.1 Modified	1.85E-02	5.22E-02	5.22E-02	2.78E-01	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Niobium-94	EPA 901.1 Modified	-5.66E-02	1.75E-01	1.75E-01	2.65E-01	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Lead-210	EPA 901.1 Modified	-2.16E+00	3.18E+00	3.19E+00	5.26E+00	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Lead-212	EPA 901.1 Modified	6.60E-01	5.28E-01	5.29E-01	8.56E-01	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Lead-214	EPA 901.1 Modified	8.36E-01	7.63E-01	7.64E-01	1.22E+00	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Promethium-145	EPA 901.1 Modified	7.47E-02	4.95E-01	4.96E-01	1.07E+00	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Radium-226	EPA 901.1 Modified	6.20E-01	3.69E-01	3.71E-01	5.47E-01		pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Antimony-125	EPA 901.1 Modified	5.43E-03	5.53E-01	5.53E-01	8.47E-01	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Thorium-234	EPA 901.1 Modified	4.25E+00	2.79E+00	2.80E+00	4.57E+00	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Thallium-208	EPA 901.1 Modified	5.39E-01	5.48E-01	5.49E-01	9.60E-01	U	pCi/g
18-04022-04	DO	B105100AFSWC017CV	03/07/18 09:35	4/5/2018	4/5/2018	18-04022	Uranium-235	EPA 901.1 Modified	3.00E+00	2.67E+00	2.67E+00	1.43E+00	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04022
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Actinium-228	EPA 901.1 Modified	6.44E-01	4.02E-01	4.03E-01	7.44E-01	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Silver-108m	EPA 901.1 Modified	5.03E-02	7.08E-02	7.08E-02	1.27E-01	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Americium-241	EPA 901.1 Modified	-2.67E-02	1.89E-01	1.89E-01	2.43E-01	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Barium-133	EPA 901.1 Modified	1.01E-02	5.93E-02	5.93E-02	1.85E-01	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Bismuth-214	EPA 901.1 Modified	6.87E-01	2.91E-01	2.93E-01	5.12E-01		pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Cobalt-60	EPA 901.1 Modified	-1.63E-02	7.61E-02	7.61E-02	1.18E-01	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Cesium-134	EPA 901.1 Modified	-4.05E-03	3.55E-02	3.55E-02	1.19E-01	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Cesium-137	EPA 901.1 Modified	2.52E+00	3.75E-01	3.97E-01	2.61E-01		pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Europium-152	EPA 901.1 Modified	-1.53E-02	2.27E-01	2.27E-01	3.49E-01	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Europium-154	EPA 901.1 Modified	3.03E-02	2.49E-01	2.49E-01	1.83E-01	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Europium-155	EPA 901.1 Modified	7.92E-02	2.07E-01	2.07E-01	2.84E-01	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Holmium-166m	EPA 901.1 Modified	-6.33E-03	1.59E-01	1.59E-01	1.43E-01	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Iodine-129	EPA 901.1 Modified	-8.81E-02	1.19E-01	1.20E-01	1.48E-01	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Potassium-40	EPA 901.1 Modified	5.21E+00	1.82E+00	1.84E+00	2.24E+00		pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Manganese-54	EPA 901.1 Modified	3.34E-02	6.03E-02	6.04E-02	1.67E-01	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Niobium-94	EPA 901.1 Modified	3.55E-02	8.81E-02	8.81E-02	1.55E-01	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Lead-210	EPA 901.1 Modified	1.67E+00	1.11E+00	1.11E+00	2.02E+00	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Lead-212	EPA 901.1 Modified	1.66E-01	1.99E-01	1.99E-01	2.87E-01	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Lead-214	EPA 901.1 Modified	8.63E-01	2.86E-01	2.89E-01	4.62E-01		pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Promethium-145	EPA 901.1 Modified	9.38E-02	1.37E-01	1.37E-01	2.27E-01	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Radium-226	EPA 901.1 Modified	6.87E-01	2.91E-01	2.93E-01	5.12E-01		pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Antimony-125	EPA 901.1 Modified	9.63E-02	2.42E-01	2.42E-01	4.33E-01	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Thorium-234	EPA 901.1 Modified	1.22E+00	1.86E+00	1.86E+00	2.61E+00	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Thallium-208	EPA 901.1 Modified	4.91E-01	2.87E-01	2.88E-01	5.33E-01	U	pCi/g
18-04022-05	TRG	B105100AFSWC041CV	03/07/18 09:25	4/5/2018	4/5/2018	18-04022	Uranium-235	EPA 901.1 Modified	3.99E-02	1.30E+00	1.30E+00	7.07E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

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Final Report of Analysis

Report To:		Work Order Details:	
Patricia Giza		SDG:	18-04022
Zion Solutions, LLC		Purchase Order:	677118
101 Shiloh Blvd		Analysis Category:	ENVIRONMENTAL
Zion, IL 60099		Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Actinium-228	EPA 901.1 Modified	6.57E-01	3.46E-01	3.48E-01	7.74E-01	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Silver-108m	EPA 901.1 Modified	-5.25E-02	1.29E-01	1.29E-01	1.45E-01	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Americium-241	EPA 901.1 Modified	-4.65E-01	2.69E-01	2.70E-01	2.65E-01	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Barium-133	EPA 901.1 Modified	-1.07E-02	7.32E-02	7.32E-02	2.61E-01	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Bismuth-214	EPA 901.1 Modified	6.49E-01	2.73E-01	2.75E-01	6.14E-01		pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Cobalt-60	EPA 901.1 Modified	-1.68E-02	6.83E-02	6.83E-02	1.36E-01	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Cesium-134	EPA 901.1 Modified	-3.23E-02	7.61E-02	7.61E-02	2.02E-01	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Cesium-137	EPA 901.1 Modified	2.19E-01	1.52E-01	1.52E-01	2.37E-01	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Europium-152	EPA 901.1 Modified	-2.37E-01	4.49E-01	4.49E-01	3.53E-01	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Europium-154	EPA 901.1 Modified	6.07E-02	2.58E-01	2.58E-01	1.78E-01	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Europium-155	EPA 901.1 Modified	-4.12E-02	2.06E-01	2.06E-01	3.31E-01	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Holmium-166m	EPA 901.1 Modified	2.36E-02	1.82E-01	1.82E-01	1.74E-01	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Iodine-129	EPA 901.1 Modified	1.08E-01	1.50E-01	1.50E-01	2.13E-01	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Potassium-40	EPA 901.1 Modified	6.82E+00	2.30E+00	2.33E+00	2.90E+00		pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Manganese-54	EPA 901.1 Modified	-4.78E-02	1.01E-01	1.01E-01	1.40E-01	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Niobium-94	EPA 901.1 Modified	2.58E-02	8.70E-02	8.70E-02	1.51E-01	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Lead-210	EPA 901.1 Modified	1.37E+00	2.01E+00	2.01E+00	2.79E+00	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Lead-212	EPA 901.1 Modified	4.53E-01	2.38E-01	2.40E-01	3.61E-01		pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Lead-214	EPA 901.1 Modified	6.06E-01	2.65E-01	2.67E-01	4.85E-01		pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Promethium-145	EPA 901.1 Modified	4.38E-02	1.89E-01	1.89E-01	2.61E-01	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Radium-226	EPA 901.1 Modified	6.49E-01	2.73E-01	2.75E-01	6.14E-01		pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Antimony-125	EPA 901.1 Modified	-8.70E-02	2.94E-01	2.95E-01	4.38E-01	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Thorium-234	EPA 901.1 Modified	2.66E+00	2.75E+00	2.75E+00	4.58E+00	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Thallium-208	EPA 901.1 Modified	5.57E-01	4.02E-01	4.03E-01	7.18E-01	U	pCi/g
18-04022-06	TRG	B105100AFSWC057CV	03/07/18 09:10	4/5/2018	4/5/2018	18-04022	Uranium-235	EPA 901.1 Modified	-1.80E-01	1.18E+00	1.18E+00	8.26E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:
Patricia Giza
Zion Solutions, LLC
101 Shiloh Blvd
Zion, IL 60099

Work Order Details:
SDG: 18-04022
Purchase Order: 677118
Analysis Category: ENVIRONMENTAL
Sample Matrix: SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Actinium-228	EPA 901.1 Modified	3.54E-01	3.45E-01	3.45E-01	6.55E-01	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Silver-108m	EPA 901.1 Modified	-3.87E-03	1.06E-01	1.06E-01	1.49E-01	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Americium-241	EPA 901.1 Modified	-4.42E-01	2.42E-01	2.43E-01	2.37E-01	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Barium-133	EPA 901.1 Modified	7.50E-02	8.96E-02	8.97E-02	2.32E-01	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Bismuth-214	EPA 901.1 Modified	7.03E-01	3.23E-01	3.25E-01	4.34E-01		pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Cobalt-60	EPA 901.1 Modified	3.40E-02	1.04E-01	1.04E-01	1.51E-01	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Cesium-134	EPA 901.1 Modified	-4.04E-01	2.18E-01	2.19E-01	1.65E-01	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Cesium-137	EPA 901.1 Modified	1.95E-01	1.15E-01	1.16E-01	2.24E-01	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Europium-152	EPA 901.1 Modified	-3.19E-01	4.14E-01	4.15E-01	3.37E-01	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Europium-154	EPA 901.1 Modified	1.10E-01	2.76E-01	2.76E-01	1.70E-01	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Europium-155	EPA 901.1 Modified	-1.52E-01	1.86E-01	1.87E-01	2.85E-01	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Holmium-166m	EPA 901.1 Modified	-1.21E-02	1.67E-01	1.68E-01	1.39E-01	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Iodine-129	EPA 901.1 Modified	-4.14E-02	1.43E-01	1.43E-01	1.81E-01	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Potassium-40	EPA 901.1 Modified	7.51E+00	1.98E+00	2.02E+00	1.90E+00		pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Manganese-54	EPA 901.1 Modified	3.03E-02	9.55E-02	9.55E-02	1.62E-01	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Niobium-94	EPA 901.1 Modified	-1.00E-01	1.12E-01	1.12E-01	1.15E-01	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Lead-210	EPA 901.1 Modified	1.81E+00	1.86E+00	1.86E+00	2.64E+00	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Lead-212	EPA 901.1 Modified	5.00E-01	1.80E-01	1.82E-01	6.54E-01	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Lead-214	EPA 901.1 Modified	4.95E-01	2.48E-01	2.49E-01	3.60E-01		pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Promethium-145	EPA 901.1 Modified	-5.48E-02	2.07E-01	2.07E-01	2.53E-01	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Radium-226	EPA 901.1 Modified	7.03E-01	3.23E-01	3.25E-01	4.34E-01		pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Antimony-125	EPA 901.1 Modified	-3.02E-02	2.76E-01	2.76E-01	4.20E-01	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Thorium-234	EPA 901.1 Modified	2.09E+00	2.31E+00	2.32E+00	3.87E+00	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Thallium-208	EPA 901.1 Modified	4.12E-01	3.61E-01	3.62E-01	6.33E-01	U	pCi/g
18-04022-07	TRG	B105100AFSWC088CV	03/07/18 08:55	4/5/2018	4/5/2018	18-04022	Uranium-235	EPA 901.1 Modified	1.68E-01	1.06E+00	1.06E+00	7.58E-01	U	pCi/g

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Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04022
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Actinium-228	EPA 901.1 Modified	3.17E-01	5.17E-01	5.17E-01	9.31E-01	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Silver-108m	EPA 901.1 Modified	5.57E-02	1.29E-01	1.29E-01	1.64E-01	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Americium-241	EPA 901.1 Modified	-2.56E-01	1.69E-01	1.70E-01	2.11E-01	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Barium-133	EPA 901.1 Modified	-2.76E-02	6.89E-02	6.89E-02	2.36E-01	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Bismuth-214	EPA 901.1 Modified	1.72E-02	1.14E-01	1.14E-01	5.46E-01	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Cobalt-60	EPA 901.1 Modified	-3.10E-02	1.63E-01	1.63E-01	2.16E-01	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Cesium-134	EPA 901.1 Modified	3.95E-02	1.28E-01	1.28E-01	2.26E-01	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Cesium-137	EPA 901.1 Modified	5.87E-01	2.08E-01	2.10E-01	2.59E-01		pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Europium-152	EPA 901.1 Modified	-7.28E-02	3.53E-01	3.53E-01	3.25E-01	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Europium-154	EPA 901.1 Modified	-9.54E-02	3.23E-01	3.23E-01	1.69E-01	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Europium-155	EPA 901.1 Modified	1.69E-02	1.82E-01	1.82E-01	2.57E-01	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Holmium-166m	EPA 901.1 Modified	8.76E-02	2.28E-01	2.28E-01	1.35E-01	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Iodine-129	EPA 901.1 Modified	3.82E-02	6.36E-02	6.37E-02	9.92E-02	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Potassium-40	EPA 901.1 Modified	7.71E+00	2.44E+00	2.47E+00	2.57E+00		pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Manganese-54	EPA 901.1 Modified	-3.56E-02	1.43E-01	1.43E-01	2.01E-01	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Niobium-94	EPA 901.1 Modified	-8.56E-03	1.31E-01	1.31E-01	1.92E-01	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Lead-210	EPA 901.1 Modified	1.44E+00	1.18E+00	1.19E+00	1.91E+00	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Lead-212	EPA 901.1 Modified	3.37E-01	1.84E-01	1.85E-01	3.09E-01	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Lead-214	EPA 901.1 Modified	4.70E-01	3.11E-01	3.12E-01	4.75E-01	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Promethium-145	EPA 901.1 Modified	-1.16E-01	1.15E-01	1.15E-01	1.56E-01	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Radium-226	EPA 901.1 Modified	1.72E-02	1.14E-01	1.14E-01	5.46E-01	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Antimony-125	EPA 901.1 Modified	-3.00E-02	3.74E-01	3.74E-01	5.25E-01	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Thorium-234	EPA 901.1 Modified	1.95E+00	1.46E+00	1.46E+00	2.35E+00	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Thallium-208	EPA 901.1 Modified	2.79E-01	4.68E-01	4.68E-01	7.13E-01	U	pCi/g
18-04022-08	TRG	B105100AFSWC101CV	03/07/18 07:25	4/5/2018	4/5/2018	18-04022	Uranium-235	EPA 901.1 Modified	4.10E-01	1.23E+00	1.23E+00	6.96E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:	
Patricia Giza	
Zion Solutions, LLC	
101 Shiloh Blvd	
Zion, IL 60099	

Work Order Details:	
SDG:	18-04022
Purchase Order:	677118
Analysis Category:	ENVIRONMENTAL
Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Actinium-228	EPA 901.1 Modified	9.95E-01	3.30E-01	3.34E-01	4.96E-01		pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Silver-108m	EPA 901.1 Modified	-6.95E-02	1.24E-01	1.24E-01	1.47E-01	U	pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Americium-241	EPA 901.1 Modified	-3.69E-01	2.67E-01	2.68E-01	2.82E-01	U	pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Barium-133	EPA 901.1 Modified	-1.83E-01	1.51E-01	1.51E-01	2.82E-01	U	pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Bismuth-214	EPA 901.1 Modified	6.40E-01	2.66E-01	2.68E-01	4.95E-01		pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Cobalt-60	EPA 901.1 Modified	1.71E-01	1.02E-01	1.02E-01	1.85E-01	U	pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Cesium-134	EPA 901.1 Modified	-3.63E-03	7.41E-02	7.41E-02	1.88E-01	U	pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Cesium-137	EPA 901.1 Modified	1.32E+00	4.61E-01	4.65E-01	6.85E-01		pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Europium-152	EPA 901.1 Modified	-1.00E+00	5.60E-01	5.62E-01	3.93E-01	U	pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Europium-154	EPA 901.1 Modified	-1.69E-01	3.33E-01	3.33E-01	1.90E-01	U	pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Europium-155	EPA 901.1 Modified	9.41E-02	1.72E-01	1.72E-01	3.34E-01	U	pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Holmium-166m	EPA 901.1 Modified	5.21E-02	2.06E-01	2.06E-01	1.68E-01	U	pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Iodine-129	EPA 901.1 Modified	2.07E-01	1.63E-01	1.64E-01	2.41E-01	U	pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Potassium-40	EPA 901.1 Modified	9.81E+00	2.50E+00	2.55E+00	2.71E+00		pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Manganese-54	EPA 901.1 Modified	-1.52E-01	1.26E-01	1.26E-01	1.36E-01	U	pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Niobium-94	EPA 901.1 Modified	-7.96E-02	1.19E-01	1.19E-01	1.58E-01	U	pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Lead-210	EPA 901.1 Modified	1.71E+00	2.19E+00	2.19E+00	3.06E+00	U	pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Lead-212	EPA 901.1 Modified	3.92E-01	1.92E-01	1.93E-01	5.66E-01	U	pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Lead-214	EPA 901.1 Modified	9.20E-01	3.04E-01	3.08E-01	4.70E-01		pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Promethium-145	EPA 901.1 Modified	1.14E-02	2.43E-01	2.43E-01	3.19E-01	U	pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Radium-226	EPA 901.1 Modified	6.40E-01	2.66E-01	2.68E-01	4.95E-01		pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Antimony-125	EPA 901.1 Modified	2.38E-01	3.16E-01	3.16E-01	5.37E-01	U	pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Thorium-234	EPA 901.1 Modified	1.38E+00	2.35E+00	2.35E+00	3.13E+00	U	pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Thallium-208	EPA 901.1 Modified	3.08E-01	2.35E-01	2.35E-01	5.08E-01	U	pCi/g
18-04022-09	TRG	B105100AFSWC115CV	03/07/18 15:30	4/5/2018	4/5/2018	18-04022	Uranium-235	EPA 901.1 Modified	5.57E-01	1.23E+00	1.23E+00	9.07E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04022
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Actinium-228	EPA 901.1 Modified	5.97E-01	4.37E-01	4.38E-01	9.24E-01	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Silver-108m	EPA 901.1 Modified	-6.19E-02	1.38E-01	1.38E-01	1.45E-01	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Americium-241	EPA 901.1 Modified	-1.28E-01	2.23E-01	2.23E-01	2.75E-01	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Barium-133	EPA 901.1 Modified	2.89E-02	7.16E-02	7.16E-02	2.00E-01	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Bismuth-214	EPA 901.1 Modified	6.73E-01	3.97E-01	3.98E-01	6.75E-01	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Cobalt-60	EPA 901.1 Modified	1.37E-01	1.32E-01	1.32E-01	2.33E-01	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Cesium-134	EPA 901.1 Modified	2.63E-02	7.32E-02	7.32E-02	1.81E-01	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Cesium-137	EPA 901.1 Modified	5.50E-01	2.06E-01	2.08E-01	2.77E-01		pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Europium-152	EPA 901.1 Modified	2.07E-03	4.33E-01	4.33E-01	3.87E-01	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Europium-154	EPA 901.1 Modified	-4.79E-02	3.24E-01	3.24E-01	1.96E-01	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Europium-155	EPA 901.1 Modified	1.70E-01	1.73E-01	1.73E-01	4.13E-01	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Holmium-166m	EPA 901.1 Modified	-6.13E-03	1.98E-01	1.98E-01	1.63E-01	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Iodine-129	EPA 901.1 Modified	7.98E-02	1.07E-01	1.07E-01	1.79E-01	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Potassium-40	EPA 901.1 Modified	1.15E+01	2.63E+00	2.70E+00	2.07E+00		pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Manganese-54	EPA 901.1 Modified	-6.90E-02	9.28E-02	9.28E-02	1.68E-01	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Niobium-94	EPA 901.1 Modified	-8.42E-02	1.30E-01	1.30E-01	1.76E-01	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Lead-210	EPA 901.1 Modified	2.18E+00	2.45E+00	2.46E+00	4.09E+00	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Lead-212	EPA 901.1 Modified	7.03E-01	2.10E-01	2.13E-01	3.55E-01		pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Lead-214	EPA 901.1 Modified	5.59E-01	2.84E-01	2.86E-01	5.27E-01		pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Promethium-145	EPA 901.1 Modified	4.46E-02	1.56E-01	1.56E-01	2.54E-01	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Radium-226	EPA 901.1 Modified	6.73E-01	3.97E-01	3.98E-01	6.75E-01	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Antimony-125	EPA 901.1 Modified	-1.35E-01	2.35E-01	2.35E-01	3.74E-01	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Thorium-234	EPA 901.1 Modified	2.19E+00	2.28E+00	2.28E+00	3.24E+00	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Thallium-208	EPA 901.1 Modified	5.93E-01	2.93E-01	2.94E-01	6.10E-01	U	pCi/g
18-04022-10	TRG	B105100AFSWC116CV	03/07/18 08:40	4/5/2018	4/5/2018	18-04022	Uranium-235	EPA 901.1 Modified	-4.01E-02	1.48E+00	1.48E+00	9.48E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:	
Patricia Giza	
Zion Solutions, LLC	
101 Shiloh Blvd	
Zion, IL 60099	

Work Order Details:	
SDG:	18-04022
Purchase Order:	677118
Analysis Category:	ENVIRONMENTAL
Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Actinium-228	EPA 901.1 Modified	2.87E-01	4.91E-01	4.91E-01	8.56E-01	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Silver-108m	EPA 901.1 Modified	4.81E-02	7.34E-02	7.34E-02	1.84E-01	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Americium-241	EPA 901.1 Modified	2.42E-01	2.13E-01	2.14E-01	3.19E-01	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Barium-133	EPA 901.1 Modified	-1.89E-02	1.09E-01	1.09E-01	2.21E-01	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Bismuth-214	EPA 901.1 Modified	7.59E-01	2.72E-01	2.74E-01	4.82E-01		pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Cobalt-60	EPA 901.1 Modified	2.02E-01	1.19E-01	1.19E-01	2.48E-01	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Cesium-134	EPA 901.1 Modified	-1.71E-01	1.20E-01	1.20E-01	1.58E-01	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Cesium-137	EPA 901.1 Modified	6.46E+00	7.81E-01	8.49E-01	2.64E-01		pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Europium-152	EPA 901.1 Modified	1.33E-01	5.34E-01	5.34E-01	4.81E-01	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Europium-154	EPA 901.1 Modified	-1.34E-01	3.66E-01	3.66E-01	2.52E-01	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Europium-155	EPA 901.1 Modified	2.63E-01	2.60E-01	2.60E-01	3.72E-01	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Holmium-166m	EPA 901.1 Modified	-6.54E-02	2.36E-01	2.36E-01	1.79E-01	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Iodine-129	EPA 901.1 Modified	-3.00E-01	2.31E-01	2.31E-01	2.23E-01	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Potassium-40	EPA 901.1 Modified	5.59E+00	2.13E+00	2.15E+00	2.65E+00		pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Manganese-54	EPA 901.1 Modified	5.43E-03	1.37E-01	1.37E-01	2.17E-01	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Niobium-94	EPA 901.1 Modified	-6.63E-02	1.54E-01	1.54E-01	2.00E-01	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Lead-210	EPA 901.1 Modified	2.97E+00	1.53E+00	1.54E+00	2.83E+00	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Lead-212	EPA 901.1 Modified	5.44E-01	2.37E-01	2.39E-01	4.36E-01		pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Lead-214	EPA 901.1 Modified	4.70E-01	3.27E-01	3.28E-01	5.99E-01	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Promethium-145	EPA 901.1 Modified	-4.33E-02	2.09E-01	2.09E-01	3.06E-01	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Radium-226	EPA 901.1 Modified	7.59E-01	2.72E-01	2.74E-01	4.82E-01		pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Antimony-125	EPA 901.1 Modified	2.48E-02	2.36E-01	2.36E-01	5.83E-01	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Thorium-234	EPA 901.1 Modified	2.36E+00	2.25E+00	2.25E+00	3.29E+00	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Thallium-208	EPA 901.1 Modified	3.65E-01	3.27E-01	3.27E-01	6.42E-01	U	pCi/g
18-04022-11	TRG	B105100AFSWC150CV	02/21/18 08:40	4/5/2018	4/5/2018	18-04022	Uranium-235	EPA 901.1 Modified	-8.91E-01	1.93E+00	1.93E+00	9.58E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04022
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Actinium-228	EPA 901.1 Modified	9.59E-01	2.38E+00	2.38E+00	3.61E+00	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Silver-108m	EPA 901.1 Modified	-4.81E-01	5.51E-01	5.52E-01	7.88E-01	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Americium-241	EPA 901.1 Modified	1.89E+00	1.09E+00	1.09E+00	1.80E+00		pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Barium-133	EPA 901.1 Modified	-5.51E-01	1.86E+00	1.86E+00	1.62E+00	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Bismuth-214	EPA 901.1 Modified	1.50E-01	1.67E+00	1.67E+00	1.96E+00	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Cobalt-60	EPA 901.1 Modified	2.92E+01	1.94E+00	2.45E+00	8.73E-01		pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Cesium-134	EPA 901.1 Modified	-3.81E-01	8.29E-01	8.29E-01	1.05E+00	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Cesium-137	EPA 901.1 Modified	3.64E+02	3.74E+01	4.18E+01	2.15E+00		pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Europium-152	EPA 901.1 Modified	4.43E+00	5.66E+00	5.66E+00	1.95E+00	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Europium-154	EPA 901.1 Modified	4.03E-02	8.28E-01	8.28E-01	1.24E+00	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Europium-155	EPA 901.1 Modified	5.20E-02	8.47E-01	8.47E-01	1.76E+00	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Holmium-166m	EPA 901.1 Modified	-1.07E-01	6.69E-01	6.69E-01	1.36E+00	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Iodine-129	EPA 901.1 Modified	-5.52E-01	1.35E+00	1.35E+00	8.45E+00	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Potassium-40	EPA 901.1 Modified	9.90E+00	2.63E+00	2.68E+00	2.14E+00		pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Manganese-54	EPA 901.1 Modified	1.94E-01	6.15E-01	6.15E-01	9.41E-01	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Niobium-94	EPA 901.1 Modified	-1.01E-01	1.79E-01	1.79E-01	8.11E-01	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Lead-210	EPA 901.1 Modified	-3.34E+01	7.70E+00	7.89E+00	2.15E+01	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Lead-212	EPA 901.1 Modified	1.66E+00	1.32E+00	1.32E+00	2.78E+00	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Lead-214	EPA 901.1 Modified	2.32E+00	2.97E+00	2.97E+00	4.28E+00	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Promethium-145	EPA 901.1 Modified	-2.79E+00	1.07E+00	1.08E+00	4.93E+00	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Radium-226	EPA 901.1 Modified	1.50E-01	1.67E+00	1.67E+00	1.96E+00	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Antimony-125	EPA 901.1 Modified	2.97E+00	5.04E+00	5.05E+00	6.73E+00	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Thorium-234	EPA 901.1 Modified	-3.04E-01	2.58E+00	2.58E+00	1.50E+01	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Thallium-208	EPA 901.1 Modified	2.41E+00	2.60E+00	2.61E+00	1.20E+00	U	pCi/g
18-04022-12	TRG	B105100AFSWC151CV	02/21/18 09:20	4/5/2018	4/5/2018	18-04022	Uranium-235	EPA 901.1 Modified	-1.21E+01	1.61E+01	1.62E+01	7.20E+00	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

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Final Report of Analysis

Report To:		Work Order Details:	
Patricia Giza		SDG:	18-04022
Zion Solutions, LLC		Purchase Order:	677118
101 Shiloh Blvd		Analysis Category:	ENVIRONMENTAL
Zion, IL 60099		Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Actinium-228	EPA 901.1 Modified	7.06E-01	1.03E+00	1.03E+00	1.61E+00	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Silver-108m	EPA 901.1 Modified	-5.63E-02	2.38E-01	2.38E-01	3.48E-01	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Americium-241	EPA 901.1 Modified	8.91E-01	5.19E-01	5.21E-01	8.50E-01		pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Barium-133	EPA 901.1 Modified	1.98E-01	7.31E-01	7.31E-01	7.91E-01	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Bismuth-214	EPA 901.1 Modified	4.13E-01	7.13E-01	7.13E-01	1.07E+00	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Cobalt-60	EPA 901.1 Modified	1.26E+01	8.81E-01	1.09E+00	5.12E-01		pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Cesium-134	EPA 901.1 Modified	-1.80E-01	2.26E-01	2.26E-01	4.28E-01	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Cesium-137	EPA 901.1 Modified	2.55E+02	2.67E+01	2.98E+01	1.19E+00		pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Europium-152	EPA 901.1 Modified	-5.05E-02	2.26E+00	2.26E+00	1.12E+00	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Europium-154	EPA 901.1 Modified	8.24E-02	3.72E-01	3.72E-01	6.26E-01	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Europium-155	EPA 901.1 Modified	1.38E-01	5.32E-01	5.32E-01	8.53E-01	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Holmium-166m	EPA 901.1 Modified	7.53E-02	3.50E-01	3.50E-01	4.98E-01	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Iodine-129	EPA 901.1 Modified	-9.04E-01	9.89E-01	9.90E-01	1.22E+00	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Potassium-40	EPA 901.1 Modified	5.71E+00	2.29E+00	2.31E+00	3.10E+00		pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Manganese-54	EPA 901.1 Modified	-1.89E-02	2.52E-01	2.52E-01	3.77E-01	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Niobium-94	EPA 901.1 Modified	-6.50E-03	2.87E-01	2.87E-01	3.88E-01	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Lead-210	EPA 901.1 Modified	4.66E+00	5.41E+00	5.42E+00	9.06E+00	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Lead-212	EPA 901.1 Modified	-1.83E-01	5.83E-01	5.83E-01	9.20E-01	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Lead-214	EPA 901.1 Modified	1.06E+00	1.17E+00	1.17E+00	1.72E+00	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Promethium-145	EPA 901.1 Modified	8.16E+00	1.11E+00	1.19E+00	1.35E+00	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Radium-226	EPA 901.1 Modified	4.13E-01	7.13E-01	7.13E-01	1.07E+00	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Antimony-125	EPA 901.1 Modified	-3.61E-01	2.01E+00	2.01E+00	2.90E+00	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Thorium-234	EPA 901.1 Modified	7.89E+00	4.99E+00	5.01E+00	7.72E+00	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Thallium-208	EPA 901.1 Modified	-6.98E-01	1.18E+00	1.18E+00	1.19E+00	U	pCi/g
18-04022-13	TRG	B105100AFSWC156CV	02/21/18 13:30	4/5/2018	4/5/2018	18-04022	Uranium-235	EPA 901.1 Modified	-3.50E-01	5.11E+00	5.11E+00	2.67E+00	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

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Patricia Giza	SDG:	18-04022
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Actinium-228	EPA 901.1 Modified	8.03E-01	4.36E-01	4.38E-01	9.41E-01	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Silver-108m	EPA 901.1 Modified	-3.07E-02	1.43E-01	1.43E-01	2.10E-01	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Americium-241	EPA 901.1 Modified	4.83E-02	1.59E-01	1.59E-01	3.25E-01	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Barium-133	EPA 901.1 Modified	6.17E-02	1.42E-01	1.42E-01	2.93E-01	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Bismuth-214	EPA 901.1 Modified	4.04E-01	3.70E-01	3.70E-01	6.00E-01	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Cobalt-60	EPA 901.1 Modified	8.61E-02	1.74E-01	1.74E-01	3.02E-01	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Cesium-134	EPA 901.1 Modified	4.38E-02	8.92E-02	8.92E-02	1.87E-01	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Cesium-137	EPA 901.1 Modified	8.89E+00	1.04E+00	1.14E+00	4.00E-01		pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Europium-152	EPA 901.1 Modified	-1.90E-01	6.53E-01	6.53E-01	4.73E-01	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Europium-154	EPA 901.1 Modified	4.28E-02	2.48E-01	2.48E-01	2.44E-01	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Europium-155	EPA 901.1 Modified	4.94E-02	2.88E-01	2.88E-01	3.84E-01	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Holmium-166m	EPA 901.1 Modified	2.30E-02	2.28E-01	2.28E-01	1.97E-01	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Iodine-129	EPA 901.1 Modified	-3.16E-01	2.26E-01	2.27E-01	2.27E-01	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Potassium-40	EPA 901.1 Modified	6.01E+00	1.91E+00	1.94E+00	1.81E+00		pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Manganese-54	EPA 901.1 Modified	-5.21E-02	1.51E-01	1.51E-01	2.20E-01	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Niobium-94	EPA 901.1 Modified	3.45E-02	1.06E-01	1.06E-01	1.60E-01	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Lead-210	EPA 901.1 Modified	2.39E+00	2.83E+00	2.84E+00	4.74E+00	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Lead-212	EPA 901.1 Modified	4.23E-01	3.44E-01	3.45E-01	5.63E-01	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Lead-214	EPA 901.1 Modified	3.28E-01	3.87E-01	3.87E-01	6.42E-01	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Promethium-145	EPA 901.1 Modified	1.59E-01	1.95E-01	1.95E-01	3.24E-01	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Radium-226	EPA 901.1 Modified	4.04E-01	3.70E-01	3.70E-01	6.00E-01	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Antimony-125	EPA 901.1 Modified	4.98E-02	4.23E-01	4.23E-01	7.09E-01	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Thorium-234	EPA 901.1 Modified	7.34E-01	2.52E+00	2.52E+00	3.36E+00	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Thallium-208	EPA 901.1 Modified	2.09E-01	4.15E-01	4.15E-01	7.38E-01	U	pCi/g
18-04022-14	TRG	B105100AFSWC162CV	02/15/18 15:50	4/5/2018	4/5/2018	18-04022	Uranium-235	EPA 901.1 Modified	1.03E+00	1.97E+00	1.97E+00	1.08E+00	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

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Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04022
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Actinium-228	EPA 901.1 Modified	7.71E-01	5.65E-01	5.66E-01	8.98E-01	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Silver-108m	EPA 901.1 Modified	1.34E-02	1.86E-01	1.86E-01	2.54E-01	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Americium-241	EPA 901.1 Modified	-1.65E-01	9.23E-02	9.27E-02	4.10E-01	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Barium-133	EPA 901.1 Modified	-6.64E-02	1.19E-01	1.19E-01	4.61E-01	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Bismuth-214	EPA 901.1 Modified	4.84E-01	4.29E-01	4.29E-01	7.51E-01	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Cobalt-60	EPA 901.1 Modified	-5.68E-02	1.73E-01	1.73E-01	2.53E-01	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Cesium-134	EPA 901.1 Modified	2.99E-01	2.15E-01	2.16E-01	2.77E-01	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Cesium-137	EPA 901.1 Modified	-1.07E-01	2.23E-01	2.23E-01	3.13E-01	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Europium-152	EPA 901.1 Modified	2.07E+00	1.01E+00	1.02E+00	6.64E-01	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Europium-154	EPA 901.1 Modified	6.42E-02	2.82E-01	2.82E-01	3.39E-01	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Europium-155	EPA 901.1 Modified	8.37E-01	3.27E-01	3.30E-01	5.30E-01	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Holmium-166m	EPA 901.1 Modified	-1.19E-01	3.46E-01	3.46E-01	2.56E-01	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Iodine-129	EPA 901.1 Modified	-2.54E+00	1.74E+00	1.74E+00	1.91E+00	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Potassium-40	EPA 901.1 Modified	7.31E+00	2.13E+00	2.17E+00	1.24E+00		pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Manganese-54	EPA 901.1 Modified	-1.33E-02	1.81E-01	1.81E-01	2.91E-01	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Niobium-94	EPA 901.1 Modified	-9.35E-02	1.69E-01	1.70E-01	2.46E-01	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Lead-210	EPA 901.1 Modified	-5.82E-01	3.18E+00	3.18E+00	5.17E+00	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Lead-212	EPA 901.1 Modified	5.28E-01	3.29E-01	3.30E-01	5.38E-01	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Lead-214	EPA 901.1 Modified	8.77E-01	4.78E-01	4.80E-01	1.21E+00	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Promethium-145	EPA 901.1 Modified	1.52E+00	7.35E-01	7.39E-01	1.10E+00	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Radium-226	EPA 901.1 Modified	4.84E-01	4.29E-01	4.29E-01	7.51E-01	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Antimony-125	EPA 901.1 Modified	6.46E-02	5.33E-01	5.33E-01	8.29E-01	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Thorium-234	EPA 901.1 Modified	-2.93E+00	2.66E+00	2.67E+00	3.85E+00	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Thallium-208	EPA 901.1 Modified	1.44E-01	4.99E-01	4.99E-01	8.38E-01	U	pCi/g
18-04022-15	TRG	B105100AFSWC163CV	02/15/18 13:50	4/5/2018	4/5/2018	18-04022	Uranium-235	EPA 901.1 Modified	1.64E+00	2.75E+00	2.75E+00	1.44E+00	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

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Zion Solutions, LLC		Purchase Order:	677118
101 Shiloh Blvd		Analysis Category:	ENVIRONMENTAL
Zion, IL 60099		Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Actinium-228	EPA 901.1 Modified	6.33E-01	4.18E-01	4.20E-01	7.74E-01	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Silver-108m	EPA 901.1 Modified	-7.16E-02	9.32E-02	9.33E-02	1.65E-01	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Americium-241	EPA 901.1 Modified	-5.39E-01	2.91E-01	2.93E-01	2.76E-01	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Barium-133	EPA 901.1 Modified	5.30E-02	7.36E-02	7.36E-02	2.89E-01	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Bismuth-214	EPA 901.1 Modified	8.38E-01	2.92E-01	2.95E-01	4.62E-01		pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Cobalt-60	EPA 901.1 Modified	5.60E-01	1.60E-01	1.63E-01	3.57E-01	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Cesium-134	EPA 901.1 Modified	8.61E-03	5.00E-02	5.00E-02	2.11E-01	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Cesium-137	EPA 901.1 Modified	5.14E+00	6.88E-01	7.37E-01	4.14E-01		pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Europium-152	EPA 901.1 Modified	3.16E-01	4.06E-01	4.06E-01	3.95E-01	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Europium-154	EPA 901.1 Modified	-5.18E-03	2.20E-01	2.20E-01	1.93E-01	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Europium-155	EPA 901.1 Modified	6.64E-02	1.47E-01	1.47E-01	3.38E-01	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Holmium-166m	EPA 901.1 Modified	-1.05E-02	1.97E-01	1.97E-01	1.74E-01	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Iodine-129	EPA 901.1 Modified	-2.22E-01	2.21E-01	2.21E-01	2.57E-01	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Potassium-40	EPA 901.1 Modified	1.03E+01	2.38E+00	2.43E+00	2.03E+00		pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Manganese-54	EPA 901.1 Modified	-2.30E-02	1.32E-01	1.32E-01	1.89E-01	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Niobium-94	EPA 901.1 Modified	-2.49E-02	9.46E-02	9.46E-02	1.32E-01	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Lead-210	EPA 901.1 Modified	2.14E+00	2.02E+00	2.02E+00	2.92E+00	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Lead-212	EPA 901.1 Modified	8.42E-01	3.22E-01	3.25E-01	4.57E-01		pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Lead-214	EPA 901.1 Modified	4.99E-01	3.20E-01	3.21E-01	6.45E-01	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Promethium-145	EPA 901.1 Modified	3.51E-01	2.32E-01	2.33E-01	3.44E-01	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Radium-226	EPA 901.1 Modified	8.38E-01	2.92E-01	2.95E-01	4.62E-01		pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Antimony-125	EPA 901.1 Modified	2.78E-01	3.72E-01	3.73E-01	6.11E-01	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Thorium-234	EPA 901.1 Modified	3.84E+00	2.39E+00	2.40E+00	3.49E+00	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Thallium-208	EPA 901.1 Modified	6.14E-01	5.19E-01	5.20E-01	8.41E-01	U	pCi/g
18-04022-16	TRG	B105100AFSWC179CV	03/07/18 07:10	4/5/2018	4/5/2018	18-04022	Uranium-235	EPA 901.1 Modified	-1.21E+00	1.51E+00	1.51E+00	8.14E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04022
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Actinium-228	EPA 901.1 Modified	3.56E-01	4.07E-01	4.08E-01	7.59E-01	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Silver-108m	EPA 901.1 Modified	2.84E-03	6.55E-02	6.55E-02	1.34E-01	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Americium-241	EPA 901.1 Modified	-1.50E-01	1.40E-01	1.40E-01	1.83E-01	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Barium-133	EPA 901.1 Modified	3.47E-03	6.34E-02	6.34E-02	2.18E-01	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Bismuth-214	EPA 901.1 Modified	4.77E-01	2.74E-01	2.75E-01	4.02E-01		pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Cobalt-60	EPA 901.1 Modified	-4.00E-02	1.09E-01	1.09E-01	1.73E-01	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Cesium-134	EPA 901.1 Modified	1.65E-02	7.63E-02	7.63E-02	1.73E-01	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Cesium-137	EPA 901.1 Modified	1.97E-01	1.33E-01	1.33E-01	2.02E-01	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Europium-152	EPA 901.1 Modified	3.52E-02	3.38E-01	3.38E-01	2.61E-01	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Europium-154	EPA 901.1 Modified	-1.14E-01	1.68E-01	1.68E-01	1.28E-01	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Europium-155	EPA 901.1 Modified	-5.86E-03	1.00E-01	1.00E-01	2.25E-01	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Holmium-166m	EPA 901.1 Modified	1.86E-01	1.74E-01	1.74E-01	1.12E-01	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Iodine-129	EPA 901.1 Modified	-2.22E-02	5.14E-02	5.14E-02	7.33E-02	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Potassium-40	EPA 901.1 Modified	4.82E+00	1.56E+00	1.58E+00	1.27E+00		pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Manganese-54	EPA 901.1 Modified	4.96E-03	6.01E-02	6.01E-02	1.86E-01	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Niobium-94	EPA 901.1 Modified	-5.97E-02	1.00E-01	1.00E-01	1.20E-01	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Lead-210	EPA 901.1 Modified	-4.45E-03	1.03E+00	1.03E+00	1.54E+00	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Lead-212	EPA 901.1 Modified	3.42E-01	1.50E-01	1.51E-01	2.58E-01	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Lead-214	EPA 901.1 Modified	4.85E-01	2.23E-01	2.25E-01	2.95E-01		pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Promethium-145	EPA 901.1 Modified	-6.51E-02	9.68E-02	9.68E-02	1.35E-01	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Radium-226	EPA 901.1 Modified	4.77E-01	2.74E-01	2.75E-01	4.02E-01		pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Antimony-125	EPA 901.1 Modified	6.72E-03	2.91E-01	2.91E-01	4.17E-01	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Thorium-234	EPA 901.1 Modified	1.32E+00	1.21E+00	1.21E+00	1.92E+00	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Thallium-208	EPA 901.1 Modified	4.40E-01	2.63E-01	2.64E-01	6.35E-01	U	pCi/g
18-04022-17	TRG	B105100AFSWC190CV	03/06/18 13:00	4/5/2018	4/5/2018	18-04022	Uranium-235	EPA 901.1 Modified	-1.36E-01	9.01E-01	9.01E-01	5.78E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04022
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Actinium-228	EPA 901.1 Modified	3.90E-01	5.31E-01	5.32E-01	9.08E-01	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Silver-108m	EPA 901.1 Modified	-8.41E-02	1.44E-01	1.44E-01	1.66E-01	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Americium-241	EPA 901.1 Modified	-1.21E-02	1.87E-01	1.87E-01	2.90E-01	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Barium-133	EPA 901.1 Modified	2.98E-02	7.95E-02	7.95E-02	2.27E-01	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Bismuth-214	EPA 901.1 Modified	5.51E-01	3.90E-01	3.91E-01	6.14E-01	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Cobalt-60	EPA 901.1 Modified	2.65E-01	1.29E-01	1.29E-01	2.48E-01		pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Cesium-134	EPA 901.1 Modified	-7.75E-03	5.26E-02	5.26E-02	1.60E-01	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Cesium-137	EPA 901.1 Modified	1.87E+00	3.42E-01	3.55E-01	2.98E-01		pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Europium-152	EPA 901.1 Modified	1.88E-02	4.72E-01	4.72E-01	4.55E-01	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Europium-154	EPA 901.1 Modified	1.35E-01	2.24E-01	2.24E-01	2.11E-01	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Europium-155	EPA 901.1 Modified	3.56E-01	2.34E-01	2.35E-01	3.58E-01	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Holmium-166m	EPA 901.1 Modified	1.44E-01	1.85E-01	1.85E-01	1.70E-01	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Iodine-129	EPA 901.1 Modified	2.53E-03	1.47E-01	1.47E-01	2.10E-01	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Potassium-40	EPA 901.1 Modified	9.28E+00	2.34E+00	2.39E+00	1.98E+00		pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Manganese-54	EPA 901.1 Modified	7.03E-03	1.35E-01	1.35E-01	1.98E-01	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Niobium-94	EPA 901.1 Modified	1.21E-01	9.86E-02	9.88E-02	2.03E-01	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Lead-210	EPA 901.1 Modified	2.93E+00	1.37E+00	1.38E+00	2.62E+00	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Lead-212	EPA 901.1 Modified	2.55E-01	1.98E-01	1.98E-01	3.18E-01	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Lead-214	EPA 901.1 Modified	7.64E-01	3.05E-01	3.08E-01	5.57E-01		pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Promethium-145	EPA 901.1 Modified	7.65E-02	1.69E-01	1.69E-01	2.76E-01	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Radium-226	EPA 901.1 Modified	5.51E-01	3.90E-01	3.91E-01	6.14E-01	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Antimony-125	EPA 901.1 Modified	-3.00E-02	2.91E-01	2.91E-01	4.93E-01	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Thorium-234	EPA 901.1 Modified	8.99E-01	2.32E+00	2.32E+00	3.18E+00	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Thallium-208	EPA 901.1 Modified	3.38E-01	2.78E-01	2.79E-01	6.28E-01	U	pCi/g
18-04022-18	TRG	B105100AFSWC201CV	03/06/18 15:13	4/5/2018	4/5/2018	18-04022	Uranium-235	EPA 901.1 Modified	1.29E+00	1.60E+00	1.60E+00	8.92E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:
Patricia Giza
Zion Solutions, LLC
101 Shiloh Blvd
Zion, IL 60099

Work Order Details:
SDG: 18-04022
Purchase Order: 677118
Analysis Category: ENVIRONMENTAL
Sample Matrix: SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Actinium-228	EPA 901.1 Modified	5.78E-01	5.25E-01	5.26E-01	9.67E-01	U	pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Silver-108m	EPA 901.1 Modified	6.13E-02	1.41E-01	1.41E-01	2.41E-01	U	pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Americium-241	EPA 901.1 Modified	-2.22E-01	1.08E-01	1.08E-01	3.83E-01	U	pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Barium-133	EPA 901.1 Modified	-1.28E-03	1.20E-01	1.20E-01	4.16E-01	U	pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Bismuth-214	EPA 901.1 Modified	8.38E-01	3.56E-01	3.58E-01	2.36E-01		pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Cobalt-60	EPA 901.1 Modified	2.48E-01	1.04E-01	1.05E-01	1.64E-01		pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Cesium-134	EPA 901.1 Modified	4.51E-03	6.04E-02	6.04E-02	3.04E-01	U	pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Cesium-137	EPA 901.1 Modified	2.13E+00	4.17E-01	4.31E-01	4.48E-01		pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Europium-152	EPA 901.1 Modified	1.96E+00	9.71E-01	9.76E-01	6.24E-01	U	pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Europium-154	EPA 901.1 Modified	5.31E-02	3.76E-01	3.76E-01	3.21E-01	U	pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Europium-155	EPA 901.1 Modified	3.18E-01	2.27E-01	2.27E-01	4.61E-01	U	pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Holmium-166m	EPA 901.1 Modified	-1.56E-01	2.48E-01	2.48E-01	2.34E-01	U	pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Iodine-129	EPA 901.1 Modified	-8.98E-01	1.24E+00	1.24E+00	1.71E+00	U	pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Potassium-40	EPA 901.1 Modified	7.64E+00	2.16E+00	2.20E+00	1.96E+00		pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Manganese-54	EPA 901.1 Modified	-6.69E-02	1.52E-01	1.52E-01	2.27E-01	U	pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Niobium-94	EPA 901.1 Modified	-8.72E-02	1.45E-01	1.46E-01	1.97E-01	U	pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Lead-210	EPA 901.1 Modified	-3.62E+00	3.18E+00	3.18E+00	4.77E+00	U	pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Lead-212	EPA 901.1 Modified	9.90E-01	4.77E-01	4.79E-01	7.21E-01		pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Lead-214	EPA 901.1 Modified	6.81E-01	5.31E-01	5.32E-01	1.17E+00	U	pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Promethium-145	EPA 901.1 Modified	1.29E+00	6.57E-01	6.60E-01	9.80E-01	U	pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Radium-226	EPA 901.1 Modified	8.38E-01	3.56E-01	3.58E-01	2.36E-01		pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Antimony-125	EPA 901.1 Modified	-4.69E-02	5.47E-01	5.47E-01	8.25E-01	U	pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Thorium-234	EPA 901.1 Modified	4.87E+00	2.04E+00	2.06E+00	5.34E+00	U	pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Thallium-208	EPA 901.1 Modified	7.57E-01	5.21E-01	5.22E-01	8.32E-01	U	pCi/g
18-04022-19	TRG	B105100AFSWC210CV	03/06/18 14:40	4/5/2018	4/5/2018	18-04022	Uranium-235	EPA 901.1 Modified	7.58E-02	2.40E+00	2.40E+00	1.35E+00	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:
Patricia Giza
Zion Solutions, LLC
101 Shiloh Blvd
Zion, IL 60099

Work Order Details:
SDG: 18-04022
Purchase Order: 677118
Analysis Category: ENVIRONMENTAL
Sample Matrix: SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Actinium-228	EPA 901.1 Modified	1.93E-01	4.77E-01	4.77E-01	8.51E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Silver-108m	EPA 901.1 Modified	1.27E-01	1.16E-01	1.16E-01	1.79E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Americium-241	EPA 901.1 Modified	-1.28E-02	1.61E-01	1.61E-01	2.35E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Barium-133	EPA 901.1 Modified	2.97E-01	1.94E-01	1.95E-01	2.54E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Bismuth-214	EPA 901.1 Modified	1.52E-01	3.55E-01	3.55E-01	5.39E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Cobalt-60	EPA 901.1 Modified	6.04E-02	1.25E-01	1.25E-01	2.14E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Cesium-134	EPA 901.1 Modified	-3.49E-01	2.49E-01	2.49E-01	2.17E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Cesium-137	EPA 901.1 Modified	2.87E-01	2.47E-01	2.47E-01	3.99E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Europium-152	EPA 901.1 Modified	-1.72E-01	4.88E-01	4.88E-01	3.51E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Europium-154	EPA 901.1 Modified	-3.64E-02	3.84E-01	3.84E-01	1.81E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Europium-155	EPA 901.1 Modified	-1.83E-02	1.03E-01	1.03E-01	2.80E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Holmium-166m	EPA 901.1 Modified	-1.53E-01	2.55E-01	2.56E-01	1.42E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Iodine-129	EPA 901.1 Modified	1.09E-02	6.88E-02	6.88E-02	1.04E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Potassium-40	EPA 901.1 Modified	7.06E+00	2.52E+00	2.54E+00	2.89E+00		pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Manganese-54	EPA 901.1 Modified	-3.20E-02	1.62E-01	1.62E-01	2.54E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Niobium-94	EPA 901.1 Modified	1.33E-02	1.42E-01	1.42E-01	2.17E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Lead-210	EPA 901.1 Modified	1.12E+00	1.24E+00	1.25E+00	1.97E+00	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Lead-212	EPA 901.1 Modified	2.20E-01	1.92E-01	1.93E-01	3.13E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Lead-214	EPA 901.1 Modified	3.52E-01	2.23E-01	2.23E-01	6.63E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Promethium-145	EPA 901.1 Modified	3.77E-02	1.20E-01	1.20E-01	1.84E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Radium-226	EPA 901.1 Modified	1.52E-01	3.55E-01	3.55E-01	5.39E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Antimony-125	EPA 901.1 Modified	1.24E-01	3.99E-01	3.99E-01	5.94E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Thorium-234	EPA 901.1 Modified	4.11E+00	1.88E+00	1.90E+00	2.96E+00		pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Thallium-208	EPA 901.1 Modified	4.13E-01	3.70E-01	3.70E-01	5.82E-01	U	pCi/g
18-04022-20	TRG	B105100AFSWC231CV	03/06/18 14:30	4/5/2018	4/5/2018	18-04022	Uranium-235	EPA 901.1 Modified	-1.14E+00	1.47E+00	1.47E+00	7.70E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

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Attachment 1 – Chain-of-Custody Form

	Sample ID	Sample Log	Matrix	Sample Type	Sample Container				Sample Date	Sample Time	Analysis Type	Preservative	Remarks
					Vol	Unit	Type	Qty					
4	B105100AFSWC017CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	0935	5ROC/HTD	N/A	0.0-0.5" 101.65g
5	B105100AFSWC041CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	0925	5ROC/HTD	N/A	0.0-0.5" 123.37g
6	B105100AFSWC057CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	0910	5ROC/HTD	N/A	0.0-0.5" 101.99g
7	B105100AFSWC088CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	0855	5ROC/HTD	N/A	0.0-0.5" 105.94g
8	B105100AFSWC101CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	0725	5ROC/HTD	N/A	0.0-0.5" 146.06g
9	B105100AFSWC115CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	1530	5ROC/HTD	N/A	0.0-0.5" 94.29g
10	B105100AFSWC116CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	0840	5ROC/HTD	N/A	0.0-0.5" 98.62g
11	B105100AFSWC150CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	02/21/2018	0840	5ROC/HTD	N/A	0.0-0.5" 97.99g
12	B105100AFSWC151CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	02/21/2018	0920	5ROC/HTD	N/A	0.0-0.5" 102.6 g
13	B105100AFSWC156CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	02/21/2018	1330	5ROC/HTD	N/A	0.0-0.5" 96.47g
14	B105100AFSWC162CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	02/15/2018	1550	5ROC/HTD	N/A	0.0-0.5" 90.81g
15	B105100AFSWC163CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	02/15/2018	1350	5ROC/HTD	N/A	0.0-0.5" 97.73g
16	B105100AFSWC179CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	0710	5ROC/HTD	N/A	0.0-0.5" 100.50g
17	B105100AFSWC190CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	1300	5ROC/HTD	N/A	0.0-1.0" 180.00g
18	B105100AFSWC201CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	1513	5ROC/HTD	N/A	0.0-0.5" 96.68g
19	B105100AFSWC210CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	1440	5ROC/HTD	N/A	0.0-0.5" 120.44g
20	B105100AFSWC231CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	1430	5ROC/HTD	N/A	0.0-0.5" 132.75g
	B105100AFSFC239CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	0955	5ROC/HTD	N/A	0.0-1.0" 209.92g
	B105100AFSFC250CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	0940	5ROC/HTD	N/A	0.0-0.5" 130.05g

B105100AFSFC255CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	1246	5ROC/HTD	N/A	0.0-0.5" 134.31g
B105100AFSFC263CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	0930	5ROC/HTD	N/A	0.0-0.5" 110.42g
B105100AFSFC276CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/05/2018	1342	5ROC/HTD	N/A	0.0-0.5" 122.7[illegible]g
B105100AFSFC282CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	0852	5ROC/HTD	N/A	0.0-0.5" 116.66g
B105100AFSFC289CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/05/2018	1352	5ROC/HTD	N/A	0.0-0.5" 119.0[illegible]g
B105100AFSFC293CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/07/2018	1345	5ROC/HTD	N/A	0.0-0.5" 132.5[illegible]g
B105100AFSFC300CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/13/2018	1250	5ROC/HTD	N/A	0.0-0.5" 85.562g
B105100AFSFC316CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/05/2018	1358	5ROC/HTD	N/A	0.0-0.5" 108.12g
B105100AFSFC321CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/13/2018	1410	5ROC/HTD	N/A	0.0-0.5" 148.80g
B105100AFSFC326CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/14/2018	0815	5ROC/HTD	N/A	0.0-0.5" 134.35g
B105100AFSFC329CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/05/2018	1418	5ROC/HTD	N/A	0.0-0.5" 115.08g
B105100AFSFC332CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/05/2018	1405	5ROC/HTD	N/A	0.0-0.5" 123.51g
B105100AFSFC345CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/07/2018	1045	5ROC/HTD	N/A	0.0-0.5" 115.27g
B105100AFSFC347CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/12/2018	1310	5ROC/HTD	N/A	0.0-0.5" 91.09[illegible]
B105100AFSFC348CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/12/2018	1515	5ROC/HTD	N/A	0.0-0.5" 88.01[illegible]
B105100AFSFC354CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/08/2018	1307	5ROC/HTD	N/A	0.0-0.5" 110.07g
B105100AFSFC363CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/06/2018	0740	5ROC/HTD	N/A	0.0-0.5" 85.52[illegible]
B105100AFSFC369CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/05/2018	1453	5ROC/HTD	N/A	0.0-0.5" 150.58g
B105100AFSFC375CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/05/2018	1431	5ROC/HTD	N/A	0.0-0.5" 119.51g
B105100AFSFC379CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/06/2018	0746	5ROC/HTD	N/A	0.0-0.5" 135.29g
B105100AFSFC383CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/06/2018	0740	5ROC/HTD	N/A	0.0-0.5" 118.83g
B105100AFSFC411CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/06/2018	0805	5ROC/HTD	N/A	0.0-0.75" 168.23[illegible]"

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B105100AFSFC433CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/08/2018	1512	5ROC/HTD	N/A	0.0-0.5" 130.9 g
B105100AFSFC434CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/08/2018	0930	5ROC/HTD	N/A	0.0-0.5" 133.5 g
B105100AFSFC435CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/07/2018	1422	5ROC/HTD	N/A	0.0-0.5" 152.3 g
B105100AFSFC436CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/14/2018	1030	5ROC/HTD	N/A	0.0-0.5" 133.5 g
B105100AFSFC438CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/08/2018	1025	5ROC/HTD	N/A	0.0-0.5" 130.9 g

Laboratory:	Date Submitted To Lab:	Ship Container No.:	Cooler Temperature:	Airbill Number:
Eberline Labs		**N/A**	**N/A**	FedEx First Overnight 8107 0645 6688

Relinquished by:	Date	Time:	Received by:	Date: (mm/dd/yyyy):	Time:
Reed R. Smith	(04/04/2018)	1346	Richard F. Rickert	04/04/2018	1346
Relinquished by: Richard F. Rickert	Date (mm/dd/yyyy): 04/04/2018	Time: 1630	Received by: Fed Ex First Overnight	Date: (mm/dd/yyyy): 04/04/2018	Time: 16:30
Relinquished by:	Date (mm/dd/yyyy):	Time:	Received by:	Date: (mm/dd/yyyy): 4-5-18	Time: 0800
Relinquished by:	Date (mm/dd/yyyy):	Time:	Received by:	Date: (mm/dd/yyyy):	Time:

Comments

PO# 677118 7 day turnaround 5-ROC / HTD / H-3

EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD
OAK RIDGE, TENNESSEE 37830
PHONE (865) 481-0683
FAX (865) 483-4621

EBS-OR-43651

April 30, 2018

Patricia Giza
Zion Solutions, LLC
101 Shiloh Blvd
Zion, IL 60099

CASE NARRATIVE
Work Order # 18-04023-OR

SAMPLE RECEIPT

This work order contains seventeen solid samples received 04/05/2018. Samples were analyzed for Total Strontium, Tritium, Nickel-63 and by Gamma Spectroscopy.

CLIENT ID	LAB ID	CLIENT ID	LAB ID
B105100AFSFC239CV	18-04023-04	B105100AFSFC316CV	18-04023-13
B105100AFSFC250CV	18-04023-05	B105100AFSFC321CV	18-04023-14
B105100AFSFC255CV	18-04023-06	B105100AFSFC326CV	18-04023-15
B105100AFSFC263CV	18-04023-07	B105100AFSFC329CV	18-04023-16
B105100AFSFC276CV	18-04023-08	B105100AFSFC332CV	18-04023-17
B105100AFSFC282CV	18-04023-09	B105100AFSFC345CV	18-04023-18
B105100AFSFC289CV	18-04023-10	B105100AFSFC347CV	18-04023-19
B105100AFSFC293CV	18-04023-11	B105100AFSFC348CV	18-04023-20
B105100AFSFC300CV	18-04023-12		

ANALYTICAL METHODS

Total Strontium was analyzed using EIChroM Method SRW01 Modified. Tritium was performed using Method LANL ER-210 Modified. Nickel-63 was performed using Method ASTM 3500-Ni Modified. Gamma Spectroscopy was performed using EPA Method 901.1 Modified.

Laboratory qualifiers are as follows:

U - Result is less than the MDA.

ANALYTICAL RESULTS

Combined Standard Uncertainty is reported at 1-sigma value.

Minimum Detectable Activity (MDA) values for data represented in this report are sample-specific. MDA measurements are determined based on factors and conditions including instrument settings, aliquot size and matrix type.

ANALYTICAL RESULTS CONTINUED

TOTAL STRONTIUM

Samples were prepared by acid digestion as appropriate for the matrix. Digested samples were acidified and were selectively extracted and precipitated. Precipitates were then mounted on 47mm filters. Filter was reweighed to determine aliquot size. Sample activities were determined by gas flow proportional counting.

Samples demonstrated acceptable results for all Total Strontium analyses. Strontium-90 results are reported from Total Strontium. Chemical recovery was acceptable for all samples. The Total Strontium method blank demonstrated an acceptable result. Results for the Total Strontium duplicate demonstrated a high relative percent difference; however, normalized difference is within acceptable limits for the analytical technique. Results for the Total Strontium laboratory control sample demonstrated an acceptable percent recovery.

TRITIUM

A representative aliquot of each sample was equilibrated with tritium free water. Equilibrates were transferred into a round-bottomed distillation flask and attached to a single stage still. A portion of each middle distillation fraction was transferred to a liquid scintillation vial and cocktail was added. Samples were then counted by beta liquid scintillation.

Samples demonstrated acceptable results for all Tritium analyses. The Tritium method blank demonstrated an acceptable result. Results for the Tritium duplicate demonstrated a high relative percent difference; however, normalized difference is within acceptable limits for the analytical technique. Results for the Tritium laboratory control sample demonstrated an acceptable percent recovery.

NICKEL-63

A representative aliquot of each sample was placed into an appropriately sized beaker. Stable elemental Nickel carrier was added to each sample prior to digestion. Samples were digested in concentrated Nitric acid. After digestion, sample pH was adjusted and Nickel-63 was precipitated selectively with Dimethylglyoxime. Precipitates were selectively separated, redissolved, and residual acid was effectively neutralized. Sample residuals were placed into scintillation vials, scintillation cocktail was added and Nickel-63 activity was determined by beta liquid scintillation.

Samples demonstrated acceptable results for all Nickel-63 analyses. Results for the method blank and laboratory fractions -03, -04, -06, -10, -15, -16 and -19 (Client ID: B105100AFSFC239CV DUP & DO, B105100AFSFC255CV, B105100AFSFC289CV, B105100AFSFC326CV, B105100AFSFC329CV and B105100AFSFC347CV) demonstrated slightly high method detection limits. The Nickel-63 method blank demonstrated an acceptable result. Results for the Nickel-63 duplicate demonstrated a high relative percent difference; however, normalized difference is within acceptable limits for the analytical technique. Results for the Nickel-63 laboratory control sample demonstrated an acceptable percent recovery.

ANALYTICAL RESULTS CONTINUED

GAMMA SPECTROSCOPY

Samples for Gamma Spectroscopy analysis were prepared by transferring a known mass/aliquot of each homogenized sample to a standard geometry container. Samples were counted on High Purity Germanium (HPGe) gamma ray detectors.

Samples demonstrated acceptable results for all gamma-emitting radionuclides as reported. Cobalt-60 and Cesium-137 results demonstrated slightly high method detection limits. Some samples demonstrated results that are greater than the method detection limit. These results are reported from the Canberra Gamma Apex "Nuclide MDA Report" and are not positive. These results are qualified as non-detect (U). The method blank demonstrated acceptable results for all radionuclides as reported. Results for the Bismuth-214 replicate demonstrated a high relative percent difference; however, normalized difference is within acceptable limits for the analytical technique. Results for the Thorium-234 and Potassium-40 replicate demonstrated an acceptable relative percent difference and normalized difference. Results for the Cobalt-60 and Cesium-137 laboratory control sample demonstrated an acceptable percent recovery.

CERTIFICATION OF ACCURACY

I certify that this data report is in compliance with the terms and conditions of the Purchase Order, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the cognizant project manager or his/her designee to be accurate as verified by the following signature.

M.R. McDougall
Laboratory Manager

Date: 4/30/2018

Eberline Analytical wants and encourages your feedback regarding our performance providing radioanalytical services. Please visit http://eberlineanalytical.com/ to provide us with feedback on our services.

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04023
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-01	LCS	KNOWN	04/05/18 00:00	4/5/2018	4/11/2018	18-04023	Tritium	LANL ER-210 Modified	2.43E+02	8.76E+00				pCi/g
18-04023-01	LCS	SPIKE	04/05/18 00:00	4/5/2018	4/11/2018	18-04023	Tritium	LANL ER-210 Modified	2.17E+02	5.63E+00	1.34E+01	3.79E+00		pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/11/2018	18-04023	Tritium	LANL ER-210 Modified	-7.60E-01	2.15E+00	2.15E+00	3.74E+00	U	pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/11/2018	18-04023	Tritium	LANL ER-210 Modified	-2.76E-01	1.04E+00	1.04E+00	1.81E+00	U	pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/11/2018	18-04023	Tritium	LANL ER-210 Modified	-5.52E-01	1.04E+00	1.04E+00	1.81E+00	U	pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/11/2018	18-04023	Tritium	LANL ER-210 Modified	-6.61E-01	1.06E+00	1.06E+00	1.86E+00	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/11/2018	18-04023	Tritium	LANL ER-210 Modified	9.67E-02	1.11E+00	1.11E+00	1.90E+00	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/11/2018	18-04023	Tritium	LANL ER-210 Modified	1.85E-01	1.06E+00	1.06E+00	1.82E+00	U	pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/11/2018	18-04023	Tritium	LANL ER-210 Modified	1.33E-01	7.62E-01	7.62E-01	1.30E+00	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/11/2018	18-04023	Tritium	LANL ER-210 Modified	2.72E-01	1.56E+00	1.56E+00	2.68E+00	U	pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/11/2018	18-04023	Tritium	LANL ER-210 Modified	-1.77E-01	1.01E+00	1.01E+00	1.74E+00	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/11/2018	18-04023	Tritium	LANL ER-210 Modified	3.12E-01	1.79E+00	1.79E+00	3.07E+00	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/11/2018	18-04023	Tritium	LANL ER-210 Modified	2.26E+00	1.91E+00	1.91E+00	3.18E+00	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/11/2018	18-04023	Tritium	LANL ER-210 Modified	-6.66E-01	1.88E+00	1.88E+00	3.27E+00	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/11/2018	18-04023	Tritium	LANL ER-210 Modified	-5.64E-01	2.13E+00	2.13E+00	3.70E+00	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/11/2018	18-04023	Tritium	LANL ER-210 Modified	8.34E-01	1.93E+00	1.93E+00	3.28E+00	U	pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/12/2018	18-04023	Tritium	LANL ER-210 Modified	-2.75E-01	1.57E+00	1.57E+00	2.71E+00	U	pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/12/2018	18-04023	Tritium	LANL ER-210 Modified	-4.85E-01	1.84E+00	1.84E+00	3.18E+00	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/12/2018	18-04023	Tritium	LANL ER-210 Modified	1.74E-01	1.99E+00	1.99E+00	3.42E+00	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/12/2018	18-04023	Tritium	LANL ER-210 Modified	4.23E+00	2.21E+00	2.23E+00	3.61E+00		pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/12/2018	18-04023	Tritium	LANL ER-210 Modified	3.67E+00	1.71E+00	1.73E+00	2.78E+00		pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:
Patricia Giza
Zion Solutions, LLC
101 Shiloh Blvd
Zion, IL 60099

Work Order Details:
SDG: 18-04023
Purchase Order: 677118
Analysis Category: ENVIRONMENTAL
Sample Matrix: SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-01	LCS	KNOWN	04/05/18 00:00	4/5/2018	4/10/2018	18-04023	Nickel-63	ASTM 3500-Ni Modified	1.50E+03	4.51E+01				pCi/g
18-04023-01	LCS	SPIKE	04/05/18 00:00	4/5/2018	4/10/2018	18-04023	Nickel-63	ASTM 3500-Ni Modified	1.52E+03	8.94E+00	8.97E+01	2.05E+00		pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/10/2018	18-04023	Nickel-63	ASTM 3500-Ni Modified	4.95E-01	1.23E+00	1.23E+00	2.09E+00	U	pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/10/2018	18-04023	Nickel-63	ASTM 3500-Ni Modified	8.54E-02	1.27E+00	1.27E+00	2.17E+00	U	pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/10/2018	18-04023	Nickel-63	ASTM 3500-Ni Modified	5.15E-01	1.28E+00	1.28E+00	2.18E+00	U	pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/10/2018	18-04023	Nickel-63	ASTM 3500-Ni Modified	3.06E-01	9.14E-01	9.15E-01	1.55E+00	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/10/2018	18-04023	Nickel-63	ASTM 3500-Ni Modified	-6.42E-01	1.18E+00	1.18E+00	2.04E+00	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/10/2018	18-04023	Nickel-63	ASTM 3500-Ni Modified	2.71E-01	8.11E-01	8.11E-01	1.38E+00	U	pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/10/2018	18-04023	Nickel-63	ASTM 3500-Ni Modified	-1.01E+00	1.05E+00	1.05E+00	1.83E+00	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/10/2018	18-04023	Nickel-63	ASTM 3500-Ni Modified	6.00E-01	1.00E+00	1.00E+00	1.69E+00	U	pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/10/2018	18-04023	Nickel-63	ASTM 3500-Ni Modified	2.42E+00	1.25E+00	1.26E+00	2.05E+00		pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/10/2018	18-04023	Nickel-63	ASTM 3500-Ni Modified	-1.51E-01	1.12E+00	1.12E+00	1.92E+00	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/10/2018	18-04023	Nickel-63	ASTM 3500-Ni Modified	2.11E+00	1.16E+00	1.17E+00	1.92E+00		pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/10/2018	18-04023	Nickel-63	ASTM 3500-Ni Modified	2.21E-01	1.10E+00	1.10E+00	1.87E+00	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/10/2018	18-04023	Nickel-63	ASTM 3500-Ni Modified	1.39E-01	1.04E+00	1.04E+00	1.77E+00	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/11/2018	18-04023	Nickel-63	ASTM 3500-Ni Modified	4.04E-01	1.21E+00	1.21E+00	2.05E+00	U	pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/11/2018	18-04023	Nickel-63	ASTM 3500-Ni Modified	1.09E+00	1.27E+00	1.27E+00	2.13E+00	U	pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/11/2018	18-04023	Nickel-63	ASTM 3500-Ni Modified	2.62E-01	9.78E-01	9.78E-01	1.66E+00	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/11/2018	18-04023	Nickel-63	ASTM 3500-Ni Modified	-2.04E-01	1.00E+00	1.00E+00	1.72E+00	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/11/2018	18-04023	Nickel-63	ASTM 3500-Ni Modified	3.03E+00	1.28E+00	1.29E+00	2.08E+00		pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/11/2018	18-04023	Nickel-63	ASTM 3500-Ni Modified	-3.06E-01	1.13E+00	1.13E+00	1.94E+00	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:
Patricia Giza
Zion Solutions, LLC
101 Shiloh Blvd
Zion, IL 60099

Work Order Details:
SDG: 18-04023
Purchase Order: 677118
Analysis Category: ENVIRONMENTAL
Sample Matrix: SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-01	LCS	KNOWN	04/05/18 00:00	4/5/2018	4/11/2018	18-04023	Strontium-90	ElChroM SRW01 Modified	5.03E+01	2.82E-01				pCi/g
18-04023-01	LCS	SPIKE	04/05/18 00:00	4/5/2018	4/11/2018	18-04023	Strontium-90	ElChroM SRW01 Modified	3.93E+01	1.68E+00	1.38E+01	7.85E-01		pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/11/2018	18-04023	Strontium-90	ElChroM SRW01 Modified	2.75E-01	4.97E-01	5.06E-01	8.56E-01	U	pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/11/2018	18-04023	Strontium-90	ElChroM SRW01 Modified	5.52E-01	4.74E-01	5.11E-01	7.80E-01	U	pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/11/2018	18-04023	Strontium-90	ElChroM SRW01 Modified	-9.07E-02	3.77E-01	3.79E-01	6.90E-01	U	pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/11/2018	18-04023	Strontium-90	ElChroM SRW01 Modified	-1.90E-01	3.13E-01	3.19E-01	5.83E-01	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/11/2018	18-04023	Strontium-90	ElChroM SRW01 Modified	1.18E-01	3.68E-01	3.71E-01	6.47E-01	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/11/2018	18-04023	Strontium-90	ElChroM SRW01 Modified	1.29E-01	2.69E-01	2.73E-01	4.66E-01	U	pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/11/2018	18-04023	Strontium-90	ElChroM SRW01 Modified	4.44E-01	3.45E-01	3.78E-01	5.60E-01	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/11/2018	18-04023	Strontium-90	ElChroM SRW01 Modified	3.22E-01	3.22E-01	3.41E-01	5.36E-01	U	pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/11/2018	18-04023	Strontium-90	ElChroM SRW01 Modified	2.74E-01	4.16E-01	4.27E-01	7.11E-01	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/11/2018	18-04023	Strontium-90	ElChroM SRW01 Modified	-1.22E-01	3.39E-01	3.42E-01	6.25E-01	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/11/2018	18-04023	Strontium-90	ElChroM SRW01 Modified	2.14E-01	3.34E-01	3.42E-01	5.71E-01	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/11/2018	18-04023	Strontium-90	ElChroM SRW01 Modified	2.90E-01	4.36E-01	4.48E-01	7.45E-01	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/11/2018	18-04023	Strontium-90	ElChroM SRW01 Modified	2.76E-01	3.29E-01	3.43E-01	5.55E-01	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/11/2018	18-04023	Strontium-90	ElChroM SRW01 Modified	7.69E-01	4.72E-01	5.43E-01	7.47E-01		pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/11/2018	18-04023	Strontium-90	ElChroM SRW01 Modified	8.94E-01	5.55E-01	6.36E-01	8.80E-01		pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/11/2018	18-04023	Strontium-90	ElChroM SRW01 Modified	2.15E-01	3.26E-01	3.34E-01	5.57E-01	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/11/2018	18-04023	Strontium-90	ElChroM SRW01 Modified	7.83E-02	3.83E-01	3.84E-01	6.73E-01	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/11/2018	18-04023	Strontium-90	ElChroM SRW01 Modified	2.80E-01	3.97E-01	4.09E-01	6.77E-01	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/11/2018	18-04023	Strontium-90	ElChroM SRW01 Modified	5.41E-01	3.60E-01	4.06E-01	5.75E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:		Work Order Details:	
Patricia Giza		SDG:	18-04023
Zion Solutions, LLC		Purchase Order:	677118
101 Shiloh Blvd		Analysis Category:	ENVIRONMENTAL
Zion, IL 60099		Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-01	LCS	KNOWN	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Cobalt-60	EPA 901.1 Modified	2.71E+02	1.06E+01				pCi/g
18-04023-01	LCS	KNOWN	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Cesium-137	EPA 901.1 Modified	1.69E+02	6.75E+00				pCi/g
18-04023-01	LCS	SPIKE	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Cobalt-60	EPA 901.1 Modified	2.69E+02	1.54E+01	2.07E+01	2.31E+00		pCi/g
18-04023-01	LCS	SPIKE	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Cesium-137	EPA 901.1 Modified	1.91E+02	2.29E+01	2.49E+01	2.52E+00		pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Actinium-228	EPA 901.1 Modified	0.00E+00	1.48E-01	1.48E-01	2.22E-01	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Silver-108m	EPA 901.1 Modified	1.19E-02	2.85E-02	2.85E-02	4.55E-02	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Americium-241	EPA 901.1 Modified	-4.18E-02	4.78E-02	4.79E-02	6.51E-02	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Barium-133	EPA 901.1 Modified	2.09E-02	5.17E-02	5.17E-02	6.58E-02	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Bismuth-214	EPA 901.1 Modified	1.58E-02	9.20E-02	9.20E-02	1.39E-01	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Cobalt-60	EPA 901.1 Modified	2.12E-02	3.50E-02	3.50E-02	6.50E-02	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Cesium-134	EPA 901.1 Modified	0.00E+00	4.53E-02	4.53E-02	6.21E-02	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Cesium-137	EPA 901.1 Modified	2.03E-02	4.54E-02	4.54E-02	7.47E-02	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Europium-152	EPA 901.1 Modified	-2.65E-02	1.34E-01	1.34E-01	1.05E-01	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Europium-154	EPA 901.1 Modified	7.96E-02	8.09E-02	8.10E-02	5.46E-02	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Europium-155	EPA 901.1 Modified	3.56E-02	3.09E-02	3.09E-02	6.36E-02	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Holmium-166m	EPA 901.1 Modified	-4.81E-02	9.72E-02	9.72E-02	3.95E-02	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Iodine-129	EPA 901.1 Modified	2.36E-03	1.95E-02	1.95E-02	2.93E-02	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Potassium-40	EPA 901.1 Modified	3.79E-02	3.18E-01	3.18E-01	6.21E-01	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Manganese-54	EPA 901.1 Modified	-8.37E-03	3.91E-02	3.91E-02	6.37E-02	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Niobium-94	EPA 901.1 Modified	1.04E-02	3.63E-02	3.63E-02	6.58E-02	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Lead-210	EPA 901.1 Modified	4.50E-01	3.56E-01	3.56E-01	5.92E-01	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Lead-212	EPA 901.1 Modified	6.26E-02	4.00E-02	4.01E-02	6.04E-02		pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Lead-214	EPA 901.1 Modified	9.67E-02	5.96E-02	5.99E-02	1.15E-01	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Promethium-145	EPA 901.1 Modified	-2.70E-03	3.36E-02	3.36E-02	5.04E-02	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Radium-226	EPA 901.1 Modified	1.58E-02	9.20E-02	9.20E-02	1.39E-01	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Antimony-125	EPA 901.1 Modified	-2.43E-02	1.04E-01	1.04E-01	1.40E-01	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Thorium-234	EPA 901.1 Modified	5.84E-01	5.33E-01	5.33E-01	8.80E-01	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Thallium-208	EPA 901.1 Modified	-3.62E-02	1.42E-01	1.42E-01	1.90E-01	U	pCi/g
18-04023-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/5/2018	18-04023	Uranium-235	EPA 901.1 Modified	-2.17E-02	3.69E-01	3.69E-01	2.26E-01	U	pCi/g

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Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04023
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Actinium-228	EPA 901.1 Modified	4.79E-01	1.89E-01	1.91E-01	2.24E-01		pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Silver-108m	EPA 901.1 Modified	-2.52E-02	6.75E-02	6.75E-02	7.03E-02	U	pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Americium-241	EPA 901.1 Modified	-2.66E-01	1.39E-01	1.39E-01	1.30E-01	U	pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Barium-133	EPA 901.1 Modified	1.97E-02	3.65E-02	3.65E-02	1.44E-01	U	pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Bismuth-214	EPA 901.1 Modified	6.81E-01	1.56E-01	1.60E-01	1.96E-01		pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Cobalt-60	EPA 901.1 Modified	1.50E-02	3.28E-02	3.29E-02	6.32E-02	U	pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Cesium-134	EPA 901.1 Modified	2.34E-02	3.79E-02	3.80E-02	9.69E-02	U	pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Cesium-137	EPA 901.1 Modified	-1.16E-02	6.66E-02	6.66E-02	9.91E-02	U	pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Europium-152	EPA 901.1 Modified	7.94E-02	1.18E-01	1.18E-01	1.94E-01	U	pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Europium-154	EPA 901.1 Modified	-1.15E-02	1.38E-01	1.38E-01	9.51E-02	U	pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Europium-155	EPA 901.1 Modified	3.56E-02	1.06E-01	1.06E-01	1.74E-01	U	pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Holmium-166m	EPA 901.1 Modified	2.56E-02	8.26E-02	8.26E-02	8.22E-02	U	pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Iodine-129	EPA 901.1 Modified	2.34E-02	7.14E-02	7.14E-02	9.83E-02	U	pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Potassium-40	EPA 901.1 Modified	4.86E+00	1.11E+00	1.14E+00	9.17E-01		pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Manganese-54	EPA 901.1 Modified	-8.61E-03	5.98E-02	5.98E-02	8.67E-02	U	pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Niobium-94	EPA 901.1 Modified	-1.02E-03	3.17E-02	3.17E-02	6.65E-02	U	pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Lead-210	EPA 901.1 Modified	1.32E+00	8.84E-01	8.87E-01	1.34E+00	U	pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Lead-212	EPA 901.1 Modified	3.39E-01	1.13E-01	1.15E-01	2.38E-01		pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Lead-214	EPA 901.1 Modified	6.48E-01	1.53E-01	1.57E-01	2.09E-01		pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Promethium-145	EPA 901.1 Modified	-3.19E-02	1.00E-01	1.00E-01	1.27E-01	U	pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Radium-226	EPA 901.1 Modified	6.81E-01	1.56E-01	1.60E-01	1.96E-01		pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Antimony-125	EPA 901.1 Modified	-4.70E-02	1.47E-01	1.47E-01	2.17E-01	U	pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Thorium-234	EPA 901.1 Modified	2.68E+00	1.07E+00	1.08E+00	1.67E+00	U	pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Thallium-208	EPA 901.1 Modified	1.87E-01	1.33E-01	1.33E-01	2.52E-01	U	pCi/g
18-04023-03	DUP	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Uranium-235	EPA 901.1 Modified	-1.78E-01	5.87E-01	5.87E-01	3.99E-01	U	pCi/g

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Patricia Giza	SDG:	18-04023
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Actinium-228	EPA 901.1 Modified	3.57E-01	1.73E-01	1.74E-01	4.87E-01	U	pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Silver-108m	EPA 901.1 Modified	-5.47E-02	5.40E-02	5.41E-02	6.67E-02	U	pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Americium-241	EPA 901.1 Modified	-9.34E-02	1.26E-01	1.26E-01	1.43E-01	U	pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Barium-133	EPA 901.1 Modified	3.35E-02	1.34E-01	1.34E-01	1.40E-01	U	pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Bismuth-214	EPA 901.1 Modified	4.14E-01	1.47E-01	1.49E-01	2.22E-01		pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Cobalt-60	EPA 901.1 Modified	1.68E-02	5.26E-02	5.26E-02	7.33E-02	U	pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Cesium-134	EPA 901.1 Modified	-4.80E-04	3.10E-02	3.10E-02	9.19E-02	U	pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Cesium-137	EPA 901.1 Modified	2.04E-02	5.38E-02	5.38E-02	9.06E-02	U	pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Europium-152	EPA 901.1 Modified	1.44E-02	1.33E-01	1.33E-01	1.89E-01	U	pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Europium-154	EPA 901.1 Modified	1.04E-01	1.05E-01	1.05E-01	9.55E-02	U	pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Europium-155	EPA 901.1 Modified	9.32E-03	8.65E-02	8.65E-02	1.65E-01	U	pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Holmium-166m	EPA 901.1 Modified	6.01E-02	9.21E-02	9.22E-02	7.55E-02	U	pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Iodine-129	EPA 901.1 Modified	9.68E-03	6.39E-02	6.39E-02	8.69E-02	U	pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Potassium-40	EPA 901.1 Modified	4.31E+00	1.08E+00	1.10E+00	1.03E+00		pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Manganese-54	EPA 901.1 Modified	3.01E-02	5.94E-02	5.94E-02	9.69E-02	U	pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Niobium-94	EPA 901.1 Modified	3.21E-03	2.36E-02	2.36E-02	7.45E-02	U	pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Lead-210	EPA 901.1 Modified	1.39E+00	1.01E+00	1.01E+00	1.64E+00	U	pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Lead-212	EPA 901.1 Modified	2.39E-01	9.40E-02	9.48E-02	2.25E-01		pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Lead-214	EPA 901.1 Modified	5.15E-01	1.54E-01	1.56E-01	2.51E-01		pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Promethium-145	EPA 901.1 Modified	6.97E-03	8.82E-02	8.82E-02	1.19E-01	U	pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Radium-226	EPA 901.1 Modified	4.14E-01	1.47E-01	1.49E-01	2.22E-01		pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Antimony-125	EPA 901.1 Modified	8.24E-02	1.30E-01	1.30E-01	2.19E-01	U	pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Thorium-234	EPA 901.1 Modified	2.90E+00	1.08E+00	1.09E+00	1.69E+00	U	pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Thallium-208	EPA 901.1 Modified	2.64E-01	1.40E-01	1.41E-01	2.52E-01		pCi/g
18-04023-04	DO	B105100AFSFC239CV	03/06/18 09:55	4/5/2018	4/5/2018	18-04023	Uranium-235	EPA 901.1 Modified	5.03E-02	6.20E-01	6.20E-01	3.96E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:		Work Order Details:	
Patricia Giza		SDG:	18-04023
Zion Solutions, LLC		Purchase Order:	677118
101 Shiloh Blvd		Analysis Category:	ENVIRONMENTAL
Zion, IL 60099		Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Actinium-228	EPA 901.1 Modified	6.13E-01	3.67E-01	3.68E-01	6.68E-01	U	pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Silver-108m	EPA 901.1 Modified	4.78E-02	8.36E-02	8.37E-02	1.15E-01	U	pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Americium-241	EPA 901.1 Modified	1.06E-01	1.73E-01	1.73E-01	2.45E-01	U	pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Barium-133	EPA 901.1 Modified	2.73E-02	7.27E-02	7.27E-02	1.58E-01	U	pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Bismuth-214	EPA 901.1 Modified	6.35E-01	2.45E-01	2.47E-01	4.02E-01		pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Cobalt-60	EPA 901.1 Modified	1.38E-01	1.21E-01	1.21E-01	1.91E-01	U	pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Cesium-134	EPA 901.1 Modified	-4.33E-02	5.17E-02	5.17E-02	1.15E-01	U	pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Cesium-137	EPA 901.1 Modified	7.02E-01	1.63E-01	1.67E-01	2.90E-01		pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Europium-152	EPA 901.1 Modified	1.50E-01	2.43E-01	2.43E-01	3.30E-01	U	pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Europium-154	EPA 901.1 Modified	3.79E-02	2.60E-01	2.60E-01	1.65E-01	U	pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Europium-155	EPA 901.1 Modified	2.38E-01	1.87E-01	1.88E-01	2.80E-01	U	pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Holmium-166m	EPA 901.1 Modified	4.89E-03	1.73E-01	1.73E-01	1.35E-01	U	pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Iodine-129	EPA 901.1 Modified	-7.04E-02	1.08E-01	1.08E-01	1.40E-01	U	pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Potassium-40	EPA 901.1 Modified	6.52E+00	1.74E+00	1.77E+00	1.83E+00		pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Manganese-54	EPA 901.1 Modified	-5.08E-03	8.16E-02	8.16E-02	1.32E-01	U	pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Niobium-94	EPA 901.1 Modified	6.12E-04	8.61E-02	8.61E-02	1.27E-01	U	pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Lead-210	EPA 901.1 Modified	2.09E+00	1.42E+00	1.43E+00	2.28E+00	U	pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Lead-212	EPA 901.1 Modified	5.63E-01	1.70E-01	1.72E-01	2.65E-01		pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Lead-214	EPA 901.1 Modified	7.31E-01	2.19E-01	2.23E-01	3.22E-01		pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Promethium-145	EPA 901.1 Modified	3.27E-02	1.19E-01	1.19E-01	1.92E-01	U	pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Radium-226	EPA 901.1 Modified	6.35E-01	2.45E-01	2.47E-01	4.02E-01		pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Antimony-125	EPA 901.1 Modified	4.81E-02	2.05E-01	2.05E-01	3.63E-01	U	pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Thorium-234	EPA 901.1 Modified	1.91E+00	1.80E+00	1.80E+00	2.61E+00	U	pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Thallium-208	EPA 901.1 Modified	5.98E-01	2.73E-01	2.75E-01	4.49E-01		pCi/g
18-04023-05	TRG	B105100AFSFC250CV	03/06/18 09:40	4/5/2018	4/5/2018	18-04023	Uranium-235	EPA 901.1 Modified	-5.53E-01	8.74E-01	8.75E-01	7.58E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04023
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Actinium-228	EPA 901.1 Modified	5.58E-01	4.66E-01	4.67E-01	9.70E-01	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Silver-108m	EPA 901.1 Modified	1.21E-02	1.22E-01	1.22E-01	1.99E-01	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Americium-241	EPA 901.1 Modified	-8.27E-01	2.57E-01	2.60E-01	3.34E-01	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Barium-133	EPA 901.1 Modified	2.58E-03	5.73E-02	5.73E-02	4.08E-01	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Bismuth-214	EPA 901.1 Modified	-2.73E-02	8.37E-02	8.37E-02	6.72E-01	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Cobalt-60	EPA 901.1 Modified	1.17E-01	1.36E-01	1.36E-01	1.56E-01	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Cesium-134	EPA 901.1 Modified	-2.73E-02	7.96E-02	7.96E-02	2.02E-01	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Cesium-137	EPA 901.1 Modified	3.13E-01	1.95E-01	1.95E-01	3.03E-01		pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Europium-152	EPA 901.1 Modified	6.97E-02	4.77E-01	4.77E-01	5.36E-01	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Europium-154	EPA 901.1 Modified	1.05E-01	2.85E-01	2.85E-01	2.77E-01	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Europium-155	EPA 901.1 Modified	8.69E-01	2.79E-01	2.82E-01	4.39E-01	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Holmium-166m	EPA 901.1 Modified	-9.70E-03	2.23E-01	2.23E-01	2.16E-01	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Iodine-129	EPA 901.1 Modified	-5.80E-01	1.05E+00	1.05E+00	1.48E+00	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Potassium-40	EPA 901.1 Modified	5.37E+00	1.65E+00	1.67E+00	1.41E+00		pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Manganese-54	EPA 901.1 Modified	-2.09E-02	8.64E-02	8.64E-02	2.12E-01	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Niobium-94	EPA 901.1 Modified	-4.58E-02	1.28E-01	1.28E-01	1.89E-01	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Lead-210	EPA 901.1 Modified	-6.52E+00	3.07E+00	3.09E+00	4.12E+00	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Lead-212	EPA 901.1 Modified	7.31E-01	4.34E-01	4.35E-01	6.81E-01		pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Lead-214	EPA 901.1 Modified	8.10E-01	3.81E-01	3.83E-01	6.45E-01		pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Promethium-145	EPA 901.1 Modified	7.40E-01	5.59E-01	5.61E-01	8.43E-01	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Radium-226	EPA 901.1 Modified	-2.73E-02	8.37E-02	8.37E-02	6.72E-01	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Antimony-125	EPA 901.1 Modified	-1.18E-02	4.31E-01	4.31E-01	6.57E-01	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Thorium-234	EPA 901.1 Modified	-4.92E+00	1.95E+00	1.96E+00	3.09E+00	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Thallium-208	EPA 901.1 Modified	5.89E-01	4.81E-01	4.82E-01	8.24E-01	U	pCi/g
18-04023-06	TRG	B105100AFSFC255CV	03/06/18 12:46	4/5/2018	4/5/2018	18-04023	Uranium-235	EPA 901.1 Modified	-1.05E+00	2.11E+00	2.11E+00	1.18E+00	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

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Patricia Giza		SDG:	18-04023
Zion Solutions, LLC		Purchase Order:	677118
101 Shiloh Blvd		Analysis Category:	ENVIRONMENTAL
Zion, IL 60099		Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Actinium-228	EPA 901.1 Modified	6.80E-01	4.72E-01	4.73E-01	9.54E-01	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Silver-108m	EPA 901.1 Modified	1.27E-02	4.76E-02	4.77E-02	1.28E-01	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Americium-241	EPA 901.1 Modified	3.41E-01	1.82E-01	1.83E-01	2.93E-01	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Barium-133	EPA 901.1 Modified	8.61E-03	6.89E-02	6.89E-02	1.82E-01	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Bismuth-214	EPA 901.1 Modified	7.47E-01	2.67E-01	2.69E-01	3.92E-01		pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Cobalt-60	EPA 901.1 Modified	9.66E-02	1.17E-01	1.17E-01	1.95E-01	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Cesium-134	EPA 901.1 Modified	-2.35E-02	5.74E-02	5.74E-02	1.32E-01	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Cesium-137	EPA 901.1 Modified	4.88E-01	2.04E-01	2.06E-01	2.91E-01		pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Europium-152	EPA 901.1 Modified	3.48E-02	2.35E-01	2.35E-01	3.74E-01	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Europium-154	EPA 901.1 Modified	1.46E-01	2.05E-01	2.05E-01	1.75E-01	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Europium-155	EPA 901.1 Modified	1.10E-01	2.17E-01	2.17E-01	3.02E-01	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Holmium-166m	EPA 901.1 Modified	-1.05E-01	2.08E-01	2.08E-01	1.52E-01	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Iodine-129	EPA 901.1 Modified	-5.16E-02	1.25E-01	1.26E-01	1.66E-01	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Potassium-40	EPA 901.1 Modified	4.55E+00	1.67E+00	1.68E+00	1.91E+00		pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Manganese-54	EPA 901.1 Modified	3.42E-02	1.12E-01	1.12E-01	1.90E-01	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Niobium-94	EPA 901.1 Modified	1.18E-02	8.66E-02	8.66E-02	1.47E-01	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Lead-210	EPA 901.1 Modified	2.03E+00	1.24E+00	1.25E+00	2.29E+00	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Lead-212	EPA 901.1 Modified	3.46E-01	1.68E-01	1.69E-01	5.21E-01	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Lead-214	EPA 901.1 Modified	8.00E-01	2.75E-01	2.78E-01	5.77E-01		pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Promethium-145	EPA 901.1 Modified	2.21E-02	1.50E-01	1.50E-01	2.35E-01	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Radium-226	EPA 901.1 Modified	7.47E-01	2.67E-01	2.69E-01	3.92E-01		pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Antimony-125	EPA 901.1 Modified	-8.17E-02	2.43E-01	2.43E-01	4.01E-01	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Thorium-234	EPA 901.1 Modified	-1.45E+00	2.21E+00	2.21E+00	2.73E+00	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Thallium-208	EPA 901.1 Modified	1.71E-01	2.92E-01	2.92E-01	5.33E-01	U	pCi/g
18-04023-07	TRG	B105100AFSFC263CV	03/06/18 09:30	4/5/2018	4/5/2018	18-04023	Uranium-235	EPA 901.1 Modified	-2.03E+00	1.77E+00	1.77E+00	7.95E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

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Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04023
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Actinium-228	EPA 901.1 Modified	1.78E-01	6.11E-01	6.12E-01	9.86E-01	U	pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Silver-108m	EPA 901.1 Modified	4.12E-03	1.57E-01	1.57E-01	2.40E-01	U	pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Americium-241	EPA 901.1 Modified	-5.15E-02	6.10E-02	6.10E-02	3.89E-01	U	pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Barium-133	EPA 901.1 Modified	1.17E+00	3.84E-01	3.89E-01	4.63E-01	U	pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Bismuth-214	EPA 901.1 Modified	1.13E+00	3.79E-01	3.83E-01	5.61E-01		pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Cobalt-60	EPA 901.1 Modified	-1.44E-02	1.48E-01	1.48E-01	1.73E-01	U	pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Cesium-134	EPA 901.1 Modified	-2.86E-02	4.07E-02	4.07E-02	2.72E-01	U	pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Cesium-137	EPA 901.1 Modified	-1.74E-02	1.95E-01	1.95E-01	2.88E-01	U	pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Europium-152	EPA 901.1 Modified	1.31E+00	9.21E-01	9.23E-01	6.02E-01	U	pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Europium-154	EPA 901.1 Modified	1.38E-01	1.82E-01	1.83E-01	3.07E-01	U	pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Europium-155	EPA 901.1 Modified	9.88E-01	3.22E-01	3.26E-01	5.05E-01	U	pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Holmium-166m	EPA 901.1 Modified	3.22E-01	2.23E-01	2.23E-01	2.48E-01	U	pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Iodine-129	EPA 901.1 Modified	-1.28E+00	1.29E+00	1.29E+00	1.67E+00	U	pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Potassium-40	EPA 901.1 Modified	5.59E+00	1.98E+00	2.00E+00	2.23E+00		pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Manganese-54	EPA 901.1 Modified	-2.02E-03	6.74E-02	6.74E-02	2.38E-01	U	pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Niobium-94	EPA 901.1 Modified	2.34E-02	1.30E-01	1.30E-01	2.16E-01	U	pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Lead-210	EPA 901.1 Modified	-3.13E-01	2.60E+00	2.60E+00	4.71E+00	U	pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Lead-212	EPA 901.1 Modified	1.03E+00	4.20E-01	4.24E-01	6.05E-01		pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Lead-214	EPA 901.1 Modified	2.34E+00	7.22E-01	7.31E-01	1.20E+00		pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Promethium-145	EPA 901.1 Modified	6.17E-01	6.28E-01	6.28E-01	9.46E-01	U	pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Radium-226	EPA 901.1 Modified	1.13E+00	3.79E-01	3.83E-01	5.61E-01		pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Antimony-125	EPA 901.1 Modified	-3.13E-02	4.90E-01	4.90E-01	7.38E-01	U	pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Thorium-234	EPA 901.1 Modified	-8.51E+00	2.79E+00	2.83E+00	3.62E+00	U	pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Thallium-208	EPA 901.1 Modified	7.27E-01	3.50E-01	3.52E-01	1.48E-01		pCi/g
18-04023-08	TRG	B105100AFSFC276CV	03/05/18 13:42	4/5/2018	4/5/2018	18-04023	Uranium-235	EPA 901.1 Modified	4.95E-01	2.41E+00	2.41E+00	1.33E+00	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:
Patricia Giza
Zion Solutions, LLC
101 Shiloh Blvd
Zion, IL 60099

Work Order Details:
SDG: 18-04023
Purchase Order: 677118
Analysis Category: ENVIRONMENTAL
Sample Matrix: SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Actinium-228	EPA 901.1 Modified	4.22E-01	6.29E-01	6.29E-01	1.15E+00	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Silver-108m	EPA 901.1 Modified	-9.15E-02	1.56E-01	1.56E-01	1.84E-01	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Americium-241	EPA 901.1 Modified	-3.32E-01	2.14E-01	2.15E-01	2.67E-01	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Barium-133	EPA 901.1 Modified	8.35E-03	1.16E-01	1.16E-01	3.02E-01	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Bismuth-214	EPA 901.1 Modified	6.33E-01	4.62E-01	4.63E-01	7.21E-01	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Cobalt-60	EPA 901.1 Modified	1.11E-01	1.50E-01	1.50E-01	2.70E-01	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Cesium-134	EPA 901.1 Modified	9.71E-03	7.67E-02	7.67E-02	2.64E-01	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Cesium-137	EPA 901.1 Modified	3.85E-01	2.72E-01	2.73E-01	4.28E-01	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Europium-152	EPA 901.1 Modified	-3.24E-01	5.62E-01	5.63E-01	3.94E-01	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Europium-154	EPA 901.1 Modified	-2.84E-01	5.10E-01	5.10E-01	1.96E-01	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Europium-155	EPA 901.1 Modified	4.13E-02	1.50E-01	1.50E-01	2.93E-01	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Holmium-166m	EPA 901.1 Modified	-2.18E-02	2.82E-01	2.82E-01	1.71E-01	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Iodine-129	EPA 901.1 Modified	-3.11E-02	7.89E-02	7.90E-02	1.14E-01	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Potassium-40	EPA 901.1 Modified	5.42E+00	2.29E+00	2.31E+00	2.65E+00		pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Manganese-54	EPA 901.1 Modified	7.36E-02	1.47E-01	1.47E-01	2.70E-01	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Niobium-94	EPA 901.1 Modified	4.82E-02	1.44E-01	1.44E-01	2.23E-01	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Lead-210	EPA 901.1 Modified	2.07E+00	1.39E+00	1.39E+00	2.30E+00	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Lead-212	EPA 901.1 Modified	5.06E-01	2.03E-01	2.04E-01	4.54E-01		pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Lead-214	EPA 901.1 Modified	4.95E-01	3.05E-01	3.06E-01	4.50E-01		pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Promethium-145	EPA 901.1 Modified	-3.97E-03	1.47E-01	1.47E-01	2.17E-01	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Radium-226	EPA 901.1 Modified	6.33E-01	4.62E-01	4.63E-01	7.21E-01	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Antimony-125	EPA 901.1 Modified	3.52E-01	3.65E-01	3.65E-01	6.02E-01	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Thorium-234	EPA 901.1 Modified	2.84E+00	1.75E+00	1.76E+00	2.89E+00	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Thallium-208	EPA 901.1 Modified	8.20E-01	5.27E-01	5.29E-01	9.39E-01	U	pCi/g
18-04023-09	TRG	B105100AFSFC282CV	03/06/18 08:52	4/5/2018	4/5/2018	18-04023	Uranium-235	EPA 901.1 Modified	1.30E-03	1.57E+00	1.57E+00	8.03E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04023
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Actinium-228	EPA 901.1 Modified	1.71E-01	4.00E-01	4.01E-01	6.64E-01	U	pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Silver-108m	EPA 901.1 Modified	3.05E-02	6.81E-02	6.81E-02	1.36E-01	U	pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Americium-241	EPA 901.1 Modified	-2.53E-01	2.17E-01	2.18E-01	2.42E-01	U	pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Barium-133	EPA 901.1 Modified	-5.61E-02	1.89E-01	1.89E-01	2.26E-01	U	pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Bismuth-214	EPA 901.1 Modified	6.41E-01	2.76E-01	2.78E-01	4.25E-01		pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Cobalt-60	EPA 901.1 Modified	2.56E-01	8.54E-02	8.64E-02	1.44E-01		pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Cesium-134	EPA 901.1 Modified	2.20E-03	5.64E-02	5.64E-02	1.49E-01	U	pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Cesium-137	EPA 901.1 Modified	1.08E+00	2.45E-01	2.51E-01	2.76E-01		pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Europium-152	EPA 901.1 Modified	-2.23E-02	2.17E-01	2.17E-01	3.27E-01	U	pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Europium-154	EPA 901.1 Modified	1.22E-01	2.55E-01	2.55E-01	1.62E-01	U	pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Europium-155	EPA 901.1 Modified	-3.15E-02	1.74E-01	1.74E-01	2.81E-01	U	pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Holmium-166m	EPA 901.1 Modified	1.61E-02	1.67E-01	1.67E-01	1.46E-01	U	pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Iodine-129	EPA 901.1 Modified	-9.79E-02	1.52E-01	1.52E-01	1.84E-01	U	pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Potassium-40	EPA 901.1 Modified	6.64E+00	1.63E+00	1.67E+00	1.21E+00		pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Manganese-54	EPA 901.1 Modified	7.41E-02	1.02E-01	1.03E-01	1.77E-01	U	pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Niobium-94	EPA 901.1 Modified	2.90E-02	9.85E-02	9.85E-02	1.39E-01	U	pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Lead-210	EPA 901.1 Modified	1.86E+00	1.60E+00	1.61E+00	2.37E+00	U	pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Lead-212	EPA 901.1 Modified	4.15E-01	2.20E-01	2.21E-01	3.36E-01		pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Lead-214	EPA 901.1 Modified	7.50E-01	2.80E-01	2.83E-01	5.18E-01		pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Promethium-145	EPA 901.1 Modified	-9.74E-02	9.54E-02	9.56E-02	2.05E-01	U	pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Radium-226	EPA 901.1 Modified	6.41E-01	2.76E-01	2.78E-01	4.25E-01		pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Antimony-125	EPA 901.1 Modified	-1.07E-03	3.01E-01	3.01E-01	4.54E-01	U	pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Thorium-234	EPA 901.1 Modified	3.37E+00	1.86E+00	1.87E+00	2.78E+00	U	pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Thallium-208	EPA 901.1 Modified	4.45E-01	2.77E-01	2.78E-01	5.66E-01	U	pCi/g
18-04023-10	TRG	B105100AFSFC289CV	03/05/18 13:52	4/5/2018	4/6/2018	18-04023	Uranium-235	EPA 901.1 Modified	2.00E-01	1.05E+00	1.05E+00	6.59E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04023
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Actinium-228	EPA 901.1 Modified	1.85E-01	5.52E-01	5.52E-01	9.76E-01	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Silver-108m	EPA 901.1 Modified	-4.37E-02	1.51E-01	1.51E-01	2.39E-01	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Americium-241	EPA 901.1 Modified	-1.82E-01	3.41E-01	3.41E-01	4.78E-01	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Barium-133	EPA 901.1 Modified	-7.61E-03	3.12E-01	3.12E-01	5.08E-01	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Bismuth-214	EPA 901.1 Modified	5.55E-01	6.54E-01	6.55E-01	9.67E-01	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Cobalt-60	EPA 901.1 Modified	-4.19E-02	1.68E-01	1.68E-01	2.25E-01	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Cesium-134	EPA 901.1 Modified	-6.79E-03	1.28E-01	1.28E-01	2.28E-01	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Cesium-137	EPA 901.1 Modified	6.79E+01	8.26E+00	8.96E+00	6.37E-01		pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Europium-152	EPA 901.1 Modified	8.90E-01	1.22E+00	1.22E+00	8.46E-01	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Europium-154	EPA 901.1 Modified	8.89E-02	3.78E-01	3.78E-01	4.33E-01	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Europium-155	EPA 901.1 Modified	1.13E-01	3.79E-01	3.79E-01	5.52E-01	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Holmium-166m	EPA 901.1 Modified	-1.10E-01	3.09E-01	3.09E-01	3.46E-01	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Iodine-129	EPA 901.1 Modified	1.10E+00	2.03E-01	2.11E-01	3.27E-01	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Potassium-40	EPA 901.1 Modified	6.78E+00	2.50E+00	2.52E+00	2.86E+00		pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Manganese-54	EPA 901.1 Modified	5.52E-02	1.62E-01	1.62E-01	2.82E-01	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Niobium-94	EPA 901.1 Modified	1.60E-02	1.20E-01	1.20E-01	2.10E-01	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Lead-210	EPA 901.1 Modified	1.59E-01	1.22E+00	1.22E+00	4.31E+00	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Lead-212	EPA 901.1 Modified	5.04E-01	4.58E-01	4.58E-01	6.88E-01	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Lead-214	EPA 901.1 Modified	9.69E-01	9.01E-01	9.02E-01	1.47E+00	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Promethium-145	EPA 901.1 Modified	-1.75E+00	5.18E-01	5.26E-01	5.22E-01	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Radium-226	EPA 901.1 Modified	5.55E-01	6.54E-01	6.55E-01	9.67E-01	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Antimony-125	EPA 901.1 Modified	-3.75E-02	1.68E+00	1.68E+00	2.23E+00	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Thorium-234	EPA 901.1 Modified	2.13E-01	3.13E+00	3.13E+00	4.58E+00	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Thallium-208	EPA 901.1 Modified	6.37E-01	9.73E-01	9.74E-01	1.42E+00	U	pCi/g
18-04023-11	TRG	B105100AFSFC293CV	02/07/18 13:45	4/5/2018	4/6/2018	18-04023	Uranium-235	EPA 901.1 Modified	2.18E+00	3.93E+00	3.93E+00	1.83E+00	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:		Work Order Details:	
Patricia Giza		SDG:	18-04023
Zion Solutions, LLC		Purchase Order:	677118
101 Shiloh Blvd		Analysis Category:	ENVIRONMENTAL
Zion, IL 60099		Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Actinium-228	EPA 901.1 Modified	1.09E+00	5.35E-01	5.38E-01	9.28E-01		pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Silver-108m	EPA 901.1 Modified	-1.43E-01	1.75E-01	1.75E-01	1.72E-01	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Americium-241	EPA 901.1 Modified	6.39E-02	2.38E-01	2.38E-01	3.23E-01	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Barium-133	EPA 901.1 Modified	-1.01E-01	1.92E-01	1.92E-01	2.36E-01	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Bismuth-214	EPA 901.1 Modified	5.93E-01	3.33E-01	3.35E-01	6.57E-01	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Cobalt-60	EPA 901.1 Modified	5.98E-02	1.52E-01	1.52E-01	1.89E-01	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Cesium-134	EPA 901.1 Modified	6.93E-02	8.40E-02	8.41E-02	2.14E-01	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Cesium-137	EPA 901.1 Modified	9.37E-01	2.45E-01	2.50E-01	2.56E-01		pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Europium-152	EPA 901.1 Modified	4.36E-01	4.46E-01	4.46E-01	4.37E-01	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Europium-154	EPA 901.1 Modified	-1.01E-01	4.05E-01	4.05E-01	2.27E-01	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Europium-155	EPA 901.1 Modified	2.94E-01	2.40E-01	2.40E-01	3.66E-01	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Holmium-166m	EPA 901.1 Modified	3.02E-02	9.51E-02	9.51E-02	1.81E-01	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Iodine-129	EPA 901.1 Modified	-8.29E-02	1.64E-01	1.64E-01	1.97E-01	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Potassium-40	EPA 901.1 Modified	8.46E+00	2.24E+00	2.28E+00	1.53E+00		pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Manganese-54	EPA 901.1 Modified	-1.36E-01	1.78E-01	1.78E-01	2.19E-01	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Niobium-94	EPA 901.1 Modified	-8.96E-02	1.22E-01	1.22E-01	1.42E-01	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Lead-210	EPA 901.1 Modified	1.42E+00	1.64E+00	1.64E+00	2.83E+00	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Lead-212	EPA 901.1 Modified	3.44E-01	2.40E-01	2.41E-01	3.65E-01	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Lead-214	EPA 901.1 Modified	3.62E-01	2.40E-01	2.41E-01	4.18E-01	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Promethium-145	EPA 901.1 Modified	9.61E-02	1.60E-01	1.60E-01	2.71E-01	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Radium-226	EPA 901.1 Modified	5.93E-01	3.33E-01	3.35E-01	6.57E-01	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Antimony-125	EPA 901.1 Modified	1.05E-01	2.92E-01	2.92E-01	5.32E-01	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Thorium-234	EPA 901.1 Modified	-1.22E+00	2.65E+00	2.65E+00	3.21E+00	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Thallium-208	EPA 901.1 Modified	3.30E-01	3.09E-01	3.10E-01	7.16E-01	U	pCi/g
18-04023-12	TRG	B105100AFSFC300CV	02/13/18 12:50	4/5/2018	4/6/2018	18-04023	Uranium-235	EPA 901.1 Modified	8.98E-01	1.76E+00	1.76E+00	1.04E+00	U	pCi/g

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Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04023
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Actinium-228	EPA 901.1 Modified	6.59E-01	5.23E-01	5.24E-01	1.00E+00	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Silver-108m	EPA 901.1 Modified	2.14E-01	1.60E-01	1.61E-01	2.72E-01	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Americium-241	EPA 901.1 Modified	-8.17E-01	2.88E-01	2.91E-01	4.01E-01	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Barium-133	EPA 901.1 Modified	-9.19E-03	1.15E-01	1.15E-01	4.79E-01	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Bismuth-214	EPA 901.1 Modified	-1.55E-01	1.93E-01	1.93E-01	7.15E-01	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Cobalt-60	EPA 901.1 Modified	1.78E-02	7.91E-02	7.91E-02	2.89E-01	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Cesium-134	EPA 901.1 Modified	-1.30E-01	1.36E-01	1.36E-01	2.79E-01	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Cesium-137	EPA 901.1 Modified	1.22E+00	3.07E-01	3.13E-01	3.55E-01		pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Europium-152	EPA 901.1 Modified	1.82E+00	1.00E+00	1.01E+00	6.57E-01	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Europium-154	EPA 901.1 Modified	1.22E-01	4.12E-01	4.12E-01	3.39E-01	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Europium-155	EPA 901.1 Modified	2.61E-01	1.71E-01	1.72E-01	4.60E-01	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Holmium-166m	EPA 901.1 Modified	-4.08E-01	3.56E-01	3.57E-01	2.73E-01	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Iodine-129	EPA 901.1 Modified	-3.43E+00	1.99E+00	2.00E+00	1.87E+00	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Potassium-40	EPA 901.1 Modified	6.52E+00	1.90E+00	1.93E+00	1.11E+00		pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Manganese-54	EPA 901.1 Modified	-1.52E-02	1.68E-01	1.68E-01	2.61E-01	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Niobium-94	EPA 901.1 Modified	1.44E-02	1.40E-01	1.40E-01	2.32E-01	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Lead-210	EPA 901.1 Modified	-7.44E+00	3.82E+00	3.83E+00	5.15E+00	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Lead-212	EPA 901.1 Modified	8.80E-01	3.55E-01	3.57E-01	4.96E-01		pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Lead-214	EPA 901.1 Modified	-9.55E-02	7.75E-02	7.77E-02	7.60E-01	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Promethium-145	EPA 901.1 Modified	1.22E+00	7.16E-01	7.19E-01	1.07E+00	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Radium-226	EPA 901.1 Modified	-1.55E-01	1.93E-01	1.93E-01	7.15E-01	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Antimony-125	EPA 901.1 Modified	-4.10E-01	5.98E-01	5.98E-01	8.25E-01	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Thorium-234	EPA 901.1 Modified	-4.21E+00	2.14E+00	2.15E+00	3.77E+00	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Thallium-208	EPA 901.1 Modified	1.12E+00	5.67E-01	5.70E-01	8.72E-01	U	pCi/g
18-04023-13	TRG	B105100AFSFC316CV	03/05/18 13:58	4/5/2018	4/6/2018	18-04023	Uranium-235	EPA 901.1 Modified	-5.50E-01	2.72E+00	2.72E+00	1.46E+00	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04023
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Actinium-228	EPA 901.1 Modified	5.30E-02	5.39E-01	5.39E-01	8.77E-01	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Silver-108m	EPA 901.1 Modified	4.90E-02	1.20E-01	1.20E-01	1.66E-01	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Americium-241	EPA 901.1 Modified	-1.53E-01	1.57E-01	1.57E-01	2.10E-01	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Barium-133	EPA 901.1 Modified	1.79E-01	1.84E-01	1.84E-01	2.32E-01	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Bismuth-214	EPA 901.1 Modified	2.84E-01	3.41E-01	3.42E-01	5.42E-01	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Cobalt-60	EPA 901.1 Modified	1.59E-02	1.51E-01	1.51E-01	2.20E-01	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Cesium-134	EPA 901.1 Modified	8.07E-03	1.06E-01	1.06E-01	2.19E-01	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Cesium-137	EPA 901.1 Modified	1.49E-01	1.20E-01	1.20E-01	1.85E-01	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Europium-152	EPA 901.1 Modified	-4.68E-02	3.37E-01	3.37E-01	3.26E-01	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Europium-154	EPA 901.1 Modified	9.66E-02	2.93E-01	2.93E-01	1.69E-01	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Europium-155	EPA 901.1 Modified	-6.04E-02	1.76E-01	1.76E-01	2.40E-01	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Holmium-166m	EPA 901.1 Modified	-1.40E-01	2.97E-01	2.97E-01	1.15E-01	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Iodine-129	EPA 901.1 Modified	1.78E-02	6.26E-02	6.26E-02	9.50E-02	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Potassium-40	EPA 901.1 Modified	6.51E+00	1.85E+00	1.88E+00	7.81E-01		pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Manganese-54	EPA 901.1 Modified	4.86E-02	1.15E-01	1.15E-01	2.11E-01	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Niobium-94	EPA 901.1 Modified	5.54E-02	1.10E-01	1.10E-01	2.03E-01	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Lead-210	EPA 901.1 Modified	1.07E+00	1.08E+00	1.08E+00	1.73E+00	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Lead-212	EPA 901.1 Modified	3.52E-01	1.64E-01	1.65E-01	2.85E-01	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Lead-214	EPA 901.1 Modified	5.15E-01	2.64E-01	2.65E-01	4.29E-01		pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Promethium-145	EPA 901.1 Modified	3.87E-02	1.01E-01	1.01E-01	1.54E-01	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Radium-226	EPA 901.1 Modified	2.84E-01	3.41E-01	3.42E-01	5.42E-01	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Antimony-125	EPA 901.1 Modified	-2.29E-03	3.72E-01	3.72E-01	5.28E-01	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Thorium-234	EPA 901.1 Modified	2.20E+00	1.30E+00	1.31E+00	2.17E+00	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Thallium-208	EPA 901.1 Modified	5.08E-01	3.77E-01	3.78E-01	6.72E-01	U	pCi/g
18-04023-14	TRG	B105100AFSFC321CV	02/13/18 14:10	4/5/2018	4/6/2018	18-04023	Uranium-235	EPA 901.1 Modified	-7.23E-01	1.27E+00	1.27E+00	6.68E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04023
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Actinium-228	EPA 901.1 Modified	7.06E-01	4.77E-01	4.78E-01	8.98E-01	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Silver-108m	EPA 901.1 Modified	7.74E-02	1.20E-01	1.20E-01	2.02E-01	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Americium-241	EPA 901.1 Modified	-5.34E-01	2.22E-01	2.24E-01	3.04E-01	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Barium-133	EPA 901.1 Modified	-1.48E-01	1.29E-01	1.29E-01	3.02E-01	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Bismuth-214	EPA 901.1 Modified	3.03E-01	3.16E-01	3.16E-01	5.45E-01	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Cobalt-60	EPA 901.1 Modified	2.12E-02	1.41E-01	1.41E-01	1.71E-01	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Cesium-134	EPA 901.1 Modified	-7.73E-03	4.68E-02	4.68E-02	2.47E-01	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Cesium-137	EPA 901.1 Modified	6.98E-02	1.64E-01	1.64E-01	2.60E-01	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Europium-152	EPA 901.1 Modified	3.53E-01	3.59E-01	3.60E-01	5.12E-01	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Europium-154	EPA 901.1 Modified	-7.06E-02	3.27E-01	3.27E-01	2.61E-01	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Europium-155	EPA 901.1 Modified	6.17E-01	2.43E-01	2.45E-01	3.90E-01	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Holmium-166m	EPA 901.1 Modified	-1.66E-01	2.24E-01	2.24E-01	1.86E-01	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Iodine-129	EPA 901.1 Modified	-7.21E-01	8.81E-01	8.82E-01	1.41E+00	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Potassium-40	EPA 901.1 Modified	6.57E+00	2.07E+00	2.10E+00	2.32E+00		pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Manganese-54	EPA 901.1 Modified	6.22E-02	1.22E-01	1.22E-01	2.16E-01	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Niobium-94	EPA 901.1 Modified	-1.19E-01	1.44E-01	1.45E-01	1.59E-01	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Lead-210	EPA 901.1 Modified	9.60E-01	2.38E+00	2.38E+00	3.89E+00	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Lead-212	EPA 901.1 Modified	5.53E-01	3.05E-01	3.06E-01	4.68E-01		pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Lead-214	EPA 901.1 Modified	3.44E-01	3.57E-01	3.57E-01	5.78E-01	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Promethium-145	EPA 901.1 Modified	-4.31E-02	2.97E-01	2.97E-01	7.98E-01	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Radium-226	EPA 901.1 Modified	3.03E-01	3.16E-01	3.16E-01	5.45E-01	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Antimony-125	EPA 901.1 Modified	2.97E-01	4.11E-01	4.11E-01	6.65E-01	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Thorium-234	EPA 901.1 Modified	4.61E+00	1.62E+00	1.64E+00	6.52E+00	U	pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Thallium-208	EPA 901.1 Modified	4.13E-01	2.29E-01	2.30E-01	1.32E-01		pCi/g
18-04023-15	TRG	B105100AFSFC326CV	02/14/18 08:15	4/5/2018	4/6/2018	18-04023	Uranium-235	EPA 901.1 Modified	5.24E-01	1.90E+00	1.90E+00	1.10E+00	U	pCi/g

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Eberline Analytical
Final Report of Analysis

Report To:		Work Order Details:	
Patricia Giza		SDG:	18-04023
Zion Solutions, LLC		Purchase Order:	677118
101 Shiloh Blvd		Analysis Category:	ENVIRONMENTAL
Zion, IL 60099		Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Actinium-228	EPA 901.1 Modified	4.03E-01	3.11E-01	3.11E-01	6.21E-01	U	pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Silver-108m	EPA 901.1 Modified	-2.69E-02	1.08E-01	1.08E-01	1.49E-01	U	pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Americium-241	EPA 901.1 Modified	-6.27E-02	2.05E-01	2.05E-01	2.61E-01	U	pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Barium-133	EPA 901.1 Modified	-3.11E-02	1.69E-01	1.69E-01	2.15E-01	U	pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Bismuth-214	EPA 901.1 Modified	8.81E-01	2.90E-01	2.93E-01	4.51E-01		pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Cobalt-60	EPA 901.1 Modified	1.17E-01	1.35E-01	1.35E-01	2.37E-01	U	pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Cesium-134	EPA 901.1 Modified	1.38E-02	6.18E-02	6.18E-02	1.55E-01	U	pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Cesium-137	EPA 901.1 Modified	3.97E+00	5.20E-01	5.58E-01	2.64E-01		pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Europium-152	EPA 901.1 Modified	3.85E-01	4.50E-01	4.50E-01	3.51E-01	U	pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Europium-154	EPA 901.1 Modified	-7.31E-02	2.69E-01	2.69E-01	1.80E-01	U	pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Europium-155	EPA 901.1 Modified	1.51E-01	2.23E-01	2.23E-01	3.13E-01	U	pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Holmium-166m	EPA 901.1 Modified	3.86E-02	1.90E-01	1.90E-01	1.49E-01	U	pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Iodine-129	EPA 901.1 Modified	-4.35E-01	2.15E-01	2.16E-01	1.66E-01	U	pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Potassium-40	EPA 901.1 Modified	6.98E+00	1.96E+00	2.00E+00	2.00E+00		pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Manganese-54	EPA 901.1 Modified	2.16E-02	1.16E-01	1.16E-01	1.89E-01	U	pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Niobium-94	EPA 901.1 Modified	-4.53E-02	1.20E-01	1.20E-01	1.42E-01	U	pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Lead-210	EPA 901.1 Modified	1.60E+00	1.33E+00	1.33E+00	2.31E+00	U	pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Lead-212	EPA 901.1 Modified	2.60E-01	2.22E-01	2.23E-01	3.22E-01	U	pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Lead-214	EPA 901.1 Modified	9.16E-01	3.89E-01	3.92E-01	8.24E-01		pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Promethium-145	EPA 901.1 Modified	1.11E-01	1.42E-01	1.43E-01	2.40E-01	U	pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Radium-226	EPA 901.1 Modified	8.81E-01	2.90E-01	2.93E-01	4.51E-01		pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Antimony-125	EPA 901.1 Modified	4.77E-02	3.16E-01	3.16E-01	5.29E-01	U	pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Thorium-234	EPA 901.1 Modified	2.04E+00	1.79E+00	1.80E+00	2.95E+00	U	pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Thallium-208	EPA 901.1 Modified	2.46E-01	2.75E-01	2.75E-01	5.20E-01	U	pCi/g
18-04023-16	TRG	B105100AFSFC329CV	03/05/18 14:18	4/5/2018	4/6/2018	18-04023	Uranium-235	EPA 901.1 Modified	-5.38E-01	1.58E+00	1.58E+00	7.84E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:		Work Order Details:	
Patricia Giza		SDG:	18-04023
Zion Solutions, LLC		Purchase Order:	677118
101 Shiloh Blvd		Analysis Category:	ENVIRONMENTAL
Zion, IL 60099		Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Actinium-228	EPA 901.1 Modified	3.04E-01	3.61E-01	3.61E-01	6.37E-01	U	pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Silver-108m	EPA 901.1 Modified	2.13E-02	6.79E-02	6.80E-02	1.39E-01	U	pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Americium-241	EPA 901.1 Modified	-5.26E-01	2.57E-01	2.59E-01	2.33E-01	U	pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Barium-133	EPA 901.1 Modified	1.34E-02	6.84E-02	6.84E-02	2.27E-01	U	pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Bismuth-214	EPA 901.1 Modified	7.40E-01	2.40E-01	2.43E-01	4.07E-01		pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Cobalt-60	EPA 901.1 Modified	7.43E-02	8.48E-02	8.49E-02	1.59E-01	U	pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Cesium-134	EPA 901.1 Modified	2.55E-02	5.65E-02	5.65E-02	1.52E-01	U	pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Cesium-137	EPA 901.1 Modified	1.99E+00	2.98E-01	3.15E-01	3.23E-01		pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Europium-152	EPA 901.1 Modified	-3.25E-02	3.82E-01	3.82E-01	3.31E-01	U	pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Europium-154	EPA 901.1 Modified	4.88E-03	2.58E-01	2.58E-01	1.74E-01	U	pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Europium-155	EPA 901.1 Modified	2.03E-01	1.69E-01	1.69E-01	2.93E-01	U	pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Holmium-166m	EPA 901.1 Modified	2.33E-02	1.60E-01	1.60E-01	1.38E-01	U	pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Iodine-129	EPA 901.1 Modified	4.53E-02	1.42E-01	1.42E-01	1.91E-01	U	pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Potassium-40	EPA 901.1 Modified	7.28E+00	2.02E+00	2.05E+00	2.29E+00		pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Manganese-54	EPA 901.1 Modified	-3.79E-02	9.35E-02	9.35E-02	1.37E-01	U	pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Niobium-94	EPA 901.1 Modified	-2.26E-02	9.27E-02	9.27E-02	1.29E-01	U	pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Lead-210	EPA 901.1 Modified	5.73E-02	1.74E+00	1.74E+00	2.25E+00	U	pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Lead-212	EPA 901.1 Modified	3.06E-01	1.49E-01	1.49E-01	4.24E-01	U	pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Lead-214	EPA 901.1 Modified	8.58E-01	2.53E-01	2.57E-01	4.69E-01		pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Promethium-145	EPA 901.1 Modified	5.36E-02	1.77E-01	1.77E-01	2.40E-01	U	pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Radium-226	EPA 901.1 Modified	7.40E-01	2.40E-01	2.43E-01	4.07E-01		pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Antimony-125	EPA 901.1 Modified	-1.21E-02	3.09E-01	3.09E-01	4.69E-01	U	pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Thorium-234	EPA 901.1 Modified	4.04E+00	1.98E+00	1.99E+00	2.89E+00	U	pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Thallium-208	EPA 901.1 Modified	2.23E-01	2.95E-01	2.95E-01	5.03E-01	U	pCi/g
18-04023-17	TRG	B105100AFSFC332CV	03/05/18 14:05	4/5/2018	4/6/2018	18-04023	Uranium-235	EPA 901.1 Modified	4.74E-01	1.06E+00	1.06E+00	7.00E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04023
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Actinium-228	EPA 901.1 Modified	1.34E-01	3.54E-01	3.54E-01	6.01E-01	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Silver-108m	EPA 901.1 Modified	-8.38E-02	1.13E-01	1.13E-01	1.08E-01	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Americium-241	EPA 901.1 Modified	-3.21E-01	2.31E-01	2.31E-01	2.28E-01	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Barium-133	EPA 901.1 Modified	-9.63E-03	5.95E-02	5.95E-02	1.99E-01	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Bismuth-214	EPA 901.1 Modified	6.80E-01	2.37E-01	2.39E-01	5.44E-01		pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Cobalt-60	EPA 901.1 Modified	2.70E-02	7.95E-02	7.95E-02	1.23E-01	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Cesium-134	EPA 901.1 Modified	-5.06E-01	2.41E-01	2.43E-01	1.60E-01	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Cesium-137	EPA 901.1 Modified	1.02E-01	7.76E-02	7.78E-02	2.35E-01	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Europium-152	EPA 901.1 Modified	-3.38E-02	3.29E-01	3.29E-01	3.23E-01	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Europium-154	EPA 901.1 Modified	2.94E-02	1.79E-01	1.79E-01	1.61E-01	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Europium-155	EPA 901.1 Modified	1.09E-01	1.61E-01	1.61E-01	2.73E-01	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Holmium-166m	EPA 901.1 Modified	3.05E-02	1.64E-01	1.64E-01	1.32E-01	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Iodine-129	EPA 901.1 Modified	3.56E-02	1.29E-01	1.29E-01	1.73E-01	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Potassium-40	EPA 901.1 Modified	5.52E+00	1.56E+00	1.59E+00	1.38E+00		pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Manganese-54	EPA 901.1 Modified	2.05E-02	9.50E-02	9.50E-02	1.58E-01	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Niobium-94	EPA 901.1 Modified	3.40E-03	3.71E-02	3.71E-02	1.24E-01	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Lead-210	EPA 901.1 Modified	1.37E+00	1.69E+00	1.69E+00	2.40E+00	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Lead-212	EPA 901.1 Modified	4.22E-01	1.61E-01	1.63E-01	3.16E-01		pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Lead-214	EPA 901.1 Modified	8.27E-01	2.55E-01	2.59E-01	4.03E-01		pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Promethium-145	EPA 901.1 Modified	6.53E-02	1.59E-01	1.59E-01	2.23E-01	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Radium-226	EPA 901.1 Modified	6.80E-01	2.37E-01	2.39E-01	5.44E-01		pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Antimony-125	EPA 901.1 Modified	1.61E-01	2.03E-01	2.03E-01	3.63E-01	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Thorium-234	EPA 901.1 Modified	3.30E+00	1.88E+00	1.89E+00	2.81E+00	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Thallium-208	EPA 901.1 Modified	5.12E-01	3.06E-01	3.07E-01	5.72E-01	U	pCi/g
18-04023-18	TRG	B105100AFSFC345CV	02/07/18 10:45	4/5/2018	4/6/2018	18-04023	Uranium-235	EPA 901.1 Modified	-3.64E-01	1.01E+00	1.01E+00	6.63E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:
Patricia Giza
Zion Solutions, LLC
101 Shiloh Blvd
Zion, IL 60099

Work Order Details:
SDG: 18-04023
Purchase Order: 677118
Analysis Category: ENVIRONMENTAL
Sample Matrix: SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Actinium-228	EPA 901.1 Modified	6.31E-01	4.44E-01	4.45E-01	9.06E-01	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Silver-108m	EPA 901.1 Modified	4.74E-02	1.29E-01	1.29E-01	1.91E-01	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Americium-241	EPA 901.1 Modified	-7.67E-02	2.30E-01	2.30E-01	2.82E-01	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Barium-133	EPA 901.1 Modified	-6.90E-03	7.13E-02	7.13E-02	2.17E-01	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Bismuth-214	EPA 901.1 Modified	5.20E-01	3.12E-01	3.14E-01	5.82E-01	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Cobalt-60	EPA 901.1 Modified	8.11E-02	8.80E-02	8.81E-02	1.96E-01	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Cesium-134	EPA 901.1 Modified	-7.02E-02	1.20E-01	1.20E-01	1.69E-01	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Cesium-137	EPA 901.1 Modified	2.95E+00	4.56E-01	4.80E-01	3.15E-01		pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Europium-152	EPA 901.1 Modified	-2.72E-02	5.27E-01	5.27E-01	4.26E-01	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Europium-154	EPA 901.1 Modified	-2.48E-02	3.64E-01	3.64E-01	2.21E-01	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Europium-155	EPA 901.1 Modified	1.88E-01	2.37E-01	2.37E-01	3.40E-01	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Holmium-166m	EPA 901.1 Modified	-1.60E-01	2.47E-01	2.48E-01	1.86E-01	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Iodine-129	EPA 901.1 Modified	-2.62E-01	2.11E-01	2.12E-01	2.01E-01	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Potassium-40	EPA 901.1 Modified	5.91E+00	1.81E+00	1.84E+00	1.42E+00		pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Manganese-54	EPA 901.1 Modified	3.83E-02	1.48E-01	1.48E-01	2.49E-01	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Niobium-94	EPA 901.1 Modified	-3.66E-02	1.19E-01	1.19E-01	1.76E-01	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Lead-210	EPA 901.1 Modified	2.87E+00	1.40E+00	1.41E+00	2.68E+00	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Lead-212	EPA 901.1 Modified	2.20E-01	2.24E-01	2.25E-01	3.35E-01	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Lead-214	EPA 901.1 Modified	5.49E-01	3.19E-01	3.20E-01	4.77E-01		pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Promethium-145	EPA 901.1 Modified	-1.31E-02	1.76E-01	1.76E-01	2.70E-01	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Radium-226	EPA 901.1 Modified	5.20E-01	3.12E-01	3.14E-01	5.82E-01	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Antimony-125	EPA 901.1 Modified	1.25E-01	2.83E-01	2.83E-01	5.09E-01	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Thorium-234	EPA 901.1 Modified	2.74E+00	2.05E+00	2.06E+00	3.15E+00	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Thallium-208	EPA 901.1 Modified	3.18E-01	3.17E-01	3.17E-01	6.29E-01	U	pCi/g
18-04023-19	TRG	B105100AFSFC347CV	02/12/18 13:10	4/5/2018	4/6/2018	18-04023	Uranium-235	EPA 901.1 Modified	-1.66E-01	1.78E+00	1.78E+00	8.30E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04023
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Actinium-228	EPA 901.1 Modified	1.75E-01	6.39E-01	6.40E-01	1.09E+00	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Silver-108m	EPA 901.1 Modified	3.46E-01	1.98E-01	1.98E-01	2.81E-01	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Americium-241	EPA 901.1 Modified	-4.77E-01	3.31E-01	3.32E-01	4.76E-01	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Barium-133	EPA 901.1 Modified	4.78E-01	3.15E-01	3.16E-01	4.94E-01	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Bismuth-214	EPA 901.1 Modified	2.80E-01	4.59E-01	4.59E-01	7.66E-01	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Cobalt-60	EPA 901.1 Modified	4.33E-02	2.46E-01	2.46E-01	2.68E-01	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Cesium-134	EPA 901.1 Modified	2.53E-01	2.20E-01	2.20E-01	3.73E-01	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Cesium-137	EPA 901.1 Modified	2.16E-01	2.23E-01	2.23E-01	3.66E-01	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Europium-152	EPA 901.1 Modified	6.51E-01	5.88E-01	5.89E-01	7.62E-01	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Europium-154	EPA 901.1 Modified	3.00E-01	4.23E-01	4.23E-01	3.85E-01	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Europium-155	EPA 901.1 Modified	7.73E-01	3.47E-01	3.50E-01	5.63E-01	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Holmium-166m	EPA 901.1 Modified	2.44E-01	3.32E-01	3.32E-01	3.04E-01	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Iodine-129	EPA 901.1 Modified	-8.73E-01	1.60E+00	1.60E+00	2.24E+00	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Potassium-40	EPA 901.1 Modified	1.41E+01	3.49E+00	3.56E+00	2.98E+00		pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Manganese-54	EPA 901.1 Modified	4.15E-02	1.73E-01	1.73E-01	2.97E-01	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Niobium-94	EPA 901.1 Modified	-6.31E-02	1.77E-01	1.77E-01	2.67E-01	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Lead-210	EPA 901.1 Modified	-9.30E+00	4.63E+00	4.65E+00	6.18E+00	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Lead-212	EPA 901.1 Modified	6.46E-01	3.49E-01	3.51E-01	5.76E-01	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Lead-214	EPA 901.1 Modified	4.51E-01	4.57E-01	4.58E-01	7.60E-01	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Promethium-145	EPA 901.1 Modified	1.30E+00	8.46E-01	8.49E-01	1.27E+00	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Radium-226	EPA 901.1 Modified	2.80E-01	4.59E-01	4.59E-01	7.66E-01	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Antimony-125	EPA 901.1 Modified	-1.00E-01	5.80E-01	5.80E-01	8.69E-01	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Thorium-234	EPA 901.1 Modified	-2.05E+00	2.49E+00	2.50E+00	4.25E+00	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Thallium-208	EPA 901.1 Modified	3.44E-01	5.75E-01	5.75E-01	9.95E-01	U	pCi/g
18-04023-20	TRG	B105100AFSFC348CV	02/12/18 15:15	4/5/2018	4/6/2018	18-04023	Uranium-235	EPA 901.1 Modified	1.25E+00	2.98E+00	2.98E+00	1.62E+00	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

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Attachment 1 – Chain-of-Custody Form

Sample ID	Sample Log	Matrix	Sample Type	Sample Container				Sample Date	Sample Time	Analysis Type	Preservative	Remarks
				Vol	Unit	Type	Qty					
B105100AFSWC017CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	0935	5ROC/HTD	N/A	0.0-0.5" 101.65g
B105100AFSWC041CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	0925	5ROC/HTD	N/A	0.0-0.5" 123.37g
B105100AFSWC057CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	0910	5ROC/HTD	N/A	0.0-0.5" 101.99g
B105100AFSWC088CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	0855	5ROC/HTD	N/A	0.0-0.5" 105.94g
B105100AFSWC101CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	0725	5ROC/HTD	N/A	0.0-0.5" 146.06g
B105100AFSWC115CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	1530	5ROC/HTD	N/A	0.0-0.5" 94.29g
B105100AFSWC116CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	0840	5ROC/HTD	N/A	0.0-0.5" 98.62g
B105100AFSWC150CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	02/21/2018	0840	5ROC/HTD	N/A	0.0-0.5" 97.99g
B105100AFSWC151CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	02/21/2018	0920	5ROC/HTD	N/A	0.0-0.5" 102.61g
B105100AFSWC156CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	02/21/2018	1330	5ROC/HTD	N/A	0.0-0.5" 96.47g
B105100AFSWC162CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	02/15/2018	1550	5ROC/HTD	N/A	0.0-0.5" 90.81g
B105100AFSWC163CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	02/15/2018	1350	5ROC/HTD	N/A	0.0-0.5" 97.73g
B105100AFSWC179CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	0710	5ROC/HTD	N/A	0.0-0.5" 100.50g
B105100AFSWC190CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	1300	5ROC/HTD	N/A	0.0-1.0" 180.00g
B105100AFSWC201CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	1513	5ROC/HTD	N/A	0.0-0.5" 96.68g
B105100AFSWC210CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	1440	5ROC/HTD	N/A	0.0-0.5" 120.44g
B105100AFSWC231CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	1430	5ROC/HTD	N/A	0.0-0.5" 132.73g
B105100AFSFC239CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	0955	5ROC/HTD	N/A	0.0-1.0" 209.92g
B105100AFSFC250CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	0940	5ROC/HTD	N/A	0.0-0.5" 130.05g

6	B105100AFSFC255CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	1246	5ROC/HTD	N/A	0.0-0.5" 134.31g
7	B105100AFSFC263CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	0930	5ROC/HTD	N/A	0.0-0.5" 110.42g
8	B105100AFSFC276CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/05/2018	1342	5ROC/HTD	N/A	0.0-0.5" 122.73g
9	B105100AFSFC282CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	0852	5ROC/HTD	N/A	0.0-0.5" 116.66g
10	B105100AFSFC289CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/05/2018	1352	5ROC/HTD	N/A	0.0-0.5" 119.03g
11	B105100AFSFC293CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/07/2018	1345	5ROC/HTD	N/A	0.0-0.5" 132.53g
12	B105100AFSFC300CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/13/2018	1250	5ROC/HTD	N/A	0.0-0.5" 85.562g
13	B105100AFSFC316CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/05/2018	1358	5ROC/HTD	N/A	0.0-0.5" 108.12g
14	B105100AFSFC321CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/13/2018	1410	5ROC/HTD	N/A	0.0-0.5" 148.80g
15	B105100AFSFC326CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/14/2018	0815	5ROC/HTD	N/A	0.0-0.5" 134.35g
16	B105100AFSFC329CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/05/2018	1418	5ROC/HTD	N/A	0.0-0.5" 115.08g
17	B105100AFSFC332CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/05/2018	1405	5ROC/HTD	N/A	0.0-0.5" 123.51g
18	B105100AFSFC345CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/07/2018	1045	5ROC/HTD	N/A	0.0-0.5" 115.27g
19	B105100AFSFC347CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/12/2018	1310	5ROC/HTD	N/A	0.0-0.5" 91.09g
20	B105100AFSFC348CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/12/2018	1515	5ROC/HTD	N/A	0.0-0.5" 88.01g
	B105100AFSFC354CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/08/2018	1307	5ROC/HTD	N/A	0.0-0.5" 110.07g
	B105100AFSFC363CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/06/2018	0740	5ROC/HTD	N/A	0.0-0.5" 85.52g
	B105100AFSFC369CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/05/2018	1453	5ROC/HTD	N/A	0.0-0.5" 150.58g
	B105100AFSFC375CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/05/2018	1431	5ROC/HTD	N/A	0.0-0.5" 119.51g
	B105100AFSFC379CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/06/2018	0746	5ROC/HTD	N/A	0.0-0.5" 135.29g
	B105100AFSFC383CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/06/2018	0740	5ROC/HTD	N/A	0.0-0.5" 118.83g
	B105100AFSFC411CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/06/2018	0805	5ROC/HTD	N/A	0.0-0.75 168.23g"

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B105100AFSFC433CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/08/2018	1512	5ROC/HTD	N/A	0.0-0.5" 130.93g
B105100AFSFC434CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/08/2018	0930	5ROC/HTD	N/A	0.0-0.5" 133.53g
B105100AFSFC435CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/07/2018	1422	5ROC/HTD	N/A	0.0-0.5" 152.36g
B105100AFSFC436CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/14/2018	1030	5ROC/HTD	N/A	0.0-0.5" 133.53g
B105100AFSFC438CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/08/2018	1025	5ROC/HTD	N/A	0.0-0.5" 130.93g

Laboratory:	Date Submitted To Lab:	Ship Container No.:	Cooler Temperature:	Airbill Number:
Eberline Labs		**N/A**	**N/A**	FedEx First Overnight 8107 0645 6688

Relinquished by:	Date	Time:	Received by:	Date: (mm/dd/yyyy):	Time:
Reed R. Smith	(04/04/2018)	1346	Richard F. Rickert	04/04/2018	1346
Relinquished by: Richard F. Rickert	Date (mm/dd/yyyy): 04/04/2018	Time: 1630	Received by: FedEx First Overnight	Date: (mm/dd/yyyy): 04/04/2018	Time: 16:30
Relinquished by:	Date (mm/dd/yyyy):	Time:	Received by:	Date: (mm/dd/yyyy): 4-5-18	Time: 0800
Relinquished by:	Date (mm/dd/yyyy):	Time:	Received by:	Date: (mm/dd/yyyy):	Time:

Comments

PO# 677118 7 day turnaround 5-ROC / HTD / H-3

EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD
OAK RIDGE, TENNESSEE 37830
PHONE (865) 481-0683
FAX (865) 483-4621

EBS-OR-43653

April 30, 2018

Patricia Giza
Zion Solutions, LLC
101 Shiloh Blvd
Zion, IL 60099

CASE NARRATIVE
Work Order # 18-04024-OR

SAMPLE RECEIPT

This work order contains twelve solid samples received 04/05/2018. Samples were analyzed for Total Strontium, Tritium, Nickel-63 and by Gamma Spectroscopy.

CLIENT ID	LAB ID	CLIENT ID	LAB ID
B105100AFSFC354CV	18-04024-04	B105100AFSFC411CV	18-04024-10
B105100AFSFC363CV	18-04024-05	B105100AFSFC433CV	18-04024-11
B105100AFSFC369CV	18-04024-06	B105100AFSFC434CV	18-04024-12
B105100AFSFC375CV	18-04024-07	B105100AFSFC435CV	18-04024-13
B105100AFSFC379CV	18-04024-08	B105100AFSFC436CV	18-04024-14
B105100AFSFC383CV	18-04024-09	B105100AFSFC438CV	18-04024-15

ANALYTICAL METHODS

Total Strontium was analyzed using EIChroM Method SRW01 Modified. Tritium was performed using Method LANL ER-210 Modified. Nickel-63 was performed using Method ASTM 3500-Ni Modified. Gamma Spectroscopy was performed using EPA Method 901.1 Modified.

Laboratory qualifiers are as follows:

U - Result is less than the MDA.

ANALYTICAL RESULTS

Combined Standard Uncertainty is reported at 1-sigma value.

Minimum Detectable Activity (MDA) values for data represented in this report are sample-specific. MDA measurements are determined based on factors and conditions including instrument settings, aliquot size and matrix type.

ANALYTICAL RESULTS CONTINUED

TOTAL STRONTIUM

Samples were prepared by acid digestion as appropriate for the matrix. Digested samples were acidified and were selectively extracted and precipitated. Precipitates were then mounted on 47mm filters. Filter was reweighed to determine aliquot size. Sample activities were determined by gas flow proportional counting.

Samples demonstrated acceptable results for all Total Strontium analyses. Strontium-90 results are reported from Total Strontium. Chemical recovery was acceptable for all samples. The Total Strontium method blank demonstrated an acceptable result. Results for the Total Strontium duplicate demonstrated an acceptable relative percent difference and normalized difference. Results for the Total Strontium laboratory control sample demonstrated an acceptable percent recovery.

TRITIUM

A representative aliquot of each sample was equilibrated with tritium free water. Equilibrates were transferred into a round-bottomed distillation flask and attached to a single stage still. A portion of each middle distillation fraction was transferred to a liquid scintillation vial and cocktail was added. Samples were then counted by beta liquid scintillation.

Samples demonstrated acceptable results for all Tritium analyses. The Tritium method blank demonstrated an acceptable result. Results for the Tritium duplicate demonstrated a high relative percent difference; however, normalized difference is within acceptable limits for the analytical technique. Results for the Tritium laboratory control sample demonstrated an acceptable percent recovery.

NICKEL-63

A representative aliquot of each sample was placed into an appropriately sized beaker. Stable elemental Nickel carrier was added to each sample prior to digestion. Samples were digested in concentrated Nitric acid. After digestion, sample pH was adjusted and Nickel-63 was precipitated selectively with Dimethylglyoxime. Precipitates were selectively separated, redissolved, and residual acid was effectively neutralized. Sample residuals were placed into scintillation vials, scintillation cocktail was added and Nickel-63 activity was determined by beta liquid scintillation.

Samples demonstrated acceptable results for all Nickel-63 analyses. The Nickel-63 method blank demonstrated an acceptable result. Results for the Nickel-63 duplicate demonstrated a high relative percent difference; however, normalized difference is within acceptable limits for the analytical technique. Results for the Nickel-63 laboratory control sample demonstrated an acceptable percent recovery.

GAMMA SPECTROSCOPY

Samples for Gamma Spectroscopy analysis were prepared by transferring a known mass/aliquot of each homogenized sample to a standard geometry container. Samples were counted on High Purity Germanium (HPGe) gamma ray detectors.

ANALYTICAL RESULTS CONTINUED

GAMMA SPECTROSCOPY CONTINUED

Samples demonstrated acceptable results for all gamma-emitting radionuclides as reported. Cobalt-60 and Cesium-137 results demonstrated slightly high method detection limits. Some samples demonstrated results that are greater than the method detection limit. These results are reported from the Canberra Gamma Apex "Nuclide MDA Report" and are not positive. These results are qualified as non-detect (U). The method blank demonstrated acceptable results for all radionuclides as reported. Results for the Actinium-228 and Potassium-40 replicate demonstrated an acceptable relative percent difference and normalized difference. Results for the Bismuth-214 replicate demonstrated a high relative percent difference; however, normalized difference is within acceptable limits for the analytical technique. Results for the Cobalt-60 and Cesium-137 laboratory control sample demonstrated an acceptable percent recovery.

CERTIFICATION OF ACCURACY

I certify that this data report is in compliance with the terms and conditions of the Purchase Order, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the cognizant project manager or his/her designee to be accurate as verified by the following signature.

M.R. McDougall
Laboratory Manager

Date: 4/30/2018

Eberline Analytical wants and encourages your feedback regarding our performance providing radioanalytical services. Please visit http://eberlineanalytical.com/ to provide us with feedback on our services.

Eberline Analytical
Final Report of Analysis

Report To:
Patricia Giza
Zion Solutions, LLC
101 Shiloh Blvd
Zion, IL 60099

Work Order Details:
SDG: 18-04024
Purchase Order: 677118
Analysis Category: ENVIRONMENTAL
Sample Matrix: SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04024-01	LCS	KNOWN	04/05/18 00:00	4/5/2018	4/11/2018	18-04024	Tritium	LANL ER-210 Modified	2.37E+02	8.52E+00				pCi/g
18-04024-01	LCS	SPIKE	04/05/18 00:00	4/5/2018	4/11/2018	18-04024	Tritium	LANL ER-210 Modified	2.02E+02	5.44E+00	1.25E+01	3.87E+00		pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/11/2018	18-04024	Tritium	LANL ER-210 Modified	-1.67E+00	2.17E+00	2.18E+00	3.82E+00	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/11/2018	18-04024	Tritium	LANL ER-210 Modified	1.96E+00	2.00E+00	2.00E+00	3.34E+00	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/11/2018	18-04024	Tritium	LANL ER-210 Modified	2.93E+00	2.01E+00	2.02E+00	3.33E+00	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/11/2018	18-04024	Tritium	LANL ER-210 Modified	3.51E-01	2.09E+00	2.09E+00	3.58E+00	U	pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/11/2018	18-04024	Tritium	LANL ER-210 Modified	4.16E-01	1.66E+00	1.66E+00	2.83E+00	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/11/2018	18-04024	Tritium	LANL ER-210 Modified	-1.27E+00	1.85E+00	1.85E+00	3.25E+00	U	pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/11/2018	18-04024	Tritium	LANL ER-210 Modified	-4.16E-01	1.64E+00	1.64E+00	2.83E+00	U	pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/11/2018	18-04024	Tritium	LANL ER-210 Modified	-1.58E+00	1.66E+00	1.66E+00	2.93E+00	U	pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/11/2018	18-04024	Tritium	LANL ER-210 Modified	5.65E-01	1.69E+00	1.69E+00	2.89E+00	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/11/2018	18-04024	Tritium	LANL ER-210 Modified	1.34E+00	1.63E+00	1.63E+00	2.74E+00	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/12/2018	18-04024	Tritium	LANL ER-210 Modified	3.13E-01	1.87E+00	1.87E+00	3.20E+00	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/12/2018	18-04024	Tritium	LANL ER-210 Modified	-6.72E-01	1.98E+00	1.98E+00	3.43E+00	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/12/2018	18-04024	Tritium	LANL ER-210 Modified	1.51E-01	1.80E+00	1.80E+00	3.09E+00	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/12/2018	18-04024	Tritium	LANL ER-210 Modified	1.86E+00	2.06E+00	2.06E+00	3.45E+00	U	pCi/g
18-04024-01	LCS	KNOWN	04/05/18 00:00	4/5/2018	4/10/2018	18-04024	Nickel-63	ASTM 3500-Ni Modified	1.45E+03	4.34E+01				pCi/g
18-04024-01	LCS	SPIKE	04/05/18 00:00	4/5/2018	4/10/2018	18-04024	Nickel-63	ASTM 3500-Ni Modified	1.45E+03	8.67E+00	8.56E+01	1.92E+00		pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/10/2018	18-04024	Nickel-63	ASTM 3500-Ni Modified	8.18E-01	1.17E+00	1.17E+00	1.97E+00	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/10/2018	18-04024	Nickel-63	ASTM 3500-Ni Modified	1.87E+00	1.14E+00	1.14E+00	1.88E+00	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/10/2018	18-04024	Nickel-63	ASTM 3500-Ni Modified	6.35E-01	1.13E+00	1.13E+00	1.91E+00	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/10/2018	18-04024	Nickel-63	ASTM 3500-Ni Modified	3.43E+00	1.12E+00	1.14E+00	1.79E+00		pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/10/2018	18-04024	Nickel-63	ASTM 3500-Ni Modified	4.12E-01	9.75E-01	9.75E-01	1.65E+00	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/10/2018	18-04024	Nickel-63	ASTM 3500-Ni Modified	2.01E+00	1.13E+00	1.14E+00	1.86E+00		pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/10/2018	18-04024	Nickel-63	ASTM 3500-Ni Modified	1.84E+00	1.08E+00	1.08E+00	1.77E+00		pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/10/2018	18-04024	Nickel-63	ASTM 3500-Ni Modified	7.14E-01	9.28E-01	9.29E-01	1.56E+00	U	pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/10/2018	18-04024	Nickel-63	ASTM 3500-Ni Modified	1.30E+00	1.04E+00	1.05E+00	1.74E+00	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/10/2018	18-04024	Nickel-63	ASTM 3500-Ni Modified	5.91E+02	5.52E+00	3.52E+01	1.86E+00		pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/11/2018	18-04024	Nickel-63	ASTM 3500-Ni Modified	8.26E+01	2.17E+00	5.32E+00	1.70E+00		pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/11/2018	18-04024	Nickel-63	ASTM 3500-Ni Modified	5.00E-01	1.01E+00	1.01E+00	1.72E+00	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/11/2018	18-04024	Nickel-63	ASTM 3500-Ni Modified	9.96E-01	1.19E+00	1.19E+00	2.00E+00	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/11/2018	18-04024	Nickel-63	ASTM 3500-Ni Modified	3.82E+00	1.13E+00	1.16E+00	1.80E+00		pCi/g

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Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04024
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04024-01	LCS	KNOWN	04/05/18 00:00	4/5/2018	4/11/2018	18-04024	Strontium-90	ElChroM SRW01 Modified	5.04E+01	2.82E-01				pCi/g
18-04024-01	LCS	SPIKE	04/05/18 00:00	4/5/2018	4/11/2018	18-04024	Strontium-90	ElChroM SRW01 Modified	3.95E+01	1.68E+00	1.39E+01	7.33E-01		pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/11/2018	18-04024	Strontium-90	ElChroM SRW01 Modified	4.74E-01	5.49E-01	5.73E-01	9.24E-01	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/11/2018	18-04024	Strontium-90	ElChroM SRW01 Modified	2.24E-01	3.28E-01	3.37E-01	5.60E-01	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/11/2018	18-04024	Strontium-90	ElChroM SRW01 Modified	2.57E-01	3.96E-01	4.06E-01	6.78E-01	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/11/2018	18-04024	Strontium-90	ElChroM SRW01 Modified	4.53E-01	4.38E-01	4.66E-01	7.29E-01	U	pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/11/2018	18-04024	Strontium-90	ElChroM SRW01 Modified	3.07E-01	4.03E-01	4.17E-01	6.83E-01	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/11/2018	18-04024	Strontium-90	ElChroM SRW01 Modified	8.41E-02	3.62E-01	3.63E-01	6.40E-01	U	pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/11/2018	18-04024	Strontium-90	ElChroM SRW01 Modified	-9.43E-02	3.63E-01	3.65E-01	6.61E-01	U	pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/11/2018	18-04024	Strontium-90	ElChroM SRW01 Modified	7.80E-02	3.22E-01	3.23E-01	5.70E-01	U	pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/11/2018	18-04024	Strontium-90	ElChroM SRW01 Modified	3.61E-01	3.89E-01	4.08E-01	6.51E-01	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/11/2018	18-04024	Strontium-90	ElChroM SRW01 Modified	4.24E-01	3.83E-01	4.10E-01	6.31E-01	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/11/2018	18-04024	Strontium-90	ElChroM SRW01 Modified	9.17E-02	3.34E-01	3.35E-01	5.88E-01	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/11/2018	18-04024	Strontium-90	ElChroM SRW01 Modified	3.87E-01	4.00E-01	4.22E-01	6.68E-01	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/11/2018	18-04024	Strontium-90	ElChroM SRW01 Modified	-1.92E-01	3.97E-01	4.03E-01	7.39E-01	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/11/2018	18-04024	Strontium-90	ElChroM SRW01 Modified	5.40E-02	3.45E-01	3.46E-01	6.13E-01	U	pCi/g
18-04024-01	LCS	KNOWN	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Cobalt-60	EPA 901.1 Modified	2.71E+02	1.06E+01				pCi/g
18-04024-01	LCS	KNOWN	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Cesium-137	EPA 901.1 Modified	1.69E+02	6.75E+00				pCi/g
18-04024-01	LCS	SPIKE	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Cobalt-60	EPA 901.1 Modified	2.69E+02	1.54E+01	2.07E+01	2.01E+00		pCi/g
18-04024-01	LCS	SPIKE	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Cesium-137	EPA 901.1 Modified	1.91E+02	2.29E+01	2.49E+01	2.26E+00		pCi/g

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Final Report of Analysis

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Patricia Giza		SDG:	18-04024
Zion Solutions, LLC		Purchase Order:	677118
101 Shiloh Blvd		Analysis Category:	ENVIRONMENTAL
Zion, IL 60099		Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Actinium-228	EPA 901.1 Modified	7.63E-02	1.25E-01	1.25E-01	2.46E-01	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Silver-108m	EPA 901.1 Modified	1.48E-02	3.77E-02	3.77E-02	6.16E-02	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Americium-241	EPA 901.1 Modified	6.60E-03	2.67E-02	2.67E-02	6.65E-02	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Barium-133	EPA 901.1 Modified	-1.57E-02	6.09E-02	6.09E-02	6.26E-02	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Bismuth-214	EPA 901.1 Modified	6.57E-03	1.20E-01	1.20E-01	1.72E-01	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Cobalt-60	EPA 901.1 Modified	-3.36E-02	4.53E-02	4.53E-02	6.05E-02	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Cesium-134	EPA 901.1 Modified	2.90E-02	5.31E-02	5.31E-02	6.94E-02	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Cesium-137	EPA 901.1 Modified	5.08E-02	4.20E-02	4.21E-02	8.33E-02	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Europium-152	EPA 901.1 Modified	1.17E-01	1.19E-01	1.19E-01	9.42E-02	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Europium-154	EPA 901.1 Modified	1.56E-02	1.11E-01	1.11E-01	4.55E-02	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Europium-155	EPA 901.1 Modified	1.17E-02	4.49E-02	4.49E-02	6.82E-02	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Holmium-166m	EPA 901.1 Modified	-3.72E-02	7.86E-02	7.86E-02	3.97E-02	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Iodine-129	EPA 901.1 Modified	1.90E-02	1.63E-02	1.63E-02	2.65E-02	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Potassium-40	EPA 901.1 Modified	-9.47E-02	4.24E-01	4.24E-01	7.11E-01	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Manganese-54	EPA 901.1 Modified	-1.42E-02	4.69E-02	4.69E-02	6.37E-02	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Niobium-94	EPA 901.1 Modified	5.18E-03	4.04E-02	4.04E-02	6.98E-02	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Lead-210	EPA 901.1 Modified	8.13E-02	3.24E-01	3.24E-01	5.03E-01	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Lead-212	EPA 901.1 Modified	2.52E-02	4.26E-02	4.26E-02	7.03E-02	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Lead-214	EPA 901.1 Modified	1.19E-02	6.33E-02	6.33E-02	1.03E-01	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Promethium-145	EPA 901.1 Modified	-2.43E-03	3.24E-02	3.24E-02	4.86E-02	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Radium-226	EPA 901.1 Modified	6.57E-03	1.20E-01	1.20E-01	1.72E-01	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Antimony-125	EPA 901.1 Modified	-1.07E-01	1.32E-01	1.32E-01	1.58E-01	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Thorium-234	EPA 901.1 Modified	-2.23E-02	4.28E-01	4.28E-01	6.42E-01	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Thallium-208	EPA 901.1 Modified	2.53E-03	1.23E-01	1.23E-01	1.71E-01	U	pCi/g
18-04024-02	MBL	BLANK	04/05/18 00:00	4/5/2018	4/6/2018	18-04024	Uranium-235	EPA 901.1 Modified	1.54E-01	3.74E-01	3.74E-01	2.12E-01	U	pCi/g

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Zion Solutions, LLC		Purchase Order:	677118
101 Shiloh Blvd		Analysis Category:	ENVIRONMENTAL
Zion, IL 60099		Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Actinium-228	EPA 901.1 Modified	5.94E-01	3.70E-01	3.72E-01	7.19E-01	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Silver-108m	EPA 901.1 Modified	6.09E-03	3.90E-02	3.90E-02	1.28E-01	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Americium-241	EPA 901.1 Modified	-4.01E-01	2.43E-01	2.44E-01	2.35E-01	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Barium-133	EPA 901.1 Modified	2.93E-02	7.20E-02	7.20E-02	2.06E-01	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Bismuth-214	EPA 901.1 Modified	5.12E-01	2.71E-01	2.72E-01	4.00E-01		pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Cobalt-60	EPA 901.1 Modified	-2.13E-02	1.00E-01	1.00E-01	1.44E-01	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Cesium-134	EPA 901.1 Modified	3.26E-02	5.31E-02	5.32E-02	1.59E-01	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Cesium-137	EPA 901.1 Modified	1.19E-01	1.12E-01	1.12E-01	2.02E-01	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Europium-152	EPA 901.1 Modified	1.08E-01	1.89E-01	1.89E-01	3.27E-01	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Europium-154	EPA 901.1 Modified	1.64E-01	2.47E-01	2.47E-01	1.62E-01	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Europium-155	EPA 901.1 Modified	1.15E-01	1.67E-01	1.68E-01	2.84E-01	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Holmium-166m	EPA 901.1 Modified	9.96E-02	1.56E-01	1.57E-01	1.51E-01	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Iodine-129	EPA 901.1 Modified	-7.56E-02	1.38E-01	1.38E-01	1.70E-01	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Potassium-40	EPA 901.1 Modified	7.21E+00	2.01E+00	2.05E+00	2.14E+00		pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Manganese-54	EPA 901.1 Modified	4.14E-02	1.08E-01	1.08E-01	1.85E-01	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Niobium-94	EPA 901.1 Modified	4.49E-02	8.90E-02	8.91E-02	1.52E-01	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Lead-210	EPA 901.1 Modified	2.18E+00	1.56E+00	1.57E+00	2.38E+00	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Lead-212	EPA 901.1 Modified	3.23E-01	1.45E-01	1.46E-01	3.43E-01	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Lead-214	EPA 901.1 Modified	6.22E-01	2.37E-01	2.39E-01	3.03E-01		pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Promethium-145	EPA 901.1 Modified	1.76E-01	1.63E-01	1.64E-01	2.46E-01	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Radium-226	EPA 901.1 Modified	5.12E-01	2.71E-01	2.72E-01	4.00E-01		pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Antimony-125	EPA 901.1 Modified	7.11E-02	2.63E-01	2.63E-01	4.22E-01	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Thorium-234	EPA 901.1 Modified	3.74E+00	1.81E+00	1.82E+00	2.81E+00	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Thallium-208	EPA 901.1 Modified	4.82E-01	3.29E-01	3.30E-01	6.04E-01	U	pCi/g
18-04024-03	DUP	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Uranium-235	EPA 901.1 Modified	-1.04E+00	1.12E+00	1.12E+00	7.17E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04024
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Actinium-228	EPA 901.1 Modified	6.13E-01	3.07E-01	3.09E-01	4.80E-01		pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Silver-108m	EPA 901.1 Modified	6.41E-02	7.58E-02	7.59E-02	1.37E-01	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Americium-241	EPA 901.1 Modified	-4.14E-01	2.34E-01	2.35E-01	2.20E-01	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Barium-133	EPA 901.1 Modified	-2.69E-02	5.23E-02	5.23E-02	2.03E-01	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Bismuth-214	EPA 901.1 Modified	3.12E-01	2.28E-01	2.29E-01	4.45E-01	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Cobalt-60	EPA 901.1 Modified	5.04E-02	9.01E-02	9.01E-02	1.56E-01	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Cesium-134	EPA 901.1 Modified	-2.39E-02	5.44E-02	5.44E-02	1.73E-01	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Cesium-137	EPA 901.1 Modified	1.31E-01	1.00E-01	1.01E-01	1.93E-01	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Europium-152	EPA 901.1 Modified	-1.52E-01	2.47E-01	2.47E-01	3.60E-01	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Europium-154	EPA 901.1 Modified	-1.27E-01	2.36E-01	2.36E-01	1.73E-01	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Europium-155	EPA 901.1 Modified	2.72E-01	1.57E-01	1.58E-01	3.57E-01	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Holmium-166m	EPA 901.1 Modified	-1.27E-01	1.59E-01	1.59E-01	1.42E-01	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Iodine-129	EPA 901.1 Modified	-5.61E-02	1.44E-01	1.44E-01	1.81E-01	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Potassium-40	EPA 901.1 Modified	9.16E+00	2.44E+00	2.48E+00	2.75E+00		pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Manganese-54	EPA 901.1 Modified	5.92E-02	1.10E-01	1.10E-01	1.91E-01	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Niobium-94	EPA 901.1 Modified	2.37E-02	8.77E-02	8.77E-02	1.32E-01	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Lead-210	EPA 901.1 Modified	2.81E+00	1.52E+00	1.53E+00	2.39E+00	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Lead-212	EPA 901.1 Modified	2.95E-01	1.82E-01	1.83E-01	2.81E-01		pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Lead-214	EPA 901.1 Modified	4.78E-01	2.78E-01	2.79E-01	4.24E-01		pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Promethium-145	EPA 901.1 Modified	-6.99E-03	1.75E-01	1.75E-01	2.26E-01	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Radium-226	EPA 901.1 Modified	3.12E-01	2.28E-01	2.29E-01	4.45E-01	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Antimony-125	EPA 901.1 Modified	1.36E-01	2.46E-01	2.46E-01	4.03E-01	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Thorium-234	EPA 901.1 Modified	1.92E+00	2.30E+00	2.30E+00	3.85E+00	U	pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Thallium-208	EPA 901.1 Modified	5.57E-01	2.72E-01	2.73E-01	4.90E-01		pCi/g
18-04024-04	DO	B105100AFSFC354CV	02/08/18 13:07	4/5/2018	4/6/2018	18-04024	Uranium-235	EPA 901.1 Modified	-5.96E-01	1.03E+00	1.03E+00	7.39E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:
Patricia Giza
Zion Solutions, LLC
101 Shiloh Blvd
Zion, IL 60099

Work Order Details:
SDG: 18-04024
Purchase Order: 677118
Analysis Category: ENVIRONMENTAL
Sample Matrix: SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Actinium-228	EPA 901.1 Modified	5.64E-01	5.82E-01	5.82E-01	1.06E+00	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Silver-108m	EPA 901.1 Modified	-1.18E-01	1.70E-01	1.70E-01	2.30E-01	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Americium-241	EPA 901.1 Modified	-4.77E-02	4.43E-01	4.43E-01	5.71E-01	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Barium-133	EPA 901.1 Modified	6.69E-02	2.24E-01	2.24E-01	5.78E-01	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Bismuth-214	EPA 901.1 Modified	9.44E-01	6.46E-01	6.48E-01	1.03E+00	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Cobalt-60	EPA 901.1 Modified	4.27E-01	1.30E-01	1.32E-01	1.95E-01		pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Cesium-134	EPA 901.1 Modified	1.42E-01	1.55E-01	1.55E-01	2.59E-01	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Cesium-137	EPA 901.1 Modified	9.38E+01	9.26E+00	1.04E+01	7.20E-01		pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Europium-152	EPA 901.1 Modified	2.51E-01	1.49E+00	1.49E+00	9.44E-01	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Europium-154	EPA 901.1 Modified	-3.80E-02	2.43E-01	2.43E-01	4.05E-01	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Europium-155	EPA 901.1 Modified	-6.52E-02	4.82E-01	4.82E-01	6.15E-01	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Holmium-166m	EPA 901.1 Modified	3.38E-02	1.99E-01	1.99E-01	3.27E-01	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Iodine-129	EPA 901.1 Modified	-3.86E+00	7.94E-01	8.19E-01	4.38E-01	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Potassium-40	EPA 901.1 Modified	1.03E+01	2.59E+00	2.65E+00	2.14E+00		pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Manganese-54	EPA 901.1 Modified	-4.65E-02	1.56E-01	1.56E-01	2.34E-01	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Niobium-94	EPA 901.1 Modified	3.21E-02	7.15E-02	7.15E-02	1.48E-01	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Lead-210	EPA 901.1 Modified	1.28E+00	2.88E+00	2.88E+00	4.54E+00	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Lead-212	EPA 901.1 Modified	6.28E-01	5.22E-01	5.23E-01	8.59E-01	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Lead-214	EPA 901.1 Modified	1.03E+00	9.05E-01	9.07E-01	1.48E+00	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Promethium-145	EPA 901.1 Modified	1.86E+00	4.58E-01	4.68E-01	7.66E-01	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Radium-226	EPA 901.1 Modified	9.44E-01	6.46E-01	6.48E-01	1.03E+00	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Antimony-125	EPA 901.1 Modified	-8.94E-01	1.09E+00	1.09E+00	1.68E+00	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Thorium-234	EPA 901.1 Modified	9.60E-02	4.27E+00	4.27E+00	5.57E+00	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Thallium-208	EPA 901.1 Modified	2.43E-01	6.98E-01	6.98E-01	1.17E+00	U	pCi/g
18-04024-05	TRG	B105100AFSFC363CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Uranium-235	EPA 901.1 Modified	5.25E-02	4.42E+00	4.42E+00	1.93E+00	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04024
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Actinium-228	EPA 901.1 Modified	1.01E-01	4.02E-01	4.02E-01	6.77E-01	U	pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Silver-108m	EPA 901.1 Modified	-4.47E-02	1.36E-01	1.36E-01	1.90E-01	U	pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Americium-241	EPA 901.1 Modified	-6.68E-02	4.89E-02	4.90E-02	3.18E-01	U	pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Barium-133	EPA 901.1 Modified	1.30E-02	7.65E-02	7.65E-02	3.89E-01	U	pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Bismuth-214	EPA 901.1 Modified	9.42E-01	4.31E-01	4.33E-01	6.28E-01		pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Cobalt-60	EPA 901.1 Modified	9.59E-03	1.12E-01	1.12E-01	1.70E-01	U	pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Cesium-134	EPA 901.1 Modified	-6.66E-04	4.38E-02	4.38E-02	2.10E-01	U	pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Cesium-137	EPA 901.1 Modified	-3.82E-02	1.50E-01	1.50E-01	2.17E-01	U	pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Europium-152	EPA 901.1 Modified	-2.82E-01	4.90E-01	4.90E-01	5.16E-01	U	pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Europium-154	EPA 901.1 Modified	-1.72E-01	3.20E-01	3.20E-01	2.61E-01	U	pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Europium-155	EPA 901.1 Modified	8.97E-01	2.71E-01	2.75E-01	4.19E-01	U	pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Holmium-166m	EPA 901.1 Modified	2.15E-01	2.10E-01	2.10E-01	2.04E-01	U	pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Iodine-129	EPA 901.1 Modified	-1.99E+00	1.26E+00	1.26E+00	1.30E+00	U	pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Potassium-40	EPA 901.1 Modified	5.76E+00	1.83E+00	1.85E+00	2.03E+00		pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Manganese-54	EPA 901.1 Modified	3.49E-02	1.18E-01	1.18E-01	1.99E-01	U	pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Niobium-94	EPA 901.1 Modified	-6.55E-04	1.12E-01	1.12E-01	1.79E-01	U	pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Lead-210	EPA 901.1 Modified	3.18E-01	2.09E+00	2.09E+00	3.86E+00	U	pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Lead-212	EPA 901.1 Modified	6.77E-01	2.68E-01	2.70E-01	4.22E-01	U	pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Lead-214	EPA 901.1 Modified	9.48E-01	4.67E-01	4.70E-01	6.42E-01		pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Promethium-145	EPA 901.1 Modified	5.99E-01	5.02E-01	5.03E-01	7.57E-01	U	pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Radium-226	EPA 901.1 Modified	9.42E-01	4.31E-01	4.33E-01	6.28E-01		pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Antimony-125	EPA 901.1 Modified	-8.81E-02	3.98E-01	3.98E-01	5.93E-01	U	pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Thorium-234	EPA 901.1 Modified	8.29E+00	2.21E+00	2.25E+00	6.91E+00		pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Thallium-208	EPA 901.1 Modified	3.58E-01	3.93E-01	3.94E-01	6.60E-01	U	pCi/g
18-04024-06	TRG	B105100AFSFC369CV	03/05/18 14:53	4/5/2018	4/6/2018	18-04024	Uranium-235	EPA 901.1 Modified	1.11E+00	1.96E+00	1.96E+00	1.10E+00	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04024
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Actinium-228	EPA 901.1 Modified	2.21E-01	3.99E-01	3.99E-01	6.97E-01	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Silver-108m	EPA 901.1 Modified	2.73E-02	6.26E-02	6.26E-02	1.16E-01	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Americium-241	EPA 901.1 Modified	-4.66E-02	1.89E-01	1.89E-01	2.43E-01	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Barium-133	EPA 901.1 Modified	2.49E-02	6.26E-02	6.27E-02	1.59E-01	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Bismuth-214	EPA 901.1 Modified	8.65E-01	2.29E-01	2.33E-01	4.06E-01		pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Cobalt-60	EPA 901.1 Modified	2.21E-02	1.06E-01	1.06E-01	1.32E-01	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Cesium-134	EPA 901.1 Modified	-3.48E-03	5.86E-02	5.86E-02	1.33E-01	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Cesium-137	EPA 901.1 Modified	3.31E-01	1.32E-01	1.33E-01	2.11E-01		pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Europium-152	EPA 901.1 Modified	1.58E-01	3.61E-01	3.62E-01	3.43E-01	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Europium-154	EPA 901.1 Modified	5.90E-02	2.49E-01	2.49E-01	1.70E-01	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Europium-155	EPA 901.1 Modified	2.63E-01	2.04E-01	2.04E-01	3.02E-01	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Holmium-166m	EPA 901.1 Modified	7.83E-02	1.82E-01	1.82E-01	1.50E-01	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Iodine-129	EPA 901.1 Modified	2.28E-02	1.01E-01	1.01E-01	1.50E-01	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Potassium-40	EPA 901.1 Modified	5.70E+00	1.70E+00	1.73E+00	1.70E+00		pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Manganese-54	EPA 901.1 Modified	6.67E-02	1.01E-01	1.01E-01	1.77E-01	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Niobium-94	EPA 901.1 Modified	2.13E-02	8.92E-02	8.92E-02	1.37E-01	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Lead-210	EPA 901.1 Modified	2.55E+00	1.12E+00	1.12E+00	2.15E+00	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Lead-212	EPA 901.1 Modified	1.71E-01	1.33E-01	1.33E-01	3.40E-01	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Lead-214	EPA 901.1 Modified	6.73E-01	2.50E-01	2.52E-01	3.90E-01		pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Promethium-145	EPA 901.1 Modified	-5.64E-02	1.30E-01	1.30E-01	1.95E-01	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Radium-226	EPA 901.1 Modified	8.65E-01	2.29E-01	2.33E-01	4.06E-01		pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Antimony-125	EPA 901.1 Modified	5.42E-02	2.37E-01	2.37E-01	4.15E-01	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Thorium-234	EPA 901.1 Modified	7.63E-01	1.88E+00	1.88E+00	2.59E+00	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Thallium-208	EPA 901.1 Modified	4.32E-01	5.37E-01	5.37E-01	8.97E-01	U	pCi/g
18-04024-07	TRG	B105100AFSFC375CV	03/05/18 14:31	4/5/2018	4/6/2018	18-04024	Uranium-235	EPA 901.1 Modified	-9.30E-02	1.29E+00	1.29E+00	7.61E-01	U	pCi/g

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Eberline Analytical
Final Report of Analysis

Report To:		Work Order Details:	
Patricia Giza		SDG:	18-04024
Zion Solutions, LLC		Purchase Order:	677118
101 Shiloh Blvd		Analysis Category:	ENVIRONMENTAL
Zion, IL 60099		Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Actinium-228	EPA 901.1 Modified	3.65E-02	6.65E-01	6.65E-01	1.09E+00	U	pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Silver-108m	EPA 901.1 Modified	5.32E-02	1.62E-01	1.62E-01	1.91E-01	U	pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Americium-241	EPA 901.1 Modified	1.01E-02	6.21E-02	6.21E-02	2.35E-01	U	pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Barium-133	EPA 901.1 Modified	1.74E-02	9.41E-02	9.41E-02	2.93E-01	U	pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Bismuth-214	EPA 901.1 Modified	1.03E+00	3.89E-01	3.93E-01	6.80E-01		pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Cobalt-60	EPA 901.1 Modified	8.73E-02	1.51E-01	1.51E-01	2.49E-01	U	pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Cesium-134	EPA 901.1 Modified	2.96E-03	6.64E-02	6.64E-02	2.46E-01	U	pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Cesium-137	EPA 901.1 Modified	7.51E-01	2.80E-01	2.82E-01	3.81E-01		pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Europium-152	EPA 901.1 Modified	-1.06E-01	3.24E-01	3.24E-01	3.56E-01	U	pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Europium-154	EPA 901.1 Modified	7.11E-02	3.95E-01	3.95E-01	1.80E-01	U	pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Europium-155	EPA 901.1 Modified	-2.94E-02	2.17E-01	2.17E-01	3.12E-01	U	pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Holmium-166m	EPA 901.1 Modified	1.66E-01	2.89E-01	2.89E-01	1.47E-01	U	pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Iodine-129	EPA 901.1 Modified	3.92E-02	6.48E-02	6.48E-02	1.01E-01	U	pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Potassium-40	EPA 901.1 Modified	5.93E+00	1.84E+00	1.87E+00	8.57E-01		pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Manganese-54	EPA 901.1 Modified	-2.45E-02	1.40E-01	1.40E-01	2.26E-01	U	pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Niobium-94	EPA 901.1 Modified	-3.52E-02	1.06E-01	1.06E-01	1.61E-01	U	pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Lead-210	EPA 901.1 Modified	1.30E+00	1.39E+00	1.39E+00	2.31E+00	U	pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Lead-212	EPA 901.1 Modified	5.00E-01	2.19E-01	2.21E-01	3.74E-01		pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Lead-214	EPA 901.1 Modified	7.11E-01	3.21E-01	3.24E-01	5.77E-01		pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Promethium-145	EPA 901.1 Modified	-1.37E-02	1.24E-01	1.24E-01	1.83E-01	U	pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Radium-226	EPA 901.1 Modified	1.03E+00	3.89E-01	3.93E-01	6.80E-01		pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Antimony-125	EPA 901.1 Modified	1.86E-01	4.19E-01	4.19E-01	6.32E-01	U	pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Thorium-234	EPA 901.1 Modified	2.04E+00	1.98E+00	1.98E+00	3.28E+00	U	pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Thallium-208	EPA 901.1 Modified	9.74E-02	5.66E-01	5.66E-01	8.14E-01	U	pCi/g
18-04024-08	TRG	B105100AFSFC379CV	03/06/18 07:46	4/5/2018	4/6/2018	18-04024	Uranium-235	EPA 901.1 Modified	-1.09E+00	1.42E+00	1.42E+00	7.80E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04024
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Actinium-228	EPA 901.1 Modified	2.61E-01	5.03E-01	5.03E-01	8.79E-01	U	pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Silver-108m	EPA 901.1 Modified	-5.29E-02	1.67E-01	1.67E-01	2.50E-01	U	pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Americium-241	EPA 901.1 Modified	-8.64E-01	2.75E-01	2.78E-01	3.61E-01	U	pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Barium-133	EPA 901.1 Modified	-1.40E-02	8.15E-02	8.15E-02	4.16E-01	U	pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Bismuth-214	EPA 901.1 Modified	8.57E-01	2.79E-01	2.82E-01	2.40E-01		pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Cobalt-60	EPA 901.1 Modified	2.48E-02	1.35E-01	1.36E-01	2.11E-01	U	pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Cesium-134	EPA 901.1 Modified	-3.64E-02	6.92E-02	6.92E-02	2.34E-01	U	pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Cesium-137	EPA 901.1 Modified	7.00E-01	2.07E-01	2.10E-01	2.39E-01		pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Europium-152	EPA 901.1 Modified	1.04E-01	4.08E-01	4.08E-01	5.58E-01	U	pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Europium-154	EPA 901.1 Modified	-3.03E-02	3.28E-01	3.28E-01	2.85E-01	U	pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Europium-155	EPA 901.1 Modified	5.23E-01	2.82E-01	2.84E-01	4.47E-01	U	pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Holmium-166m	EPA 901.1 Modified	1.99E-02	2.42E-01	2.42E-01	2.36E-01	U	pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Iodine-129	EPA 901.1 Modified	-2.40E+00	1.54E+00	1.54E+00	1.60E+00	U	pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Potassium-40	EPA 901.1 Modified	6.28E+00	1.86E+00	1.89E+00	1.44E+00		pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Manganese-54	EPA 901.1 Modified	7.60E-02	1.46E-01	1.46E-01	2.51E-01	U	pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Niobium-94	EPA 901.1 Modified	1.94E-02	9.07E-02	9.07E-02	2.00E-01	U	pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Lead-210	EPA 901.1 Modified	-6.13E+00	3.35E+00	3.36E+00	4.55E+00	U	pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Lead-212	EPA 901.1 Modified	-1.64E-02	5.11E-02	5.11E-02	4.71E-01	U	pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Lead-214	EPA 901.1 Modified	1.04E+00	4.89E-01	4.92E-01	7.81E-01		pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Promethium-145	EPA 901.1 Modified	1.18E+00	6.21E-01	6.24E-01	9.32E-01	U	pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Radium-226	EPA 901.1 Modified	8.57E-01	2.79E-01	2.82E-01	2.40E-01		pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Antimony-125	EPA 901.1 Modified	-2.24E-01	5.19E-01	5.19E-01	7.55E-01	U	pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Thorium-234	EPA 901.1 Modified	-5.53E+00	2.50E+00	2.51E+00	3.40E+00	U	pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Thallium-208	EPA 901.1 Modified	7.60E-01	4.78E-01	4.79E-01	7.37E-01	U	pCi/g
18-04024-09	TRG	B105100AFSFC383CV	03/06/18 07:40	4/5/2018	4/6/2018	18-04024	Uranium-235	EPA 901.1 Modified	3.79E-02	2.31E+00	2.31E+00	1.30E+00	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:
Patricia Giza
Zion Solutions, LLC
101 Shiloh Blvd
Zion, IL 60099

Work Order Details:
SDG: 18-04024
Purchase Order: 677118
Analysis Category: ENVIRONMENTAL
Sample Matrix: SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Actinium-228	EPA 901.1 Modified	7.10E-01	4.16E-01	4.18E-01	7.33E-01	U	pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Silver-108m	EPA 901.1 Modified	9.37E-03	1.12E-01	1.12E-01	1.75E-01	U	pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Americium-241	EPA 901.1 Modified	1.32E-01	1.53E-01	1.53E-01	2.89E-01	U	pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Barium-133	EPA 901.1 Modified	4.56E-01	2.14E-01	2.15E-01	2.51E-01	U	pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Bismuth-214	EPA 901.1 Modified	1.02E+00	2.82E-01	2.87E-01	3.60E-01		pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Cobalt-60	EPA 901.1 Modified	-1.26E-02	3.61E-02	3.61E-02	2.06E-01	U	pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Cesium-134	EPA 901.1 Modified	-6.83E-01	3.11E-01	3.12E-01	1.93E-01	U	pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Cesium-137	EPA 901.1 Modified	5.42E-01	2.10E-01	2.12E-01	2.86E-01		pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Europium-152	EPA 901.1 Modified	3.91E-03	2.22E-01	2.22E-01	3.02E-01	U	pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Europium-154	EPA 901.1 Modified	3.54E-02	3.00E-01	3.00E-01	1.54E-01	U	pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Europium-155	EPA 901.1 Modified	4.18E-02	1.12E-01	1.12E-01	2.59E-01	U	pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Holmium-166m	EPA 901.1 Modified	1.86E-01	1.98E-01	1.99E-01	1.18E-01	U	pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Iodine-129	EPA 901.1 Modified	-1.78E-03	5.66E-02	5.66E-02	8.39E-02	U	pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Potassium-40	EPA 901.1 Modified	6.14E+00	1.78E+00	1.81E+00	1.31E+00		pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Manganese-54	EPA 901.1 Modified	-6.68E-02	1.29E-01	1.29E-01	1.92E-01	U	pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Niobium-94	EPA 901.1 Modified	-2.47E-02	8.48E-02	8.48E-02	1.58E-01	U	pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Lead-210	EPA 901.1 Modified	5.23E-01	1.10E+00	1.10E+00	1.67E+00	U	pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Lead-212	EPA 901.1 Modified	5.10E-01	1.76E-01	1.78E-01	3.12E-01		pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Lead-214	EPA 901.1 Modified	9.00E-01	2.67E-01	2.71E-01	7.19E-01		pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Promethium-145	EPA 901.1 Modified	-8.95E-02	1.10E-01	1.10E-01	1.53E-01	U	pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Radium-226	EPA 901.1 Modified	1.02E+00	2.82E-01	2.87E-01	3.60E-01		pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Antimony-125	EPA 901.1 Modified	-1.81E-01	3.83E-01	3.84E-01	4.90E-01	U	pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Thorium-234	EPA 901.1 Modified	2.48E+00	1.37E+00	1.37E+00	2.22E+00	U	pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Thallium-208	EPA 901.1 Modified	5.86E-01	3.86E-01	3.87E-01	6.72E-01	U	pCi/g
18-04024-10	TRG	B105100AFSFC411CV	03/06/18 08:05	4/5/2018	4/6/2018	18-04024	Uranium-235	EPA 901.1 Modified	-5.58E-01	1.18E+00	1.18E+00	6.22E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:
Patricia Giza
Zion Solutions, LLC
101 Shiloh Blvd
Zion, IL 60099

Work Order Details:
SDG: 18-04024
Purchase Order: 677118
Analysis Category: ENVIRONMENTAL
Sample Matrix: SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Actinium-228	EPA 901.1 Modified	6.90E-01	9.35E-01	9.35E-01	1.42E+00	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Silver-108m	EPA 901.1 Modified	2.53E-02	1.97E-01	1.97E-01	2.91E-01	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Americium-241	EPA 901.1 Modified	-4.85E-01	3.31E-01	3.32E-01	3.83E-01	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Barium-133	EPA 901.1 Modified	-2.50E-01	3.47E-01	3.47E-01	3.97E-01	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Bismuth-214	EPA 901.1 Modified	9.44E-02	4.43E-01	4.43E-01	6.60E-01	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Cobalt-60	EPA 901.1 Modified	1.43E+01	9.42E-01	1.19E+00	4.16E-01		pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Cesium-134	EPA 901.1 Modified	-2.75E-01	2.33E-01	2.34E-01	3.04E-01	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Cesium-137	EPA 901.1 Modified	5.46E+01	5.78E+00	6.42E+00	8.27E-01		pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Europium-152	EPA 901.1 Modified	-4.13E-02	1.01E+00	1.01E+00	6.32E-01	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Europium-154	EPA 901.1 Modified	-1.11E-02	3.24E-01	3.24E-01	3.25E-01	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Europium-155	EPA 901.1 Modified	2.04E-01	2.71E-01	2.71E-01	4.43E-01	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Holmium-166m	EPA 901.1 Modified	1.29E-01	3.17E-01	3.17E-01	2.50E-01	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Iodine-129	EPA 901.1 Modified	-3.57E-02	3.86E-01	3.86E-01	4.87E-01	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Potassium-40	EPA 901.1 Modified	8.73E+00	1.91E+00	1.96E+00	1.56E+00		pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Manganese-54	EPA 901.1 Modified	2.22E-01	2.43E-01	2.44E-01	3.80E-01	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Niobium-94	EPA 901.1 Modified	1.05E-01	2.22E-01	2.22E-01	2.86E-01	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Lead-210	EPA 901.1 Modified	1.76E+00	2.79E+00	2.80E+00	3.71E+00	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Lead-212	EPA 901.1 Modified	3.02E-01	3.16E-01	3.17E-01	5.23E-01	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Lead-214	EPA 901.1 Modified	2.14E-01	5.33E-01	5.33E-01	7.85E-01	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Promethium-145	EPA 901.1 Modified	1.23E+00	4.15E-01	4.20E-01	5.72E-01	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Radium-226	EPA 901.1 Modified	9.44E-02	4.43E-01	4.43E-01	6.60E-01	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Antimony-125	EPA 901.1 Modified	1.65E-01	8.65E-01	8.65E-01	1.27E+00	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Thorium-234	EPA 901.1 Modified	2.25E+00	2.95E+00	2.96E+00	3.92E+00	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Thallium-208	EPA 901.1 Modified	4.64E-01	3.35E-01	3.36E-01	5.91E-01	U	pCi/g
18-04024-11	TRG	B105100AFSFC433CV	02/08/18 15:12	4/5/2018	4/6/2018	18-04024	Uranium-235	EPA 901.1 Modified	4.74E-01	2.32E+00	2.32E+00	1.30E+00	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Patricia Giza	SDG:	18-04024
Zion Solutions, LLC	Purchase Order:	677118
101 Shiloh Blvd	Analysis Category:	ENVIRONMENTAL
Zion, IL 60099	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Actinium-228	EPA 901.1 Modified	-1.03E-02	9.58E-01	9.58E-01	1.42E+00	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Silver-108m	EPA 901.1 Modified	4.59E-02	2.07E-01	2.07E-01	3.18E-01	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Americium-241	EPA 901.1 Modified	2.39E-01	3.77E-01	3.77E-01	4.97E-01	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Barium-133	EPA 901.1 Modified	-1.08E-01	4.02E-01	4.02E-01	4.69E-01	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Bismuth-214	EPA 901.1 Modified	3.00E-01	4.79E-01	4.80E-01	7.35E-01	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Cobalt-60	EPA 901.1 Modified	1.24E+01	8.39E-01	1.05E+00	3.44E-01		pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Cesium-134	EPA 901.1 Modified	-1.17E-01	1.73E-01	1.73E-01	2.68E-01	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Cesium-137	EPA 901.1 Modified	8.57E+01	8.41E+00	9.49E+00	6.18E-01		pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Europium-152	EPA 901.1 Modified	-1.29E-02	1.20E+00	1.20E+00	7.53E-01	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Europium-154	EPA 901.1 Modified	-2.76E-01	4.11E-01	4.11E-01	3.80E-01	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Europium-155	EPA 901.1 Modified	1.35E-01	3.95E-01	3.95E-01	5.17E-01	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Holmium-166m	EPA 901.1 Modified	-1.91E-01	3.39E-01	3.40E-01	2.79E-01	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Iodine-129	EPA 901.1 Modified	-6.01E+00	9.24E-01	9.74E-01	3.88E-01	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Potassium-40	EPA 901.1 Modified	7.10E+00	1.92E+00	1.96E+00	2.06E+00		pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Manganese-54	EPA 901.1 Modified	3.04E-02	2.36E-01	2.36E-01	3.59E-01	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Niobium-94	EPA 901.1 Modified	1.75E-01	2.20E-01	2.20E-01	2.69E-01	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Lead-210	EPA 901.1 Modified	2.90E+00	2.42E+00	2.42E+00	3.85E+00	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Lead-212	EPA 901.1 Modified	6.77E-01	4.33E-01	4.35E-01	5.83E-01	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Lead-214	EPA 901.1 Modified	5.04E-01	6.46E-01	6.47E-01	8.58E-01	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Promethium-145	EPA 901.1 Modified	2.47E+00	4.20E-01	4.39E-01	6.63E-01	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Radium-226	EPA 901.1 Modified	3.00E-01	4.79E-01	4.80E-01	7.35E-01	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Antimony-125	EPA 901.1 Modified	-9.02E-01	8.96E-01	8.97E-01	1.36E+00	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Thorium-234	EPA 901.1 Modified	2.07E+00	3.52E+00	3.52E+00	4.67E+00	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Thallium-208	EPA 901.1 Modified	3.55E-01	5.73E-01	5.73E-01	9.62E-01	U	pCi/g
18-04024-12	TRG	B105100AFSFC434CV	02/08/18 09:30	4/5/2018	4/6/2018	18-04024	Uranium-235	EPA 901.1 Modified	-3.24E+00	3.79E+00	3.79E+00	1.54E+00	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:
Patricia Giza
Zion Solutions, LLC
101 Shiloh Blvd
Zion, IL 60099

Work Order Details:
SDG: 18-04024
Purchase Order: 677118
Analysis Category: ENVIRONMENTAL
Sample Matrix: SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Actinium-228	EPA 901.1 Modified	5.75E-01	4.50E-01	4.51E-01	8.24E-01	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Silver-108m	EPA 901.1 Modified	9.11E-02	9.73E-02	9.74E-02	1.81E-01	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Americium-241	EPA 901.1 Modified	-5.60E-01	2.09E-01	2.11E-01	2.82E-01	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Barium-133	EPA 901.1 Modified	3.99E-01	1.96E-01	1.97E-01	3.08E-01	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Bismuth-214	EPA 901.1 Modified	1.99E-01	3.03E-01	3.03E-01	5.02E-01	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Cobalt-60	EPA 901.1 Modified	3.68E-02	1.22E-01	1.22E-01	1.63E-01	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Cesium-134	EPA 901.1 Modified	1.01E-03	4.22E-02	4.22E-02	1.94E-01	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Cesium-137	EPA 901.1 Modified	1.37E-01	1.46E-01	1.46E-01	2.45E-01	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Europium-152	EPA 901.1 Modified	4.55E-01	5.65E-01	5.66E-01	4.50E-01	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Europium-154	EPA 901.1 Modified	-6.66E-02	3.40E-01	3.40E-01	2.33E-01	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Europium-155	EPA 901.1 Modified	1.26E-01	1.01E-01	1.01E-01	3.61E-01	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Holmium-166m	EPA 901.1 Modified	-9.26E-02	1.13E-01	1.14E-01	1.79E-01	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Iodine-129	EPA 901.1 Modified	-1.12E+00	9.91E-01	9.93E-01	1.25E+00	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Potassium-40	EPA 901.1 Modified	6.48E+00	1.67E+00	1.70E+00	1.18E+00		pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Manganese-54	EPA 901.1 Modified	5.08E-02	1.13E-01	1.13E-01	1.96E-01	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Niobium-94	EPA 901.1 Modified	8.65E-03	9.21E-02	9.21E-02	1.51E-01	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Lead-210	EPA 901.1 Modified	-4.42E+00	2.62E+00	2.63E+00	3.59E+00	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Lead-212	EPA 901.1 Modified	4.28E-01	2.98E-01	2.99E-01	4.74E-01	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Lead-214	EPA 901.1 Modified	6.62E-02	2.99E-01	2.99E-01	4.60E-01	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Promethium-145	EPA 901.1 Modified	6.75E-01	4.82E-01	4.83E-01	7.27E-01	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Radium-226	EPA 901.1 Modified	1.99E-01	3.03E-01	3.03E-01	5.02E-01	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Antimony-125	EPA 901.1 Modified	1.49E-01	3.81E-01	3.81E-01	6.02E-01	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Thorium-234	EPA 901.1 Modified	-3.60E+00	1.90E+00	1.91E+00	2.63E+00	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Thallium-208	EPA 901.1 Modified	-1.91E-01	3.92E-01	3.92E-01	5.93E-01	U	pCi/g
18-04024-13	TRG	B105100AFSFC435CV	02/07/18 14:22	4/5/2018	4/6/2018	18-04024	Uranium-235	EPA 901.1 Modified	-5.06E-02	1.77E+00	1.77E+00	9.72E-01	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

Eberline Analytical
Final Report of Analysis

Report To:
Patricia Giza
Zion Solutions, LLC
101 Shiloh Blvd
Zion, IL 60099

Work Order Details:
SDG: 18-04024
Purchase Order: 677118
Analysis Category: ENVIRONMENTAL
Sample Matrix: SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Actinium-228	EPA 901.1 Modified	6.73E-01	5.25E-01	5.26E-01	1.02E+00	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Silver-108m	EPA 901.1 Modified	8.09E-02	1.53E-01	1.53E-01	1.71E-01	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Americium-241	EPA 901.1 Modified	-2.40E-01	1.90E-01	1.91E-01	2.44E-01	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Barium-133	EPA 901.1 Modified	1.71E-02	7.17E-02	7.17E-02	3.10E-01	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Bismuth-214	EPA 901.1 Modified	3.74E-01	3.60E-01	3.61E-01	5.83E-01	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Cobalt-60	EPA 901.1 Modified	-5.21E-02	1.28E-01	1.28E-01	2.44E-01	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Cesium-134	EPA 901.1 Modified	-3.55E-01	2.55E-01	2.56E-01	2.24E-01	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Cesium-137	EPA 901.1 Modified	7.93E-02	1.93E-01	1.93E-01	2.96E-01	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Europium-152	EPA 901.1 Modified	-4.36E-02	4.33E-01	4.33E-01	3.17E-01	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Europium-154	EPA 901.1 Modified	-1.83E-01	4.11E-01	4.11E-01	1.72E-01	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Europium-155	EPA 901.1 Modified	5.63E-02	2.00E-01	2.00E-01	3.02E-01	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Holmium-166m	EPA 901.1 Modified	1.66E-01	2.51E-01	2.52E-01	1.42E-01	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Iodine-129	EPA 901.1 Modified	2.48E-02	6.86E-02	6.86E-02	1.04E-01	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Potassium-40	EPA 901.1 Modified	7.05E+00	2.57E+00	2.59E+00	3.06E+00		pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Manganese-54	EPA 901.1 Modified	-2.54E-02	1.34E-01	1.34E-01	2.16E-01	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Niobium-94	EPA 901.1 Modified	-2.18E-02	1.32E-01	1.32E-01	2.10E-01	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Lead-210	EPA 901.1 Modified	1.55E+00	1.60E+00	1.60E+00	2.67E+00	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Lead-212	EPA 901.1 Modified	7.41E-01	2.27E-01	2.30E-01	3.90E-01	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Lead-214	EPA 901.1 Modified	4.65E-01	3.71E-01	3.72E-01	5.89E-01	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Promethium-145	EPA 901.1 Modified	-1.45E-03	1.28E-01	1.28E-01	1.91E-01	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Radium-226	EPA 901.1 Modified	3.74E-01	3.60E-01	3.61E-01	5.83E-01	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Antimony-125	EPA 901.1 Modified	-4.18E-01	4.57E-01	4.57E-01	4.74E-01	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Thorium-234	EPA 901.1 Modified	2.60E+00	1.68E+00	1.68E+00	2.70E+00	U	pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Thallium-208	EPA 901.1 Modified	9.66E-01	4.29E-01	4.32E-01	3.45E-01		pCi/g
18-04024-14	TRG	B105100AFSFC436CV	02/14/18 10:30	4/5/2018	4/6/2018	18-04024	Uranium-235	EPA 901.1 Modified	-2.14E+00	1.54E+00	1.54E+00	7.79E-01	U	pCi/g

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Eberline Analytical
Final Report of Analysis

Report To:
Patricia Giza
Zion Solutions, LLC
101 Shiloh Blvd
Zion, IL 60099

Work Order Details:
SDG: 18-04024
Purchase Order: 677118
Analysis Category: ENVIRONMENTAL
Sample Matrix: SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Qualifier	Report Units
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Actinium-228	EPA 901.1 Modified	5.43E-01	4.13E-01	4.14E-01	7.38E-01	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Silver-108m	EPA 901.1 Modified	-1.00E-01	1.14E-01	1.14E-01	1.53E-01	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Americium-241	EPA 901.1 Modified	-3.69E-01	4.92E-01	4.92E-01	6.02E-01	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Barium-133	EPA 901.1 Modified	2.27E-01	3.64E-01	3.65E-01	6.20E-01	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Bismuth-214	EPA 901.1 Modified	8.80E-01	5.68E-01	5.70E-01	8.82E-01	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Cobalt-60	EPA 901.1 Modified	2.07E+00	2.22E-01	2.46E-01	2.05E-01		pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Cesium-134	EPA 901.1 Modified	-4.11E-01	3.12E-01	3.12E-01	2.02E-01	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Cesium-137	EPA 901.1 Modified	1.95E+02	2.04E+01	2.27E+01	8.88E-01		pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Europium-152	EPA 901.1 Modified	9.29E-01	1.71E+00	1.71E+00	6.56E-01	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Europium-154	EPA 901.1 Modified	9.22E-03	2.00E-01	2.00E-01	3.35E-01	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Europium-155	EPA 901.1 Modified	-1.80E-01	4.33E-01	4.33E-01	6.81E-01	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Holmium-166m	EPA 901.1 Modified	-3.09E-02	1.91E-01	1.91E-01	2.86E-01	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Iodine-129	EPA 901.1 Modified	-7.92E-01	6.05E-01	6.06E-01	7.29E-01	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Potassium-40	EPA 901.1 Modified	7.96E+00	1.88E+00	1.92E+00	1.74E+00		pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Manganese-54	EPA 901.1 Modified	9.63E-02	1.08E-01	1.08E-01	1.90E-01	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Niobium-94	EPA 901.1 Modified	-3.55E-02	1.09E-01	1.09E-01	1.59E-01	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Lead-210	EPA 901.1 Modified	4.71E+00	4.44E+00	4.45E+00	5.84E+00	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Lead-212	EPA 901.1 Modified	5.15E-01	5.85E-01	5.85E-01	9.71E-01	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Lead-214	EPA 901.1 Modified	9.12E-01	7.91E-01	7.93E-01	1.30E+00	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Promethium-145	EPA 901.1 Modified	2.87E+00	6.65E-01	6.81E-01	8.69E-01	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Radium-226	EPA 901.1 Modified	8.80E-01	5.68E-01	5.70E-01	8.82E-01	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Antimony-125	EPA 901.1 Modified	-3.61E-01	1.56E+00	1.56E+00	2.11E+00	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Thorium-234	EPA 901.1 Modified	4.71E+00	4.51E+00	4.51E+00	5.93E+00	U	pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Thallium-208	EPA 901.1 Modified	5.51E-01	3.45E-01	3.46E-01	5.11E-01		pCi/g
18-04024-15	TRG	B105100AFSFC438CV	02/08/18 10:25	4/5/2018	4/6/2018	18-04024	Uranium-235	EPA 901.1 Modified	-1.85E+00	4.01E+00	4.01E+00	2.08E+00	U	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (1-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample;MBL=Blank;DUP=Duplicate;TRG=Normal Sample;DO=Duplicate Original;U=Non-detect

ZION SOLUTIONS LLC
An EnergySolutions Company

ZS-WM-131
Revision 0
Information Use

REC'D APR 05 2018
18-04024

Attachment 1 – Chain-of-Custody Form

Sample ID	Sample Log	Matrix	Sample Type	Sample Container				Sample Date	Sample Time	Analysis Type	Preservative	Remarks
				Vol	Unit	Type	Qty					
B105100AFSWC017CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	0935	5ROC/HTD	N/A	0.0-0.5" 101.65g
B105100AFSWC041CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	0925	5ROC/HTD	N/A	0.0-0.5" 123.37g
B105100AFSWC057CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	0910	5ROC/HTD	N/A	0.0-0.5" 101.99g
B105100AFSWC088CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	0855	5ROC/HTD	N/A	0.0-0.5" 105.94g
B105100AFSWC101CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	0725	5ROC/HTD	N/A	0.0-0.5" 146.06g
B105100AFSWC115CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	1530	5ROC/HTD	N/A	0.0-0.5" 94.29g
B105100AFSWC116CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	0840	5ROC/HTD	N/A	0.0-0.5" 98.62g
B105100AFSWC150CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	02/21/2018	0840	5ROC/HTD	N/A	0.0-0.5" 97.99g
B105100AFSWC151CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	02/21/2018	0920	5ROC/HTD	N/A	0.0-0.5" 102.61g
B105100AFSWC156CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	02/21/2018	1330	5ROC/HTD	N/A	0.0-0.5" 96.47g
B105100AFSWC162CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	02/15/2018	1550	5ROC/HTD	N/A	0.0-0.5" 90.81g
B105100AFSWC163CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	02/15/2018	1350	5ROC/HTD	N/A	0.0-0.5" 97.73g
B105100AFSWC179CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/07/2018	0710	5ROC/HTD	N/A	0.0-0.5" 100.50g
B105100AFSWC190CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	1300	5ROC/HTD	N/A	0.0-1.0" 180.00g
B105100AFSWC201CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	1513	5ROC/HTD	N/A	0.0-0.5" 96.68g
B105100AFSWC210CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	1440	5ROC/HTD	N/A	0.0-0.5" 120.44g
B105100AFSWC231CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	1430	5ROC/HTD	N/A	0.0-0.5" 132.73g
B105100AFSFC239CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	0955	5ROC/HTD	N/A	0.0-1.0" 209.92g
B105100AFSFC250CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	0940	5ROC/HTD	N/A	0.0-0.5" 130.05g

B105100AFSFC255CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	1246	5ROC/HTD	N/A	0.0-0.5" 134.31g
B105100AFSFC263CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	0930	5ROC/HTD	N/A	0.0-0.5" 110.42g
B105100AFSFC276CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/05/2018	1342	5ROC/HTD	N/A	0.0-0.5" 122.73g
B105100AFSFC282CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/06/2018	0852	5ROC/HTD	N/A	0.0-0.5" 116.66g
B105100AFSFC289CV	N/A	CONCRETE	CONCRETE	57.94	cm^3	Puck	1	03/05/2018	1352	5ROC/HTD	N/A	0.0-0.5" 119.03g
B105100AFSFC293CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/07/2018	1345	5ROC/HTD	N/A	0.0-0.5" 132.53g
B105100AFSFC300CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/13/2018	1250	5ROC/HTD	N/A	0.0-0.5" 85.562g
B105100AFSFC316CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/05/2018	1358	5ROC/HTD	N/A	0.0-0.5" 108.12g
B105100AFSFC321CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/13/2018	1410	5ROC/HTD	N/A	0.0-0.5" 148.80g
B105100AFSFC326CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/14/2018	0815	5ROC/HTD	N/A	0.0-0.5" 134.35g
B105100AFSFC329CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/05/2018	1418	5ROC/HTD	N/A	0.0-0.5" 115.08g
B105100AFSFC332CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/05/2018	1405	5ROC/HTD	N/A	0.0-0.5" 123.51g
B105100AFSFC345CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/07/2018	1045	5ROC/HTD	N/A	0.0-0.5" 115.27g
B105100AFSFC347CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/12/2018	1310	5ROC/HTD	N/A	0.0-0.5" 91.09g
B105100AFSFC348CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/12/2018	1515	5ROC/HTD	N/A	0.0-0.5" 88.01g
4 B105100AFSFC354CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/08/2018	1307	5ROC/HTD	N/A	0.0-0.5" 110.07g
5 B105100AFSFC363CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/06/2018	0740	5ROC/HTD	N/A	0.0-0.5" 85.52g
6 B105100AFSFC369CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/05/2018	1453	5ROC/HTD	N/A	0.0-0.5" 150.58g
7 B105100AFSFC375CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/05/2018	1431	5ROC/HTD	N/A	0.0-0.5" 119.51g
8 B105100AFSFC379CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/06/2018	0746	5ROC/HTD	N/A	0.0-0.5" 135.29g
9 B105100AFSFC383CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/06/2018	0740	5ROC/HTD	N/A	0.0-0.5" 118.83g
10 B105100AFSFC411CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	03/06/2018	0805	5ROC/HTD	N/A	0.0-0.75 168.23g"

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11	B105100AFSFC433CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/08/2018	1512	5ROC/HTD	N/A	0.0-0.5" 130.93g
12	B105100AFSFC434CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/08/2018	0930	5ROC/HTD	N/A	0.0-0.5" 133.53g
13	B105100AFSFC435CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/07/2018	1422	5ROC/HTD	N/A	0.0-0.5" 152.36g
14	B105100AFSFC436CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/14/2018	1030	5ROC/HTD	N/A	0.0-0.5" 133.53g
15	B105100AFSFC438CV	N/A	CONCRETE	CONCRETE	57.94	cm3	Puck	1	02/08/2018	1025	5ROC/HTD	N/A	0.0-0.5" 130.93g

Laboratory:	Date Submitted To Lab:	Ship Container No.:	Cooler Temperature:	Airbill Number: Fed Ex First Overnight
Eberline Labs		**N/A**	**N/A**	8107 0645 6688

Relinquished by:	Date (04/04/2018)	Time:	Received by:	Date: (mm/dd/yyyy):	Time:
Reed R. Smith		1346	Richard F. Rickert	04/04/2018	1346
Relinquished by: Richard F. Rickert	Date (mm/dd/yyyy): 04/04/2018	Time: 1630	Received by: Fed Ex First Overnight	Date: (mm/dd/yyyy): 04/04/2018	Time: 16:30
Relinquished by:	Date (mm/dd/yyyy):	Time:	Received by:	Date: (mm/dd/yyyy): 4-5-18	Time: 0800
Relinquished by:	Date (mm/dd/yyyy):	Time:	Received by:	Date: (mm/dd/yyyy):	Time:

Comments

PO# 677118 7 day turnaround 5-ROC / HTD / H-3