

# **Final Status Survey Final Report Phase VI**

**Appendix A5  
Survey Unit Release Record  
9512-0000, Northwest Site Grounds  
(Non-Protected Area)**

**February 2007**



CYAPCO  
FINAL STATUS SURVEY RELEASE RECORD  
NORTHWEST SITE GROUNDS (NON-PROTECTED AREA)  
SURVEY UNIT 9512-0000

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**1. SURVEY UNIT DESCRIPTION**

Survey Unit 9512-0000, Northwest Site Grounds, is designated as Final Status Survey (FSS) Class 3 and consists of approximately 30,701 m<sup>2</sup> (7.58 acres) of open land area located approximately 0.007 miles from the reference coordinate system benchmark used at the Haddam Neck Plant (HNP) (see Attachment 1, Figure 1). The Northwest Site Grounds survey unit is bounded as follows: on the west by the Connecticut River; Survey Area 9506-0000, 9514-0000, 9302-0000 and 9304-0001 are to the east; Survey Area 9304-0001 is to the south and the property boundary bounds this unit to the north (called north as oriented with the north to south flow of the Connecticut River). The survey unit is comprised of predominately flat open land that slopes, slightly, from east to west toward the Connecticut River. At the far northeastern end of the survey unit, the topography changes from flat to steep hillside. The hillside is covered with large trees and thick brush. At the southern most section of the survey unit, the area is a steep hillside that falls off to the Connecticut River.

Connecticut Yankee (CY) memorandum, CY-06-093, addresses the abandonment of buried pipes, concrete, and drains onsite that will remain in place at the completion of the decommissioning. The sidewalk and two (2) electric/telephone duct banks that traverse the site adjacent to the access road will be abandoned in place. Sufficient radiological assessment has been performed to confirm that the components or structures will meet all applicable unrestricted release criteria.

The reference coordinates associated with this survey area are E002 through E008 by S039 through S064 (refer to License Termination Plan Section 5.4.4, Figure 5-2). The reference coordinates provide the maximum dimensions of a rectangle containing this survey unit. Some areas contained in this rectangle may not be part of this survey area. The boundary of the survey area was defined using a Global Positioning System (GPS) based on the Connecticut State Plane System North American Datum (NAD) 1927.

**2. CLASSIFICATION BASIS**

The survey unit was classified in accordance with Procedure RPM 5.1-10, "Survey Unit Classification." The historical information, scoping analyses and characterization results provided sufficient data to designate Survey Unit 9512-0000 as Class 3 in May 2006.

The "Classification Basis Summary" conducted for this survey unit consisted of:

- a) A review of the 10CFR50.75 (g) (1) database,
- b) A review of the "Initial Characterization Report" and the "Historic Site Assessment (HSA) Supplement,"

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c) Historic and current survey records review,

d) Visual inspections and a "walk-down."

A review of the 10CFR50.75(g)(1) database report identified one (1) significant radiological event that may have impacted this survey area. Several small areas of low-level radioactive contaminated material were found on facility grounds through routine testing. (PIR 80-37) The radioactive material was removed and no further radioactive material was located.

The historical documents reviewed included the "*Results of Scoping Survey*", (performed during late 1997) and the "*Historical Site Assessment*". No additional information was provided that was pertinent to this survey unit.

A review of the "*Initial and Supplemental Characterization Reports*" as well as the previous "*Classification Basis Summaries*" also provided no additional pertinent information.

Final characterization was performed by Site Closure personnel in May of 2005 to obtain data of sufficient quality for Final Status Survey (FSS) planning purposes. This sampling was performed under Survey Sampling Work Plan (SSWP) 05-05-014. Ten (10) soil samples were taken from ten (10) biased locations. All of the samples were analyzed on-site using gamma spectroscopy. Hard-to-Detect (HTD) analyses were conducted on one (1) of the ten (10) samples. The only plant-related radionuclide identified in the samples was Cs-137 (refer to Table 1).

**Table 1 – Basic Statistical Quantities for Cs-137 from the Characterization Survey**

Parameter	Cs-137 (pCi/g)
Minimum Value:	5.44E-02
Maximum Value:	4.95E-01
Mean:	2.65E-01
Median:	2.31E-01
Standard Deviation:	1.47E-01

The FSS Engineer performed a visual inspection and walk-down during September 2006 to assess the physical condition of the survey unit, evaluate access points and travel paths and identify potentially hazardous conditions. At the time of the walk-down the area was being used for storage of heavy equipment and over-flow parking.

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Based upon a review of the historical information and the results of the characterization survey data, it was concluded that there was a low probability for residual radioactivity in concentrations greater than the Derived Concentration Guideline Levels (DCGLs), justifying a final survey unit classification of Class 3.

**3. DATA QUALITY OBJECTIVES (DQO)**

FSS design and planning is based on the Data Quality Objective (DQO) process as described by the LTP, Procedure RPM 5.1-11, "*Preparation of Final Status Survey Plan*," and the "*Multi-Agency Radiation Survey and Site Investigation Manual*" (MARSSIM). A summary of the main features of the DQO process is provided herein.

The DQO process incorporates 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 defined 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 the level of residual activity in the survey unit exceeded the release criteria. Therefore, the survey unit would satisfy the primary objective of the Final Status Survey Plan (FSSP).

The primary objective of the FSSP was to demonstrate that the level of residual radioactivity in Survey Unit 9512-0000 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).

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 soil (called Base Case Soil DCGL), existing groundwater radioactivity and for future groundwater radioactivity that will be contributed by building foundations and footings.

The DCGLs presented in Chapter 6 of the LTP were developed for exposures from three (3) components, that is, residual radioactivity in soil, existing groundwater radioactivity, and future groundwater radioactivity from the burial of concrete foundations or footings from site buildings containing residual radioactivity. Equation 1 shows the mathematical relationship between the three (3) components and the total dose.

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### *Equation 1:*

$$H_{\text{Total}} = H_{\text{Soil (sediment)}} + H_{\text{Existing GW}} + H_{\text{Future GW}}$$

The total dose under the LTP criteria is twenty five (25) mrem/yr Total Effective Dose Equivalent (TEDE) from all three (3) components. The allowable total dose under the Connecticut Department of Environmental Protection (CTDEP) radiological remediation standard for Connecticut Yankee (CY) is nineteen (19) mrem/yr TEDE. To satisfy both the LTP and CY CTDEP criteria, the dose from soil must be reduced when using the existing and future groundwater dose values discussed above. (reference CY memo ISC 06-024)

This survey unit is considered affected by existing groundwater radioactive contamination (reference CY memo ISC 06-024). Therefore, the dose contribution from existing groundwater is two (2) mrem/yr TEDE.

This survey unit is not considered impacted by future groundwater radioactive contamination, as there are no radioactive concrete foundations or footings remaining within the groundwater saturated zone in the area. Therefore, the dose contribution from future groundwater is zero (0) mrem/yr TEDE.

### *Equation 2:*

$$19 \text{ mrem/yr}_{\text{Total}} = 17 \text{ mrem/yr}_{\text{Soil}} + 2 \text{ mrem/yr}_{\text{Existing GW}} + 0 \text{ mrem/yr}_{\text{Future GW}}$$

The allowable dose for soil in this survey unit is seventeen (17) mrem/yr TEDE as shown by Equation 2 above. The concentration of residual radioactivity resulting in seventeen (17) mrem/yr TEDE is designated as the Operational DCGL(s), and has been established for the radionuclides of concern as provided in Table 2.

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**Table 2 – Radionuclide Specific Base Case Soil DCGLs, Operational DCGLs  
and Required Minimum Detectable Concentrations**

<b>Radionuclide <sup>(1)</sup></b>	<b>Base Case Soil DCGL (pCi/g) <sup>(2)</sup></b>	<b>Operational DCGL (pCi/g) <sup>(3)</sup></b>	<b>Required MDC (pCi/g) <sup>(4)</sup></b>
<b>H-3</b>	4.12E+02	2.80E+02	1.65E+01
<b>C-14</b>	5.66E+00	3.85E+00	2.26E-01
Mn-54	1.74E+01	1.18E+01	6.96E-01
<b>Fe-55</b>	2.74E+04	1.86E+04	1.10E+03
Co-60	3.81E+00	2.59E+00	1.52E-01
<b>Ni-63</b>	7.23E+02	4.92E+02	2.89E+01
<b>Sr-90</b>	1.55E+00	1.05E+00	6.20E-02
Nb-94	7.12E+00	4.84E+00	2.85E-01
<b>Tc-99</b>	1.26E+01	9.58E+00	5.04E-01
Ag-108m	7.14E+00	4.86E+00	2.86E-01
Cs-134	4.67E+00	3.18E+00	1.87E-01
Cs-137	7.91E+00	5.38E+00	3.16E-01
Eu-152	1.01E+01	6.87E+00	4.04E-01
Eu-154	9.29E+00	6.32E+00	3.72E-01
Eu-155	3.92E+02	2.67E+02	1.57E+01
<b>Pu-238</b>	2.96E+01	2.01E+01	1.18E+00
<b>Pu-239/240</b>	2.67E+01	1.82E+01	1.07E+00
<b>Pu-241</b>	8.70E+02	5.92E+02	3.48E+01
Am-241 <sup>(5)</sup>	2.58E+01	1.75E+01	1.03E+00
<b>Cm-243/244</b>	2.90E+01	1.97E+01	1.16E+00

- (1) **Bold** indicates those radionuclides considered to be Hard to Detect (HTD)
- (2) The Base Case Soil DCGLs for soil are specified by the LTP in Chapter 6 and are equivalent to twenty-five (25) mrem/yr TEDE
- (3) The Operational DCGL is equivalent to seventeen (17) mrem/yr TEDE
- (4) The required MDC is equivalent to one (1) mrem/yr TEDE
- (5) Americium-241 can be analyzed by gamma and alpha spectroscopy and is considered to be Easy to Detect (ETD). The preferred result is the alpha spectroscopy's when both analyses are performed.



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Another important facet of the DQO process is to identify the radionuclides of concern and determine the concentration variability. Characterization was performed in May of 2005 as discussed in Section 2. Cs-137 was found to be the only radionuclide of concern. The basic statistical quantities (i.e., mean, standard deviation, median) for Cs-137 are provided in Table 1.

Laboratory DQOs and analysis results were to be reported as actual calculated results. Results reported as less than Minimum Detectable Concentration (MDC) would not be accepted for FSS. Sample report summaries were to include unique sample identification, analytical method, radionuclide, result, and uncertainty of two standard deviations, laboratory data qualifiers, units, and the required and observed MDC.

#### 4. SURVEY DESIGN

The level of effort associated with planning a survey is based on the complexity of the survey and nature of the hazards. Guidance for preparing FSS plans is provided in Procedure RPM 5.1-11, "*Preparation of Final Status Survey Plans*". The FSSP uses an integrated sample design that combines scanning surveys and sampling which can be either random or biased.

The DQO process determined that Cs-137 would be the radionuclide of concern in survey unit 9512-0000 (refer to Section 3). The characterization survey did not identify any HTD radionuclides of concern for this survey unit. Other radionuclides identified during FSS would be evaluated to ensure adequate survey design and compliance with the unity rule.

Surrogate DCGLs were not required for this survey unit based on process knowledge from FSS of nearby adjacent areas and via screening under LTP Section 5.4.7.2, "Gross Activity DCGLs". Radionuclide screening or de-selection is a process where an individual radionuclide or aggregate may be considered insignificant and eliminated from the FSS. The criteria for de-selection are concentrations less than 5% for individual radionuclides and less than 10% for aggregates.

The Elevated Measurement Comparison (EMC) did not apply to this survey unit since the survey unit is a Class 3 and discrete, elevated areas of contamination were not expected.

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

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The number of soil samples for FSS was determined in accordance with Procedure RPM 5.1-12, *"Determination of the Number of Samples for Final Status Survey."* The Lower Bound of the Gray Region (LBGR) was set in accordance with Procedure RPM 5.1-11, *"Preparation of Final Status Survey Plans"* to 2.69 pCi/g Cs-137 to maintain the relative shift ( $\Delta/\sigma$ ) in the range of 1 and 3. The resulting relative shift was 2. A Prospective Power Curve was generated using COMPASS, a software package developed under the sponsorship of the United States Nuclear Regulatory Commission (USNRC) for implementation of MARSSIM in support of the decommissioning license termination rule (10 CFR 20, Subpart E). The result of the COMPASS computer run showed adequate power for the survey design. Survey design specified fifteen (15) soil samples for non-parametric statistical testing.

The grid pattern and locations of the soil samples were determined using Visual Sample Plan (VSP) in accordance with Procedure RPM 5.1-14, *"Identifying, and Marking Surface Sample Locations for Final Status Survey."* Visual Sample Plan was created by Pacific Northwest National Laboratory (PNNL) for the United States Department of Energy. A random grid pattern with a random starting point was selected for sample design, which is appropriate for a Class 3 area.

Sample locations were identified using AutoCAD-LT, a commercially available plotting software package with coordinates consistent with the Connecticut State Plane System. These coordinates were integrated with a GPS to locate sample locations in the field. Sample Measurement Locations for the design are listed with the GPS coordinates in Table 3.

**Table 3 - Sample Measurement Locations with Associated GPS Coordinates**

Designation	Northing	Easting
9512-0000-001F	236938.75	667501.04
9512-0000-002F	236609.40	668025.17
9512-0000-003F	237055.61	667329.83
9512-0000-004F	237282.99	667275.84
9512-0000-005F	237238.76	667268.76
9512-0000-006F	237085.20	667324.58
9512-0000-007F	237370.49	667155.29
9512-0000-009F	237222.97	667187.94
9512-0000-010F	237124.15	667504.61
9512-0000-013F	237033.24	667448.53

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Table 3 - (continued)

Designation	Northing	Easting
9512-0000-014F/FS	236957.70	667636.66
9512-0000-015F	236681.41	667973.12
9512-0000-017F/FS	236562.14	668058.53
9512-0000-018F	237153.95	667352.35
9512-0000-019F	236541.30	668115.12

The sample location designations of Table 3 are not sequentially inclusive because of the necessity to relocate three (3) of the original sample locations 9512-0000-008F/FS, 9512-0000-011F and 9512-0000-012F as they were located outside the survey unit. The initial design of the survey unit included area that was not within the property boundary. This was discovered during implementation of FSS. Addendum 1 to FSSP 9512-0000 was written to address the collection of three (3) additional samples. Sample locations 9512-0000-017F/FS, 9512-0000-018F and 9512-0000-019F were selected randomly, in accordance with the FSSP 9512-0000 Addendum 1, as determined by using Visual Sample Plan (VSP) in accordance with Procedure RPM 5.1-14, "Identifying and Marking Surface Sample Locations for Final Status Survey".

Judgmental sampling was included as a feature of this survey design to account for any anomalies identified in the field. Sample location 9512-0000-016F was selected as a judgmental location. The judgmental sample location was selected based on its proximity to an area where radioactive material previously located and removed in 1980 (PIR 80-37).

Procedure RPM 5.1-11, "*Preparation of Final Status Survey Plans*" specifies that 5% of the samples are required to be selected for HTD analysis. Two (2) soil samples or 13% were analyzed for HTDs, exceeding the required percentage. The two (2) samples that were tested were randomly selected for HTD radionuclide analyses using the Microsoft Excel "RAND" function. Each sample was sent off-site for a full suite analysis of the HTD radionuclides specified in Table 2.

The implementation of survey specific quality control measures as referenced by Procedure RPM 5.1-24, "*Split Sample Assessment for Final Status Survey*," included the collection of two (2) soil samples for "split sample" analysis by the off-site laboratory. These locations were selected randomly using the Microsoft Excel "RAND" function. The number of quality control samples exceeded the 5 % requirement.

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The LTP specifies that scanning will be performed along with random and judgmental measurements (samples) in a Class 3 survey unit. The scanning for a Class 3 survey unit can be judgmental. Approximately 10% of this survey unit was scanned. Scanning was biased to areas where radioactive material was previously located and removed in 1980 (PIR 80-37). Table 4 provides a synopsis of the survey design.

**Table 4 – Synopsis of the Survey Design <sup>(1)</sup>**

<b>Feature</b>	<b>Design Criteria</b>	<b>Basis</b>
Survey Unit Land Area	30,701 m <sup>2</sup>	Based on AutoCAD-LT and Visual Sample Plan calculations
Number of Measurements	15	Type 1 and Type 2 errors were 0.05, sigma was 0.147 pCi/g Cs-137 the LBGR was adjusted to 2.76 pCi/g Cs-137 to maintain Relative Shift in the range of 1 and 3.
Grid Spacing	NA	Based on random grid
Operational DCGL	5.38 pCi/g Cs-137	To achieve 17 mrem/yr TEDE
Soil Investigation Level	5.38 pCi/g Cs-137	To achieve 17 mrem/yr TEDE <sup>(1)</sup> . The Operational DCGL meets the LTP Criteria for a Class 3 survey unit.
Scan Coverage	Approximately 10% of the area	Judgmental bases
Scan Investigation Level	Detectable over background	Administratively set to achieve 17 mrem/yr TEDE <sup>(1)</sup>

(1) The allowable dose for soil in this survey unit is seventeen (17) mrem/yr TEDE as the bounding dose from existing and future groundwater has been established based on field data (reference CY memo ISC 06-024.)

## **5. SURVEY IMPLEMENTATION**

Final Status Survey field activities were conducted under Work Plan and Inspection Record (WP&IR) 2006-0027. The WP&IR package included a detailed FSSP, job safety analysis, job planning checklist and related procedures for reference.

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Daily briefings were conducted to discuss the expectations for job performance and the safety aspects of the survey. The "Daily Survey Journal" was used to document field activities and other information pertaining to the FSS.

Three (3) scan areas were established that constituted approximately 10% of the surface area of the Survey Unit 9512-0000. Grid lines, one meter wide, were established in each of the three (3) scan areas. Background was established at the beginning of each grid line, prior to scanning, using an Eberline E-600 with a SPA-3 sodium iodide detector, background ranged from 5,200 counts per minute (cpm) up to 8,700 cpm. The E-600 was operated in the rate-meter mode and used with the audio response. The probe was positioned as close to the ground as possible and was moved at a scan speed of about 0.5 meters per second in a serpentine pattern.

Fifteen (15) soil samples were collected for non-parametric statistical testing and packaged in accordance with Haddam Neck Plant (HNP) Procedure RPM 5.1-3, "*Collection of Sample Media for Final Status Survey*" and FSS design.

Samples were controlled, transported, stored, and transferred to the off-site laboratory using Chain-of-Custody (COC) protocol in accordance with Procedure RPM 5.1-5, "*Chain of Custody for Final Status Survey Samples.*"

Two (2) samples (9512-0000-003F and 9512-0000-007F) were randomly selected for HTD radionuclide analysis by the off-site laboratory.

One (1) biased soil sample, 9512-0000-016F, was collected and analyzed by the offsite laboratory for gamma spectroscopy.

The implementation of survey specific quality control measures included the collection of two (2) split samples at locations 9512-0000-014F and 9512-0000-017F for "split sample" analysis by the off-site laboratory.

#### **6. SURVEY RESULTS**

All field survey activities were conducted in October 2006.

The areas were scanned in accordance with the FSSP in October 2006. There were two areas of elevated activity identified during the scanning process of the sample measurement locations.

The fifteen (15) sample fixed measurement locations identified in the FSS plan were scanned over approximately a one (1) meter radius for elevated radiation levels. Table 5 provides an overview of the scan results for sample measurement locations.

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**Table 5 - Scan Results for Sample Measurement Locations**

<b>Sample Measurement Location</b>	<b>Highest Logged Reading (kcpm)</b>	<b>Action Level <sup>(1)</sup> (kcpm)</b>	<b>&gt; Action Level <sup>(2)</sup></b>
1	5.86	7.34	NO
2	8.45	8.73	NO
3	7.19	6.33	YES
4	8.57	8.84	NO
5	9.54	10.0	NO
6	7.27	8.60	NO
7	7.50	8.86	NO
9	6.15	7.34	NO
10	6.14	6.03	YES
13	6.46	7.08	NO
14	5.50	6.28	NO
15	7.64	9.16	NO
17	8.22	8.88	NO
18	6.63	7.84	NO
19	6.71	7.44	NO

(1) The action level is based on a measurement above ambient background in accordance with the FSS plan

(2) FSS sample plan requires movement of the sample measurement location to the area within the 1 meter radius yielding the response above the action level. Sample locations 9512-0000-003F and 9512-0000-010F were moved accordingly.

The scan areas, that comprised approximately 10% of the total surface area for the survey unit, were scanned for elevated radiation levels. Table 6 provides an overview of the scan area survey. Scan results are provided in Attachment 2.

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**Table 6 - Scan Area Results**

Scan Area	Range of Logged Reading (kcpm)	Highest Logged Reading (kcpm)	Range of Action Level <sup>(1)</sup> (kcpm)	>Action Level <sup>(2)</sup>
1	6.74-8.71	8.71	8.32-9.51	NO
2	6.15-7.94	7.94	7.31-9.39	NO
3	6.00-6.77	6.77	6.82-8.14	NO

(1) The action level is based on a measurement above ambient background in accordance with the FSS plan.

(2) There were no elevated readings detected in the scan areas.

The off-site laboratory employed for the radiological analyses of samples was General Engineering Laboratories (GEL) – Charleston, South Carolina. The laboratory analyzed the fifteen (15) samples taken for non-parametric statistical testing and the associated duplicates using gamma spectroscopy. Gamma spectroscopy analysis was performed to the required MDC. Gamma spectroscopy results identified some radionuclides meeting the acceptance criteria for detection (i.e., a result greater than two standard deviations uncertainty). All could be de-selected or excluded using the 5% and 10% rule described in Section 4.

Cs-137 was identified in eleven (11) of the fifteen (15) samples. None of the samples exceeded the Operational DCGL. Gamma spectroscopy sample analysis did not require further investigation. A summary of the sample results is provided in Table 7.

**Table 7 - Summary of Soil Sample Results**

Sample Number	Cs-137 $\mu\text{Ci/g}$	Fraction of the Operational DCGL <sup>(1)</sup>
9512-0000-001F	2.49E-01	0.04
9512-0000-002F	1.60E-01	0.03
9512-0000-003F	3.32E-01	0.06
9512-0000-004F	3.05E-01	0.05
9512-0000-005F	6.12E-01	0.11
9512-0000-006F	3.64E-01	0.06
9512-0000-007F	5.80E-01	0.10
9512-0000-009F	2.28E-01	0.04

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**Table 7 - (continued)**

<b>Sample Number</b>	<b>Cs-137 pCi/g</b>	<b>Fraction of the Operational DCGL <sup>(1)</sup></b>
9512-0000-010F	-2.67E-03	0.00
9512-0000-013F	4.53E-02	0.00
9512-0000-014F	6.72E-03	0.00
9512-0000-015F	1.35E-03	0.00
9512-0000-017F	6.83E-02	0.01
9512-0000-018F	1.93E-02	0.00
9512-0000-019F	3.10E-02	0.00

(1) The Operational DCGLs from Table 2 is 5.38 pCi/g for Cs-137 to achieve seventeen (17) mrem/yr TEDE.

The off-site laboratory also processed two (2) samples for HTD analyses as required by the sample plan. The requested analyses included alpha spectroscopy, gas proportional counting, and liquid scintillation depending on the radionuclide and the measurement method. HTD analysis identified some radionuclides meeting the acceptance criteria for detection (i.e., a result greater than two standard deviations uncertainty). All could be de-selected or excluded using the 5% and 10% rule described in Section 4. All analyses met the required MDC.

One (1) biased sample was collected at a location selected by FSS Supervision based on professional judgment and observation. Gamma spectroscopy analysis was performed by the off-site laboratory to the required MDC. The detectable radionuclide concentrations were a very small fraction of the Operational DCGL. No further action or investigations were required. A summary of the sample results is provided in Table 8.

**Table 8 – Biased Sample Results**

<b>Sample Number</b>	<b>Cs-137 pCi/g</b>	<b>Fraction of the Operational DCGL <sup>(1)</sup></b>
9506-0000-016F	2.28E-01	0.043

(1) The Operational DCGLs from Table 2 is 5.38 pCi/g for Cs-137 to achieve a TEDE of seventeen (17) mrem/yr.



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**7. QUALITY CONTROL**

The off-site laboratory processed the split samples and performed gamma spectroscopy analysis. The data was evaluated using USNRC acceptance criteria specified in Inspection Procedure 84750 as detailed in HNP Procedure RPM 5.1-24, "*Split Sample Assessment for Final Status Survey*." There was acceptable agreement between the split results at location 9512-0000-017F/FS. The other split sample, 9512-0000-014F/FS, K-40, a natural radioisotope, was found to be present at acceptable level of agreement, therefore, the comparison was determined to be acceptable. There was no Cs-137 to compare in this sample.

The sample analysis vendor, General Engineering Laboratories (GEL) – Charleston, South Carolina, maintains quality control and quality assurance plans as part of normal operation. Refer to Attachment 2 for data and data quality analysis results.

**8. INVESTIGATIONS AND RESULTS**

Sample investigation levels were not exceeded during the implementation of FSS in this survey unit. Consequently, no investigations were required.

**9. REMEDIATION AND RESULTS**

Historically, no radiological remedial action as described by MARSSIM Section 5.4 was performed in this survey unit prior to or as a result of the FSS. Health Physics TSD BCY-HP-0078, "*ALARA Evaluation of Soil Remediation in Support of Final Status Survey*," determined that remediation beyond that required to meet the release criteria to be unnecessary and that the remaining residual radioactivity in soil was ALARA.

**10. CHANGES FROM THE FINAL STATUS SURVEY PLAN**

Three (3) of the systematic samples (samples 9512-0000-008F/FS, 9512-0000-011F and 9512-0000-012F) initially identified for non-parametric testing fell outside of the survey unit. The initial design of the survey unit included area that was not within the property boundary. This was discovered during the implementation of the FSSP. Three additional random samples were selected for non-parametric testing, in accordance with Addendum 1 of the FSSP. The random samples were numbered 9512-0000-017F/FS, 9512-0000-018F and 9512-0000-019F.

NORTHWEST SITE GROUNDS (NON-PROTECTED AREA)  
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**11. DATA QUALITY ASSESSMENT (DQA)**

The DQO sample design and data were reviewed in accordance with Procedure RPM 5.1-23, "*Data Quality Assessment*," for completeness and consistency. The sampling design had adequate power as indicated by the Retrospective Power Curve. The Sign Test was performed on the data and compared to the original assumptions of the DQOs. The evaluation of the sign test results demonstrates that the survey unit passes the unrestricted release criteria, thus, the null hypothesis is rejected.

Documentation was complete and legible. Surveys and sample collection were consistent with the DQOs and were sufficient to ensure that the survey unit was properly designated as Class 3.

The preliminary data review consisted of calculating basic statistical quantities (e.g., mean, median, standard deviation). See Table 9.

**Table 9 – Basic Statistical Quantities for Cs-137 from the Final Status Survey**

	<b>Cs-137 pCi/g</b>
DCGL <sub>op</sub> :	5.38E+00
Minimum Value:	-2.67E-03
Maximum Value:	6.12E-01
Mean:	2.00E-01
Median:	1.60E-01
Standard Deviation:	2.06E-01

The sample standard deviation was slightly more than the value used for the survey design. This is represented by the shift in the retrospective power curve as shown in Attachment 2f. This would indicate a change to the original LBGR to maintain the number of samples at fifteen (15) to meet the Operational DCGL. However, the value of LBGR is less of a critical issue as the survey unit has passed the statistical test, and the mean and median values are well below the Operational DCGL. Also, the retrospective power curve shows that a sufficient number of samples were collected to achieve the desired power. Therefore, the survey unit meets the release criteria with adequate power as required by the DQOs.

NORTHWEST SITE GROUNDS (NON-PROTECTED AREA)  
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The range of the data is approximately 2.98 standard deviations. The difference between the mean and median was 38.6% of the standard deviation which indicates some skewness in the data. The data was represented graphically through posting plots, a frequency plot, and a quantile plot. The frequency plot shows some positive skewness as confirmed by the calculated skew of 0.859.

All data, assessments, and graphical representations are provided in Attachment 2.

**12. ANOMALIES**

No anomalies were noted in the performance of this FSS.

**13. CONCLUSION**

Survey Unit 9512-0000 has met the final DQOs of the FSS. The ALARA criteria for soils as specified in Chapter 4 of the LTP were achieved. Elevated Measurement Comparison and remediation were not required.

The sample data passed the Sign Test. The null hypothesis was rejected. The Retrospective Power Curve generated using COMPASS shows adequate power was achieved. The survey unit was properly designated as Class 3.

The soil of this survey area meets the requirements for unrestricted release as a Class 3 survey unit under the criteria and requirements of the HNP License Termination Plan (LTP).

The dose contribution from soil is 0.50 mrem/yr TEDE based on the average concentration of the samples used for non-parametric statistical sampling.

This survey unit is affected by existing groundwater (reference CY memo ISC 06-024). The dose contribution from existing groundwater is two (2) mrem/yr TEDE.

This survey unit is not considered impacted by future groundwater radioactive contamination, as there are no concrete foundations or footings containing residual radioactive material within the groundwater saturated zone in the area (reference CY memo ISC 06-024). The dose contribution from future groundwater, the third dose component, is therefore zero (0) mrem/yr TEDE.

The average total dose from residual radioactivity in this survey unit, including exposures from the three (3) components as described in Section 3, that is, residual radioactivity in soil, existing groundwater radioactivity, and future groundwater radioactivity from the burial of concrete foundations or footings from site buildings containing residual radioactivity is 2.5 mrem/yr TEDE. Therefore, Survey Unit 9512-0000 is acceptable for unrestricted release.

NORTHWEST SITE GROUNDS (NON-PROTECTED AREA)  
SURVEY UNIT 9512-0000

RELEASE RECORD

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**14. ATTACHMENTS**

14.1 Attachment 1 – Figures

14.2 Attachment 2 – Scan Results

14.3 Attachment 3 – Laboratory Results

14.4 Attachment 4 – DQA Results

NORTHWEST SITE GROUNDS (NON-PROTECTED AREA)  
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RELEASE RECORD

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**ATTACHMENT 1 (FIGURES)**

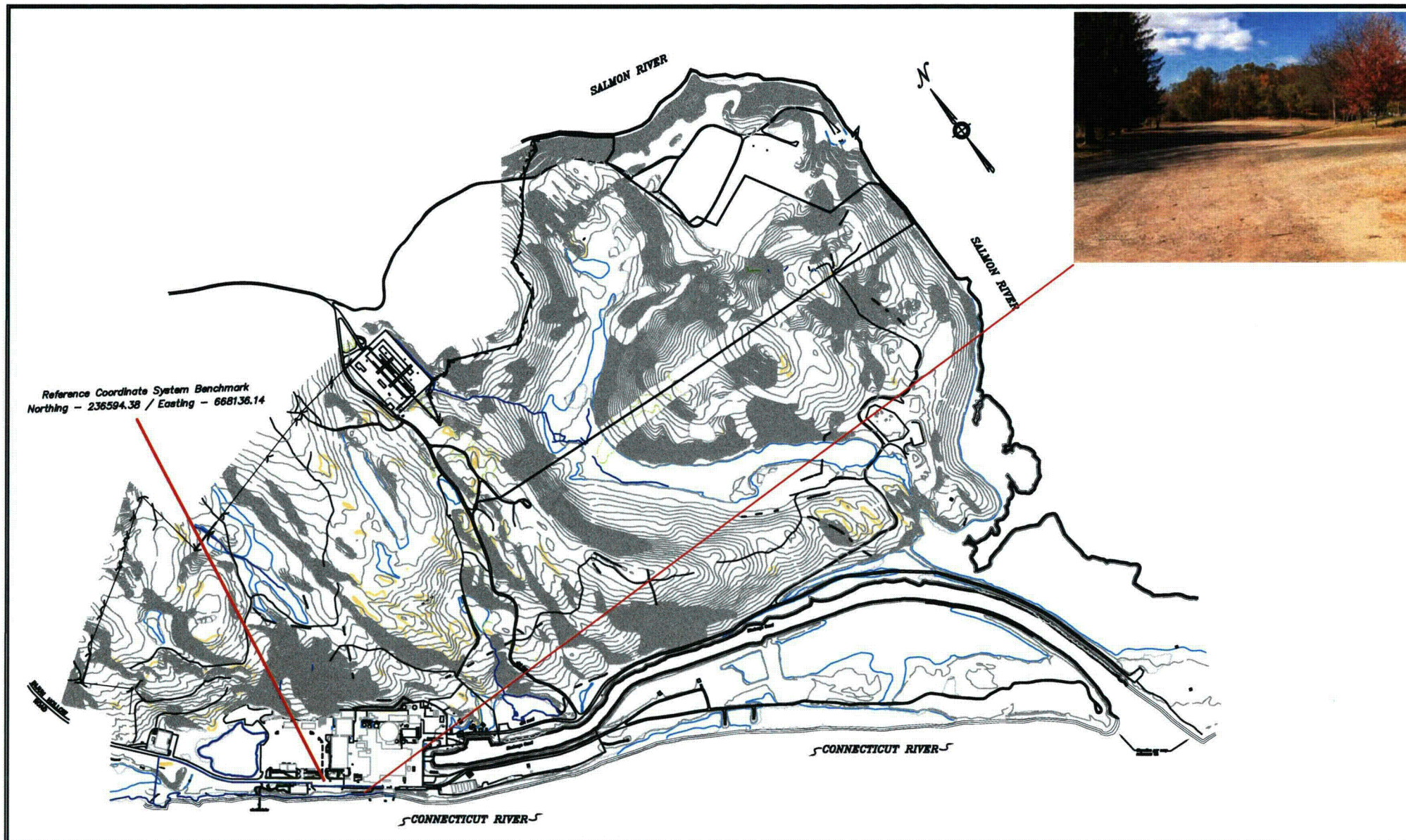


Figure 1



Connecticut Yankee Atomic Power Company  
 Site Map With Reference To Survey Unit 9512-0000

Date

By

December 2006

A.L.H.



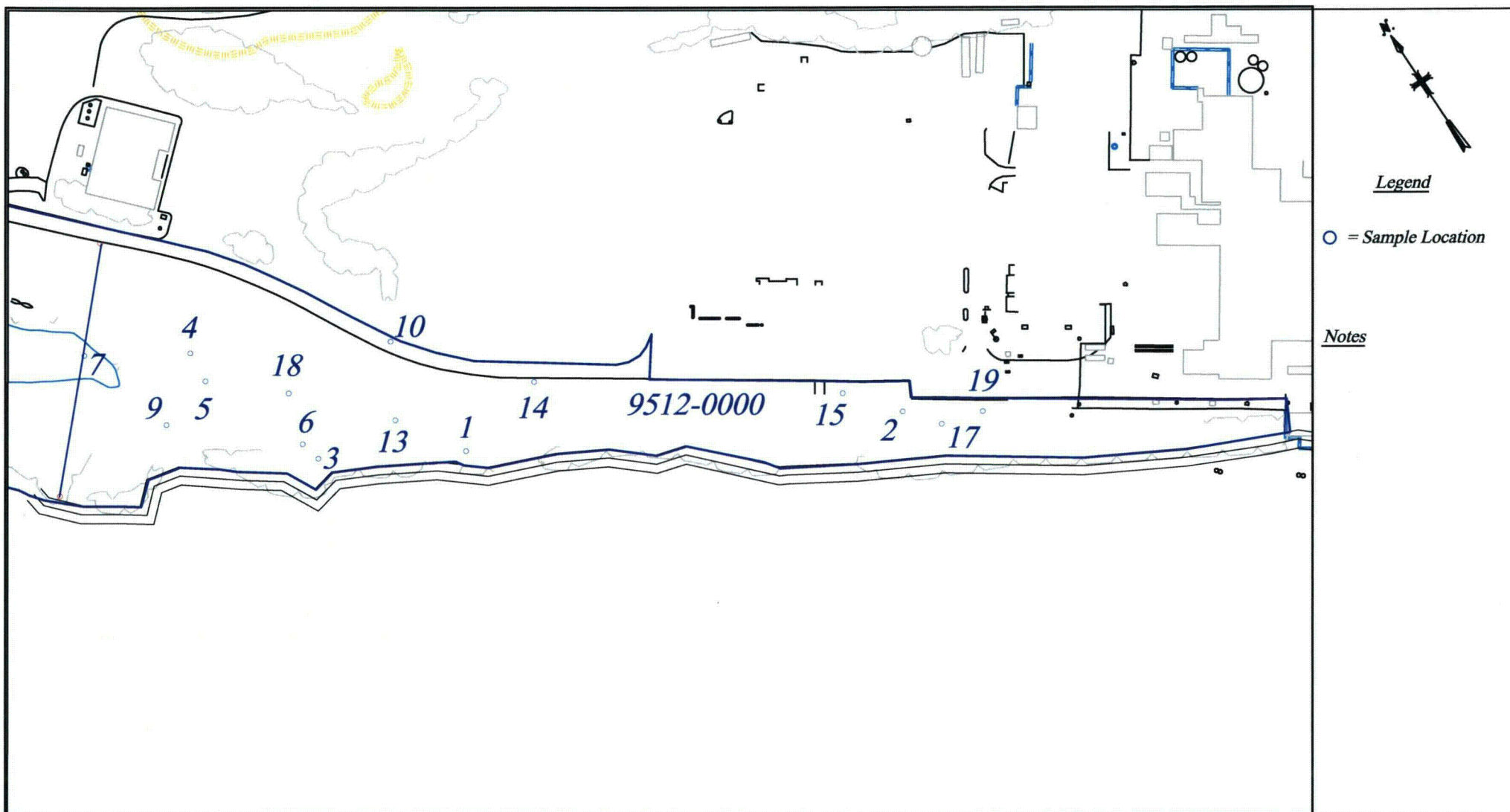


Figure 2



Connecticut Yankee Atomic Power Company  
9512-0000 Sample Locations

Name:  
Arthur L.  
Hammond

Date:  
January  
2007

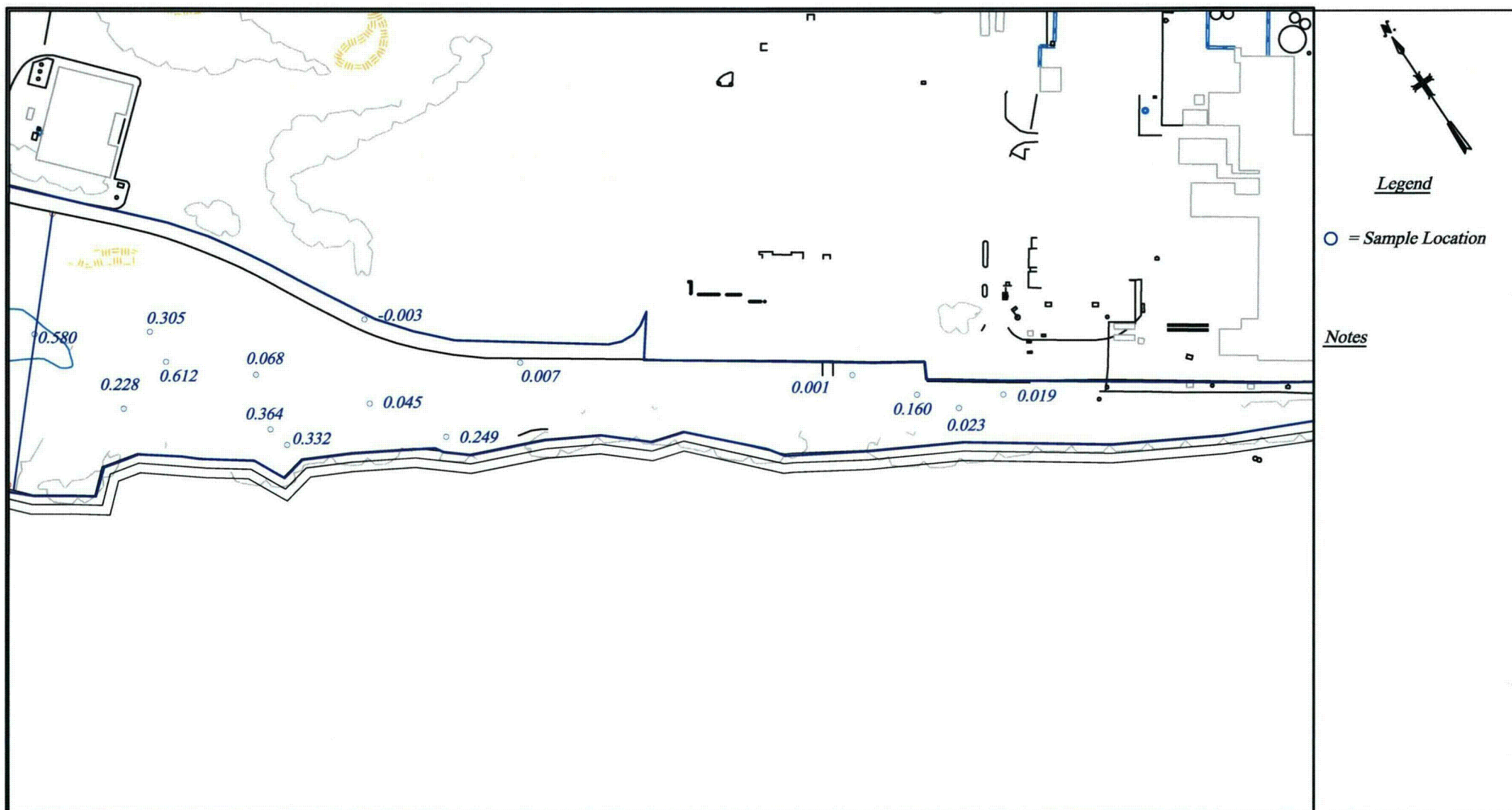


Figure 3

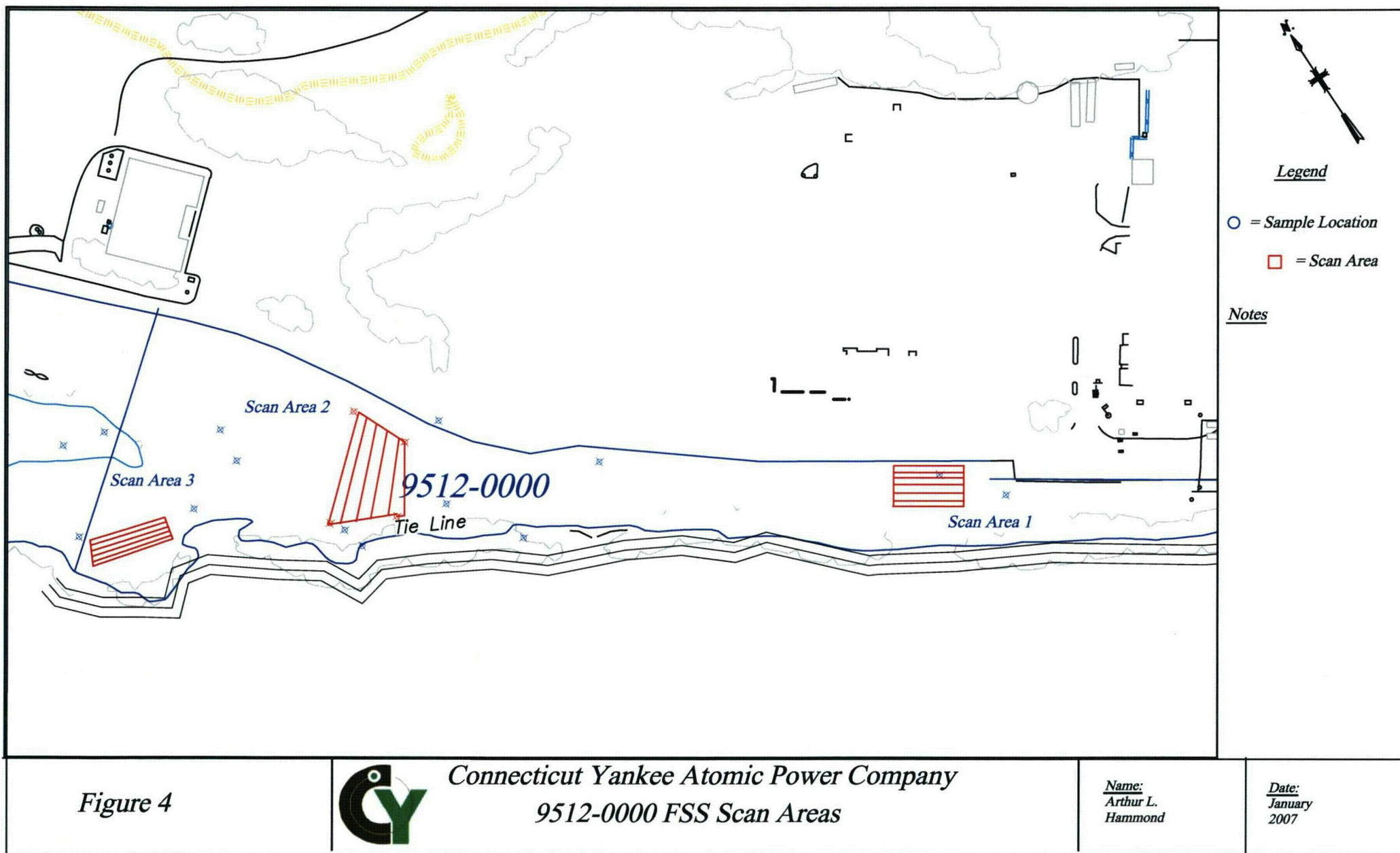


Connecticut Yankee Atomic Power Company  
9512-0000 Cs-137 Posting Plot

Name:  
Arthur L.  
Hammond

Date  
January  
2007





NORTHWEST SITE GROUNDS (NON-PROTECTED AREA)  
SURVEY UNIT 9512-0000

RELEASE RECORD

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**ATTACHMENT 2 (SCAN RESULTS)**

# Survey Release Record Sample Location Scan Results

## Survey Unit 9512-0000

<u>Sample Name</u>	<u>Background (cpm)</u>	<u>Action Level (cpm)</u>	<u>Results (cpm)</u>	<u>Above AL</u>	<u>Log Date</u>	<u>Log Time</u>	<u>E600 S/N</u>	<u>Probe S/N</u>
9512-00-SL-00-01-0	6.21E+03	7.34E+03	5.86E+03		10/25/2006	13:30:00	1116	1006
9512-00-SL-00-02-0	7.49E+03	8.73E+03	8.45E+03		10/25/2006	13:04:00	1116	1006
9512-00-SL-00-03-0	5.29E+03	6.33E+03	7.19E+03	+	10/25/2006	13:57:00	1116	1006
9512-00-SL-00-04-0	7.60E+03	8.84E+03	8.57E+03		10/26/2006	10:03:00	1115	1001
9512-00-SL-00-05-0	8.67E+03	1.00E+04	9.54E+03		10/26/2006	8:21:00	1114	1014
9512-00-SL-00-06-0	7.37E+03	8.60E+03	7.27E+03		10/26/2006	7:52:00	1114	1014
9512-00-SL-00-07-0	7.61E+03	8.86E+03	7.50E+03		10/25/2006	14:52:00	1112	1013
9512-00-SL-00-09-0	6.21E+03	7.34E+03	6.15E+03		10/26/2006	8:19:00	1115	1001
9512-00-SL-00-10-0	5.02E+03	6.03E+03	6.14E+03	+	10/26/2006	7:47:00	1115	1001
9512-00-SL-00-13-0	5.98E+03	7.08E+03	6.46E+03		10/25/2006	14:28:00	1116	1006
9512-00-SL-00-14-0	5.25E+03	6.28E+03	5.50E+03		10/26/2006	9:34:00	1115	1001
9512-00-SL-00-15-0	7.89E+03	9.16E+03	7.64E+03		10/25/2006	13:05:00	1112	1013
9512-00-SL-00-17-0	7.63E+03	8.88E+03	8.22E+03		10/25/2006	13:25:00	1112	1013
9512-00-SL-00-18-0	6.67E+03	7.84E+03	6.63E+03		10/26/2006	9:44:00	1114	1014
9512-00-SL-00-19-0	6.31E+03	7.44E+03	6.71E+03		10/25/2006	13:59:00	1112	1013

# Survey Release Record Scan Area Results

## Survey Unit 9512-0000

9512-0000 SCAN AREA 1

<u>Sample Name</u>	<u>Background (cpm)</u>	<u>Action Level (cpm)</u>	<u>Results (cpm)</u>	<u>Above AL</u>	<u>Log Date</u>	<u>Log Time</u>	<u>E600 S/N</u>	<u>Probe S/N</u>
9512-00-SC-01-01-0	7.67E+03	8.92E+03	7.95E+03		10/24/2006	9:51:00	1112	1013
9512-00-SC-01-02-0	7.54E+03	8.78E+03	8.12E+03		10/24/2006	9:57:00	1112	1013
9512-00-SC-01-03-0	8.17E+03	9.46E+03	7.25E+03		10/24/2006	10:00:00	1112	1013
9512-00-SC-01-04-0	7.15E+03	8.36E+03	6.88E+03		11/1/2006	7:29:00	1112	1013
9512-00-SC-01-05-0	7.12E+03	8.32E+03	7.88E+03		10/24/2006	10:08:00	1112	1013
9512-00-SC-01-06-0	7.54E+03	8.78E+03	7.84E+03		10/24/2006	10:12:00	1112	1013
9512-00-SC-01-07-0	7.23E+03	8.44E+03	6.74E+03		10/24/2006	13:30:00	1112	1013
9512-00-SC-01-08-0	7.28E+03	8.50E+03	7.27E+03		10/24/2006	13:33:00	1112	1013
9512-00-SC-01-09-0	8.15E+03	9.44E+03	8.38E+03		10/24/2006	13:37:00	1107	1003
9512-00-SC-01-10-0	8.20E+03	9.49E+03	8.71E+03		10/24/2006	13:41:00	1107	1003
9512-00-SC-01-11-0	7.55E+03	8.79E+03	8.11E+03		10/24/2006	13:44:00	1107	1003
9512-00-SC-01-12-0	7.39E+03	8.62E+03	6.89E+03		10/24/2006	13:47:00	1112	1013
9512-00-SC-01-13-0	8.27E+03	9.57E+03	7.54E+03		10/24/2006	13:51:00	1107	1003
9512-00-SC-01-14-0	8.22E+03	9.51E+03	8.32E+03		10/24/2006	13:54:00	1107	1003

# Survey Release Record Scan Area Results

## Survey Unit 9512-0000

9512-0000 SCAN AREA 2

<u>Sample Name</u>	<u>Background (cpm)</u>	<u>Action Level (cpm)</u>	<u>Results (cpm)</u>	<u>Above AL</u>	<u>Log Date</u>	<u>Log Time</u>	<u>E600 S/N</u>	<u>Probe S/N</u>
9512-00-SC-02-01-0	7.63E+03	8.88E+03	7.18E+03		10/24/2006	13:07:00	1107	1003
9512-00-SC-02-02-0	7.66E+03	8.91E+03	6.77E+03		10/24/2006	13:10:00	1107	1003
9512-00-SC-02-03-0	6.61E+03	7.77E+03	6.73E+03		10/24/2006	13:13:00	1107	1003
9512-00-SC-02-04-0	6.75E+03	7.92E+03	6.85E+03		10/24/2006	13:16:00	1107	1003
9512-00-SC-02-05-0	6.19E+03	7.31E+03	7.02E+03		10/24/2006	13:24:00	1107	1003
9512-00-SC-02-06-0	6.86E+03	8.04E+03	6.82E+03		10/24/2006	13:27:00	1107	1003
9512-00-SC-02-07-0	6.80E+03	7.98E+03	7.68E+03		10/24/2006	13:30:00	1107	1003
9512-00-SC-02-08-0	7.30E+03	8.52E+03	6.15E+03		10/24/2006	13:33:00	1107	1003
9512-00-SC-02-09-0	6.93E+03	8.12E+03	7.79E+03		10/24/2006	13:37:00	1107	1003
9512-00-SC-02-10-0	8.10E+03	9.39E+03	6.94E+03		10/24/2006	13:41:00	1107	1003
9512-00-SC-02-11-0	7.34E+03	8.56E+03	7.73E+03		10/24/2006	13:44:00	1107	1003
9512-00-SC-02-12-0	6.92E+03	8.11E+03	7.60E+03		10/24/2006	13:47:00	1107	1003
9512-00-SC-02-13-0	7.12E+03	8.32E+03	7.44E+03		10/24/2006	13:51:00	1107	1003
9512-00-SC-02-14-0	7.20E+03	8.41E+03	7.94E+03		10/24/2006	13:54:00	1107	1003
9512-00-SC-02-15-0	6.17E+03	7.29E+03	6.89E+03		10/24/2006	13:57:00	1107	1003
9512-00-SC-02-16-0	7.30E+03	8.52E+03	7.29E+03		10/24/2006	14:01:00	1107	1003
9512-00-SC-02-17-0	6.34E+03	7.48E+03	7.06E+03		10/24/2006	14:42:00	1107	1003
9512-00-SC-02-18-0	6.57E+03	7.73E+03	7.19E+03		10/24/2006	14:18:00	1107	1003
9512-00-SC-02-19-0	7.58E+03	8.82E+03	7.06E+03		10/24/2006	14:21:00	1107	1003
9512-00-SC-02-20-0	6.72E+03	7.89E+03	7.62E+03		10/24/2006	14:25:00	1107	1003
9512-00-SC-02-21-0	7.09E+03	8.29E+03	7.07E+03		10/24/2006	14:30:00	1107	1003
9512-00-SC-02-22-0	6.50E+03	7.65E+03	6.98E+03		11/1/2006	7:45:00	1112	1013
9512-00-SC-02-23-0	6.43E+03	7.58E+03	7.45E+03		10/24/2006	14:38:00	1107	1003

# Survey Release Record Scan Area Results

## Survey Unit 9512-0000

9512-0000 SCAN AREA 3

<u>Sample Name</u>	<u>Background (cpm)</u>	<u>Action Level (cpm)</u>	<u>Results (cpm)</u>	<u>Above AL</u>	<u>Log Date</u>	<u>Log Time</u>	<u>E600 S/N</u>	<u>Probe S/N</u>
9512-00-SC-03-01-0	6.12E+03	7.24E+03	6.00E+03		10/24/2006	14:09:00	1112	1013
9512-00-SC-03-02-0	6.19E+03	7.31E+03	6.21E+03		10/24/2006	14:13:00	1112	1013
9512-00-SC-03-03-0	6.62E+03	7.78E+03	6.15E+03		10/24/2006	14:15:00	1112	1013
9512-00-SC-03-04-0	5.74E+03	6.82E+03	6.12E+03		10/24/2006	14:19:00	1112	1013
9512-00-SC-03-05-0	6.44E+03	7.59E+03	6.22E+03		10/24/2006	14:23:00	1112	1013
9512-00-SC-03-06-0	6.77E+03	7.94E+03	6.77E+03		10/24/2006	14:26:00	1112	1013
9512-00-SC-03-07-0	6.32E+03	7.46E+03	6.42E+03		10/24/2006	14:29:00	1112	1013
9512-00-SC-03-08-0	6.95E+03	8.14E+03	6.50E+03		10/24/2006	14:32:00	1112	1013
9512-00-SC-03-09-0	5.75E+03	6.83E+03	6.29E+03		10/24/2006	14:49:00	1112	1013

NORTHWEST SITE GROUNDS (NON-PROTECTED AREA)  
SURVEY UNIT 9512-0000

RELEASE RECORD

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**ATTACHMENT 3  
(LABORATORY DATA)**

# **General Narrative**



**General Narrative  
for  
Connecticut Yankee Atomic Power Co.  
Work Order: 175288  
SDG: MSR#06-1425**

**November 06, 2006**

**Laboratory Identification:**

General Engineering Laboratories, LLC  
2040 Savage Road  
Charleston, South Carolina 29407  
(843) 556-8171

**Summary**

**Sample receipt**

The samples arrived at General Engineering Laboratories, LLC, Charleston, South Carolina on November 01, 2006 for analysis. Shipping container temperatures were checked, documented, and within specifications. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage.

**Sample Identification** The laboratory received the following samples:

<b><u>Laboratory Identification</u></b>	<b><u>Sample Description</u></b>
175288001	9512-00-010F
175288002	9512-00-006F
175288003	9512-00-005F
175288004	9512-00-009F
175288005	9512-00-014F
175288006	9512-00-014FS
175288007	9512-00-018F
175288008	9512-00-004F
175288009	9512-00-002F
175288010	9512-00-015F
175288011	9512-00-017F
175288012	9512-00-017FS
175288013	9512-00-001F
175288014	9512-00-019F
175288015	9512-00-003F
175288016	9512-00-016F
175288017	9512-00-013F
175288018	9512-00-007F

**Items of Note**

There are no items to note.

**Case Narrative**

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

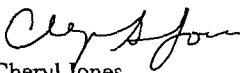
**Analytical Request**

Sixteen soil samples were analyzed for FSSGAM. Two soil samples were analyzed for FSSALL.

**Data Package**

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, Data Review Qualifier Definitions, and data from the following fractions: Radiochemistry.

I certify that this data package is in compliance with the SOW, 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 Laboratory Manager or a designee, as verified by the following signature.



Cheryl Jones  
Project Manager

**List of current GEL Certifications as of 01 November 2006**

<b>State</b>	<b>Certification</b>
Alaska	UST-062
Arizona	AZ0668
Arkansas	88-0651
CLIA	42D0904046
California	01151CA
Colorado	GenEngLabs
Connecticut	PH-0169
Dept. of Navy	NFESC 413
EPA	WG-15J
Florida/NELAP	E87156
Georgia	E87156 (FL/NELAP)
Hawaii	N/A
Idaho	N/A
Illinois	200029
Indiana	C-SC-01
Kansas	E-10332
Kentucky	90129
Louisiana	03046
Maryland	270
Massachusetts	M-SC012
Michigan	9903
Nevada	SC12
New Jersey	SC002
New Mexico	FL NELAP E87156
New York	11501
North Carolina	233
North Carolina Drinking W	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania	68-00485
South Carolina	10120001/10585001/10120002
Tennessee	02934
Texas	TX213-2006A
Texas NELAP	T104704235-06-TX
U.S. Dept. of Agriculture	S-52597
US Army Corps of Engineer	N/A
Utah	8037697376 GEL
Vermont	VT87156
Virginia	00151
Washington	C1641

# **Chain of Custody and Supporting Documentation**

## Chain of Custody Form

**No. 2006-00642**

362 Injun Hollow Road, East Hampton, CT 06424  
860-267-2556

Project Name: Haddam Neck Decommissioning			Media Code	Sample Type Code	Container Size- & Type Code	Analyses Requested						Lab Use Only		
Contact Name & Phone: Jack McCarthy 860-267-3924						FSSGAM	FSSALL						Comments:	
Analytical Lab (Name, City, State) General Engineering Laboratories 2040 Savage Road. Charleston SC. 29407 843 556 8171. Attn. Cheryl Jones														
Priority: <input type="checkbox"/> 30 D. <input type="checkbox"/> 14 D. <input checked="" type="checkbox"/> 7 D. <input type="checkbox"/> 3 D.														
Sample Designation	Date	Time	Comment, Preservation	Lab Sample ID										
9512-00-010F	10/26/06	0748	TS G BP X											
9512-00-006F	10/26/06	0757	TS G BP X											
9512-00-005F	10/26/06	0820	TS G BP X											
9512-00-009F	10/26/06	0818	TS G BP X											
9512-00-014F	10/26/06	0933	TS G BP X											
9512-00-014FS	10/26/06	0933	TS G BP X											
9512-00-018F	10/26/06	0945	TS G BP X											
9512-00-004F	10/26/06	1002	TS G BP X											

NOTES: PO #: 002332    MSR #: 06-12 SSWP# NA <input checked="" type="checkbox"/> LTP QA <input type="checkbox"/> Radwaste QA <input type="checkbox"/> Non QA				Samples Shipped Via: <input checked="" type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> Hand  <input type="checkbox"/> Other	Internal Container Temp.: 18 Deg. C Custody Sealed? Y <input checked="" type="checkbox"/> N <input type="checkbox"/> Custody Seal Intact? Y <input checked="" type="checkbox"/> N <input type="checkbox"/>
1) Relinquished By <i>[Signature]</i>	Date/Time 10/31/06 14:00	2) Received By <i>[Signature]</i>	Date/Time 11-1-6 1000	Bill of Lading # 7485 3247 9517	
3) Relinquished By	Date/Time	4) Received By	Date/Time		

## Chain of Custody Form

**No. 2006-00643**

362 Injun Hollow Road, East Hampton, CT 06424  
860-267-2556

Project Name: Haddam Neck Decommissioning			Media Code	Sample Type Code	Container Size- & Type Code	Analyses Requested						Lab Use Only		
Contact Name & Phone: Jack McCarthy 860-267-3924						FSSGAM	FSSALL						Comments:	175288 %
Analytical Lab (Name, City, State) General Engineering Laboratories 2040 Savage Road. Charleston SC. 29407 843 556 8171. Attn. Cheryl Jones														
Priority: <input type="checkbox"/> 30 D. <input type="checkbox"/> 14 D. <input checked="" type="checkbox"/> 7 D. <input type="checkbox"/> 3 D.														
Sample Designation	Date	Time	Comment, Preservation	Lab Sample ID										
9512-00-002F	10/25/06	1302	TS G BP X											
9512-00-015F	10/25/06	1306	TS G BP X											
9512-00-017F	10/25/06	1318	TS G BP X											
9512-00-017FS	10/25/06	1318	TS G BP X											
9512-00-001F	10/25/06	1327	TS G BP X											
9512-00-019F	10/25/06	1400	TS G BP X											
9512-00-003F	10/25/06	1355	TS G BP X											
9512-00-016F	10/25/06	1416	TS G BP X											
9512-00-013F	10/25/06	1426	TS G BP X											
9512-00-007F	10/25/06	1450	TS G BP X											
NOTES: PO #: 002332    MSR #: 06-1425 SSWP# NA <input checked="" type="checkbox"/> LTP QA <input type="checkbox"/> Radwaste QA <input type="checkbox"/> Non QA											Samples Shipped Via: <input checked="" type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> Hand  <input type="checkbox"/> Other		Internal Container Temp.: 17 Deg. C Custody Sealed? Y <input checked="" type="checkbox"/> N <input type="checkbox"/> Custody Seal Intact? Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	
1) Relinquished By <i>[Signature]</i> Date/Time 11/31/06 1400			2) Received By <i>[Signature]</i> Date/Time 11-1-06 10:00			Bill of Lading # 7985 3247 9550								
3) Relinquished By    Date/Time			4) Received By    Date/Time											

Figure 1. Sample Check-in List

Date/Time Received: 11-1-06 10:00

SDG#: MSR#06-1425

Work Order Number: 1752881

Shipping Container ID: 7985 3247 9550-17° Chain of Custody #: 2006-00642  
7985 3247 9517-18° 2006-00643

1. Custody Seals on shipping container intact? Yes [☒] No [ ]
2. Custody Seals dated and signed? Yes [☒] No [ ]
3. Chain-of-Custody record present? Yes [☒] No [ ]
4. Cooler temperature 17° and 18°
5. Vermiculite/packing materials is: Wet [ ] Dry [☒]
6. Number of samples in shipping container: 18 total
7. Sample holding times exceeded? Yes [ ] No [☒]

8. Samples have:

☒ tape ☐ hazard labels  
☐ custody seals ☐ appropriate sample labels

9. Samples are:

☒ in good condition ☐ leaking  
☐ broken ☐ have air bubbles

10. Were any anomalies identified in sample receipt? Yes [ ] No [☒]

11. Description of anomalies (include sample numbers): \_\_\_\_\_

Sample Custodian/Laboratory: Tan SJS Date: 11-1-06

Telephoned to: \_\_\_\_\_ On \_\_\_\_\_ By \_\_\_\_\_

CPM 60

8

# **Data Review Qualifier Definitions**



## Data Review Qualifier Definitions

Qualifier	Explanation
-----------	-------------

- |     |   |
|-----|---|
| *   | A quality control analyte recovery is outside of specified acceptance criteria  |
| **  | Analyte is a surrogate compound   |
| <   | Result is less than value reported  |
| >   | Result is greater than value reported   |
| ^   | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL  |
| A   | The TIC is a suspected aldol-condensation product   |
| B   | Target analyte was detected in the associated blank   |
| B   | Metals-Either presence of analyte detected in the associated blank, or<br>MDL/IDL < sample value < PQL  |
| BD  | Results are either below the MDC or tracer recovery is low  |
| C   | Analyte has been confirmed by GC/MS analysis  |
| D   | Results are reported from a diluted aliquot of the sample   |
| d   | 5-day BOD-The 2:1 depletion requirement was not met for this sample   |
| E   | Organics-Concentration of the target analyte exceeds the instrument calibration range   |
| E   | Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria   |
| H   | Analytical holding time was exceeded  |
| h   | Preparation or preservation holding time was exceeded   |
| J   | Value is estimated  |
| N   | Metals-The Matrix spike sample recovery is not within specified control limits  |
| N   | Organics-Presumptive evidence based on mass spectral library search to make a tentative<br>identification of the analyte (TIC). Quantitation is based on nearest internal standard<br>response factor |
| N/A | Spike recovery limits do not apply. Sample concentration exceeds spike concentration<br>by 4X or more   |
| ND  | Analyte concentration is not detected above the reporting limit   |
| UI  | Gamma Spectroscopy-Uncertain identification   |
| X   | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier  |
| Y   | QC Samples were not spiked with this compound   |
| Z   | Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.  |

# **RADIOLOGICAL ANALYSIS**

**Radiochemistry Case Narrative  
Connecticut Yankee Atomic Power Co. (YANK)  
Work Order 175288**

**Method/Analysis Information**

**Product:** Alphaspec Am241, Cm, Solid ALL FSS  
**Analytical Method:** DOE EML HASL-300, Am-05-RC Modified  
**Prep Method:** Ash Soil Prep  
**Dry Soil Prep GL-RAD-A-021 Method:** Dry Soil Prep  
**Analytical Batch Number:** 584744  
**Prep Batch Number:** 584632  
**Dry Soil Prep GL-RAD-A-021 Batch Number:** 584631

<b>Sample ID</b>	<b>Client ID</b>
175288015	9512-00-003F
175288018	9512-00-007F
1201220201	Method Blank (MB)
1201220202	175290002(9106-0007-021F) Sample Duplicate (DUP)
1201220203	175290002(9106-0007-021F) Matrix Spike (MS)
1201220204	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 14.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:****Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 175290002 (9106-0007-021F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:****NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Manual Integration**

No manual integrations were performed on data in this batch.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

<b>Product:</b>	<b>Alphaspec Pu, Solid-ALL FSS</b>
Analytical Method:	DOE EML HASL-300, Pu-11-RC Modified
Prep Method:	Ash Soil Prep
Dry Soil Prep GL-RAD-A-021 Method:	Dry Soil Prep
Analytical Batch Number:	584747
Prep Batch Number:	584632
Dry Soil Prep GL-RAD-A-021 Batch Number:	584631

<b>Sample ID</b>	<b>Client ID</b>
175288015	9512-00-003F
175288018	9512-00-007F
1201220218	Method Blank (MB)
1201220219	175290002(9106-0007-021F) Sample Duplicate (DUP)
1201220220	175290002(9106-0007-021F) Matrix Spike (MS)
1201220221	Laboratory Control Sample (LCS)

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 14.

#### **Calibration Information:**

##### **Calibration Information**

All initial and continuing calibration requirements have been met.

##### **Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

##### **Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

#### **Quality Control (QC) Information:**

##### **Blank Information**

The blank volume is representative of the sample volume in this batch.

##### **Designated QC**

The following sample was used for QC: 175290002 (9106-0007-021F).

##### **QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:****NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Manual Integration**

No manual integrations were performed on data in this batch.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

<b>Product:</b>	<b>Liquid Scint Pu241, Solid-ALL FSS</b>
Analytical Method:	DOE EML HASL-300, Pu-11-RC Modified
Prep Method:	Ash Soil Prep
Dry Soil Prep GL-RAD-A-021 Method:	Dry Soil Prep
Analytical Batch Number:	584751
Prep Batch Number:	584632
Dry Soil Prep GL-RAD-A-021 Batch Number:	584631

<b>Sample ID</b>	<b>Client ID</b>
175288015	9512-00-003F
175288018	9512-00-007F
1201220222	Method Blank (MB)
1201220223	175290002(9106-0007-021F) Sample Duplicate (DUP)
1201220224	175290002(9106-0007-021F) Matrix Spike (MS)
1201220225	Laboratory Control Sample (LCS)

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-035 REV# 8.

#### **Calibration Information:**

##### **Calibration Information**

All initial and continuing calibration requirements have been met.

##### **Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

##### **Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

#### **Quality Control (QC) Information:**

##### **Blank Information**

The blank volume is representative of the sample volumes in this batch.

##### **Designated QC**

The following sample was used for QC: 175290002 (9106-0007-021F).

##### **QC Information**

All of the QC samples met the required acceptance limits.

#### **Technical Information:**

##### **Holding Time**

All sample procedures for this sample set were performed within the required holding time.

##### **Preparation Information**

All preparation criteria have been met for these analyses.

##### **Sample Re-prep/Re-analysis**

Samples were recounted due to quench number being outside calibration range.

#### **Miscellaneous Information:**

##### **NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from

referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

#### **Manual Integration**

No manual integrations were performed on data in this batch.

#### **Additional Comments**

Additional comments were not required for this sample set.

#### **Qualifier information**

Manual qualifiers were not required.

#### **Method/Analysis Information**

**Product:** Gamma,Solid-FSS GAM & ALL FSS 226 Ingrowth Waived  
**Analytical Method:** EML HASL 300, 4.5.2.3  
**Prep Method:** Dry Soil Prep  
**Analytical Batch Number:** 585612  
**Prep Batch Number:** 584631

<b>Sample ID</b>	<b>Client ID</b>
175288001	9512-00-010F
175288002	9512-00-006F
175288003	9512-00-005F
175288004	9512-00-009F
175288005	9512-00-014F
175288006	9512-00-014FS
175288007	9512-00-018F
175288008	9512-00-004F
175288009	9512-00-002F
175288010	9512-00-015F
175288011	9512-00-017F
175288012	9512-00-017FS
175288013	9512-00-001F
175288014	9512-00-019F
175288015	9512-00-003F
175288016	9512-00-016F
175288017	9512-00-013F
175288018	9512-00-007F
1201222576	Method Blank (MB)
1201222577	175288001(9512-00-010F) Sample Duplicate (DUP)
1201222578	Laboratory Control Sample (LCS)



**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 13.

**Calibration Information:****Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:****Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 175288001 (9512-00-010F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:****NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Additional Comments**

The sample and the duplicate, 1201222577 (9512-00-010F) and 175288001 (9512-00-010F), did not meet the relative percent difference requirement for Bi-214 and Ra-226, however they do meet the relative error ratio requirement with value of 2.12175

**Qualifier information**

Qualifier	Reason	Analyte	Sample
UI	Data rejected due to interference.	Cesium-134	175288013
			175288016
		Europium-155	175288013
			175288018
		Manganese-54	175288013
UI	Data rejected due to low abundance.	Americium-241	175288017
		Cesium-134	175288001
			175288003
			175288004
			175288005
			175288008
			175288009
			175288010
			175288011
			175288012
			175288014
			175288015
			175288017
			175288018
		Niobium-94	175288012

**Method/Analysis Information**

<b>Product:</b>	<b>GFPC, Sr90, solid - 0.025 pCi/g</b>
Analytical Method:	EPA 905.0 Modified
Prep Method:	Ash Soil Prep
Dry Soil Prep GL-RAD-A-021 Method:	Dry Soil Prep
Analytical Batch Number:	584652
Prep Batch Number:	584632
Dry Soil Prep GL-RAD-A-021 Batch Number:	584631

<b>Sample ID</b>	<b>Client ID</b>
175288015	9512-00-003F
175288018	9512-00-007F
1201219935	Method Blank (MB)
1201219936	175288015(9512-00-003F) Sample Duplicate (DUP)
1201219937	175288015(9512-00-003F) Matrix Spike (MS)
1201219938	Laboratory Control Sample (LCS)

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 10.

#### **Calibration Information:**

##### **Calibration Information**

All initial and continuing calibration requirements have been met.

##### **Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

##### **Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

#### **Quality Control (QC) Information:**

##### **Blank Information**

The blank volume is representative of the sample volume in this batch.

##### **Designated QC**

The following sample was used for QC: 175288015 (9512-00-003F).

##### **QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

Samples 1201219935 (MB) and 175288015 (9512-00-003F) were recounted due to high MDAs.

**Chemical Recoveries**

All chemical recoveries meet the required acceptance limits for this sample set.

**Miscellaneous Information:****NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** Liquid Scint Tc99, Solid-ALL FSS  
**Analytical Method:** DOE EML HASL-300, Tc-02-RC Modified  
**Analytical Batch Number:** 584644

<b>Sample ID</b>	<b>Client ID</b>
175288015	9512-00-003F
175288018	9512-00-007F
1201219905	Method Blank (MB)
1201219906	175288015(9512-00-003F) Sample Duplicate (DUP)
1201219907	175288015(9512-00-003F) Matrix Spike (MS)
1201219908	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this

narrative has been analyzed in accordance with GL-RAD-A-005 REV# 13.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 175288015 (9512-00-003F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

<b>Product:</b>	<b>Liquid Scint Fe55, Solid-ALL FSS</b>
Analytical Method:	DOE RESL Fe-1, Modified
Prep Method:	Ash Soil Prep
Dry Soil Prep GL-RAD-A-021 Method:	Dry Soil Prep
Analytical Batch Number:	584650
Prep Batch Number:	584632
Dry Soil Prep GL-RAD-A-021 Batch Number:	584631

<b>Sample ID</b>	<b>Client ID</b>
175288015	9512-00-003F
175288018	9512-00-007F
1201219928	Method Blank (MB)
1201219929	175288015(9512-00-003F) Sample Duplicate (DUP)
1201219930	175288015(9512-00-003F) Matrix Spike (MS)
1201219931	Laboratory Control Sample (LCS)

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-040 REV# 3.

#### **Calibration Information:**

##### **Calibration Information**

All initial and continuing calibration requirements have been met.

##### **Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

##### **Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

#### **Quality Control (QC) Information:**

##### **Blank Information**

The blank volume is representative of the sample volume in this batch.

##### **Designated QC**

The following sample was used for QC: 175288015 (9512-00-003F).

##### **QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:****NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

<b>Product:</b>	<b>Liquid Scint Ni63, Solid-ALL FSS</b>
Analytical Method:	DOE RESL Ni-1, Modified
Prep Method:	Ash Soil Prep
Dry Soil Prep GL-RAD-A-021 Method:	Dry Soil Prep
Analytical Batch Number:	584649
Prep Batch Number:	584632
Dry Soil Prep GL-RAD-A-021 Batch Number:	584631

<b>Sample ID</b>	<b>Client ID</b>
175288015	9512-00-003F
175288018	9512-00-007F
1201219924	Method Blank (MB)
1201219925	175288015(9512-00-003F) Sample Duplicate (DUP)
1201219926	175288015(9512-00-003F) Matrix Spike (MS)
1201219927	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-022 REV# 8.

**Calibration Information:****Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:****Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 175288015 (9512-00-003F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:****NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Additional Comments**

Additional comments were not required for this sample set.



### **Qualifier information**

Manual qualifiers were not required.

### **Method/Analysis Information**

**Product:** LSC, Tritium Dist, Solid - 3 pCi/g  
**Analytical Method:** EPA 906.0 Modified  
**Analytical Batch Number:** 585989

<b>Sample ID</b>	<b>Client ID</b>
175288015	9512-00-003F
175288018	9512-00-007F
1201223381	Method Blank (MB)
1201223382	175288015(9512-00-003F) Sample Duplicate (DUP)
1201223383	175288015(9512-00-003F) Matrix Spike (MS)
1201223384	Laboratory Control Sample (LCS)

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-002 REV# 13.

### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

#### **Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

### **Quality Control (QC) Information:**

#### **Blank Information**

The blank volume is representative of the sample volume in this batch.

#### **Designated QC**

The following sample was used for QC: 175288015 (9512-00-003F).

#### **QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

Samples 1201223381 (MB), 175288015 (9512-00-003F) and 175288018 (9512-00-007F) were reprepared due to high relative percent difference/relative error ratio.

**Miscellaneous Information:****NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following NCR was generated for this SDG:

NCR 380628 was generated due to Container scanning event for custody missed. 1. The analyst did not scan the samples 175288 015,018, 175290 002 into the batch prior to analysis, however the samples did remain in their custody at all times. 1. The error has been corrected and the analyst has been instructed on the proper scanning procedures.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** Liquid Scint C14, Solid All,FSS

**Analytical Method:** EPA EERF C-01 Modified

**Analytical Batch Number:** 584648

<b>Sample ID</b>	<b>Client ID</b>
175288015	9512-00-003F
175288018	9512-00-007F
1201219920	Method Blank (MB)
1201219921	175288018(9512-00-007F) Sample Duplicate (DUP)
1201219922	175288018(9512-00-007F) Matrix Spike (MS)
1201219923	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General

Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-003 REV# 8.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volumes in this batch.

**Designated QC**

The following sample was used for QC: 175288018 (9512-00-007F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

Sample 1201219920 (MB) was recounted due to the quench number being outside the calibration range. Samples 1201219922 (9512-00-007F) and 1201219923 (LCS) were recounted due to analyst error.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Certification Statement**


Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

**Reviewer/Date:** \_\_\_\_\_

 11/8/06

COMPANY - WIDE NONCONFORMANCE REPORT			
<b>Mo.Day Yr.</b> 08-NOV-06	<b>Division:</b> Radiochemistry	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> LSC	<b>Test / Method:</b> EPA 906.0 Modified	<b>Matrix Type:</b> Solid	<b>Client Code:</b> YANK
<b>Batch ID:</b> 585989	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG):</b> 175288(MSR#06-1425),175290(MSR#06-1310) <b>Application Issues:</b> Container scanning event for custody missed			
<b>Specification and Requirements</b>		<b>NRG Disposition:</b>	
<b>Nonconformance Description:</b>			
1. The analyst did not scan the samples 175288 015,018, 175290 002 into the batch prior to analysis, however the samples did remain in their custody at all times.		1. The error has been corrected and the analyst has been instructed on the proper scanning procedures.	

**Originator's Name:**

Amy Scott 08-NOV-06

**Data Validator/Group Leader:**

Heather Anderson 08-NOV-06

**Quality Review:**

**Director:**

# SAMPLE DATA SUMMARY

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis Report for

YANK001 Connecticut Yankee Atomic Power Co.

Client SDG: MSR#06-1425 GEL Work Order: 175288

**The Qualifiers in this report are defined as follows:**

- \* A quality control analyte recovery is outside of specified acceptance criteria
- \*\* Analyte is a surrogate compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- ND The analyte concentration is not detected above the detection limit.

The above sample is reported on a dry weight basis except where prohibited by the analytical procedure.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, LLC standard operating procedures. Please direct any questions to your Project Manager, Cheryl Jones.



Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-010F  
Sample ID: 175288001  
Matrix: TS  
Collect Date: 26-OCT-06  
Receive Date: 01-NOV-06  
Collector: Client  
Moisture: 4.27%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.673	+/-0.128	0.0504	+/-0.128	0.107	pCi/g						
Americium-241	U	-0.0211	+/-0.0623	0.0509	+/-0.0623	0.105	pCi/g						
Bismuth-212		0.426	+/-0.192	0.0882	+/-0.192	0.188	pCi/g						
Bismuth-214		0.404	+/-0.0624	0.0258	+/-0.0624	0.0543	pCi/g						
Cesium-134	UI	0.00	+/-0.0215	0.0172	+/-0.0215	0.0361	pCi/g						
Cesium-137	U	-0.00276	+/-0.016	0.0134	+/-0.016	0.0283	pCi/g						
Cobalt-60	U	-0.0111	+/-0.016	0.0127	+/-0.016	0.0277	pCi/g						
Europium-152	U	0.0027	+/-0.0421	0.0362	+/-0.0421	0.0756	pCi/g						
Europium-154	U	-0.022	+/-0.0486	0.0402	+/-0.0486	0.0864	pCi/g						
Europium-155	U	0.0578	+/-0.0544	0.0387	+/-0.0544	0.0801	pCi/g						
Lead-212		0.612	+/-0.0489	0.0203	+/-0.0489	0.0422	pCi/g						
Lead-214		0.558	+/-0.0655	0.0245	+/-0.0655	0.0513	pCi/g						
Manganese-54	U	0.0218	+/-0.0214	0.0135	+/-0.0214	0.0285	pCi/g						
Niobium-94	U	-0.0128	+/-0.0147	0.0116	+/-0.0147	0.0246	pCi/g						
Potassium-40		9.85	+/-0.594	0.111	+/-0.594	0.244	pCi/g						
Radium-226		0.404	+/-0.0624	0.0258	+/-0.0624	0.0543	pCi/g						
Silver-108m	U	0.000905	+/-0.0131	0.0116	+/-0.0131	0.0244	pCi/g						
Thallium-208		0.185	+/-0.0323	0.0124	+/-0.0323	0.0263	pCi/g						

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	11/01/06	1051	584631

### The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

### Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported



# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-010F  
Sample ID: 175288001

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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> Result is greater than value reported  
A The TIC is a suspected aldol-condensation product  
B Target analyte was detected in the associated blank  
BD Results are either below the MDC or tracer recovery is low  
C Analyte has been confirmed by GC/MS analysis  
D Results are reported from a diluted aliquot of the sample  
H Analytical holding time was exceeded  
J Value is estimated  
N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more  
R Sample results are rejected  
U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.  
UI Gamma Spectroscopy—Uncertain identification  
X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier  
Y QC Samples were not spiked with this compound  
^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL  
h Preparation or preservation holding time was exceeded  
The above sample is reported on a dry weight basis.

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-006F  
Sample ID: 175288002  
Matrix: TS  
Collect Date: 26-OCT-06  
Receive Date: 01-NOV-06  
Collector: Client  
Moisture: 24.6%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.915	+/-0.271	0.0966	+/-0.271	0.193	pCi/g		MJH1	11/03/06	2046	585612	1
Americium-241	U	0.0533	+/-0.0445	0.0354	+/-0.0445	0.0707	pCi/g						
Bismuth-212		0.670	+/-0.364	0.226	+/-0.364	0.451	pCi/g						
Bismuth-214		0.524	+/-0.153	0.0528	+/-0.153	0.106	pCi/g						
Cesium-134	U	0.0467	+/-0.0329	0.0313	+/-0.0329	0.0626	pCi/g						
Cesium-137		0.364	+/-0.0846	0.0291	+/-0.0846	0.0581	pCi/g						
Cobalt-60	U	0.00	+/-0.0377	0.0311	+/-0.00	0.0622	pCi/g						
Europium-152	U	0.0321	+/-0.105	0.0633	+/-0.105	0.127	pCi/g						
Europium-154	U	0.0589	+/-0.116	0.102	+/-0.116	0.204	pCi/g						
Europium-155	U	0.0473	+/-0.0831	0.0546	+/-0.0831	0.109	pCi/g						
Lead-212		0.766	+/-0.0996	0.035	+/-0.0996	0.070	pCi/g						
Lead-214		0.600	+/-0.120	0.0459	+/-0.120	0.0917	pCi/g						
Manganese-54	U	0.0276	+/-0.0311	0.0287	+/-0.0311	0.0573	pCi/g						
Niobium-94	U	-0.00446	+/-0.0303	0.0257	+/-0.0303	0.0513	pCi/g						
Potassium-40		12.6	+/-1.33	0.191	+/-1.33	0.382	pCi/g						
Radium-226		0.524	+/-0.153	0.0528	+/-0.153	0.106	pCi/g						
Silver-108m	U	0.0164	+/-0.0309	0.0238	+/-0.0309	0.0475	pCi/g						
Thallium-208		0.235	+/-0.0798	0.0264	+/-0.0798	0.0527	pCi/g						

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	11/01/06	1138	584631

### The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

### Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

# GENERAL ENGINEERING LABORATORIES, LLC

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-006F  
Sample ID: 175288002

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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> Result is greater than value reported  
A The TIC is a suspected aldol-condensation product  
B Target analyte was detected in the associated blank  
BD Results are either below the MDC or tracer recovery is low  
C Analyte has been confirmed by GC/MS analysis  
D Results are reported from a diluted aliquot of the sample  
H Analytical holding time was exceeded  
J Value is estimated  
N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more  
R Sample results are rejected  
U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.  
UI Gamma Spectroscopy—Uncertain identification  
X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier  
Y QC Samples were not spiked with this compound  
^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL  
h Preparation or preservation holding time was exceeded  
The above sample is reported on a dry weight basis.

# GENERAL ENGINEERING LABORATORIES, LLC

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-005F  
Sample ID: 175288003  
Matrix: TS  
Collect Date: 26-OCT-06  
Receive Date: 01-NOV-06  
Collector: Client  
Moisture: 26.4%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		1.21	+/-0.195	0.0648	+/-0.195	0.140	pCi/g						
Americium-241	U	-0.0785	+/-0.133	0.0938	+/-0.133	0.194	pCi/g						
Bismuth-212		0.930	+/-0.273	0.164	+/-0.273	0.347	pCi/g						
Bismuth-214		0.882	+/-0.127	0.0371	+/-0.127	0.0784	pCi/g						
Cesium-134	UI	0.00	+/-0.0379	0.0274	+/-0.0379	0.0578	pCi/g						
Cesium-137		0.612	+/-0.0717	0.0195	+/-0.0717	0.0415	pCi/g						
Cobalt-60	U	0.00618	+/-0.0255	0.0217	+/-0.0255	0.0474	pCi/g						
Europium-152	U	0.00712	+/-0.0693	0.0559	+/-0.0693	0.116	pCi/g						
Europium-154	U	0.0308	+/-0.0795	0.0684	+/-0.0795	0.148	pCi/g						
Europium-155	U	0.0598	+/-0.0661	0.0581	+/-0.0661	0.120	pCi/g						
Lead-212		1.25	+/-0.0782	0.0299	+/-0.0782	0.062	pCi/g						
Lead-214		0.951	+/-0.119	0.040	+/-0.119	0.0833	pCi/g						
Manganese-54	U	-0.0195	+/-0.025	0.0189	+/-0.025	0.0404	pCi/g						
Niobium-94	U	0.0142	+/-0.0243	0.0208	+/-0.0243	0.0437	pCi/g						
Potassium-40		12.5	+/-1.02	0.180	+/-1.02	0.400	pCi/g						
Radium-226		0.882	+/-0.127	0.0371	+/-0.127	0.0784	pCi/g						
Silver-108m	U	0.0241	+/-0.0216	0.0194	+/-0.0216	0.0407	pCi/g						
Thallium-208		0.404	+/-0.0686	0.0189	+/-0.0686	0.0401	pCi/g						

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	11/01/06	1139	584631

### The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

### Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-005F  
Sample ID: 175288003

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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> Result is greater than value reported  
A The TIC is a suspected aldol-condensation product  
B Target analyte was detected in the associated blank  
BD Results are either below the MDC or tracer recovery is low  
C Analyte has been confirmed by GC/MS analysis  
D Results are reported from a diluted aliquot of the sample  
H Analytical holding time was exceeded  
J Value is estimated  
N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more  
R Sample results are rejected  
U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.  
UI Gamma Spectroscopy—Uncertain identification  
X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier  
Y QC Samples were not spiked with this compound  
^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL  
h Preparation or preservation holding time was exceeded  
The above sample is reported on a dry weight basis.

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-009F  
Sample ID: 175288004  
Matrix: TS  
Collect Date: 26-OCT-06  
Receive Date: 01-NOV-06  
Collector: Client  
Moisture: 15.7%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.672	+/-0.111	0.0369	+/-0.111	0.0781	pCi/g		MJH1	11/04/06	0802	585612	1
Americium-241	U	-0.0211	+/-0.0808	0.0644	+/-0.0808	0.133	pCi/g						
Bismuth-212		0.524	+/-0.157	0.0851	+/-0.157	0.179	pCi/g						
Bismuth-214		0.458	+/-0.0641	0.0204	+/-0.0641	0.0427	pCi/g						
Cesium-134	UI	0.00	+/-0.0241	0.0147	+/-0.0241	0.0307	pCi/g						
Cesium-137		0.228	+/-0.0275	0.0113	+/-0.0275	0.0237	pCi/g						
Cobalt-60	U	0.00973	+/-0.013	0.0119	+/-0.013	0.0254	pCi/g						
Europium-152	U	-0.013	+/-0.0342	0.0304	+/-0.0342	0.0631	pCi/g						
Europium-154	U	-0.0326	+/-0.0458	0.0316	+/-0.0458	0.0675	pCi/g						
Europium-155	U	0.0373	+/-0.052	0.0374	+/-0.052	0.077	pCi/g						
Lead-212		0.688	+/-0.041	0.0189	+/-0.041	0.0389	pCi/g						
Lead-214		0.534	+/-0.0555	0.0212	+/-0.0555	0.044	pCi/g						
Manganese-54	U	-0.00843	+/-0.0128	0.0107	+/-0.0128	0.0225	pCi/g						
Niobium-94	U	0.00866	+/-0.0116	0.0105	+/-0.0116	0.0219	pCi/g						
Potassium-40		13.1	+/-0.606	0.0891	+/-0.606	0.194	pCi/g						
Radium-226		0.458	+/-0.0641	0.0204	+/-0.0641	0.0427	pCi/g						
Silver-108m	U	0.00168	+/-0.0107	0.00953	+/-0.0107	0.0199	pCi/g						
Thallium-208		0.234	+/-0.0333	0.0102	+/-0.0333	0.0214	pCi/g						

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	11/01/06	1139	584631

### The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

### Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-009F  
Sample ID: 175288004

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-014F  
Sample ID: 175288005  
Matrix: TS  
Collect Date: 26-OCT-06  
Receive Date: 01-NOV-06  
Collector: Client  
Moisture: 4.95%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.574	+/-0.0992	0.0351	+/-0.0992	0.0744	pCi/g						
Americium-241	U	0.0388	+/-0.0487	0.0424	+/-0.0487	0.0871	pCi/g						
Bismuth-212		0.346	+/-0.159	0.0826	+/-0.159	0.174	pCi/g						
Bismuth-214		0.322	+/-0.0534	0.0191	+/-0.0534	0.0401	pCi/g						
Cesium-134	UI	0.00	+/-0.0199	0.013	+/-0.0199	0.0272	pCi/g						
Cesium-137	U	0.00672	+/-0.0144	0.0111	+/-0.0144	0.0232	pCi/g						
Cobalt-60	U	0.0118	+/-0.0133	0.0122	+/-0.0133	0.0259	pCi/g						
Europium-152	U	-0.0376	+/-0.0384	0.0271	+/-0.0384	0.0563	pCi/g						
Europium-154	U	-0.0156	+/-0.0337	0.0278	+/-0.0337	0.060	pCi/g						
Europium-155	U	0.00184	+/-0.0371	0.0334	+/-0.0371	0.0687	pCi/g						
Lead-212		0.493	+/-0.0391	0.0165	+/-0.0391	0.0341	pCi/g						
Lead-214		0.440	+/-0.0553	0.0181	+/-0.0553	0.0377	pCi/g						
Manganese-54	U	0.00801	+/-0.0124	0.0109	+/-0.0124	0.023	pCi/g						
Niobium-94	U	0.00139	+/-0.0136	0.0101	+/-0.0136	0.0211	pCi/g						
Potassium-40		9.59	+/-0.499	0.081	+/-0.499	0.178	pCi/g						
Radium-226		0.322	+/-0.0534	0.0191	+/-0.0534	0.0401	pCi/g						
Silver-108m	U	0.00384	+/-0.0109	0.00993	+/-0.0109	0.0207	pCi/g						
Thallium-208		0.158	+/-0.0241	0.00948	+/-0.0241	0.020	pCi/g						

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	11/01/06	1139	584631

### The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

### Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported



# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-014F  
Sample ID: 175288005

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy--Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-014FS  
Sample ID: 175288006  
Matrix: TS  
Collect Date: 26-OCT-06  
Receive Date: 01-NOV-06  
Collector: Client  
Moisture: 4.92%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.548	+/-0.140	0.0573	+/-0.140	0.115	pCi/g		MJH1	11/04/06	0841	585612	1
Americium-241	U	0.0172	+/-0.0255	0.0219	+/-0.0255	0.0438	pCi/g						
Bismuth-212		0.290	+/-0.249	0.134	+/-0.249	0.267	pCi/g						
Bismuth-214		0.415	+/-0.0831	0.0322	+/-0.0831	0.0644	pCi/g						
Cesium-134	U	0.0222	+/-0.0248	0.0211	+/-0.0248	0.0421	pCi/g						
Cesium-137	U	-0.00913	+/-0.0187	0.0162	+/-0.0187	0.0324	pCi/g						
Cobalt-60	U	0.00689	+/-0.0218	0.0191	+/-0.0218	0.0382	pCi/g						
Europium-152	U	0.00464	+/-0.0577	0.0399	+/-0.0577	0.0798	pCi/g						
Europium-154	U	-0.0215	+/-0.0621	0.0506	+/-0.0621	0.101	pCi/g						
Europium-155	U	0.0204	+/-0.0444	0.0366	+/-0.0444	0.0731	pCi/g						
Lead-212		0.565	+/-0.0656	0.0208	+/-0.0656	0.0415	pCi/g						
Lead-214		0.432	+/-0.0747	0.0274	+/-0.0747	0.0547	pCi/g						
Manganese-54	U	0.0264	+/-0.0259	0.0188	+/-0.0259	0.0375	pCi/g						
Niobium-94	U	0.00349	+/-0.0164	0.0149	+/-0.0164	0.0297	pCi/g						
Potassium-40		8.96	+/-0.787	0.155	+/-0.787	0.310	pCi/g						
Radium-226		0.415	+/-0.0831	0.0322	+/-0.0831	0.0644	pCi/g						
Silver-108m	U	-0.00508	+/-0.0153	0.0134	+/-0.0153	0.0267	pCi/g						
Thallium-208		0.201	+/-0.0358	0.0157	+/-0.0358	0.0313	pCi/g						

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	11/01/06	1139	584631

### The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

### Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-014FS  
Sample ID: 175288006

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-018F  
Sample ID: 175288007  
Matrix: TS  
Collect Date: 26-OCT-06  
Receive Date: 01-NOV-06  
Collector: Client  
Moisture: 8.19%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.484	+/-0.0824	0.0319	+/-0.0824	0.0673	pCi/g		MJH1	11/04/06	1605	585612	1
Americium-241	U	0.00423	+/-0.0134	0.0109	+/-0.0134	0.0224	pCi/g						
Bismuth-212		0.328	+/-0.114	0.0628	+/-0.114	0.132	pCi/g						
Bismuth-214		0.292	+/-0.0497	0.0165	+/-0.0497	0.0345	pCi/g						
Cesium-134	U	0.0157	+/-0.0156	0.0112	+/-0.0156	0.0233	pCi/g						
Cesium-137	U	0.0193	+/-0.0159	0.0104	+/-0.0159	0.0217	pCi/g						
Cobalt-60	U	0.00702	+/-0.0104	0.00925	+/-0.0104	0.0199	pCi/g						
Europium-152	U	0.0066	+/-0.026	0.0223	+/-0.026	0.0461	pCi/g						
Europium-154	U	-0.0155	+/-0.0353	0.0287	+/-0.0353	0.0611	pCi/g						
Europium-155	U	0.0126	+/-0.0269	0.0187	+/-0.0269	0.0384	pCi/g						
Lead-212		0.466	+/-0.0291	0.0115	+/-0.0291	0.0237	pCi/g						
Lead-214		0.353	+/-0.0422	0.0155	+/-0.0422	0.0321	pCi/g						
Manganese-54	U	0.00584	+/-0.0109	0.00935	+/-0.0109	0.0196	pCi/g						
Niobium-94	U	-0.00465	+/-0.0104	0.00858	+/-0.0104	0.0179	pCi/g						
Potassium-40		6.79	+/-0.462	0.0878	+/-0.462	0.190	pCi/g						
Radium-226		0.292	+/-0.0497	0.0165	+/-0.0497	0.0345	pCi/g						
Silver-108m	U	0.00177	+/-0.00833	0.00749	+/-0.00833	0.0156	pCi/g						
Thallium-208		0.158	+/-0.0244	0.00877	+/-0.0244	0.0183	pCi/g						

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	11/01/06	1139	584631

### The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

### Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-018F  
Sample ID: 175288007

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-004F  
Sample ID: 175288008  
Matrix: TS  
Collect Date: 26-OCT-06  
Receive Date: 01-NOV-06  
Collector: Client  
Moisture: 16.8%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid - FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		1.34	+/-0.206	0.0397	+/-0.206	0.0838	pCi/g		MJH1	11/04/06	1605	585612	1
Americium-241	U	-0.0019	+/-0.0476	0.0388	+/-0.0476	0.0792	pCi/g						
Bismuth-212		0.754	+/-0.263	0.0908	+/-0.263	0.190	pCi/g						
Bismuth-214		0.900	+/-0.113	0.0222	+/-0.113	0.0462	pCi/g						
Cesium-134	UI	0.00	+/-0.0319	0.0177	+/-0.0319	0.0367	pCi/g						
Cesium-137		0.305	+/-0.045	0.013	+/-0.045	0.0272	pCi/g						
Cobalt-60	U	0.00202	+/-0.0149	0.0127	+/-0.0149	0.0271	pCi/g						
Europium-152	U	-0.00971	+/-0.0425	0.0308	+/-0.0425	0.0637	pCi/g						
Europium-154	U	-0.0109	+/-0.0434	0.0361	+/-0.0434	0.0768	pCi/g						
Europium-155	U	0.058	+/-0.0507	0.0323	+/-0.0507	0.066	pCi/g						
Lead-212		1.28	+/-0.108	0.0175	+/-0.108	0.036	pCi/g						
Lead-214		1.02	+/-0.109	0.0229	+/-0.109	0.0473	pCi/g						
Manganese-54	U	0.0179	+/-0.0139	0.0128	+/-0.0139	0.0267	pCi/g						
Niobium-94	U	-0.00509	+/-0.0137	0.0113	+/-0.0137	0.0235	pCi/g						
Potassium-40		11.7	+/-0.962	0.106	+/-0.962	0.228	pCi/g						
Radium-226		0.900	+/-0.113	0.0222	+/-0.113	0.0462	pCi/g						
Silver-108m	U	0.0111	+/-0.0134	0.0113	+/-0.0134	0.0233	pCi/g						
Thallium-208		0.400	+/-0.0497	0.0127	+/-0.0497	0.0265	pCi/g						

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	11/01/06	1139	584631

### The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

### Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

# GENERAL ENGINEERING LABORATORIES, LLC

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

Contact: East Hampton, Connecticut 06424  
Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-004F  
Sample ID: 175288008

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

# GENERAL ENGINEERING LABORATORIES, LLC

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-002F  
Sample ID: 175288009  
Matrix: TS  
Collect Date: 25-OCT-06  
Receive Date: 01-NOV-06  
Collector: Client  
Moisture: 13%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.714	+/-0.117	0.034	+/-0.117	0.068	pCi/g		MJH1	11/04/06	1606	585612	1
Americium-241	U	0.0428	+/-0.0428	0.0341	+/-0.0428	0.0682	pCi/g						
Bismuth-212		0.407	+/-0.165	0.0717	+/-0.165	0.143	pCi/g						
Bismuth-214		0.524	+/-0.0653	0.0183	+/-0.0653	0.0366	pCi/g						
Cesium-134	UI	0.00	+/-0.0194	0.0124	+/-0.0194	0.0248	pCi/g						
Cesium-137		0.160	+/-0.0231	0.0094	+/-0.0231	0.0188	pCi/g						
Cobalt-60	U	0.00335	+/-0.0118	0.0101	+/-0.0118	0.0201	pCi/g						
Europium-152	U	-0.0286	+/-0.0364	0.0253	+/-0.0364	0.0506	pCi/g						
Europium-154	U	-0.0204	+/-0.0401	0.0328	+/-0.0401	0.0655	pCi/g						
Europium-155	U	-0.000292	+/-0.0323	0.0291	+/-0.0323	0.0581	pCi/g						
Lead-212		0.726	+/-0.0665	0.0155	+/-0.0665	0.031	pCi/g						
Lead-214		0.590	+/-0.0686	0.0187	+/-0.0686	0.0373	pCi/g						
Manganese-54	U	0.0164	+/-0.0131	0.00889	+/-0.0131	0.0178	pCi/g						
Niobium-94	U	0.0178	+/-0.0136	0.00959	+/-0.0136	0.0192	pCi/g						
Potassium-40		12.3	+/-0.878	0.0933	+/-0.878	0.187	pCi/g						
Radium-226		0.524	+/-0.0653	0.0183	+/-0.0653	0.0366	pCi/g						
Silver-108m	U	-0.00466	+/-0.0102	0.00874	+/-0.0102	0.0175	pCi/g						
Thallium-208		0.233	+/-0.0296	0.00847	+/-0.0296	0.0169	pCi/g						

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	11/01/06	1142	584631

### The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

### Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported



# GENERAL ENGINEERING LABORATORIES, LLC

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-002F  
Sample ID: 175288009

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-015F  
Sample ID: 175288010  
Matrix: TS  
Collect Date: 25-OCT-06  
Receive Date: 01-NOV-06  
Collector: Client  
Moisture: 4.07%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.648	+/-0.123	0.0441	+/-0.123	0.0881	pCi/g		MJH1	11/04/06	1607	585612	1
Americium-241	U	0.0285	+/-0.0227	0.0178	+/-0.0227	0.0357	pCi/g						
Bismuth-212		0.555	+/-0.233	0.0954	+/-0.233	0.191	pCi/g						
Bismuth-214		0.519	+/-0.075	0.0224	+/-0.075	0.0448	pCi/g						
Cesium-134	UI	0.00	+/-0.0236	0.0159	+/-0.0236	0.0317	pCi/g						
Cesium-137	U	0.00135	+/-0.0228	0.0129	+/-0.0228	0.0258	pCi/g						
Cobalt-60	U	0.0192	+/-0.0153	0.015	+/-0.0153	0.030	pCi/g						
Europium-152	U	-0.0294	+/-0.0417	0.0292	+/-0.0417	0.0584	pCi/g						
Europium-154	U	-0.0206	+/-0.0484	0.0395	+/-0.0484	0.079	pCi/g						
Europium-155	U	0.0289	+/-0.0296	0.0272	+/-0.0296	0.0544	pCi/g						
Lead-212		0.604	+/-0.0622	0.0155	+/-0.0622	0.0309	pCi/g						
Lead-214		0.590	+/-0.0744	0.0212	+/-0.0744	0.0423	pCi/g						
Manganese-54	U	0.00387	+/-0.0147	0.013	+/-0.0147	0.0261	pCi/g						
Niobium-94	U	-0.00016	+/-0.0128	0.0113	+/-0.0128	0.0226	pCi/g						
Potassium-40		11.3	+/-0.698	0.113	+/-0.698	0.225	pCi/g						
Radium-226		0.519	+/-0.075	0.0224	+/-0.075	0.0448	pCi/g						
Silver-108m	U	-0.00216	+/-0.012	0.0105	+/-0.012	0.0209	pCi/g						
Thallium-208		0.181	+/-0.0348	0.011	+/-0.0348	0.022	pCi/g						

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	11/01/06	1142	584631

### The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

### Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-015F  
Sample ID: 175288010

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-017F  
Sample ID: 175288011  
Matrix: TS  
Collect Date: 25-OCT-06  
Receive Date: 01-NOV-06  
Collector: Client  
Moisture: 8.78%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.637	+/-0.0927	0.0338	+/-0.0927	0.0712	pCi/g		MJH1	11/04/06	1707	585612	1
Americium-241	U	0.0363	+/-0.0597	0.0497	+/-0.0597	0.102	pCi/g						
Bismuth-212		0.345	+/-0.157	0.0718	+/-0.157	0.151	pCi/g						
Bismuth-214		0.552	+/-0.059	0.0176	+/-0.059	0.0368	pCi/g						
Cesium-134	UI	0.00	+/-0.0249	0.0127	+/-0.0249	0.0264	pCi/g						
Cesium-137		0.0683	+/-0.0317	0.00905	+/-0.0317	0.019	pCi/g						
Cobalt-60	U	0.0105	+/-0.0114	0.0104	+/-0.0114	0.0222	pCi/g						
Europium-152	U	-0.0167	+/-0.0298	0.0248	+/-0.0298	0.0514	pCi/g						
Europium-154	U	-0.0147	+/-0.0387	0.032	+/-0.0387	0.0679	pCi/g						
Europium-155	U	0.0182	+/-0.031	0.0295	+/-0.031	0.0603	pCi/g						
Lead-212		0.693	+/-0.0359	0.0152	+/-0.0359	0.0312	pCi/g						
Lead-214		0.571	+/-0.0501	0.0188	+/-0.0501	0.0388	pCi/g						
Manganese-54	U	0.00321	+/-0.0119	0.0102	+/-0.0119	0.0214	pCi/g						
Niobium-94	U	0.00106	+/-0.0104	0.00894	+/-0.0104	0.0187	pCi/g						
Potassium-40		9.24	+/-0.531	0.0969	+/-0.531	0.208	pCi/g						
Radium-226		0.552	+/-0.059	0.0176	+/-0.059	0.0368	pCi/g						
Silver-108m	U	0.00406	+/-0.00958	0.00876	+/-0.00958	0.0182	pCi/g						
Thallium-208		0.232	+/-0.0264	0.0103	+/-0.0264	0.0215	pCi/g						

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	11/01/06	1142	584631

### The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

### Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

# GENERAL ENGINEERING LABORATORIES, LLC

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-017F  
Sample ID: 175288011

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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> Result is greater than value reported  
A The TIC is a suspected aldol-condensation product  
B Target analyte was detected in the associated blank  
BD Results are either below the MDC or tracer recovery is low  
C Analyte has been confirmed by GC/MS analysis  
D Results are reported from a diluted aliquot of the sample  
H Analytical holding time was exceeded  
J Value is estimated  
N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more  
R Sample results are rejected  
U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.  
UI Gamma Spectroscopy—Uncertain identification  
X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier  
Y QC Samples were not spiked with this compound  
^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL  
h Preparation or preservation holding time was exceeded  
The above sample is reported on a dry weight basis.

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-017FS  
Sample ID: 175288012  
Matrix: TS  
Collect Date: 25-OCT-06  
Receive Date: 01-NOV-06  
Collector: Client  
Moisture: 8.88%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.672	+/-0.0996	0.0298	+/-0.0996	0.0629	pCi/g		MJH1	11/04/06	1713	585612	1
Americium-241	U	0.0487	+/-0.0683	0.0572	+/-0.0683	0.117	pCi/g						
Bismuth-212		0.409	+/-0.197	0.067	+/-0.197	0.141	pCi/g						
Bismuth-214		0.467	+/-0.0453	0.0177	+/-0.0453	0.0369	pCi/g						
Cesium-134	UI	0.00	+/-0.0203	0.0121	+/-0.0203	0.0251	pCi/g						
Cesium-137		0.0598	+/-0.0169	0.00891	+/-0.0169	0.0186	pCi/g						
Cobalt-60	U	-0.00244	+/-0.0115	0.00958	+/-0.0115	0.0205	pCi/g						
Europium-152	U	-0.0213	+/-0.0289	0.0239	+/-0.0289	0.0495	pCi/g						
Europium-154	U	0.005	+/-0.0363	0.0311	+/-0.0363	0.0658	pCi/g						
Europium-155	U	0.0565	+/-0.0307	0.0303	+/-0.0307	0.0618	pCi/g						
Lead-212		0.621	+/-0.0347	0.015	+/-0.0347	0.0307	pCi/g						
Lead-214		0.584	+/-0.0495	0.0167	+/-0.0495	0.0345	pCi/g						
Manganese-54	U	0.0038	+/-0.0114	0.00976	+/-0.0114	0.0204	pCi/g						
Niobium-94	UI	0.00	+/-0.0194	0.00897	+/-0.0194	0.0187	pCi/g						
Potassium-40		9.75	+/-0.476	0.0863	+/-0.476	0.186	pCi/g						
Radium-226		0.467	+/-0.0453	0.0177	+/-0.0453	0.0369	pCi/g						
Silver-108m	U	0.00457	+/-0.00891	0.00821	+/-0.00891	0.017	pCi/g						
Thallium-208		0.223	+/-0.0269	0.00873	+/-0.0269	0.0182	pCi/g						

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	11/01/06	1142	584631

### The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

### Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-017FS  
Sample ID: 175288012

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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> Result is greater than value reported  
A The TIC is a suspected aldol-condensation product  
B Target analyte was detected in the associated blank  
BD Results are either below the MDC or tracer recovery is low  
C Analyte has been confirmed by GC/MS analysis  
D Results are reported from a diluted aliquot of the sample  
H Analytical holding time was exceeded  
J Value is estimated  
N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more  
R Sample results are rejected  
U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.  
UI Gamma Spectroscopy--Uncertain identification  
X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier  
Y QC Samples were not spiked with this compound  
^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL  
h Preparation or preservation holding time was exceeded  
The above sample is reported on a dry weight basis.

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-001F  
Sample ID: 175288013  
Matrix: TS  
Collect Date: 25-OCT-06  
Receive Date: 01-NOV-06  
Collector: Client  
Moisture: 27.4%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid - FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		1.02	+/-0.143	0.0415	+/-0.143	0.0878	pCi/g		MJH1	11/04/06	1714	585612	1
Americium-241	U	-0.00964	+/-0.020	0.0178	+/-0.020	0.0362	pCi/g						
Bismuth-212		0.674	+/-0.209	0.103	+/-0.209	0.215	pCi/g						
Bismuth-214		0.614	+/-0.0673	0.0233	+/-0.0673	0.0484	pCi/g						
Cesium-134	UI	0.00	+/-0.0252	0.0138	+/-0.0252	0.0289	pCi/g						
Cesium-137		0.249	+/-0.0328	0.0138	+/-0.0328	0.0287	pCi/g						
Cobalt-60	U	-0.00252	+/-0.0172	0.0143	+/-0.0172	0.0304	pCi/g						
Europium-152	U	0.0166	+/-0.0362	0.0324	+/-0.0362	0.0669	pCi/g						
Europium-154	U	-0.0165	+/-0.0558	0.0397	+/-0.0558	0.0843	pCi/g						
Europium-155	UI	0.00	+/-0.0478	0.0302	+/-0.0478	0.0617	pCi/g						
Lead-212		0.972	+/-0.0491	0.0191	+/-0.0491	0.0392	pCi/g						
Lead-214		0.701	+/-0.0716	0.0225	+/-0.0716	0.0465	pCi/g						
Manganese-54	UI	0.00	+/-0.0296	0.0126	+/-0.0296	0.0263	pCi/g						
Niobium-94	U	0.000854	+/-0.014	0.0118	+/-0.014	0.0246	pCi/g						
Potassium-40		14.1	+/-0.681	0.0987	+/-0.681	0.216	pCi/g						
Radium-226		0.614	+/-0.0673	0.0233	+/-0.0673	0.0484	pCi/g						
Silver-108m	U	-0.00305	+/-0.0134	0.0115	+/-0.0134	0.0238	pCi/g						
Thallium-208		0.292	+/-0.039	0.0127	+/-0.039	0.0265	pCi/g						

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	11/01/06	1142	584631

### The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

### Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported



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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-001F  
Sample ID: 175288013

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gei.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-019F  
Sample ID: 175288014  
Matrix: TS  
Collect Date: 25-OCT-06  
Receive Date: 01-NOV-06  
Collector: Client  
Moisture: 4.65%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.558	+/-0.0973	0.035	+/-0.0973	0.0737	pCi/g		MJH1	11/04/06	1714	585612	1
Americium-241	U	-0.00653	+/-0.0518	0.0424	+/-0.0518	0.0868	pCi/g						
Bismuth-212		0.417	+/-0.177	0.0721	+/-0.177	0.152	pCi/g						
Bismuth-214		0.439	+/-0.0517	0.0171	+/-0.0517	0.0357	pCi/g						
Cesium-134	UI	0.00	+/-0.0208	0.0137	+/-0.0208	0.0284	pCi/g						
Cesium-137		0.031	+/-0.0196	0.0106	+/-0.0196	0.0221	pCi/g						
Cobalt-60	U	0.0179	+/-0.0116	0.0113	+/-0.0116	0.024	pCi/g						
Europium-152	U	-0.0274	+/-0.032	0.0268	+/-0.032	0.0554	pCi/g						
Europium-154	U	0.0352	+/-0.0372	0.0343	+/-0.0372	0.0726	pCi/g						
Europium-155	U	0.0338	+/-0.0291	0.0286	+/-0.0291	0.0584	pCi/g						
Lead-212		0.494	+/-0.034	0.0157	+/-0.034	0.0323	pCi/g						
Lead-214		0.496	+/-0.0538	0.0188	+/-0.0538	0.0389	pCi/g						
Manganese-54	U	0.00994	+/-0.0113	0.0102	+/-0.0113	0.0214	pCi/g						
Niobium-94	U	0.00576	+/-0.0102	0.00921	+/-0.0102	0.0192	pCi/g						
Potassium-40		8.61	+/-0.520	0.0983	+/-0.520	0.211	pCi/g						
Radium-226		0.439	+/-0.0517	0.0171	+/-0.0517	0.0357	pCi/g						
Silver-108m	U	-0.00993	+/-0.0104	0.00835	+/-0.0104	0.0174	pCi/g						
Thallium-208		0.182	+/-0.0251	0.00978	+/-0.0251	0.0204	pCi/g						

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	11/01/06	1142	584631

### The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

### Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

# GENERAL ENGINEERING LABORATORIES, LLC

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-019F  
Sample ID: 175288014

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-003F  
Sample ID: 175288015  
Matrix: TS  
Collect Date: 25-OCT-06  
Receive Date: 01-NOV-06  
Collector: Client  
Moisture: 17.4%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Alpha Spec Analysis</b>													
<i>Alphaspec Am241, Cm, Solid ALL FSS</i>													
Americium-241	U	0.135	+/-0.254	0.180	+/-0.255	0.457	pCi/g	MXA	11/03/06	0749	584744	1	1
Curium-242	U	0.003	+/-0.115	0.0951	+/-0.115	0.292	pCi/g						
Curium-243/244	U	-0.0893	+/-0.166	0.168	+/-0.167	0.433	pCi/g						
<i>Alphaspec Pu, Solid-ALL FSS</i>													
Plutonium-238	U	0.0468	+/-0.0877	0.039	+/-0.0878	0.161	pCi/g	MXA	11/03/06	0749	584747	2	1
Plutonium-239/240	U	0.108	+/-0.122	0.039	+/-0.123	0.161	pCi/g						
<i>Liquid Scint Pu241, Solid-ALL FSS</i>													
Plutonium-241	U	0.00	+/-9.14	7.67	+/-9.14	16.1	pCi/g	MXA	11/07/06	1001	584751	3	1
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.877	+/-0.0946	0.0335	+/-0.0946	0.0703	pCi/g	MJH1	11/04/06	1710	585612	5	
Americium-241	U	0.00132	+/-0.0467	0.0438	+/-0.0467	0.0893	pCi/g						
Bismuth-212		0.430	+/-0.154	0.0749	+/-0.154	0.156	pCi/g						
Bismuth-214		0.469	+/-0.0605	0.0173	+/-0.0605	0.036	pCi/g						
Cesium-134	UI	0.00	+/-0.0199	0.0131	+/-0.0199	0.0272	pCi/g						
Cesium-137		0.332	+/-0.0314	0.0102	+/-0.0314	0.0213	pCi/g						
Cobalt-60	U	-0.00483	+/-0.0122	0.00987	+/-0.0122	0.021	pCi/g						
Europium-152	U	0.0384	+/-0.0286	0.0268	+/-0.0286	0.0552	pCi/g						
Europium-154	U	-0.0308	+/-0.0369	0.0293	+/-0.0369	0.062	pCi/g						
Europium-155	U	0.0286	+/-0.0319	0.0296	+/-0.0319	0.0603	pCi/g						
Lead-212		0.712	+/-0.0372	0.0154	+/-0.0372	0.0315	pCi/g						
Lead-214		0.567	+/-0.0539	0.0179	+/-0.0539	0.0369	pCi/g						
Manganese-54	U	0.000228	+/-0.0115	0.0101	+/-0.0115	0.0211	pCi/g						
Niobium-94	U	-0.000419	+/-0.0106	0.00894	+/-0.0106	0.0186	pCi/g						
Potassium-40		11.9	+/-0.554	0.0783	+/-0.554	0.169	pCi/g						
Radium-226		0.469	+/-0.0605	0.0173	+/-0.0605	0.036	pCi/g						
Silver-108m	U	0.00798	+/-0.0104	0.00942	+/-0.0104	0.0194	pCi/g						
Thallium-208		0.211	+/-0.0282	0.00958	+/-0.0282	0.0199	pCi/g						
<b>Rad Gas Flow Proportional Counting</b>													
<i>GFPC, Sr90, solid - 0.025 pCi/g</i>													
Strontium-90		0.0264	+/-0.0119	0.00695	+/-0.0119	0.016	pCi/g	KSD1	11/07/06	1103	584652	6	
<b>Rad Liquid Scintillation Analysis</b>													

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2040 Savage Road Charleston SC 29407 --(843) 556-8171 -- www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-003F  
Sample ID: 175288015

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Liquid Scintillation Analysis</b>													
LSC, Tritium Dist, Solid - 3 pCi/g													
Tritium	U	0.178	+/-0.744	0.613	+/-0.744	1.32	pCi/g		DFA1	11/07/06	1718	585989	7
Liquid Scint C14, Solid ALL FSS													
Carbon-14	U	-0.0691	+/-0.122	0.104	+/-0.122	0.212	pCi/g		AXD2	11/03/06	0413	584648	10
Liquid Scint Fe55, Solid-ALL FSS													
Iron-55	U	-20.5	+/-52.3	39.0	+/-52.3	81.5	pCi/g		MXP1	11/03/06	1512	584650	11
Liquid Scint Ni63, Solid-ALL FSS													
Nickel-63	U	-1.75	+/-9.40	7.95	+/-9.40	16.5	pCi/g		MXP1	11/06/06	1230	584649	12
Liquid Scint Tc99, Solid-ALL FSS													
Technetium-99	U	0.0477	+/-0.270	0.225	+/-0.270	0.465	pCi/g		KXR1	11/06/06	0714	584644	13

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	11/01/06	1142	584631

### The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Am-05-RC Modified
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, Pu-11-RC Modified
4	DOE EML HASL-300, Pu-11-RC Modified
5	EML HASL 300, 4.5.2.3
6	EPA 905.0 Modified
7	EPA 906.0 Modified
8	EPA 906.0 Modified
9	EPA 906.0 Modified
10	EPA EERF C-01 Modified
11	DOE RESL Fe-1, Modified
12	DOE RESL Ni-1, Modified
13	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
Americium-243	Alphaspec Am241, Cm, Solid ALL	87	(15%-125%)
Plutonium-242	Alphaspec Pu, Solid-ALL FSS	94	(15%-125%)

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Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-003F  
Sample ID: 175288015

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
Plutonium-241		Liquid Scint Pu241, Solid-ALL FS			82		(25%-125%)						
Strontium-90		GFPC, Sr90, solid - 0.025 pCi/g			72		(25%-125%)						
Carrier/Tracer Recovery		GFPC, Sr90, solid - 0.025 pCi/g			72		(25%-125%)						
Iron-55		Liquid Scint Fe55, Solid-ALL FS			67		(15%-125%)						
Nickel-63		Liquid Scint Ni63, Solid-ALL FS			88		(25%-125%)						
Carrier/Tracer Recovery		Liquid Scint Ni63, Solid-ALL FS			88		(25%-125%)						
Technetium-99		Liquid Scint Tc99, Solid-ALL FS			75		(15%-125%)						
Carrier/Tracer Recovery		Liquid Scint Tc99, Solid-ALL FS			75		(15%-125%)						

### Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
  - < Result is less than value reported
  - > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy--Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-016F  
Sample ID: 175288016  
Matrix: TS  
Collect Date: 25-OCT-06  
Receive Date: 01-NOV-06  
Collector: Client  
Moisture: 28.8%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.848	+/-0.148	0.040	+/-0.148	0.0839	pCi/g						
Americium-241	U	0.00581	+/-0.112	0.087	+/-0.112	0.177	pCi/g						
Bismuth-212		0.505	+/-0.185	0.0874	+/-0.185	0.182	pCi/g						
Bismuth-214		0.597	+/-0.0838	0.0219	+/-0.0838	0.0455	pCi/g						
Cesium-134	UI	0.00	+/-0.0238	0.0124	+/-0.0238	0.026	pCi/g						
Cesium-137		0.228	+/-0.0392	0.0125	+/-0.0392	0.026	pCi/g						
Cobalt-60	U	0.009	+/-0.0148	0.0131	+/-0.0148	0.0278	pCi/g						
Europium-152	U	-0.00605	+/-0.0368	0.0312	+/-0.0368	0.0642	pCi/g						
Europium-154	U	0.00481	+/-0.0504	0.0376	+/-0.0504	0.0795	pCi/g						
Europium-155	U	0.0755	+/-0.0433	0.038	+/-0.0433	0.0774	pCi/g						
Lead-212		0.856	+/-0.0816	0.0173	+/-0.0816	0.0354	pCi/g						
Lead-214		0.640	+/-0.0811	0.022	+/-0.0811	0.0454	pCi/g						
Manganese-54	U	0.0185	+/-0.0136	0.0122	+/-0.0136	0.0255	pCi/g						
Niobium-94	U	0.000615	+/-0.0132	0.0113	+/-0.0132	0.0235	pCi/g						
Potassium-40		13.2	+/-1.04	0.110	+/-1.04	0.235	pCi/g						
Radium-226		0.597	+/-0.0838	0.0219	+/-0.0838	0.0455	pCi/g						
Silver-108m	U	-0.0114	+/-0.0128	0.0103	+/-0.0128	0.0213	pCi/g						
Thallium-208		0.274	+/-0.0402	0.0116	+/-0.0402	0.0241	pCi/g						

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	11/01/06	1142	584631

### The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

### Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-016F  
Sample ID: 175288016

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.



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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-013F  
Sample ID: 175288017  
Matrix: TS  
Collect Date: 25-OCT-06  
Receive Date: 01-NOV-06  
Collector: Client  
Moisture: 15.3%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
Rad Gamma Spec Analysis													
Gamma, Solid - FSS GAM & ALL FSS 226 Ingrowth													
Waived													
Actinium-228		0.634	+/-0.105	0.0288	+/-0.105	0.0603	pCi/g						
Americium-241	UI	0.00	+/-0.0386	0.0334	+/-0.0386	0.0677	pCi/g						
Bismuth-212		0.416	+/-0.178	0.0647	+/-0.178	0.135	pCi/g						
Bismuth-214		0.557	+/-0.0681	0.0171	+/-0.0681	0.0352	pCi/g						
Cesium-134	UI	0.00	+/-0.021	0.0119	+/-0.021	0.0246	pCi/g						
Cesium-137		0.0453	+/-0.0174	0.00989	+/-0.0174	0.0205	pCi/g						
Cobalt-60	U	-0.00114	+/-0.0101	0.00858	+/-0.0101	0.0182	pCi/g						
Europium-152	U	-0.0134	+/-0.031	0.024	+/-0.031	0.0493	pCi/g						
Europium-154	U	-0.0275	+/-0.0331	0.0271	+/-0.0331	0.057	pCi/g						
Europium-155	U	0.0266	+/-0.0305	0.0286	+/-0.0305	0.0581	pCi/g						
Lead-212		0.699	+/-0.0634	0.0145	+/-0.0634	0.0297	pCi/g						
Lead-214		0.630	+/-0.0699	0.017	+/-0.0699	0.0349	pCi/g						
Manganese-54	U	0.00909	+/-0.00907	0.00842	+/-0.00907	0.0176	pCi/g						
Niobium-94	U	0.00367	+/-0.00968	0.00852	+/-0.00968	0.0176	pCi/g						
Potassium-40		10.7	+/-0.747	0.0657	+/-0.747	0.142	pCi/g						
Radium-226		0.557	+/-0.0681	0.0171	+/-0.0681	0.0352	pCi/g						
Silver-108m	U	0.0029	+/-0.011	0.00823	+/-0.011	0.017	pCi/g						
Thallium-208		0.225	+/-0.0299	0.00864	+/-0.0299	0.0179	pCi/g						

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	11/01/06	1142	584631

### The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3

### Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported

# GENERAL ENGINEERING LABORATORIES, LLC

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-013F  
Sample ID: 175288017

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time Batch	Mtd
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- > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-007F  
Sample ID: 175288018  
Matrix: TS  
Collect Date: 25-OCT-06  
Receive Date: 01-NOV-06  
Collector: Client  
Moisture: 31.7%

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Alpha Spec Analysis</b>													
<i>Alphaspec Am241, Cm, Solid ALL FSS</i>													
Americium-241	U	-0.134	+/-0.0868	0.108	+/-0.0873	0.308	pCi/g	MXA	11/03/06	0749	584744	1	1
Curium-242	U	-0.0418	+/-0.0367	0.0699	+/-0.037	0.234	pCi/g						
Curium-243/244	U	-0.0174	+/-0.165	0.144	+/-0.165	0.379	pCi/g						
<i>Alphaspec Pu, Solid-ALL FSS</i>													
Plutonium-238	U	-0.0136	+/-0.0588	0.0361	+/-0.0589	0.149	pCi/g	MXA	11/03/06	0749	584747	2	1
Plutonium-239/240	U	0.0148	+/-0.0588	0.0361	+/-0.0588	0.149	pCi/g						
<i>Liquid Scint Pu241, Solid-ALL FSS</i>													
Plutonium-241	U	-3.43	+/-7.18	6.18	+/-7.18	13.0	pCi/g	MXA	11/07/06	1017	584751	3	1
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		1.03	+/-0.171	0.0591	+/-0.171	0.123	pCi/g	MJH1	11/04/06	1715	585612	5	
Americium-241	U	0.00711	+/-0.0259	0.0222	+/-0.0259	0.0451	pCi/g						
Bismuth-212		1.10	+/-0.290	0.127	+/-0.290	0.263	pCi/g						
Bismuth-214		0.656	+/-0.0915	0.0298	+/-0.0915	0.0616	pCi/g						
Cesium-134	UI	0.00	+/-0.0383	0.0213	+/-0.0383	0.044	pCi/g						
Cesium-137		0.580	+/-0.0449	0.0169	+/-0.0449	0.0349	pCi/g						
Cobalt-60	U	0.00358	+/-0.0191	0.0161	+/-0.0191	0.034	pCi/g						
Europium-152	U	-0.0382	+/-0.0492	0.0398	+/-0.0492	0.0817	pCi/g						
Europium-154	U	0.0107	+/-0.0607	0.0511	+/-0.0607	0.107	pCi/g						
Europium-155	UI	0.00	+/-0.0715	0.0327	+/-0.0715	0.0667	pCi/g						
Lead-212		0.947	+/-0.0525	0.0211	+/-0.0525	0.0431	pCi/g						
Lead-214		0.742	+/-0.0742	0.0302	+/-0.0742	0.062	pCi/g						
Manganese-54	U	0.0184	+/-0.0269	0.0168	+/-0.0269	0.0348	pCi/g						
Niobium-94	U	0.00423	+/-0.0179	0.0151	+/-0.0179	0.0313	pCi/g						
Potassium-40		15.9	+/-0.780	0.152	+/-0.780	0.323	pCi/g						
Radium-226		0.656	+/-0.0915	0.0298	+/-0.0915	0.0616	pCi/g						
Silver-108m	U	0.00366	+/-0.016	0.0141	+/-0.016	0.029	pCi/g						
Thallium-208		0.301	+/-0.0484	0.0165	+/-0.0484	0.034	pCi/g						
<b>Rad Gas Flow Proportional Counting</b>													
<i>GFPC, Sr90, solid - 0.025 pCi/g</i>													
Strontium-90		0.0356	+/-0.0191	0.011	+/-0.0192	0.0263	pCi/g	KSD1	11/03/06	1524	584652	6	
<b>Rad Liquid Scintillation Analysis</b>													

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## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-007F  
Sample ID: 175288018

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
<b>Rad Liquid Scintillation Analysis</b>													
LSC, Tritium Dist, Solid – 3 pCi/g													
Tritium	U	-0.529	+/-0.760	0.673	+/-0.760	1.44	pCi/g		DFA1	11/07/06	1820	585989	7
Liquid Scint C14, Solid ALL FSS													
Carbon-14	U	-0.013	+/-0.127	0.106	+/-0.127	0.217	pCi/g		AXD2	11/03/06	0505	584648	10
Liquid Scint Fe55, Solid-ALL FSS													
Iron-55	U	6.40	+/-37.7	27.4	+/-37.7	57.4	pCi/g		MXP1	11/03/06	1529	584650	11
Liquid Scint Ni63, Solid-ALL FSS													
Nickel-63	U	2.37	+/-10.5	8.72	+/-10.5	18.1	pCi/g		MXP1	11/06/06	1246	584649	12
Liquid Scint Tc99, Solid-ALL FSS													
Technetium-99	U	0.0522	+/-0.267	0.223	+/-0.267	0.460	pCi/g		KXR1	11/06/06	0731	584644	13

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	11/01/06	1142	584631

### The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Am-05-RC Modified
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, Pu-11-RC Modified
4	DOE EML HASL-300, Pu-11-RC Modified
5	EML HASL 300, 4.5.2.3
6	EPA 905.0 Modified
7	EPA 906.0 Modified
8	EPA 906.0 Modified
9	EPA 906.0 Modified
10	EPA EERF C-01 Modified
11	DOE RESL Fe-1, Modified
12	DOE RESL Ni-1, Modified
13	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer recovery	Test	Recovery %	Acceptable Limits
Americium-243	Alphaspec Am241, Cm, Solid ALL	80	(15%-125%)
Plutonium-242	Alphaspec Pu, Solid-ALL FSS	96	(15%-125%)

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

## Certificate of Analysis

Company : Connecticut Yankee Atomic Power  
Address : 362 Injun Hollow Rd

East Hampton, Connecticut 06424  
Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: November 8, 2006

Client Sample ID: 9512-00-007F  
Sample ID: 175288018

Project: YANK01204  
Client ID: YANK001  
Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Mtd
Plutonium-241		Liquid Scint Pu241, Solid-ALL FS			102		(25%-125%)						
Strontium-90		GFPC, Sr90, solid – 0.025 pCi/g			89		(25%-125%)						
Carrier/Tracer Recovery		GFPC, Sr90, solid – 0.025 pCi/g			89		(25%-125%)						
Iron-55		Liquid Scint Fe55, Solid-ALL FS			72		(15%-125%)						
Nickel-63		Liquid Scint Ni63, Solid-ALL FS			87		(25%-125%)						
Carrier/Tracer Recovery		Liquid Scint Ni63, Solid-ALL FS			87		(25%-125%)						
Technetium-99		Liquid Scint Tc99, Solid-ALL FS			75		(15%-125%)						
Carrier/Tracer Recovery		Liquid Scint Tc99, Solid-ALL FS			75		(15%-125%)						

### Notes:

The Qualifiers in this report are defined as follows :

- \* A quality control analyte recovery is outside of specified acceptance criteria
  - < Result is less than value reported
  - > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy—Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

# QUALITY CONTROL DATA

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

Report Date: November 8, 2006

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Client : Connecticut Yankee Atomic Power  
362 Injun Hollow Rd

Contact: East Hampton, Connecticut  
Mr. Jack McCarthy

Workorder: 175288

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	584744										
QC1201220202	175290002	DUP									
Americium-241		U	0.0491	U	-0.037	pCi/g	1420	(0% - 100%)	MXA1	11/03/06	07:49
		Uncert:	+/-0.185		+/-0.122						
		TPU:	+/-0.185		+/-0.122						
Curium-242		U	0.134	U	-0.0189	pCi/g	266	(0% - 100%)			
		Uncert:	+/-0.303		+/-0.159						
		TPU:	+/-0.303		+/-0.159						
Curium-243/244		U	0.224	U	-0.0959	pCi/g	499	(0% - 100%)			
		Uncert:	+/-0.307		+/-0.292						
		TPU:	+/-0.308		+/-0.292						
QC1201220204	LCS										
Americium-241		13.5			14.2	pCi/g	105	(75%-125%)			
		Uncert:			+/-1.38						
		TPU:			+/-2.23						
Curium-242				U	-0.0168	pCi/g					
		Uncert:			+/-0.0725						
		TPU:			+/-0.0725						
Curium-243/244		16.3			17.1	pCi/g	105	(75%-125%)			
		Uncert:			+/-1.52						
		TPU:			+/-2.60						
QC1201220201	MB										
Americium-241				U	-0.0992	pCi/g					
		Uncert:			+/-0.126						
		TPU:			+/-0.127						
Curium-242				U	0.056	pCi/g					
		Uncert:			+/-0.126						
		TPU:			+/-0.127						
Curium-243/244				U	0.00871	pCi/g					
		Uncert:			+/-0.212						
		TPU:			+/-0.212						
QC1201220203	175290002	MS									
Americium-241		13.6	U	0.0491	12.8	pCi/g	94	(75%-125%)			
		Uncert:			+/-1.38						
		TPU:			+/-2.13						
Curium-242			U	0.134	0.0501	pCi/g					
		Uncert:			+/-0.133						
		TPU:			+/-0.133						
Curium-243/244		16.6	U	0.224	16.8	pCi/g	101	(75%-125%)			
		Uncert:			+/-1.58						
		TPU:			+/-2.65						
Batch	584747										
QC1201220219	175290002	DUP									
Plutonium-238		U	0.00833	U	0.00	pCi/g	200	(0% - 100%)	MXA1	11/03/06	07:49

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## QC Summary

Workorder: 175288

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Rad Alpha Spec</b>											
Batch	584747										
Plutonium-239/240		Uncert:	+/-0.0631	+/-0.0586							
		TPU:	+/-0.0631	+/-0.0586							
		U	0.038	U	0.00955	pCi/g	120	(0% - 100%)			
		Uncert:	+/-0.0857	+/-0.0907							
		TPU:	+/-0.0857	+/-0.0907							
QC1201220221 LCS											
Plutonium-238				U	0.178	pCi/g		(75%-125%)		11/03/06	07:49
		Uncert:		+/-0.266							
		TPU:		+/-0.267							
Plutonium-239/240	12.5				13.7	pCi/g	110	(75%-125%)			
		Uncert:		+/-1.54							
		TPU:		+/-2.21							
QC1201220218 MB											
Plutonium-238				U	-0.00987	pCi/g				11/03/06	07:49
		Uncert:		+/-0.0829							
		TPU:		+/-0.083							
Plutonium-239/240				U	-0.00987	pCi/g					
		Uncert:		+/-0.0829							
		TPU:		+/-0.083							
QC1201220220 175290002 MS											
Plutonium-238		U	0.00833		0.289	pCi/g		(75%-125%)			
		Uncert:	+/-0.0631	+/-0.200							
		TPU:	+/-0.0631	+/-0.203							
Plutonium-239/240	12.6	U	0.038		11.0	pCi/g	87	(75%-125%)			
		Uncert:	+/-0.0857	+/-1.20							
		TPU:	+/-0.0857	+/-1.66							
Batch	584751										
QC1201220223 175290002 DUP											
Plutonium-241		U	3.26	U	-2.83	pCi/g	0	(0% - 100%)	MXA1	11/07/06	11:06
		Uncert:	+/-8.75	+/-7.80							
		TPU:	+/-8.76	+/-7.80							
QC1201220225 LCS											
Plutonium-241					142	pCi/g	99	(75%-125%)		11/07/06	11:39
		Uncert:		+/-19.1							
		TPU:		+/-25.7							
QC1201220222 MB											
Plutonium-241				U	-4.48	pCi/g				11/07/06	10:50
		Uncert:		+/-8.90							
		TPU:		+/-8.90							
QC1201220224 175290002 MS											
Plutonium-241		U	3.26		128	pCi/g	88	(75%-125%)		11/07/06	11:22
		Uncert:	+/-8.75	+/-13.8							
		TPU:	+/-8.76	+/-19.2							
<b>Rad Gamma Spec</b>											
Batch	585612										
QC1201222577 175288001 DUP											
Actinium-228			0.673		0.647	pCi/g	4	(0% - 100%)	MJH1	11/04/06	17:06
		Uncert:	+/-0.128	+/-0.109							
				+/-0.109							



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## QC Summary

Workorder: 175288

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch 585612											
Americium-241	U	TPU:		+/-0.128							
				-0.0211							
		Uncert:		+/-0.0623							
Bismuth-212		TPU:		+/-0.0623							
				0.426							
		Uncert:		+/-0.192							
Bismuth-214		TPU:		+/-0.192							
				0.404							
		Uncert:		+/-0.0624							
Cesium-134	UI	TPU:		+/-0.0624							
				0.00							
		Uncert:		+/-0.0215							
Cesium-137	U	TPU:		+/-0.0215							
				-0.00276							
		Uncert:		+/-0.016							
Cobalt-60	U	TPU:		+/-0.016							
				-0.0111							
		Uncert:		+/-0.016							
Europium-152	U	TPU:		+/-0.016							
				0.0027							
		Uncert:		+/-0.0421							
Europium-154	U	TPU:		+/-0.0421							
				-0.022							
		Uncert:		+/-0.0486							
Europium-155	U	TPU:		+/-0.0486							
				0.0578							
		Uncert:		+/-0.0544							
Lead-212		TPU:		+/-0.0544							
				0.612							
		Uncert:		+/-0.0489							
Lead-214		TPU:		+/-0.0489							
				0.558							
		Uncert:		+/-0.0655							
Manganese-54	U	TPU:		+/-0.0655							
				0.0218							
		Uncert:		+/-0.0214							
Niobium-94	U	TPU:		+/-0.0214							
				-0.0128							
		Uncert:		+/-0.0147							
Potassium-40		TPU:		+/-0.0147							
				9.85							
		Uncert:		+/-0.594							
Radium-226		TPU:		+/-0.594							
				0.404							
		Uncert:		+/-0.0624							
Silver-108m	U	TPU:		+/-0.0624							
				0.000905							
		Uncert:		+/-0.0131							

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## QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	585612										
Thallium-208	TPU:	+/-0.0131		+/-0.011							
		0.185		0.181	pCi/g	2		(0% - 100%)			
	Uncert:	+/-0.0323		+/-0.0328							
	TPU:	+/-0.0323		+/-0.0328							
QC1201222578	LCS										
Actinium-228			U	0.115	pCi/g					11/04/06	17:06
	Uncert:			+/-0.248							
	TPU:			+/-0.248							
Americium-241	23.4			24.3	pCi/g		104	(75%-125%)			
	Uncert:			+/-0.234							
	TPU:			+/-0.234							
Bismuth-212			U	0.0978	pCi/g						
	Uncert:			+/-0.365							
	TPU:			+/-0.365							
Bismuth-214			U	0.0897	pCi/g						
	Uncert:			+/-0.0917							
	TPU:			+/-0.0917							
Cesium-134			U	-0.00517	pCi/g						
	Uncert:			+/-0.0559							
	TPU:			+/-0.0559							
Cesium-137	9.54			10.5	pCi/g		110	(75%-125%)			
	Uncert:			+/-0.187							
	TPU:			+/-0.187							
Cobalt-60	14.2			15.2	pCi/g		107	(75%-125%)			
	Uncert:			+/-0.250							
	TPU:			+/-0.250							
Europium-152			U	-0.0164	pCi/g						
	Uncert:			+/-0.0974							
	TPU:			+/-0.0974							
Europium-154			U	-0.0205	pCi/g						
	Uncert:			+/-0.102							
	TPU:			+/-0.102							
Europium-155			U	-0.0362	pCi/g						
	Uncert:			+/-0.0824							
	TPU:			+/-0.0824							
Lead-212			U	0.0045	pCi/g						
	Uncert:			+/-0.0684							
	TPU:			+/-0.0684							
Lead-214			U	0.000938	pCi/g						
	Uncert:			+/-0.0721							
	TPU:			+/-0.0721							
Manganese-54			U	-0.00555	pCi/g						
	Uncert:			+/-0.0507							
	TPU:			+/-0.0507							
Niobium-94			U	-0.0445	pCi/g						
	Uncert:			+/-0.0419							
	TPU:			+/-0.0419							
Potassium-40			U	0.455	pCi/g						

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## QC Summary

Workorder: 175288

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Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec Batch 585612										
			Uncert:							
			TPU:							
Radium-226		U	+/-0.363 +/-0.363 0.0897	pCi/g			(75%-125%)			
			Uncert:							
			TPU:							
Silver-108m		U	+/-0.0917 +/-0.0917 -0.00252	pCi/g						
			Uncert:							
			TPU:							
Thallium-208		U	+/-0.0399 +/-0.0399 0.0196	pCi/g						
			Uncert:							
			TPU:							
QC1201222576 MB Actinium-228		U	+/-0.0446 +/-0.0446 0.0232	pCi/g					11/04/06	17:06
			Uncert:							
			TPU:							
Americium-241		U	+/-0.0382 +/-0.0382 0.0133	pCi/g						
			Uncert:							
			TPU:							
Bismuth-212		U	+/-0.0331 +/-0.0331 0.0153	pCi/g						
			Uncert:							
			TPU:							
Bismuth-214		U	+/-0.0386 +/-0.0386 0.00701	pCi/g						
			Uncert:							
			TPU:							
Cesium-134		U	+/-0.0311 +/-0.0311 -0.00104	pCi/g						
			Uncert:							
			TPU:							
Cesium-137		U	+/-0.00572 +/-0.00572 0.00215	pCi/g						
			Uncert:							
			TPU:							
Cobalt-60		U	+/-0.00537 +/-0.00537 -0.00015	pCi/g						
			Uncert:							
			TPU:							
Europium-152		U	+/-0.00538 +/-0.00538 0.0175	pCi/g						
			Uncert:							
			TPU:							
Europium-154		U	+/-0.0136 +/-0.0136 0.00143	pCi/g						
			Uncert:							
			TPU:							
Europium-155		U	+/-0.0168 +/-0.0168 0.00185	pCi/g						
			Uncert:							
			TPU:							
Lead-212		U	+/-0.0153 +/-0.0153 0.00297	pCi/g						
			Uncert:							
			TPU:							
Lead-214		U	+/-0.0137 +/-0.0137 0.0159	pCi/g						
			Uncert:							
			TPU:							

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## QC Summary

Workorder: 175288

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Parmname	NOM	Sample	Qual	QC	Units	RPD %	REC %	Range	Anlst	Date	Time
<b>Rad Gamma Spec</b>											
Batch	585612										
Manganese-54			U	0.00475	pCi/g						
	Uncert:			+/-0.00931							
	TPU:			+/-0.00931							
Niobium-94			U	0.000918	pCi/g						
	Uncert:			+/-0.005							
	TPU:			+/-0.005							
Potassium-40			U	0.0596	pCi/g						
	Uncert:			+/-0.131							
	TPU:			+/-0.131							
Radium-226			U	0.00701	pCi/g						
	Uncert:			+/-0.0311							
	TPU:			+/-0.0311							
Silver-108m			U	-2.000E-05	pCi/g						
	Uncert:			+/-0.00452							
	TPU:			+/-0.00452							
Thallium-208			U	0.008	pCi/g						
	Uncert:			+/-0.0102							
	TPU:			+/-0.0102							
<b>Rad Gas Flow</b>											
Batch	584652										
QC1201219936	175288015	DUP									
Strontium-90				0.0264	0.0609	pCi/g	79*	(0% - 100%)	KSD1	11/03/06	15:25
	Uncert:			+/-0.0119	+/-0.0184						
	TPU:			+/-0.0119	+/-0.0185						
QC1201219938	LCS										
Strontium-90				1.18	1.05	pCi/g	89	(75%-125%)		11/03/06	16:37
	Uncert:			+/-0.107							
	TPU:			+/-0.110							
QC1201219935	MB										
Strontium-90			U	0.00653	pCi/g					11/07/06	11:03
	Uncert:			+/-0.00814							
	TPU:			+/-0.00814							
QC1201219937	175288015	MS									
Strontium-90				2.20	0.0264	1.71	pCi/g	77	(75%-125%)	11/03/06	15:44
	Uncert:			+/-0.0119	+/-0.188						
	TPU:			+/-0.0119	+/-0.192						
<b>Rad Liquid Scintillation</b>											
Batch	584644										
QC1201219906	175288015	DUP									
Technetium-99			U	0.0477	U	-0.0932	pCi/g	0	(0% - 100%)	KXR1	11/06/06 08:20
	Uncert:			+/-0.270		+/-0.255					
	TPU:			+/-0.270		+/-0.255					
QC1201219908	LCS										
Technetium-99				13.0	12.2	pCi/g	94	(75%-125%)		11/06/06	08:53
	Uncert:			+/-0.489							
	TPU:			+/-0.576							
QC1201219905	MB										
Technetium-99			U	-0.00874	pCi/g					11/06/06	08:03

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## QC Summary

Workorder: 175288

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Liquid Scintillation											
Batch	584644										
QC1201219907	175288015	MS									
Technetium-99		13.0	U	0.0477	12.2	pCi/g	93	(75%-125%)		11/06/06	08:36
		Uncert:		+/-0.270	+/-0.513						
		TPU:		+/-0.270	+/-0.596						
Batch	584648										
QC1201219921	175288018	DUP									
Carbon-14			U	-0.013	U	-0.0381	pCi/g	0	(0% - 100%)	4XD2	11/03/06 08:12
		Uncert:		+/-0.127		+/-0.119					
		TPU:		+/-0.127		+/-0.119					
QC1201219923	LCS										
Carbon-14		6.74			6.38	pCi/g	95	(75%-125%)		11/03/06	09:27
		Uncert:			+/-0.376						
		TPU:			+/-0.389						
QC1201219920	MB										
Carbon-14				U	0.0531	pCi/g				11/06/06	10:43
		Uncert:			+/-0.108						
		TPU:			+/-0.108						
QC1201219922	175288018	MS									
Carbon-14		6.99	U	-0.013	6.34	pCi/g	91	(75%-125%)		11/03/06	09:03
		Uncert:		+/-0.127	+/-0.319						
		TPU:		+/-0.127	+/-0.334						
Batch	584649										
QC1201219925	175288015	DUP									
Nickel-63			U	-1.75	U	5.23	pCi/g	0	(0% - 100%)	MXP1	11/06/06 13:35
		Uncert:		+/-9.40		+/-9.62					
		TPU:		+/-9.40		+/-9.62					
QC1201219927	LCS										
Nickel-63		508			417	pCi/g	82	(75%-125%)		11/06/06	14:08
		Uncert:			+/-19.6						
		TPU:			+/-24.3						
QC1201219924	MB										
Nickel-63				U	3.97	pCi/g				11/06/06	13:19
		Uncert:			+/-9.36						
		TPU:			+/-9.36						
QC1201219926	175288015	MS									
Nickel-63		562	U	-1.75	432	pCi/g	77	(75%-125%)		11/06/06	13:51
		Uncert:		+/-9.40	+/-20.1						
		TPU:		+/-9.40	+/-25.4						
Batch	584650										
QC1201219929	175288015	DUP									
Iron-55			U	-20.5	U	-20	pCi/g	0	(0% - 100%)	MXP1	11/03/06 16:18
		Uncert:		+/-52.3		+/-32.0					
		TPU:		+/-52.3		+/-32.0					
QC1201219931	LCS										
Iron-55		587			573	pCi/g	98	(75%-125%)		11/03/06	16:51
		Uncert:			+/-46.4						
		TPU:			+/-64.1						

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## QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Rad Liquid Scintillation</b>											
Batch	584650										
QC1201219928	MB										
Iron-55			U	-11.8	pCi/g					11/03/06	16:02
				Uncert:							
				TPU:							
QC1201219930	175288015	MS									
Iron-55		632	U	-20.5	pCi/g		97	(75%-125%)		11/03/06	16:34
				Uncert:							
				TPU:							
Batch	585989										
QC1201223382	175288015	DUP									
Tritium			U	0.178	pCi/g	0		(0% - 100%)	DFA1	11/07/06	21:28
				Uncert:							
				TPU:							
QC1201223384	LCS										
Tritium		20.2		18.5	pCi/g		92	(75%-125%)		11/07/06	22:48
				Uncert:							
				TPU:							
QC1201223381	MB										
Tritium			U	0.326	pCi/g					11/07/06	20:25
				Uncert:							
				TPU:							
QC1201223383	175288015	MS									
Tritium		21.2	U	0.178	pCi/g		82	(75%-125%)		11/07/06	22:30
				Uncert:							
				TPU:							

### Notes:

The Qualifiers in this report are defined as follows:

- \* A quality control analyte recovery is outside of specified acceptance criteria
  - < Result is less than value reported
  - > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
  - B Target analyte was detected in the associated blank
  - BD Results are either below the MDC or tracer recovery is low
  - C Analyte has been confirmed by GC/MS analysis
  - D Results are reported from a diluted aliquot of the sample
  - H Analytical holding time was exceeded
  - J Value is estimated
  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy--Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
- RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

Workorder: 175288

Page 9 of 9

Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
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^

h Preparation or preservation holding time was exceeded

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.

\*\* Indicates analyte is a surrogate compound.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

NORTHWEST SITE GROUNDS (NON-PROTECTED AREA)  
SURVEY UNIT 9512-0000

RELEASE RECORD

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**ATTACHMENT 4 (DQA RESULTS)**



NORTHWEST SITE GROUNDS (NON-PROTECTED AREA)  
SURVEY UNIT 9512-0000

RELEASE RECORD

---

**ATTACHMENT 4A  
(PRELIMINARY DATA REVIEW)**

**Preliminary Data Review Form - Samples for the Sign Test**

Survey Unit: 9512- 0000  
Survey Unit Name: Northwest Site Grounds

Classification: 3  
Survey Media: Soil  
Type of Survey: Final Status Survey  
Type of Measurement: Radionuclide Specific  
Number of Measurements: 15  
Operational DCGL (pCi/g) 5.38E+00

**BASIC STATISTICAL QUANTITIES**

Cs-137  
Minimum Value: -2.67E-03  
Maximum Value: 6.12E-01  
Mean: 2.00E-01  
Median: 1.60E-01  
Standard Deviation: 2.06E-01

**RADIONUCLIDE CONCENTRATION (pCi/g)**

NUMBER	Cs-137	Identified?
9512-0000-001F	2.49E-01	Y
9512-0000-002F	1.60E-01	N
9512-0000-003F	3.32E-01	Y
9512-0000-004F	3.05E-01	Y
9512-0000-005F	6.12E-01	Y
9512-0000-006F	3.64E-01	Y
9512-0000-007F	5.80E-01	Y
9512-0000-009F	2.28E-01	Y
9512-0000-010F	-2.67E-03	Y
9512-0000-013F	4.53E-02	N
9512-0000-014F	6.72E-03	Y
9512-0000-015F	1.35E-03	Y
9512-0000-017F	6.83E-02	Y
9512-0000-018F	1.93E-02	N
9512-0000-019F	3.10E-02	N

Performed By: *adefly*

Date: 1/31/07

Independent Review: *R. Massengill*

Date: 2/1/07

NORTHWEST SITE GROUNDS (NON-PROTECTED AREA)  
SURVEY UNIT 9512-0000

RELEASE RECORD

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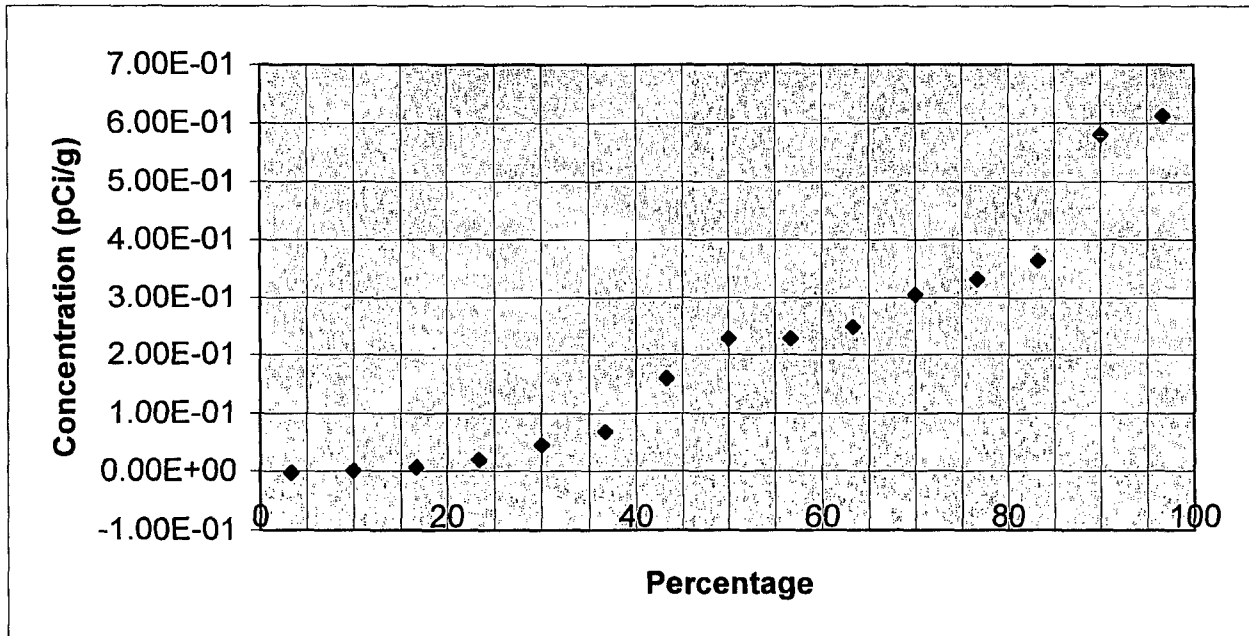
**ATTACHMENT 4B  
(GRAPHICAL REPRESENTATION OF  
DATA)**

**Quantile Plot For Cesium - 137**

Survey Unit: 9512-0000

Survey Unit Name: Northwest Site Grounds

Mean: 2.00E-01 pCi/g



Cs-137	Rank	Percentage
-2.67E-03	1	3 %
1.35E-03	2	10 %
6.72E-03	3	17 %
1.93E-02	4	23 %
4.53E-02	5	30 %
6.83E-02	6	37 %
1.60E-01	7	43 %
2.28E-01	8	50 %
2.28E-01	9	57 %
2.49E-01	10	63 %
3.05E-01	11	70 %
3.32E-01	12	77 %
3.64E-01	13	83 %
5.80E-01	14	90 %
6.12E-01	15	97 %

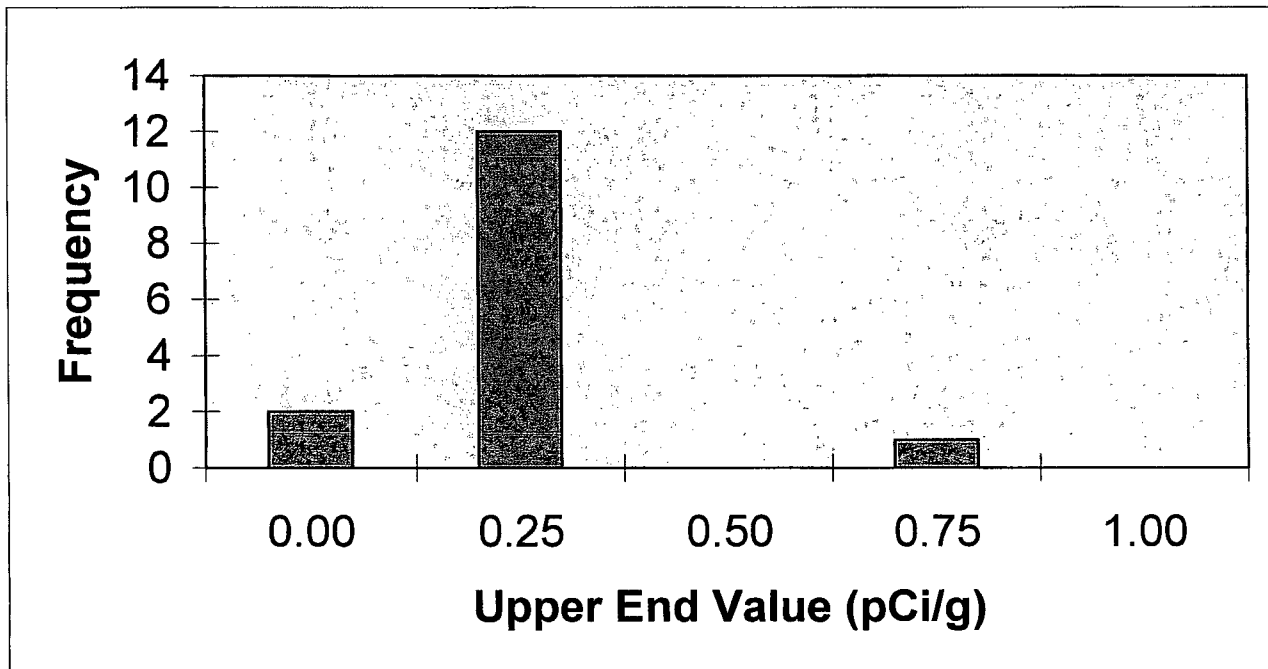
Prepared By: A. HARRISONDate: 1/21/09Reviewed By: P. MASSENGILLDate: 01/31/2007

**Frequency Plot For Cs - 137**

Survey Unit: 9512-0000

Survey Unit Name: Northwest Site Grounds

Mean: 0.200 pCi/g



Upper End Value	Observation Frequency	Observation % Frequency
0.00	2	13%
0.25	12	80%
0.50	0	0%
0.75	1	7%
1.00	0	0%
Total	15	100%

Prepared By: Ant 4/1Date: 1/31/07Reviewed By: R. MassengillDate: 01/31/2007

NORTHWEST SITE GROUNDS (NON-PROTECTED AREA)  
SURVEY UNIT 9512-0000

RELEASE RECORD

---

**ATTACHMENT 4C (SIGN TEST)**

## Sign Test Calculation Sheet For Single Radionuclide

Survey Unit Number: 9512-0000			
Survey Unit Name: Northwest Site Grounds			
WP&IR#: 2006-0038			
Classification : 3	TYPE I ( $\alpha$ error): 0.05		(N) 15
<p>Radionuclides: Cs-137</p> <p>Survey Design DCGL (pCi/g): 5.38</p>			
Cs-137 Results	Weighted Sum ( $W_s$ )	DCGL-Result	Sign
2.49E-01	4.61E-02	9.54E-01	1
1.60E-01	3.13E-02	9.69E-01	1
3.32E-01	6.14E-02	9.39E-01	1
3.05E-01	5.64E-02	9.44E-01	1
6.12E-01	1.13E-01	8.87E-01	1
3.64E-01	6.74E-02	9.33E-01	1
5.80E-01	1.07E-01	8.93E-01	1
2.28E-01	4.22E-02	9.58E-01	1
2.67E-03	4.94E-04	1.00E+00	1
4.53E-02	8.38E-03	9.92E-01	1
6.72E-03	1.24E-03	9.99E-01	1
1.35E-03	2.50E-04	1.00E+00	1
6.83E-02	1.26E-02	9.87E-01	1
1.93E-02	3.57E-03	9.96E-01	1
3.10E-02	5.70E-03	9.94E-01	1
Number of Positive Differences (S+):		15	

Critical Value: 11Survey Unit: Meets Acceptance CriterionPerformed By: Atte/H/Date: 1/31/07Independent Review: R. MasseyDate: 2-1-07

NORTHWEST SITE GROUNDS (NON-PROTECTED AREA)  
SURVEY UNIT 9512-0000


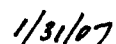
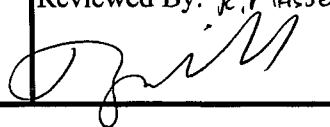
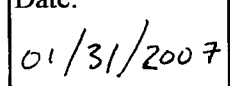
RELEASE RECORD

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**ATTACHMENT 4D  
(QC SPLIT RESULTS)**




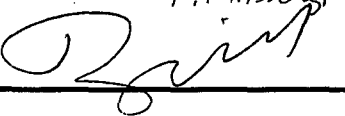
### Split Sample Assessment Form

Survey Area #:	9512	Survey Unit #:	0000	Survey Unit Name:	Northwest Site Grounds																											
Sample Plan or WPIR#:					2006-038																											
					SML #: 9512-0000-014FS																											
<p>Sample Description: Comparison of split samples collected from sample measurement location #14 and analyzed using gamma spectroscopy by an off-site vendor laboratory. The standard sample was <u>9512-0000-014F</u> the comparison sample was <u>9512-0000-014FS</u>.</p>																																
STANDARD					COMPARISON																											
Radionuclide	Activity Value	Standard Error	Resolution	Agreement Range	Activity Value	Standard Error	Comparison Ratio	Acceptable (Y/N)																								
Cs-137	6.72E-03	7.20E-03	1	NONE -	-9.13E-03	9.35E-03	-1.36	NA																								
K-40	9.59E+00	2.50E-01	38	0.75 - 1.33	8.96E+00	3.94E-01	0.93	Y																								
<p>Comments/Corrective Actions: In consideration of Cs-137 results, guidance for agreement ranges, obtained from USNRC Inspection Procedure 84750, does not address resolution ratios less than 4, therefore, a determination of acceptability for such ratios cannot be made. The agreement level for K-40 was found to be acceptable, no further actions are warranted.</p>					<p>Table is provided to show acceptance criteria used to assess split samples.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">Resolution</th> <th colspan="2">Agreement Range</th> </tr> <tr> <td>4</td> <td>7</td> <td>0.50</td> <td>2.00</td> </tr> <tr> <td>8</td> <td>15</td> <td>0.60</td> <td>1.66</td> </tr> <tr> <td>16</td> <td>50</td> <td>0.75</td> <td>1.33</td> </tr> <tr> <td>51</td> <td>200</td> <td>0.80</td> <td>1.25</td> </tr> <tr> <td colspan="2">&gt; 200</td> <td>0.85</td> <td>1.18</td> </tr> </table>				Resolution		Agreement Range		4	7	0.50	2.00	8	15	0.60	1.66	16	50	0.75	1.33	51	200	0.80	1.25	> 200		0.85	1.18
									Resolution		Agreement Range																					
									4	7	0.50	2.00																				
									8	15	0.60	1.66																				
									16	50	0.75	1.33																				
51	200	0.80	1.25																													
> 200		0.85	1.18																													
Performed By:			Date:		Reviewed By:		Date:																									
																																

WPIR – Work Plan and Inspection Record

SML – Sample Measurement Location designation

### Split Sample Assessment Form

Survey Area#:	9512	Survey Unit #:	0000	Survey Unit Name: Northwest Site Grounds																												
Sample Plan or WPIR#: 2006-0038				SML #: 9512-0000-017FS																												
<p>Sample Description: Comparison of split samples collected from sample measurement location #17 and analyzed using gamma spectroscopy by an off-site vendor laboratory. The standard sample was <u>9512-0000-017F</u>, the comparison sample was <u>9512-0000-017FS</u>.</p>																																
STANDARD					COMPARISON																											
Radionuclide	Activity Value	Standard Error	Resolution	Agreement Range	Activity Value	Standard Error	Comparison Ratio	Acceptable (Y/N)																								
Cs-137	6.83E-02	1.59E-02	4	0.5 2	5.98E-02	8.45E-03	0.88	Y																								
<p>Comments/Corrective Actions: The agreement level for Cs-137 was found to be acceptable, no further actions are warranted.</p>					<p>Table is provided to show acceptance criteria used to assess split samples.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Resolution</th> <th colspan="2">Agreement Range</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>7</td> <td>0.50</td> <td>2.00</td> </tr> <tr> <td>8</td> <td>15</td> <td>0.60</td> <td>1.66</td> </tr> <tr> <td>16</td> <td>50</td> <td>0.75</td> <td>1.33</td> </tr> <tr> <td>51</td> <td>200</td> <td>0.80</td> <td>1.25</td> </tr> <tr> <td colspan="2">&gt; 200</td> <td>0.85</td> <td>1.18</td> </tr> </tbody> </table>				Resolution		Agreement Range		4	7	0.50	2.00	8	15	0.60	1.66	16	50	0.75	1.33	51	200	0.80	1.25	> 200		0.85	1.18
									Resolution		Agreement Range																					
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> 200		0.85	1.18																													
Performed By:				Date:		Reviewed By: R. Massengill		Date:																								
				1/31/07				01/31/2007																								

WPIR – Work Plan and Inspection Record

SML – Sample Measurement Location designation