

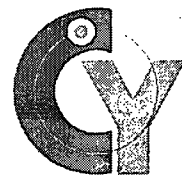


# **Final Status Survey Final Report Phase V**

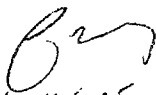
## **Appendix A8**

**Survey Unit Release Record  
9530-0003, Central Peninsula**

**December 2006**



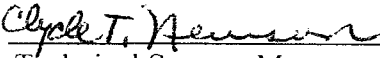
CYAPCO  
FINAL STATUS SURVEY RELEASE RECORD  
CENTRAL PENINSULA  
SURVEY UNIT 9530-0003

Prepared By:   
FSS Engineer

Date: 10/25/06

Reviewed By:   
FSS Engineer

Date: 10/25/06

Approved By:   
Technical Support Manager

Date: 11/26/06

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**1. SURVEY UNIT DESCRIPTION**

Survey Unit 9530-0003 (Central Peninsula) is designated as Final Status Survey (FSS) Class 2 and consists of 6,438 m<sup>2</sup> (1.6 acres) of uninhabited open land located approximately 3,160 feet from the reference coordinate system benchmark used at Haddam Neck Plant (HNP) (see Attachment 1). The survey unit is bounded by land Survey Unit 9530-0004. The survey unit is relatively level open space in the middle of the peninsula. The restoration of the peninsula for FSS has removed most surface interference in the survey unit.

The reference coordinates associated with this survey unit are E015 through E022 by S110 through S116 (refer to License Termination Plan (LTP) Section 5.4.4). 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 unit. The boundary of the survey unit 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 9530-0003 as Class 2 in September 2006.

The "Classification Basis Summary" conducted for Survey Unit 9530-0003 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 Supplement,"
- c) Historic and current survey records review,
- d) Visual inspections and a "walkdown."

A review of the 10CFR50.75(g)(1) database report identified two documents associated with this survey unit.

- a) Northeast Utilities Radiological Assessment Branch memo NE-86-RA-1142: Relates to dredging of two areas of the Discharge Canal to support the Low Pressure Turbine replacement project. Spoils from dredging were relocated to this survey unit and adjacent survey unit 9530-0002.
- b) Condition Report (CR) 98-0049: Documents that dredge spoils from the Discharge Canal contained radioactive material in 1987.

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

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The survey unit had undergone FSS in the fall of 2004 and release records documenting the satisfactory completion of the FSS objectives were in preparation. In 2006, utilities were being removed as part of the decommissioning effort on the Upper Peninsula. Construction debris including Asbestos Containing Material (ACM) was identified and remediated. In addition to the ACM, several objects were also identified that had detectable radioactivity. Two pieces of angle iron were located in a water utility trench in adjacent Survey Unit 9530-0004. Most of the work involved two areas adjacent to Survey Unit 9530-0003. Based on the potential to change the final radiological status of the survey unit, another FSS was considered prudent to define the as-left radiological condition.

Soil samples were collected in 2006 to establish the radiological condition of the surface and subsurface area following removal of soil. Cs-137 was the only gamma emitting radionuclide reported in concentrations with the potential for exceeding the screening criteria. Therefore, the previous FSS data and statistical parameters were used for the survey design. Statistical quantities from the previous FSS survey are provided in Table 1.

**Table 1—Basic Statistical Quantities for Cs-137 from the previous FSS Survey**

Minimum Observed Concentration (pCi/g) :	1.07E-01
Maximum Observed Concentration (pCi/g) :	4.15E-01
Mean (pCi/g):	2.65E-01
Median (pCi/g):	2.64E-01
Standard Deviation (pCi/g):	7.13E-02

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.

This survey area is affected by existing groundwater (reference CY memo ISC 06-024) which will be a source of dose from residual radioactivity, as discussed in Section 3 under the Data Quality Objectives.

Based upon the historical information and the results of radiological surveys performed during characterization, it was concluded that there was a low probability for residual radioactivity to be present in this survey unit in concentrations greater than the Operational Derived Concentration Guideline Levels (DCGLs) justifying a final survey unit classification of Class 2 (refer to Section 3).

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3. DATA QUALITY OBJECTIVES (DQO)

FSS design and planning used 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 are provided herein.

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

The primary objective of the FSS plan was to demonstrate that the level of residual radioactivity in Survey Unit 9530-0003 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 future groundwater radioactivity that will be contributed by building basements 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***

$$H_{\text{Total}} = H_{\text{Soil}} + H_{\text{ExistingGW}} + H_{\text{FutureGW}}$$

The total dose under the LTP criteria is twenty-five (25) mrem/yr TEDE from all three (3) components. The allowable total dose under the Connecticut Department of Environmental Protection (CTDEP) radiological remediation standard for 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.

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

This survey unit is not considered impacted by future groundwater radioactive contamination, as there are no buried 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.

***Equation 2***

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

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, 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 DCGL, 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	8.57E+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	1.74E+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 25 mrem/yr TEDE

(3) The Operational DCGL is equivalent to 17 mrem/yr TEDE

(4) The required MDC is equivalent to 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

Another important facet of the DQO process is to identify the radionuclides of concern and determine the concentration variability. Soil samples were collected in 2006 to establish the radiological condition of the surface and subsurface area following removal of soil. Cs-137 was the only gamma emitting radionuclide reported in concentrations with the potential for exceeding the screening criteria. The previous FSS data and statistical parameters were used for the survey design and are provided in Table 1.



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Instrument DQOs included a verification of the ability of the survey instrument to detect the radiation(s) of interest relative to the DCGL. Survey instrument response checks were required prior to issue and after the instrument had been used. Control and accountability of survey instruments was required to assure the quality and prevent the loss of data.

As part of the DQOs applied to laboratory processes, analysis results were reported as actual calculated results. Results reported as less than Minimum Detectable Concentration (MDC) were not accepted for FSS. Sample report summaries included unique sample identification, analytical method, radionuclide, result, and uncertainty to two (2) 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 FSS plan 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 9530-0003 (refer to Section 3). Other radionuclides identified during this FSS would be evaluated to ensure adequate survey design.

Surrogate DCGLs were not required for this survey unit based the previous FSS of this survey unit 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 aggregates 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 it is a Class 2 area and discrete, elevated areas of contamination were not expected.

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

The number of soil samples for FSS was determined in accordance with Procedure RPM 5.1-12, "Determination of the Number of Surface Samples for Final Status Survey." The Lower Bound of the Gray Region (LBGR) was set in accordance with Procedure RPM 5.1-11 to 5.24 to maintain the relative shift ( $\Delta/\sigma$ ) in the range of 1 and 3. The resulting Adjusted Relative Shift was 2.0. 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 the MARSSIM in support of the

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decommissioning license termination rule (10 CFR 20, Subpart E). The result of the COMPASS computer run showed adequate power for the survey design. The survey design specified fifteen (15) surface soil samples for non-parametric statistical testing and one (1) sample at biased locations.

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 systematic triangular grid pattern with a random starting point was selected for sample design, which is appropriate for a Class 2 area.

Judgmental sampling was included as a feature of this survey design to account for any anomalies potentially identified in the field.

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
9530-0003-001F	235444.17	671142.01
9530-0003-002F	235444.17	671214.42
9530-0003-003F	235381.47	671105.81
9530-0003-004F	235381.47	671178.21
9530-0003-005F	235381.47	671250.62
9530-0003-006F	235381.47	671323.03
9530-0003-007F	235318.76	671069.60
9530-0003-008F	235318.76	671142.01
9530-0003-009F	235318.76	671214.42
9530-0003-010F	235318.76	671286.82
9530-0003-011F	235256.05	671105.81
9530-0003-012F	235256.05	671178.21
9530-0003-013F	235256.05	671250.62
9530-0003-014F	235193.35	671142.01
9530-0003-015F	235193.35	671214.42
9530-0003-016F	235221.79	671062.34

Procedure RPM 5.1-11 specifies that 5% of the samples are required to be selected for HTD analysis. Two (2) soil samples, or about 10% of the number of samples that would be used for non-parametric statistical testing were

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randomly selected for HTD radionuclide analysis using the Microsoft Excel "RANDBETWEEN" function. Each sample was sent off-site for a full suite analysis of the HTD radionuclides specified in the LTP, Table 2-12, "Radionuclides Potentially Present at Haddam Neck Plant" and as provided in Table 2.

The implementation of 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 "RANDBETWEEN" function. The number of quality control soil samples was about 10% of fifteen (15) samples.

The LTP specifies that scanning will be performed along with a combination of systematic and judgmental measurements (samples) for a Class 2 land area and should cover between 10% to 100% of the area. The fraction of scanning coverage was determined during the DQO process with the total amount and location(s) based on the likelihood of finding elevated activity during FSS.

Based on the historical site assessment, the characterization data available, and the use of the survey unit to store spoils from remediation, it was determined that scanning was required in three (3) separate areas. The total surface area to be scanned was approximately 12% of the survey unit. A map of the scan grid locations is provided in Attachment 1.

For this Class 2 survey unit, the "Investigation Level" for area scanning and soil sample measurement results are those levels specified in LTP, Table 5-8. Table 4 provides a synopsis of the survey design.

**Table 4 – Synopsis of the Survey Design**

<b>Feature</b>	<b>Design Criteria</b>	<b>Basis</b>
Survey Unit Land Area	6,438 m <sup>2</sup>	Based on AutoCAD-LT
Number of Measurements	16 (15 systematic grid) (1 biased)	Type 1 and Type 2 errors were 0.05, sigma was 0.071 pCi/g, the LBGR was adjusted to 5.24 to maintain Relative Shift in the range of 1 and 3
Grid Spacing	22.3 m	Based on triangular grid
Operational DCGL	5.38 pCi/g Cs-137	Administratively set to achieve 17 mrem/yr TEDE <sup>(1)</sup>
Soil Investigation Level	5.38 pCi/g Cs-137	The Operational DCGL meets the LTP criteria for a Class 2 survey unit

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**Table 4 - Synopsis of the Survey Design**

Feature	Design Criteria	Basis
Scan Survey Area Coverage	Approximately 12% of the area	The LTP requires >10% area coverage for Class 2 survey units
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 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) 2006-0038. The WP&IR package included a detailed FSS plan, job safety analysis, job planning checklist and related procedures for reference. 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.

Two (2) scan areas were established that constituted approximately 12% of the surface area of Survey Unit 9530-0003. Grid lines, one meter wide, were painted on the ground of the scan area. A background survey was performed around the survey unit and it was determined that, using an Eberline E-600 with a SPA-3 sodium iodide detector, background ranged from 6,280 counts per minute (cpm) up to 8,220 cpm.

The scan areas were established and scanned for elevated readings (see Attachment 2 for all scan results). Scanning was performed with an Eberline E-600 using a SPA-3 sodium iodide detector. The E-600 was operated in the rate-meter mode and used with 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. Approximately 12% of the survey unit was scanned.

Measurement locations were identified in North American Datum (NAD) 1927 coordinates using GPS coordinates; sample locations were identified and marked with a surveyor's flag or paint for identification. At each sample location, a one (1) meter radius around the sample flag or paint mark was scanned for elevated radiation levels.

Sixteen (16) surface soil samples were collected 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."

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Two (2) samples (9530-0003-013F and 9530-0003-014F) were randomly selected for HTD radionuclide analysis.

The implementation of survey specific quality control measures included the collection of two (2) samples (9530-0003-004F and 9530-0003-006F) for "split sample" analysis.

6. SURVEY RESULTS

All field survey activities were conducted between September 12, 2006 and September 13, 2006.

The sample 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. Scan results are provided in Attachment 2.

Table 5 - Scan Results for Sample Measurement Locations

Sample Measurement Location	Highest Logged Reading (kcpm)	Action Level <sup>(1)</sup> (kcpm)	> Action Level <sup>(2)</sup>
1	7.55	8.57	NO
2	7.26	8.87	NO
3	7.60	8.66	NO
4	7.57	8.77	NO
5	8.28	9.45	NO
6	6.53	7.59	NO
7	7.50	7.89	NO
8	7.69	8.51	NO
9	7.08	8.62	NO
10	7.72	9.05	NO
11	7.49	7.89	NO
12	7.46	8.59	NO
13	7.28	8.22	NO
14	6.38	8.37	NO
15	8.60	9.02	NO
16	5.87	7.34	NO

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

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Table 5 - Scan Results for Sample Measurement Locations

Sample Measurement Location	Highest Logged Reading (kcpm)	Action Level <sup>(1)</sup> (kcpm)	> Action Level <sup>(2)</sup>
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(2) The FSS plan requires movement of the sample measurement location to the area within the 1 meter radius yielding the response above the action level

The scan areas, that comprised approximately 12% of the total surface area for the survey unit, were scanned for elevated radiation levels. The areas were scanned in accordance with the FSS plan on September 12, 2006 and September 13, 2006. No elevated measurement locations were identified during scanning. Table 6 provides an overview of the scan area survey. Scan results are provided in Attachment 2.

Table 6 - Scan Area Results

Scan Area	Highest Logged Reading (kcpm)	Action Level <sup>(1)</sup> (kcpm)	Elevated Reading Identification <sup>(2)</sup>	Investigation Sample
1	8.35	9.40	None – no elevated areas identified	None
2	8.83	9.16	None – no elevated areas identified	None

(1) The action level is based on a measurement above ambient background

(2) ER is an abbreviation associated with the barcodes used in the field where ER stands for Elevated Reading

The off-site laboratory employed for the radiological analyses of samples was General Engineering Laboratories, LLC. The laboratory analyzed the fifteen (15) samples collected for non-parametric statistical testing, the associated field splits, and the one (1) biased sample using gamma spectroscopy. Gamma spectroscopy analysis was performed to the required MDCs. Gamma spectroscopy results identified some radionuclides meeting the accepted criteria for detection (i.e., a result greater than two standard deviations uncertainty). However, Cs-137 was the only radionuclide reported in concentrations exceeding the de-selection criteria.

Cs-137 was identified in all fifteen (15) samples collected for non-parametric statistical testing. Cs-137 was the primary radionuclide confirming the DQOs. The mean of the gamma spectroscopic analysis results for the sample population indicated that Cs-137 was present at levels lower than the concentrations of Cs-137 found in soil at off-site locations within the vicinity of the HNP as presented in the Health Physics TSD BCY-HP-0063.

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A summary of the fifteen (15) samples collected for non-parametric statistical testing results is provided in Table 7.

Table 7 - Summary of Soil Sample Results for the Statistical Sample Population		
Sample Number	Cs-137 pCi/g	Fraction of the Operational DCGL <sup>(1)</sup>
9530-0003-001F	1.41E-01	0.026
9530-0003-002F	3.26E-01	0.061
9530-0003-003F	2.83E-01	0.053
9530-0003-004F	3.09E-01	0.057
9530-0003-005F	4.87E-01	0.091
9530-0003-006F	9.57E-02	0.018
9530-0003-007F	5.70E-02	0.011
9530-0003-008F	2.89E-01	0.054
9530-0003-009F	3.95E-01	0.073
9530-0003-010F	2.87E-01	0.053
9530-0003-011F	2.27E-01	0.042
9530-0003-012F	3.19E-01	0.059
9530-0003-013F	2.27E-01	0.042
9530-0003-014F	1.17E-01	0.022
9530-0003-015F	1.63E-01	0.030

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

The off-site laboratory also processed two (2) samples for HTD analysis 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. All analyses met the required MDC.

As previously stated in Section 4 of this report, the criteria for de-selection of a radionuclide is a concentration that is less than 5% of the Operational DCGL for individual radionuclides and less than 10% of the Operational DCGLs for aggregates. Tc-99 was the only HTD, which by analysis, met the criteria for detection (i.e., a result greater than two standard deviations uncertainty). The highest result for Tc-99 was at 2.9% of the Operational DCGL.

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**Table 8 - Hard-to-Detect Sample Results**

Sample	Tc-99 (pCi/g)	Fraction of Operational DCGL <sup>(1)</sup>
9530-0003-013F	1.89E-01	0.019
9530-0003-014F	2.74E-01	0.029

(1) The Operational DCGL from Table 2 is 8.57 pCi/g for Tc-99 to achieve 17 mrem/yr TEDE

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.

**Table 9 - Judgmental or Biased Sample Results**

Sample Number	Cs-137 pCi/g	Fraction of the Operational DCGL <sup>(1)</sup>
9530-0003-016F	9.17E-02	0.017

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

**7. QUALITY CONTROL**

The off-site laboratory processed the split samples and performed gamma spectroscopy analysis. Ten percent (10%) of the samples were selected for analysis, which exceeds the 5% minimum required by the LTP. The data were 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 field split results for Cs-137 at both locations.

The sample analysis vendor, General Engineering Laboratories, LLC, maintains quality control and quality assurance plans as part of normal operation. Refer to Attachment 4 for data and data quality analysis results.

**8. INVESTIGATIONS AND RESULTS**

No confirmatory samples were necessary.

**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 is unnecessary and that the remaining residual radioactivity in soil was ALARA.

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

No changes were made to the FSS plan.



CENTRAL PENINSULA  
SURVEY UNIT 9530-0003

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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 2.

The preliminary data review consisted of calculating basic statistical quantities (e.g., mean, median, standard deviation). 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 unrestricted release criteria with adequate power as required by the DQOs.

For Cs-137, the range of the data, about four (4) standard deviations, was not a particularly large variation considering that the levels were essentially at existing environmental levels where such variation is to be expected. The difference between the mean and median was -30% 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 indicates positive skewness as confirmed by the calculated skew of 0.17.

All data, assessments, and graphical representations are provided in Attachment 4.

**12. ANOMALIES**

No anomalies were noted.

**13. CONCLUSION**

Survey Unit 9530-0003 has met the final DQOs of the FSS plan. The ALARA criteria for soils as specified in Chapter 4 of the LTP were achieved. Elevated Measurement Comparison and remediation was not required.

Cs-137 was used for statistical testing to determine the adequacy of the survey unit for FSS.

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 is properly designated as Class 2.

CENTRAL PENINSULA  
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The dose contribution from soil is less than 1 mrem/yr TEDE based on the average concentration of the samples used for non-parametric statistical sampling.

This survey area is affected by existing groundwater (reference CY memo ISC 06-024); therefore the dose contribution from existing groundwater is bounded at two (2) mrem/yr TEDE.

This survey unit is not considered impacted by future groundwater radioactive contamination, as there are underground structures, systems or components containing residual radioactive material within the groundwater saturated zone in the area (reference CY memo ISC 06-024); therefore, the dose contribution from future groundwater is 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, will not exceed 3 mrem/yr TEDE. Therefore, Survey Unit 9530-0003 is acceptable for unrestricted release.

**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

CENTRAL PENINSULA  
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RELEASE RECORD

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**ATTACHMENT 1 (FIGURES)**

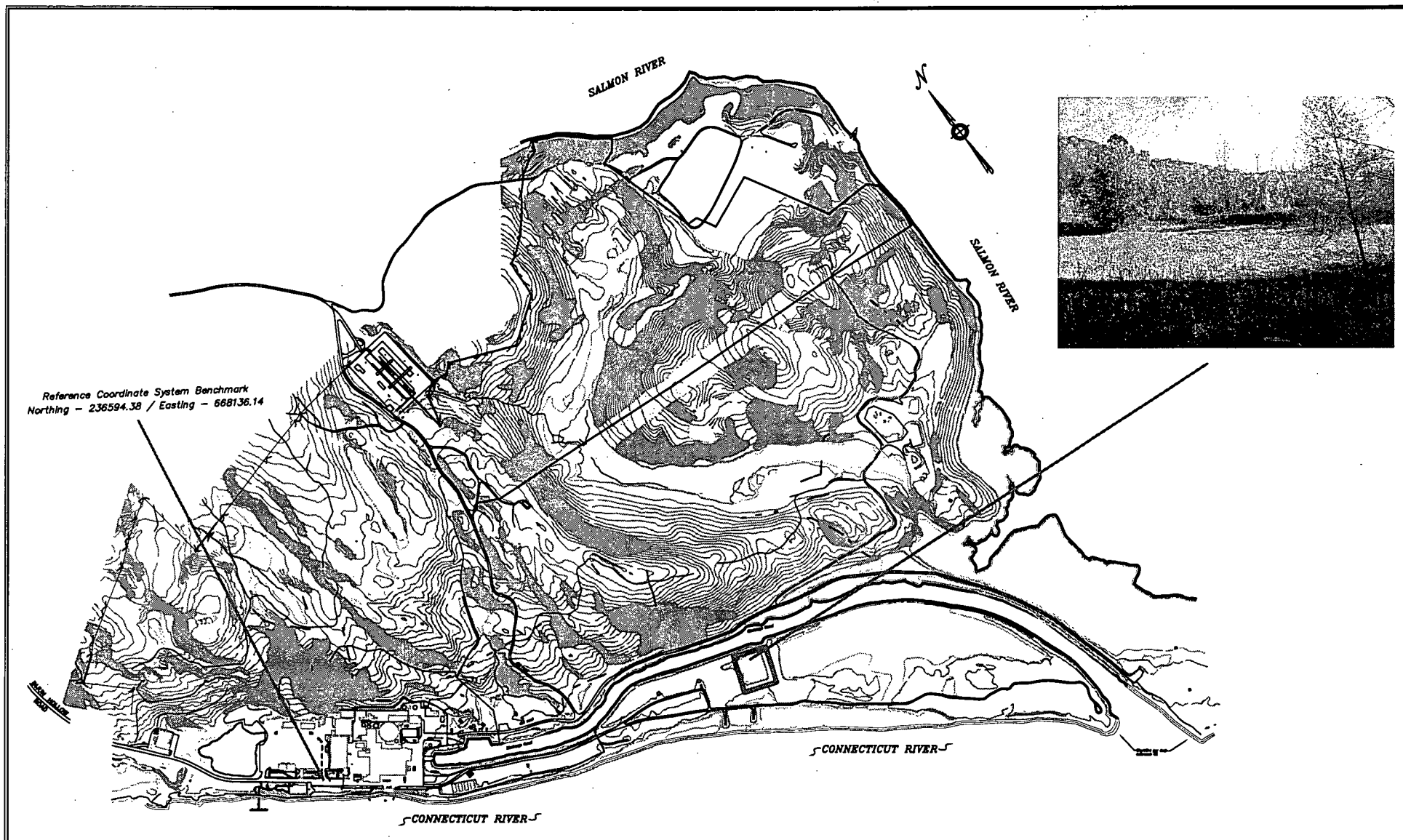


Figure 1



Connecticut Yankee Atomic Power Company  
Site Map With Reference To Survey Unit 9530-0003

Date

By

October 2006

J. McC.

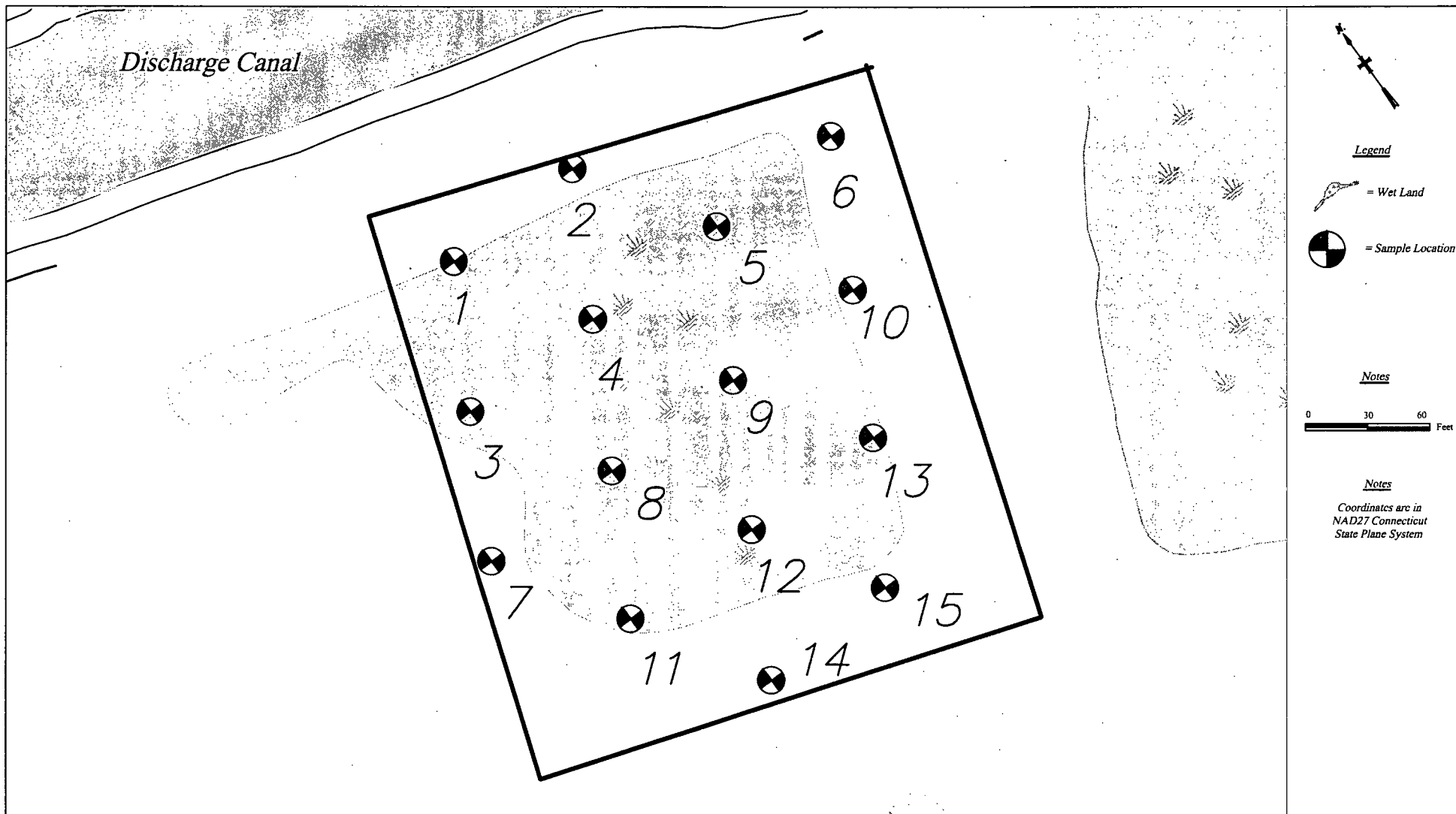


Figure 2

Connecticut Yankee Atomic Power Company  
Survey Unit 9530-0003 Final Status Survey Design

Date: October 2006

Revision: 0

Created by: J. McCarthy

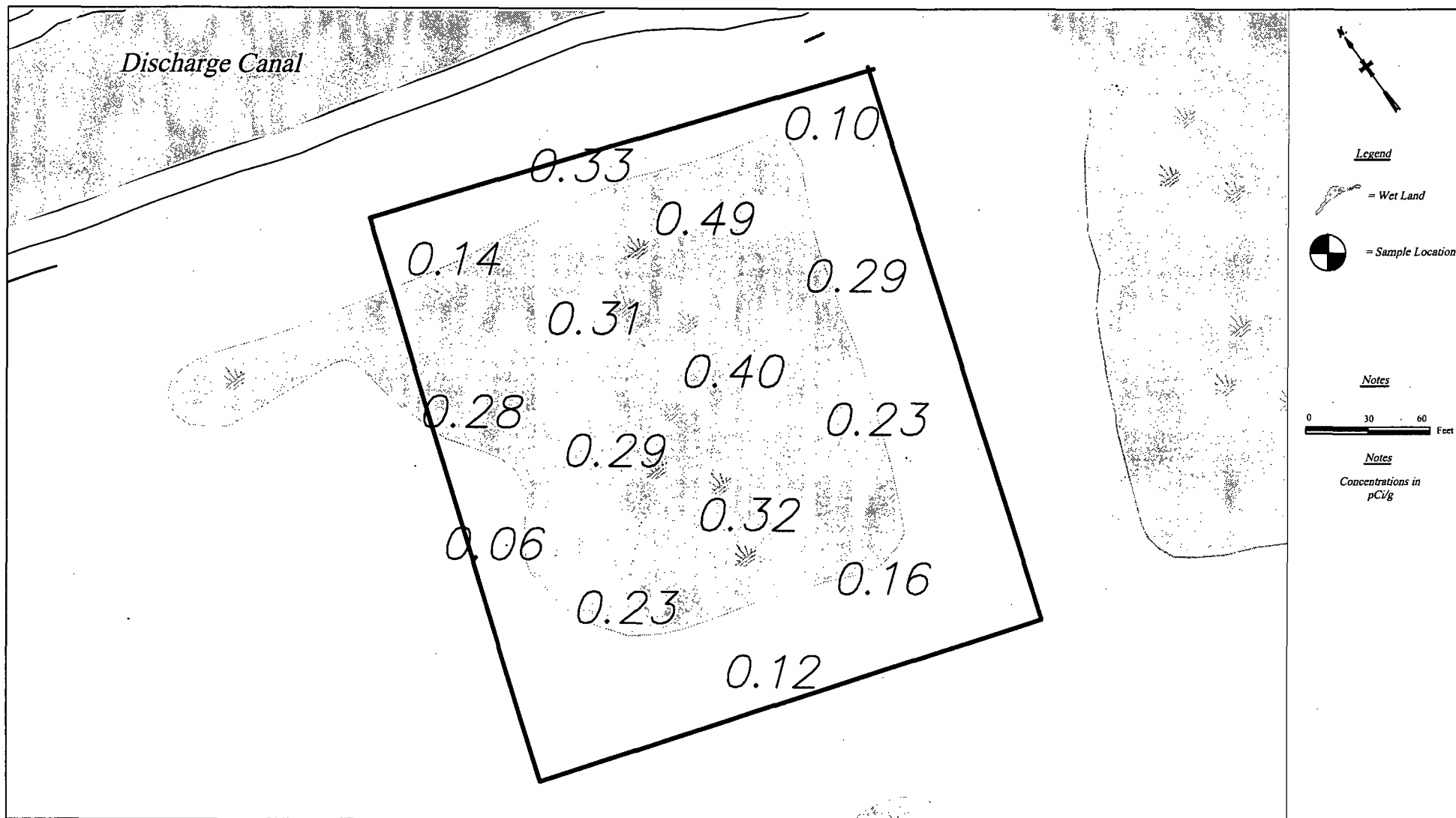


Figure 3

Connecticut Yankee Atomic Power Company  
Survey Unit 9530-0003 Final Status Survey Cs-137 Posting Plot

Date: October 2006

Revision: 0

Created by: J. McCarthy

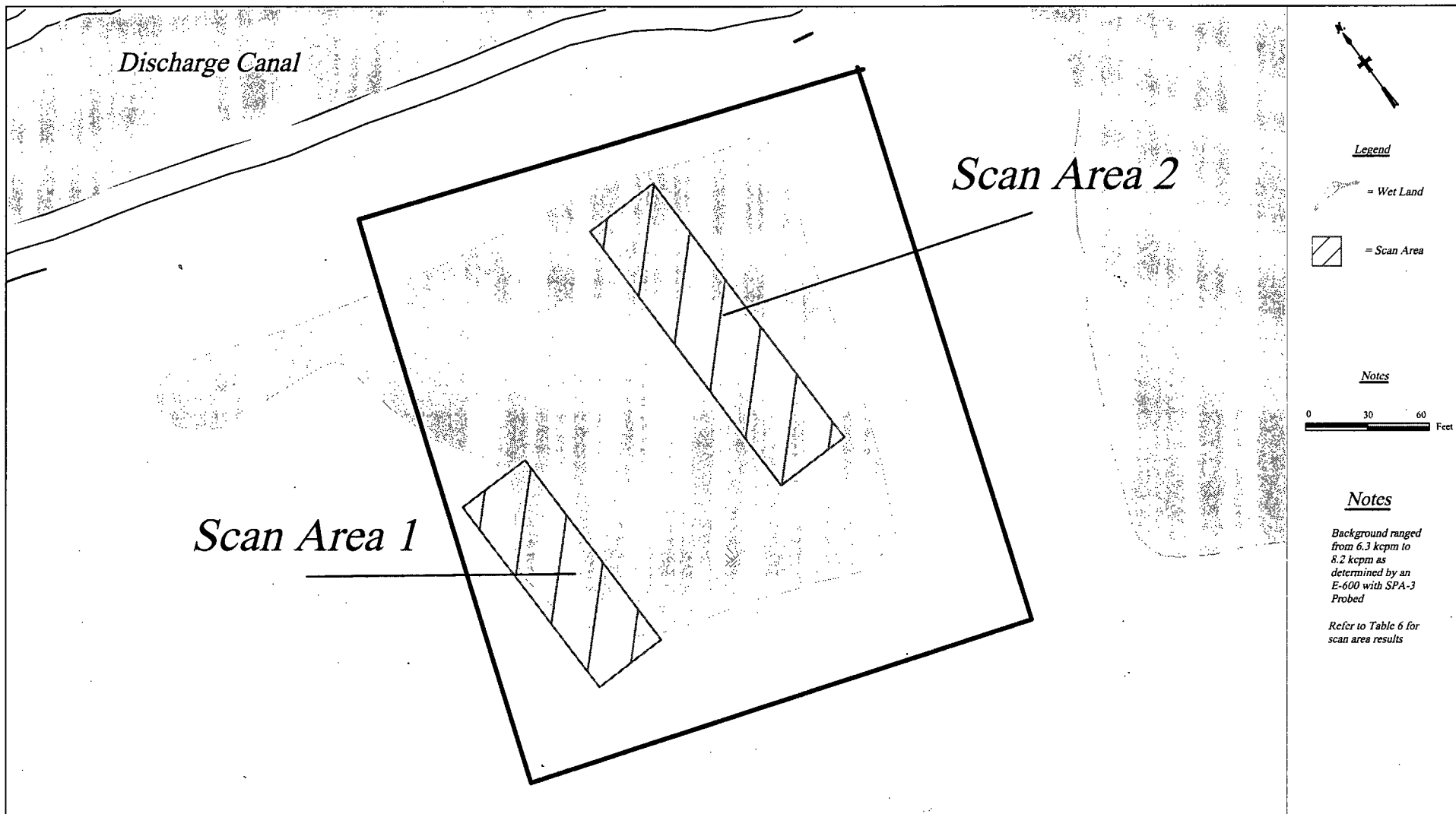


Figure 4

Connecticut Yankee Atomic Power Company  
Survey Unit 9530-0003 Final Status Survey Scan Areas

Date: October 2006

Revision: 0

Created by: J. McCarthy

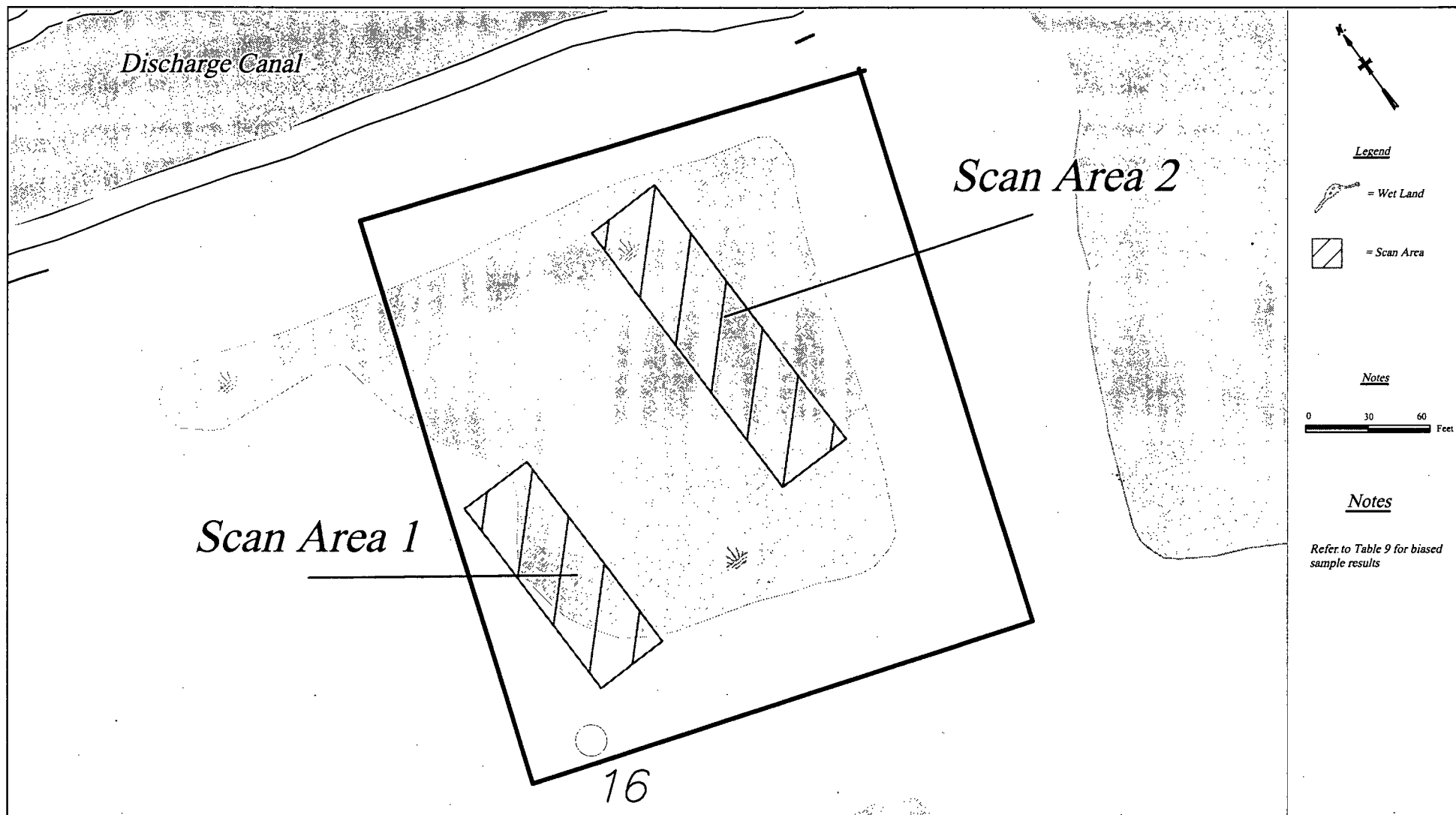


Figure 5

Connecticut Yankee Atomic Power Company  
Survey Unit 9530-0003 Biased

Date: October 2006

Revision: 0

Created by: J. McCarthy



CENTRAL PENINSULA  
SURVEY UNIT 9530-0003

RELEASE RECORD

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**ATTACHMENT 2 (SCAN RESULTS)**

# Survey Release Record Sample Location Scan Results

## Survey Unit 9530-0003

<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>
9530-03-SL-00-01-0	7.35E+03	8.57E+03	7.55E+03		9/12/2006	10:40:00	1116	1006
9530-03-SL-00-02-0	7.62E+03	8.87E+03	7.26E+03		9/12/2006	10:46:00	1116	1006
9530-03-SL-00-03-0	7.43E+03	8.66E+03	7.60E+03		9/12/2006	10:51:00	1116	1006
9530-03-SL-00-04-0	7.53E+03	8.77E+03	7.57E+03		9/12/2006	11:01:00	1116	1006
9530-03-SL-00-05-0	8.16E+03	9.45E+03	8.28E+03		9/12/2006	11:05:00	1116	1006
9530-03-SL-00-06-0	6.44E+03	7.59E+03	6.53E+03		9/12/2006	13:04:00	1116	1006
9530-03-SL-00-07-0	6.72E+03	7.89E+03	7.50E+03		9/12/2006	13:31:00	1116	1006
9530-03-SL-00-08-0	7.29E+03	8.51E+03	7.69E+03		9/12/2006	13:45:00	1116	1006
9530-03-SL-00-09-0	7.39E+03	8.62E+03	7.08E+03		9/12/2006	13:59:00	1116	1006
9530-03-SL-00-10-0	7.79E+03	9.05E+03	7.72E+03		9/12/2006	11:23:00	1116	1006
9530-03-SL-00-11-0	6.72E+03	7.89E+03	7.49E+03		9/12/2006	14:26:00	1116	1006
9530-03-SL-00-12-0	7.36E+03	8.59E+03	7.46E+03		9/12/2006	14:40:00	1116	1006
9530-03-SL-00-13-0	7.02E+03	8.22E+03	7.28E+03		9/12/2006	14:46:00	1116	1006
9530-03-SL-00-14-0	7.16E+03	8.37E+03	6.38E+03		9/12/2006	14:58:00	1116	1006
9530-03-SL-00-15-0	7.76E+03	9.02E+03	8.60E+03		9/12/2006	14:52:00	1116	1006
9530-03-SL-00-16-0	6.21E+03	7.34E+03	5.87E+03		9/12/2006	15:01:00	1116	1006

# Survey Release Record Scan Area Results

## Survey Unit 9530-0003

### 9530-0003 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>
9530-03-SC-01-01-0	6.63E+03	7.79E+03	6.73E+03		9/12/2006	13:30:00	1117	1008
9530-03-SC-01-02-0	7.72E+03	8.97E+03	6.67E+03		9/12/2006	13:35:00	1117	1008
9530-03-SC-01-03-0	6.75E+03	7.92E+03	6.68E+03		9/12/2006	13:38:00	1117	1008
9530-03-SC-01-04-0	7.75E+03	9.01E+03	6.05E+03		9/12/2006	13:42:00	1117	1008
9530-03-SC-01-05-0	6.28E+03	7.41E+03	7.16E+03		9/12/2006	13:50:00	1117	1008
9530-03-SC-01-06-0	7.12E+03	8.32E+03	7.23E+03		9/12/2006	13:54:00	1117	1008
9530-03-SC-01-07-0	7.22E+03	8.43E+03	7.67E+03		9/12/2006	13:59:00	1117	1008
9530-03-SC-01-08-0	8.11E+03	9.40E+03	8.35E+03		9/12/2006	14:04:00	1117	1008
9530-03-SC-01-09-0	7.49E+03	8.73E+03	7.06E+03		9/12/2006	14:09:00	1117	1008
9530-03-SC-01-10-0	7.94E+03	9.21E+03	7.39E+03		9/12/2006	14:16:00	1117	1008
9530-03-SC-01-11-0	7.98E+03	9.26E+03	7.21E+03		9/12/2006	14:19:00	1117	1008
9530-03-SC-01-12-0	7.31E+03	8.53E+03	7.51E+03		9/12/2006	14:24:00	1117	1008

### 9530-0003 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>
9530-03-SC-02-01-0	7.67E+03	8.92E+03	8.64E+03		9/13/2006	13:03:00	1116	1006
9530-03-SC-02-02-0	7.65E+03	8.90E+03	7.95E+03		9/13/2006	13:07:00	1116	1006
9530-03-SC-02-03-0	7.82E+03	9.08E+03	7.34E+03		9/13/2006	13:12:00	1116	1006
9530-03-SC-02-04-0	7.55E+03	8.79E+03	8.41E+03		9/13/2006	13:18:00	1116	1006
9530-03-SC-02-05-0	7.89E+03	9.16E+03	8.83E+03		9/13/2006	13:23:00	1116	1006
9530-03-SC-02-06-0	7.67E+03	8.92E+03	7.59E+03		9/13/2006	13:34:00	1116	1006
9530-03-SC-02-07-0	7.75E+03	9.01E+03	7.36E+03		9/13/2006	13:29:00	1116	1006
9530-03-SC-02-08-0	8.15E+03	9.44E+03	8.08E+03		9/13/2006	13:40:00	1116	1006
9530-03-SC-02-09-0	8.09E+03	9.37E+03	7.41E+03		9/13/2006	13:43:00	1116	1006
9530-03-SC-02-10-0	7.94E+03	9.21E+03	7.45E+03		9/13/2006	13:46:00	1116	1006
9530-03-SC-02-11-0	8.22E+03	9.51E+03	7.06E+03		9/13/2006	13:50:00	1116	1006
9530-03-SC-02-12-0	6.67E+03	7.84E+03	7.31E+03		9/13/2006	13:55:00	1116	1006

CENTRAL PENINSULA  
SURVEY UNIT 9530-0003

RELEASE RECORD

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**ATTACHMENT 3 (LABORATORY DATA)**

# **General Narrative**

**CASE NARRATIVE**  
**For**  
**CONNECTICUT YANKEE**  
**RE: Soil**  
**PO# 002332**  
**Work Order: 171772**  
**SDG: MSR#06-1255**

**September 27, 2006**

**Laboratory Identification:**

General Engineering Laboratories, LLC

**Mailing Address:**

P.O. Box 30712

Charleston, South Carolina 29417

**Express Mail Delivery and Shipping Address:**

2040 Savage Road

Charleston, South Carolina 29407

**Telephone Number:**

(843) 556-8171

**Summary:**

**Sample receipt**

The sample(s) for this Project arrived at General Engineering Laboratories, LLC, (GEL) in Charleston, South Carolina on September 15, 2006. All sample containers arrived without any visible signs of tampering or breakage. The chain of custody contained the proper documentation and signatures.

The laboratory received the following sample(s):

<b><u>Sample ID</u></b>	<b><u>Client Sample ID</u></b>
171772001	9530-0003-001F
171772002	9530-0003-002F
171772003	9530-0003-003F
171772004	9530-0003-004F
171772005	9530-0003-004FS
171772006	9530-0003-005F
171772007	9530-0003-006F
171772008	9530-0003-006FS
171772009	9530-0003-007F

171772010	9530-0003-008F
171772011	9530-0003-009F
171772012	9530-0003-010F
171772013	9530-0003-011F
171772014	9530-0003-012F
171772015	9530-0003-013F
171772016	9530-0003-014F
171772017	9530-0003-015F
171772018	9530-0003-016F

**Items of Note:**

There are no items of 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 listed below by analytical parameter.

**Analytical Request:**

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

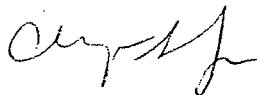
**Internal Chain of Custody:**

Custody was maintained for the sample(s).

**Data Package:**

The enclosed data package contains the following sections: Case Narrative, Chain of Custody and Supporting Documentation and all analytical fractions.

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 26 September 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

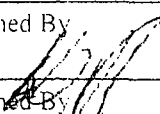
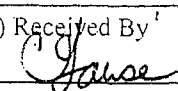
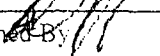


# **Chain of Custody And Supporting Documentation**

## Chain of Custody Form

No. 2006-00566

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													1717721		
Priority: <input type="checkbox"/> 30 D. <input checked="" type="checkbox"/> 14 D. <input type="checkbox"/> 7 D. <input type="checkbox"/> 3 D.															
Sample Designation	Date	Time									Comment, Preservation	Lab Sample ID			
9530-0003-001F	9/12/06	1042	TS	G	BP	X									
9530-0003-002F	9/12/06	1047	TS	G	BP	X									
9530-0003-003F	9/12/06	1051	TS	G	BP	X									
9530-0003-004F	9/12/06	1101	TS	G	BP	X									
9530-0003-004FS	9/12/06	1101	TS	G	BP	X									
9530-0003-005F	9/12/06	1105	TS	G	BP	X									
9530-0003-006F	9/12/06	1105	TS	G	BP	X									
9530-0003-006FS	9/12/06	1105	TS	G	BP	X									
9530-0003-007F	9/12/06	1325	TS	G	BP	X									
NOTES: PO #: 002332    MSR #: 06-1255    SSWP# NA <input checked="" type="checkbox"/> LTP QA <input type="checkbox"/> Radwaste QA <input type="checkbox"/> Non QA															
1) Relinquished By: 			Date/Time: 9/14/05 1425			2) Received By: 			Date/Time: 9/15/06 9:15			Samples Shipped Via: <input checked="" type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> Hand <input type="checkbox"/> Other		Internal Container Temp.: 22 Deg. C Custody Sealed? Y <input checked="" type="checkbox"/> N Custody Seal Intact? Y <input checked="" type="checkbox"/> N	
3) Relinquished By: 			Date/Time:			4) Received By:			Date/Time:			Bill of Lading #			

## Connecticut Yankee Atomic Power Company

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

## Chain of Custody Form

No. 2006-00567

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 checked="" type="checkbox"/> 14 D. <input type="checkbox"/> 7 D. <input type="checkbox"/> 3 D.															
Sample Designation	Date	Time										Comment, Preservation	Lab Sample ID		
9530-0003-008F	9/12/06	1343	TS	G	BP	X									
9530-0003-009F	9/12/06	1356	TS	G	BP	X									
9530-0003-010F	9/12/06	1121	TS	G	BP	X									
9530-0003-011F	9/12/06	1427	TS	G	BP	X									
9530-0003-012F	9/12/06	1440	TS	G	BP	X									
9530-0003-013F	9/12/06	1446	TS	G	BP		X								
9530-0003-014F	9/12/06	1457	TS	G	BP		X								
9530-0003-015F	9/12/06	1453	TS	G	BP	X									
9530-0003-016F	9/12/06	1505	TS	G	BP	X									
NOTES: PO #: 002332    MSR #: 06-1255    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.: 22 Deg. Custody Sealed? Y <input checked="" type="checkbox"/> N Custody Seal Intact? Y <input checked="" type="checkbox"/> N	
1) Relinquished By <i>[Signature]</i>			Date/Time 9/14/06 1405			2) Received By <i>[Signature]</i>			Date/Time 9/15/06 9.15			Bill of Lading #			
3) Relinquished By			Date/Time			4) Received By			Date/Time						

Figure 1. Sample Check-in List

Date/Time Received: 9/15/06 9:15

SDG#: MSR#06-1255

Work Order Number: 171772

Shipping Container ID: 7905 6194 3283 Chain of Custody # 2006 06566

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 22°

5. Vermiculite/packing materials is: Wet [ ] Dry [ ☒ ]

6. Number of samples in shipping container: 18

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: \_\_\_\_\_ Date: \_\_\_\_\_

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

# RADIOLOGICAL ANALYSIS

**Radiochemistry Case Narrative  
Connecticut Yankee Atomic Power Co. (YANK)  
Work Order 171772**

**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:** 569530  
**Prep Batch Number:** 569079  
**Dry Soil Prep GL-RAD-A-021 Batch Number:** 569078

<b>Sample ID</b>	<b>Client ID</b>
171772015	9530-0003-013F
171772016	9530-0003-014F
1201185572	Method Blank (MB)
1201185573	171772015(9530-0003-013F) Sample Duplicate (DUP)
1201185574	171772015(9530-0003-013F) Matrix Spike (MS)
1201185575	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: 171772015 (9530-0003-013F).

**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 1201185572 (MB) was recounted due to a negative result greater than three times the 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.

**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:	569531
Prep Batch Number:	569079
Dry Soil Prep GL-RAD-A-021 Batch Number:	569078

<b>Sample ID</b>	<b>Client ID</b>
171772015	9530-0003-013F
171772016	9530-0003-014F
1201185576	Method Blank (MB)
1201185577	171772015(9530-0003-013F) Sample Duplicate (DUP)
1201185578	171772015(9530-0003-013F) Matrix Spike (MS)
1201185579	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: 171772015 (9530-0003-013F).

##### **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:	573310
Prep Batch Number:	569079
Dry Soil Prep GL-RAD-A-021 Batch Number:	569078

<b>Sample ID</b>	<b>Client ID</b>
171772015	9530-0003-013F
171772016	9530-0003-014F
1201194062	Method Blank (MB)
1201194063	171772015(9530-0003-013F) Sample Duplicate (DUP)
1201194064	171772015(9530-0003-013F) Matrix Spike (MS)
1201194065	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 volume in this batch.

##### **Designated QC**

The following sample was used for QC: 171772015 (9530-0003-013F).

##### **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 reprepared due to low/high carrier/tracer yield..

#### **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>Gamma,Solid-FSS GAM &amp; ALL FSS 226 Ingrowth Waived</b>
Analytical Method:	EML HASL 300, 4.5.2.3
Prep Method:	Dry Soil Prep
Analytical Batch Number:	569469
Prep Batch Number:	569078

<b>Sample ID</b>	<b>Client ID</b>
171772001	9530-0003-001F
171772002	9530-0003-002F
171772003	9530-0003-003F
171772004	9530-0003-004F
171772005	9530-0003-004FS
171772006	9530-0003-005F
171772007	9530-0003-006F
171772008	9530-0003-006FS
171772009	9530-0003-007F
171772010	9530-0003-008F
171772011	9530-0003-009F
171772012	9530-0003-010F
171772013	9530-0003-011F
171772014	9530-0003-012F
171772015	9530-0003-013F
171772016	9530-0003-014F
171772017	9530-0003-015F
171772018	9530-0003-016F
1201185431	Method Blank (MB)
1201185432	171772001(9530-0003-001F) Sample Duplicate (DUP)
1201185433	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# 12.

**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: 171772001 (9530-0003-001F).

**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 171772001 (9530-0003-001F), 171772004 (9530-0003-004F), 171772005 (9530-0003-004FS), 171772006 (9530-0003-005F), 171772016 (9530-0003-014F), 171772017 (9530-0003-015F) and 171772018 (9530-0003-016F) were recounted due to high MDAs.

**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**

Qualifier	Reason	Analyte	Sample
UI	Data rejected due to interference.	Europium-155	171772004
			171772011
			171772013
			171772014
			171772015
		Manganese-54	171772011
UI	Data rejected due to low abundance.	Actinium-228	171772012
			1201185431
		Bismuth-214	171772012
			1201185431
		Cesium-134	171772005
			171772006
			171772008
			171772009
			171772010
			171772011
			171772013
			171772014
			171772015
			171772017
			1201185432
UI	Data rejected due to no valid peak.	Radium-226	1201185431

**Method/Analysis Information**

**Product:** GFPC, Sr90, solid-ALL FSS  
**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:** 569258  
**Prep Batch Number:** 569079  
**Dry Soil Prep GL-RAD-A-021 Batch Number:** 569078

Sample ID	Client ID
171772015	9530-0003-013F
171772016	9530-0003-014F
1201184955	Method Blank (MB)
1201184956	171772015(9530-0003-013F) Sample Duplicate (DUP)
1201184957	171772015(9530-0003-013F) Matrix Spike (MS)
1201184958	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 volumes in this batch.

##### **Designated QC**

The following sample was used for QC: 171772015 (9530-0003-013F).

##### **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**

The batch was recounted due to a high relative percent difference.

**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:** 569161

<b>Sample ID</b>	<b>Client ID</b>
171772015	9530-0003-013F
171772016	9530-0003-014F
1201184719	Method Blank (MB)
1201184720	171772015(9530-0003-013F) Sample Duplicate (DUP)
1201184721	171772015(9530-0003-013F) Matrix Spike (MS)
1201184722	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: 171772015 (9530-0003-013F).

**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 171772016 (9530-0003-014F) was recounted due to high MDA.

**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:	569145
Prep Batch Number:	569079
Dry Soil Prep GL-RAD-A-021 Batch Number:	569078

<b>Sample ID</b>	<b>Client ID</b>
171772015	9530-0003-013F
171772016	9530-0003-014F
1201184670	Method Blank (MB)
1201184671	171772016(9530-0003-014F) Sample Duplicate (DUP)
1201184672	171772016(9530-0003-014F) Matrix Spike (MS)
1201184673	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: 171772016 (9530-0003-014F).

##### **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:	569146
Prep Batch Number:	569079
Dry Soil Prep GL-RAD-A-021 Batch Number:	569078

<b>Sample ID</b>	<b>Client ID</b>
171772015	9530-0003-013F
171772016	9530-0003-014F
1201184674	Method Blank (MB)
1201184675	171772016(9530-0003-014F) Sample Duplicate (DUP)
1201184676	171772016(9530-0003-014F) Matrix Spike (MS)
1201184677	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: 171772016 (9530-0003-014F).

**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-HTD2,ALL FSS

**Analytical Method:** EPA 906.0 Modified

**Analytical Batch Number:** 569133

<b>Sample ID</b>	<b>Client ID</b>
171772015	9530-0003-013F
171772016	9530-0003-014F
1201184634	Method Blank (MB)
1201184635	171772015(9530-0003-013F) Sample Duplicate (DUP)
1201184636	171772015(9530-0003-013F) Matrix Spike (MS)
1201184637	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 volumes in this batch.

#### **Designated QC**

The following sample was used for QC: 171772015 (9530-0003-013F).

#### **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 1201184634 (MB), 1201184635 (9530-0003-013F), 171772015 (9530-0003-013F) and 171772016 (9530-0003-014F) were recounted due to high MDAs.

**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 C14, Solid All,FSS</b>
Analytical Method:	EPA EERF C-01 Modified
Analytical Batch Number:	572496

<b>Sample ID</b>	<b>Client ID</b>
171772015	9530-0003-013F
171772016	9530-0003-014F
1201192245	Method Blank (MB)
1201192246	171772015(9530-0003-013F) Sample Duplicate (DUP)
1201192247	171772015(9530-0003-013F) Matrix Spike (MS)
1201192248	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 volume in this batch.

**Designated QC**

The following sample was used for QC: 171772015 (9530-0003-013F).

**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 171772015 (9530-0003-013F) and 171772016 (9530-0003-014F) were reprepared due to low/high recovery.

**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**

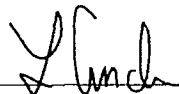
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**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:** \_\_\_\_\_

 10/3/06

# 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#06-1255 GEL Work Order: 171772

### 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: October 3, 2006

Client Sample ID: 9530-0003-001F  
Sample ID: 171772001  
Matrix: TS  
Collect Date: 12-SEP-06  
Receive Date: 15-SEP-06  
Collector: Client  
Moisture: 23.2%

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		1.00	+/-0.199	0.0629	+/-0.199	0.137	pCi/g		MJH1	09/27/06	1300	569469	1
Americium-241	U	0.0354	+/-0.071	0.0622	+/-0.071	0.128	pCi/g						
Bismuth-212		0.465	+/-0.287	0.171	+/-0.287	0.364	pCi/g						
Bismuth-214		0.531	+/-0.104	0.039	+/-0.104	0.0826	pCi/g						
Cesium-134	U	0.0412	+/-0.0379	0.0245	+/-0.0379	0.0522	pCi/g						
Cesium-137		0.141	+/-0.0362	0.0203	+/-0.0362	0.0433	pCi/g						
Cobalt-60	U	-3.370E-05	+/-0.0257	0.0216	+/-0.0257	0.0475	pCi/g						
Europium-152	U	0.0209	+/-0.0776	0.0593	+/-0.0776	0.124	pCi/g						
Europium-154	U	-0.0547	+/-0.0796	0.0622	+/-0.0796	0.136	pCi/g						
Europium-155	U	0.111	+/-0.0802	0.0548	+/-0.0802	0.113	pCi/g						
Lead-212		0.766	+/-0.0868	0.0316	+/-0.0868	0.0656	pCi/g						
Lead-214		0.545	+/-0.0993	0.0441	+/-0.0993	0.0919	pCi/g						
Manganese-54	U	-0.00902	+/-0.0261	0.0209	+/-0.0261	0.0447	pCi/g						
Niobium-94	U	-0.00508	+/-0.0217	0.0178	+/-0.0217	0.0379	pCi/g						
Potassium-40		15.0	+/-1.36	0.174	+/-1.36	0.391	pCi/g						
Radium-226		0.531	+/-0.104	0.039	+/-0.104	0.0826	pCi/g						
Silver-108m	U	-0.013	+/-0.0226	0.0186	+/-0.0226	0.0391	pCi/g						
Thallium-208		0.272	+/-0.0562	0.0204	+/-0.0562	0.0432	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	LXM1	09/15/06	1530	569078

### 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

# 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: October 3, 2006

Client Sample ID: 9530-0003-001F  
Sample ID: 171772001

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 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: October 3, 2006

Client Sample ID: 9530-0003-002F  
Sample ID: 171772002  
Matrix: TS  
Collect Date: 12-SEP-06  
Receive Date: 15-SEP-06  
Collector: Client  
Moisture: 18.4%

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		1.03	+/-0.262	0.0873	+/-0.262	0.202	pCi/g		MJH1	09/22/06	0822	569469	1
Americium-241	U	-0.0227	+/-0.0503	0.0428	+/-0.0503	0.0894	pCi/g						
Bismuth-212	U	0.439	+/-0.549	0.231	+/-0.549	0.514	pCi/g						
Bismuth-214		0.764	+/-0.164	0.0574	+/-0.164	0.126	pCi/g						
Cesium-134	U	0.0205	+/-0.0567	0.0481	+/-0.0567	0.104	pCi/g						
Cesium-137		0.326	+/-0.0926	0.0323	+/-0.0926	0.0712	pCi/g						
Cobalt-60	U	0.00301	+/-0.0498	0.0418	+/-0.0498	0.0942	pCi/g						
Europium-152	U	-0.0163	+/-0.0943	0.0803	+/-0.0943	0.172	pCi/g						
Europium-154	U	-0.0746	+/-0.137	0.105	+/-0.137	0.238	pCi/g						
Europium-155	U	0.0756	+/-0.0874	0.0779	+/-0.0874	0.163	pCi/g						
Lead-212		0.766	+/-0.0981	0.0465	+/-0.0981	0.098	pCi/g						
Lead-214		0.550	+/-0.136	0.0605	+/-0.136	0.129	pCi/g						
Manganese-54	U	0.000407	+/-0.0544	0.0387	+/-0.0544	0.0845	pCi/g						
Niobium-94	U	-0.00308	+/-0.0377	0.0308	+/-0.0377	0.0675	pCi/g						
Potassium-40		13.6	+/-1.64	0.297	+/-1.64	0.701	pCi/g						
Radium-226		0.764	+/-0.164	0.0574	+/-0.164	0.126	pCi/g						
Silver-108m	U	-0.0291	+/-0.0339	0.0265	+/-0.0339	0.0577	pCi/g						
Thallium-208		0.354	+/-0.0715	0.0337	+/-0.0715	0.0734	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	LXM1	09/15/06	1530	569078

### 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: October 3, 2006

Client Sample ID: 9530-0003-002F

Sample ID: 171772002

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: October 3, 2006

Client Sample ID: 9530-0003-003F  
Sample ID: 171772003  
Matrix: TS  
Collect Date: 12-SEP-06  
Receive Date: 15-SEP-06  
Collector: Client  
Moisture: 34.2%

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		1.31	+/-0.294	0.113	+/-0.294	0.251	pCi/g		MJH1	09/22/06	1007	569469	1
Americium-241	U	0.021	+/-0.0507	0.0443	+/-0.0507	0.0918	pCi/g						
Bismuth-212	U	0.503	+/-0.584	0.252	+/-0.584	0.549	pCi/g						
Bismuth-214		0.897	+/-0.148	0.0557	+/-0.148	0.121	pCi/g						
Cesium-134	U	0.0512	+/-0.0531	0.0402	+/-0.0531	0.0873	pCi/g						
Cesium-137		0.283	+/-0.0918	0.0304	+/-0.0918	0.0667	pCi/g						
Cobalt-60	U	0.00468	+/-0.0366	0.0308	+/-0.0366	0.0708	pCi/g						
Europium-152	U	0.0296	+/-0.0847	0.0742	+/-0.0847	0.159	pCi/g						
Europium-154	U	-0.0443	+/-0.115	0.0888	+/-0.115	0.203	pCi/g						
Europium-155	U	0.0278	+/-0.0842	0.072	+/-0.0842	0.150	pCi/g						
Lead-212		1.19	+/-0.113	0.044	+/-0.113	0.0926	pCi/g						
Lead-214		0.952	+/-0.171	0.0549	+/-0.171	0.117	pCi/g						
Manganese-54	U	-0.00228	+/-0.0362	0.0306	+/-0.0362	0.0674	pCi/g						
Niobium-94	U	0.00389	+/-0.0366	0.0302	+/-0.0366	0.0656	pCi/g						
Potassium-40		15.9	+/-1.64	0.363	+/-1.64	0.819	pCi/g						
Radium-226		0.897	+/-0.148	0.0557	+/-0.148	0.121	pCi/g						
Silver-108m	U	0.0254	+/-0.0316	0.0285	+/-0.0316	0.061	pCi/g						
Thallium-208		0.368	+/-0.0746	0.032	+/-0.0746	0.0693	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	LXM1	09/15/06	1530	569078

### 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: October 3, 2006

Client Sample ID: 9530-0003-003F  
Sample ID: 171772003

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: October 3, 2006

Client Sample ID: 9530-0003-004F  
Sample ID: 171772004  
Matrix: TS  
Collect Date: 12-SEP-06  
Receive Date: 15-SEP-06  
Collector: Client  
Moisture: 37.3%

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		1.56	+/-0.297	0.0845	+/-0.297	0.182	pCi/g						
Americium-241	U	-0.0256	+/-0.0908	0.069	+/-0.0908	0.143	pCi/g						
Bismuth-212	U	0.268	+/-0.418	0.198	+/-0.418	0.421	pCi/g						
Bismuth-214		0.861	+/-0.159	0.0437	+/-0.159	0.0927	pCi/g						
Cesium-134	U	0.0649	+/-0.0451	0.0333	+/-0.0451	0.0703	pCi/g						
Cesium-137		0.309	+/-0.0611	0.0277	+/-0.0611	0.0584	pCi/g						
Cobalt-60	U	0.0236	+/-0.0351	0.0311	+/-0.0351	0.0672	pCi/g						
Europium-152	U	0.0479	+/-0.0748	0.062	+/-0.0748	0.130	pCi/g						
Europium-154	U	-0.0644	+/-0.0904	0.0698	+/-0.0904	0.153	pCi/g						
Europium-155	UI	0.00	+/-0.119	0.0567	+/-0.119	0.118	pCi/g						
Lead-212		1.52	+/-0.149	0.0314	+/-0.149	0.0655	pCi/g						
Lead-214		1.23	+/-0.171	0.0399	+/-0.171	0.084	pCi/g						
Manganese-54	U	0.0389	+/-0.0359	0.0222	+/-0.0359	0.0478	pCi/g						
Niobium-94	U	0.0259	+/-0.0273	0.0239	+/-0.0273	0.0507	pCi/g						
Potassium-40		24.4	+/-2.08	0.200	+/-2.08	0.450	pCi/g						
Radium-226		0.861	+/-0.159	0.0437	+/-0.159	0.0927	pCi/g						
Silver-108m	U	-0.0186	+/-0.0269	0.0201	+/-0.0269	0.0425	pCi/g						
Thallium-208		0.427	+/-0.0809	0.0237	+/-0.0809	0.0503	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	LXMI	09/15/06	1530	569078

### The following Analytical Methods were performed

Method	Description
I	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: October 3, 2006

Client Sample ID: 9530-0003-004F  
Sample ID: 171772004

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: October 3, 2006

Client Sample ID: 9530-0003-004FS  
Sample ID: 171772005  
Matrix: TS  
Collect Date: 12-SEP-06  
Receive Date: 15-SEP-06  
Collector: Client  
Moisture: 37.6%

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		1.57	+/-0.318	0.0851	+/-0.318	0.183	pCi/g		MJH1	09/27/06	1301	569469	1
Americium-241	U	-0.0262	+/-0.0823	0.066	+/-0.0823	0.136	pCi/g						
Bismuth-212		0.919	+/-0.411	0.265	+/-0.411	0.554	pCi/g						
Bismuth-214		0.951	+/-0.164	0.0557	+/-0.164	0.117	pCi/g						
Cesium-134	UI	0.00	+/-0.0814	0.037	+/-0.0814	0.0777	pCi/g						
Cesium-137		0.311	+/-0.0725	0.0271	+/-0.0725	0.0573	pCi/g						
Cobalt-60	U	0.00424	+/-0.0302	0.0224	+/-0.0302	0.0497	pCi/g						
Europium-152	U	-0.0525	+/-0.0822	0.0667	+/-0.0822	0.139	pCi/g						
Europium-154	U	0.0495	+/-0.0944	0.0828	+/-0.0944	0.179	pCi/g						
Europium-155	U	0.065	+/-0.119	0.0698	+/-0.119	0.144	pCi/g						
Lead-212		1.50	+/-0.155	0.0389	+/-0.155	0.0804	pCi/g						
Lead-214		1.17	+/-0.167	0.0497	+/-0.167	0.104	pCi/g						
Manganese-54	U	-0.0192	+/-0.0341	0.0263	+/-0.0341	0.0559	pCi/g						
Niobium-94	U	0.0174	+/-0.0312	0.0263	+/-0.0312	0.0553	pCi/g						
Potassium-40		24.9	+/-1.99	0.248	+/-1.99	0.545	pCi/g						
Radium-226		0.951	+/-0.164	0.0557	+/-0.164	0.117	pCi/g						
Silver-108m	U	0.00734	+/-0.0374	0.0242	+/-0.0374	0.0506	pCi/g						
Thallium-208		0.467	+/-0.0801	0.0245	+/-0.0801	0.0519	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	LXM1	09/15/06	1530	569078

### 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: October 3, 2006

Client Sample ID: 9530-0003-004FS  
Sample ID: 171772005

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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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: October 3, 2006

Client Sample ID: 9530-0003-005F  
Sample ID: 171772006  
Matrix: TS  
Collect Date: 12-SEP-06  
Receive Date: 15-SEP-06  
Collector: Client  
Moisture: 41.2%

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		1.56	+/-0.344	0.121	+/-0.344	0.243	pCi/g		MJH1	09/27/06	1317	569469	1
Americium-241	U	0.0225	+/-0.0546	0.0382	+/-0.0546	0.0763	pCi/g						
Bismuth-212		1.13	+/-0.510	0.292	+/-0.510	0.584	pCi/g						
Bismuth-214		1.11	+/-0.190	0.0575	+/-0.190	0.115	pCi/g						
Cesium-134	UI	0.00	+/-0.0901	0.043	+/-0.0901	0.0859	pCi/g						
Cesium-137		0.487	+/-0.0973	0.0325	+/-0.0973	0.0649	pCi/g						
Cobalt-60	U	-0.07	+/-0.0493	0.0344	+/-0.0493	0.0687	pCi/g						
Europium-152	U	-0.00677	+/-0.114	0.0754	+/-0.114	0.151	pCi/g						
Europium-154	U	-0.0501	+/-0.141	0.111	+/-0.141	0.222	pCi/g						
Europium-155	U	0.021	+/-0.0931	0.0616	+/-0.0931	0.123	pCi/g						
Lead-212		1.56	+/-0.165	0.0393	+/-0.165	0.0785	pCi/g						
Lead-214		1.07	+/-0.167	0.0536	+/-0.167	0.107	pCi/g						
Manganese-54	U	0.0454	+/-0.0403	0.0344	+/-0.0403	0.0687	pCi/g						
Niobium-94	U	0.00204	+/-0.0377	0.0314	+/-0.0377	0.0628	pCi/g						
Potassium-40		25.7	+/-1.72	0.263	+/-1.72	0.525	pCi/g						
Radium-226		1.11	+/-0.190	0.0575	+/-0.190	0.115	pCi/g						
Silver-108m	U	-0.0102	+/-0.0381	0.0261	+/-0.0381	0.0521	pCi/g						
Thallium-208		0.586	+/-0.0997	0.0312	+/-0.0997	0.0623	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	LXM1	09/15/06	1530	569078

### 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: October 3, 2006

Client Sample ID: 9530-0003-005F  
Sample ID: 171772006

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: October 3, 2006

Client Sample ID: 9530-0003-006F  
Sample ID: 171772007  
Matrix: TS  
Collect Date: 12-SEP-06  
Receive Date: 15-SEP-06  
Collector: Client  
Moisture: 6.63%

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		0.494	+/-0.0975	0.0418	+/-0.0975	0.0887	pCi/g						
Americium-241	U	0.0088	+/-0.0174	0.0167	+/-0.0174	0.0341	pCi/g						
Bismuth-212		0.258	+/-0.188	0.095	+/-0.188	0.200	pCi/g						
Bismuth-214		0.413	+/-0.0516	0.0231	+/-0.0516	0.0483	pCi/g						
Cesium-134	U	0.0291	+/-0.0242	0.016	+/-0.0242	0.0334	pCi/g						
Cesium-137		0.0957	+/-0.0327	0.0123	+/-0.0327	0.0258	pCi/g						
Cobalt-60	U	0.00364	+/-0.0147	0.0126	+/-0.0147	0.0272	pCi/g						
Europium-152	U	-0.0176	+/-0.0326	0.0286	+/-0.0326	0.0595	pCi/g						
Europium-154	U	-0.000325	+/-0.0451	0.0381	+/-0.0451	0.0815	pCi/g						
Europium-155	U	0.022	+/-0.0444	0.0283	+/-0.0444	0.0581	pCi/g						
Lead-212		0.485	+/-0.0377	0.0165	+/-0.0377	0.0341	pCi/g						
Lead-214		0.395	+/-0.052	0.0214	+/-0.052	0.0444	pCi/g						
Manganese-54	U	0.0144	+/-0.0201	0.0112	+/-0.0201	0.0238	pCi/g						
Niobium-94	U	0.0119	+/-0.0131	0.0117	+/-0.0131	0.0246	pCi/g						
Potassium-40		11.1	+/-0.634	0.127	+/-0.634	0.273	pCi/g						
Radium-226		0.413	+/-0.0516	0.0231	+/-0.0516	0.0483	pCi/g						
Silver-108m	U	0.00401	+/-0.0118	0.0106	+/-0.0118	0.0221	pCi/g						
Thallium-208		0.148	+/-0.0308	0.0119	+/-0.0308	0.0249	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	LXM1	09/15/06	1530	569078

### 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: October 3, 2006

Client Sample ID: 9530-0003-006F  
Sample ID: 171772007

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: October 3, 2006

Client Sample ID: 9530-0003-006FS  
Sample ID: 171772008  
Matrix: TS  
Collect Date: 12-SEP-06  
Receive Date: 15-SEP-06  
Collector: Client  
Moisture: 6.72%

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		0.502	+/-0.139	0.0497	+/-0.139	0.105	pCi/g		MJH1	09/22/06	1826	569469	1
Americium-241	U	0.00606	+/-0.0222	0.0202	+/-0.0222	0.0413	pCi/g						
Bismuth-212	U	0.145	+/-0.218	0.126	+/-0.218	0.261	pCi/g						
Bismuth-214		0.339	+/-0.0713	0.0283	+/-0.0713	0.0587	pCi/g						
Cesium-134	UI	0.00	+/-0.0256	0.0179	+/-0.0256	0.0373	pCi/g						
Cesium-137		0.0947	+/-0.0286	0.0163	+/-0.0286	0.034	pCi/g						
Cobalt-60	U	-0.000735	+/-0.0182	0.0153	+/-0.0182	0.0325	pCi/g						
Europium-152	U	-0.0201	+/-0.040	0.0336	+/-0.040	0.0696	pCi/g						
Europium-154	U	0.0304	+/-0.0526	0.0463	+/-0.0526	0.0978	pCi/g						
Europium-155	U	0.0246	+/-0.0362	0.032	+/-0.0362	0.0655	pCi/g						
Lead-212		0.370	+/-0.0478	0.0244	+/-0.0478	0.0498	pCi/g						
Lead-214		0.375	+/-0.0679	0.0249	+/-0.0679	0.0516	pCi/g						
Manganese-54	U	-0.0152	+/-0.0184	0.0147	+/-0.0184	0.0307	pCi/g						
Niobium-94	U	0.0172	+/-0.0169	0.0152	+/-0.0169	0.0314	pCi/g						
Potassium-40		11.2	+/-0.641	0.129	+/-0.641	0.277	pCi/g						
Radium-226		0.339	+/-0.0713	0.0283	+/-0.0713	0.0587	pCi/g						
Silver-108m	U	0.00459	+/-0.0137	0.0126	+/-0.0137	0.026	pCi/g						
Thallium-208		0.161	+/-0.0404	0.0142	+/-0.0404	0.0296	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	LXM1	09/15/06	1530	569078

### 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: October 3, 2006

Client Sample ID: 9530-0003-006FS  
Sample ID: 171772008

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.
  - U1 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: October 3, 2006

Client Sample ID: 9530-0003-007F  
Sample ID: 171772009  
Matrix: TS  
Collect Date: 12-SEP-06  
Receive Date: 15-SEP-06  
Collector: Client  
Moisture: 4.71%

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		0.520	+/-0.0844	0.0294	+/-0.0844	0.0617	pCi/g		MJH1	09/22/06	1826	569469	1
Americium-241	U	0.00503	+/-0.0573	0.0503	+/-0.0573	0.103	pCi/g						
Bismuth-212		0.227	+/-0.116	0.0668	+/-0.116	0.139	pCi/g						
Bismuth-214		0.362	+/-0.0532	0.0165	+/-0.0532	0.0343	pCi/g						
Cesium-134	UI	0.00	+/-0.0174	0.011	+/-0.0174	0.0228	pCi/g						
Cesium-137		0.057	+/-0.0155	0.00945	+/-0.0155	0.0196	pCi/g						
Cobalt-60	U	0.00905	+/-0.0181	0.00995	+/-0.0181	0.021	pCi/g						
Europium-152	U	0.000663	+/-0.0254	0.0229	+/-0.0254	0.0474	pCi/g						
Europium-154	U	-0.0346	+/-0.0308	0.0247	+/-0.0308	0.0525	pCi/g						
Europium-155	U	0.028	+/-0.0314	0.0299	+/-0.0314	0.0613	pCi/g						
Lead-212		0.502	+/-0.0311	0.0138	+/-0.0311	0.0283	pCi/g						
Lead-214		0.402	+/-0.044	0.0154	+/-0.044	0.032	pCi/g						
Manganese-54	U	0.0139	+/-0.0119	0.00783	+/-0.0119	0.0164	pCi/g						
Niobium-94	U	0.00226	+/-0.00891	0.00799	+/-0.00891	0.0166	pCi/g						
Potassium-40		12.5	+/-0.500	0.0834	+/-0.500	0.178	pCi/g						
Radium-226		0.362	+/-0.0532	0.0165	+/-0.0532	0.0343	pCi/g						
Silver-108m	U-0.000607		+/-0.00859	0.00756	+/-0.00859	0.0157	pCi/g						
Thallium-208		0.143	+/-0.0256	0.00795	+/-0.0256	0.0166	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	LXM1	09/15/06	1530	569078

### The following Analytical Methods were performed

Method	Description
I	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: October 3, 2006

Client Sample ID: 9530-0003-007F  
Sample ID: 171772009

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: October 3, 2006

Client Sample ID: 9530-0003-008F  
Sample ID: 171772010  
Matrix: TS  
Collect Date: 12-SEP-06  
Receive Date: 15-SEP-06  
Collector: Client  
Moisture: 35.6%

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		1.28	+/-0.150	0.0465	+/-0.150	0.0976	pCi/g		MJH	09/22/06	1827	569469	1
Americium-241	U	-0.0448	+/-0.0654	0.0538	+/-0.0654	0.110	pCi/g						
Bismuth-212		0.865	+/-0.244	0.0967	+/-0.244	0.203	pCi/g						
Bismuth-214		0.777	+/-0.0788	0.0291	+/-0.0788	0.0603	pCi/g						
Cesium-134	UI	0.00	+/-0.0281	0.0182	+/-0.0281	0.0377	pCi/g						
Cesium-137		0.289	+/-0.0386	0.0138	+/-0.0386	0.0288	pCi/g						
Cobalt-60	U	-0.000164	+/-0.018	0.0146	+/-0.018	0.0309	pCi/g						
Europium-152	U	0.00156	+/-0.0443	0.0371	+/-0.0443	0.0766	pCi/g						
Europium-154	U	-0.0147	+/-0.0539	0.0431	+/-0.0539	0.0909	pCi/g						
Europium-155	U	0.0509	+/-0.0547	0.0461	+/-0.0547	0.0941	pCi/g						
Lead-212		1.28	+/-0.0639	0.0213	+/-0.0639	0.0437	pCi/g						
Lead-214		0.900	+/-0.0761	0.0255	+/-0.0761	0.0526	pCi/g						
Manganese-54	U	0.0205	+/-0.0208	0.014	+/-0.0208	0.0292	pCi/g						
Niobium-94	U	0.00113	+/-0.0161	0.0137	+/-0.0161	0.0284	pCi/g						
Potassium-40		20.1	+/-0.774	0.107	+/-0.774	0.232	pCi/g						
Radium-226		0.777	+/-0.0788	0.0291	+/-0.0788	0.0603	pCi/g						
Silver-108m	U	0.00182	+/-0.0152	0.0126	+/-0.0152	0.0262	pCi/g						
Thallium-208		0.348	+/-0.0449	0.0142	+/-0.0449	0.0296	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	LXM1	09/15/06	1530	569078

### 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: October 3, 2006

Client Sample ID: 9530-0003-008F  
Sample ID: 171772010

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: October 3, 2006

Client Sample ID: 9530-0003-009F  
Sample ID: 171772011  
Matrix: TS  
Collect Date: 12-SEP-06  
Receive Date: 15-SEP-06  
Collector: Client  
Moisture: 42.4%

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		1.30	+/-0.331	0.113	+/-0.331	0.225	pCi/g						
Americium-241	U	0.0636	+/-0.0573	0.0383	+/-0.0573	0.0766	pCi/g						
Bismuth-212		1.01	+/-0.483	0.248	+/-0.483	0.496	pCi/g						
Bismuth-214		0.983	+/-0.161	0.0595	+/-0.161	0.119	pCi/g						
Cesium-134	UI	0.00	+/-0.0632	0.0414	+/-0.0632	0.0827	pCi/g						
Cesium-137		0.395	+/-0.0783	0.0364	+/-0.0783	0.0727	pCi/g						
Cobalt-60	U	-0.0288	+/-0.0476	0.0364	+/-0.0476	0.0728	pCi/g						
Europium-152	U	0.0338	+/-0.125	0.071	+/-0.125	0.142	pCi/g						
Europium-154	U	-0.0177	+/-0.146	0.118	+/-0.146	0.235	pCi/g						
Europium-155	UI	0.00	+/-0.105	0.0581	+/-0.105	0.116	pCi/g						
Lead-212		1.50	+/-0.157	0.0355	+/-0.157	0.071	pCi/g						
Lead-214		1.19	+/-0.171	0.0509	+/-0.171	0.102	pCi/g						
Manganese-54	UI	0.00	+/-0.051	0.0333	+/-0.051	0.0665	pCi/g						
Niobium-94	U	0.00922	+/-0.035	0.0295	+/-0.035	0.059	pCi/g						
Potassium-40		25.6	+/-1.73	0.337	+/-1.73	0.674	pCi/g						
Radium-226		0.983	+/-0.161	0.0595	+/-0.161	0.119	pCi/g						
Silver-108m	U	-0.0361	+/-0.0342	0.0261	+/-0.0342	0.0522	pCi/g						
Thallium-208		0.539	+/-0.094	0.0272	+/-0.094	0.0544	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	LXM1	09/15/06	1530	569078

### 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: October 3, 2006

Client Sample ID: 9530-0003-009F  
Sample ID: 171772011

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: October 3, 2006

Client Sample ID: 9530-0003-010F  
Sample ID: 171772012  
Matrix: TS  
Collect Date: 12-SEP-06  
Receive Date: 15-SEP-06  
Collector: Client  
Moisture: 29.3%

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	UI	0.00	+/-0.347	0.283	+/-0.347	0.566	pCi/g		MJH1	09/23/06	1423	569469	1
Americium-241	U	0.00686	+/-0.0668	0.0489	+/-0.0668	0.0977	pCi/g						
Bismuth-212		1.42	+/-0.702	0.287	+/-0.702	0.574	pCi/g						
Bismuth-214	UI	0.00	+/-0.214	0.159	+/-0.214	0.318	pCi/g						
Cesium-134	U	0.0404	+/-0.0542	0.0493	+/-0.0542	0.0986	pCi/g						
Cesium-137		0.287	+/-0.0826	0.0417	+/-0.0826	0.0833	pCi/g						
Cobalt-60	U	0.046	+/-0.0581	0.0535	+/-0.0581	0.107	pCi/g						
Europium-152	U	-0.0499	+/-0.134	0.0932	+/-0.134	0.186	pCi/g						
Europium-154	U	-0.0079	+/-0.148	0.120	+/-0.148	0.240	pCi/g						
Europium-155	U	0.131	+/-0.097	0.0834	+/-0.097	0.167	pCi/g						
Lead-212		1.10	+/-0.154	0.0488	+/-0.154	0.0975	pCi/g						
Lead-214		0.695	+/-0.164	0.0713	+/-0.164	0.143	pCi/g						
Manganese-54	U	-0.0231	+/-0.0515	0.0411	+/-0.0515	0.0821	pCi/g						
Niobium-94	U	0.00586	+/-0.0455	0.0391	+/-0.0455	0.0781	pCi/g						
Potassium-40		16.3	+/-1.90	0.153	+/-1.90	0.307	pCi/g						
Radium-226		0.759	+/-0.214	0.0701	+/-0.214	0.140	pCi/g						
Silver-108m	U	0.00115	+/-0.0381	0.0316	+/-0.0381	0.0631	pCi/g						
Thallium-208		0.338	+/-0.099	0.0335	+/-0.099	0.0671	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	LXM1	09/15/06	1530	569078

### 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

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Address : 362 Injun Hollow Rd

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

Report Date: October 3, 2006

Client Sample ID: 9530-0003-010F  
Sample ID: 171772012

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: October 3, 2006

Client Sample ID: 9530-0003-011F  
Sample ID: 171772013  
Matrix: TS  
Collect Date: 12-SEP-06  
Receive Date: 15-SEP-06  
Collector: Client  
Moisture: 30.7%

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		0.998	+/-0.109	0.0362	+/-0.109	0.075	pCi/g						
Americium-241	U	0.00879	+/-0.0156	0.0137	+/-0.0156	0.0278	pCi/g						
Bismuth-212		0.604	+/-0.161	0.081	+/-0.161	0.167	pCi/g						
Bismuth-214		0.753	+/-0.0574	0.0187	+/-0.0574	0.0384	pCi/g						
Cesium-134	UI	0.00	+/-0.0203	0.0139	+/-0.0203	0.0284	pCi/g						
Cesium-137		0.227	+/-0.0234	0.0109	+/-0.0234	0.0224	pCi/g						
Cobalt-60	U	0.0132	+/-0.0129	0.0112	+/-0.0129	0.0235	pCi/g						
Europium-152	U	0.017	+/-0.0372	0.0255	+/-0.0372	0.0522	pCi/g						
Europium-154	U	0.000298	+/-0.0406	0.0336	+/-0.0406	0.070	pCi/g						
Europium-155	UI	0.00	+/-0.0401	0.0222	+/-0.0401	0.0451	pCi/g						
Lead-212		1.02	+/-0.0372	0.0138	+/-0.0372	0.0282	pCi/g						
Lead-214		0.705	+/-0.0587	0.0191	+/-0.0587	0.0389	pCi/g						
Manganese-54	U	0.017	+/-0.0151	0.0102	+/-0.0151	0.021	pCi/g						
Niobium-94	U	0.0012	+/-0.0121	0.00999	+/-0.0121	0.0206	pCi/g						
Potassium-40		15.0	+/-0.553	0.0885	+/-0.553	0.187	pCi/g						
Radium-226		0.753	+/-0.0574	0.0187	+/-0.0574	0.0384	pCi/g						
Silver-108m	U	-0.00615	+/-0.0106	0.00879	+/-0.0106	0.018	pCi/g						
Thallium-208		0.351	+/-0.031	0.00992	+/-0.031	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	LXM1	09/15/06	1530	569078

### The following Analytical Methods were performed

Method	Description
I	EML HASL 300.4.5.2.3

### Notes:

The Qualifiers in this report are defined as follows :

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## Certificate of Analysis

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Address : 362 Injun Hollow Rd

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

Report Date: October 3, 2006

Client Sample ID: 9530-0003-011F  
Sample ID: 171772013

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

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Contact: Mr. Jack McCarthy

Project: Soils PO# 002332

Report Date: October 3, 2006

Client Sample ID: 9530-0003-012F

Sample ID: 171772014

Matrix: TS

Collect Date: 12-SEP-06

Receive Date: 15-SEP-06

Collector: Client

Moisture: 36.1%

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		1.20	+/-0.0875	0.0271	+/-0.0875	0.0559	pCi/g		MJH1	09/24/06	1115	569469	1
Americium-241	U	-0.0412	+/-0.0648	0.0464	+/-0.0648	0.0941	pCi/g						
Bismuth-212		0.890	+/-0.151	0.0606	+/-0.151	0.124	pCi/g						
Bismuth-214		0.711	+/-0.0555	0.0157	+/-0.0555	0.0322	pCi/g						
Cesium-134	UI	0.00	+/-0.0212	0.011	+/-0.0212	0.0226	pCi/g						
Cesium-137		0.319	+/-0.023	0.00845	+/-0.023	0.0173	pCi/g						
Cobalt-60	U	0.00637	+/-0.0102	0.00884	+/-0.0102	0.0183	pCi/g						
Europium-152	U	-0.0168	+/-0.0261	0.0219	+/-0.0261	0.0447	pCi/g						
Europium-154	U	0.00798	+/-0.032	0.0274	+/-0.032	0.0564	pCi/g						
Europium-155	UI	0.00	+/-0.0498	0.0267	+/-0.0498	0.0541	pCi/g						
Lead-212		1.25	+/-0.0367	0.0125	+/-0.0367	0.0254	pCi/g						
Lead-214		0.929	+/-0.0476	0.0151	+/-0.0476	0.0309	pCi/g						
Manganese-54	U	0.0167	+/-0.0186	0.00858	+/-0.0186	0.0176	pCi/g						
Niobium-94	U	0.0108	+/-0.00913	0.00802	+/-0.00913	0.0164	pCi/g						
Potassium-40		20.9	+/-0.498	0.0695	+/-0.498	0.145	pCi/g						
Radium-226		0.711	+/-0.0555	0.0157	+/-0.0555	0.0322	pCi/g						
Silver-108m	U	0.00453	+/-0.0088	0.00748	+/-0.0088	0.0153	pCi/g						
Thallium-208		0.392	+/-0.0288	0.00773	+/-0.0288	0.0158	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	LXM1	09/15/06	1530	569078

### 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: October 3, 2006

Client Sample ID: 9530-0003-012F  
Sample ID: 171772014

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time Batch	Mtd
-----------	-----------	--------	-------------	----	-----	-----	-------	----	---------	------	------------	-----

- > 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: October 3, 2006

Client Sample ID: 9530-0003-013F  
Sample ID: 171772015  
Matrix: TS  
Collect Date: 12-SEP-06  
Receive Date: 15-SEP-06  
Collector: Client  
Moisture: 26.7%

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	-0.000541	+/-0.129	0.109	+/-0.129	0.309	pCi/g		BXL1	09/28/06	0936	569530	1
Curium-242	U	-0.0173	+/-0.0747	0.0458	+/-0.0747	0.189	pCi/g						
Curium-243/244	U	-0.0175	+/-0.166	0.145	+/-0.166	0.381	pCi/g						
<i>Alphaspec Pu. Solid-ALL FSS</i>													
Plutonium-238		0.025	+/-0.0663	0.0295	+/-0.0664	0.148	pCi/g		BXL1	09/28/06	0936	569531	2
Plutonium-239/240		-0.0158	+/-0.0681	0.0417	+/-0.0681	0.173	pCi/g						
<i>Liquid Scint Pu241, Solid-ALL FSS</i>													
Plutonium-241	U	4.46	+/-9.11	7.45	+/-9.12	15.6	pCi/g		DDR1	10/03/06	0858	573310	3
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.662	+/-0.0686	0.0211	+/-0.0686	0.0434	pCi/g		MJH1	09/24/06	1116	569469	5
Americium-241	U	-0.0011	+/-0.0272	0.0243	+/-0.0272	0.0492	pCi/g						
Bismuth-212		0.508	+/-0.110	0.0431	+/-0.110	0.0887	pCi/g						
Bismuth-214		0.426	+/-0.038	0.0118	+/-0.038	0.0241	pCi/g						
Cesium-134	UI	0.00	+/-0.0148	0.00811	+/-0.0148	0.0166	pCi/g						
Cesium-137		0.227	+/-0.0165	0.00603	+/-0.0165	0.0124	pCi/g						
Cobalt-60	U	0.00368	+/-0.00741	0.00623	+/-0.00741	0.0129	pCi/g						
Europium-152	U	0.0101	+/-0.019	0.0166	+/-0.019	0.0339	pCi/g						
Europium-154	U	-0.0158	+/-0.0224	0.0179	+/-0.0224	0.0371	pCi/g						
Europium-155	UI	0.00	+/-0.0301	0.0191	+/-0.0301	0.0387	pCi/g						
Lead-212		0.666	+/-0.0279	0.00939	+/-0.0279	0.0191	pCi/g						
Lead-214		0.469	+/-0.0353	0.0114	+/-0.0353	0.0233	pCi/g						
Manganese-54	U	0.00388	+/-0.0109	0.00589	+/-0.0109	0.0121	pCi/g						
Niobium-94	U	0.00201	+/-0.00644	0.00564	+/-0.00644	0.0116	pCi/g						
Potassium-40		14.9	+/-0.376	0.0472	+/-0.376	0.0988	pCi/g						
Radium-226		0.426	+/-0.038	0.0118	+/-0.038	0.0241	pCi/g						
Silver-108m	U	0.0103	+/-0.00632	0.00562	+/-0.00632	0.0115	pCi/g						
Thallium-208		0.208	+/-0.0193	0.00584	+/-0.0193	0.012	pCi/g						
<b>Rad Gas Flow Proportional Counting</b>													
<i>GFPC, Sr90, solid-ALL FSS</i>													
Strontium-90	U	0.007	+/-0.0247	0.0203	+/-0.0247	0.0435	pCi/g		KSD1	09/28/06	1949	569258	6
<b>Rad Liquid Scintillation Analysis</b>													
<i>LSC, Tritium Dist, Solid-HTD2.ALL FSS</i>													
Tritium	U	-6.64	+/-7.74	6.87	+/-7.74	14.6	pCi/g		ATH2	09/28/06	1001	569133	8

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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: October 3, 2006

Client Sample ID: 9530-0003-013F  
Sample ID: 171772015

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>													
<i>Liquid Scint C14, Solid All FSS</i> Carbon-14	U	-0.0273	+/-0.0774	0.0653	+/-0.0774	0.133	pCi/g		AXD2	09/28/06	0325	572496	10
<i>Liquid Scint Fe55, Solid-ALL FSS</i> Iron-55	U	-1.57	+/-37.6	26.6	+/-37.6	55.7	pCi/g		MXPI	09/22/06	0523	569145	12
<i>Liquid Scint Ni63, Solid-ALL FSS</i> Nickel-63	U	1.66	+/-7.81	6.51	+/-7.81	13.4	pCi/g		MXPI	09/24/06	1912	569146	13
<i>Liquid Scint Tc99, Solid-ALL FSS</i> Technetium-99	U	0.189	+/-0.275	0.226	+/-0.275	0.466	pCi/g		KXR1	09/24/06	1525	569161	14

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM1	09/15/06	1530	569078

### 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 905.0 Modified
8	EPA 906.0 Modified
9	EPA 906.0 Modified
10	EPA EERF C-01 Modified
11	EPA EERF C-01 Modified
12	DOE RESL Fe-1, Modified
13	DOE RESL Ni-1, Modified
14	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	76	(15%-125%)
Carrier/Tracer Recovery	Liquid Scint Pu241, Solid-ALL FS	74	(25%-125%)

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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: October 3, 2006

Client Sample ID: 9530-0003-013F  
Sample ID: 171772015

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time Batch	Mtd
Carrier/Tracer Recovery	GFPC, Sr90. solid-ALL FSS				68		(25%-125%)					
Carrier/Tracer Recovery	Liquid Scint Fe55, Solid-ALL FS				59		(15%-125%)					
Carrier/Tracer Recovery	Liquid Scint Ni63, Solid-ALL FS				59		(25%-125%)					
Carrier/Tracer Recovery	Liquid Scint Tc99, Solid-ALL FS				77		(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: October 3, 2006

Client Sample ID: 9530-0003-014F  
Sample ID: 171772016  
Matrix: TS  
Collect Date: 12-SEP-06  
Receive Date: 15-SEP-06  
Collector: Client  
Moisture: 5.75%

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	0.0692	+/-0.210	0.145	+/-0.210	0.435	pCi/g	BXL1	09/28/06	0936	569530	1	
Curium-242	U	-0.0115	+/-0.128	0.116	+/-0.128	0.388	pCi/g						
Curium-243/244	U	-7.700E-08	+/-0.288	0.242	+/-0.288	0.629	pCi/g						
<i>Alphaspec Pu, Solid-ALL FSS</i>													
Plutonium-238		-0.024	+/-0.0706	0.0517	+/-0.0706	0.194	pCi/g	BXL1	09/28/06	0936	569531	2	
Plutonium-239/240		0.0173	+/-0.0688	0.0422	+/-0.0689	0.175	pCi/g						
<i>Liquid Scint Pu241, Solid-ALL FSS</i>													
Plutonium-241	U	6.00	+/-8.55	6.91	+/-8.57	14.5	pCi/g	DDR1	10/03/06	0914	573310	3	
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth Waived</i>													
Actinium-228		0.539	+/-0.137	0.0394	+/-0.137	0.0849	pCi/g	MJH1	09/27/06	1441	569469	5	
Americium-241	U	0.00129	+/-0.0906	0.0797	+/-0.0906	0.164	pCi/g						
Bismuth-212		0.548	+/-0.272	0.0956	+/-0.272	0.203	pCi/g						
Bismuth-214		0.343	+/-0.0725	0.0246	+/-0.0725	0.0518	pCi/g						
Cesium-134	U	0.0246	+/-0.025	0.0154	+/-0.025	0.0325	pCi/g						
Cesium-137		0.117	+/-0.0278	0.0139	+/-0.0278	0.0293	pCi/g						
Cobalt-60	U	0.00944	+/-0.0153	0.0136	+/-0.0153	0.0297	pCi/g						
Europium-152	U	-0.0402	+/-0.0415	0.0341	+/-0.0415	0.0711	pCi/g						
Europium-154	U	-0.0221	+/-0.0507	0.0405	+/-0.0507	0.0875	pCi/g						
Europium-155	U	0.0604	+/-0.0627	0.0369	+/-0.0627	0.076	pCi/g						
Lead-212		0.483	+/-0.0587	0.020	+/-0.0587	0.0413	pCi/g						
Lead-214		0.368	+/-0.069	0.0255	+/-0.069	0.053	pCi/g						
Manganese-54	U	-0.00496	+/-0.0156	0.0132	+/-0.0156	0.0279	pCi/g						
Niobium-94	U	0.0025	+/-0.0143	0.0126	+/-0.0143	0.0266	pCi/g						
Potassium-40		12.5	+/-1.07	0.108	+/-1.07	0.240	pCi/g						
Radium-226		0.343	+/-0.0725	0.0246	+/-0.0725	0.0518	pCi/g						
Silver-108m	U	-0.00682	+/-0.0134	0.0111	+/-0.0134	0.0233	pCi/g						
Thallium-208		0.146	+/-0.0396	0.0119	+/-0.0396	0.0252	pCi/g						
<b>Rad Gas Flow Proportional Counting</b>													
<i>GFPC, Sr90, solid-ALL FSS</i>													
Strontium-90	U	-0.00463	+/-0.0223	0.019	+/-0.0223	0.0409	pCi/g	KSD1	09/28/06	1949	569258	6	
<b>Rad Liquid Scintillation Analysis</b>													
<i>LSC, Tritium Dist, Solid-HTD2, ALL FSS</i>													

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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: October 3, 2006

Client Sample ID: 9530-0003-014F

Sample ID: 171772016

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>													
<i>LSC, Tritium Dist, Solid-HTD2.ALL FSS</i>													
Tritium	U	-6.8	+/-7.52	6.59	+/-7.52	13.8	pCi/g		ATH2	09/28/06	1448	569133	8
<i>Liquid Scint C14, Solid All,FSS</i>													
Carbon-14	U	0.00324	+/-0.0795	0.0667	+/-0.0795	0.136	pCi/g		AXD2	09/28/06	0622	572496	11
<i>Liquid Scint Fe55, Solid-ALL FSS</i>													
Iron-55	U	12.3	+/-36.0	24.7	+/-36.0	51.5	pCi/g		MXPI	09/22/06	0540	569145	13
<i>Liquid Scint Ni63, Solid-ALL FSS</i>													
Nickel-63	U	0.0779	+/-5.27	4.42	+/-5.27	9.09	pCi/g		MXPI	09/24/06	1959	569146	14
<i>Liquid Scint Tc99, Solid-ALL FSS</i>													
Technetium-99	U	0.274	+/-0.247	0.200	+/-0.247	0.412	pCi/g		KXR1	09/26/06	1832	569161	15

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM1	09/15/06	1530	569078

### 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 905.0 Modified
8	EPA 906.0 Modified
9	EPA 906.0 Modified
10	EPA 906.0 Modified
11	EPA EERF C-01 Modified
12	EPA EERF C-01 Modified
13	DOE RESL Fe-1, Modified
14	DOE RESL Ni-1, Modified
15	DOE EML HASL-300, Tc-02-RC Modified
16	DOE EML HASL-300, Tc-02-RC Modified

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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: October 3, 2006

Client Sample ID: 9530-0003-014F

Sample ID: 171772016

Project: YANK01204

Client ID: YANK001

Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time Batch	Mtd
Surrogate/Tracer recovery	Test				Recovery %		Acceptable Limits					
Americium-243		Alphaspec Am241, Cm. Solid	ALL		55		(15%-125%)					
Plutonium-242		Alphaspec Pu. Solid-ALL	FSS		73		(15%-125%)					
Carrier/Tracer Recovery		Liquid Scint Pu241, Solid-ALL	FS		77		(25%-125%)					
Carrier/Tracer Recovery		GFPC, Sr90, solid-ALL	FSS		72		(25%-125%)					
Carrier/Tracer Recovery		Liquid Scint Fe55, Solid-ALL	FS		71		(15%-125%)					
Carrier/Tracer Recovery		Liquid Scint Ni63, Solid-ALL	FS		78		(25%-125%)					
Carrier/Tracer Recovery		Liquid Scint Tc99, Solid-ALL	FS		72		(15%-125%)					

### Notes:

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  - < 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
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- 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: October 3, 2006

Client Sample ID: 9530-0003-015F  
Sample ID: 171772017  
Matrix: TS  
Collect Date: 12-SEP-06  
Receive Date: 15-SEP-06  
Collector: Client  
Moisture: 22.4%

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		0.776	+/-0.196	0.0691	+/-0.196	0.138	pCi/g						
Americium-241	U	0.00596	+/-0.0776	0.0566	+/-0.0776	0.113	pCi/g						
Bismuth-212		0.599	+/-0.231	0.155	+/-0.231	0.309	pCi/g						
Bismuth-214		0.560	+/-0.0913	0.0332	+/-0.0913	0.0663	pCi/g						
Cesium-134	UI	0.00	+/-0.0275	0.0232	+/-0.0275	0.0463	pCi/g						
Cesium-137		0.163	+/-0.0363	0.0181	+/-0.0363	0.0361	pCi/g						
Cobalt-60	U	0.00301	+/-0.0242	0.0201	+/-0.0242	0.0402	pCi/g						
Europium-152	U	-0.0258	+/-0.064	0.0474	+/-0.064	0.0947	pCi/g						
Europium-154	U	-0.0311	+/-0.0745	0.0589	+/-0.0745	0.118	pCi/g						
Europium-155	U	-0.0301	+/-0.0592	0.0476	+/-0.0592	0.0952	pCi/g						
Lead-212		0.848	+/-0.091	0.0269	+/-0.091	0.0538	pCi/g						
Lead-214		0.701	+/-0.100	0.0347	+/-0.100	0.0693	pCi/g						
Manganese-54	U	0.0193	+/-0.0233	0.0205	+/-0.0233	0.0411	pCi/g						
Niobium-94	U	0.0119	+/-0.0241	0.0183	+/-0.0241	0.0366	pCi/g						
Potassium-40		15.1	+/-1.29	0.160	+/-1.29	0.320	pCi/g						
Radium-226		0.560	+/-0.0913	0.0332	+/-0.0913	0.0663	pCi/g						
Silver-108m	U	0.00264	+/-0.0198	0.0165	+/-0.0198	0.0331	pCi/g						
Thallium-208		0.271	+/-0.0492	0.0173	+/-0.0492	0.0346	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	LXM1	09/15/06	1530	569078

### 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: October 3, 2006

Client Sample ID: 9530-0003-015F  
Sample ID: 171772017

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

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

Report Date: October 3, 2006

Client Sample ID: 9530-0003-016F  
Sample ID: 171772018  
Matrix: TS  
Collect Date: 12-SEP-06  
Receive Date: 15-SEP-06  
Collector: Client  
Moisture: 7.46%

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		0.596	+/-0.156	0.0516	+/-0.156	0.112	pCi/g						
Americium-241	U	-0.0717	+/-0.122	0.0949	+/-0.122	0.196	pCi/g						
Bismuth-212	U	0.167	+/-0.152	0.144	+/-0.152	0.305	pCi/g						
Bismuth-214		0.317	+/-0.0736	0.0266	+/-0.0736	0.0571	pCi/g						
Cesium-134	U	0.0283	+/-0.0283	0.0194	+/-0.0283	0.0415	pCi/g						
Cesium-137		0.0917	+/-0.0302	0.015	+/-0.0302	0.0323	pCi/g						
Cobalt-60	U	0.0111	+/-0.0164	0.0152	+/-0.0164	0.0339	pCi/g						
Europium-152	U	-0.0239	+/-0.0474	0.0404	+/-0.0474	0.085	pCi/g						
Europium-154	U	0.00756	+/-0.0564	0.0482	+/-0.0564	0.106	pCi/g						
Europium-155	U	0.0333	+/-0.0538	0.0486	+/-0.0538	0.101	pCi/g						
Lead-212		0.500	+/-0.0642	0.0232	+/-0.0642	0.0483	pCi/g						
Lead-214		0.304	+/-0.0764	0.0292	+/-0.0764	0.0615	pCi/g						
Manganese-54	U	0.00535	+/-0.0161	0.0145	+/-0.0161	0.0314	pCi/g						
Niobium-94	U	0.00382	+/-0.015	0.0135	+/-0.015	0.0291	pCi/g						
Potassium-40		11.6	+/-1.10	0.110	+/-1.10	0.255	pCi/g						
Radium-226		0.317	+/-0.0736	0.0266	+/-0.0736	0.0571	pCi/g						
Silver-108m	U	-0.0121	+/-0.0154	0.0125	+/-0.0154	0.0267	pCi/g						
Thallium-208		0.173	+/-0.0457	0.0141	+/-0.0457	0.0303	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	LXM1	09/15/06	1530	569078

### 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: October 3, 2006

Client Sample ID: 9530-0003-016F  
Sample ID: 171772018

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
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  - N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
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  - 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

Client : Connecticut Yankee Atomic Power  
362 Injun Hollow Rd

Report Date: October 3, 2006  
Page 1 of 9

Contact: East Hampton, Connecticut  
Mr. Jack McCarthy

Workorder: 171772

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Rad Alpha Spec</b>											
Batch	569530										
QC1201185573	171772015	DUP									
Americium-241		U	-0.000541	U	-0.0675	pCi/g	197	(0% - 100%)	BXL1	09/28/06	09:36
		Uncert:	+/-0.129		+/-0.0888						
		TPU:	+/-0.129		+/-0.0892						
Curium-242		U	-0.0173	U	-0.0429	pCi/g	85	(0% - 100%)			
		Uncert:	+/-0.0747		+/-0.0376						
		TPU:	+/-0.0747		+/-0.038						
Curium-243/244		U	-0.0175	U	0.0107	pCi/g	829	(0% - 100%)			
		Uncert:	+/-0.166		+/-0.205						
		TPU:	+/-0.166		+/-0.205						
QC1201185575	LCS										
Americium-241		13.6			14.8	pCi/g	109	(75%-125%)		09/28/06	09:36
		Uncert:			+/-1.43						
		TPU:			+/-2.33						
Curium-242				U	-0.0177	pCi/g					
		Uncert:			+/-0.0246						
		TPU:			+/-0.0247						
Curium-243/244		16.4			17.8	pCi/g	109	(75%-125%)			
		Uncert:			+/-1.57						
		TPU:			+/-2.71						
QC1201185572	MB										
Americium-241				U	-0.00771	pCi/g				09/29/06	09:15
		Uncert:			+/-0.119						
		TPU:			+/-0.119						
Curium-242				U	0.00	pCi/g					
		Uncert:			+/-0.0748						
		TPU:			+/-0.0748						
Curium-243/244				U	-0.148	pCi/g					
		Uncert:			+/-0.107						
		TPU:			+/-0.108						
QC1201185574	171772015	MS									
Americium-241		13.9	U	-0.000541	14.3	pCi/g	103	(75%-125%)		09/28/06	09:36
		Uncert:		+/-0.129	+/-1.31						
		TPU:		+/-0.129	+/-2.15						
Curium-242			U	-0.0173	0.0439	pCi/g					
		Uncert:		+/-0.0747	+/-0.120						
		TPU:		+/-0.0747	+/-0.120						
Curium-243/244		16.8	U	-0.0175	16.9	pCi/g	101	(75%-125%)			
		Uncert:		+/-0.166	+/-1.43						
		TPU:		+/-0.166	+/-2.47						
Batch	569531										
QC1201185577	171772015	DUP									
Plutonium-238			0.025		-0.0118	pCi/g	558	(0% - 100%)	BXL1	09/28/06	09:36

# GENERAL ENGINEERING LABORATORIES, LLC

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## QC Summary

Workorder: 171772

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	569531										
Plutonium-239/240		Uncert:	+/-0.0663	+/-0.0611							
		TPU:	+/-0.0664	+/-0.0611							
			-0.0158	-0.00644	pCi/g	84		(0% - 100%)			
		Uncert:	+/-0.0681	+/-0.0541							
		TPU:	+/-0.0681	+/-0.0542							
QC1201185579	LCS										
Plutonium-238				-0.0177	pCi/g			(75%-125%)		09/28/06	09:36
		Uncert:		+/-0.052							
		TPU:		+/-0.0521							
Plutonium-239/240		12.6		12.3	pCi/g		98	(75%-125%)			
		Uncert:		+/-1.08							
		TPU:		+/-1.73							
QC1201185576	MB										
Plutonium-238				-0.0118	pCi/g					09/28/06	09:36
		Uncert:		+/-0.0509							
		TPU:		+/-0.051							
Plutonium-239/240				0.0128	pCi/g						
		Uncert:		+/-0.0509							
		TPU:		+/-0.0509							
QC1201185578	171772015	MS									
Plutonium-238			0.025	0.0538	pCi/g			(75%-125%)		09/28/06	09:36
		Uncert:	+/-0.0663	+/-0.122							
		TPU:	+/-0.0664	+/-0.122							
Plutonium-239/240		12.8	-0.0158	13.8	pCi/g		108	(75%-125%)			
		Uncert:	+/-0.0681	+/-1.49							
		TPU:	+/-0.0681	+/-2.28							
Batch	573310										
QC1201194063	171772015	DUP									
Plutonium-241		U	4.46	U	4.13	pCi/g	0	(0% - 100%)	DDR1	10/03/06	09:47
		Uncert:	+/-9.11	+/-8.44							
		TPU:	+/-9.12	+/-8.45							
QC1201194065	LCS										
Plutonium-241		142		116	pCi/g		81	(75%-125%)		10/03/06	10:19
		Uncert:		+/-12.4							
		TPU:		+/-17.6							
QC1201194062	MB										
Plutonium-241				U	-0.714	pCi/g				10/03/06	09:31
		Uncert:		+/-6.51							
		TPU:		+/-6.51							
QC1201194064	171772015	MS									
Plutonium-241		146	U	4.46	140	pCi/g		96	(75%-125%)	10/03/06	10:03
		Uncert:	+/-9.11	+/-13.3							
		TPU:	+/-9.12	+/-20.0							
Rad Gamma Spec											
Batch	569469										
QC1201185432	171772001	DUP									
Actinium-228			1.00	0.722	pCi/g	4		(0% - 100%)	MJH1	09/25/06	05:37
		Uncert:	+/-0.199	+/-0.187							
				+/-0.187							

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch 569469											
Americium-241		TPU:	+/-0.199								
	U	0.0354	U	0.0458	pCi/g	618		(0% - 100%)			
		Uncert:	+/-0.071	+/-0.0896							
Bismuth-212		TPU:	+/-0.071	+/-0.0896							
		0.465		0.617	pCi/g	8		(0% - 100%)			
		Uncert:	+/-0.287	+/-0.321							
Bismuth-214		TPU:	+/-0.287	+/-0.321							
		0.531		0.575	pCi/g	18		(0% - 100%)			
		Uncert:	+/-0.104	+/-0.104							
Cesium-134		TPU:	+/-0.104	+/-0.104							
	U	0.0412	U	0.00	pCi/g	87		(0% - 100%)			
		Uncert:	+/-0.0379	+/-0.0429							
Cesium-137		TPU:	+/-0.0379	+/-0.0429							
		0.141		0.141	pCi/g	10		(0% - 100%)			
		Uncert:	+/-0.0362	+/-0.0559							
Cobalt-60		TPU:	+/-0.0362	+/-0.0559							
	U	-3.370E-05	U	0.000692	pCi/g	143		(0% - 100%)			
		Uncert:	+/-0.0257	+/-0.022							
Europium-152		TPU:	+/-0.0257	+/-0.022							
	U	0.0209	U	0.00935	pCi/g	332		(0% - 100%)			
		Uncert:	+/-0.0776	+/-0.0601							
Europium-154		TPU:	+/-0.0776	+/-0.0601							
	U	-0.0547	U	0.0125	pCi/g	101		(0% - 100%)			
		Uncert:	+/-0.0796	+/-0.0628							
Europium-155		TPU:	+/-0.0796	+/-0.0628							
	U	0.111	U	0.0817	pCi/g	57		(0% - 100%)			
		Uncert:	+/-0.0802	+/-0.0702							
Lead-212		TPU:	+/-0.0802	+/-0.0702							
		0.766		0.724	pCi/g	2		(0% - 20%)			
		Uncert:	+/-0.0868	+/-0.0689							
Lead-214		TPU:	+/-0.0868	+/-0.0689							
		0.545		0.554	pCi/g	18		(0% - 20%)			
		Uncert:	+/-0.0993	+/-0.0931							
Manganese-54		TPU:	+/-0.0993	+/-0.0931							
	U	-0.00902	U	0.000707	pCi/g	246		(0% - 100%)			
		Uncert:	+/-0.0261	+/-0.0208							
Niobium-94		TPU:	+/-0.0261	+/-0.0208							
	U	-0.00508	U	-0.0114	pCi/g	16		(0% - 100%)			
		Uncert:	+/-0.0217	+/-0.0204							
Potassium-40		TPU:	+/-0.0217	+/-0.0204							
		15.0		15.1	pCi/g	0		(0% - 20%)			
		Uncert:	+/-1.36	+/-1.03							
Radium-226		TPU:	+/-1.36	+/-1.03							
		0.531		0.575	pCi/g	18		(0% - 100%)			
		Uncert:	+/-0.104	+/-0.104							
Silver-108m		TPU:	+/-0.104	+/-0.104							
	U	-0.013	U	-0.00982	pCi/g	53		(0% - 100%)			
		Uncert:	+/-0.0226	+/-0.0211							

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Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Rad Gamma Spec</b>										
Batch	569469									
Thallium-208	TPU: +/-0.0226 0.272 Uncert: +/-0.0562 TPU: +/-0.0562		+/-0.0211 0.208 +/-0.0503 +/-0.0503	pCi/g	15		(0% - 100%)			
QC1201185433 LCS Actinium-228		U	-0.838	pCi/g					09/22/06	08:36
	Uncert: +/-0.784 TPU: +/-0.784		+/-0.784 +/-0.784							
Americium-241	23.4 Uncert: +/-2.11 TPU: +/-2.11		25.6 +/-2.11 +/-2.11	pCi/g		109	(75%-125%)			
Bismuth-212		U	0.183	pCi/g						
	Uncert: +/-1.39 TPU: +/-1.39		+/-1.39 +/-1.39							
Bismuth-214		U	0.369	pCi/g						
	Uncert: +/-0.315 TPU: +/-0.315		+/-0.315 +/-0.315							
Cesium-134		U	0.0523	pCi/g						
	Uncert: +/-0.192 TPU: +/-0.192		+/-0.192 +/-0.192							
Cesium-137	9.57 Uncert: +/-1.13 TPU: +/-1.13		10.5 +/-1.13 +/-1.13	pCi/g		110	(75%-125%)			
Cobalt-60	14.4 Uncert: +/-0.863 TPU: +/-0.863		15.4 +/-0.863 +/-0.863	pCi/g		107	(75%-125%)			
Europium-152		U	-0.304	pCi/g						
	Uncert: +/-0.351 TPU: +/-0.351		+/-0.351 +/-0.351							
Europium-154		U	-0.157	pCi/g						
	Uncert: +/-0.376 TPU: +/-0.376		+/-0.376 +/-0.376							
Europium-155		U	0.205	pCi/g						
	Uncert: +/-0.314 TPU: +/-0.314		+/-0.314 +/-0.314							
Lead-212		U	0.228	pCi/g						
	Uncert: +/-0.303 TPU: +/-0.303		+/-0.303 +/-0.303							
Lead-214		U	0.110	pCi/g						
	Uncert: +/-0.266 TPU: +/-0.266		+/-0.266 +/-0.266							
Manganese-54		U	-0.122	pCi/g						
	Uncert: +/-0.171 TPU: +/-0.171		+/-0.171 +/-0.171							
Niobium-94		U	-0.0594	pCi/g						
	Uncert: +/-0.160 TPU: +/-0.160		+/-0.160 +/-0.160							
Potassium-40		U	0.0985	pCi/g						

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Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec										
Barch	569469									
		Uncert:	+/-1.24							
		TPU:	+/-1.24							
Radium-226		U	0.369	pCi/g			(75%-125%)			
		Uncert:	+/-0.315							
		TPU:	+/-0.315							
Silver-108m		U	-0.103	pCi/g						
		Uncert:	+/-0.150							
		TPU:	+/-0.150							
Thallium-208		U	0.144	pCi/g						
		Uncert:	+/-0.164							
		TPU:	+/-0.164							
QC1201185431 MB										
Actinium-228		U	0.0375	pCi/g					09/25/06	05:36
		Uncert:	+/-0.0692							
		TPU:	+/-0.0692							
Americium-241		U	0.0538	pCi/g						
		Uncert:	+/-0.0833							
		TPU:	+/-0.0833							
Bismuth-212		U	-0.0346	pCi/g						
		Uncert:	+/-0.141							
		TPU:	+/-0.141							
Bismuth-214		UI	0.00	pCi/g						
		Uncert:	+/-0.0602							
		TPU:	+/-0.0602							
Cesium-134		U	0.0208	pCi/g						
		Uncert:	+/-0.0236							
		TPU:	+/-0.0236							
Cesium-137		U	0.00464	pCi/g						
		Uncert:	+/-0.0268							
		TPU:	+/-0.0268							
Cobalt-60		U	0.00218	pCi/g						
		Uncert:	+/-0.0182							
		TPU:	+/-0.0182							
Europium-152		U	-0.0209	pCi/g						
		Uncert:	+/-0.0493							
		TPU:	+/-0.0493							
Europium-154		U	0.00015	pCi/g						
		Uncert:	+/-0.0476							
		TPU:	+/-0.0476							
Europium-155		U	-0.027	pCi/g						
		Uncert:	+/-0.0446							
		TPU:	+/-0.0446							
Lead-212		U	0.0118	pCi/g						
		Uncert:	+/-0.0464							
		TPU:	+/-0.0464							
Lead-214		U	0.0415	pCi/g						
		Uncert:	+/-0.0405							
		TPU:	+/-0.0405							

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Rad Gamma Spec</b>											
Batch	569469										
Manganese-54			U	0.00295	pCi/g						
	Uncert:			+/-0.0172							
	TPU:			+/-0.0172							
Niobium-94			U	0.00439	pCi/g						
	Uncert:			+/-0.0183							
	TPU:			+/-0.0183							
Potassium-40			U	0.210	pCi/g						
	Uncert:			+/-0.270							
	TPU:			+/-0.270							
Radium-226			U	0.00	pCi/g						
	Uncert:			+/-0.0602							
	TPU:			+/-0.0602							
Silver-108m			U	0.00855	pCi/g						
	Uncert:			+/-0.0151							
	TPU:			+/-0.0151							
Thallium-208			U	0.0198	pCi/g						
	Uncert:			+/-0.0186							
	TPU:			+/-0.0186							
<b>Rad Gas Flow</b>											
Batch	569258										
QC1201184956	171772015	DUP									
Strontium-90			U	0.007	pCi/g	0		(0% - 100%) KSD1		09/28/06	19:49
	Uncert:			+/-0.0247							
	TPU:			+/-0.0247							
QC1201184958	LCS										
Strontium-90				5.21	pCi/g		103	(75%-125%)		09/28/06	19:49
	Uncert:			+/-0.401							
	TPU:			+/-0.421							
QC1201184955	MB										
Strontium-90			U	-0.00432	pCi/g					09/28/06	19:49
	Uncert:			+/-0.020							
	TPU:			+/-0.020							
QC1201184957	171772015	MS									
Strontium-90			U	0.007	pCi/g		88	(75%-125%)		09/28/06	19:49
	Uncert:			+/-0.0247							
	TPU:			+/-0.0247							
<b>Rad Liquid Scintillation</b>											
Batch	569133										
QC1201184635	171772015	DUP									
Tritium			U	-6.64	pCi/g	0		(0% - 100%) ATH2		09/28/06	11:06
	Uncert:			+/-7.74							
	TPU:			+/-7.74							
QC1201184637	LCS										
Tritium				66.2	pCi/g		102	(75%-125%)		09/23/06	05:38
	Uncert:			+/-13.0							
	TPU:			+/-13.0							
QC1201184634	MB										
Tritium			U	-7.78	pCi/g					09/28/06	10:44

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time	
Rad Liquid Scintillation												
Batch	569133											
		Uncert:		+/-7.70								
		TPU:		+/-7.70								
QC1201184636	171772015	MS										
Tritium		66.2	-0.387	56.6	pCi/g		86	(75%-125%)		09/23/06	05:22	
		Uncert:	+/-8.81	+/-13.2								
		TPU:	+/-8.81	+/-13.2								
Batch	569145											
QC1201184671	171772016	DUP										
Iron-55		U	12.3	U	-23.8	pCi/g	0	(0% - 100%)	MXPI	09/22/06	06:54	
		Uncert:	+/-36.0	+/-34.8								
		TPU:	+/-36.0	+/-34.8								
QC1201184673	LCS											
Iron-55		667		615	pCi/g		92	(75%-125%)		09/22/06	07:26	
		Uncert:		+/-54.9								
		TPU:		+/-68.1								
QC1201184670	MB											
Iron-55				U	-4.53	pCi/g				09/22/06	05:56	
		Uncert:		+/-75.9								
		TPU:		+/-75.9								
QC1201184672	171772016	MS										
Iron-55		671	U	12.3	631	pCi/g		94	(75%-125%)		09/22/06	07:10
		Uncert:	+/-36.0	+/-49.3								
		TPU:	+/-36.0	+/-64.6								
Batch	569146											
QC1201184675	171772016	DUP										
Nickel-63		U	0.0779	U	-4.22	pCi/g	0	(0% - 100%)	MXPI	09/24/06	21:33	
		Uncert:	+/-5.27	+/-6.00								
		TPU:	+/-5.27	+/-6.00								
QC1201184677	LCS											
Nickel-63		512		442	pCi/g		86	(75%-125%)		09/24/06	23:07	
		Uncert:		+/-13.7								
		TPU:		+/-19.7								
QC1201184674	MB											
Nickel-63				U	-3.65	pCi/g				09/24/06	20:46	
		Uncert:		+/-6.37								
		TPU:		+/-6.37								
QC1201184676	171772016	MS										
Nickel-63		594	U	0.0779	519	pCi/g		87	(75%-125%)		09/24/06	22:20
		Uncert:	+/-5.27	+/-15.0								
		TPU:	+/-5.27	+/-23.3								
Batch	569161											
QC1201184720	171772015	DUP										
Technetium-99		U	0.189	U	0.445	pCi/g	0	(0% - 100%)	KXR1	09/24/06	16:14	
		Uncert:	+/-0.275	+/-0.294								
		TPU:	+/-0.275	+/-0.294								
QC1201184722	LCS											
Technetium-99		13.0		12.9	pCi/g		99	(75%-125%)		09/24/06	16:46	
		Uncert:		+/-0.508								
		TPU:		+/-0.586								

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Rad Liquid Scintillation</b>											
Batch	569161										
QC1201184719	MB										
Technetium-99			U	0.338	pCi/g					09/24/06	15:57
		Uncert:		+/-0.251							
		TPU:		+/-0.252							
QC1201184721	171772015 MS										
Technetium-99		13.0	U	0.189	pCi/g		99	(75%-125%)		09/24/06	16:30
		Uncert:		+/-0.275							
		TPU:		+/-0.275							
Batch	572496										
QC1201192246	171772015 DUP										
Carbon-14			U	-0.0273	pCi/g	0		(0%-100%)	AXD2	09/28/06	09:42
		Uncert:		+/-0.0774							
		TPU:		+/-0.0774							
QC1201192248	LCS										
Carbon-14		6.68		7.60	pCi/g		114	(75%-125%)		09/28/06	10:26
		Uncert:		+/-0.320							
		TPU:		+/-0.341							
QC1201192245	MB										
Carbon-14			U	-0.0388	pCi/g					09/28/06	07:55
		Uncert:		+/-0.0777							
		TPU:		+/-0.0777							
QC1201192247	171772015 MS										
Carbon-14		31.2	U	-0.0273	pCi/g		117	(75%-125%)		09/28/06	10:04
		Uncert:		+/-0.0774							
		TPU:		+/-0.0774							

### 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



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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.

CENTRAL PENINSULA  
SURVEY UNIT 9530-0003

RELEASE RECORD

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**ATTACHMENT 4 (DQA RESULTS)**

CENTRAL PENINSULA  
SURVEY UNIT 9530-0003

RELEASE RECORD

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

# PRELIMINARY DATA REVIEW FORM

Survey Unit : 9530-0003  
 Survey Unit Name : Central Peninsula  
 Classification : 2  
 Survey Media : Soil  
 Type of Survey : Final Status Survey  
 Type of Measurement : Radionuclide Specific  
 Number of Measurements : 15

## BASIC STATISTICAL QUANTITIES

Cs-137  
 Target Level (pCi/g) : 5.38E+00  
 Minimum Value : 5.70E-02  
 Maximum Value : 4.87E-01  
 Mean : 2.48E-01  
 Median : 2.83E-01  
 Standard Deviation : 1.18E-01

## Reported Results

Sample Identification	Cs-137 Concentration (pCi/g)	Detect?	Fraction of Target Level
9530-0003-001F	1.41E-01	+	0.026
9530-0003-002F	3.26E-01	+	0.061
9530-0003-003F	2.83E-01	+	0.053
9530-0003-004F	3.09E-01	+	0.057
9530-0003-005F	4.87E-01	+	0.091
9530-0003-006F	9.57E-02	+	0.018
9530-0003-007F	5.70E-02	+	0.011
9530-0003-008F	2.89E-01	+	0.054
9530-0003-009F	3.95E-01	+	0.073
9530-0003-010F	2.87E-01	+	0.053
9530-0003-011F	2.27E-01	+	0.042
9530-0003-012F	3.19E-01	+	0.059
9530-0003-013F	2.27E-01	+	0.042
9530-0003-014F	1.17E-01	+	0.022
9530-0003-015F	1.63E-01	+	0.030



Submitted by/Date  
 Jack McEntee 10/24/06

CENTRAL PENINSULA  
SURVEY UNIT 9530-0003

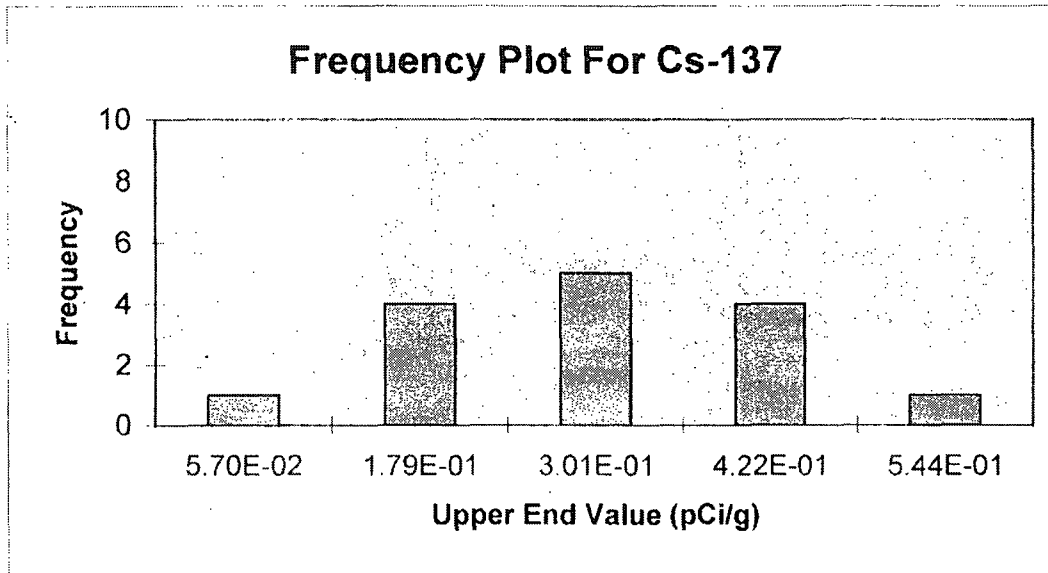
RELEASE RECORD

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

# FREQUENCY PLOT FOR CESIUM-137

Survey Unit: 9530-0003  
 Survey Unit Name: Central Peninsula  
 Mean: 2.48E-01 pCi/g



Upper End Value	Observation Frequency	Observation Frequency
5.70E-02	1	7%
1.79E-01	4	27%
3.01E-01	5	33%
4.22E-01	4	27%
5.44E-01	1	7%
Total:	15	100%

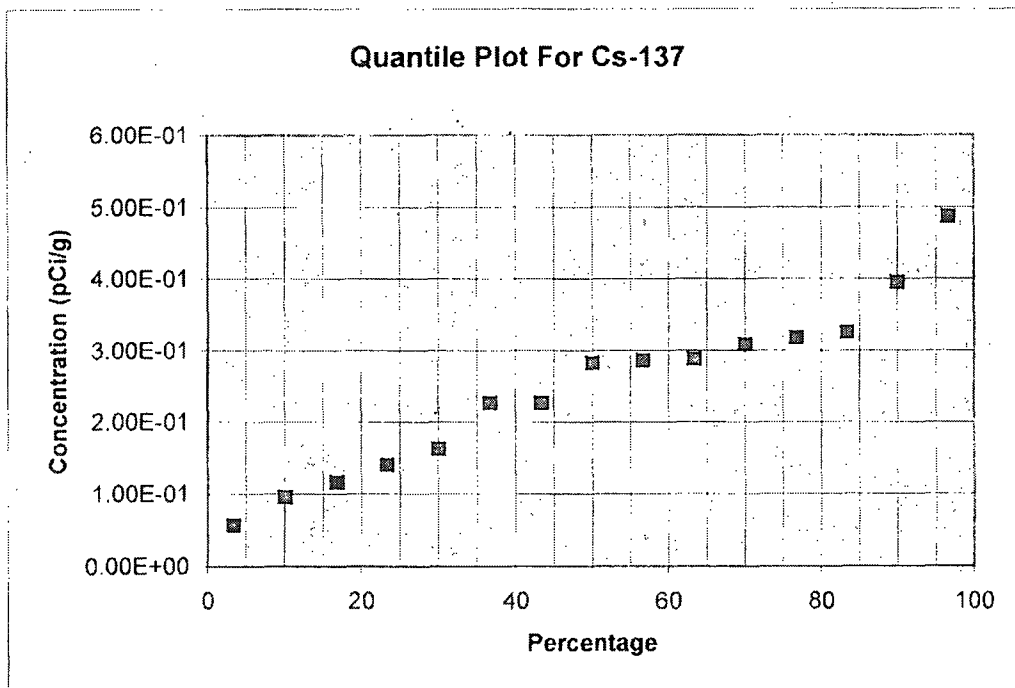
Submitted by/Date

Reviewed by/Date

10/25/06

# QUANTILE PLOT FOR CESIUM-137

Survey Unit: 9530-0003  
 Survey Unit Name: Central Peninsula  
 Mean: 2.48E-01 pCi/g



Cs-137	Rank	Percentage
5.70E-02	1	3%
9.57E-02	2	10%
1.17E-01	3	17%
1.41E-01	4	23%
1.63E-01	5	30%
2.27E-01	6	37%
2.27E-01	7	43%
2.83E-01	8	50%
2.87E-01	9	57%
2.89E-01	10	63%
3.09E-01	11	70%
3.19E-01	12	77%
3.26E-01	13	83%
3.95E-01	14	90%
4.87E-01	15	97%

*Jack McLauchlin*  
 Submitted by/Date

10/23/06

*[Signature]*  
 Reviewed by/Date

10/25/06

CENTRAL PENINSULA  
SURVEY UNIT 9530-0003

RELEASE RECORD

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**ATTACHMENT 4C (SIGN TEST)**



[illegible]

### Survey Unit Meets Acceptance Criterion

Date: 10/27/06

Date: 10/25/06

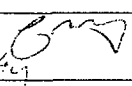
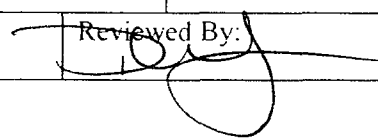
CENTRAL PENINSULA  
SURVEY UNIT 9530-0003

RELEASE RECORD

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

## Split Sample Assessment Form

Survey Area#: 9530		Survey Unit #: 0003		Survey Unit name: Central Peninsula																
Sample Plan or WPIR#: 2005-0038						SML#: 9530-0003-004														
Sample Description: Comparison of split samples collected from sample measurement location #4 and analyzed using gamma spectroscopy by off-site Vendor Laboratory. The standard sample was 9530-0003-004F, the comparison sample was 9530-0003-004FS.																				
STANDARD					COMPARISON															
Radionuclide	Activity Value	Standard Error	Resolution	Agreement Range	Activity Value	Standard Error	Comparison Ratio	Acceptable (Y/N)												
Cs-137	3.09E-1	3.06E-2	10	0.6 - 1.66	3.11E-1	3.63E-2	1.0	Y												
Comments/Corrective Actions: N/A					Table is provided to show acceptance criteria used to assess split samples. <table border="1"> <thead> <tr> <th>Resolution</th> <th>Agreement Range</th> </tr> </thead> <tbody> <tr> <td>4 - 7</td> <td>0.5 - 2.0</td> </tr> <tr> <td>8 - 15</td> <td>0.6 - 1.66</td> </tr> <tr> <td>16 - 50</td> <td>0.75 - 1.33</td> </tr> <tr> <td>51 - 200</td> <td>0.80 - 1.25</td> </tr> <tr> <td>&gt;200</td> <td>0.85 - 1.18</td> </tr> </tbody> </table>				Resolution	Agreement Range	4 - 7	0.5 - 2.0	8 - 15	0.6 - 1.66	16 - 50	0.75 - 1.33	51 - 200	0.80 - 1.25	>200	0.85 - 1.18
									Resolution	Agreement Range										
4 - 7	0.5 - 2.0																			
8 - 15	0.6 - 1.66																			
16 - 50	0.75 - 1.33																			
51 - 200	0.80 - 1.25																			
>200	0.85 - 1.18																			
Performed By:  JACK M. GARSLEY					Date: 10/24/06		Reviewed By: 													
					Date: 10/25/06															

**Split Sample Assessment Form**

Survey Area#: 9530		Survey Unit #: 0003		Survey Unit name: Central Peninsula																
Sample Plan or WPIR#: 2005-0038					SML#: 9530-0003-006															
Sample Description: Comparison of split samples collected from sample measurement location #6 and analyzed using gamma spectroscopy by off-site Vendor Laboratory. The standard sample was 9530-0003-006F, the comparison sample was 9530-0003-006FS.																				
STANDARD					COMPARISON															
Radionuclide	Activity Value	Standard Error	Resolution	Agreement Range	Activity Value	Standard Error	Comparison Ratio	Acceptable (Y/N)												
Cs-137	9.57E-2	1.64E-2	6	0.5 - 2.0	9.47E-2	1.43E-2	0.99	Y												
Comments/Corrective Actions: N/A					Table is provided to show acceptance criteria used to assess split samples. <table style="margin-left: auto; margin-right: auto; border: none;"> <tr> <td style="text-align: center;"><u>Resolution</u></td> <td style="text-align: center;"><u>Agreement Range</u></td> </tr> <tr> <td style="text-align: center;">4 - 7</td> <td style="text-align: center;">0.5 - 2.0</td> </tr> <tr> <td style="text-align: center;">8 - 15</td> <td style="text-align: center;">0.6 - 1.66</td> </tr> <tr> <td style="text-align: center;">16 - 50</td> <td style="text-align: center;">0.75 - 1.33</td> </tr> <tr> <td style="text-align: center;">51 - 200</td> <td style="text-align: center;">0.80 - 1.25</td> </tr> <tr> <td style="text-align: center;">&gt;200</td> <td style="text-align: center;">0.85 - 1.18</td> </tr> </table>				<u>Resolution</u>	<u>Agreement Range</u>	4 - 7	0.5 - 2.0	8 - 15	0.6 - 1.66	16 - 50	0.75 - 1.33	51 - 200	0.80 - 1.25	>200	0.85 - 1.18
									<u>Resolution</u>	<u>Agreement Range</u>										
4 - 7	0.5 - 2.0																			
8 - 15	0.6 - 1.66																			
16 - 50	0.75 - 1.33																			
51 - 200	0.80 - 1.25																			
>200	0.85 - 1.18																			
Performed By: <i>Jack McCreesh</i>					Date: <i>10/24/06</i>															
Reviewed By: <i>[Signature]</i>					Date: <i>10/25/06</i>															

CENTRAL PENINSULA  
SURVEY UNIT 9530-0003

RELEASE RECORD


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**ATTACHMENT 4E (COMPASS DQA WITH POWER CURVE)**



# DQA Surface Soil Report

## Assessment Summary

Site:	9530-0003 FSS		
Planner(s):	McCarthy		10/24/06
Survey Unit Name:	Central Peninsula area		
Report Number:	1		
Survey Unit Samples:	15		
Reference Area Samples:	0		
Test Performed:	Sign	Test Result:	Not Performed
Judgmental Samples:	0	EMC Result:	Not Performed
Assessment Conclusion:	<b>Reject Null Hypothesis (Survey Unit PASSES)</b>		

## Retrospective Power Curve

