



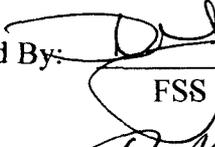
# **Final Status Survey Final Report Phase VII**

**Appendix A18  
Survey Unit Release Record  
9803-0000, Subsurface Area Associated  
with North Grounds  
(non-protected area)**

**May 2007**



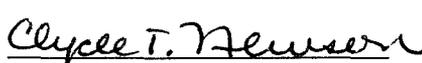
CYAPCO  
FINAL STATUS SURVEY RELEASE RECORD  
SUBSURFACE AREA ASSOCIATED WITH THE  
NORTH GROUNDS - (NON-PROTECTED AREA)  
SURVEY UNIT 9803-0000

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TOTAL 120

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**1. SURVEY UNIT DESCRIPTION**

Survey Unit 9803-0000 (Subsurface Area associated with the North Site Grounds (non-protected area) is designated as Final Status Survey (FSS) Class "C" subsurface soils area and consists of approximately thirty-five thousand four hundred eighty-five square meters (35,485 m<sup>2</sup>) of area under uninhabited land associated with the parking lot, Warehouse #s 1 & 2 and the Steam Generator Mockup Building and is located approximately five hundred sixty five feet (565 ft) from the reference coordinate system benchmark used at Haddam Neck Plant (HNP) (see Attachment 1). Survey Unit 9803-0000 includes the subsurface soils located under open land area Survey Units 9504-0000, 9514-0000, 9514-0001, 9313-0000, 9302-0000 and 9512-0000. The topography consists of relatively flat open land that is void of all vegetation with a gentle slope toward the onsite pond (Survey Area 9508) to the north (called north as oriented with the north to south flow of the Connecticut River) of the survey area.

The reference coordinates associated with this survey unit are E002 through E014 by S050 through S063 (refer to "*HNP 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 "*Classification Basis Summary*" conducted for Survey Unit 9803-0000 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,

The initial classification for subsurface soil Survey Area 9803 was Class C in accordance with Table 2-10 of the LTP. A review of the "*Initial and Supplemental Characterization Reports*" as well as the previous "*Classification Basis Summaries*" was performed. The source documents, the "*Connecticut Yankee Haddam Neck Characterization Report*" and "*Initial Classification for Survey Areas at Connecticut Yankee*", were incorporated by reference in LTP, Revision 0.

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Survey Area 9803 is comprised of subsurface soils located primarily under what was the main parking lot for the facility. During plant operation, this area was used to stockpile soils, asphalt spoils, snow and other materials. In addition, packaged radioactive materials have been staged in this area during the decommissioning process while awaiting shipment. The areas behind the Building Maintenance Equipment Warehouse and the Chemical Storage Warehouse were also used as storage areas for recovered radioactive materials returned to site as a result of the Offsite Materials Recovery Program.

The chronological age of the paved area dates back to the earliest days of plant operation. The *"Initial Characterization Report"* and the *"Historic Site Assessment Supplement"* contained minimal information on this area. One incident that was cited that may have affected this area was the discovery of several sources of elevated activity in March 1980 in the parking lot, along with other areas of the site. The investigation into the incident concluded that the elevated activity was most likely due to radioactive materials ejected from the Primary Vent Stack as a result of operational events in 1979. The report states that all elevated areas were removed upon detection.

In 1989, Warehouse #2 and Office Building #3/Primary Access Point (PAP) were built. When the buildings were constructed, only the parking lot asphalt was removed. The road way and the underlying soil was not disturbed. Subsequently, the primary parking lot was enlarged, re-paved and storm drains were installed for drainage. Outfalls from the storm drain system discharge to the southeast and southwest banks of the north pond (Survey Area 9508). The storm drain system piping may have acted as a possible pathway for the transport of residual activity from Survey Area 9313.

In 1997, scanning of the parking lot was performed using a floor monitor. No areas of elevated activity were identified. Soil samples were taken of a proposed sanitary sewer sump location just west of the PAP. No plant related radioactivity was identified in these samples.

As previously stated, a storm drain system was installed in 1989 under the parking area. The storm drain systems purpose was to conduct runoff water from the parking lot, including the northern most side of Survey Area 9313 (adjacent to the office building and warehouses), and the west hillside primarily to the retention pond. Outfalls from the storm drain system discharge to the southeast and southwest banks of the pond (Survey Area 9508). Overflow from the retention pond discharges to the east bank of the Connecticut River (Survey Area 9512). Leakage from the storm drain system piping may have conducted radioactive materials either from stack emissions in 1980 or from the radioactive materials transport path from Survey Area 9313 to the soil beneath.

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Recent decommissioning activities included the removal of all asphalt, concrete and sub-surface commodities such as storm drain and sewer system piping from this survey unit. Evaluation of soils exposed by commodities removal was performed under Radiological Assessment (RA) SSWP 06-08-009. The analytical results of soil samples taken from the exposed soils under the asphalt were used to provide information with regard to the distribution and concentration of residual activity in this survey unit and to identify the radionuclides of concern. Statistical quantities (mean, median and standard deviation) from the 2006 Radiological Assessment conducted under SSWP-06-08-009 are provided in Table 1.

	<b>Cs-137 (pCi/g)</b>	<b>Co-60 (pCi/g)</b>
Minimum Value :	2.86E-02	2.84E-02
Maximum Value :	9.00E-02	8.41E-02
Mean :	4.82E-02	5.40E-02
Median :	4.56E-02	4.86E-02
Standard Deviation :	1.24E-02	1.56E-02

Cs-137 and Co-60 were the primary radionuclides detected in the sample population with both isotopes reported at fairly low concentrations.

No “Hard-to-Detect” (HTD) radionuclides were positively identified in any of the samples taken during the Radiological Assessment in concentrations meeting the accepted criteria for detection (i.e., a result greater than two (2) standard deviations uncertainty).

While Sr-90 was not identified in the analytical results, it was decided to include Sr-90 as a radionuclide of concern for this survey unit since Sr-90 was positively identified in the surface soils that correspond to this subsurface survey unit. Therefore, all volumetric soil samples taken as part of the survey design for this survey unit were subjected to direct analysis for Sr-90.

**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.

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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 9803-0000 did not exceed the release criteria specified in the LTP and that the potential dose from residual radioactivity is As Low As Reasonably Achievable (ALARA).

A fundamental precursor to survey design is to establish a relationship between the release criteria and some measurable quantity. This is done through the development of Derived Concentration Guideline Levels (DCGL). 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.

***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 Total Effective Dose Equivalent (TEDE) from all three (3) components. The allowable total dose under the Connecticut Department of Environmental Protection (CTDEP) radiological remediation standard for 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.

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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 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, bounded by 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 DCGLs, Operational DCGLs and Required Minimum Detectable Concentrations (MDCs)**

Radionuclide <sup>(1)</sup>	Base Case Soil DCGL (pC/g) <sup>(2)</sup>	Operational DCGL (pC/g) <sup>(3)</sup>	Required MDC (pC/g) <sup>(4)</sup>
<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
Am-241 <sup>(5)</sup>	2.58E+01	5.92E+02	1.03E+00
<b>Pu-241</b>	8.70E+02	1.75E+01	3.48E+01
<b>Cm-243/244</b>	2.90E+01	1.97E+01	1.16E+00

(1) Bold indicates those radionuclides considered Hard to Detect (HTD)

(2) The Base Case Soil DCGL(s) are specified by the LTP in Chapter 6 and are equivalent to twenty-five (25) mrem/yr TEDE

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

(4) The required MDC is equivalent to achieving one (1) mrem/yr TEDE

(5) Americium-241 can be analyzed by gamma and alpha spectroscopy and is considered to be Easy to Detect (ETD). The preferred result is the alpha spectroscopy's when both analyses are performed

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Another important facet of the DQO process is to identify the radionuclides of concern and determine the concentration variability. During the survey of the subsurface soils in this survey unit, Cs-137 and Co-60 were identified as the principle gamma emitting radionuclides which were present in sufficient concentrations that could potentially exceed the screening criteria. Sr-90 was included as a radionuclide of concern due to its presence in the surface soils in the land survey units associated with this subsurface area. The Radiological Assessment survey data were used for the survey design and are provided in Table 1.

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 a sample design that includes either random or biased media sampling.

The DQO process determined that both Cs-137 and Co-60 would be the primary radionuclides of concern in Survey Unit 9803-0000. The Radiological Assessment survey did not include any other additional HTD radionuclides of concern for this survey unit. As Sr-90 concentrations were determined by direct analysis, surrogate DCGLs were not required as part of the survey design for this survey unit via screening under LTP Section 5.4.7.2, "*Gross Activity DCGLs*". Other radionuclides that were positively identified in concentrations greater than the screening criteria during the performance of this FSS would be evaluated to ensure adequate survey design. 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% of the respective Operational DCGL for individual radionuclides and less than 10% of the combined Operational DCGL for aggregates.

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The Elevated Measurement Comparison (EMC) did not apply to this survey unit since it is a Class C subsurface soils 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.

In accordance with LTP Section 5.7.3.2.2, fifteen (15) subsurface soil samples were required in a Class C subsurface soils survey unit for non-parametric statistical testing. LTP Section 5.7.3.2.2 states that there will be a minimum of fifteen (15) measurement locations in a Class C subsurface soil area. LTP Section 5.7.3.2.2 states that the range of the number of measurements in Class C areas corresponds to the range of values for N (for Sign test), considering  $\alpha = 0.05$ ,  $\beta = 0.05$ , and a relative shift of  $< 3.0$ . Based upon a review of the historical information, the results of Radiological Assessments and Characterization Survey data, the acquisition of additional judgmental subsurface soil samples from within this survey unit was deemed unnecessary.

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

During the performance of the survey, it was discovered that one (1) of the fifteen (15) sample locations identified for non-parametric testing were deemed to be inaccessible due to the presence of a steep bank which prevented GeoProbe travel. The location identified was 9803-0000-006F. Subsequently, an addendum to the FSS plan was issued denoting an additional random sample measurement location to replace the location that was deemed to be inaccessible.

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.

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<b>Table 3 - Sample Measurement Locations with Associated GPS Coordinates for Non-parametric Sample Population</b>		
<b>Designation</b>	<b>Northing</b>	<b>Easting</b>
9803-0000-001F	237032.21	667885.67
9803-0000-002F	236841.78	668105.44
9803-0000-003F	236743.64	668401.39
9803-0000-004F	236787.90	667915.01
9803-0000-005F	236894.77	668100.32
9803-0000-007F	236758.73	668203.85
9803-0000-008F	236530.38	668222.47
9803-0000-009F	236676.97	668180.87
9803-0000-010F	236657.73	668386.46
9803-0000-011F	236941.16	668324.68
9803-0000-012F	236748.12	668053.19
9803-0000-013F	236606.37	668343.48
9803-0000-014F	236873.17	668566.16
9803-0000-015F	236550.98	668170.66
9803-0000-016F <sup>(1)</sup>	236847.09	668399.07

(1) Sample location 9803-0000-006F was inaccessible due to the presence of a steep bank; sample location 9803-0000-016F was added under an FSS plan addendum (refer to Section 10)

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 13% of the number of samples that would be used for non-parametric statistical testing were 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.

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Survey Unit 9803-0000 is a subsurface survey unit. Subsequently, no scanning was required.

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

<b>Feature</b>	<b>Design Criteria</b>	<b>Basis</b>
Subsurface Survey Unit Land Area	35,485 m <sup>2</sup>	Based on AutoCAD-LT
Number of Measurements	15 (15 Random)	IAW LTP Section 5.7.3.2.2 for a Class C Subsurface Soil Survey Unit
Grid Spacing	N/A	Random sampling for Class C in accordance with LTP.
Operational DCGL	5.38 pCi/g Cs-137 2.59 pCi/g Co-60 1.05 pCi/g Sr-90	Administratively set to achieve seventeen (17) mrem/yr TEDE <sup>(1)</sup>
Soil Investigation Level	5.38 pCi/g Cs-137 2.59 pCi/g Co-60 1.05 pCi/g Sr-90	The Operational DCGL meets the LTP criteria for a Class C survey unit

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

## 5. SURVEY IMPLEMENTATION

Final status survey field activities were conducted under a Final Status Survey Plan (FSSP). The FSSP package included a detailed survey 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.

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.

Fifteen (15) subsurface 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 collected using direct push probe technology (GeoProbe<sup>®</sup>).

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All samples were obtained to a depth of three (3) meters with the exception of sample numbers 9803-0000-004F, 9803-0000-005F, 9803-0000-008F and 9803-0000-014, where refusal was encountered due to the presence of bedrock prior to reaching a three (3) meter depth. Large stones, wood and/or root pieces were removed and the soil matrix was homogenized from each 3 meter soil column. Samples were controlled, transported, stored, and transferred to the off-site laboratory using Chain-of-Custody (COC) protocol in accordance with Procedure RPM 5.1-5, "*Chain of Custody for Final Status Survey Samples.*"

Two (2) samples (9803-0000-003F and 9803-0000-013F) were randomly selected for HTD radionuclide analysis.

The implementation of survey specific quality control measures included the collection of two (2) samples (9803-0000-001F and 9803-0000-014F) for "split sample" analysis.

## 6. SURVEY RESULTS

All field survey activities were conducted between April 9, 2007 and April 10, 2007.

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 and the associated field splits 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 gamma-emitting radionuclides reported in concentrations exceeding the de-selection criteria.

Cs-137 was positively identified (i.e., a result greater than two (2) standard deviations uncertainty) in one (1) of the fifteen (15) samples collected for non-parametric statistical testing. Co-60 was not positively identified in any sample. The mean of the gamma spectroscopic analysis results for the sample population indicated that Cs-137 was present at levels approaching 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. A summary of the fifteen (15) samples collected for non-parametric statistical testing results is provided in Table 5.

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**Table 5 - Summary of Gamma Spectroscopy Results for Subsurface Soil Samples Comprising the Statistical Sample Population**

Sample Number	Depth (ft) <sup>(1)</sup>	Cs-137 pCi/g
9803-0000-001F	12	2.81E-02
9803-0000-002F	12	1.12E-02
9803-0000-003F	12	2.58E-02
9803-0000-004F	4	-1.45E-02
9803-0000-005F	6	7.78E-03
9803-0000-007F	12	1.49E-02
9803-0000-008F	11	-2.90E-03
9803-0000-009F	12	-5.11E-04
9803-0000-010F	12	1.08E-02
9803-0000-011F	12	6.01E-03
9803-0000-012F	12	4.66E-03
9803-0000-013F	12	1.80E-02
9803-0000-014F	3	1.13E-02
9803-0000-015F	12	-5.15E-03
9803-0000-016F	12	-8.08E-03

(1) Depth in feet is approximate. One (1) push of GeoProbe® equals approximately four (4) feet of vertical depth.

In addition to Cs-137 and Co-60, Sr-90 was also identified during the DQO process as a radionuclide of concern. Subsequently, all samples were subjected to analysis by gas proportional counting for Sr-90. All analyses met the required minimum MDC.

Sr-90 was positively identified (i.e., a result greater than two (2) standard deviations uncertainty) in four (4) of the fifteen (15) samples collected for non-parametric statistical testing. The results of the Sr-90 analysis for the statistical sample population are provided below in Table 6.

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<b>Table 6 - Summary of Sr-90 Analysis Results for Subsurface Soil Samples Comprising the Statistical Sample Population</b>	
<b>Sample Number</b>	<b>Sr-90 pCi/g</b>
9803-0000-001F	2.54E-03
9803-0000-002F	1.70E-02
9803-0000-003F	-1.50E-02
9803-0000-004F	-1.13E-02
9803-0000-005F	3.63E-03
9803-0000-007F	-5.93E-03
9803-0000-008F	-1.08E-02
9803-0000-009F	1.64E-02
9803-0000-010F	1.16E-03
9803-0000-011F	2.60E-03
9803-0000-012F	1.28E-02
9803-0000-013F	-2.88E-03
9803-0000-014F	1.67E-02
9803-0000-015F	5.05E-02
9803-0000-016F	1.74E-02

In addition to Sr-90, the off-site laboratory also processed, as required by the sample plan, two (2) samples for the full suite of HTD radionuclides as specified in LTP, Table 2-12, "*Radionuclides Potentially Present at Haddam Neck Plant*" and as provided in Table 3. The requested analyses included alpha spectroscopy, gas proportional counting, and liquid scintillation depending on the radionuclide and the measurement method. All analyses performed met the required minimum MDC.

Tc-99 was the only HTD other than Sr-90, which by analysis, met the criteria for detection (i.e., a result greater than two (2) standard deviations uncertainty). The highest result for Tc-99 was less than 5% of the Operational DCGL for Tc-99. Therefore, Tc-99 will not be considered in the final dose determination for this survey unit. 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.

SUBSURFACE AREA ASSOCIATED WITH THE NORTH GROUNDS  
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The “sum-of-fractions” or “unity rule” is the mathematical test used to evaluate compliance with radiological criteria for license termination when more than one radionuclide has been determined to be potentially present. The unity rule is:

**Equation 3**

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

Where:  $C_n$  = concentration of radionuclide  $n$  and  
 $DCGL_n$  = DCGL of radionuclide  $n$ .

The results of the unity rule calculation for the radionuclides of concern in the statistical sample population for Survey Unit 9803-0000 are provided in Table 7 below.

<b>Table 7 – Results of Unity Calculation for Subsurface Soil Samples Comprising the Statistical Sample Population <sup>(3)</sup></b>			
Sample Number	Fraction of the Operational DCGL <sup>(1)</sup>		Unity
	Cs-137	Sr-90	
9803-0000-001F	0.005	-	0.005
9803-0000-002F	-	0.016	0.016
9803-0000-003F	-	-	-
9803-0000-004F	-	-	-
9803-0000-005F	-	-	-
9803-0000-007F	-	-	-
9803-0000-008F	-	-	-
9803-0000-009F	-	0.016	0.016
9803-0000-0010F	-	-	-
9803-0000-0011F	-	-	-
9803-0000-0012F	-	-	-
9803-0000-0013F	-	-	-
9803-0000-0014F	-	-	-
9803-0000-0015F	-	0.048	0.048
9803-0000-0016F	-	0.017	0.017

(1) The Operational DCGL is 5.38 pCi/g for Cs-137 and 1.05 pCi/g for Sr-90 to achieve seventeen (17) mrem/yr TEDE respectively.

(2) “-” indicate that the radionuclide was not positively detected in the sample.

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SUBSURFACE AREA ASSOCIATED WITH THE NORTH GROUNDS  
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RELEASE RECORD

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**7. QUALITY CONTROL**

The off-site laboratory processed the split samples and performed gamma spectroscopy analysis. Thirteen percent (13%) 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*".

Cs-137 was not detected in sufficient quantities in the field split results at locations 9803-0000-001 or 9803-0000-014 to evaluate in accordance with procedure. Evaluation using the reported results for naturally occurring K-40 resulted in acceptable agreement between the field-split results at these locations.

The sample analysis vendor, GEL, maintains quality control and quality assurance plans as part of normal operation. Refer to Attachment 3 for data and data quality analysis results.

**8. INVESTIGATIONS AND RESULTS**

No investigations were conducted within this survey unit.

**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**

During the performance of the survey, it was discovered that one (1) of the fifteen (15) sample locations identified for non-parametric testing were deemed to be inaccessible due to the presence of a steep bank which prevented GeoProbe travel. The location identified was 9803-0000-006F. Subsequently, an addendum to the FSS plan was issued denoting an additional random sample measurement location to replace the location that was deemed to be inaccessible.

**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.

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RELEASE RECORD

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 C.

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. Therefore, the survey unit meets the unrestricted release criteria. The basic statistical quantities for the statistical sample population are provided below in Table 8.

	<b>Cs-137 pCi/g</b>	<b>Sr-90 pCi/g</b>
DCGL <sub>op</sub> :	5.38E+00	1.05E+00
Minimum Value:	-1.45E-02	-1.73E-02
Maximum Value:	2.81E-02	2.02E-02
Mean:	7.16E-03	1.71E-03
Median:	7.78E-03	1.93E-03
Standard Deviation:	1.20E-02	9.57E-03

Co-60 was not positively detected in any of the samples collected for non-parametric statistical testing. Cs-137 was positively identified in only one (1) of the samples collected for non-parametric statistical testing. Subsequently, a statistical analysis of the data sets for any of these radionuclides would provide no useful information.

For Sr-90, 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 about 23% 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 1.26.

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

**12. ANOMALIES**

No anomalies were noted.

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SUBSURFACE AREA ASSOCIATED WITH THE NORTH GROUNDS  
SURVEY UNIT 9803-0000

RELEASE RECORD

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**13. CONCLUSION**

Subsurface soils Survey Unit 9803-0000 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 was not required.

All positively identified radionuclides of concern were 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 survey unit is properly designated as Class C.

The dose contribution from soil is 0.14 mrem/yr TEDE based on the average radionuclide concentrations in 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 no underground structures, foundations or footings 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 2.14 mrem/yr TEDE. Therefore, Survey Unit 9803-0000 is acceptable for unrestricted release.

**14. ATTACHMENTS**

14.1 Attachment 1 – Survey Unit Location Map

14.3 Attachment 2 – Laboratory Results

14.4 Attachment 3 – DQA Results

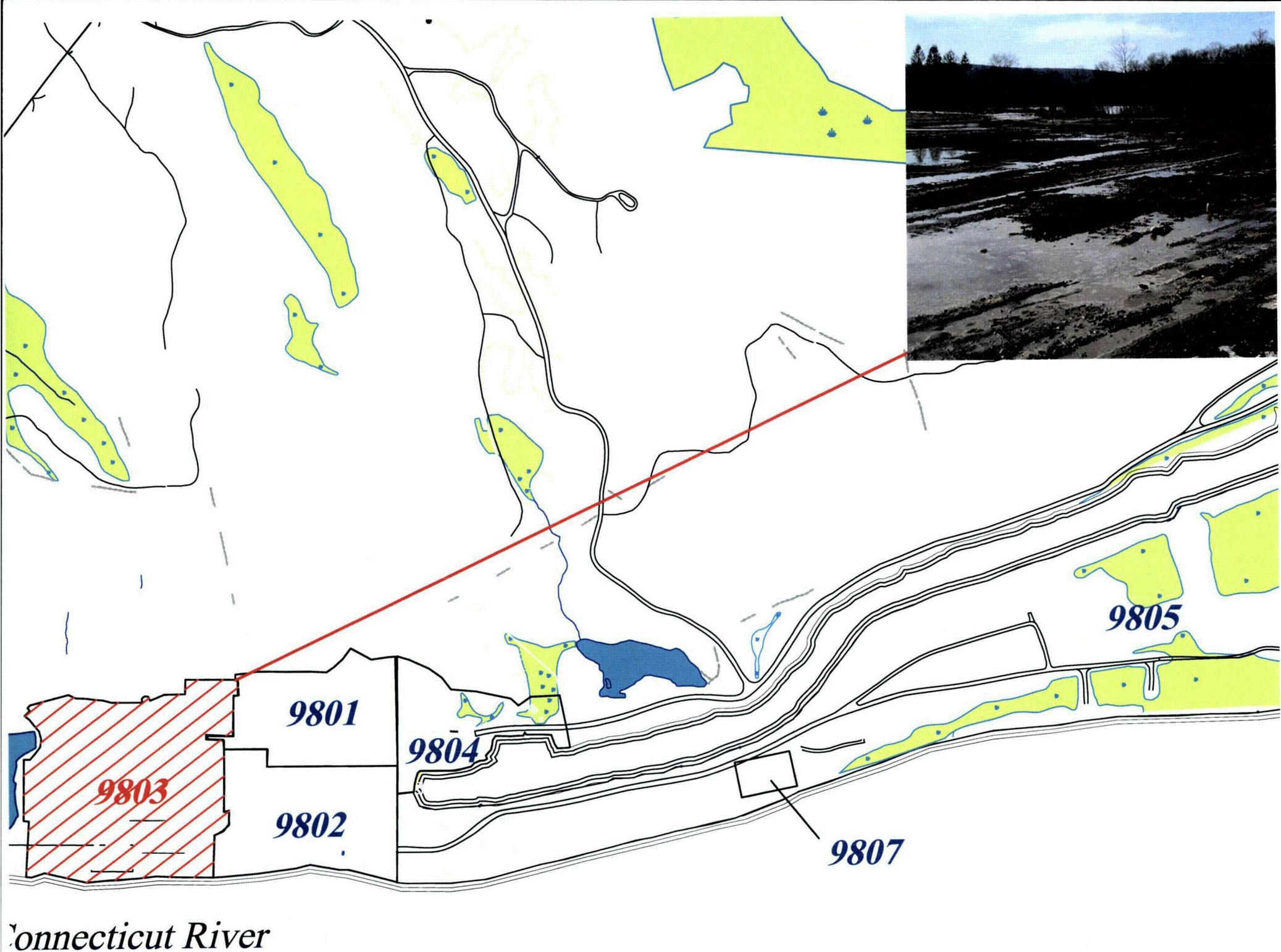
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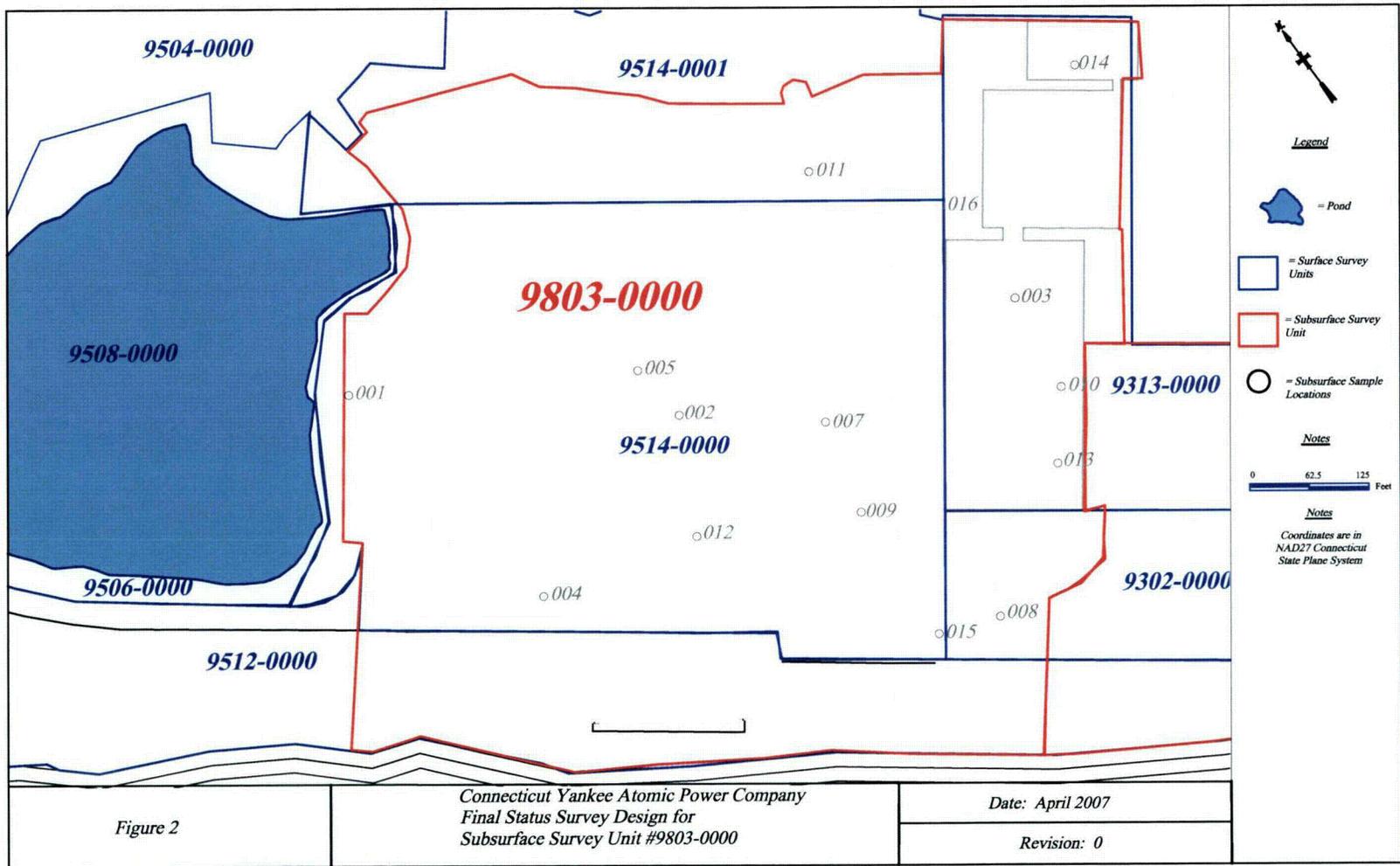
SUBSURFACE AREA ASSOCIATED WITH THE NORTH GROUNDS  
SURVEY UNIT 9803-0000

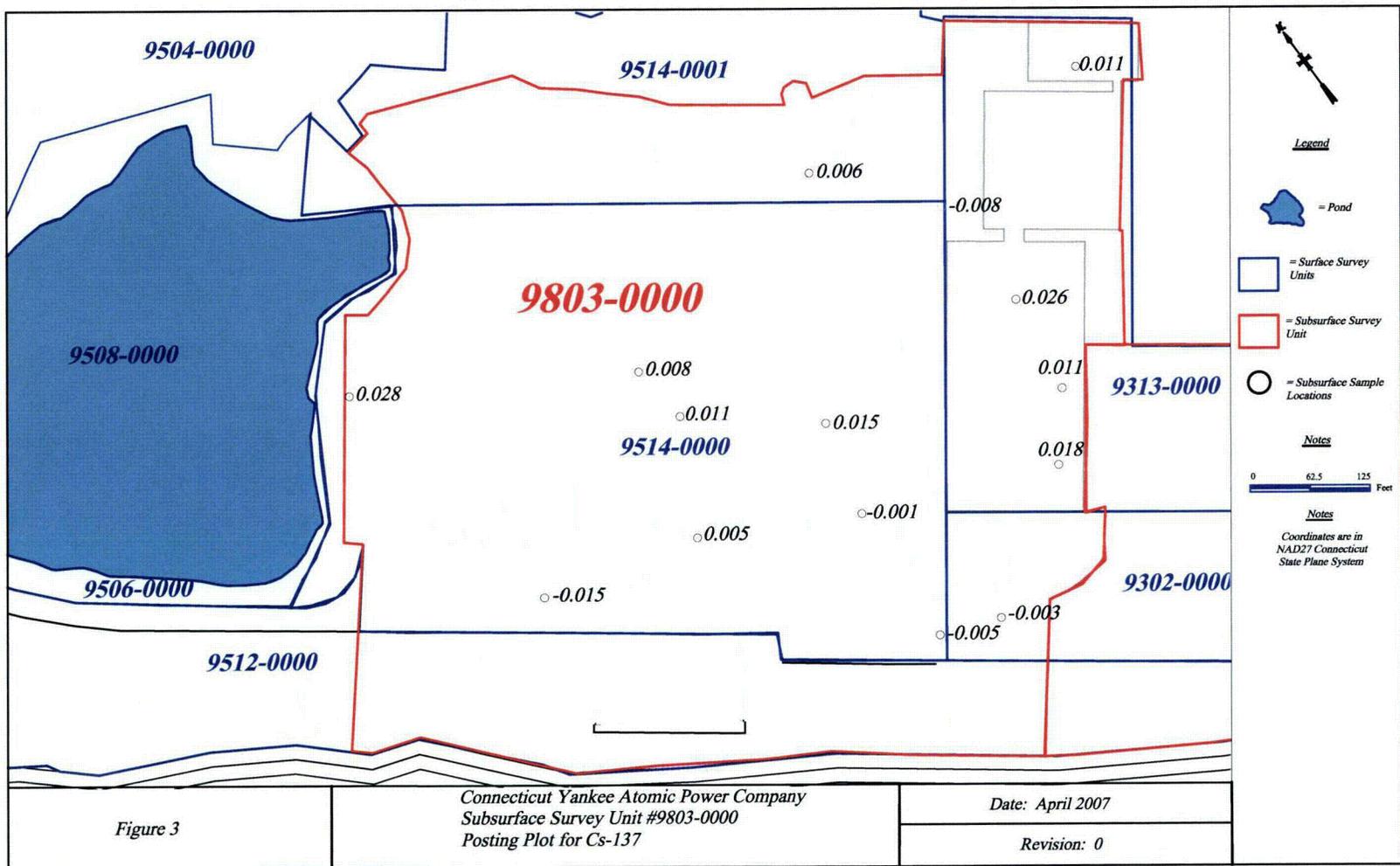
RELEASE RECORD

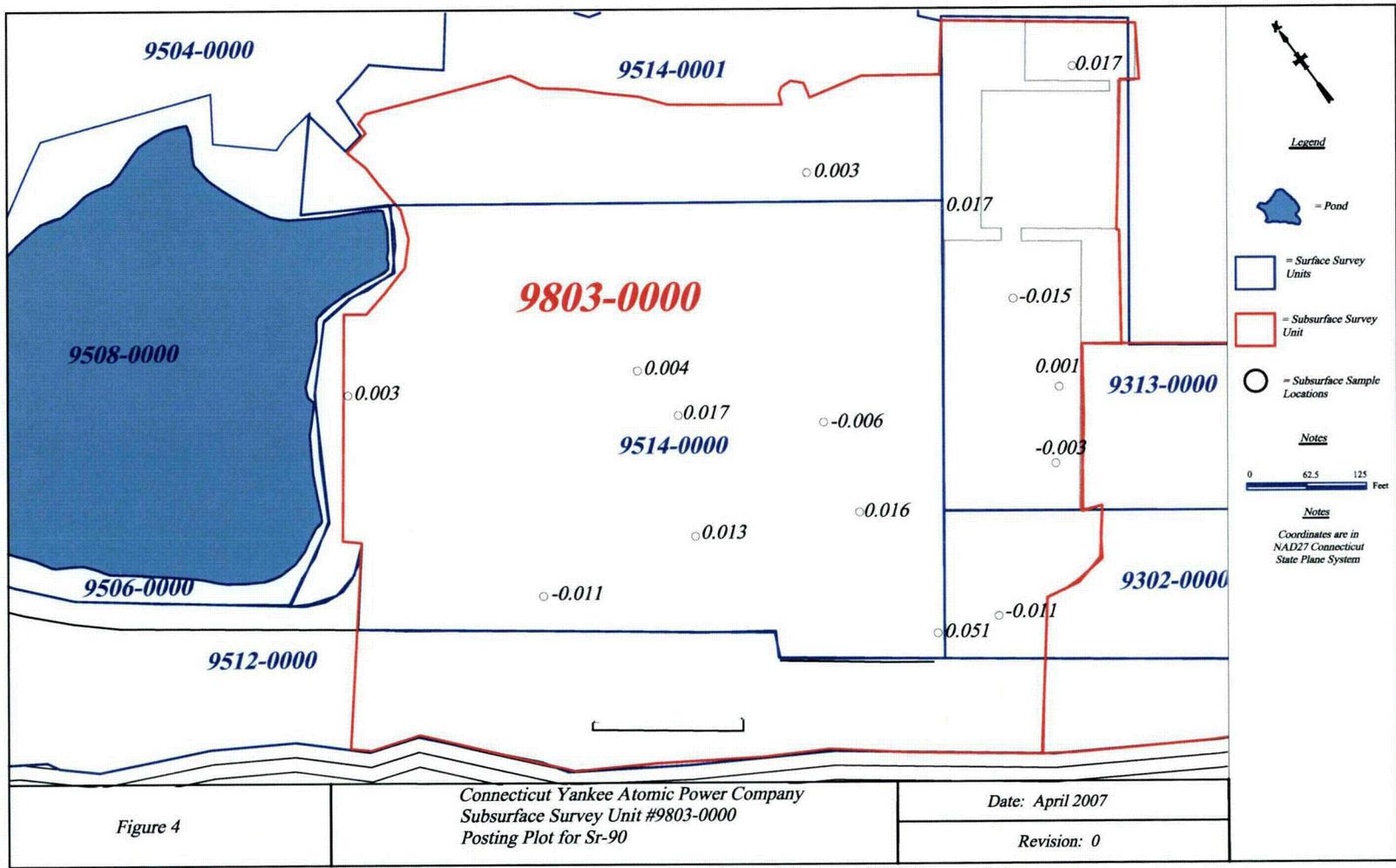
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**ATTACHMENT 1 (FIGURES)**









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SUBSURFACE AREA ASSOCIATED WITH THE NORTH GROUNDS  
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RELEASE RECORD

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**ATTACHMENT 2 (LABORATORY DATA)**

# **General Narrative**

**General Narrative  
for  
Connecticut Yankee Atomic Power Co.  
Work Order: 184030  
SDG: MSR#07-0145**

**April 16, 2007**

**Laboratory Identification:**

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

**Summary**

**Sample receipt**

The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on April 12, 2007 for analysis. Shipping container temperatures were checked, documented, and within specifications. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage.

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

<b><u>Laboratory Identification</u></b>	<b><u>Sample Description</u></b>
184030001	9803-0000-001F
184030002	9803-0000-001FS
184030003	9803-0000-002F
184030004	9803-0000-003F
184030005	9803-0000-004F
184030006	9803-0000-005F
184030007	9803-0000-007F
184030008	9803-0000-008F
184030009	9803-0000-009F
184030010	9803-0000-010F
184030011	9803-0000-011F
184030012	9803-0000-012F
184030013	9803-0000-013F
184030014	9803-0000-014F
184030015	9803-0000-014FS
184030016	9803-0000-015F
184030017	9803-0000-016F

**Items of Note**

There are no items to note.

**Case Narrative**

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

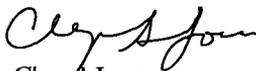
**Analytical Request**

Fifteen samples were analyzed for FSSGAM and Strontium 90. Two samples were analyzed for FSSALL.

**Data Package**

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

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.



Cheryl Jones  
Project Manager

**List of current GEL Certifications as of 16 April 2007**

<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 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**

### Connecticut Yankee Atomic Power Company

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

### Chain of Custody Form

No. 2007-00124

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 & Sr-90	FSSALL						Comments:	
Analytical Lab (Name, City, State): General Engineering Laboratories 2040 Savage Road Charleston, SC 29407 ATT: Cheryl Jones (843-556-8171)													1840307	
Priority: <input type="checkbox"/> 30 D. <input type="checkbox"/> 14 D. <input checked="" type="checkbox"/> 7 D. Other:													Comment, Preservation	Lab Sample ID
Sample Designation	Date	Time												
9803-0000-001F	4/10/07	1007	TS	C	BP	X								
9803-0000-001FS	4/10/07	1007	TS	C	BP	X								
9803-0000-002F	4/10/07	0756	TS	C	BP	X								
9803-0000-003F	4/9/07	1500	TS	C	BP		X							
9803-0000-004F	4/10/07	0950	TS	C	BP	X								
9803-0000-005F	4/10/07	0736	TS	C	BP	X								
9803-0000-007F	4/9/07	1035	TS	C	BP	X								
9803-0000-008F	4/9/07	1340	TS	C	BP	X								
9803-0000-009F	4/9/07	1130	TS	C	BP	X								
9803-0000-010F	4/9/07	1435	TS	C	BP	X								
9803-0000-011F	4/9/07	1540	TS	C	BP	X								
NOTES: PO #: 002332    MSR #: 07-0145 <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.: <u>13</u> Deg. C  Custody Sealed? Custody Seal Intact?  Y <input checked="" type="checkbox"/> N <input type="checkbox"/>					
1) Relinquished By <i>[Signature]</i>		Date/Time 4/11/07 0845		2) Received By <i>[Signature]</i>		Date/Time 4-12-07 915		Bill of Lading #						
3) Relinquished By		Date/Time		4) Received By		Date/Time								
5) Relinquished By		Date/Time		6) Received By		Date/Time								

# Connecticut Yankee Atomic Power Company

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

# Chain of Custody Form

No. 2007-00125

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 & Sr-90	FSSALL						Comments:	
Analytical Lab (Name, City, State): General Engineering Laboratories 2040 Savage Road Charleston, SC 29407 ATT: Cheryl Jones (843-556-8171)													1840307	
Priority: <input type="checkbox"/> 30 D. <input type="checkbox"/> 14 D. <input checked="" type="checkbox"/> 7 D. Other:													Comment, Preservation	Lab Sample ID
Sample Designation	Date	Time												
9803-0000-012F	4/10/07	0821	TS	C	BP	X								
9803-0000-013F	4/9/07	1405	TS	C	BP		X							
9803-0000-014F	4/9/07	1525	TS	C	BP	X								
9803-0000-014FS	4/9/07	1525	TS	C	BP	X								
9803-0000-015F	4/9/07	1305	TS	C	BP	X								
9803-0000-016F	4/10/07	1323	TS	C	BP	X								
NOTES: PO #: 002332    MSR #: 07-0145 <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.: <u>18</u> ° Deg. C  Custody Sealed? Custody Seal Intact?  Y <input checked="" type="checkbox"/> N <input type="checkbox"/>					
1) Relinquished By <i>[Signature]</i>		Date/Time <u>4/11/07 0845</u>		2) Received By <i>T. S. B.</i>		Date/Time <u>4-12-07 915</u>		Bill of Lading #						
3) Relinquished By		Date/Time		4) Received By		Date/Time								
5) Relinquished By		Date/Time		6) Received By		Date/Time								

Figure 1. Sample Check-in List

Date/Time Received: 4-12-07 . 915

SDG#: MSR#07-0144, 0145, 0146, 0148

Work Order Number: 184029, 184030, 184031, 184032

Shipping Container ID: 7907, 1375, 5631 Chain of Custody #: 2007-00123, 2007-00129, 2007-00124, 2007-00125

- 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 13° 14°
- 5. Vermiculite/packing materials is: Wet  Dry
- 6. Number of samples in shipping container: TS 8-8-5, 17  
4-12-07
- 7. Sample holding times exceeded? Yes  No

8. Samples have:	
<input checked="" type="checkbox"/> tape	<input type="checkbox"/> hazard labels
<input type="checkbox"/> custody seals	<input type="checkbox"/> appropriate sample labels
9. Samples are:	
<input checked="" type="checkbox"/> in good condition	<input type="checkbox"/> leaking
<input type="checkbox"/> broken	<input type="checkbox"/> have air bubbles

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

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

Sample Custodian/Laboratory: Tara St Date: 4-12-07 915

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



# SAMPLE RECEIPT & REVIEW FORM

Pages

PM use only

Client: <u>Comcast Yankee</u>	SDG/ARCOC/Work Order: <u>184029, 184030, 184031, 184032</u>
Date Received: <u>4-12-07</u>	PM(A) Review (ensure non-conforming items are resolved prior to signing):
Received By: <u>TS</u>	<u>Clyde Jones</u>

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: seals broken damaged container leaking container other (describe)
2 Samples requiring cold preservation within (4 +/- 2 C)? Record preservation method.		<input checked="" type="checkbox"/>		Circle Coolant # ice bags blue ice dry ice none other descri <u>See below</u>
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: seals broken damaged container leaking container other (describe)
5 Samples requiring chemical preservation at proper pH?		<input checked="" type="checkbox"/>		Sample ID's, containers affected and observed pH:
6 VOA vials free of headspace (defined as < 6mm bubble)?		<input checked="" type="checkbox"/>		Sample ID's and containers affected:
7 Are Encore containers present? (If yes, immediately deliver to VOA laboratory)			<input checked="" type="checkbox"/>	
8 Samples received within holding time?	<input checked="" type="checkbox"/>			Id's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
12 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			
14 Air Bill ,Tracking #'s, & Additional Comments				<u>7907-1375 5631 13°</u> <u>7986 4952 6000 14°</u>

Suspected Hazard Information	Non-Regulated	Regulated	High Level	RSO RAD Receipt # _____ *If > x2 area background is observed on samples identified as "non-regulated/non-radioactive", contact the Radiation Safety group for further investigation.
A Radiological Classification?	<input checked="" type="checkbox"/>			Maximum Counts Observed*: <u>600 cpm</u>
B PCB Regulated?	<input checked="" type="checkbox"/>			
C Shipped as DOT Hazardous Material? If yes, contact Waste Manager or ESH Manager.	<input checked="" type="checkbox"/>			Hazard Class Shipped: UN#:
D Regulated as a Foreign Soil?	<input checked="" type="checkbox"/>			

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 (PMA) review of Hazard classification:  Initials CW Date: 4/12/07

**Subject:** Samples

**From:** "Rick E. Gault" <Gault@CYAPCO.com>

**Date:** Wed, 11 Apr 2007 09:14:03 -0400

**To:** "Cheryl Jones" <cj@gel.com>

Cheryl;

We're sending the following samples (total 22 all in the same package) to GEL today. All of the samples have a 7 day TAT request. It is acceptable for GEL to use the traced/untraced Tc-99 process for these quick TAT requests. See attached COC for requested analyses.

Under MSR 07-0144 – 5 samples - Area 9514-0000

Under MSR 07-0145 – 17 samples – Area 9803-0000

Thanks;

Rick Gault  
CYAPCO  
860-267-3903

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<b>COC 07_00124_00125.pdf</b>	<b>Content-Type:</b> application/octet-stream
	<b>Content-Encoding:</b> base64

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	<b>Content-Description:</b> COC 07_00123.pdf
<b>COC 07_00123.pdf</b>	<b>Content-Type:</b> application/octet-stream
	<b>Content-Encoding:</b> base64

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# **Data Review Qualifier Definitions**

## Data Review Qualifier Definitions

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

# RADIOLOGICAL ANALYSIS

**Radiochemistry Case Narrative  
Connecticut Yankee Atomic Power Co. (YANK)  
Work Order 184030**

**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:** 625064  
**Prep Batch Number:** 624895  
**Dry Soil Prep GL-RAD-A-021 Batch Number:** 624891

<b>Sample ID</b>	<b>Client ID</b>
184030004	9803-0000-003F
184030013	9803-0000-013F
1201314145	Method Blank (MB)
1201314146	184030004(9803-0000-003F) Sample Duplicate (DUP)
1201314147	184030004(9803-0000-003F) Matrix Spike (MS)
1201314148	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 15.

**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: 184030004 (9803-0000-003F).

#### **QC Information**

All of the QC samples met the required acceptance limits.

### **Technical Information:**

#### **Holding Time**

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

#### **Preparation Information**

All preparation criteria have been met for these analyses.

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

Samples were recounted due to detector 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**

**Product:** Alphaspec Pu, Solid-ALL FSS  
**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:** 625065  
**Prep Batch Number:** 624895  
**Dry Soil Prep GL-RAD-A-021 Batch Number:** 624891

<b>Sample ID</b>	<b>Client ID</b>
184030004	9803-0000-003F
184030013	9803-0000-013F
1201314155	Method Blank (MB)
1201314156	184030004(9803-0000-003F) Sample Duplicate (DUP)
1201314157	184030004(9803-0000-003F) Matrix Spike (MS)
1201314158	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 15.

**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: 184030004 (9803-0000-003F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

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

**Preparation Information**

All preparation criteria have been met for these analyses.

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

Samples were recounted due to detector 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>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:	626590
Prep Batch Number:	624895
Dry Soil Prep GL-RAD-A-021 Batch Number:	624891

<b>Sample ID</b>	<b>Client ID</b>
184030004	9803-0000-003F
184030013	9803-0000-013F
1201317873	Method Blank (MB)
1201317874	184030004(9803-0000-003F) Sample Duplicate (DUP)
1201317875	184030004(9803-0000-003F) Matrix Spike (MS)
1201317876	Laboratory Control Sample (LCS)

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-035 REV# 9.

### **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: 184030004 (9803-0000-003F).

#### **QC Information**

All of the QC samples met the required acceptance limits.

### **Technical Information:**

#### **Holding Time**

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

#### **Preparation Information**

All preparation criteria have been met for these analyses.

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

Samples were re-prepped due to high blank activity.

### **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:	625519
Prep Batch Number:	624891

<b>Sample ID</b>	<b>Client ID</b>
184030001	9803-0000-001F
184030002	9803-0000-001FS
184030003	9803-0000-002F
184030004	9803-0000-003F
184030005	9803-0000-004F
184030006	9803-0000-005F
184030007	9803-0000-007F
184030008	9803-0000-008F
184030009	9803-0000-009F
184030010	9803-0000-010F
184030011	9803-0000-011F
184030012	9803-0000-012F
184030013	9803-0000-013F
184030014	9803-0000-014F
184030015	9803-0000-014FS
184030016	9803-0000-015F
184030017	9803-0000-016F
1201315240	Method Blank (MB)
1201315241	184030001(9803-0000-001F) Sample Duplicate (DUP)
1201315242	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 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: 184030001 (9803-0000-001F).

**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**

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**

<b>Qualifier</b>	<b>Reason</b>	<b>Analyte</b>	<b>Sample</b>
UI	Data rejected due to high peak width.	Manganese-54	184030009
UI	Data rejected due to interference.	Europium-155	184030012
			184030014
			184030017
		Manganese-54	184030014
UI	Data rejected due to low abundance.	Actinium-228	184030009
		Bismuth-212	184030001
			184030003
			184030009
			184030011
		Cesium-134	184030011
			184030012
			184030013
			184030014
			184030015
			184030016
			184030017
			1201315241

**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:** 624917  
**Prep Batch Number:** 624895  
**Dry Soil Prep GL-RAD-A-021 Batch Number:** 624891

<b>Sample ID</b>	<b>Client ID</b>
184030001	9803-0000-001F
184030002	9803-0000-001FS
184030003	9803-0000-002F
184030004	9803-0000-003F
184030005	9803-0000-004F
184030006	9803-0000-005F
184030007	9803-0000-007F
184030008	9803-0000-008F
184030009	9803-0000-009F
184030010	9803-0000-010F
1201313721	Method Blank (MB)
1201313722	184029002(9514-0000-016J) Sample Duplicate (DUP)
1201313723	184029002(9514-0000-016J) Matrix Spike (MS)
1201313724	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 11.

**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: 184029002 (9514-0000-016J).

**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 184030001 (9803-0000-001F) was recounted due to a negative result greater than three times the error.

**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**

Samples were dried and reweighed due to low matrix spike recovery.

**Qualifier information**

Manual qualifiers were not required.

**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: 624928

Prep Batch Number: 624895

Dry Soil Prep GL-RAD-A-021 Batch Number: 624891

<b>Sample ID</b>	<b>Client ID</b>
184030011	9803-0000-011F
184030012	9803-0000-012F
184030013	9803-0000-013F
184030014	9803-0000-014F
184030015	9803-0000-014FS
184030016	9803-0000-015F
184030017	9803-0000-016F
1201313741	Method Blank (MB)
1201313742	184030011(9803-0000-011F) Sample Duplicate (DUP)
1201313743	184030011(9803-0000-011F) Matrix Spike (MS)
1201313744	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 11.

**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: 184030011 (9803-0000-011F).

**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.

**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:** 625122

<b>Sample ID</b>	<b>Client ID</b>
184030004	9803-0000-003F
184030013	9803-0000-013F
1201314276	Method Blank (MB)
1201314277	184030004(9803-0000-003F) Sample Duplicate (DUP)
1201314278	184030004(9803-0000-003F) Matrix Spike (MS)
1201314279	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-005 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: 184030004 (9803-0000-003F).

**QC Information**

All of the QC samples met the required acceptance limits.

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

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

**Preparation Information**

All preparation criteria have been met for these analyses.

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

Sample 184030004 (9803-0000-003F) was recounted due to a suspected blank false positive.

**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:	625115
Prep Batch Number:	624895
Dry Soil Prep GL-RAD-A-021 Batch Number:	624891

<b>Sample ID</b>	<b>Client ID</b>
184030004	9803-0000-003F
184030013	9803-0000-013F
1201314267	Method Blank (MB)
1201314268	184030004(9803-0000-003F) Sample Duplicate (DUP)
1201314269	184030004(9803-0000-003F) Matrix Spike (MS)
1201314270	Laboratory Control Sample (LCS)

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-040 REV# 4.

### **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: 184030004 (9803-0000-003F).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

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

**Preparation Information**

All preparation criteria have been met for these analyses.

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

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

**Miscellaneous Information:**

**NCR Documentation**

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

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

<b>Product:</b>	<b>Liquid Scint Ni63, Solid-ALL FSS</b>
Analytical Method:	DOE RESL Ni-1, Modified
Prep Method:	Ash Soil Prep
Dry Soil Prep GL-RAD-A-021 Method:	Dry Soil Prep
Analytical Batch Number:	625116
Prep Batch Number:	624895
Dry Soil Prep GL-RAD-A-021 Batch Number:	624891

<b>Sample ID</b>	<b>Client ID</b>
184030004	9803-0000-003F
184030013	9803-0000-013F
1201314272	Method Blank (MB)
1201314273	184030004(9803-0000-003F) Sample Duplicate (DUP)
1201314274	184030004(9803-0000-003F) Matrix Spike (MS)
1201314275	Laboratory Control Sample (LCS)

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL 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: 184030004 (9803-0000-003F).

#### **QC Information**

All of the QC samples met the required acceptance limits.

### **Technical Information:**

#### **Holding Time**

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

#### **Preparation Information**

All preparation criteria have been met for these analyses.

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

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

### **Miscellaneous Information:**

#### **NCR Documentation**

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

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

#### **Additional Comments**

Additional comments were not required for this sample set.

#### **Qualifier information**

Manual qualifiers were not required.

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

**Product:** LSC, Tritium Dist, Solid - 3 pCi/g  
**Analytical Method:** EPA 906.0 Modified  
**Analytical Batch Number:** 625106

<b>Sample ID</b>	<b>Client ID</b>
184030004	9803-0000-003F
184030013	9803-0000-013F
1201314248	Method Blank (MB)
1201314249	184030004(9803-0000-003F) Sample Duplicate (DUP)
1201314250	184030004(9803-0000-003F) Matrix Spike (MS)
1201314251	Laboratory Control Sample (LCS)

#### **SOP Reference**

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

**Designated QC**

The following sample was used for QC: 184030004 (9803-0000-003F).

**QC Information**

All of the QC samples met the required acceptance limits.

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

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

**Preparation Information**

All preparation criteria have been met for these analyses.

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

Samples were recounted due to a suspected blank false positive.

**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:	625109

<b>Sample ID</b>	<b>Client ID</b>
184030004	9803-0000-003F
184030013	9803-0000-013F
1201314252	Method Blank (MB)
1201314253	184030004(9803-0000-003F) Sample Duplicate (DUP)
1201314254	184030004(9803-0000-003F) Matrix Spike (MS)
1201314255	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-003 REV# 9.

**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: 184030004 (9803-0000-003F).

**QC Information**

All of the QC samples met the required acceptance limits.

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

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

**Preparation Information**

All preparation criteria have been met for these analyses.

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

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

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

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

**Additional Comments**

Additional comments were not required for this sample set.



# SAMPLE DATA SUMMARY

## GEL 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#07-0145 GEL Work Order: 184030

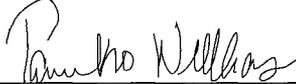
**The Qualifiers in this report are defined as follows:**

- \* 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 GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Cheryl Jones.



Reviewed by \_\_\_\_\_

# GEL 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: April 19, 2007

Client Sample ID:	9803-0000-001F	Project:	YANK01204
Sample ID:	184030001	Client ID:	YANK001
Matrix:	TS	Vol. Recv.:	
Collect Date:	10-APR-07		
Receive Date:	12-APR-07		
Collector:	Client		
Moisture:	8.54%		

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	N
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.522	+/-0.132	0.0454	+/-0.132	0.0908	pCi/g		MJH1	04/16/07	1356	625519	
Americium-241	U	0.026	+/-0.0682	0.0557	+/-0.0682	0.111	pCi/g						
Bismuth-212	UI	0.00	+/-0.167	0.131	+/-0.167	0.263	pCi/g						
Bismuth-214		0.459	+/-0.0869	0.0247	+/-0.0869	0.0494	pCi/g						
Cesium-134	U	0.0223	+/-0.0275	0.017	+/-0.0275	0.0339	pCi/g						
Cesium-137		0.0281	+/-0.0239	0.0128	+/-0.0239	0.0255	pCi/g						
Cobalt-60	U	0.00538	+/-0.0175	0.0153	+/-0.0175	0.0306	pCi/g						
Europium-152	U	0.0238	+/-0.0609	0.0381	+/-0.0609	0.0761	pCi/g						
Europium-154	U	0.0124	+/-0.0562	0.0423	+/-0.0562	0.0844	pCi/g						
Europium-155	U	-0.0291	+/-0.0519	0.0413	+/-0.0519	0.0825	pCi/g						
Lead-212		0.547	+/-0.0594	0.022	+/-0.0594	0.0439	pCi/g						
Lead-214		0.496	+/-0.0742	0.0269	+/-0.0742	0.0537	pCi/g						
Manganese-54	U	0.00646	+/-0.0156	0.014	+/-0.0156	0.028	pCi/g						
Niobium-94	U	0.0109	+/-0.017	0.0132	+/-0.017	0.0263	pCi/g						
Potassium-40		12.0	+/-0.987	0.113	+/-0.987	0.226	pCi/g						
Radium-226		0.459	+/-0.0869	0.0247	+/-0.0869	0.0494	pCi/g						
Silver-108m	U	0.00418	+/-0.0141	0.0124	+/-0.0141	0.0247	pCi/g						
Thallium-208		0.168	+/-0.0297	0.0127	+/-0.0297	0.0254	pCi/g						
<b>Rad Gas Flow Proportional Counting</b>													
<i>GFPC, Sr90, solid-ALL FSS</i>													
Strontium-90	U	0.00254	+/-0.0217	0.0179	+/-0.0217	0.041	pCi/g		KSD1	04/18/07	1525	624917	

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	04/12/07	1117	624891

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3
2	EPA 905.0 Modified
3	EPA 905.0 Modified

# GEL 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: April 19, 2007

Client Sample ID: 9803-0000-001F  
Sample ID: 184030001

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	M
<b>Surrogate/Tracer recovery</b>	<b>Test</b>				<b>Recovery%</b>		<b>Acceptable Limits</b>						
Strontium Carrier		GFPC, Sr90, solid-ALL FSS			70		(25%-125%)						

### Notes:

The Qualifiers in this report are defined as follows :

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the 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
- ND Analyte concentration is not detected above the detection limit
- 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.

# GEL 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: April 19, 2007

Client Sample ID: 9803-0000-001FS  
Sample ID: 184030002  
Matrix: TS  
Collect Date: 10-APR-07  
Receive Date: 12-APR-07  
Collector: Client  
Moisture: 8.74%

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch
<b>Rad Gamma Spec Analysis</b>												
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth Waived</i>												
Actinium-228		0.441	+/-0.192	0.0975	+/-0.192	0.195	pCi/g		MJH1	04/16/07	1346	625519
Americium-241	U	0.0438	+/-0.0394	0.034	+/-0.0394	0.068	pCi/g					
Bismuth-212	U	0.356	+/-0.284	0.193	+/-0.284	0.387	pCi/g					
Bismuth-214		0.454	+/-0.139	0.0474	+/-0.139	0.0948	pCi/g					
Cesium-134	U	0.0184	+/-0.0344	0.0312	+/-0.0344	0.0624	pCi/g					
Cesium-137	U	0.00265	+/-0.0301	0.027	+/-0.0301	0.0539	pCi/g					
Cobalt-60	U	0.0103	+/-0.0313	0.0278	+/-0.0313	0.0556	pCi/g					
Europium-152	U	0.0696	+/-0.0874	0.0603	+/-0.0874	0.121	pCi/g					
Europium-154	U	-0.0354	+/-0.120	0.0848	+/-0.120	0.170	pCi/g					
Europium-155	U	0.0312	+/-0.0599	0.0553	+/-0.0599	0.111	pCi/g					
Lead-212		0.534	+/-0.0821	0.0323	+/-0.0821	0.0646	pCi/g					
Lead-214		0.490	+/-0.108	0.0389	+/-0.108	0.0778	pCi/g					
Manganese-54	U	-0.00404	+/-0.0326	0.024	+/-0.0326	0.0479	pCi/g					
Niobium-94	U	-0.00401	+/-0.0293	0.0256	+/-0.0293	0.0512	pCi/g					
Potassium-40		9.42	+/-1.09	0.185	+/-1.09	0.369	pCi/g					
Radium-226		0.454	+/-0.139	0.0474	+/-0.139	0.0948	pCi/g					
Silver-108m	U	-0.0079	+/-0.0282	0.0206	+/-0.0282	0.0411	pCi/g					
Thallium-208		0.191	+/-0.0682	0.0192	+/-0.0682	0.0385	pCi/g					
<b>Rad Gas Flow Proportional Counting</b>												
<i>GFPC, Sr90, solid-ALL FSS</i>												
Strontium-90	U	0.0101	+/-0.0198	0.0157	+/-0.0198	0.0345	pCi/g		KSD1	04/16/07	2259	624917

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	04/12/07	1117	624891

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3
2	EPA 905.0 Modified

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
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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: April 19, 2007

Client Sample ID: 9803-0000-001FS  
Sample ID: 184030002

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	M
<b>Surrogate/Tracer recovery</b>	<b>Test</b>				<b>Recovery%</b>		<b>Acceptable Limits</b>						
Strontium Carrier	GFPC, Sr90, solid-ALL FSS				79		(25%-125%)						

### Notes:

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- 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
- ND Analyte concentration is not detected above the detection limit
- 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: April 19, 2007

Client Sample ID: 9803-0000-002F  
Sample ID: 184030003  
Matrix: TS  
Collect Date: 10-APR-07  
Receive Date: 12-APR-07  
Collector: Client  
Moisture: 6.12%

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch
<b>Rad Gamma Spec Analysis</b>												
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>												
<i>Waived</i>												
Actinium-228		0.422	+/-0.158	0.0503	+/-0.158	0.101	pCi/g		MJH1	04/16/07	1440	625519
Americium-241	U	0.0648	+/-0.0635	0.0541	+/-0.0635	0.108	pCi/g					
Bismuth-212	UI	0.00	+/-0.234	0.155	+/-0.234	0.309	pCi/g					
Bismuth-214		0.421	+/-0.0829	0.0295	+/-0.0829	0.059	pCi/g					
Cesium-134	U	0.0333	+/-0.0182	0.0178	+/-0.0182	0.0355	pCi/g					
Cesium-137	U	0.0112	+/-0.019	0.0162	+/-0.019	0.0324	pCi/g					
Cobalt-60	U	0.0171	+/-0.0199	0.0184	+/-0.0199	0.0367	pCi/g					
Europium-152	U	-0.0306	+/-0.0576	0.0402	+/-0.0576	0.0803	pCi/g					
Europium-154	U	0.0194	+/-0.0599	0.0525	+/-0.0599	0.105	pCi/g					
Europium-155	U	-0.0039	+/-0.0488	0.044	+/-0.0488	0.088	pCi/g					
Lead-212		0.505	+/-0.0612	0.0234	+/-0.0612	0.0468	pCi/g					
Lead-214		0.541	+/-0.0817	0.0279	+/-0.0817	0.0557	pCi/g					
Manganese-54	U	-0.00497	+/-0.0165	0.0142	+/-0.0165	0.0283	pCi/g					
Niobium-94	U3.510E-05		+/-0.019	0.014	+/-0.019	0.0279	pCi/g					
Potassium-40		7.87	+/-0.800	0.141	+/-0.800	0.281	pCi/g					
Radium-226		0.421	+/-0.0829	0.0295	+/-0.0829	0.059	pCi/g					
Silver-108m	U	-0.00423	+/-0.0151	0.013	+/-0.0151	0.026	pCi/g					
Thallium-208		0.186	+/-0.0422	0.0135	+/-0.0422	0.027	pCi/g					
<b>Rad Gas Flow Proportional Counting</b>												
<i>GFPC, Sr90, solid-ALL FSS</i>												
Strontium-90	U	0.017	+/-0.017	0.0126	+/-0.0171	0.0282	pCi/g		KSD1	04/16/07	2259	624917

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	04/12/07	1117	624891

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3
2	EPA 905.0 Modified

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
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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: April 19, 2007

Client Sample ID: 9803-0000-002F  
Sample ID: 184030003

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	NA
<b>Surrogate/Tracer recovery</b>	<b>Test</b>				<b>Recovery%</b>		<b>Acceptable Limits</b>						
Strontium Carrier		GFPC, Sr90, solid-ALL FSS			83		(25%-125%)						

### Notes:

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- 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
- ND Analyte concentration is not detected above the detection limit
- 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: April 19, 2007

Client Sample ID: 9803-0000-003F  
Sample ID: 184030004  
Matrix: TS  
Collect Date: 09-APR-07  
Receive Date: 12-APR-07  
Collector: Client  
Moisture: 9.22%

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	N
<b>Rad Alpha Spec Analysis</b>													
<i>Alphaspec Am241, Cm, Solid ALL FSS</i>													
Americium-241	U	0.121	+/-0.160	0.0819	+/-0.160	0.257	pCi/g		BXL1	04/16/07	1247	625064	
Curium-242	U	0.0356	+/-0.0698	0.00	+/-0.0699	0.0965	pCi/g						
Curium-243/244	U	-0.0828	+/-0.0513	0.0979	+/-0.0523	0.289	pCi/g						
<i>Alphaspec Pu, Solid-ALL FSS</i>													
Plutonium-238	U	-0.012	+/-0.0517	0.0317	+/-0.0517	0.131	pCi/g		BXL1	04/16/07	1247	625065	
Plutonium-239/240	U	0.0569	+/-0.0871	0.0388	+/-0.0873	0.145	pCi/g						
<i>Liquid Scint Pu241, Solid-ALL FSS</i>													
Plutonium-241	U	-1.17	+/-4.67	3.98	+/-4.67	8.40	pCi/g		GXR1	04/19/07	1228	626590	
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.922	+/-0.271	0.106	+/-0.271	0.212	pCi/g		MJH1	04/16/07	1450	625519	
Americium-241	U	0.00981	+/-0.0627	0.0516	+/-0.0627	0.103	pCi/g						
Bismuth-212		0.607	+/-0.462	0.215	+/-0.462	0.430	pCi/g						
Bismuth-214		0.692	+/-0.165	0.0637	+/-0.165	0.127	pCi/g						
Cesium-134	U	0.0423	+/-0.0464	0.0384	+/-0.0464	0.0768	pCi/g						
Cesium-137	U	0.0258	+/-0.0407	0.033	+/-0.0407	0.066	pCi/g						
Cobalt-60	U	0.0202	+/-0.0404	0.0357	+/-0.0404	0.0713	pCi/g						
Europium-152	U	0.0105	+/-0.109	0.0744	+/-0.109	0.149	pCi/g						
Europium-154	U	-0.0589	+/-0.111	0.0873	+/-0.111	0.175	pCi/g						
Europium-155	U	0.0995	+/-0.0976	0.0745	+/-0.0976	0.149	pCi/g						
Lead-212		0.812	+/-0.109	0.0438	+/-0.109	0.0876	pCi/g						
Lead-214		0.744	+/-0.154	0.0528	+/-0.154	0.106	pCi/g						
Manganese-54	U	0.0104	+/-0.0402	0.0323	+/-0.0402	0.0645	pCi/g						
Niobium-94	U	-0.0298	+/-0.036	0.0283	+/-0.036	0.0566	pCi/g						
Potassium-40		10.4	+/-1.22	0.304	+/-1.22	0.608	pCi/g						
Radium-226		0.692	+/-0.165	0.0637	+/-0.165	0.127	pCi/g						
Silver-108m	U	-0.00128	+/-0.0314	0.0274	+/-0.0314	0.0548	pCi/g						
Thallium-208		0.248	+/-0.0812	0.032	+/-0.0812	0.064	pCi/g						
<b>Rad Gas Flow Proportional Counting</b>													
<i>GFPC, Sr90, solid-ALL FSS</i>													
Strontium-90	U	-0.015	+/-0.0165	0.0153	+/-0.0165	0.0335	pCi/g		KSD1	04/16/07	2259	624917	
<b>Rad Liquid Scintillation Analysis</b>													
<i>LSC, Tritium Dist, Solid - 3 pCi/g</i>													
Tritium	U	-0.565	+/-1.03	0.892	+/-1.03	1.87	pCi/g		AXD2	04/17/07	1535	625106	

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Address : 362 Injun Hollow Rd

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

Report Date: April 19, 2007

Client Sample ID: 9803-0000-003F  
Sample ID: 184030004

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch
<b>Rad Liquid Scintillation Analysis</b>												
<i>Liquid Scint C14, Solid All, FSS</i>												
Carbon-14	U	-0.0433	+/-0.0989	0.0838	+/-0.0989	0.171	pCi/g		AXD2	04/13/07	2210	625109
<i>Liquid Scint Fe55, Solid-ALL FSS</i>												
Iron-55	U	-13.4	+/-24.1	17.2	+/-24.1	36.5	pCi/g		MXP1	04/16/07	2015	625115
<i>Liquid Scint Ni63, Solid-ALL FSS</i>												
Nickel-63	U	-6.58	+/-9.20	8.00	+/-9.20	16.7	pCi/g		MXP1	04/16/07	2212	625116
<i>Liquid Scint Tc99, Solid-ALL FSS</i>												
Technetium-99	U	0.325	+/-0.260	0.210	+/-0.261	0.433	pCi/g		MXP1	04/18/07	0803	625122

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	04/12/07	1117	624891

**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	DOE EML HASL-300, Pu-11-RC Modified
6	EML HASL 300, 4.5.2.3
7	EPA 905.0 Modified
8	EPA 906.0 Modified
9	EPA EERF C-01 Modified
10	DOE RESL Fe-1, Modified
11	DOE RESL Ni-1, Modified
12	DOE EML HASL-300, Tc-02-RC Modified
13	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
Americium-243 Tracer	Alphaspec Am241, Cm, Solid ALL	86	(15%-125%)
Plutonium-242 Tracer	Alphaspec Pu, Solid-ALL FSS	106	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid-ALL FS	94	(25%-125%)
Strontium Carrier	GFPC, Sr90, solid-ALL FSS	85	(25%-125%)
			(15%-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: April 19, 2007

Client Sample ID: 9803-0000-003F  
Sample ID: 184030004

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	M
Iron-59 Tracer		Liquid Scint Fe55, Solid-ALL FS			75								
Nickel Carrier		Liquid Scint Ni63, Solid-ALL FS			87		(25%-125%)						
Technetium-99m Tracer		Liquid Scint Tc99, Solid-ALL FS			85		(15%-125%)						

### Notes:

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  - B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
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  - 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
  - ND Analyte concentration is not detected above the detection limit
  - 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: April 19, 2007

Client Sample ID: 9803-0000-004F  
Sample ID: 184030005  
Matrix: TS  
Collect Date: 10-APR-07  
Receive Date: 12-APR-07  
Collector: Client  
Moisture: 6.62%

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch
<b>Rad Gamma Spec Analysis</b>												
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>												
<i>Waived</i>												
Actinium-228		0.685	+/-0.184	0.0679	+/-0.184	0.136	pCi/g		MJH1	04/16/07	1451	625519
Americium-241	U	0.0419	+/-0.0359	0.0313	+/-0.0359	0.0626	pCi/g					
Bismuth-212	U	0.396	+/-0.357	0.225	+/-0.357	0.450	pCi/g					
Bismuth-214		0.576	+/-0.130	0.0369	+/-0.130	0.0737	pCi/g					
Cesium-134	U	0.0305	+/-0.0287	0.0269	+/-0.0287	0.0538	pCi/g					
Cesium-137	U	-0.0145	+/-0.0298	0.0203	+/-0.0298	0.0405	pCi/g					
Cobalt-60	U	0.00928	+/-0.0272	0.0239	+/-0.0272	0.0477	pCi/g					
Europium-152	U	0.0399	+/-0.0678	0.053	+/-0.0678	0.106	pCi/g					
Europium-154	U	-0.0365	+/-0.0831	0.0658	+/-0.0831	0.132	pCi/g					
Europium-155	U	0.0351	+/-0.0512	0.048	+/-0.0512	0.0959	pCi/g					
Lead-212		0.652	+/-0.0918	0.0294	+/-0.0918	0.0587	pCi/g					
Lead-214		0.547	+/-0.0957	0.0369	+/-0.0957	0.0738	pCi/g					
Manganese-54	U	-0.00283	+/-0.0226	0.0195	+/-0.0226	0.0389	pCi/g					
Niobium-94	U	-0.0158	+/-0.0228	0.0179	+/-0.0228	0.0357	pCi/g					
Potassium-40		9.82	+/-1.13	0.171	+/-1.13	0.342	pCi/g					
Radium-226		0.576	+/-0.130	0.0369	+/-0.130	0.0737	pCi/g					
Silver-108m	U	0.00352	+/-0.0206	0.0183	+/-0.0206	0.0366	pCi/g					
Thallium-208		0.202	+/-0.0516	0.0209	+/-0.0516	0.0417	pCi/g					
<b>Rad Gas Flow Proportional Counting</b>												
<i>GFPC, Sr90, solid-ALL FSS</i>												
Strontium-90	U	-0.0113	+/-0.0135	0.0125	+/-0.0135	0.0278	pCi/g		KSD1	04/16/07	2259	624917

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	04/12/07	1117	624891

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3
2	EPA 905.0 Modified

Surrogate/Tracer recovery	Test	Recovery %	Acceptable Limits
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# GEL 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: April 19, 2007

Client Sample ID: 9803-0000-004F  
Sample ID: 184030005

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	N
<b>Surrogate/Tracer recovery</b>	<b>Test</b>				<b>Recovery %</b>		<b>Acceptable Limits</b>						
Strontium Carrier		GFPC, Sr90, solid-ALL FSS			89		(25%-125%)						

### Notes:

The Qualifiers in this report are defined as follows :

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the 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
- ND Analyte concentration is not detected above the detection limit
- 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.

# GEL 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: April 19, 2007

Client Sample ID: 9803-0000-005F  
Sample ID: 184030006  
Matrix: TS  
Collect Date: 10-APR-07  
Receive Date: 12-APR-07  
Collector: Client  
Moisture: 9.22%

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch
<b>Rad Gamma Spec Analysis</b>												
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>												
<i>Waived</i>												
Actinium-228		0.421	+/-0.226	0.0834	+/-0.226	0.167	pCi/g		MJH1	04/16/07	1451	625519
Americium-241	U	0.0233	+/-0.0377	0.0337	+/-0.0377	0.0673	pCi/g					
Bismuth-212		0.624	+/-0.364	0.211	+/-0.364	0.421	pCi/g					
Bismuth-214		0.401	+/-0.103	0.0416	+/-0.103	0.0832	pCi/g					
Cesium-134	U	0.0443	+/-0.0339	0.0267	+/-0.0339	0.0533	pCi/g					
Cesium-137	U	0.00778	+/-0.036	0.0273	+/-0.036	0.0547	pCi/g					
Cobalt-60	U	-0.0173	+/-0.0315	0.0236	+/-0.0315	0.0472	pCi/g					
Europium-152	U	0.0761	+/-0.0589	0.0607	+/-0.0589	0.121	pCi/g					
Europium-154	U	-0.0196	+/-0.0908	0.073	+/-0.0908	0.146	pCi/g					
Europium-155	U	0.0396	+/-0.0698	0.0506	+/-0.0698	0.101	pCi/g					
Lead-212		0.456	+/-0.0713	0.0306	+/-0.0713	0.0611	pCi/g					
Lead-214		0.424	+/-0.107	0.0391	+/-0.107	0.0781	pCi/g					
Manganese-54	U	0.0104	+/-0.0288	0.026	+/-0.0288	0.052	pCi/g					
Niobium-94	U	0.0311	+/-0.032	0.0266	+/-0.032	0.0531	pCi/g					
Potassium-40		6.76	+/-1.07	0.222	+/-1.07	0.444	pCi/g					
Radium-226		0.401	+/-0.103	0.0416	+/-0.103	0.0832	pCi/g					
Silver-108m	U	0.0114	+/-0.023	0.0212	+/-0.023	0.0423	pCi/g					
Thallium-208		0.164	+/-0.0521	0.0234	+/-0.0521	0.0467	pCi/g					
<b>Rad Gas Flow Proportional Counting</b>												
<i>GFPC, Sr90, solid-ALL FSS</i>												
Strontium-90	U	0.00363	+/-0.0162	0.0132	+/-0.0162	0.0296	pCi/g		KSD1	04/16/07	2259	624917

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	04/12/07	1117	624891

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3
2	EPA 905.0 Modified

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
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# GEL 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: April 19, 2007

Client Sample ID: 9803-0000-005F  
Sample ID: 184030006

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Notes
<b>Surrogate/Tracer recovery</b>	<b>Test</b>				<b>Recovery%</b>		<b>Acceptable Limits</b>						
Strontium Carrier		GFPC, Sr90, solid-ALL FSS			80		(25%-125%)						

Notes:

The Qualifiers in this report are defined as follows :

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the 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
- ND Analyte concentration is not detected above the detection limit
- 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.

# GEL LABORATORIES LLC

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## Certificate of Analysis

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

Contact: Mr. Jack McCarthy  
Project: Soils PO# 002332

Report Date: April 19, 2007

Client Sample ID: 9803-0000-007F  
Sample ID: 184030007  
Matrix: TS  
Collect Date: 09-APR-07  
Receive Date: 12-APR-07  
Collector: Client  
Moisture: 5.46%

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch
<b>Rad Gamma Spec Analysis</b>												
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>												
<i>Waived</i>												
Actinium-228		0.559	+/-0.145	0.0558	+/-0.145	0.112	pCi/g		MJH1	04/16/07	1457	625519
Americium-241	U	0.0269	+/-0.0631	0.0537	+/-0.0631	0.107	pCi/g					
Bismuth-212	U	0.271	+/-0.222	0.141	+/-0.222	0.283	pCi/g					
Bismuth-214		0.539	+/-0.0934	0.0339	+/-0.0934	0.0678	pCi/g					
Cesium-134	U	0.0235	+/-0.0249	0.0206	+/-0.0249	0.0412	pCi/g					
Cesium-137	U	0.0149	+/-0.0199	0.0179	+/-0.0199	0.0359	pCi/g					
Cobalt-60	U	0.00193	+/-0.0213	0.0181	+/-0.0213	0.0362	pCi/g					
Europium-152	U	-0.0105	+/-0.0626	0.0485	+/-0.0626	0.097	pCi/g					
Europium-154	U	-0.0341	+/-0.0731	0.0491	+/-0.0731	0.0982	pCi/g					
Europium-155	U	0.0245	+/-0.055	0.0513	+/-0.055	0.103	pCi/g					
Lead-212		0.598	+/-0.070	0.0273	+/-0.070	0.0546	pCi/g					
Lead-214		0.683	+/-0.100	0.0339	+/-0.100	0.0678	pCi/g					
Manganese-54	U	-0.00765	+/-0.0212	0.0182	+/-0.0212	0.0364	pCi/g					
Niobium-94	U	0.00682	+/-0.0191	0.0167	+/-0.0191	0.0333	pCi/g					
Potassium-40		9.66	+/-0.929	0.139	+/-0.929	0.278	pCi/g					
Radium-226		0.539	+/-0.0934	0.0339	+/-0.0934	0.0678	pCi/g					
Silver-108m	U	0.00375	+/-0.0179	0.0161	+/-0.0179	0.0321	pCi/g					
Thallium-208		0.190	+/-0.0441	0.0161	+/-0.0441	0.0323	pCi/g					
<b>Rad Gas Flow Proportional Counting</b>												
<i>GFPC, Sr90, solid-ALL FSS</i>												
Strontium-90	U	-0.00593	+/-0.0163	0.0143	+/-0.0163	0.0319	pCi/g		KSD1	04/16/07	2300	624917

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	04/12/07	1117	624891

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3
2	EPA 905.0 Modified

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
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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: April 19, 2007

Client Sample ID: 9803-0000-007F  
Sample ID: 184030007

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	NA
<b>Surrogate/Tracer recovery</b>	<b>Test</b>				<b>Recovery%</b>		<b>Acceptable Limits</b>						
Strontium Carrier	GFPC, Sr90, solid-ALL FSS				77		(25%-125%)						

### Notes:

The Qualifiers in this report are defined as follows :

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the 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
- ND Analyte concentration is not detected above the detection limit
- 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.

# GEL 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: April 19, 2007

Client Sample ID: 9803-0000-008F  
Sample ID: 184030008  
Matrix: TS  
Collect Date: 09-APR-07  
Receive Date: 12-APR-07  
Collector: Client  
Moisture: 5.92%

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch
<b>Rad Gamma Spec Analysis</b>												
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>												
<i>Waived</i>												
Actinium-228		0.511	+/-0.194	0.100	+/-0.194	0.200	pCi/g		MJH1	04/16/07	1548	625519
Americium-241	U	0.0327	+/-0.039	0.0336	+/-0.039	0.0671	pCi/g					
Bismuth-212	U	0.311	+/-0.394	0.176	+/-0.394	0.352	pCi/g					
Bismuth-214		0.490	+/-0.106	0.0403	+/-0.106	0.0805	pCi/g					
Cesium-134	U	0.0548	+/-0.0399	0.0321	+/-0.0399	0.0642	pCi/g					
Cesium-137	U	-0.0029	+/-0.0293	0.0259	+/-0.0293	0.0518	pCi/g					
Cobalt-60	U	-0.00875	+/-0.042	0.0288	+/-0.042	0.0575	pCi/g					
Europium-152	U	-0.019	+/-0.0839	0.0552	+/-0.0839	0.110	pCi/g					
Europium-154	U	-0.0513	+/-0.0975	0.0755	+/-0.0975	0.151	pCi/g					
Europium-155	U	-0.0129	+/-0.0546	0.0492	+/-0.0546	0.0984	pCi/g					
Lead-212		0.505	+/-0.0751	0.0296	+/-0.0751	0.0592	pCi/g					
Lead-214		0.465	+/-0.118	0.0411	+/-0.118	0.0822	pCi/g					
Manganese-54	U	-0.000797	+/-0.0274	0.0239	+/-0.0274	0.0478	pCi/g					
Niobium-94	U	0.015	+/-0.0271	0.0253	+/-0.0271	0.0505	pCi/g					
Potassium-40		8.41	+/-1.11	0.197	+/-1.11	0.394	pCi/g					
Radium-226		0.490	+/-0.106	0.0403	+/-0.106	0.0805	pCi/g					
Silver-108m	U	-0.0227	+/-0.0228	0.0182	+/-0.0228	0.0363	pCi/g					
Thallium-208		0.219	+/-0.0554	0.0235	+/-0.0554	0.047	pCi/g					
<b>Rad Gas Flow Proportional Counting</b>												
<i>GFPC, Sr90, solid-ALL FSS</i>												
Strontium-90	U	-0.0108	+/-0.0154	0.014	+/-0.0154	0.0312	pCi/g		KSD1	04/16/07	2300	624917

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	04/12/07	1117	624891

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3
2	EPA 905.0 Modified

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
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# GEL 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: April 19, 2007

Client Sample ID: 9803-0000-008F  
Sample ID: 184030008

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Notes
<b>Surrogate/Tracer recovery</b>	<b>Test</b>				<b>Recovery%</b>		<b>Acceptable Limits</b>						
Strontium Carrier		GFPC, Sr90, solid-ALL FSS			79		(25%-125%)						

### Notes:

The Qualifiers in this report are defined as follows :

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the 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
- ND Analyte concentration is not detected above the detection limit
- 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.

# GEL 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: April 19, 2007

Client Sample ID: 9803-0000-009F  
Sample ID: 184030009  
Matrix: TS  
Collect Date: 09-APR-07  
Receive Date: 12-APR-07  
Collector: Client  
Moisture: 2.1%

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch
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**Rad Gamma Spec Analysis**

*Gamma, Solid-FSS GAM & ALL FSS 226 Ingrowth  
Waived*

Actinium-228	UI	0.00	+/-0.236	0.166	+/-0.236	0.331	pCi/g		MJH1	04/16/07	1554	625519
Americium-241	U	0.0542	+/-0.0431	0.0374	+/-0.0431	0.0747	pCi/g					
Bismuth-212	UI	0.00	+/-0.395	0.241	+/-0.395	0.481	pCi/g					
Bismuth-214		0.631	+/-0.134	0.0458	+/-0.134	0.0914	pCi/g					
Cesium-134	U	0.0204	+/-0.0598	0.0312	+/-0.0598	0.0624	pCi/g					
Cesium-137	U	-0.000511	+/-0.0318	0.027	+/-0.0318	0.0539	pCi/g					
Cobalt-60	U	0.00338	+/-0.0291	0.0248	+/-0.0291	0.0496	pCi/g					
Europium-152	U	-0.038	+/-0.0787	0.0602	+/-0.0787	0.120	pCi/g					
Europium-154	U	-0.0213	+/-0.108	0.0748	+/-0.108	0.150	pCi/g					
Europium-155	U	0.0731	+/-0.0901	0.0595	+/-0.0901	0.119	pCi/g					
Lead-212		0.614	+/-0.0962	0.0381	+/-0.0962	0.0762	pCi/g					
Lead-214		0.774	+/-0.132	0.0451	+/-0.132	0.0902	pCi/g					
Manganese-54	UI	0.00	+/-0.0596	0.0259	+/-0.0596	0.0518	pCi/g					
Niobium-94	U	-0.0033	+/-0.0273	0.0227	+/-0.0273	0.0454	pCi/g					
Potassium-40		10.4	+/-1.19	0.199	+/-1.19	0.398	pCi/g					
Radium-226		0.631	+/-0.134	0.0458	+/-0.134	0.0914	pCi/g					
Silver-108m	U	-0.00806	+/-0.0242	0.0206	+/-0.0242	0.0411	pCi/g					
Thallium-208		0.187	+/-0.0496	0.0262	+/-0.0496	0.0523	pCi/g					

**Rad Gas Flow Proportional Counting**

*GFPC, Sr90, solid-ALL FSS*

Strontium-90	U	0.0164	+/-0.015	0.0107	+/-0.015	0.0243	pCi/g		KSD1	04/16/07	2300	624917
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**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	04/12/07	1117	624891

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3
2	EPA 905.0 Modified

Surrogate/Tracer recovery	Test	Recovery %	Acceptable Limits
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# GEL 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: April 19, 2007

Client Sample ID: 9803-0000-009F  
Sample ID: 184030009

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	N
<b>Surrogate/Tracer recovery</b>	<b>Test</b>				<b>Recovery%</b>		<b>Acceptable Limits</b>						
Strontium Carrier		GFPC, Sr90, solid-ALL	FSS		86		(25%-125%)						

### Notes:

The Qualifiers in this report are defined as follows :

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the 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
- ND Analyte concentration is not detected above the detection limit
- 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.

# GEL 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: April 19, 2007

Client Sample ID: 9803-0000-010F  
Sample ID: 184030010  
Matrix: TS  
Collect Date: 09-APR-07  
Receive Date: 12-APR-07  
Collector: Client  
Moisture: 7.63%

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch
<b>Rad Gamma Spec Analysis</b>												
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>												
<i>Waived</i>												
Actinium-228		0.705	+/-0.143	0.0396	+/-0.143	0.0791	pCi/g		MJH1	04/16/07	1844	625519
Americium-241	U	0.0646	+/-0.080	0.067	+/-0.080	0.134	pCi/g					
Bismuth-212		0.480	+/-0.159	0.0853	+/-0.159	0.170	pCi/g					
Bismuth-214		0.624	+/-0.0795	0.0216	+/-0.0795	0.0432	pCi/g					
Cesium-134	U	0.0258	+/-0.0175	0.0144	+/-0.0175	0.0287	pCi/g					
Cesium-137	U	0.0108	+/-0.0137	0.011	+/-0.0137	0.0219	pCi/g					
Cobalt-60	U	-0.00421	+/-0.0134	0.011	+/-0.0134	0.0219	pCi/g					
Europium-152	U	-0.0173	+/-0.0404	0.0307	+/-0.0404	0.0614	pCi/g					
Europium-154	U	-0.0541	+/-0.043	0.0327	+/-0.043	0.0654	pCi/g					
Europium-155	U	0.0471	+/-0.0447	0.0368	+/-0.0447	0.0736	pCi/g					
Lead-212		0.712	+/-0.0663	0.0176	+/-0.0663	0.0352	pCi/g					
Lead-214		0.736	+/-0.0819	0.0214	+/-0.0819	0.0427	pCi/g					
Manganese-54	U	-0.000683	+/-0.0136	0.0118	+/-0.0136	0.0236	pCi/g					
Niobium-94	U	0.00271	+/-0.0124	0.0106	+/-0.0124	0.0212	pCi/g					
Potassium-40		10.3	+/-0.860	0.0962	+/-0.860	0.192	pCi/g					
Radium-226		0.624	+/-0.0795	0.0216	+/-0.0795	0.0432	pCi/g					
Silver-108m	U	-0.00219	+/-0.0119	0.0104	+/-0.0119	0.0208	pCi/g					
Thallium-208		0.231	+/-0.0338	0.0112	+/-0.0338	0.0224	pCi/g					

### Rad Gas Flow Proportional Counting

*GFPC, Sr90, solid-ALL FSS*

Strontium-90	U	0.00116	+/-0.0139	0.0115	+/-0.0139	0.0259	pCi/g		KSD1	04/16/07	2300	624917
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### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	04/12/07	1117	624891

### The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3
2	EPA 905.0 Modified

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
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# GEL 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: April 19, 2007

Client Sample ID: 9803-0000-010F  
Sample ID: 184030010

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	N
<b>Surrogate/Tracer recovery</b>	<b>Test</b>				<b>Recovery %</b>		<b>Acceptable Limits</b>						
Strontium Carrier	GFPC, Sr90, solid-ALL	FSS			87		(25%-125%)						

### Notes:

The Qualifiers in this report are defined as follows :

- \*\* Analyte is a surrogate compound
  - < Result is less than value reported
  - > Result is greater than value reported
  - A The TIC is a suspected aldol-condensation product
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  - 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
  - ND Analyte concentration is not detected above the detection limit
  - 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: April 19, 2007

Client Sample ID:	9803-0000-011F	Project:	YANK01204
Sample ID:	184030011	Client ID:	YANK001
Matrix:	TS	Vol. Recv.:	
Collect Date:	09-APR-07		
Receive Date:	12-APR-07		
Collector:	Client		
Moisture:	5.6%		

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch
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**Rad Gamma Spec Analysis**

*Gamma, Solid-FSS GAM & ALL FSS 226 Ingrowth  
Waived*

Actinium-228		0.485	+/-0.115	0.0405	+/-0.115	0.081	pCi/g		MJH1	04/16/07	1844	625519
Americium-241	U	0.0319	+/-0.0603	0.0507	+/-0.0603	0.101	pCi/g					
Bismuth-212	UI	0.00	+/-0.166	0.109	+/-0.166	0.217	pCi/g					
Bismuth-214		0.686	+/-0.0822	0.0221	+/-0.0822	0.0442	pCi/g					
Cesium-134	UI	0.00	+/-0.0207	0.0138	+/-0.0207	0.0276	pCi/g					
Cesium-137	U	0.00601	+/-0.0184	0.0121	+/-0.0184	0.0243	pCi/g					
Cobalt-60	U	0.00364	+/-0.0145	0.0124	+/-0.0145	0.0248	pCi/g					
Europium-152	U	-0.0587	+/-0.058	0.0313	+/-0.058	0.0626	pCi/g					
Europium-154	U	-0.0433	+/-0.0462	0.037	+/-0.0462	0.074	pCi/g					
Europium-155	U	0.0182	+/-0.0374	0.0342	+/-0.0374	0.0683	pCi/g					
Lead-212		0.447	+/-0.0489	0.0177	+/-0.0489	0.0355	pCi/g					
Lead-214		0.798	+/-0.094	0.022	+/-0.094	0.044	pCi/g					
Manganese-54	U	0.00802	+/-0.0144	0.0126	+/-0.0144	0.0253	pCi/g					
Niobium-94	U	-0.00628	+/-0.0128	0.011	+/-0.0128	0.0219	pCi/g					
Potassium-40		10.4	+/-0.855	0.116	+/-0.855	0.232	pCi/g					
Radium-226		0.686	+/-0.0822	0.0221	+/-0.0822	0.0442	pCi/g					
Silver-108m	U	-0.00829	+/-0.0114	0.00982	+/-0.0114	0.0196	pCi/g					
Thallium-208		0.129	+/-0.0261	0.0111	+/-0.0261	0.0223	pCi/g					

**Rad Gas Flow Proportional Counting**

*GFPC, Sr90, solid-ALL FSS*

Strontium-90	U	0.0026	+/-0.0163	0.0134	+/-0.0163	0.0297	pCi/g		NXL3	04/16/07	2031	624928
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**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	04/12/07	1117	624891

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3
2	EPA 905.0 Modified

# GEL 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: April 19, 2007

Client Sample ID: 9803-0000-011F  
Sample ID: 184030011

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	N
<b>Surrogate/Tracer recovery</b>	<b>Test</b>				<b>Recovery%</b>		<b>Acceptable Limits</b>						
Strontium Carrier		GFPC, Sr90, solid-ALL FSS			86		(25%-125%)						

### Notes:

The Qualifiers in this report are defined as follows :

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- 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
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- 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: April 19, 2007

Client Sample ID: 9803-0000-012F  
Sample ID: 184030012  
Matrix: TS  
Collect Date: 10-APR-07  
Receive Date: 12-APR-07  
Collector: Client  
Moisture: 11.7%

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch
<b>Rad Gamma Spec Analysis</b>												
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>												
<i>Waived</i>												
Actinium-228		0.802	+/-0.128	0.037	+/-0.128	0.0739	pCi/g		MJH1	04/16/07	1845	625519
Americium-241	U	0.0338	+/-0.045	0.0377	+/-0.045	0.0753	pCi/g					
Bismuth-212		0.497	+/-0.180	0.0749	+/-0.180	0.150	pCi/g					
Bismuth-214		0.713	+/-0.0884	0.0188	+/-0.0884	0.0376	pCi/g					
Cesium-134	UI	0.00	+/-0.0219	0.0125	+/-0.0219	0.0249	pCi/g					
Cesium-137	U	0.00466	+/-0.0146	0.0109	+/-0.0146	0.0218	pCi/g					
Cobalt-60	U	0.00175	+/-0.0203	0.0114	+/-0.0203	0.0227	pCi/g					
Europium-152	U	-0.0222	+/-0.038	0.027	+/-0.038	0.054	pCi/g					
Europium-154	U	-0.0168	+/-0.0394	0.0323	+/-0.0394	0.0646	pCi/g					
Europium-155	UI	0.00	+/-0.0443	0.0278	+/-0.0443	0.0556	pCi/g					
Lead-212		0.767	+/-0.0677	0.0157	+/-0.0677	0.0313	pCi/g					
Lead-214		0.773	+/-0.081	0.0195	+/-0.081	0.039	pCi/g					
Manganese-54	U	0.00618	+/-0.0134	0.0104	+/-0.0134	0.0207	pCi/g					
Niobium-94	U	-0.00581	+/-0.0114	0.0094	+/-0.0114	0.0188	pCi/g					
Potassium-40		10.8	+/-0.821	0.0908	+/-0.821	0.182	pCi/g					
Radium-226		0.713	+/-0.0884	0.0188	+/-0.0884	0.0376	pCi/g					
Silver-108m	U	0.0143	+/-0.0106	0.00967	+/-0.0106	0.0193	pCi/g					
Thallium-208		0.228	+/-0.0314	0.0104	+/-0.0314	0.0207	pCi/g					
<b>Rad Gas Flow Proportional Counting</b>												
<i>GFPC, Sr90, solid-ALL FSS</i>												
Strontium-90	U	0.0128	+/-0.0168	0.0127	+/-0.0168	0.0286	pCi/g		NXL3	04/16/07	2031	624928

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	04/12/07	1117	624891

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3
2	EPA 905.0 Modified

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
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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: April 19, 2007

Client Sample ID: 9803–0000–012F  
Sample ID: 184030012

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	N
<b>Surrogate/Tracer recovery</b>	<b>Test</b>				<b>Recovery%</b>		<b>Acceptable Limits</b>						
Strontium Carrier	GFPC, Sr90, solid–ALL	FSS			79		(25%–125%)						

### Notes:

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- \*\* Analyte is a surrogate compound
  - < Result is less than value reported
  - > Result is greater than value reported
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  - 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
  - ND Analyte concentration is not detected above the detection limit
  - 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: April 19, 2007

Client Sample ID: 9803-0000-013F  
Sample ID: 184030013  
Matrix: TS  
Collect Date: 09-APR-07  
Receive Date: 12-APR-07  
Collector: Client  
Moisture: 9.95%

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	N
<b>Rad Alpha Spec Analysis</b>													
<i>Alphaspec Am241, Cm, Solid ALL FSS</i>													
Americium-241	U	0.00464	+/-0.0737	0.0585	+/-0.0737	0.205	pCi/g		BXL1	04/16/07	1247	625064	
Curium-242	U	-0.00807	+/-0.0158	0.0302	+/-0.0159	0.152	pCi/g						
Curium-243/244	U	-0.0691	+/-0.0845	0.105	+/-0.0849	0.299	pCi/g						
<i>Alphaspec Pu, Solid-ALL FSS</i>													
Plutonium-238	U	0.061	+/-0.121	0.0744	+/-0.122	0.228	pCi/g		BXL1	04/16/07	1247	625065	
Plutonium-239/240	U	-0.0211	+/-0.0239	0.0456	+/-0.024	0.171	pCi/g						
<i>Liquid Scint Pu241, Solid-ALL FSS</i>													
Plutonium-241	U	-2.8	+/-5.13	4.45	+/-5.13	9.39	pCi/g		GXR1	04/19/07	1244	626590	
<b>Rad Gamma Spec Analysis</b>													
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>													
<i>Waived</i>													
Actinium-228		0.636	+/-0.114	0.0404	+/-0.114	0.0808	pCi/g		MJH1	04/16/07	1845	625519	
Americium-241	U	-0.00138	+/-0.0201	0.0176	+/-0.0201	0.0352	pCi/g						
Bismuth-212		0.395	+/-0.180	0.090	+/-0.180	0.180	pCi/g						
Bismuth-214		0.661	+/-0.0846	0.0216	+/-0.0846	0.0432	pCi/g						
Cesium-134	UI	0.00	+/-0.0231	0.0154	+/-0.0231	0.0308	pCi/g						
Cesium-137	U	0.018	+/-0.0208	0.0126	+/-0.0208	0.0251	pCi/g						
Cobalt-60	U	-0.00369	+/-0.015	0.0122	+/-0.015	0.0245	pCi/g						
Europium-152	U	-0.0032	+/-0.0311	0.0282	+/-0.0311	0.0564	pCi/g						
Europium-154	U	-0.0288	+/-0.0429	0.0341	+/-0.0429	0.0681	pCi/g						
Europium-155	U	0.0416	+/-0.0439	0.0262	+/-0.0439	0.0524	pCi/g						
Lead-212		0.643	+/-0.0668	0.0151	+/-0.0668	0.0302	pCi/g						
Lead-214		0.730	+/-0.0843	0.0204	+/-0.0843	0.0408	pCi/g						
Manganese-54	U	0.022	+/-0.0181	0.0111	+/-0.0181	0.0222	pCi/g						
Niobium-94	U	0.0151	+/-0.0175	0.0122	+/-0.0175	0.0244	pCi/g						
Potassium-40		9.11	+/-0.730	0.0987	+/-0.730	0.197	pCi/g						
Radium-226		0.661	+/-0.0846	0.0216	+/-0.0846	0.0432	pCi/g						
Silver-108m	U	-0.00124	+/-0.0111	0.00981	+/-0.0111	0.0196	pCi/g						
Thallium-208		0.205	+/-0.0337	0.0115	+/-0.0337	0.0231	pCi/g						
<b>Rad Gas Flow Proportional Counting</b>													
<i>GFPC, Sr90, solid-ALL FSS</i>													
Strontium-90	U	-0.00288	+/-0.0188	0.016	+/-0.0188	0.0351	pCi/g		NXL3	04/16/07	2032	624928	
<b>Rad Liquid Scintillation Analysis</b>													
<i>LSC, Tritium Dist, Solid - 3 pCi/g</i>													
Tritium	U	0.477	+/-1.08	0.887	+/-1.08	1.86	pCi/g		AXD2	04/17/07	1637	625106	

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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: April 19, 2007

Client Sample ID: 9803-0000-013F  
Sample ID: 184030013

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch
<b>Rad Liquid Scintillation Analysis</b>												
<i>Liquid Scint C14, Solid ALL FSS</i>												
Carbon-14	U	-0.0629	+/-0.100	0.085	+/-0.100	0.173	pCi/g		AXD2	04/13/07	2312	625109
<i>Liquid Scint Fe55, Solid-ALL FSS</i>												
Iron-55	U	-1.08	+/-30.9	21.5	+/-30.9	45.6	pCi/g		MXP1	04/16/07	2032	625115
<i>Liquid Scint Ni63, Solid-ALL FSS</i>												
Nickel-63	U	-6.66	+/-10.5	9.11	+/-10.5	19.1	pCi/g		MXP1	04/16/07	2229	625116
<i>Liquid Scint Tc99, Solid-ALL FSS</i>												
Technetium-99	U	0.0752	+/-0.217	0.180	+/-0.217	0.370	pCi/g		MXP1	04/17/07	1152	625122

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	04/12/07	1117	624891

**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	DOE EML HASL-300, Pu-11-RC Modified
6	EML HASL 300, 4.5.2.3
7	EPA 905.0 Modified
8	EPA 906.0 Modified
9	EPA EERF C-01 Modified
10	DOE RESL Fe-1, Modified
11	DOE RESL Ni-1, Modified
12	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
Americium-243 Tracer	Alphaspec Am241, Cm, Solid ALL	89	(15%-125%)
Plutonium-242 Tracer	Alphaspec Pu, Solid-ALL FSS	96	(15%-125%)
Plutonium-242 Tracer	Liquid Scint Pu241, Solid-ALL FS	84	(25%-125%)
Strontium Carrier	GFPC, Sr90, solid-ALL FSS	82	(25%-125%)
Iron-59 Tracer	Liquid Scint Fe55, Solid-ALL FS	68	(15%-125%)
Nickel Carrier	Liquid Scint Ni63, Solid-ALL FS	79	(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: April 19, 2007

Client Sample ID: 9803-0000-013F  
Sample ID: 184030013

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Λ	
Technetium-99m Tracer		Liquid Scint Tc99, Solid-ALL FS			73		(15%-125%)							

Notes:

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  - B For General Chemistry and Organic analysis the 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
  - ND Analyte concentration is not detected above the detection limit
  - 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: April 19, 2007

Client Sample ID: 9803-0000-014F  
Sample ID: 184030014  
Matrix: TS  
Collect Date: 09-APR-07  
Receive Date: 12-APR-07  
Collector: Client  
Moisture: 4.09%

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch #
<b>Rad Gamma Spec Analysis</b>												
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>												
<i>Waived</i>												
Actinium-228		0.854	+/-0.133	0.0314	+/-0.133	0.0627	pCi/g		MJH1	04/16/07	1845	625519
Americium-241	U	0.0401	+/-0.0654	0.0556	+/-0.0654	0.111	pCi/g					
Bismuth-212		0.506	+/-0.150	0.0666	+/-0.150	0.133	pCi/g					
Bismuth-214		0.811	+/-0.0895	0.0184	+/-0.0895	0.0368	pCi/g					
Cesium-134	UI	0.00	+/-0.020	0.0117	+/-0.020	0.0235	pCi/g					
Cesium-137	U	0.0113	+/-0.0123	0.00947	+/-0.0123	0.0189	pCi/g					
Cobalt-60	U	-0.00193	+/-0.0107	0.00915	+/-0.0107	0.0183	pCi/g					
Europium-152	U	-0.0238	+/-0.0321	0.0235	+/-0.0321	0.0471	pCi/g					
Europium-154	U	0.0312	+/-0.0366	0.0286	+/-0.0366	0.0572	pCi/g					
Europium-155	UI	0.00	+/-0.0474	0.0315	+/-0.0474	0.0631	pCi/g					
Lead-212		0.887	+/-0.0776	0.0143	+/-0.0776	0.0286	pCi/g					
Lead-214		0.980	+/-0.0956	0.0169	+/-0.0956	0.0338	pCi/g					
Manganese-54	UI	0.00	+/-0.0127	0.00875	+/-0.0127	0.0175	pCi/g					
Niobium-94	U	0.00557	+/-0.010	0.0087	+/-0.010	0.0174	pCi/g					
Potassium-40		11.8	+/-0.808	0.0797	+/-0.808	0.159	pCi/g					
Radium-226		0.811	+/-0.0895	0.0184	+/-0.0895	0.0368	pCi/g					
Silver-108m	U	-0.00492	+/-0.0089	0.00783	+/-0.0089	0.0157	pCi/g					
Thallium-208		0.267	+/-0.0335	0.00883	+/-0.0335	0.0177	pCi/g					
<b>Rad Gas Flow Proportional Counting</b>												
<i>GFPC, Sr90, solid-ALL FSS</i>												
Strontium-90	U	0.0167	+/-0.0184	0.0138	+/-0.0184	0.0308	pCi/g		NXL3	04/16/07	2032	624928

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	04/12/07	1117	624891

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3
2	EPA 905.0 Modified

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
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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: April 19, 2007

Client Sample ID: 9803-0000-014F  
Sample ID: 184030014

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	N
<b>Surrogate/Tracer recovery</b>	<b>Test</b>				<b>Recovery %</b>		<b>Acceptable Limits</b>						
Strontium Carrier		GFPC, Sr90, solid-ALL FSS			85		(25%-125%)						

### Notes:

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  - 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
  - ND Analyte concentration is not detected above the detection limit
  - 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
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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: April 19, 2007

Client Sample ID: 9803-0000-014FS  
Sample ID: 184030015  
Matrix: TS  
Collect Date: 09-APR-07  
Receive Date: 12-APR-07  
Collector: Client  
Moisture: 4.05%

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch
<b>Rad Gamma Spec Analysis</b>												
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>												
<i>Waived</i>												
Actinium-228		0.479	+/-0.0966	0.0306	+/-0.0966	0.0612	pCi/g		MJH1	04/16/07	1846	625519
Americium-241	U	0.0338	+/-0.0446	0.0382	+/-0.0446	0.0764	pCi/g					
Bismuth-212		0.311	+/-0.131	0.0638	+/-0.131	0.128	pCi/g					
Bismuth-214		0.431	+/-0.0618	0.0161	+/-0.0618	0.0321	pCi/g					
Cesium-134	UI	0.00	+/-0.017	0.0115	+/-0.017	0.0229	pCi/g					
Cesium-137	U	-0.00357	+/-0.0109	0.00928	+/-0.0109	0.0185	pCi/g					
Cobalt-60	U	-0.0024	+/-0.0105	0.00878	+/-0.0105	0.0176	pCi/g					
Europium-152	U	-0.0366	+/-0.0317	0.0237	+/-0.0317	0.0473	pCi/g					
Europium-154	U	0.0065	+/-0.0365	0.0295	+/-0.0365	0.0589	pCi/g					
Europium-155	U	0.0375	+/-0.0344	0.0258	+/-0.0344	0.0517	pCi/g					
Lead-212		0.453	+/-0.0455	0.0134	+/-0.0455	0.0267	pCi/g					
Lead-214		0.426	+/-0.0576	0.0174	+/-0.0576	0.0347	pCi/g					
Manganese-54	U	0.00673	+/-0.00935	0.00876	+/-0.00935	0.0175	pCi/g					
Niobium-94	U	0.000264	+/-0.00981	0.00848	+/-0.00981	0.017	pCi/g					
Potassium-40		8.96	+/-0.731	0.0785	+/-0.731	0.157	pCi/g					
Radium-226		0.431	+/-0.0618	0.0161	+/-0.0618	0.0321	pCi/g					
Silver-108m	U	-0.0076	+/-0.00897	0.00775	+/-0.00897	0.0155	pCi/g					
Thallium-208		0.153	+/-0.0249	0.00811	+/-0.0249	0.0162	pCi/g					
<b>Rad Gas Flow Proportional Counting</b>												
<i>GFPC, Sr90, solid-ALL FSS</i>												
Strontium-90	U	0.0167	+/-0.0196	0.015	+/-0.0196	0.0331	pCi/g		NXL3	04/16/07	2032	624928

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	04/12/07	1117	624891

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3
2	EPA 905.0 Modified

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
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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: April 19, 2007

Client Sample ID: 9803-0000-014FS  
Sample ID: 184030015

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	N
<b>Surrogate/Tracer recovery</b>	<b>Test</b>				<b>Recovery%</b>		<b>Acceptable Limits</b>						
Strontium Carrier		GFPC, Sr90, solid-ALL	FSS		85		(25%-125%)						

### Notes:

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  - 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
  - ND Analyte concentration is not detected above the detection limit
  - 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: April 19, 2007

Client Sample ID: 9803-0000-015F  
Sample ID: 184030016  
Matrix: TS  
Collect Date: 09-APR-07  
Receive Date: 12-APR-07  
Collector: Client  
Moisture: 8.06%

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch
<b>Rad Gamma Spec Analysis</b>												
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>												
<i>Waived</i>												
Actinium-228		0.617	+/-0.103	0.0338	+/-0.103	0.0676	pCi/g		MJH1	04/16/07	1846	625519
Americium-241	U	0.0181	+/-0.0352	0.030	+/-0.0352	0.0599	pCi/g					
Bismuth-212		0.367	+/-0.112	0.0747	+/-0.112	0.149	pCi/g					
Bismuth-214		0.469	+/-0.0595	0.0198	+/-0.0595	0.0396	pCi/g					
Cesium-134	UI	0.00	+/-0.0185	0.0126	+/-0.0185	0.0252	pCi/g					
Cesium-137	U	-0.00515	+/-0.012	0.0101	+/-0.012	0.0201	pCi/g					
Cobalt-60	U	0.0052	+/-0.0116	0.010	+/-0.0116	0.0201	pCi/g					
Europium-152	U	-0.0363	+/-0.0347	0.026	+/-0.0347	0.052	pCi/g					
Europium-154	U	0.00401	+/-0.0336	0.0286	+/-0.0336	0.0572	pCi/g					
Europium-155	U	0.00741	+/-0.0394	0.0289	+/-0.0394	0.0579	pCi/g					
Lead-212		0.532	+/-0.0519	0.0158	+/-0.0519	0.0317	pCi/g					
Lead-214		0.560	+/-0.0627	0.0194	+/-0.0627	0.0388	pCi/g					
Manganese-54	U	-0.0028	+/-0.0119	0.0103	+/-0.0119	0.0207	pCi/g					
Niobium-94	U	0.00487	+/-0.0115	0.00995	+/-0.0115	0.0199	pCi/g					
Potassium-40		9.45	+/-0.711	0.0712	+/-0.711	0.142	pCi/g					
Radium-226		0.469	+/-0.0595	0.0198	+/-0.0595	0.0396	pCi/g					
Silver-108m	U	0.00267	+/-0.012	0.00933	+/-0.012	0.0187	pCi/g					
Thallium-208		0.190	+/-0.0277	0.00926	+/-0.0277	0.0185	pCi/g					
<b>Rad Gas Flow Proportional Counting</b>												
<i>GFPC, Sr90, solid-ALL FSS</i>												
Strontium-90		0.0505	+/-0.0184	0.0108	+/-0.0184	0.0243	pCi/g		NXL3	04/16/07	2032	624928

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	04/12/07	1117	624891

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3
2	EPA 905.0 Modified

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits
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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: April 19, 2007

Client Sample ID: 9803-0000-015F  
Sample ID: 184030016

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	N
<b>Surrogate/Tracer recovery</b>	<b>Test</b>				<b>Recovery %</b>		<b>Acceptable Limits</b>						
Strontium Carrier		GFPC, Sr90, solid-ALL FSS			89		(25%-125%)						

### Notes:

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- 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
- ND Analyte concentration is not detected above the detection limit
- 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.

# GEL 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: April 19, 2007

Client Sample ID: 9803-0000-016F  
Sample ID: 184030017  
Matrix: TS  
Collect Date: 10-APR-07  
Receive Date: 12-APR-07  
Collector: Client  
Moisture: 9.81%

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch
<b>Rad Gamma Spec Analysis</b>												
<i>Gamma, Solid-FSS GAM &amp; ALL FSS 226 Ingrowth</i>												
<i>Waived</i>												
Actinium-228		0.951	+/-0.145	0.0285	+/-0.145	0.057	pCi/g		MJH1	04/16/07	1846	625519
Americium-241	U	0.012	+/-0.0478	0.0382	+/-0.0478	0.0764	pCi/g					
Bismuth-212		0.631	+/-0.175	0.065	+/-0.175	0.130	pCi/g					
Bismuth-214		0.851	+/-0.0946	0.0173	+/-0.0946	0.0345	pCi/g					
Cesium-134	UI	0.00	+/-0.0176	0.0117	+/-0.0176	0.0233	pCi/g					
Cesium-137	U	-0.00808	+/-0.0108	0.00905	+/-0.0108	0.0181	pCi/g					
Cobalt-60	U	-0.00636	+/-0.011	0.00912	+/-0.011	0.0182	pCi/g					
Europium-152	U	-0.0283	+/-0.0372	0.0237	+/-0.0372	0.0474	pCi/g					
Europium-154	U	-0.0129	+/-0.0341	0.0288	+/-0.0341	0.0576	pCi/g					
Europium-155	UI	0.00	+/-0.0453	0.0277	+/-0.0453	0.0554	pCi/g					
Lead-212		0.862	+/-0.0713	0.0148	+/-0.0713	0.0295	pCi/g					
Lead-214		0.919	+/-0.0892	0.0176	+/-0.0892	0.0351	pCi/g					
Manganese-54	U	0.00312	+/-0.0132	0.00923	+/-0.0132	0.0184	pCi/g					
Niobium-94	U	0.0111	+/-0.00993	0.00875	+/-0.00993	0.0175	pCi/g					
Potassium-40		10.9	+/-0.782	0.0774	+/-0.782	0.155	pCi/g					
Radium-226		0.851	+/-0.0946	0.0173	+/-0.0946	0.0345	pCi/g					
Silver-108m	U	-0.00101	+/-0.00953	0.00815	+/-0.00953	0.0163	pCi/g					
Thallium-208		0.252	+/-0.0301	0.00872	+/-0.0301	0.0174	pCi/g					
<b>Rad-Gas Flow Proportional Counting</b>												
<i>GFPC, Sr90, solid-ALL FSS</i>												
Strontium-90	U	0.0174	+/-0.0163	0.0118	+/-0.0163	0.0267	pCi/g		NXL3	04/16/07	2032	624928

**The following Prep Methods were performed**

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	04/12/07	1117	624891

**The following Analytical Methods were performed**

Method	Description
1	EML HASL 300, 4.5.2.3
2	EPA 905.0 Modified

Surrogate/Tracer recovery	Test	Recovery %	Acceptable Limits
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# GEL 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: April 19, 2007

Client Sample ID: 9803-0000-016F  
Sample ID: 184030017

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst	Date	Time	Batch	Notes
<b>Surrogate/Tracer recovery</b>	<b>Test</b>				<b>Recovery%</b>		<b>Acceptable Limits</b>						
Strontium Carrier		GFPC, Sr90, solid-ALL FSS			89		(25%-125%)						

### Notes:

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- \*\* Analyte is a surrogate compound
  - < Result is less than value reported
  - > Result is greater than value reported
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  - 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
  - ND Analyte concentration is not detected above the detection limit
  - R Sample results are rejected
  - U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
  - UI Gamma Spectroscopy--Uncertain identification
  - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
  - Y QC Samples were not spiked with this compound
  - ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
  - h Preparation or preservation holding time was exceeded
- The above sample is reported on a dry weight basis.

# QUALITY CONTROL DATA

# GEL LABORATORIES LLC

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

## QC Summary

Report Date: April 19, 2007  
Page 1 of 9

Client : Connecticut Yankee Atomic Power  
362 Injun Hollow Rd

Contact: East Hampton, Connecticut  
Mr. Jack McCarthy

Vorkorder: 184030

Formname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
atch	625064										
QC1201314146	184030004	DUP									
Mercurium-241		U	0.121	U	-0.0105	pCi/g	238	(0% - 100%)	BXL1	04/16/07	12:47
		Uncert:	+/-0.160		+/-0.0755						
		TPU:	+/-0.160		+/-0.0755						
Mercurium-242		U	0.0356	U	0.00	pCi/g	200	(0% - 100%)			
		Uncert:	+/-0.0698		+/-0.0646						
		TPU:	+/-0.0699		+/-0.0646						
Mercurium-243/244		U	-0.0828	U	0.0192	pCi/g	321	(0% - 100%)			
		Uncert:	+/-0.0513		+/-0.118						
		TPU:	+/-0.0523		+/-0.118						
QC1201314148	LCS										
Mercurium-241	13.0				12.4	pCi/g	95	(75%-125%)			
		Uncert:			+/-1.17						
		TPU:			+/-1.87						
Mercurium-242				U	-0.0139	pCi/g					
		Uncert:			+/-0.0192						
		TPU:			+/-0.0193						
Mercurium-243/244	15.5				15.4	pCi/g	99	(75%-125%)			
		Uncert:			+/-1.30						
		TPU:			+/-2.24						
QC1201314145	MB										
Mercurium-241				U	-0.0469	pCi/g					
		Uncert:			+/-0.105						
		TPU:			+/-0.105						
Mercurium-242				U	0.0164	pCi/g					
		Uncert:			+/-0.0654						
		TPU:			+/-0.0654						
Mercurium-243/244				U	0.119	pCi/g					
		Uncert:			+/-0.156						
		TPU:			+/-0.156						
QC1201314147	184030004	MS									
Mercurium-241	13.5	U	0.121		13.2	pCi/g	98	(75%-125%)			
		Uncert:	+/-0.160		+/-1.26						
		TPU:	+/-0.160		+/-2.02						
Mercurium-242		U	0.0356	U	0.0244	pCi/g					
		Uncert:	+/-0.0698		+/-0.0648						
		TPU:	+/-0.0699		+/-0.0649						
Mercurium-243/244	16.2	U	-0.0828		15.3	pCi/g	94	(75%-125%)			
		Uncert:	+/-0.0513		+/-1.36						
		TPU:	+/-0.0523		+/-2.29						
atch	625065										
QC1201314156	184030004	DUP									
lutonium-238		U	-0.012	U	0.0292	pCi/g	479	(0% - 100%)	BXL1	04/16/07	12:47

# GEL LABORATORIES LLC

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## QC Summary

Vorkorder: 184030

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armname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>ad Alpha Spec</b>											
atch		625065									
		Uncert:		+/-0.0517							
		TPU:		+/-0.0517							
lutonium-239/240		U		0.0569	U			0.0708	pCi/g	22	(0% - 100%)
		Uncert:		+/-0.0871							
		TPU:		+/-0.0873							
QC1201314158	LCS										
lutonium-238				U				0.0701	pCi/g		(75%-125%)
		Uncert:						+/-0.124			
		TPU:						+/-0.124			
lutonium-239/240		12.9						12.2	pCi/g	95	(75%-125%)
		Uncert:						+/-1.19			
		TPU:						+/-1.72			
QC1201314155	MB										
lutonium-238				U				-0.0799	pCi/g		
		Uncert:						+/-0.0892			
		TPU:						+/-0.0896			
lutonium-239/240				U				0.0257	pCi/g		
		Uncert:						+/-0.0682			
		TPU:						+/-0.0683			
QC1201314157	184030004	MS									
lutonium-238				U				-0.012	pCi/g		(75%-125%)
		Uncert:						+/-0.0517			
		TPU:						+/-0.0517			
lutonium-239/240		13.5	U					0.0569	pCi/g	105	(75%-125%)
		Uncert:						+/-0.0871			
		TPU:						+/-0.0873			
atch		626590									
QC1201317874	184030004	DUP									
lutonium-241				U				-1.17	pCi/g	0	(0% - 100%) GXR1
		Uncert:						+/-4.67			04/19/07 13:16
		TPU:						+/-4.67			
QC1201317876	LCS										
lutonium-241								93.4	pCi/g	80	(75%-125%)
		Uncert:						74.3			04/19/07 13:48
		TPU:						+/-8.21			
		TPU:						+/-11.0			
QC1201317873	MB										
lutonium-241				U				0.465	pCi/g		04/19/07 13:00
		Uncert:						+/-5.00			
		TPU:						+/-5.00			
QC1201317875	184030004	MS									
lutonium-241				U				94.7	pCi/g	83	(75%-125%)
		Uncert:						-1.17			04/19/07 13:32
		TPU:						+/-4.67			
		TPU:						+/-4.67			
		TPU:						+/-11.7			
<b>ad Gamma Spec</b>											
atch		625519									
QC1201315241	184030001	DUP									
actinium-228								0.522	pCi/g	15	(0% - 100%) MJH1
		Uncert:						+/-0.132			04/17/07 09:11
								+/-0.183			
								+/-0.183			

# GEL LABORATORIES LLC

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## QC Summary

Vorkorder: 184030

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armname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
atch											
		TPU:									
mericium-241		U	+/-0.132	U							
			0.026		pCi/g	21		(0% - 100%)			
		Uncert:	+/-0.0682								
		TPU:	+/-0.0682								
ismuth-212		UI	0.00	U							
					pCi/g	13		(0% - 100%)			
		Uncert:	+/-0.167								
		TPU:	+/-0.167								
ismuth-214			0.459								
					pCi/g	9		(0% - 100%)			
		Uncert:	+/-0.0869								
		TPU:	+/-0.0869								
esium-134		U	0.0223	UI							
					pCi/g	85		(0% - 100%)			
		Uncert:	+/-0.0275								
		TPU:	+/-0.0275								
esium-137			0.0281	U							
					pCi/g	89		(0% - 100%)			
		Uncert:	+/-0.0239								
		TPU:	+/-0.0239								
obalt-60		U	0.00538	U							
					pCi/g	443		(0% - 100%)			
		Uncert:	+/-0.0175								
		TPU:	+/-0.0175								
uropium-152		U	0.0238	U							
					pCi/g	2660		(0% - 100%)			
		Uncert:	+/-0.0609								
		TPU:	+/-0.0609								
uropium-154		U	0.0124	U							
					pCi/g	42		(0% - 100%)			
		Uncert:	+/-0.0562								
		TPU:	+/-0.0562								
uropium-155		U	-0.0291	U							
					pCi/g	440		(0% - 100%)			
		Uncert:	+/-0.0519								
		TPU:	+/-0.0519								
ead-212			0.547								
					pCi/g	12		(0%-20%)			
		Uncert:	+/-0.0594								
		TPU:	+/-0.0594								
ead-214			0.496								
					pCi/g	14		(0%-20%)			
		Uncert:	+/-0.0742								
		TPU:	+/-0.0742								
anganese-54		U	0.00646	U							
					pCi/g	61		(0% - 100%)			
		Uncert:	+/-0.0156								
		TPU:	+/-0.0156								
liobium-94		U	0.0109	U							
					pCi/g	1630		(0% - 100%)			
		Uncert:	+/-0.017								
		TPU:	+/-0.017								
otassium-40			12.0								
					pCi/g	6		(0% - 20%)			
		Uncert:	+/-0.987								
		TPU:	+/-0.987								
adium-226			0.459								
					pCi/g	9		(0% - 100%)			
		Uncert:	+/-0.0869								
		TPU:	+/-0.0869								
ilver-108m		U	0.00418	U							
					pCi/g	29		(0% - 100%)			
		Uncert:	+/-0.0141								

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## QC Summary

Vorkorder: 184030

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armname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
ad Gamma Spec										
atch	625519									
thallium-208		TPU:	+/-0.0141	+/-0.0198						
			0.168	0.150	pCi/g	12	(0% - 100%)			
		Uncert:	+/-0.0297	+/-0.0478						
tinium-228		TPU:	+/-0.0297	+/-0.0478						
	QC1201315242	LCS		1.02	pCi/g					04/17/07 09:10
		Uncert:		+/-0.578						
mericium-241		TPU:		+/-0.578						
		16.0		14.0	pCi/g		87 (75%-125%)			
		Uncert:		+/-1.66						
ismuth-212		TPU:		+/-1.66						
		U		0.627	pCi/g					
		Uncert:		+/-0.764						
ismuth-214		TPU:		+/-0.764						
				0.624	pCi/g					
		Uncert:		+/-0.244						
esium-134		TPU:		+/-0.244						
		U		0.0266	pCi/g					
		Uncert:		+/-0.111						
esium-137		TPU:		+/-0.111						
		6.19		5.89	pCi/g		95 (75%-125%)			
		Uncert:		+/-0.546						
obalt-60		TPU:		+/-0.546						
		9.28		9.15	pCi/g		99 (75%-125%)			
		Uncert:		+/-0.717						
uropium-152		TPU:		+/-0.717						
		U		-0.142	pCi/g					
		Uncert:		+/-0.294						
uropium-154		TPU:		+/-0.294						
		U		-0.147	pCi/g					
		Uncert:		+/-0.283						
uropium-155		TPU:		+/-0.283						
		U		0.00105	pCi/g					
		Uncert:		+/-0.269						
ead-212		TPU:		+/-0.269						
				0.937	pCi/g					
		Uncert:		+/-0.230						
ead-214		TPU:		+/-0.230						
				0.665	pCi/g					
		Uncert:		+/-0.260						
anganese-54		TPU:		+/-0.260						
		U		-0.0119	pCi/g					
		Uncert:		+/-0.0972						
iobium-94		TPU:		+/-0.0972						
		U		-0.00404	pCi/g					
		Uncert:		+/-0.0942						
otassium-40		TPU:		+/-0.0942						
		U		1.06	pCi/g					

# GEL LABORATORIES LLC

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## QC Summary

Vorkorder: 184030

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armname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec atch 625519										
radium-226			Uncert: TPU: 0.624	pCi/g			(75%-125%)			
silver-108m		U	Uncert: TPU: -0.0182	pCi/g						
thallium-208			Uncert: TPU: 0.317	pCi/g						
QC1201315240 MB actinium-228		U	Uncert: TPU: 0.0048	pCi/g					04/17/07	09:11
mercurium-241		U	Uncert: TPU: 0.0157	pCi/g						
bismuth-212		U	Uncert: TPU: 0.107	pCi/g						
bismuth-214		U	Uncert: TPU: -0.00637	pCi/g						
cesium-134		U	Uncert: TPU: 0.00663	pCi/g						
cesium-137		U	Uncert: TPU: -0.0133	pCi/g						
cobalt-60		U	Uncert: TPU: -0.0238	pCi/g						
europium-152		U	Uncert: TPU: -0.00193	pCi/g						
europium-154		U	Uncert: TPU: 0.0251	pCi/g						
europium-155		U	Uncert: TPU: 0.000307	pCi/g						
lead-212		U	Uncert: TPU: 0.0203	pCi/g						
lead-214		U	Uncert: TPU: 0.0266	pCi/g						

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## QC Summary

Vorkorder: 184030

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armname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>ad Gamma Spec</b>										
atch	625519									
Manganese-54		U	-0.00236	pCi/g						
	Uncert:		+/-0.0236							
	TPU:		+/-0.0236							
Rubidium-94		U	0.0103	pCi/g						
	Uncert:		+/-0.0279							
	TPU:		+/-0.0279							
Potassium-40		U	-0.17	pCi/g						
	Uncert:		+/-0.297							
	TPU:		+/-0.297							
Radium-226		U	-0.00637	pCi/g						
	Uncert:		+/-0.0531							
	TPU:		+/-0.0531							
Silver-108m		U	0.0101	pCi/g						
	Uncert:		+/-0.0222							
	TPU:		+/-0.0222							
Thallium-208		U	-0.0122	pCi/g						
	Uncert:		+/-0.0295							
	TPU:		+/-0.0295							
<b>ad Gas Flow</b>										
atch	624917									
QC1201313722	184029002	DUP								
Strontium-90		U	-0.0115	U	-0.0163	pCi/g	0	(0% - 100%)	KSD1	04/16/07 22:58
	Uncert:		+/-0.0162		+/-0.0138					
	TPU:		+/-0.0162		+/-0.0138					
QC1201313724	LCS									
Strontium-90		1.41			1.44	pCi/g	102	(75%-125%)		04/16/07 22:59
	Uncert:				+/-0.105					
	TPU:				+/-0.114					
QC1201313721	MB									
Strontium-90				U	0.0164	pCi/g				04/16/07 22:58
	Uncert:				+/-0.0145					
	TPU:				+/-0.0145					
QC1201313723	184029002	MS								
Strontium-90		1.59	U	-0.0115	1.22	pCi/g	77	(75%-125%)		04/16/07 22:58
	Uncert:				+/-0.102					
	TPU:				+/-0.109					
atch	624928									
QC1201313742	184030011	DUP								
Strontium-90		U	0.0026	U	0.000838	pCi/g	0	(0% - 100%)	NXL3	04/16/07 22:53
	Uncert:		+/-0.0163		+/-0.0157					
	TPU:		+/-0.0163		+/-0.0157					
QC1201313744	LCS									
Strontium-90		1.43			1.54	pCi/g	107	(75%-125%)		04/16/07 22:54
	Uncert:				+/-0.102					
	TPU:				+/-0.108					
QC1201313741	MB									
Strontium-90				U	0.0164	pCi/g				04/16/07 20:36
	Uncert:				+/-0.0189					

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## QC Summary

Vorkorder: 184030

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armname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>ad Gas Flow</b>											
atch	624928										
		TPU:		+/-0.0189							
QC1201313743	184030011	MS									
Strontium-90		1.59	U	0.0026	1.59	pCi/g	100	(75%-125%)		04/16/07	22:53
		Uncert:		+/-0.0163	+/-0.109						
		TPU:		+/-0.0163	+/-0.115						
<b>ad Liquid Scintillation</b>											
atch	625106										
QC1201314249	184030004	DUP									
Strontium			U	-0.565	U	0.536	pCi/g	0	(0% - 100%)	AXD2	04/17/07 18:39
		Uncert:		+/-1.03	+/-1.10						
		TPU:		+/-1.03	+/-1.10						
QC1201314251	LCS										
Strontium		23.8			23.7	pCi/g	100	(75%-125%)		04/17/07	20:41
		Uncert:			+/-1.96						
		TPU:			+/-2.01						
QC1201314248	MB										
Strontium					U	0.0348	pCi/g				04/17/07 17:38
		Uncert:			+/-1.08						
		TPU:			+/-1.08						
QC1201314250	184030004	MS									
Strontium		23.9	U	-0.565	24.1	pCi/g	101	(75%-125%)		04/17/07	19:40
		Uncert:		+/-1.03	+/-1.97						
		TPU:		+/-1.03	+/-2.01						
atch	625109										
QC1201314253	184030004	DUP									
Carbon-14			U	-0.0433	U	-0.043	pCi/g	0	(0% - 100%)	AXD2	04/14/07 01:17
		Uncert:		+/-0.0989	+/-0.0953						
		TPU:		+/-0.0989	+/-0.0953						
QC1201314255	LCS										
Carbon-14		6.80			6.83	pCi/g	100	(75%-125%)		04/14/07	03:22
		Uncert:			+/-0.192						
		TPU:			+/-0.219						
QC1201314252	MB										
Carbon-14					U	-0.0298	pCi/g				04/14/07 00:15
		Uncert:			+/-0.0944						
		TPU:			+/-0.0944						
QC1201314254	184030004	MS									
Carbon-14		7.27	U	-0.0433	7.25	pCi/g	100	(75%-125%)		04/14/07	02:20
		Uncert:		+/-0.0989	+/-0.206						
		TPU:		+/-0.0989	+/-0.235						
atch	625115										
QC1201314268	184030004	DUP									
Carbon-55			U	-13.4	U	-4.14	pCi/g	0	(0% - 100%)	MXPI	04/16/07 21:05
		Uncert:		+/-24.1	+/-29.1						
		TPU:		+/-24.1	+/-29.1						
QC1201314270	LCS										
Carbon-55		1190			1200	pCi/g	100	(75%-125%)		04/16/07	21:39
		Uncert:			+/-65.3						
		TPU:			+/-108						

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## QC Summary

Vorkorder: 184030

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armname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>ad Liquid Scintillation</b>										
atch	625115									
QC1201314267	MB									
on-55			U	4.53	pCi/g				04/16/07	20:48
				Uncert:						
				TPU:						
QC1201314269	184030004	MS								
on-55			1200 U	-13.4	1140	pCi/g	95 (75%-125%)		04/16/07	21:22
				Uncert:	+/-24.1					
				TPU:	+/-24.1					
atch	625116									
QC1201314273	184030004	DUP								
lickel-63			U	-6.58	U	-13.6	pCi/g	0	(0% - 100%) MXP1	04/16/07 23:02
				Uncert:	+/-9.20	+/-10.4				
				TPU:	+/-9.20	+/-10.4				
QC1201314275	LCS									
lickel-63			558		425	pCi/g	76 (75%-125%)		04/16/07	23:36
				Uncert:	+/-22.1					
				TPU:	+/-26.8					
QC1201314272	MB									
lickel-63			U	-9.31	pCi/g				04/16/07	22:46
				Uncert:	+/-10.9					
				TPU:	+/-10.9					
QC1201314274	184030004	MS								
lickel-63			591 U	-6.58	510	pCi/g	86 (75%-125%)		04/16/07	23:19
				Uncert:	+/-9.20	+/-26.1				
				TPU:	+/-9.20	+/-32.1				
atch	625122									
QC1201314277	184030004	DUP								
echnetium-99			U	0.325	U	0.0581	pCi/g	0	(0% - 100%) MXP1	04/17/07 13:17
				Uncert:	+/-0.260	+/-0.206				
				TPU:	+/-0.261	+/-0.206				
QC1201314279	LCS									
echnetium-99			19.4		19.7	pCi/g	102 (75%-125%)		04/17/07	14:15
				Uncert:	+/-0.777					
				TPU:	+/-0.925					
QC1201314276	MB									
echnetium-99			U	0.075	pCi/g				04/17/07	12:35
				Uncert:	+/-0.185					
				TPU:	+/-0.185					
QC1201314278	184030004	MS								
echnetium-99			20.0 U	0.325	16.2	pCi/g	81 (75%-125%)		04/17/07	13:59
				Uncert:	+/-0.260	+/-0.826				
				TPU:	+/-0.261	+/-0.924				

Notes:

The Qualifiers in this report are defined as follows:

- \*\* Analyte is a surrogate compound
- < Result is less than value reported

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## QC Summary

Vorkorder: 184030

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armname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
>	Result is greater than value reported									
A	The TIC is a suspected aldol-condensation product									
B	For General Chemistry and Organic analysis the 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									
ND	Analyte concentration is not detected above the detection limit									
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									

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.

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SUBSURFACE AREA ASSOCIATED WITH THE NORTH GROUNDS  
SURVEY UNIT 9803-0000

RELEASE RECORD

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**ATTACHMENT 3 (DQA RESULTS)**

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SUBSURFACE AREA ASSOCIATED WITH THE NORTH GROUNDS  
SURVEY UNIT 9803-0000

RELEASE RECORD

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**ATTACHMENT 3A (PRELIMINARY DATA REVIEW)**

SUBSURFACE SOILS FOR NORTH GROUNDS (NON-PROTECTED AREA)  
SURVEY UNIT 9803-0000

RELEASE RECORD  
Attachment 4

**Survey Unit:** 9803-0000  
**Area Description:** Subsurface Soils, Parking Lot  
**Classification:** 1  
**Survey Media:** Sub-Surface Soils  
**Type of Survey:** Final Status Survey  
**Number of Measurements:** 15 Static

**STATISTICS on TOTAL  
POPULATION**

	<b>Cs-137</b>	<b>Co-60</b>	<b>Sr-90</b>
<b>DCGL<sub>op</sub> (pCi/g):</b>	5.38E+00	2.59E+00	1.05E+00
<b>Minimum Value:</b>	-1.45E-02	-1.73E-02	-1.50E-02
<b>Maximum Value:</b>	2.81E-02	2.02E-02	5.05E-02
<b>Mean:</b>	7.16E-03	1.71E-03	6.32E-03
<b>Median:</b>	7.78E-03	1.93E-03	2.60E-03
<b>Standard Deviation:</b>	1.20E-02	9.57E-03	1.65E-02

**STATISTICS on NON-  
PARAMETRIC POPULATION**

	<b>Cs-137</b>	<b>Co-60</b>	<b>Sr-90</b>
<b>DCGL<sub>op</sub> (pCi/g):</b>	5.38E+00	2.59E+00	1.05E+00
<b>Minimum Value:</b>	-1.45E-02	-1.73E-02	-1.50E-02
<b>Maximum Value:</b>	2.81E-02	2.02E-02	5.05E-02
<b>Mean:</b>	7.16E-03	1.71E-03	6.32E-03
<b>Median:</b>	7.78E-03	1.93E-03	2.60E-03
<b>Standard Deviation:</b>	1.20E-02	9.57E-03	1.65E-02

Sample ID	GPS Coordinates North East		Cs-137				Co-60				Sr-90				Fraction of DCGL
			Result (pCi/g)	2σ	MDA (pCi/g)	Identified	Result (pCi/g)	2σ	MDA (pCi/g)	Identified	Result (pCi/g)	2σ	MDA (pCi/g)	Identified	
9803-0000-001F	237032.21	667885.67	2.81E-02	0.024	2.55E-02	+	5.38E-03	0.018	3.06E-02		2.54E-03	0.022	4.10E-02		0.010
9803-0000-002F	236841.78	668105.44	1.12E-02	0.019	3.24E-02		1.71E-02	0.020	3.67E-02		1.70E-02	0.017	2.82E-02	+	0.025
9803-0000-003F	236743.64	668401.39	2.58E-02	0.041	6.60E-02		2.02E-02	0.040	7.13E-02		-1.50E-02	0.017	3.35E-02		-0.002
9803-0000-004F	236787.90	667915.01	-1.45E-02	0.030	4.05E-02		9.28E-03	0.027	4.77E-02		-1.13E-02	0.014	2.78E-02		-0.010
9803-0000-005F	236894.77	668100.32	7.78E-03	0.036	5.47E-02		-1.73E-02	0.032	4.72E-02		3.63E-03	0.016	2.96E-02		-0.002
9803-0000-007F	236758.73	668203.85	1.49E-02	0.020	3.59E-02		1.93E-03	0.021	3.62E-02		-5.93E-03	0.016	3.19E-02		-0.002
9803-0000-008F	236530.38	668222.47	-2.90E-03	0.029	5.18E-02		-8.75E-03	0.042	5.75E-02		-1.08E-02	0.015	3.12E-02		-0.014
9803-0000-009F	236676.97	668180.87	-5.11E-04	0.032	5.39E-02		3.38E-03	0.029	4.96E-02		1.64E-02	0.015	2.43E-02	+	0.017
9803-0000-010F	236657.73	668386.46	1.08E-02	0.014	2.19E-02		-4.21E-03	0.013	2.19E-02		1.16E-03	0.014	2.59E-02		0.001
9803-0000-011F	236941.16	668324.68	6.01E-03	0.018	2.43E-02		3.64E-03	0.015	2.48E-02		2.60E-03	0.016	2.97E-02		0.005

SUBSURFACE SOILS FOR NORTH GROUNDS (NON-PROTECTED AREA)  
SURVEY UNIT 9803-0000

RELEASE RECORD  
Attachment 4

Sample ID	GPS Coordinates North East		Cs-137				Co-60				Sr-90				Fraction of DCGL
			Result (pCi/g)	2σ	MDA (pCi/g)	Identified	Result (pCi/g)	2σ	MDA (pCi/g)	Identified	Result (pCi/g)	2σ	MDA (pCi/g)	Identified	
9803-0000-012F	236748.12	668053.19	4.66E-03	0.015	2.18E-02		1.75E-03	0.020	2.27E-02		1.28E-02	0.017	2.86E-02		0.014
9803-0000-013F	236606.37	668343.48	1.80E-02	0.021	2.51E-02		-3.69E-03	0.015	2.45E-02		-2.88E-03	0.019	3.51E-02		-0.001
9803-0000-014F	236873.17	668566.16	1.13E-02	0.012	1.89E-02		-1.93E-03	0.011	1.83E-02		1.67E-02	0.018	3.08E-02		0.017
9803-0000-015F	236550.98	668170.66	-5.15E-03	0.012	2.01E-02		5.20E-03	0.012	2.01E-02		5.05E-02	0.018	2.43E-02	+	0.049
9803-0000-016F	236847.09	668399.07	-8.08E-03	0.011	1.81E-02		-6.36E-03	0.011	1.82E-02		1.74E-02	0.016	2.67E-02	+	0.013
9803-0000-001FS	237032.21	667885.67	2.65E-03	0.030	5.39E-02		1.03E-02	0.031	5.56E-02		1.01E-02	0.020	3.45E-02		0.014
9803-0000-014FS	236873.17	668566.16	-3.57E-03	0.011	1.85E-02		-2.40E-03	0.011	1.76E-02		1.67E-02	0.020	3.31E-02		0.014

OTHER RADIONUCLIDES

Sample ID	Isotope	Result (pCi/g)	2σ	MDA (pCi/g)	Identified	DCGL <sub>op</sub> (pCi/g)	Fraction of DCGL
9803-0000-003F	Tc-99	3.25E-01	0.260	4.33E-01	+	7.6E+00	0.043
9803-0000-003F	Eu-155	9.95E-02	0.098	1.49E-01	+	2.4E+02	0.000
9803-0000-003F	Mn-54	2.20E-02	0.018	2.22E-02	+	1.0E+01	0.002

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SUBSURFACE AREA ASSOCIATED WITH THE NORTH GROUNDS  
SURVEY UNIT 9803-0000

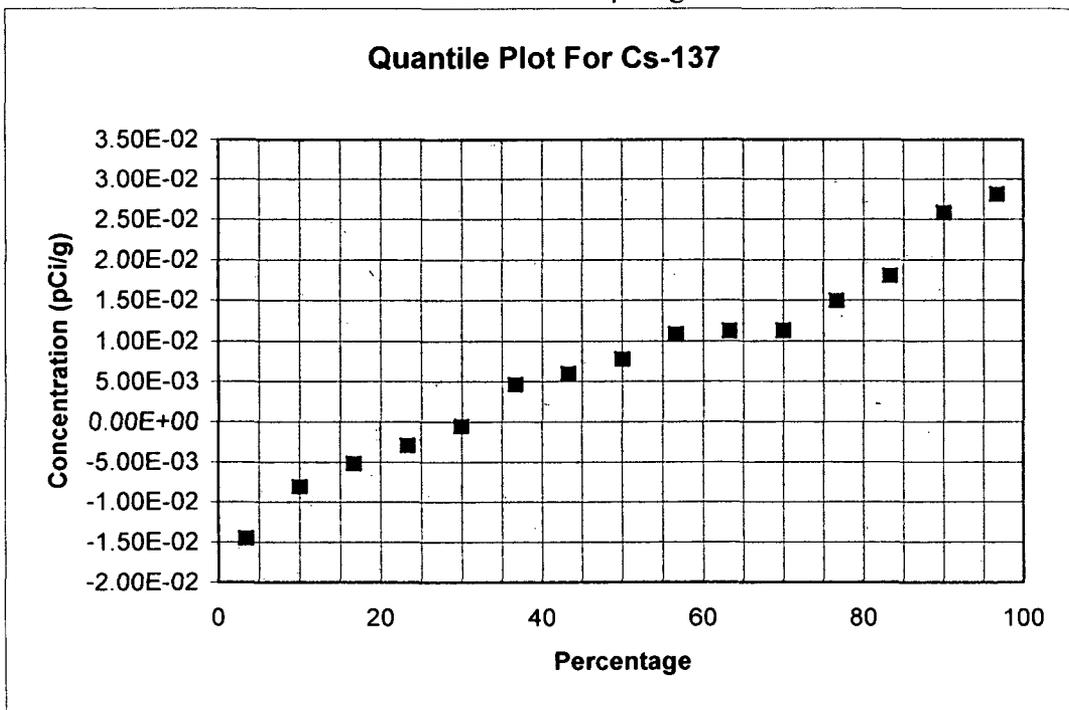
RELEASE RECORD

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**ATTACHMENT 3B (GRAPHICAL REPRESENTATION OF  
DATA)**

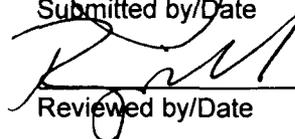
QUANTILE PLOT FOR CESIUM-137

Survey Unit: 9803-0000  
 Survey Unit Name: Subsurface Soils under Parking Lot, Warehouses 1 & 2, & S/G MU Building  
 Mean: 7.16E-03 pCi/g



Cs-137	Rank	Percentage
-1.45E-02	1	3.3%
-8.08E-03	2	10.0%
-5.15E-03	3	16.7%
-2.90E-03	4	23.3%
-5.11E-04	5	30.0%
4.66E-03	6	36.7%
6.01E-03	7	43.3%
7.78E-03	8	50.0%
1.08E-02	9	56.7%
1.12E-02	10	63.3%
1.13E-02	11	70.0%
1.49E-02	12	76.7%
1.80E-02	13	83.3%
2.58E-02	14	90.0%
2.81E-02	15	96.7%

 J. WOJTKOWIAK 4/26/07  
 Submitted by/Date

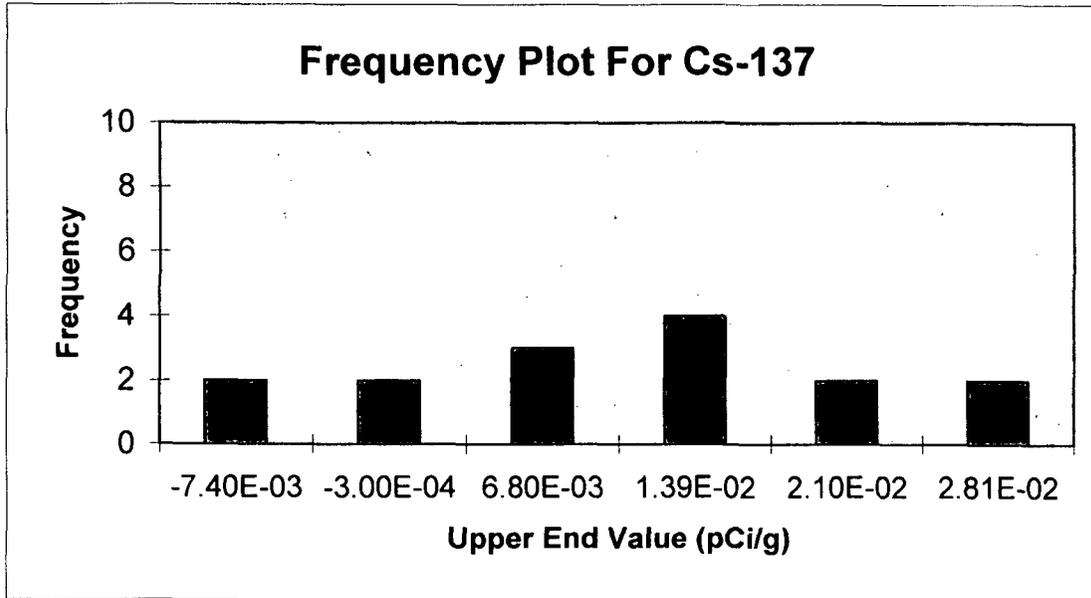
 R. Massengill 4/30/07  
 Reviewed by/Date

# FREQUENCY PLOT FOR CESIUM-137

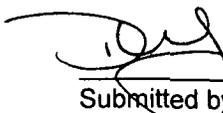
Survey Unit: 9803-0000

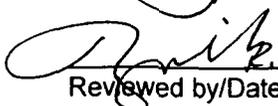
Survey Unit Name: Subsurface Soils under Parking Lot, Warehouses 1 & 2,  
& S/G MU Building

Mean: 7.16E-03 pCi/g



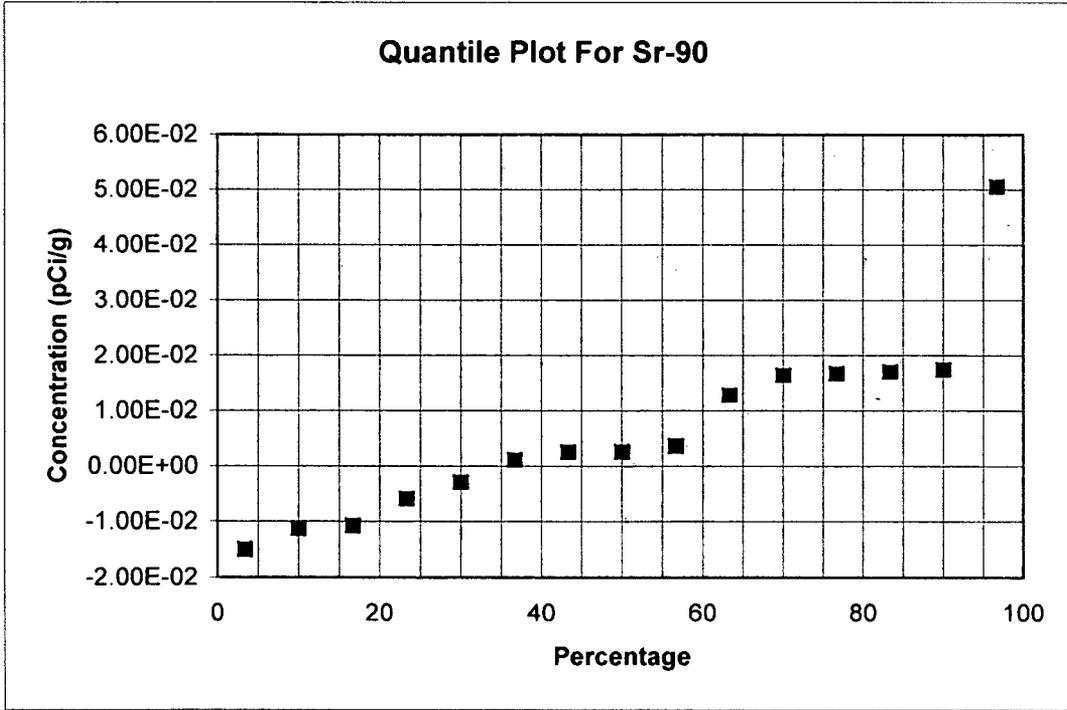
Upper End Value	Observation Frequency	Observation Frequency
-7.40E-03	2	13%
-3.00E-04	2	13%
6.80E-03	3	20%
1.39E-02	4	27%
2.10E-02	2	13%
2.81E-02	2	13%
Total:	15	100%

 J. WOJTKOWIAK 4/26/07  
Submitted by/Date

 R. MASSENGILL 4/30/07  
Reviewed by/Date

QUANTILE PLOT FOR STRONTIUM-90

Survey Unit: 9803-0000  
 Survey Unit Name: Subsurface Soils under Parking Lot, Warehouses 1 & 2, & S/G MU Building  
 Mean: 6.32E-03 pCi/g



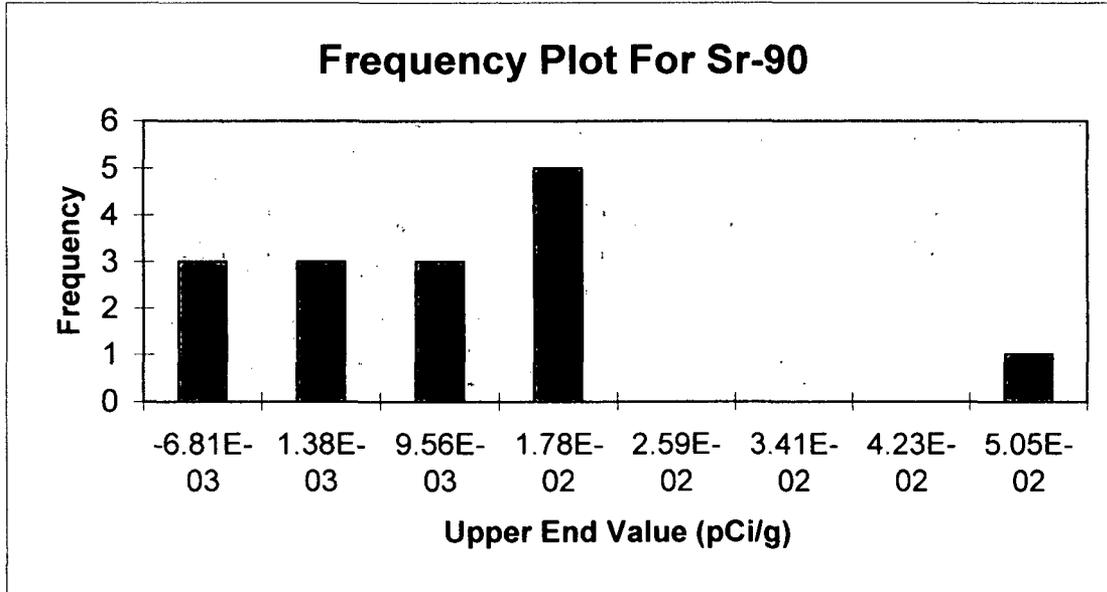
Sr-90	Rank	Percentage
-1.50E-02	1	3.3%
-1.13E-02	2	10.0%
-1.08E-02	3	16.7%
-5.93E-03	4	23.3%
-2.88E-03	5	30.0%
1.16E-03	6	36.7%
2.54E-03	7	43.3%
2.60E-03	8	50.0%
3.63E-03	9	56.7%
1.28E-02	10	63.3%
1.64E-02	11	70.0%
1.67E-02	12	76.7%
1.70E-02	13	83.3%
1.74E-02	14	90.0%
5.05E-02	15	96.7%

*[Signature]*  
 Submitted by/Date: D. WOJTKOWIAK 4/20/07

*[Signature]*  
 Reviewed by/Date: R. MASSENGILL 4/30/07

FREQUENCY PLOT FOR STRONTIUM-90

Survey Unit: 9803-0000  
 Survey Unit Name: Subsurface Soils under Parking Lot, Warehouses 1 & 2,  
 & S/G MU Building  
 Mean: 6.32E-03 pCi/g



Upper End Value	Observation Frequency	Observation Frequency
-6.81E-03	3	20%
1.38E-03	3	20%
9.56E-03	3	20%
1.78E-02	5	33%
2.59E-02	0	0%
3.41E-02	0	0%
4.23E-02	0	0%
5.05E-02	1	7%
<b>Total:</b>	<b>15</b>	<b>100%</b>

*[Signature]*  
 Submitted by/Date: J. WOJTKOWIAK 4/26/07

*[Signature]*  
 Reviewed by/Date: M. MASSENGILL 4/30/07

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SUBSURFACE AREA ASSOCIATED WITH THE NORTH GROUNDS  
SURVEY UNIT 9803-0000

RELEASE RECORD

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**ATTACHMENT 3C (SIGN TEST)**

**Sign Test Calculation Sheet for Multiple Radionuclides**

Survey Area Number: 9803		Survey Unit Number: 0000		WPIR #: N/A		
Survey Area Name: Subsurface Soils under Parking Lot & Warehouses		Classification: C	TYPE I (α error): 0.05	N: 15		
Radionuclides:	1 <sup>st</sup> Radionuclide Cs-137	2 <sup>nd</sup> Radionuclide Co-60	3 <sup>rd</sup> Radionuclide Sr-90	4 <sup>th</sup> Radionuclide		
DCGL:	5.38E+00	2.59E+00	1.05E+00			
Results 1 <sup>st</sup> Radionuclide (pCi/g)	Results 2 <sup>nd</sup> Radionuclide (pCi/g)	Results 3 <sup>rd</sup> Radionuclide (pCi/g)	Results 4 <sup>th</sup> Radionuclide (pCi/g)	Weighted Sum (W <sub>s</sub> )	1-W <sub>s</sub>	Sign
2.81E-02	5.38E-03	2.54E-03		0.01	0.99	+1
1.12E-02	1.71E-02	1.70E-02		0.02	0.98	+1
2.58E-02	2.02E-02	-1.50E-02		0.00	1.00	+1
-1.45E-02	9.28E-03	-1.13E-02		-0.01	1.01	+1
7.78E-03	-1.73E-02	3.63E-03		0.00	1.00	+1
1.49E-02	1.93E-03	-5.93E-03		0.00	1.00	+1
-2.90E-03	-8.75E-03	-1.08E-02		-0.01	1.01	+1
-5.11E-04	3.38E-03	1.64E-02		0.02	0.98	+1
1.08E-02	-4.21E-03	1.16E-03		0.00	1.00	+1
6.01E-03	3.64E-03	2.60E-03		0.00	1.00	+1
4.66E-03	1.75E-03	1.28E-02		0.01	0.99	+1
1.80E-02	-3.69E-03	-2.88E-03		0.00	1.00	+1
1.13E-02	-1.93E-03	1.67E-02		0.02	0.98	+1
-5.15E-03	5.20E-03	5.05E-02		0.05	0.95	+1
-8.08E-03	-6.36E-03	1.74E-02		0.01	0.99	+1
Number of positive differences (S+)						15

Critical Value 11

Survey Unit Meets the Acceptance Criteria

Performed by: David Wojtkowiak Date: 4/24/2007

Independent Review by: R. Massery Date: 4/30/2007

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SUBSURFACE AREA ASSOCIATED WITH THE NORTH GROUNDS  
SURVEY UNIT 9803-0000

RELEASE RECORD

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**ATTACHMENT 3D (QC SPLIT RESULTS)**

### Split Sample Assessment Form

Survey Area #: 9803	Survey Unit #: 0000	Survey Unit Name: Subsurface Soils under Parking Lot & Warehouses
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Sample Plan or WPIR#: N/A	SML#: 9803-0000-001F
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Sample Description: Comparison of split samples collected from sample measurement location #1 and analyzed using gamma spectroscopy by off-site Vendor Laboratory. The standard sample was 9803-0000-001F, the comparison sample was 9803-0000-001FS.

STANDARD					COMPARISON			
Radionuclide	Activity Value	Standard Error	Resolution	Agreement Range	Activity Value	Standard Error	Comparison Ratio	Acceptable (Y/N)
K-40	1.20E+01	0.4935	24	0.75 - 1.33	9.42E+00	0.55	0.79	Y

Comments/Corrective Actions: Cs-137 was not detected in sufficient quantities in the field split results at location 9803-0000-001FS to evaluate in accordance with procedure. Evaluation using the reported results for K-40 resulted in acceptable agreement between the field-split results at these locations.. Since K-40 was found to be present at an acceptable level of agreement, no further action is warranted.

Table is provided to show acceptance criteria used to assess split samples.

<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: D. Wojtkowiak	Date: 4/24/2007	Reveiwed by: <i>R. Massersill</i>	Date: 4/30/2007
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### Split Sample Assessment Form

Survey Area #: 9803	Survey Unit #: 0000	Survey Unit Name: Subsurface Soils under Parking Lot & Warehouses
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Sample Plan or WPIR#: N/A	SML#: 9803-0000-014F
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Sample Description: Comparison of split samples collected from sample measurement location #1 and analyzed using gamma spectroscopy by off-site Vendor Laboratory. The standard sample was 9803-0000-014F, the comparison sample was 9803-0000-014FS.

STANDARD					COMPARISON			
Radionuclide	Activity Value	Standard Error	Resolution	Agreement Range	Activity Value	Standard Error	Comparison Ratio	Acceptable (Y/N)
K-40	1.18E+01	0.404	29	0.75 - 1.33	8.96E+00	0.37	0.76	Y

Comments/Corrective Actions: Cs-137 was not detected in sufficient quantities in the field split results at locations 9803-0000-014F and 9803-0000-014FS to evaluate in accordance with procedure. Evaluation using the reported results for K-40 resulted in acceptable agreement between the field-split results at these locations. Since K-40 was found to be present at an acceptable level of agreement, no further action is warranted.

Table is provided to show acceptance criteria used to assess split samples.

Resolution	Agreement Range
4 - 7	0.5 - 2.0
8 - 15	0.6 - 1.66
16 - 50	0.75 - 1.33
51 - 200	0.80 - 1.25
>200	0.85 - 1.18

Performed by: D. Wojtkowiak	Date: 4/24/2007	Reveiwed by: <i>R. Masseria</i>	Date: 4/30/2007
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