

# Final Status Survey Final Report Phase IV

**Appendix A11**Survey Unit Release Record 9106-0011, Discharge Canal

November 2006



# CYAPCO FINAL STATUS SURVEY RELEASE RECORD DISCHARGE CANAL SURVEY UNIT 9106-0011

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#### 1. SURVEY UNIT DESCRIPTION

Survey Unit 9106-0011 (Discharge Canal) is designated as Final Status Survey (FSS) Class 2 and consists of approximately 6,394 m² (1.58 acres) of water covered sediment in an area located approximately 1.58 miles from the reference coordinate system benchmark used at the Haddam Neck Plant (HNP) (see Attachment 1, Figure 1). The Discharge Canal is a man-made mile long waterway that runs parallel to, and ultimately communicates with the Connecticut River. The Discharge Canal is subdivided into fifteen (15) survey units including two (2) permanent wetland areas for FSS purposes. The survey unit is bounded as follows: Discharge Canal Survey Unit 9106-0010 is to the north (called north as oriented with the north to south flow of the Connecticut River), Survey Area 9521 is to the east, the Connecticut River is to the south and west, and Survey Area 9530 is also to the west. The survey unit comprises the canal sediments to the depth of three (3) feet from the top of the sediment layer or the original construction depth and it extends up the canal banks to the mean high water level.

This survey unit is bounded by reference coordinates E008 through E016 and by S157 through S173 (refer to License Termination Plan Section 5.4.4). The reference coordinates provide the maximum dimensions of a rectangle containing this survey unit. Some areas contained in this rectangle may not be part of this survey unit. The boundary of the survey unit was defined using a Global Positioning System (GPS) based on the Connecticut State Plane System North American Datum (NAD) 1927.

#### 2. CLASSIFICATION BASIS

The survey unit was classified in accordance with Procedure RPM 5.1-10, "Survey Unit Classification." The historical information, scoping analyses and characterization results provided sufficient data to designate Survey Unit 9106-0011 as Class 2 in May 2006.

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

- a) A review of the 10CFR50.75 (g) (1) database,
- b) A review of the "Initial Characterization Report" and the "Historic Site Assessment (HSA) Supplement,"
- c) Historic and current survey records review,
- d) Visual inspections and a "walk-down."
- e) Formal or informal interviews with cognizant personnel.

A review of the 10CFR50.75(g)(1) database report identified a number of events that may have impacted this survey unit. Several events indicated the potential for plant related contamination in the survey unit. These included a number of primary side system to secondary side system leakage events,

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contamination found to be present in secondary side systems and components, and unmonitored spills that drained to the discharge canal. In 1986, samples were taken from the legacy dredge spoils removed in 1979 dredged spoils area and from recently dredged canal sediment. The sample analyses indicated that the concentrations of Cs-137, Co-60 and other radionuclides were a small fraction of the DCGLs for those nuclides that could be identified by gamma spectroscopy. (refer to NE-86-RA-1142 dated 11-13-86). None of the available historical information reviewed would support a conclusion that any residual activity in this survey unit is likely to be present at concentrations greater than the respective DCGLs.

Additional information was provided by several historical documents, including the "Results of Scoping Survey", (completed 9/1/98), the "Historical Site Assessment", and the HSA Supplement (dated 6-30-00). These documents presented the results of several sediment samples taken in 1997. These sample results indicated concentrations of 0.5 ρCi/g for Co-60, 0.024 ρCi/g for Cs-134 and 0.722 ρCi/g for Cs-137.

An initial characterization survey was implemented during April and May of 2004. Six (6) samples from three (3) locations were obtained by biased sampling throughout the area. The samples were analyzed off-site by gamma spectroscopy and with radiochemical analyses for Sr-90 and Tritium. Hard-to-Detect analyses were also conducted on two (2) of the six (6) samples. The only plant-related dosimetrically significant radionuclides identified in the samples were Cs-137, Co-60 and Ni-63. No samples indicated radioactive material in quantities above the ten (10) mrem/yr design DCGL. Cobalt-60 accounted for the majority of the dose in these samples with a maximum concentration of 1.05 pCi/g.

A final characterization was performed by Site Closure personnel in April of 2006. Six (6) sediment samples from six (6) locations were taken. All of the samples were analyzed by gamma spectroscopy. Although no additional HTD testing was performed for characterization; four (4) of the fifteen (15) samples taken to demonstrate compliance with the release criteria during FSS were tested for the full suite of HTD nuclides to provide additional assurance that all of the radionuclides of concern were appropriately addressed. As a result of characterization, the radionuclides of concern identified for FSS planning purposes were Cs-137, Co-60 and Ni-63 (refer to Table 1).

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Table 1 — Basic Statistical Quantities for Cs-137, Co-60 and Ni-63 from the Characterization Survey							
Parameter	Cs=137 (pCi/g)	Co-60 (pCi/g)	Ni-63 (ρCi/g)				
Minimum Value:	1.09E-02	-4.95E-03	2.42E+01				
Maximum Value:	2.85E-01	3.69E-01	2.59E+01				
Mean:	1.48E-01	1.26E-01	2.51E+01				
Median:	1.43E-01	7.50E-02	2.51E+01				
Standard Deviation:	1.25E-01	1.57E-01	1.20E+00				

NOTE: The Operational DCGLs from Table 2 are 6.01 pCi/g for Cs-137, 2.90 pCi/g for Co-60 and 549 for Ni-63; these are used in conjunction with the unity rule to achieve nineteen (19) mrem/yr TEDE.

The FSS Engineer performed a visual inspection and walk-down during May 2006 to assess the physical condition of the survey unit, evaluate access points and travel paths and identify potentially hazardous conditions.

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

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

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

The DQO process incorporates hypothesis testing and probabilistic sampling distributions to control decision errors during data analysis. Hypothesis testing is a process based on the scientific method that compares a baseline condition to an alternate condition. The baseline condition is 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 satisfy the release criteria objective of the FSS.

The primary objective of the Final Status Survey Plan (FSSP) was to demonstrate that the level of residual radioactivity in Survey Unit 9106-0011 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).

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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 (DCGLs). The DCGLs represent the concentration of radioactivity above background, equivalent to a dose-based release criterion and is 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), for existing groundwater radioactivity and for future groundwater radioactivity that will be contributed by building foundations and footings.

As described in detail in the LTP, the dose model applied to the discharge canal presumes that the canal sediments are dredged to a depth of three (3) feet below the top of the sediment layer and spread for the planting of crops per the Resident Farmer Scenario. Consequently, the soil DCGLs are directly applied to the canal sediment media

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:

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

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

This survey unit is not affected by existing groundwater (reference CY memo ISC 06-024). Therefore, dose contribution from existing groundwater is zero (0) mrem/yr TEDE.

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

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#### Equation 2:

19 mrem/yr<sub>Total</sub>=19 mrem/yr<sub>Soil</sub>+0 mrem/yr<sub>Existing GW</sub>+0 mrem/yr<sub>Future GW</sub>

The allowable dose for soil in this survey unit is nineteen (19) mrem/yr TEDE as shown by Equation 2 above. The concentration of residual radioactivity resulting in nineteen (19) mrem/yr TEDE is designated as the Operational DCGL, and has been established for the radionuclides of concern as provided in Table 2.

Note: The survey design used a much smaller value for investigation than the Operational DCGL provided by Table 2 to conservatively account for the contribution to the total dose from existing and future groundwater which had not been established at the time of planning the FSS.

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Table 2 - Radionuclide Specific Base Case Soil DCGL, Operational DCGLs and Required Minimum Detectable Concentrations						
Radionuclide (1)	Base Case Soil	Operational DCGL (pCi/g) (3)	Required MDC (pCi/g) (4)			
H-3	4.12E+02	3.13E+02	1.65E+01			
C-14	5.66E+00	4.30E+00	2.26E-01			
Mn-54	1.74E+01	1.32E+01	6.96E-01			
Fe-55	2.74E+04	2.08E+04	1.10E+03			
Co-60	3.81E+00	2.90E+00	1.52E-01			
Ni-63	7.23E+02	5.49E+02	2.89E+01			
Sr-90	1.55E+00	1.18E+00	6.20E-02			
Nb-94	7.12E+00	5.41E+00	2.85E-01			
Tc-99	1.26E+01	9.58E+00	5.04E-01			
Ag-108m	7.14E+00	5.43E+00	2.86E-01			
Cs-134	4.67E+00	3.55E+00	1.87E-01			
Cs-137	7.91E+00	6.01E+00	3.16E-01			
Eu-152	1.01E+01	7.68E+00	4.04E-01			
Eu-154	9.29E+00	7.06E+00	3.72E-01			
Eu-155	3.92E+02	2.98E+02	1.57E+01			
Pu-238	2.96E+01	2.25E+01	1.18E+00			
Pu-239/240	2.67E+01	2.03E+01	1.07E+00			
Pu-241	8.70E+02	6.61E+02	3.48E+01			
Am-241 (5)	2.58E+01	1.96E+01	1.03E+00			
Cm-243/244	2.90E+01	2.20E+01	1.16E+00			

- (1) **Bold** indicates those radionuclides considered to be Hard to Detect (HTD)
- (2) The Base Case Soil DCGLs for soil are specified by the LTP in Chapter 6 and are equivalent to twenty-five (25) mrem/yr TEDE
- (3) The Operational DCGL is equivalent to nineteen (19) mrem/yr TEDE
- (4) The required MDC is equivalent to one (1) mrem/yr TEDE
- (5) Americium-241 can be analyzed by gamma and alpha spectroscopy and is considered to be Easy to Detect (ETD). The preferred result is the alpha spectroscopy's when both analyses are performed.

Another important facet of the DQO process is to identify the radionuclides of concern and determine the concentration variability. Initial characterization was performed in April of 2004 as discussed in Section 2. Cs-137, Co-60 and Ni-63 were found to be the predominate radionuclides of concern. The basic statistical quantities (i.e., mean, standard deviation, median) for Cs-137, Co-60 and Ni-63 are provided in Table 1.

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

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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".

This survey was initially designed to ten (10) mrem/yr TEDE. At the time when the survey was designed, the dose contribution for existing and future groundwater had not yet been determined. Subsequently, a conservative value was chosen for the Operational DCGL. This approach is no longer required as the total dose from existing and future groundwater has been established. The dose for soil used for this survey unit to demonstrate compliance with the LTP criteria is nineteen (19) mrem/yr TEDE, as discussed in Section 2 of this Release Record.

The DQO process determined that Cs-137, Co-60 and Ni-63 were the radionuclides of concern (refer to Section 3). The sum of fractions or unity rule was used with the individual Operational DCGLs because multiple radionuclides (Cs-137, Co-60 and Ni-63) were considered in the survey design.

Surrogate DCGLs were not required for this survey unit based on process knowledge from FSS of nearby adjacent areas and via screening process described in LTP Section 5.4.7.2, "Gross Activity DCGLs". Ni-63 concentrations in sediment and soil were ascertained by direct analysis.

Radionuclide screening or de-selection is a process where an individual radionuclide or aggregate may be considered insignificant and eliminated from the FSS. The criteria for de-selection are concentrations that are less than 5% for individual radionuclides and that are less than 10% for the aggregate of all radionuclides that are de-selected. This process was applied to analysis data for this survey unit.

The Elevated Measurement Comparison (EMC) did not apply to this survey unit since it is a Class 2 area and discrete, elevated areas of contamination were not expected.

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

The number of sediment samples for FSS was determined in accordance with Procedure RPM 5.1-12, "Determination of the Number of Samples for Final Status Survey." The Lower Bound of the Gray Region (LBGR) was set in

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accordance with Procedure RPM 5.1-11 to 0.778 to maintain the relative shift  $(\Delta/\sigma)$  in the range of 1 and 3. The resulting relative shift was 2.0. A Prospective Power Curve was generated using COMPASS, a software package developed under the sponsorship of the United States Nuclear Regulatory Commission (USNRC) for implementation of MARSSIM in support of the decommissioning license termination rule (10 CFR 20, Subpart E). The result of the COMPASS computer run showed adequate power for the survey design. This indicates that the survey unit has a high probability of rejecting the null hypothesis, assuming that the characterization data are representative of the FSS results. Survey design specified fifteen (15) sediment core samples for non-parametric statistical testing.

The grid pattern and locations of the sediment samples were determined using Visual Sample Plan (VSP) in accordance with Procedure RPM 5.1-14, "Identifying, and Marking Surface Sample Locations for Final Status Survey." Visual Sample Plan was created by Pacific Northwest National Laboratory (PNNL) for the United States Department of Energy. A systematic triangular grid pattern with a random starting point was selected for sample design, which is appropriate for a Class 2 area.

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

Table 3 -Sample Measurement Locations with Associated GPS Coordinates						
Designation	Northing	Easting ****				
9106-0011-002F	233348.73	673092.56				
9106-0011-003F	233348.73	673165.28				
9106-0011-004F	233285.75	673128.92				
9106-0011-005F	233285.75	673201.64				
9106-0011-006F	233222.77	673165.28				
9106-0011-007F	233222.77	673238.00				
9106-0011-008F	233222.77	673310.72				
9106-0011-009F	233159.79	673274.36				
9106-0011-010F	233159.79	673347.09				
9106-0011-011F	233096.81	673310.72				
9106-0011-012F	233096.81	673383.45				
9106-0011-014F	233033.83	673419.81				
9106-0011-015F	232970.85	673456.17				
9106-0011-017F	235120.91	672468.82				
9106-0011-018F	233321.34	673176.29				

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The sample location designations of Table 3 are not sequentially inclusive because of the necessity to relocate some samples due to the accessibility of the original sample locations. Sample locations 9106-0011-001F and 9106-0011-013F were found to be inaccessible. These were randomly re-located using the VSP software to two (2) new locations designated as 9106-0011-016F and 9106-0011-017F, except that location 9106-0011-016F was also found to be inaccessible. So, an additional randomly located sample, 9106-0011-018F was also generated. Since sample 9106-0011-001F was randomly selected as a Quality Control (QC) split sample, sample 9106-0011-017F was designated as the replacement QC sample.

While comparing sample design locations to the actual sample location provided by Ocean Surveys, Inc (OSI) in order to determine the maximum design to actual offset, an anomaly was found concerning sample numbering.

It was found that the sample offsets for sample numbers 9106-0000-017F and 9106-0000-018F were quite extreme. It was further noticed that the sample location provided by OSI for sample number 9106-0000-017F closely matched that of sample design location for 9106-0000-016F and that the sample location provided by OSI for sample location 9106-0000-018F closely matched the sample design location for 9106-0000-017F.

A review of the OSI Daily Sampling Logs, Sample Analysis Reports and Chain of Custody forms and interviews with the FSS Project Engineer were performed in order to resolve the anomaly. It was determined that, on 5/10/06, Sample Number 9106-0000-016 was used for a DEP sample. Sampling to replace sample design locations which were unobtainable from Sample Locations 9106-0000-001F and 9106-0000-013F did not begin until 5/17/06. The OSI crew encountered high winds, significant rainfall and strong currents during this period. Evidence supports the hypothesis that the crew became confused with regard to sample numbering at this time. Either the FSS Engineer in charge of the project did not provide corresponding sample numbers with the sample coordinates that were provided to the OSI crew or the OSI crew, knowing that Sample Number 9106-0000-016F had already been used, guided the boat captain to the first set of coordinates provided by the FSS Engineer and called this point Sample Number 9106-0000-017F. In any case, there is no documentation of a Sample Number 9106-0000-016F on Chain of Custody Forms or in the Sample Analysis packages. There is also no documentation in the OSI Daily Sampling Logs to show that Sample Number 9106-0000-016F was ever taken; however, there is documentation of a Sample Number 9106-0000-016DEP, taken in the vicinity of Sample Location 9106-0000-007F.

Therefore, the evaluation determined that the GPS coordinates for sample design location 9106-0000-016F were used and called Sample Number 9106-0000-017F and the coordinates for sample design location 9106-0000-017F

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were used for Sample Number 9106-0000-018F. There is no documentation that the coordinates for sample design location 9106-0000-018F were used.

Three (3) sediment samples were analyzed for the full suite of radionuclides specified in Table 1, exceeding the requirement to analyze 5% of the sample population for HTD analysis specified in procedure RPM 5.1-11. Two (2) of the three (3) samples were randomly selected using the Microsoft Excel "RAND" function. The two (2) samples exhibiting the highest observed radionuclide concentrations by gamma analyses were also selected.

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

Section 5.7.3.2.6 of the LTP specifies that scanning is not required for the FSS of the Discharge Canal. Table 4 provides a synopsis of the survey design.

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esign Criteria (6,394 m²	Basis Based on AutoCAD-LT and Visual
6,394 m <sup>2</sup>	
	Sample Plan calculations
15	Type 1 and Type 2 errors were 0.05, sigma was 0.111 the LBGR was set to 0.778 to maintain Relative Shift in the range of 1 and 3, Relative Shift was 2.0
22.2 m	Based on triangular grid
6 ρCi/g Cs-137 2 ρCi/g Co-60 9 ρCi/g Ni-63	To achieve ten (10) mrem/yr TEDE
1 ρCi/g Cs-137	To achieve nineteen (19) mrem/yr
, .	TEDE (2) to demonstrate compliance with
9 ρCi/g Ni-63	Equation 2 of this Release Record
N/A	The LTP exempts this area
1 ρCi/g Cs-137 0 ρCi/g Co-60 9 ρCi/g Ni-63	The Operational DCGL meets the LTP criteria for a Class 2 survey unit
	22.2 m 6 pCi/g Cs-137 2 pCi/g Co-60 9 pCi/g Ni-63 1 pCi/g Cs-137 0 pCi/g Co-60 9 pCi/g Ni-63 N/A 1 pCi/g Cs-137

<sup>(1)</sup> The survey design used a much smaller value for investigation than the Operational DCGL provided by Table 2 as the total dose from existing and future groundwater had not been established at the time of planning the FSS.

#### 5. SURVEY IMPLEMENTATION

Final Status Survey field activities were conducted under Work Plan and Inspection Record (WP&IR) 2006-0021. The WP&IR package included a detailed FSSP, 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 that were supplied to the sampling vendor, Ocean Surveys, Inc. (OSI) of Old Saybrook, Connecticut. Discharge Canal sampling was accomplished using direct push technology to collect composite samples of bottom and mean high water mark sediments. Sediment cores from the Discharge Canal were obtained by OSI using a vibrating corer that is platform mounted on a sampling vessel. The core barrel was a three (3) inch diameter thin-walled aluminum tube which also served as a core liner (ten (10) feet or less). A core catcher was available to prevent the sample from sliding out of the bottom of the tube. Vessel positioning and the determination of sample

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<sup>(2)</sup> The allowable dose for soil in this survey unit is nineteen (19) 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.)

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locations were accomplished using a GPS interfaced with a navigation and data logging system.

After extraction, water was drained from above the sample by drilling holes above the sediment. The liner was cut, capped, sealed, labeled and turned over to site personnel who processed and controlled the samples under Chain of Custody (COC) protocols in accordance with procedure RPM 5.1-5, "Chain of Custody for Final Status Survey Samples." Rinsing of the barrel and associated equipment was performed between sampling events. New aluminum tubes were used for each sample to prevent cross-contamination of subsequent samples.

The fifteen (15) sediment samples were collected and packaged in accordance with Haddam Neck Plant (HNP) Procedure RPM 5.1-3, "Collection of Sample Media for Final Status Survey" and FSS design. Samples were controlled, transported, stored, and transferred to the off-site laboratory using COC protocols.

Four (4) samples (9106-0011-003F, 9106-0011-009F and 9106-0011-018F) were selected for HTD radionuclide analysis by the off-site laboratory.

The implementation of quality control measures included the collection of two (2) split samples at locations 9106-0011-012F and 9106-0011-017F for comparative analysis by the off-site laboratory.

#### 6. SURVEY RESULTS

The off-site laboratory employed for the radiological analyses of samples was General Engineering Laboratories (GEL) – Charleston, South Carolina. The laboratory analyzed the fifteen (15) samples taken for non-parametric statistical testing and the associated duplicates using gamma spectroscopy. Ni-63 was analyzed by liquid scintillation analyses. All analyses were performed to the required MDC.

Cs-137 was positively identified above the accepted criteria for detection (i.e., a result greater than two (2) standard deviations uncertainty) in thirteen (13), Co-60 was positively identified in seven (7) and Ni-63 in three (3) of the fifteen (15) samples.

Several other radionuclides which were positively identified could be deselected or excluded using the 5% and 10% rule described in Section 5.4.7.2 of the LTP.

The off-site laboratory also processed three (3) samples for full HTD analysis as required by the sample plan. The requested analyses included alpha spectroscopy and liquid scintillation depending upon the radionuclide and the measurement method. All analyses were performed to the required MDC. None of the HTD radionuclides met the accepted criteria for detection (i.e., a

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result greater than two standard deviations uncertainty) in more than one sample; however, each of the positive results for HTD radionuclides could be de-selected based on the 5% and 10% rules.

None of the sample results exceeded the Operational DCGL or required further investigation. A summary of the sample results is provided in Table 5.

Table 5- Summary of Soil Sample Results							
Sample Number	Cs-137 ρCi/g	Co-60 ρCi/g	Ni-63 ρCi/g	Fraction of the Operational DCGL			
9106-0011-002F	8.89E-02	2.69E-02	1.53E+00	2.69E-02			
9106-0011-003F	7.37E-01	1.38E-01	-4.64E-01	1.69E-01			
9106-0011-004F	1.02E-01	-1.19E-02	5.93E+00	2.37E-02			
9106-0011-005F	2.13E-01	1.52E-01	5.96E+00	9.87E-02			
9106-0011-006F	3.22E-01	1.99E-02	2.44E+00	6.49E-02			
9106-0011-007F	1.84E-01	5.52E-02	1.40E+01	7.52E-02			
9106-0011-008F	1.56E-01	1.53E-01	-5.23E-01	7.78E-02			
9106-0011-009F	6.23E-02	3.42E-02	8.59E-01	2.37E-02			
9106-0011-010F	3.71E-02	-1.19E-02	6.11E+00	1.32E-02			
9106-0011-011F	1.57E-02	1.17E-02	9.78E-01	8.43E-03			
9106-0011-012F	-3.48E-03	3.11E-02	-1.12E+00	8.11E-03			
9106-0011-014F	2.49E-02	-4.54E-04	2.76E+00	9.01E-03			
9106-0011-015F	1.18E-01	-4.29E-03	8.67E+00	3.39E-02			
9106-0011-017F	4.06E-01	6.52E-03	1.18E+01	9.13E-02			
9106-0011-018F	1.99E-01	1.81E-01	5.22E+00	1.05E-01			

<sup>(1)</sup> The Operational DCGLs from Table 2 are 6.01 pCi/g for Cs-137, 2.90 pCi/g for Co-60 and 549 for Ni-63; these are used in conjunction with the unity rule to achieve nineteen (19) mrem/yr TEDE

The sample location designations of Table 5 are not sequentially inclusive because of the necessity to relocate some samples due to the accessibility of the original sample locations. Sample locations 9106-0011-001F and 9106-0011-013F were found to be inaccessible. These were randomly re-located using the VSP software to two (2) new locations designated as 9106-0011-016F and 9106-0011-017F, except that location 9106-0011-016F was also found to be inaccessible. So, an additional randomly located sample, 9106-0011-018F was also generated. Biased samples were not required per the sample plan.

#### 7. **QUALITY CONTROL**

The two (2) split samples taken for QC were analyzed by the off-site laboratory. The data were evaluated using USNRC acceptance criteria specified in Inspection Procedure 84750 and as detailed in HNP Procedure RPM 5.1-24, "Split Sample Assessment for Final Status Survey." For both QC split samples, there was an acceptable level of agreement.

#### RELEASE RECORD

The sample analysis vendor, GEL, maintained quality control and quality assurance plans as part of normal operation. Refer to Attachment 2 for data and data quality analysis results.

#### 8. INVESTIGATIONS AND RESULTS

None of the sample results were found to exceed the nineteen (19) mrem/yr Operational DCGL. Thus, no investigations were required.

#### 9. REMEDIATION AND RESULTS

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

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

The survey was designed to ten (10) mrem/yr TEDE which was conservative and necessary at the time of FSS planning. It is no longer required as the total dose from existing and future groundwater has been established. The dose for soil used to demonstrate compliance with the LTP and CTDEP criteria is nineteen (19) mrem/yr TEDE as discussed in Section 2 of this Release Record.

#### 11. DATA QUALITY ASSESSMENT (DQA)

The DQO sample design and data were reviewed in accordance with Procedure RPM 5.1-23, "Data Quality Assessment." The sample 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 indicates that the survey unit passes the unrestricted release criterion, thus, the null hypothesis is rejected.

Documentation was complete and legible. Surveys and sample collection were consistent with the DQOs and were sufficient to ensure that the survey unit was properly designated as Class 2.

#### RELEASE RECORD

The preliminary data review consisted of calculating basic statistical quantities (e.g., mean, median, standard deviation). The standard deviation was slightly more than the value used for the survey design. This is represented by the shift in the retrospective power curve as shown in Attachment 2f. This would indicate a need to change the original LBGR in order to maintain the number of samples at fifteen (15) to meet the Operational DCGL. However, the value of LBGR is not a critical issue as the survey unit has passed the statistical test, and the mean and median values are well below the Operational DCGL when used in conjunction with the unity rule. Also, the retrospective power curve shows that a sufficient number of samples were collected to achieve the desired power. Therefore, the survey unit meets the unrestricted release criterion with adequate power as required by the DQOs.

The range of the data, about 3.41 standard deviations, was not unusually large. The difference between the mean and median was 45.8% of the standard deviation which indicates some skewness in the data. The data was represented graphically through posting plots, a frequency plot, and a quantile plot. The frequency plot shows some positive skewness as confirmed by the calculated skew of 1.00.

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

#### 12. ANOMALIES

The following anomalies were noted:

- Upon receipt at the off-site laboratory, it was discovered that the labels for two (2) of the samples (9106-0011-007F and 9106-0011-017FS) were smudged in transit, rendering them illegible. This issue and measures to prevent a recurrence are documented in Condition Report 06-0168, initiated on 6-25-06.
- Sample location 9106-0011-017 was designated as a QC split sample. Sample 9106-0011-017F (the split to illegibly labeled sample 9106-0011-017FS) had a legible label and was counted at the offsite laboratory. This result was included in sample results packages returned from the off-site laboratory (MSR#06-0877).

To resolve this issue, three additional samples (9106-0011-007F, 9106-0011-017F and 9106-0011-017FS) were sent from excess aliquot that had been retained in appropriate packaging on-site and in compliance with chain of custody requirements. An additional issue was encountered with this:

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#### RELEASE RECORD

• Sample 9106-0011-007F was erroneously sent out the second time with the sample labeled as "9106-0011-007FS", this is how the sample is now titled in the results.

The results appearing in sample package MSR#06-960 are the results of record for the three (3) affected samples. A memo noting these discrepancies has been attached to the sample results package.

# • Sample numbering error identified during compilation of this release record, as described in Section 4 of this report.

Design Sample Number 9106-0000-016F was notated as a sample number which was not used.

Design Sample Location 9106-0000-017F was shown at the coordinates originally designated for Design Sample Location 9106-0000-016F.

Design Sample Location 9106-0000-018F was shown at the coordinates originally designated for Design Sample Location 9106-0000-017F.

#### 13. CONCLUSION

Survey Unit 9106-0011 has demonstrated compliance with the dose based, unrestricted release criterion. The sample data passed the Sign Test and the null hypothesis was rejected. The ALARA criteria for soils as specified in Chapter 4 of the LTP were achieved. Reclassification and remediation of this survey unit was not required.

Graphical representation of data indicates some positive skewness that is probably due to localized differences in particulate deposition rates, hydraulic velocity and sedimentation rates. The Retrospective Power Curve generated using COMPASS shows adequate power was achieved. The survey unit was properly designated as a Class 2 survey unit.

The dose contribution from sediment in this survey unit is 1.0 mrem/yr TEDE based on the average concentration of the samples used for non-parametric statistical sampling.

This survey unit is not affected by existing groundwater (reference CY memo ISC 06-024). It has been determined that the dose contribution from groundwater sources is bounded by zero (0) mrem/yr TEDE.

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

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#### RELEASE RECORD

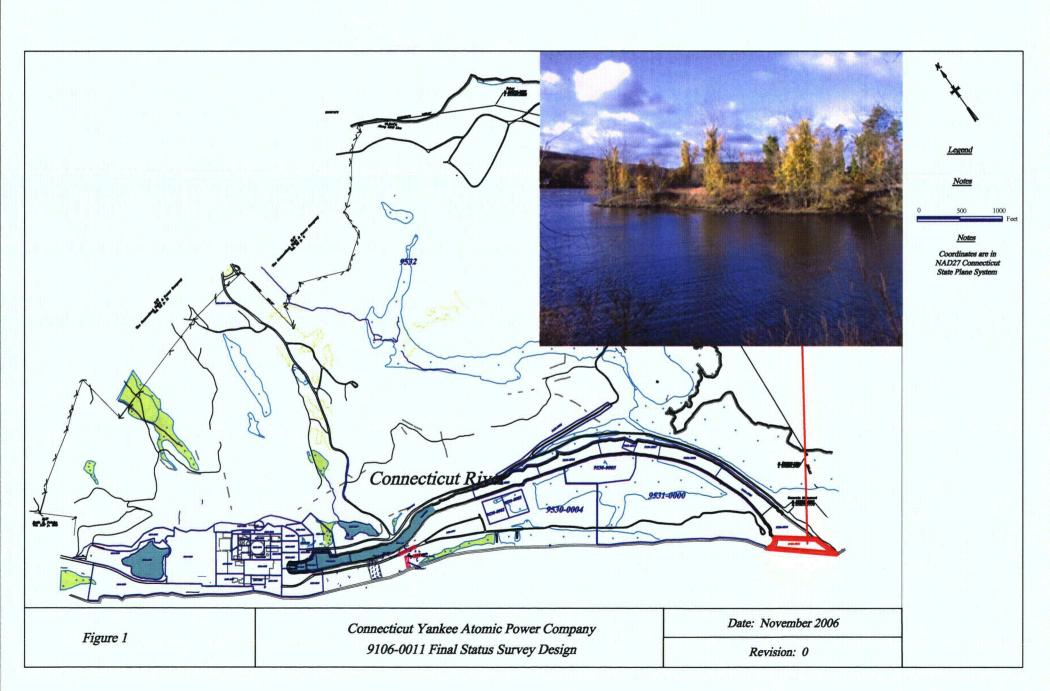
The average total dose from residual radioactivity in this survey unit, including exposures from the three (3) components as described in Section 3, that is, residual radioactivity in soil, existing groundwater radioactivity, and future groundwater radioactivity from the burial of concrete foundations or footings from site buildings containing residual radioactivity, will not exceed 1.0 mrem/yr Total Effective Dose Equivalent (TEDE).

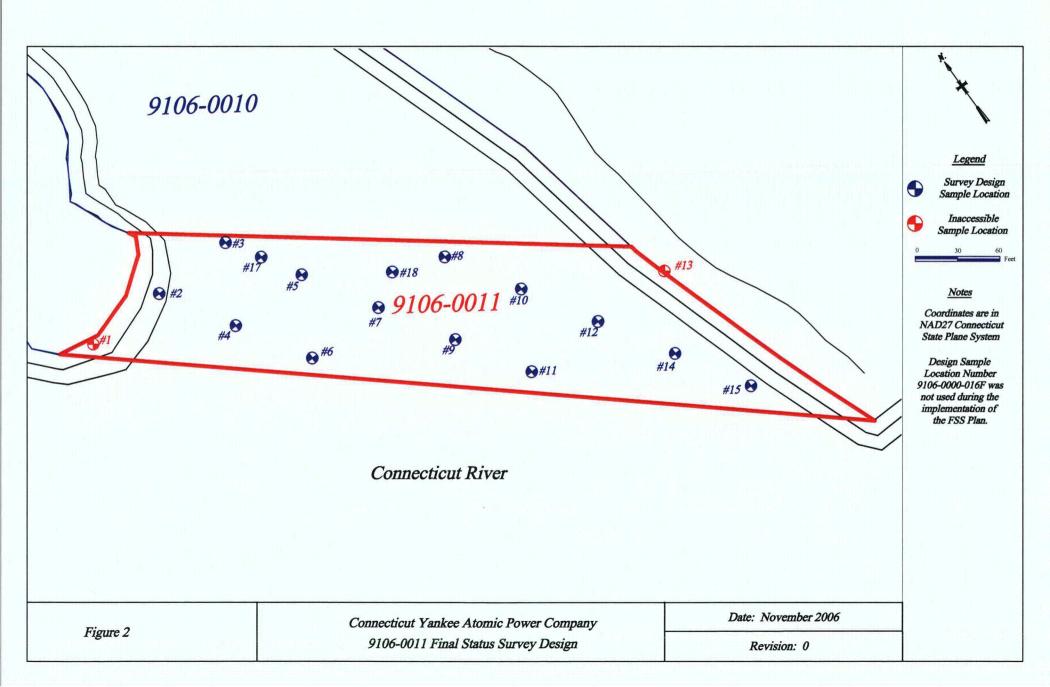
#### 14. ATTACHMENTS

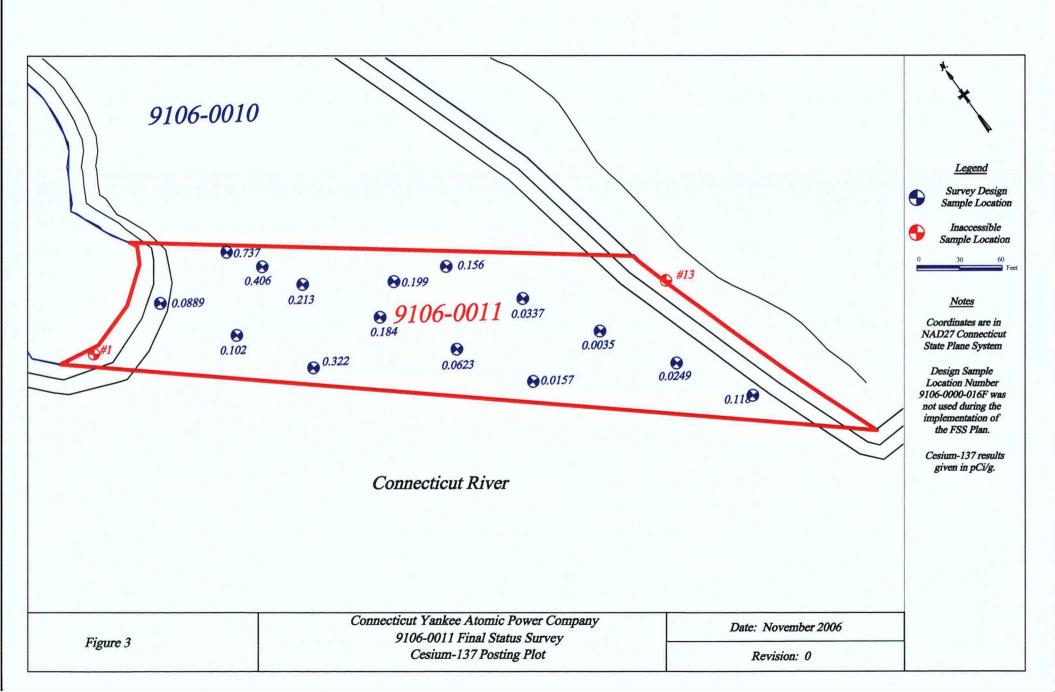
- 14.1 Attachment 1 Figures
- 14.2 Attachment 2 Sample and Statistical Data

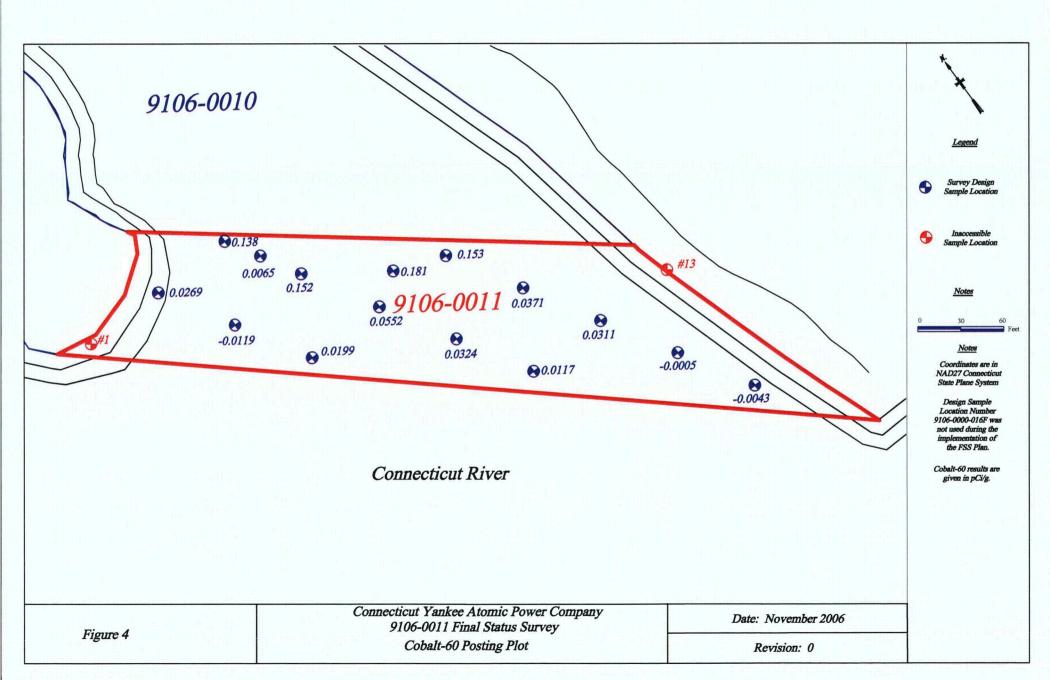
# DISCHARGE CANAL SURVEY UNIT 9106-0011 RELEASE RECORD

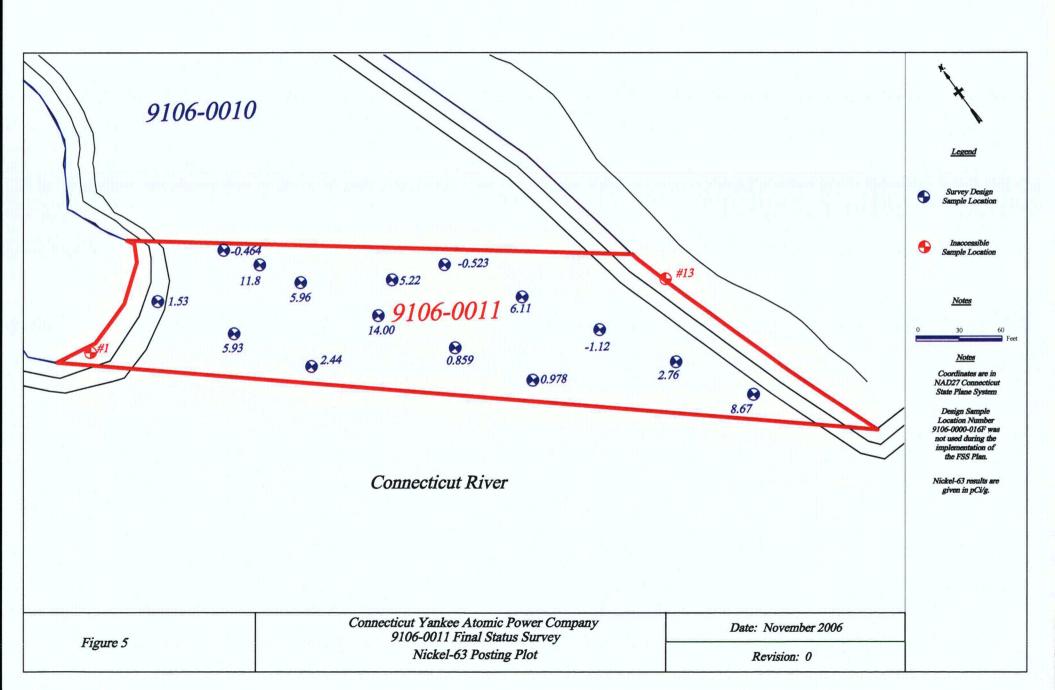
Attachment 1
Figures
(5 pages)











### DISCHARGE CANAL SURVEY UNIT 9106-0011 RELEASE RECORD

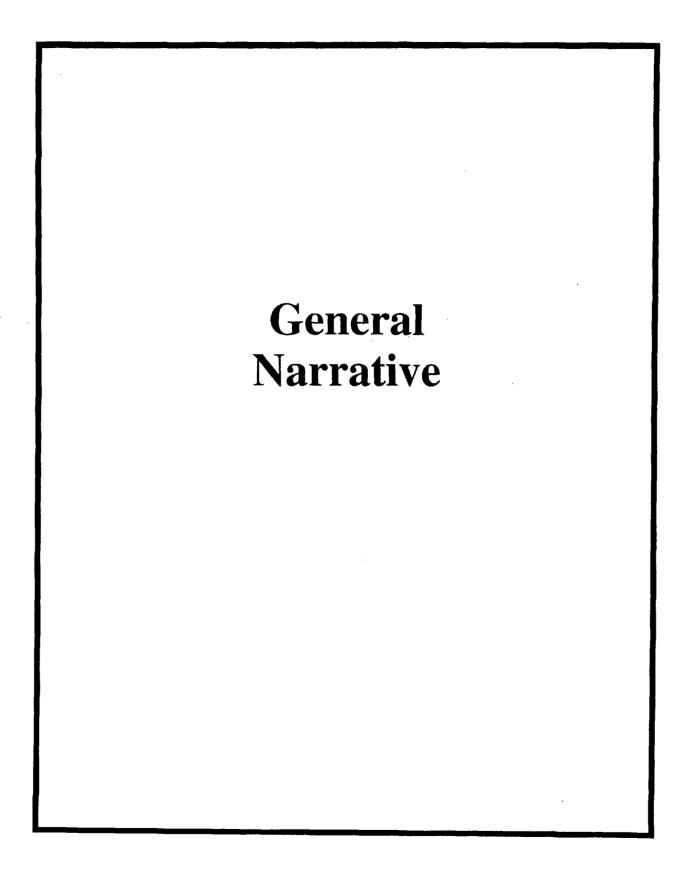
Attachment 2 Sample and Statistical Data

# DISCHARGE CANAL SURVEY UNIT 9106-0011 RELEASE RECORD

Attachment 2a Sample Data (188 Pages)

# Table of Contents

General Narrative	1
Chain of Custody and Supporting Documentation	4
Radiological Analysis	8
Sample Data Summary	27
Quality Control Data	



#### CASE NARRATIVE

For

CONNECTICUT YANKEE

RE: Sediment PO# 002332

Work Order: 165614 SDG: MSR #06-0877

June 30, 2006

#### **Laboratory Identification:**

General Engineering Laboratories, LLC

#### **Mailing Address:**

P.O. Box 30712 Charleston, South Carolina 29417

#### **Express Mail Delivery and Shipping Address:**

2040 Savage Road Charleston, South Carolina 29407

#### **Telephone Number:**

(843) 556-8171

#### **Summary:**

#### Sample receipt

The sample(s) for this Project arrived at General Engineering Laboratories, LLC, (GEL) in Charleston, South Carolina on June 21, 2006. All sample containers arrived without any visible signs of tampering or breakage. The chain of custody contained the proper documentation and signatures.

The laboratory received the following sample(s):

Sample ID	Client Sample ID
165614001	9106-0011-011F
165614002	9106-0011-012F
165614003	9106-0011-012FS
165614004	9106-0011-014F
165614005	9106-0011-015F
165614006	9106-0011-018F
165614007	9106-0011-002F
165614008	9106-0011-003F

#### **Items of Note:**

There are no items of note.

#### Case Narrative:

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are listed below by analytical parameter.

#### **Analytical Request:**

Seven sediment samples were analyzed for FSSGAM and Ni-63. One sediment sample was analyzed for FSSALL.

#### **Internal Chain of Custody:**

Custody was maintained for the sample(s).

#### Data Package:

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

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

Cheryl Jones

Project Manager

# Chain of Custody and Supporting Documentation

Connecticut Y 362 Injun F	ankee At Hollow Road, E 860-267	ast Hampton			y			Cha	ain o	f Custo	ody Form	No	o. 2006-00413
Project Name: Haddam N	eck Decomn	nissioning					A	nalyses	Reque	sted	Lab Use Only		f to
Contact Name & Phone: Jack McCarthy 860-267-	-2556 Ext. 1	3024									Comments:		
Analytical Lab (Name, City, State) General Engineering Laboratories 2040 Savage Road. Charleston SC. 29407 843 556 8171. Attn. Cheryl Jones						FSSGAM	SSALL	Ni-63					
Priority: ☐ 30 D. ⊠ 14 D. ☐ 7 D.		Media	Sample	Container Size- &Type							1656	H. Exp.	
Sample Designation	Date	Time	Code	Type Code	Code				1		Comment, Pres	ervation	: Lab Sample ID
9106-0011-011F	5/17/06	08:15	SE	С	BP	Х		X			Transferred from COC	2006-00356	
9106-0011-012F	5/17/06	08:41	SE	С	BP	X		X	Ī		Transferred from COC		
9106-0011-012FS	5/17/06	08:41	SE	С	BP	X		X			Transferred from COO		MARKET AND ST
9106-0011-014F	5/17/06	09:34	SE	С	BP	X		X			Transferred from COO		
9106-0011-015F	5/17/06	09:12	SE	С	BP	X		X			Transferred from CO		HEAD PARTS
9106-0011-018F	5/17/06	10:01	SE	C	BP	X		X			Transferred from CO		
9106-0011-002F	5/15/06	14:33	SE	C	BP	X		X	,		Transferred from CO		
9106-0011-003F	5/15/06	14:58	SE	С	BP		X				Transferred from CO	C 2006-00352	
			<u> </u>	<u> </u>	<u> </u>		<u> </u>						Maxia X X Table 1
NOTES: PO#: 002332 MSR#: 06- SSWP# NA \ LTP QA \ Radwaste QA \ Non QA  0877 per accompanying paper work. Cffor 421/06						Samples Shipped  Fed Ex UPS  Hand	Via:	Internal Container Temp. 24 Deg. C Custody Sealed?					
1) Relinquished By Date/Time			ie	2) Recei	ved By	1			Date	/Time			Custody Seal
JAIME RICARTE	JAIME RICARTE 6-20-06/1100				AM.	S/L		Ł	1216	6 093	O Other		Intact?
3) Relinquished By Date/Time 4) Recei			ved By				<b>y</b> –	/Time			YY NO		
5) Relinquished By	Relinquished By Date/Time 6) Received			ved By				Date	/Time	Bill of Lading # 79.00 2328 7	540		



Manager or ESH Manager.

PM (or PMA) review of Hazard classification:

#### SAMPLE RECEIPT & REVIEW FORM

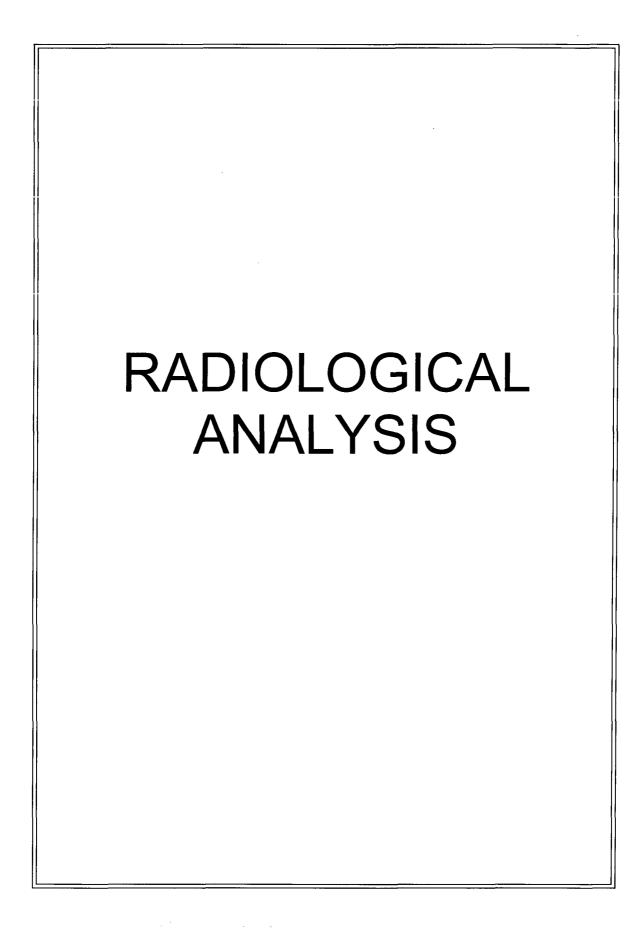
PM use only YANKEE Client: CONN ATOMIC SDG/ARCOC/Work Order: Date Received: -21-06 PM(A) Review (ensure non-conforming items are resolved prior to signing): Acm Received By: Ž ŝ Sample Receipt Criteria Comments/Qualifiers (Required for Non-Conforming Items) Circle Applicable: seals broken damaged container leaking container other (describe) Shipping containers received intact and sealed? blue ice Circle Coolant # other describe) Samples requiring cold ice bags 2 preservation within (4 + /- 2 C)? Record preservation method. Chain of custody documents included with shipment? Sample containers intact and Circle Applicable: seals broken damaged container leaking container other (describe) sealed? Sample ID's, containers affected and observed pH: Samples requiring chemical preservation at proper pH? Sample ID's and containers affected: VOA vials free of headspace (defined as < 6mm bubble)? Are Encore containers present? 7 (If yes, immediately deliver to VOA laboratory) ld's and tests affected: Samples received within holding time? Sample ID's and containers affected: Sample ID's on COC match ID's on bottles? Date & time on COC match date TIME DATES WERE WIPED OFF & time on bottles? Number of containers received match number indicated on COC? COC form is properly signed in relinquished/received sections? 7910 2328 7540 Air Bill, Tracking #'s, & Additional Comments RSO RAD Receipt # Regulated Regulated \*If > x2 area background is observed on samples identified as "non-**Suspected Hazard Information** regulated/non-radioactive", contact the Radiation Safety group for further investigation. A Radiological Classification? Maximum Counts Observed\*: B PCB Regulated? Comments: Shipped as DOT Hazardous Hazard Class Shipped: C Material? If yes, contact Waste X UN#:

Initials

Date: (

Figure	1.	Sample	Check-in	Lis

Date/Time Received: 6-21-06 00	i <i>30</i>
SDG#:	06-0877
Work Order Number: 1656141.	
Shipping Container ID: 7910 2328 2540 Cha	ain of Custody # 2006 - 004/3
1. Custody Seals on shipping container intact?	Yes [4] No []
2. Custody Seals dated and signed?	Yes [ ] No [≰]
3. Chain-of-Custody record present?	Yes [*] No [ ]
4. Cooler temperature 24°C	
5. Vermiculite/packing materials is:	Wet [★] Dry [\]
6. Number of samples in shipping container: 8	
7. Sample holding times exceeded?	Yes [ ] No [ ]
8. Samples have:	₹.
9. Samples are:	
in good conditionleaking	
brokenhave air	bubbles
10. Were any anomalies identified in sample receipt?	Yes [ ] No <b>K</b> ]
Description of anomalies (include sample numbers	s):
Sample Custodian/Laboratory: AMWY	Date: 6/21/06 0930
Telephoned to:On	By



# Radiochemistry Case Narrative Connecticut Yankee Atomic Power Co. (YANK) Work Order 165614

# **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: 542293

Prep Batch Number: 541984

Dry Soil Prep GL-RAD-A-021 Batch Number: 541800

Sample ID	Client ID
165614008	9106-0011-003F
1201121832	Method Blank (MB)
1201121833	165557001(1000-0000-119-C-1C-01) Sample Duplicate (DUP)
1201121834	165557001(1000-0000-119-C-1C-01) Matrix Spike (MS)
1201121835	Laboratory Control Sample (LCS)

#### **SOP Reference**

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

# **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

# **Standards Information**

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

#### Sample Geometry

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

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

#### **Blank Information**

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

### **Designated QC**

The following sample was used for QC: 165557001 (1000-0000-119-C-1C-01).

#### **QC** Information

All of the QC samples met the required acceptance limits.

#### **Technical Information:**

# **Holding Time**

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

# **Preparation Information**

All preparation criteria have been met for these analyses.

# Sample Re-prep/Re-analysis

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

### **Miscellaneous Information:**

#### **NCR** Documentation

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

# **Manual Integration**

No manual integrations were performed on data in this batch.

### **Additional Comments**

The Cm-233/234 blank result is greater than the MDA but less than the detection limit.

# **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: 542294

Prep Batch Number: 541984

Dry Soil Prep GL-RAD-A-021 Batch Number: 541800

Sample ID	Client ID
165614008	9106-0011-003F
1201121836	Method Blank (MB)
1201121837	165557001(1000-0000-119-C-1C-01) Sample Duplicate (DUP)
1201121838	165557001(1000-0000-119-C-1C-01) Matrix Spike (MS)
1201121839	Laboratory Control Sample (LCS)

#### **SOP Reference**

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

# **Calibration Information:**

#### Calibration Information

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

### Sample Geometry

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

#### Quality Control (QC) Information:

#### **Blank Information**

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

# **Designated QC**

The following sample was used for QC: 165557001 (1000-0000-119-C-1C-01).

# **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 165614008 (9106-0011-003F) was recounted due to a negative result greater than three times the error.

# **Miscellaneous Information:**

#### **NCR Documentation**

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

# **Manual Integration**

No manual integrations were performed on data in this batch.

#### **Additional Comments**

Additional comments were not required for this sample set.

# **Qualifier information**

Manual qualifiers were not required.

# **Method/Analysis Information**

Product:	Liquid Scint Pu241, 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:	542295
Prep Batch Number:	541984
Dry Soil Prep GL-RAD-A-021 Batch Number:	541800

Sample ID	Client ID
165614008	9106-0011-003F
1201121840	Method Blank (MB)
1201121841	165557001(1000-0000-119-C-1C-01) Sample Duplicate (DUP)
1201121842	165557001(1000-0000-119-C-1C-01) Matrix Spike (MS)
1201121843	Laboratory Control Sample (LCS)

#### **SOP Reference**

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

#### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

#### Sample Geometry

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

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

#### **Blank Information**

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

#### **Designated OC**

The following sample was used for QC: 165557001 (1000-0000-119-C-1C-01).

#### OC Information

All of the QC samples met the required acceptance limits.

#### **Technical Information:**

#### **Holding Time**

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

### **Preparation Information**

All preparation criteria have been met for these analyses.

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

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

#### **Miscellaneous Information:**

#### **NCR** Documentation

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

#### SDG.

# **Manual Integration**

No manual integrations were performed on data in this batch.

#### **Additional Comments**

Additional comments were not required for this sample set.

# **Qualifier information**

Manual qualifiers were not required.

# **Method/Analysis Information**

Product: Gamma, Solid-FSS GAM & ALL FSS 226 Ingrowth Waived

Analytical Method: EML HASL 300, 4.5.2.3

Prep Method: Dry Soil Prep

Analytical Batch Number: 541904

Prep Batch Number: 541800

Sample ID	Client ID
165614001	9106-0011-011F
165614002	9106-0011-012F
165614003	9106-0011-012FS
165614004	9106-0011-014F
165614005	9106-0011-015F
165614006	9106-0011-018F
165614007	9106-0011-002F
165614008	9106-0011-003F
1201120872	Method Blank (MB)
1201120873	165614001(9106-0011-011F) Sample Duplicate (DUP)
1201120874	Laboratory Control Sample (LCS)

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 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: 165614001 (9106-0011-011F).

#### **OC** 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 1201120872 (MB) recounted due to a suspected blank false positive. Since the reason for the recount was due to a counting irregularity specific to the detector, the rest of batch was not recounted.

#### Miscellaneous Information:

#### **NCR Documentation**

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

#### **Additional Comments**

The relative percent difference between samples 1201120873 (9106-0011-011F) and 165614001 (9106-0011-011F) for Ac-228 and Tl-208 did not meet the duplication criteria. However, when a relative error ratio is calculated, precision is shown at 2.06 for Ac-228 and .9919 for Tl-208.

#### **Qualifier information**

Qualifier	Reason	Analyte	Sample
UI	Data rejected due to low abundance.	Cesium-134	165614006
			165614007
			165614008

# **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: 545299

Prep Batch Number: 541984

Dry Soil Prep GL-RAD-A-021 Batch Number: 541800

Sample ID	Client ID
165614008	9106-0011-003F
1201128844	Method Blank (MB)
1201128845	165011040(1000-0000-120-C-1C-03) Sample Duplicate (DUP)
1201128846	165011040(1000-0000-120-C-1C-03) Matrix Spike (MS)
1201128847	Laboratory Control Sample (LCS)

### **SOP Reference**

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

#### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

#### Sample Geometry

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

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

# **Blank Information**

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

### **Designated QC**

The following sample was used for QC: 165011040 (1000-0000-120-C-1C-03).

### **QC** Information

Refer to Non-Conformance Report.

#### **Technical Information:**

# **Holding Time**

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

#### **Preparation Information**

All preparation criteria have been met for these analyses.

### Sample Re-prep/Re-analysis

The batch was reprepped due to a low matrix spike recovery.

#### **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. The following NCR was generated for this SDG: NCR 335049 was generated due to RDL less than MDA and Failed Recovery for MS/PS. 1. Samples 165011031, 165011033, 165011034, 165011035, 165011036, 165011037, 165011039, 165011042, 165011043, and duplicate 1201128845 did not meet the detection limit. 2. The matrix spike, 1201128846, did not meet the recovery requirement due to the matrix of the sample. 1. Client was contacted and granted relief to report results. 2. The batch was previously prepped with similar results. Client was contacted and granted relief to report results.

### **Additional Comments**

Additional comments were not required for this sample set.

#### **Qualifier information**

Manual qualifiers were not required.

#### Method/Analysis Information

Product: Liquid Scint Te99, Solid-ALL FSS

Analytical Method: DOE EML HASL-300, Tc-02-RC Modified

Analytical Batch Number: 541378

Sample ID	Client ID
165614008	9106-0011-003F
1201119751	Method Blank (MB)
1201119752	165557011(1000-0000-121-C-1C-02) Sample Duplicate (DUP)
1201119753	165557011(1000-0000-121-C-1C-02) Matrix Spike (MS)
1201119754	Laboratory Control Sample (LCS)

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-005 REV# 13.

#### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

#### Sample Geometry

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

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

#### **Blank Information**

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

#### **Designated OC**

The following sample was used for QC: 165557011 (1000-0000-121-C-1C-02).

#### **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**

Draduate	Liquid Coint Foff Colid All I FCC
Product:	Liquid Scint Fe55, Solid-ALL FSS

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: 542567

Prep Batch Number: 541984

Dry Soil Prep GL-RAD-A-021 Batch Number: 541800

Sample ID	Client ID
165614008	9106-0011-003F
1201122392	Method Blank (MB)
1201122393	165614008(9106-0011-003F) Sample Duplicate (DUP)
1201122394	165614008(9106-0011-003F) Matrix Spike (MS)
1201122395	Laboratory Control Sample (LCS)

# **SOP Reference**

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

# **Calibration Information:**

# **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

#### Sample Geometry

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

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

#### **Blank Information**

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

#### **Designated QC**

The following sample was used for QC: 165614008 (9106-0011-003F).

#### **OC** 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:	Liquid Scint Ni63, Solid-ALL FSS
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:	542563
Prep Batch Number:	541984
Dry Soil Prep GL-RAD-A-021 Batch Number:	541800

Sample ID	Client ID
165614001	9106-0011-011F
165614002	9106-0011-012F
165614003	9106-0011-012FS
165614004	9106-0011-014F
165614005	9106-0011-015F
165614006	9106-0011-018F
165614007	9106-0011-002F
165614008	9106-0011-003F
1201122381	Method Blank (MB)
1201122382	165614008(9106-0011-003F) Sample Duplicate (DUP)
1201122383	165614008(9106-0011-003F) Matrix Spike (MS)
1201122384	Laboratory Control Sample (LCS)

#### **SOP Reference**

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

# **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

### Sample Geometry

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

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

#### **Blank Information**

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

### **Designated QC**

The following sample was used for QC: 165614008 (9106-0011-003F).

#### **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-HTD2, ALL FSS

Analytical Method: EPA 906.0 Modified

Analytical Batch Number: 542430

Sample ID	Client ID
165614008	9106-0011-003F
1201122131	Method Blank (MB)
1201122132	165011027(1000-0000-125-C-10C-07) Sample Duplicate (DUP)
1201122133	165011027(1000-0000-125-C-10C-07) Matrix Spike (MS)
1201122134	Laboratory Control Sample (LCS)

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-002 REV# 12.

### **Calibration Information:**

### **Calibration Information**

All initial and continuing calibration requirements have been met.

# **Standards Information**

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

#### Sample Geometry

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

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

# **Blank Information**

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

# **Designated QC**

The following sample was used for QC: 165011027 (1000-0000-125-C-10C-07).

#### **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 165614008 (9106-0011-003F) was recounted due to high MDA.

#### **Miscellaneous Information:**

#### **NCR Documentation**

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

#### **Additional Comments**

Additional comments were not required for this sample set.

# **Qualifier information**

Manual qualifiers were not required.

#### Method/Analysis Information

Product: Liquid Scint C14, Solid All,FSS

Analytical Method: EPA EERF C-01 Modified

Analytical Batch Number: 541380

Sample ID	Client ID
165614008	9106-0011-003F
1201119755	Method Blank (MB)
1201119756	165557010(1000-0000-121-C-1C-01) Sample Duplicate (DUP)
1201119757	165557010(1000-0000-121-C-1C-01) Matrix Spike (MS)
1201119758	Laboratory Control Sample (LCS)

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-003 REV# 8.

#### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

#### Sample Geometry

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

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

#### **Blank Information**

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

#### **Designated OC**

The following sample was used for QC: 165557010 (1000-0000-121-C-1C-01).

#### OC 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.

# **Certification Statement**

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

# **Review Validation:**

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

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

Reviewer/Date:	Reviewer/Date:	Sollat The	
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1/

Melanie Aycock

**Quality Review:** 

Director:

14-JUL-06

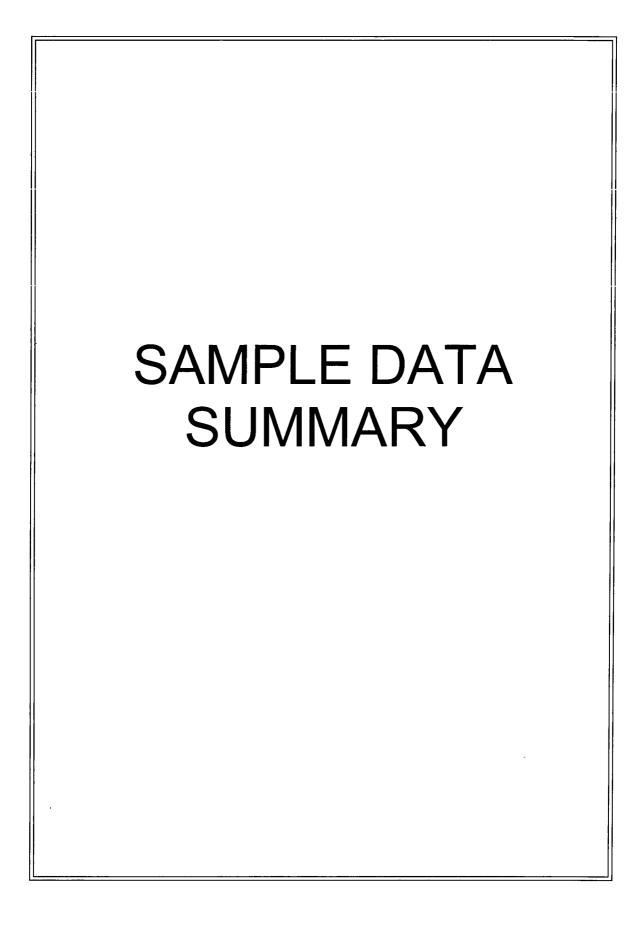
NCR Report No.: 335049 Revision No.: 1

	10-770-1 , 20-7-2-2		
	COMPANY - WIDE NONC	ONFORMANCE REPOR	RT
Mo.Day Yr. 14-JUL-06	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: GFPC	Test / Method: EPA 905.0 Modified	Matrix Type: Solid	Client Code: YANK
Batch ID: 545299	Sample Numbers: See Below		
Potentially affected work order(s)(	(SDG): 165011(MSR#06-0828),165614(	MSR#06-0877),165702(MSR#0	06-0877)
Application Issues:			
RDL less than MDA			
Failed Recovery for MS/PS			
Specification and Requirements Nonconformance Description:		NRG Disposition:	
1. Samples 165011031, 165011033 165011036, 165011037, 16501103 duplicate 1201128845 did not meet 2. The matrix spike, 1201128846, due to the matrix of the sample.	9, 165011042, 165011043, and		granted relief to report results.  prepped with similar results. Client was to report results.
Originator's Name:		Data Validator/Group Lead	er:

Page 1

Heather Anderson

14-JUL-06



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# Certificate of Analysis Report for

YANK001 Connecticut Yankee Atomic Power Co.

Client SDG: MSR#06-0877 GEL Work Order: 165614

# The Qualifiers in this report are defined as follows:

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

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

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

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

Reviewed by

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

# **Certificate of Analysis**

Connecticut Yankee Atomic Power

Address:

362 Injun Hollow Rd

East Hampton, Connecticut 06424

Contact: Project:

Mr. Jack McCarthy Soils PO# 002332

Report Date: July 14, 2006

Client Sample ID:

Sample ID:

9106-0011-011F 165614001

Project: Client ID: Vol. Recv.:

YANK01204 YANK001

Matrix: Collect Date:

Receive Date: Collector:

Moisture:

SE 17-MAY-06 21-JUN-06

Client 22.3%

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

Rau Gamma Spec Analysis								
Gamma,Solid-FSS GAM & Waived	ALL FSS	226 Ingrov	vth					
Actinium-228		0.669	+/-0.127	0.0474 +/-0.127	0.102	pCi/g	MJH1 06/29/06 1322 5	541904 1
Americium-241	U	0.0549	+/-0.0804	0.0676 +/-0.0804	0.139	pCi/g		
Bismuth-212		0.401	+/-0.220	0.110 +/-0.220	0.233	pCi/g		
Bismuth-214		0.473	+/-0.0699	0.0245 +/-0.0699	0.0518	pCi/g		
Cesium-134	U	0.0328	+/-0.020	0.0189 +/-0.020	0.0398	pCi/g		
Cesium-137	U	0.0157	+/-0.0158	0.0142 +/-0.0158	0.030	pCi/g		
Cobalt-60	U	0.0117	+/-0.017	0.0155 +/-0.017	0.0336	pCi/g		
Europium-152	U	0.0317	+/-0.0426	0.0379 +/-0.0426	0.079	pCi/g		
Europium-154	U	-0.0318	+/-0.0551	0.0442 +/-0.0551	0.0957	pCi/g		
Europium-155	U	0.0426	+/-0.0446	0.0431 +/-0.0446	0.0887	pCi/g ,	•	
Lead-212		0.609	+/-0.0496	0.0207 +/-0.0496	0.043	pCi/g		
Lead-214		0.467	+/-0.0614	0.025 +/-0.0614	0.0524	pCi/g		
Manganese-54	U	0.0136	+/-0.0175	0.0156 +/-0.0175	0.0331	pCi/g		
Niobium-94	U	0.00856	+/-0.0147	0.0131 +/-0.0147	0.0276	pCi/g		
Potassium-40		12.5	+/-0.763	0.111 +/-0.763	0.248	pCi/g		
Radium-226		0.473	+/-0.0699	0.0245 +/-0.0699	0.0518	pCi/g		
Silver-108m	U	0.00554	+/-0.0136	0.0125 +/-0.0136	0.0262	pCi/g		
Thallium-208		0.164	+/-0.0418	0.0133 +/-0.0418	0.0282	pCi/g		
Rad Liquid Scintillation Ana	alysis							
Liquid Scint Ni63, Solid-AL	LL FSS							

Nickel-63 0.978 +/-5.34 4.45 +/-5.34 9.20 pCi/g SLN1 07/02/06 1812 542563 2 U

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	06/22/06	1916	541800

The following Analytical Methods were performed

Method	Description	
1	EML HASL 300, 4.5.2.3	

DOE RESL Ni-1, Modified

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# **Certificate of Analysis**

Company: Connecticut Yankee Atomic Power

Address:

362 Injun Hollow Rd

Contact:

East Hampton, Connecticut 06424

Project:

Mr. Jack McCarthy Soils PO# 002332

Client Sample ID:

Sample ID:

9106-0011-011F

165614001

YANK01204

Report Date: July 14, 2006

Project: Client ID: YANK001 Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
Surrogate/Tracer recovery Test					Recovery%	Acce	eptable Limits		
Carrier/Tracer Recovery	Liqui	d Scint N	63, Solid-ALL FS		92	(:	25%-125%)		,

#### Notes:

The Qualifiers in this report are defined as follows:

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

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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

Client Sample ID:

Sample ID: Matrix:

Collect Date:

Receive Date: Collector: Moisture:

9106-0011-012F

165614002 SE

17-MAY-06 21-JUN-06

Client 21.8% Report Date: July 14, 2006

Project: Client ID: Vol. Recv.:

YANK01204 YANK001

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Dat	e Time Batch Mt	td
Rad Gamma Spec Ana	lysis									_
Gamma,Solid-FSS G	AM & ALL FSS	226 Ingro	wth							
Waived										
Actinium-228		0.855	+/-0.225	0.0824	+/-0.225	0.181	pCi/g	MJH1 06/2	9/06 1322 541904	1
Americium-241	U	0.018	+/-0.0359	0.0342	+/-0.0359	0.0708	pCi/g			
Bismuth-212		0.702	+/-0.375	0.180	+/-0.375	0.392	pCi/g			
Bismuth-214		0.655	+/-0.141	0.0497	+/-0.141	0.106	pCi/g			
Cesium-134	U	0.0385	+/-0.0821	0.0349	+/-0.0821	0.0746	pCi/g			
Cesium-137	U	-0.00348	+/-0.0301	0.0252	+/-0.0301	0.0544	pCi/g			
Cobalt-60	U	0.0311	+/-0.0298	0.0287	+/-0.0298	0.0637	pCi/g			
Europium-152	U	-0.0521	+/-0.0672	0.0567	+/-0.0672	0.121	pCi/g			
Europium-154	U	0.0502	+/-0.0881	0.0797	+/-0.0881	0.176	pCi/g			
Europium-155	U	0.0499	+/-0.0873	0.0609	+/-0.0873	0.126	pCi/g			
Lead-212		0.912	+/-0.128	0.0339	+/-0.128	0.0711	pCi/g			
Lead-214		0.624	+/-0.117	0.0428	+/-0.117	0.0908	pCi/g			
Manganese-54	U	0.0341	+/-0.0317	0.0278	+/-0.0317	0.0602	pCi/g			
Niobium-94	U	-0.00106	+/-0.0264	0.0222	+/-0.0264	0.0479	pCi/g			
Potassium-40		13.0	+/-1.40	0.230	+/-1.40	0.523	pCi/g			
Radium-226		0.655	+/-0.141	0.0497	+/-0.141	0.106	pCi/g			
Silver-108m	U	-0.00675	+/-0.0209	0.0178	+/-0.0209	0.0384	pCi/g			
Thallium-208		0.298	+/-0.0656	0.0248	+/-0.0656	0.0533	pCi/g			
Rad Liquid Scintillation	n Analysis									
Liquid Scint Ni63, Soli	id-ALL FSS									
Nickel-63	U	-1.12	+/-6.94	5.86	+/-6.94	12.1	pCi/g	SLN1 07/0	2/06 1844 542563 2	2

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	06/22/06	1916	541800

The following Analytical Methods were performed Description

1	EML HASL 300, 4.5.2.3
2	DOE RESL Ni-1, Modified

Method

Surrogate/Tracer recovery Test Recovery% **Acceptable Limits** 

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# **Certificate of Analysis**

Connecticut Yankee Atomic Power

Address:

362 Injun Hollow Rd

Contact:

East Hampton, Connecticut 06424

Mr. Jack McCarthy Soils PO# 002332

Project:

Client Sample ID: Sample ID:

9106-0011-012F

165614002

Project:

Report Date: July 14, 2006

YANK01204 Client ID: YANK001 Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
Surrogate/Tracer recovery To		Test			Recovery%	Acc	eptable Limits		<u>-</u>
Carrier/Tracer Recovery	Liqui	d Scint Ni	63, Solid-ALL FS		78	(	25%-125%)		

#### Notes:

The Qualifiers in this report are defined as follows:

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

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

Report Date: July 14, 2006

YANK01204

YANK001

Project: Client ID:

Vol. Recv.:

# **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

Client Sample ID:

Sample ID: Matrix:

Collect Date: Receive Date:

Collector: Moisture:

9106-0011-012FS 165614003

SE 17-MAY-06 21-JUN-06

Client 22%

Qualifier Parameter Result Uncertainty LC **TPU** MDA Units **DF** Analyst Date Time Batch Mtd Rad Gamma Spec Analysis Gamma, Solid-FSS GAM & ALL FSS 226 Ingrowth Waived Actinium-228 0.761 +/-0.256 0.124 +/-0.256 0.265 pCi/g MJH1 06/29/06 1323 541904 1 Americium-241 U -0.00524 +/-0.0553 0.0458 +/-0.0553 0.0946 pCi/g Bismuth-212 +/-0.593 0.255 +/-0.593 0.544 pCi/g 1.16 +/-0.140 Bismuth-214 0.641 0.0428 +/-0.140 0.0929 pCi/g Cesium-134 0.0231 +/-0.0443 0.0397 +/-0.0443 0.0845 pCi/g Cesium-137 U 0.0406 +/-0.0384 0.0361 +/-0.0384 0.0764 pCi/g Cobalt-60 U 0.0109 +/-0.0395 0.0347 +/-0.0395 0.0759 pCi/g Europium-152 U -0.0343+/-0.0953 0.082 +/-0.0953 0.172 pCi/g Europium-154 0.100 +/-0.118 U -0.0138+/-0.1180.218 pCi/g Europium-155 0.124 +/-0.105 0.0716 +/-0.105 0.149 pCi/g 0.0449 +/-0.0944 Lead-212 0.931 +/-0.0944 0.0935 pCi/g Lead-214 0.0555 +/-0.145+/-0.145pCi/g 0.657 0.117 U -0.00109 +/-0.0489 0.0361 +/-0.0489 Manganese-54 0.0771 pCi/g U -0.00118 0.0309 +/-0.0355 Niobium-94 +/-0.0355 0.0655 pCi/g +/-1.220.299 +/-1.22Potassium-40 12.3 0.661 pCi/g Radium-226 0.641 +/-0.140 0.0428 +/-0.140 0.0929 pCi/g Silver-108m -0.012+/-0.0325 0.0273 +/-0.0325 0.0577 pCi/g Thallium-208 0.289 +/-0.0697 0.0319 +/-0.0697 0.0678 pCi/g Rad Liquid Scintillation Analysis Liquid Scint Ni63, Solid-ALL FSS +/-7.16 +/-7.17 Nickel-63 U 7.07 5.78 11.9 pCi/g SLN1 07/02/06 1915 542563 2

The following Pren Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	06/22/06	1916	541800

The following Analytical Methods were performed Description

EML HASL 300, 4.5.2.3 2 DOE RESL Ni-1, Modified

Method

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 Soils PO# 002332

Project:

Client Sample ID:

Sample ID:

9106-0011-012FS

165614003

Project: Client ID:

Report Date: July 14, 2006

YANK01204 YANK001 Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
Surrogate/Tracer recover	y Test				Recovery%	Acce	eptable Limits		
Carrier/Tracer Recovery	Liqui	d Scint Ni	63, Solid-ALL FS		73	(2	25%–125%)		

#### Notes:

The Qualifiers in this report are defined as follows:

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

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

Report Date: July 14, 2006

YANK01204

YANK001

Project: Client ID:

Vol. Recv.:

# **Certificate of Analysis**

Company:

Connecticut Yankee Atomic Power

362 Injun Hollow Rd Address:

Contact:

East Hampton, Connecticut 06424

Mr. Jack McCarthy

Project:

Soils PO# 002332

Client Sample ID:

Sample ID: Matrix:

Collect Date: Receive Date:

Collector: Moisture:

9106-0011-014F

165614004 SE

17-MAY-06 21-JUN-06

Client

19.2%

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analys	t Date	Time Batch	Mte
Rad Gamma Spec Ana	alysis										
Gamma,Solid-FSS G	AM & ALL FSS	226 Ingro	wth								
Waived											
Actinium-228		0.468	+/-0.108	0.0389	+/-0.108	0.0836	pCi/g	MJH1	06/29/06	1323 541904	1
Americium-241	U	-0.0359	+/-0.0837	0.0675	+/-0.0837	0.141	pCi/g				
Bismuth-212	U	0.173	+/-0.196	0.0983	+/-0.196	0.208	pCi/g				
Bismuth-214		0.345	+/-0.0531	0.0218	+/-0.0531	0.0461	pCi/g				
Cesium-134	U	0.0236	+/-0.0258	0.0163	+/-0.0258	0.0343	pCi/g				
Cesium-137	U	0.0249	+/-0.024	0.0125	+/-0.024	0.0265	pCi/g				
Cobalt-60	U-	-0.000454	+/-0.0154	0.0128	+/-0.0154	0.0278	pCi/g				
Europium-152	U	0.0126	+/-0.0352	0.033	+/-0.0352	0.0692	pCi/g				
Europium-154	U	0.00393	+/-0.0427	0.0362	+/-0.0427	0.0783	pCi/g				
Europium-155	U	0.0369	+/-0.0412	0.0408	+/-0.0412	0.0847	pCi/g				
Lead-212		0.495	+/-0.044	0.0214	+/-0.044	0.0445	pCi/g				
Lead-214		0.383	+/-0.0586	0.0221	+/-0.0586	0.0464	pCi/g				
Manganese-54	U	-0.00115	+/-0.0151	0.0132	+/-0.0151	0.0281	pCi/g				
Niobium-94	U	-0.0016	+/-0.0139	0.0117	+/-0.0139	0.0248	pCi/g				
Potassium-40		12.4	+/0.680	0.106	+/-0.680	0.233	pCi/g				
Radium-226		0.345	+/-0.0531	0.0218	+/-0.0531	0.0461	pCi/g				
Silver-108m	U	-0.00562	+/-0.0124	0.0109	+/-0.0124	0.0229	pCi/g				
Thallium-208		0.159	+/-0.0325	0.0121	+/-0.0325	0.0256	pCi/g				
Rad Liquid Scintillation	n Analysis										
Liquid Scint Ni63, Soi											
Nickel-63	U	2.76	+/-6.18	5.09	+/-6.18	10.5	pCi/g	SLN1	07/02/06	1947 542563	2

The following Pren Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	06/22/06	1916	541800

The following Analytical Methods were performed

Method	Description	
1	EML HASL 300, 4.5.2.3	
2	DOE RESL Ni-1, Modified	

Test **Acceptable Limits** Surrogate/Tracer recovery Recovery%

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# **Certificate of Analysis**

Connecticut Yankee Atomic Power

Address: 362 Injun Hollow Rd

Contact:

East Hampton, Connecticut 06424

Mr. Jack McCarthy Soils PO# 002332

Project:

Client Sample ID: Sample ID:

9106-0011-014F

165614004

Project: Client ID: YANK01204

Vol. Recv.:

YANK001

Report Date: July 14, 2006

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Da	te Time Batch Mtd
Surrogate/Tracer recover	y Test				Recovery%	Acce	eptable Limits		
Carrier/Tracer Recovery	Liqui	d Scint N	63, Solid-ALL FS		80	(2	25%-125%)		

#### Notes:

The Qualifiers in this report are defined as follows:

- A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported
- > Result is greater than value reported
- Α The TIC is a suspected aldol-condensation product
- B Target analyte was detected in the associated blank
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- H Analytical holding time was exceeded
- J Value is estimated

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

- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
- 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

0.460

0.278

8.67

0.0249

+/-0.123

+/-0.0283

+/-0.0647

+/-6.20

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

Client Sample ID:

Sample ID:

Matrix: Collect Date: Receive Date: Collector:

165614005 17-MAY-06 21-JUN-06

9106-0011-015F

Client 27.2% Report Date: July 14, 2006

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

	Moisture:			27.2%					
Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
Rad Gamma Spec An	alysis								
Gamma,Solid=FSS C	GAM & ALL FSS	S 226 Ingro	wth						
Waived		Ū							
Actinium-228		0.731	+/-0.236	0.110	+/-0.236	0.221	pCi/g	MJH1 06/29/0	06 1331 541904 1
Americium-241	U	0.0236	+/-0.0463	0.0378	+/-0.0463	0.0756	pCi/g		
Bismuth-212		0.488	+/-0.346	0.224	+/-0.346	0.448	pCi/g		
Bismuth-214		0.460	+/-0.123	0.0534	+/-0.123	0.107	pCi/g		
Cesium-134	U	0.0693	+/-0.0413	0.0412	+/-0.0413	0.0824	pCi/g		
Cesium-137		0.118	+/-0.0591	0.0336	+/-0.0591	0.0672	pCi/g		
Cobalt-60	U	-0.00429	+/-0.0441	0.0363	+/-0.0441	0.0726	pCi/g		
Europium-152	U	0.121	+/~0.0926	0.0635	+/-0.0926	0.127	pCi/g		
Europium-154	U	-0.0186	+/-0.121	0.0834	+/-0.121	0.167	pCi/g		
Europium-155	U	-0.00174	+/-0.0695	0.0614	+/-0.0695	0.123	pCi/g		
Lead-212		0.735	+/-0.101	0.0361	+/-0.101	0.0721	pCi/g		
Lead-214		0.589	+/-0.104	0.0415	+/-0.104	0.083	pCi/g		
Manganese-54	U	-0.0054	+/-0.0366	0.0312	+/-0.0366	0.0623	pCi/g		
Niobium-94	U	-0.0281	+/-0.0326	0.0255	+/-0.0326	0.0509	pCi/g		
Potassium-40		12.2	+/-1.31	0.226	+/-1.31	0.452	pCi/g		

+/-0.123

+/-6.21

0.0262 +/-0.0283

0.027 +/-0.0647

0.107

0.0523

0.054

10.2

pCi/g

pCi/g

pCi/g

pCi/g

SLN1 07/02/06 2019 542563 2

The following Pren Methods were performed

Radium-226

Silver-108m

Thallium-208

Nickel-63

Rad Liquid Scintillation Analysis Liquid Scint Ni63, Solid-ALL FSS

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	06/22/06	1916	541800

The following Analytical Methods were performed

Method	Description			
1	EML HASL 300, 4.5.2.3			
2	DOE RESL Ni-1, Modified			
Surrogate/Ti	racer recovery Test	Recovery%	Acceptable Limits	

0.0534

4.93

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# **Certificate of Analysis**

Connecticut Yankee Atomic Power

Address: 362 Injun Hollow Rd

Contact:

East Hampton, Connecticut 06424

Mr. Jack McCarthy Soils PO# 002332

Project:

Client Sample ID: Sample ID:

9106-0011-015F

165614005

Project: Client ID:

Report Date: July 14, 2006

YANK01204 YANK001 Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
Surrogate/Tracer recover	ry Test				Recovery%	Acce	eptable Limits		
Carrier/Tracer Recovery	Liqui	d Scint Ni	63, Solid-ALL FS		96	(2	25%-125%)		

#### Notes:

The Qualifiers in this report are defined as follows:

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

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# **Certificate of Analysis**

Connecticut Yankee Atomic Power Company:

Address: 362 Injun Hollow Rd

East Hampton, Connecticut 06424

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

Client Sample ID:

Sample ID: Matrix:

Collect Date: Receive Date: Collector: Moisture:

9106-0011-018F

165614006 SE 17-MAY-06 21-JUN-06

Client 30.1%

Report Date: July 14, 2006

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mt	d
Rad Gamma Spec Ana	lysis						•			_
Gamma,Solid-FSS G.	AM & ALL FSS	S 226 Ingro	wth							
Waived										
Actinium-228		0.866	+/-0.168	0.0395	+/-0.168	0.0868	pCi/g	MJH1 06/29	0/06 1323 541904 1	1
Americium-241	U	0.0632	+/-0.0711	0.0637	+/-0.0711	0.131	pCi/g			
Bismuth-212		0.798	+/-0.337	0.124	+/-0.337	0.264	pCi/g			
Bismuth-214		0.525	+/-0.0947	0.0298	+/-0.0947	0.0631	pCi/g			
Cesium-134	UI	0.00	+/-0.0367	0.021	+/-0.0367	0.0443	pCi/g			
Cesium-137		0.199	+/-0.0508	0.0182	+/-0.0508	0.0384	pCi/g			
Cobalt-60		0.181	+/-0.053	0.0156	+/-0.053	0.0341	pCi/g			
Europium-152	U	-0.0143	+/-0.0552	0.0407	+/-0.0552	0.0854	pCi/g			
Europium-154	U	0.00275	+/-0.0601	0.0495	+/-0.0601	0.107	pCi/g			
Europium-155	U	0.0102	+/-0.0594	0.0507	+/-0.0594	0.105	pCi/g			
Lead-212		0.815	+/-0.0875	0.0256	+/-0.0875	0.0532	pCi/g			
Lead-214		0.639	+/-0.105	0.0306	+/-0.105	0.064	pCi/g			
Manganese-54	U	0.0141	+/-0.0212	0.0188	+/-0.0212	0.0398	pCi/g			
Niobium-94	U	-0.00538	+/-0.0178	0.015	+/-0.0178	0.0317	pCi/g			
Potassium-40		13.4	+/-1.14	0.129	+/-1.14	0.288	pCi/g			
Radium-226		0.525	+/-0.0947	0.0298	+/-0.0947	0.0631	pCi/g			
Silver-108m	U	-0.00164	+/-0.0169	0.0142	+/-0.0169	0.0299	pCi/g			
Thallium-208		0.243	+/-0.0476	0.0171	+/-0.0476	0.036	pCi/g			
Rad Liquid Scintillatio	n Analysis									
Liquid Scint Ni63, Soli	id-ALL FSS									
Nickel-63	U	5.22	+/-5.86	4.75	+/-5.86	9.81	pCi/g	SLN1 07/02	/06 2050 542563 2	,
NICKCI OJ	O	5.22	17 3.00	4.73	17 3.00	7.01	peng	3EIVI 07/02	700 2030 342303 2	•

The following Pren Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	06/22/06	1916	541800

The following Analytical Methods were performed Description

1	EML HASL 300, 4.5.2.3
2	DOE RESL Ni-1, Modified

Method

Surrogate/Tracer recovery Test Recovery% **Acceptable Limits** 

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# **Certificate of Analysis**

Connecticut Yankee Atomic Power

Address: 362 Injun Hollow Rd

East Hampton, Connecticut 06424

Contact:

Mr. Jack McCarthy Soils PO# 002332

Project:

Client Sample ID:

Sample ID:

9106-0011-018F

165614006

Report Date: July 14, 2006

Project: Client ID: YANK01204 YANK001

Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
Surrogate/Tracer recovery Test					Recovery%	Acc	eptable Limits		
Carrier/Tracer Recovery Liquid Scint Ni63, Solid-ALL FS				89	(	25%-125%)			

#### Notes:

The Qualifiers in this report are defined as follows:

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

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

Contact:

East Hampton, Connecticut 06424

Project:

Mr. Jack McCarthy

Soils PO# 002332

Client Sample ID:

Sample ID: Matrix:

Moisture:

Collect Date: Receive Date: Collector:

9106-0011-002F

165614007 SE

15-MAY-06 21-JUN-06

Client 22.9% Report Date: July 14, 2006

Project: Client ID: Vol. Recv.:

YANK01204 YANK001

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst	Date Tin	ne Batch N	
Rad Gamma Spec Analys	sis										
Gamma,Solid-FSS GAM	1 & ALL FSS	226 Ingro	wth								
Waived		Ü									
Actinium-228		0.658	+/-0.138	0.0508	+/-0.138	0.109	pCi/g	MJH1 C	6/29/06 185	55 541904	1
Americium-241	U	-0.0311	+/-0.0756	0.0669	+/-0.0756	0.138	pCi/g				
Bismuth-212		0.345	+/-0.292	0.103	+/-0.292	0.220	pCi/g				
Bismuth-214		0.499	+/-0.0747	0.0244	+/-0.0747	0.0517	pCi/g				
Cesium-134	UI	0.00	+/-0.0195	0.0182	+/-0.0195	0.0385	pCi/g				
Cesium-137		0.0889	+/-0.027	0.0145	+/-0.027	0.0306	pCi/g				
Cobalt-60		0.0269	+/-0.0233	0.00536	+/-0.0233	0.0135	pCi/g				
Europium-152	U	-0.0229	+/-0.0433	0.0363	+/-0.0433	0.0759	pCi/g				
Europium-154	U	-0.017	+/-0.048	0.0394	+/-0.048	0.0862	pCi/g				
Europium-155	U	0.0358	+/-0.0436	0.0429	+/-0.0436	0.0883	pCi/g				
Lead-212		0.579	+/-0.0538	0.0337	+/-0.0538	0.069	pCi/g				
Lead-214		0.580	+/-0.0665	0.0257	+/-0.0665	0.0537	pCi/g				
Manganese-54	U	-0.0115	+/-0.0174	0.0139	+/-0.0174	0.0297	pCi/g				
Niobium-94	U	-0.00762	+/-0.0139	0.0115	+/-0.0139	0.0245	pCi/g				
Potassium-40		9.35	+/-0.691	0.116	+/-0.691	0.259	pCi/g				
Radium-226		0.499	+/-0.0747	0.0244	+/-0.0747	0.0517	pCi/g				
Silver-108m	U	-0.00182	+/-0.0131	0.0118	+/-0.0131	0.0249	pCi/g				
Thallium-208		0.212	+/-0.0381	0.0134	+/-0.0381	0.0284	pCi/g				
Rad Liquid Scintillation A	Analysis										
Liquid Scint Ni63, Solid-	-ALL FSS										
Nickel-63	U	1.53	+/-6.28	5.22	+/-6.28	10.8	pCi/g	SLN1 0	7/02/06 212	2 542563	2

The following Pren Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	06/22/06	1916	541800

The following Analytical Methods were performed Description

1 EML HASL 300, 4.5.2.3 2 DOE RESL Ni-1, Modified

Surrogate/Tracer recovery

Method

Test

Recovery%

**Acceptable Limits** 

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 Soils PO# 002332

Project:

Client Sample ID:

Sample ID:

9106-0011-002F

165614007

Project: Client ID:

Report Date: July 14, 2006

YANK01204 YANK001 Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF	Analyst Date	Time Batch Mtd
Surrogate/Tracer recover	y Test				Recovery%	Acc	eptable Limits			
Carrier/Tracer Recovery	Liqui	d Scint Ni	63, Solid-ALL FS		84	(	(25%–125%)			

#### Notes:

The Qualifiers in this report are defined as follows:

- A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported
- Result is greater than value reported >
- Α The TIC is a suspected aldol-condensation product
- B Target analyte was detected in the associated blank
- BD Results are either below the MDC or tracer recovery is low
- Analyte has been confirmed by GC/MS analysis C
- D Results are reported from a diluted aliquot of the sample
- Н Analytical holding time was exceeded
- J Value is estimated
- N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
- R Sample results are rejected
- Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. U
- 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
- Preparation or preservation holding time was exceeded

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: Project:

Mr. Jack McCarthy Soils PO# 002332

Client Sample ID: Sample ID:

Matrix:

Collect Date: Receive Date: Collector:

9106-0011-003F

165614008 SE 15-MAY-06 21-JUN-06

Client

Report Date: July 14, 2006

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

	Moisture:			35.4%							
Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analy	st Date	Time Batch	Mtd
Rad Alpha Spec Analysis	5			,				· · ·	-		
Alphaspec Am241, Cm,	Solid ALL FS	SS									
Americium-241		0.054	+/-0.0385	0.0127	+/-0.039	0.043	pCi/g	LCW1	06/29/0	06 1420 542293	1
Curium-242	U	0.00784	+/-0.0154	0.00	+/-0.0154	0.0212	pCi/g				
Curium-243/244	U	0.0135	+/-0.0268	0.0209	+/-0.0269	0.0593	pCi/g				
Alphaspec Pu, Solid-AL	LL FSS										
Plutonium-238	U	0.00557	+/-0.0109	0.00	+/-0.0109	0.0151	pCi/g	LCW1	06/29/0	06 0902 542294	. 2
Plutonium-239/240		0.0167	+/-0.0189	0.00	+/-0.019	0.0151	pCi/g				_
Liquid Scint Pu241, Soli	d-ALL FSS										
Plutonium-241	U	0.856	+/-1.15	1.09	+/-1.15	2.22	pCi/g	LCW1	07/03/0	06 1323 542295	3
Rad Gamma Spec Analy	_	0.000		,	,	2.22	pes	20	077027	,0,10110 0 11110	
Gamma,Solid-FSS GAN		S 226 Ingro	wth								
Waived											
Actinium-228		0.975	+/-0.218	0.0817	+/-0.218	0.177	pCi/g	MJH1	06/29/0	06 1855 541904	4
Americium-241	U	0.0948	+/-0.107	0.0932	+/-0.107	0.193	pCi/g				
Bismuth-212		0.654	+/-0.378	0.191	+/-0.378	0.409	pCi/g				
Bismuth-214		0.555	+/-0.120	0.0463	+/-0.120	0.0982	pCi/g				
Cesium-134	UI	0.00	+/-0.0608	0.0334	+/-0.0608	0.0708	pCi/g				
Cesium-137		0.737	+/-0.0708	0.0249	+/-0.0708	0.053	pCi/g				
Cobalt-60		0.138	+/-0.051	0.030	+/-0.051	0.0653	pCi/g				
Europium-152	U	0.00922	+/-0.0681	0.0548	+/-0.0681	0.116	pCi/g				
Europium-154	U	0.0148	+/-0.0716	0.062	+/-0.0716	0.138	pCi/g				
Europium-155	U	0.000332	+/-0.0703	0.0586	+/-0.0703	0.121	pCi/g				
Lead-212		1.16	+/-0.0877	0.0379	+/-0.0877	0.0785	pCi/g				
Lead-214		0.730	+/-0.124	0.0406	+/-0.124	0.0856	pCi/g				
Manganese-54	U	0.0441	+/-0.0381	0.0236	+/-0.0381	0.051	pCi/g				
Niobium-94	U	-0.00358	+/-0.0263	0.0215	+/-0.0263	0.0459	pCi/g				
Potassium-40		15.7	+/-1.23	0.247	+/-1.23	0.547	pCi/g				
Radium-226		0.555	+/-0.120	0.0463	+/-0.120	0.0982	pCi/g				
Silver-108m	U	0.0181	+/-0.0259	0.0228	+/-0.0259	0.0479	pCi/g				
Thallium-208		0.331	+/-0.0695	0.0208	+/-0.0695	0.0447	pCi/g				
Rad Gas Flow Proportion	•	g									
GFPC, Sr90, solid-ALL	FSS										
Strontium-90	U	0.00308	+/-0.00873	0.00721	+/-0.00873	0.015	pCi/g	BXF1	07/09/0	6 2208 545299	5
Rad Liquid Scintillation	Analysis										
LSC, Tritium Dist, Solid	-HTD2,ALL	FSS									
Tritium	U	0.0442	+/-1.51	1.27	+/-1.51	2.60	pCi/g	NXP1	07/05/0	6 1959 542430	7

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Client Sample ID: Sample ID:

9106-0011-003F

165614008

Report Date: July 14, 2006

Project: Client ID: Vol. Recv.:

YANK01204 YANK001

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
Rad Liquid Scintillati	on Analysis								
Liquid Scint C14, Soi	lid All,FSS								
Carbon-14	U	-0.0948	+/-0.108	0.0924	+/-0.108	0.188	pCi/g	ATH2 06/30/0	06 1635 541380 8
Liquid Scint Fe55, Sc	olid-ALL FSS								
Iron-55	U	-11.6	+/-25.9	21.1	+/-26.0	44.2	pCi/g	SLN1 07/03/0	06 1833 542567 9
Liquid Scint Ni63, So	olid-ALL FSS								
Nickel-63	U	-0.464	+/-5.78	4.87	+/-5.78	10.1	pCi/g	SLN1 07/02/0	06 2154 542563 10
Liquid Scint Tc99, So	olid–ALL FSS								
Technetium-99	U	0.091	+/-0.255	0.212	+/-0.255	0.436	pCi/g	EGD1 06/30/0	06 0942 541378 11

I he following	rrep Methods were performed				
Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	06/22/06	1916	541800

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

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits	
Americium-243	Alphaspec Am241, Cm, Solid ALL	89	(15%–125%)	
Plutonium-242	Alphaspec Pu, Solid-ALL FSS	97	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Pu241, Solid-ALL FS	71	(25%-125%)	
Carrier/Tracer Recovery	GFPC, Sr90, solid-ALL FSS	76	(25%-125%)	
Carrier/Tracer Recovery	Liquid Scint Fe55, Solid-ALL FS	71	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Ni63, Solid-ALL FS	93	(25%-125%)	

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9106-0011-003F

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Project: Client ID:

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YANK01204 YANK001 Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
Corrier/Treeser Bassyami	Lian	id Coint Te	200 Salid_ALL ES		70		(150/_1250/)		

Carrier/Tracer Recovery

Liquid Scint Tc99, Solid-ALL FS

(15%-125%)

#### Notes:

The Qualifiers in this report are defined as follows:

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

The above sample is reported on a dry weight basis.



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Report Date: July 14, 2006

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**QC Summary** 

Client:

**Connecticut Yankee Atomic Power** 

362 Injun Hollow Rd

East Hampton, Connecticut

Contact:

Mr. Jack McCarthy

Workorder: 165614

Parmname			NOM	Sample (	Qual	QC	Units	RPD%	REC%	Range Anist	Date Time
Rad Alpha Spec											
Batch 5422	93										
QC1201121833	165557001	DUP									
Americium-241			U	0.0069		0.0442	pCi/	g 146		(0% - 100%) LCW1	06/29/06 14:20
			Uncert:	+/-0.013		+/-0.0412					
			TPU:	+/-0.013		+/-0.0417					
Curium-242			U	0.00685	U	-0.00258	pCi/	g 442		(0% - 100%)	
			Uncert:	+/-0.0134		+/-0.0217					
			TPU:	+/-0.0135		+/-0.0217					
Curium-243/244			U	0.00332	U	0.0176	pCi/	g 137		(0% - 100%)	
			Uncert:	+/-0.0132		+/-0.0282					
			TPU:	+/-0.0132		+/-0.0283					
QC1201121835	LCS					• • •	0.1		100	(750/ 1050/)	
Americium-241			2.68			2.84	pCi/	g	106	(75%-125%)	
			Uncert:			+/-0.266					
G : 242			TPU:			+/-0.426	0:1				
Curium-242					U	0.00	pCi/	g			
			Uncert:			+/-0.0129					
0 1 010/011			TPU:			+/-0.0129	0.1		0.4	(750/ 1050/)	
Curium-243/244			3.26			3.05	pCi/	g	94	(75%-125%)	
			Uncert:			+/-0.276					
			TPU:			+/-0.452					
QC1201121832	MB				* *	0.0040	0.7				
Americium-241					U	0.0049	pCi/į	g			
			Uncert:			+/-0.0157					
G : 242			TPU:		* *	+/-0.0157	C:/				
Curium-242			* *		U	0.00	pCi/į	3			
			Uncert:			+/-0.0141					
G : 242/244			TPU:			+/-0.0141	C:/	_			
Curium-243/244						0.0424	pCi/į	3			
			Uncert:			+/-0.034					
0.01201121024	1.66657001	140	TPU:			+/-0.0343					
QC1201121834 Americium-241	165557001	MS	2.73 U	0.0069		2.70	pCi/s	7	99	(75%-125%)	
Americium-241			Uncert:	+/-0.013		+/-0.250	pc I/ §	5	27	(7370-12376)	
			TPU:	+/-0.013		+/-0.230					
Curium-242				0.00685	U	0.00644	pCi/s	7			
Currum-242			U Uncert:	+/-0.0134	U	+/-0.0126	pc I/ §	š			
						+/-0.0126					
Curium-243/244			TPU: 3.33 U	+/-0.0135 0.00332		3.12	pCi/į		04	(75%-125%)	
Currum-243/244			•			+/-0.269	pc i/ §	3	77	(7370-12370)	
			Uncert:	+/-0.0132			•				
Batch 5422	94		TPU:	+/-0.0132		+/-0.447					
QC1201121837 Plutonium-238	165557001	DUP	U	0.0117	U	0.0162	pCi/g	g 32		(0% - 100%) LCW1	06/28/06 23:03

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#### **QC Summary**

Workorder: 165614 Page 2 of 9 **Parmname** NOM Sample Qual QC Units RPD% REC% Range Anlst Date Time Rad Alpha Spec 542294 Batch +/-0.0281 Uncert: +/-0.0336 +/-0.0281 TPU: +/-0.0336 Plutonium-239/240 0.00369 U 0.0159 pCi/g 125 (0% - 100%) U Uncert: +/-0.0147 +/-0.0221 TPU: +/-0.0147 +/-0.0221 QC1201121839 LCS 0.00893 (75%-125%) 06/28/06 23:03 Plutonium-238 pCi/g +/-0.0143 Uncert: +/-0.0143 TPU: Plutonium-239/240 2.48 2.10 pCi/g 85 (75%-125%) Uncert: +/-0.202 TPU: +/-0.302 QC1201121836 MB Plutonium-238 -0.00137 06/28/06 23:03 pCi/g Uncert: +/-0.0115 TPU: +/-0.0115 Plutonium-239/240 0.00435 pCi/g +/-0.0115 Uncert: +/-0.0115 TPU: QC1201121838 165557001 MS Plutonium-238 0.0117 0.0336 (75%-125%) 06/28/06 23:03 pCi/g U +/-0.0336 +/-0.0295 Uncert: +/-0.0336 +/-0.0297 TPU: Plutonium-239/240 2.52 0.00369 pCi/g 91 (75%-125%) 2.28 U +/-0.0147 +/-0.242 Uncert: +/-0.0147 +/-0.355 TPU: Batch 542295 QC1201121841 165557001 DUP Plutonium-241 0.395 U 1.16 pCi/g 0 (0% - 100%) LCW1 07/03/06 16:27 U +/-1.89 Uncert: +/-1.29 TPU: +/-1.29 +/-1.89 OC1201121843 LCS Plutonium-241 35.0 27.3 pCi/g 78 (75%-125%) 07/03/06 18:31 Uncert: +/-1.43 +/-3.02 TPU: QC1201121840 MB Plutonium-241 U 0.499 pCi/g 07/03/06 15:26 Uncert: +/-0.891 TPU: +/-0.893 QC1201121842 165557001 MS Plutonium-241 35.3 0.395 31.7 pCi/g 90 (75%-125%) 07/03/06 17:29 U Uncert: +/-1.29 +/-1.58 +/-3.43 TPU: +/-1.29 Rad Gamma Spec Batch 541904 QC1201120873 165614001 DUP Actinium-228 0.669 0.385 pCi/g 54 (0% - 100%) MJH1 06/29/06 18:58 Uncert: +/-0.127 +/-0.239

+/-0.239

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# **QC** Summary

Workorder: 165614 Page 3
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Dawmana	NOM	Commits 6	Ouel	00	Unita	DDD0/	DFC% Pange		Dad	Т:
Parmname	NOM	Sample	( <u>uai</u>	QC	Units	RPD%	REC% Range	Anlst	Date	Time
Rad Gamma Spec										
Batch 541904										
	TPU:	+/-0.127								
Americium-241	U	0.0549	U	0.0237	pCi/g	g 80	(0% - 100%)	)		
	Uncert:	+/-0.0804		+/-0.0384						
	TPU:	+/-0.0804		+/-0.0384						
Bismuth-212		0.401	U	0.334	pCi/g	, 18	(0% - 100%)	)		
	Uncert:	+/-0.220		+/-0.239						
	TPU:	+/-0.220		+/-0.239						
Bismuth-214		0.473		0.489	pCi/g	3	(0% - 100%)	ŀ		
	Uncert:	+/-0.0699		+/-0.112						
	TPU:	+/-0.0699		+/-0.112						
Cesium-134	U	0.0328	U	0.0258	pCi/g	; 24	(0% - 100%)	1		
	Uncert:	+/~0.020		+/-0.0337						
	TPU:	+/-0.020		+/-0.0337						
Cesium-137	U	0.0157	U	-0.0084	pCi/g	660	(0% - 100%)			
	Uncert:	+/-0.0158		+/-0.0301						
•	TPU:	+/-0.0158		+/-0.0301						
Cobalt-60	U	0.0117	U	-0.0145	pCi/g	1840	(0% - 100%)			
	Uncert:	+/-0.017		+/-0.0289						
	TPU:	+/-0.017		+/-0.0289						
Europium-152	U	0.0317	U	-0.0192	pCi/g	813	(0% - 100%)			
	Uncert:	+/-0.0426		+/-0.0634						
	TPU:	+/-0.0426		+/-0.0634						
Europium-154	U	-0.0318	U	0.0556	pCi/g	733	(0% - 100%)			
	Uncert:	+/-0.0551		+/-0.0814						
	TPU:	+/-0.0551		+/-0.0814						
Europium-155	U	0.0426	U	0.0126	pCi/g	109	(0% - 100%)			
	Uncert:	+/-0.0446		+/-0.0591						
	TPU:	+/-0.0446		+/-0.0591						
Lead-212		0.609		0.501	pCi/g	20	(0% - 20%)			
	Uncert:	+/-0.0496		+/-0.0722						
	TPU:	+/-0.0496		+/-0.0722						
Lead-214		0.467		0.430	pCi/g	8	(0% - 100%)			
	Uncert:	+/-0.0614		+/-0.106						
	TPU:	+/-0.0614		+/-0.106						
Manganese-54	Ū	0.0136	U	0.0196	pCi/g	36	(0% - 100%)			
	Uncert:	+/-0.0175		+/-0.0316						
	TPU:	+/-0.0175		+/-0.0316						
Niobium-94	U	0.00856	U	-0.0061	pCi/g	1190	(0% - 100%)			
	Uncert:	+/-0.0147		+/-0.0263	. •					
	TPU:	+/-0.0147		+/-0.0263						
Potassium-40		12.5		12.2	pCi/g	3	(0% - 20%)			
	Uncert:	+/-0.763		+/-1.23			,			
	TPU:	+/-0.763		+/-1.23						
Radium-226		0.473		0.489	pCi/g	3	(0% - 100%)			
	Uncert:	+/-0.0699		+/-0.112			, ,			
	TPU:	+/-0.0699		+/-0.112						
Silver-108m	U	0.00554	U	0.00226	pCi/g	84	(0% - 100%)			
	Uncert:	+/-0.0136		+/-0.0231			, , , , , , ,			
	C.1.001			<b></b>						

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#### **QC Summary**

Workorder: 165614 Page 4 of 9 NOM QC RPD% REC% Range Anlst Parmname Sample Qual Units Date Time Rad Gamma Spec Batch 541904 TPU: +/-0.0136 +/-0.0231 Thallium-208 (0% - 100%) 0.164 0.203 pCi/g 21 Uncert: +/-0.0418 +/-0.0645 +/-0.0418 +/-0.0645 TPU: QC1201120874 LCS U Actinium-228 0.257 pCi/g 06/29/06 18:58 Uncert: +/-0.387 TPU: +/-0.387 23.4 105 (75%-125%) Americium-241 24.6 pCi/g +/-2.02 Uncert: +/-2.02 TPU: Bismuth-212 U -0.084 pCi/g Uncert: +/-0.708 TPU: +/-0.708 Bismuth-214 -0.00724 pCi/g Uncert: +/-0.183 TPU: +/-0.183 Cesium-134 -0.00761 pCi/g +/-0.101 Uncert: +/-0.101 TPU: Cesium-137 9.62 104 (75%-125%) 10.0 pCi/g +/-0.921 Uncert: +/-0.921 TPU: Cobalt-60 14.9 15.1 pCi/g 102 (75%-125%) +/-0.935 Uncert: +/-0.935 TPU: Europium-152 U -0.234 pCi/g Uncert: +/-0.226 TPU: +/-0.226 Europium-154 U -0.105 pCi/g Uncert: +/-0.229 TPU: +/-0.229 U Europium-155 -0.0941 pCi/g +/-0.288 Uncert: +/-0.288 TPU: Lead-212 U 0.0458 pCi/g +/-0.141 Uncert: TPU: +/-0.141 Lead-214 U -0.0295 pCi/g +/-0.158 Uncert: TPU: +/-0.158 Manganese-54 U -0.0537 pCi/g Uncert: +/-0.0955 TPU: +/-0.0955 Niobium-94 U 0.00301 pCi/g Uncert: +/-0.0829 TPU: +/-0.0829 Potassium-40 U 0.0392 pCi/g

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### **QC** Summary

		<u>QC Su</u>	<u>mmai y</u>				
Workorder: 165614						Page 5 of 9	
Parmname	NOM	Sample Qual	QC	Units RPD%	REC%	Range Anlst	Date Time
Rad Gamma Spec							
Batch 541904							
	Uncert:		+/-0.911				
	TPU:		+/-0.911				
Radium-226		U	-0.00724	pCi/g	(	(75%-125%)	
	Uncert:		+/-0.183				
	TPU:		+/-0.183				
Silver-108m		U	0.133	pCi/g			
	Uncert:		+/-0.0861				
	TPU:		+/-0.0861				
Thallium-208		U	-0.0458	pCi/g			
	Uncert:		+/-0.0936				
	TPU:		+/-0.0936				
QC1201120872 MB			0.0661	0:1			07/02/04 10 44
Actinium-228	• •	U	0.0661	pCi/g			07/02/06 19:56
	Uncert:		+/-0.109				
	TPU:	<b>T</b> 1	+/-0.109	0:1			
Americium-241	I.I.,	U	-0.132	pCi/g			
	Uncert:		+/-0.103				
Diamonth 212	TPU:	7.7	+/-0.103	-C:/-			
Bismuth-212	Uncert:	U	0.0987	pCi/g			
			+/-0.140				
Bismuth-214	TPU:	U	+/-0.140 0.0297	nCi/a		•	
Dismun-214	Uncert:	U	+/-0.0399	pCi/g			
	V		+/-0.0399				
Cesium-134	TPU:	U	0.0152	pCi/g			
Cestain 15 t	Uncert:	O	+/-0.0208	pers			
	TPU:		+/-0.0208				
Cesium-137	110.	U	0.00321	pCi/g			
	Uncert:	•	+/-0.014	P = 2 8			
	TPU:		+/-0.014				
Cobalt-60	110.	U	0.0147	pCi/g			
	Uncert:	_	+/-0.0117	P == 3			
	TPU:		+/-0.0117				
Europium-152		U	-0.0287	pCi/g			
•	Uncert:		+/-0.0501	1 0			
	TPU:		+/-0.0501				
Europium-154		U	0.0195	pCi/g			
•	Uncert:		+/-0.0444				
	TPU:		+/-0.0444				
Europium-155		U	0.00022	pCi/g			
	Uncert:		+/-0.0525				
	TPU:		+/-0.0525				
Lead-212		U	0.0228	pCi/g			
	Uncert:		+/-0.038				
	TPU:		+/-0.038				
Lead-214		U	0.00181	pCi/g			
	Uncert:		+/-0.0453				
	TPU:		+/-0.0453				

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#### **QC Summary**

		QC S	<u>ummary</u>					
Workorder: 165614							Page 6 of 9	
Parmname	NOM	Sample Qua	QC	Units	RPD%	REC%	Range Anlst	Date Time
Rad Gamma Spec Batch 541904								
Manganese-54		U	0.00971	pCi/g	g			
-	Uncert:		+/-0.0166					
	TPU:		+/-0.0166					
Niobium-94		U		pCi/g	g			
	Uncert:		+/-0.0157					
D : 40	TPU:	* *	+/-0.0157	0.7				
Potassium-40		U		pCi/g	g			
	Uncert:		+/-0.237					
D-4: 226	TPU:	7.1	+/-0.237	-C://	_			
Radium-226	Hannet	U	0.0297 +/-0.0399	pCi/g	g			
	Uncert:		+/-0.0399					
Silver-108m	TPU:	U		pCi/g	,			
Silver-100iii	Uncert:	O	+/-0.0154	PCD	5			
	TPU:		+/-0.0154					
Thallium-208	110.	U		pCi/g	7			
Thamain 200	Uncert:	J	+/-0.0188	F 8	7			
	TPU:		+/-0.0188					
Rad Gas Flow Batch 545299								
QC1201128845 165011040 DUP								
Strontium-90	U	0.00424 U	-0.00211	pCi/g	g 0		(0% - 100%) BXFI	07/09/06 22:06
	Uncert:	+/-0.00511	+/-0.00864					
	TPU:	+/-0.00511	+/-0.00864					
QC1201128847 LCS	0.874		0.719	~C:/a		อา	(75%-125%)	07/00/06 12:20
Strontium-90	Uncert:		0.718 +/-0.0548	pCi/g	3	62	(7370-12370)	07/09/06 13:30
			+/-0.0587					
QC1201128844 MB	TPU:		T/-U.U367					
Strontium-90		U	0.00281	pCi/g	2			07/09/06 22:06
	Uncert:		+/-0.00503	r c	7			
	TPU:		+/-0.00503					
QC1201128846 165011040 MS								
Strontium-90	2.60 U	0.00424	1.75	pCi/g	3	67*	(75%-125%)	07/09/06 14:48
	Uncert:	+/-0.00511	+/-0.155					
	TPU:	+/-0.00511	+/-0.164					
Rad Liquid Scintillation Batch 541378								
QC1201119752 165557011 DUP								
Technetium-99	U	-0.0712 U		pCi/g	g 0		(0% - 100%) EGD1	06/30/06 10:15
	Uncert:	+/-0.415	+/-0.434					
	TPU:	+/-0.415	+/-0.434					
QC1201119754 LCS	10.0					~ -	(750/ 1050/)	0.410.016.5.5.5
Technetium-99	12.8		12.2	pCi/g	5	96	(75%-125%)	06/30/06 10:48
	Uncert:		+/-0.483					
0.51001110551	TPU:		+/-0.571					,
QC1201119751 MB Technetium-99		U	-0.0564	pCi/g	;			06/30/06 09:59

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#### **QC Summary**

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Parmname			NOM	Sample (	Qual	QC	Units	RPD%	REC%	Range Anlst	Date Time
Rad Liquid Scintilla	ition										
-	1378										
			Uncert:			+/-0.211					
			TPU:			+/-0.211					
QC1201119753	165557011	MS								(===)	
Technetium-99			23.3 U	-0.0712		22.3	pCi/į	g	96	(75%-125%)	06/30/06 10:31
			Uncert: TPU:	+/-0.415 +/-0.415		+/-0.977 +/-1.12					
Batch 54	1380		IFO.	17-0.415		17-1.12					
QC1201119756	165557010	DUP									
Carbon-14			U	-0.38	U	0.561	pCi/g	g 0*		(0% - 100%) ATH2	06/30/06 19:00
			Uncert:	+/-0.322		+/-0.348					
0.51401110540			TPU:	+/-0.322		+/-0.349					
QC1201119758 Carbon-14	LCS		7.05			6.94	pCi/s	y .	99	(75%-125%)	06/30/06 21:26
Carbon-14			Uncert:			+/-0.203	peng	5	,,,	(7370 12370)	00/30/00 21.20
			TPU:			+/-0.230					
QC1201119755	MB										
Carbon-14					U	-0.154	pCi/g	g			06/30/06 17:48
			Uncert:			+/-0.106					
QC1201119757	165557010	MS	TPU:			+/-0.106					
Carbon-14	103337010	WIS	20.4 U	-0.38		20.4	pCi/į	g	100	(75%-125%)	06/30/06 20:13
			Uncert:	+/-0.322		+/-0.593		-		,	
			TPU:	+/-0.322		+/-0.674					
Batch 542	2430										
QC1201122132	165011027	DUP		107		06.6	G:/	0			07/02/0/ 22 47
Tritium			Uncert:	105 +/-7.18		96.6 +/-6.34	pCi/į	g 9		(0% - 20%) NXPI	07/02/06 23:47
			TPU:	+/-7.10		+/-6.56					
QC1201122134	LCS		110.	17 7.10		17 0.50					
Tritium			11.4			11.4	pCi/g	3	100	(75%-125%)	07/03/06 00:20
			Uncert:			+/-2.12					
			TPU:			+/-2.13					
QC1201122131 Tritium	MB				U	1.82	pCi/g	7			07/02/06 23:31
Tritiani			Uncert:		U	+/-1.52	peng	>			01102100 23.31
			TPU:			+/-1.52					
QC1201122133	165011027	MS									
Tritium			10.7	105		118	pCi/g	3	119	(75%-125%)	07/03/06 00:03
			Uncert:	+/-7.18		+/-7.00					
Batch 542	2563		TPU:	+/-7.40		+/-7.29					
		DUD									
QC1201122382 Nickel-63	165614008	DOP	U	-0.464	U	1.22	pCi/g	g 0		(0% - 100%) SLNI	07/03/06 02:39
			Uncert:	+/-5.78	_	+/-7.42	r 2	,			
			TPU:	+/-5.78		+/-7.42					
QC1201122384	LCS		450				<u> </u>		0.2	(250/ 1250/)	0.000.000.000.00
Nickel-63			450			372	pCi/g	3	83	(75%-125%)	07/03/06 03:43
			Uncert:			+/-13.2 +/-17.2					
			TPU:			<i>⊤₁-11.</i> ∠					

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#### **QC Summary**

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165614

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Parmname	NOM	Sample (	Qual	QC	Units	RPD%	REC%	Range Anlst	Date Time
Rad Liquid Scintillation Batch 542563									
QC1201122381 MB									
Nickel-63			U	4.76	pCi/g	g			07/03/06 02:08
	Uncert:			+/-5.21					
	TPU:			+/-5.21					
QC1201122383 165614008 MS									
Nickel-63	451 U	-0.464		360	pCi/g	3	80	(75%-125%)	07/03/06 03:11
	Uncert:	+/-5.78		+/-13.1					
	TPU:	+/-5.78		+/-16.9					
Batch 542567									
QC1201122393 165614008 DUP									
Iron-55	U	-11.6	U	-16.3	pCi/g	g 0		(0% - 100%) SLN1	07/03/06 19:22
	Uncert:	+/-25.9		+/-22.8				· ·	
	TPU:	+/-26.0		+/-22.9					
QC1201122395 LCS									
Iron-55	571			562	pCi/g	7	98	(75%-125%)	07/03/06 19:55
	Uncert:			+/-59.5	•	=			
	TPU:			+/-102					
QC1201122392 MB									
Iron-55			U	-12.4	pCi/g	3			07/03/06 19:06
	Uncert:			+/-38.9					
	TPU:			+/-39.0					
QC1201122394 165614008 MS									
Iron-55	608 U	-11.6		611	pCi/g	3	100	(75%-125%)	07/03/06 19:38
	Uncert:	+/-25.9		+/-46.4					
	TPU:	+/-26.0		+/-99.9					

#### Notes:

The Qualifiers in this report are defined as follows:

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

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#### **QC Summary**

Workorder: 165614 Page 9 of 9

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

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.

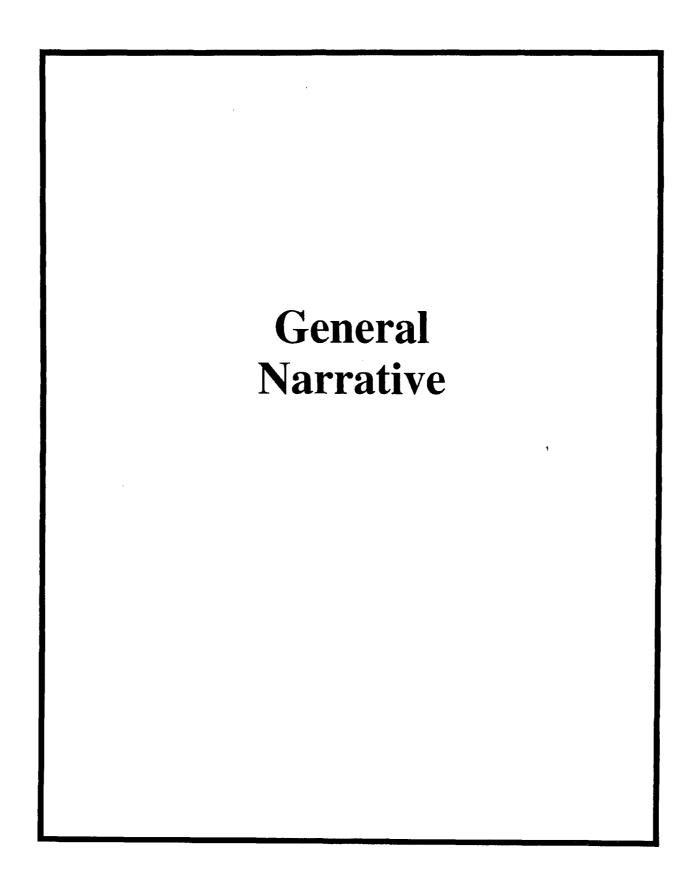
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

<sup>^</sup> The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptence 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.

# **Table of Contents**

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# CASE NARRATIVE For CONNECTICUT YANKEE RE: Sediment

PO# 002332 Work Order: 165702 SDG: MSR #06-0877

July 5, 2006

#### **Laboratory Identification:**

General Engineering Laboratories, LLC

#### **Mailing Address:**

P.O. Box 30712 Charleston, South Carolina 29417

#### **Express Mail Delivery and Shipping Address:**

2040 Savage Road Charleston, South Carolina 29407

#### **Telephone Number:**

(843) 556-8171

#### **Summary:**

#### Sample receipt

The sample(s) for this Project arrived at General Engineering Laboratories, LLC, (GEL) in Charleston, South Carolina on June 22, 2006. Samples 9106-0011-007F and 9106-0011-017FS arrived with illegible dates, times and identifying marks. Mr. Arthur Hammond of CY was contact on this matter. The chain of custody contained the proper documentation and signatures.

The laboratory received the following sample(s):

Sample ID	Client Sample ID
165702001	9106-0011-004F
165702002	9106-0011-005F
165702003	9106-0011-006F
165702004	9106-0011-008F
165702005	9106-0011-009F
165702006	9106-0011-010F
165702007 *	9106-0011-017F
165702008 *	9106-0011-007F
165702009 *	9106-0011-017FS

\* See Items of Note Section below

#### **Items of Note:**

Mr. Arthur Hammond informed GEL that samples 9106-0011-007F, 9106-1100-017FS and 9106-1100-017F would be recollected at a later date. Sample 9106-1100-017FS is a duplicate of 017F. Therefore, no data for these three samples will appear in the report.

#### **Case Narrative:**

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are listed below by analytical parameter.

#### **Analytical Request:**

Five sediment samples were analyzed for FSSGAM and Ni-63. One sediment sample was analyzed for FSSALL.

#### **Internal Chain of Custody:**

Custody was maintained for the sample(s).

#### Data Package:

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

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

Cheryl Jones

Project Manager

# Chain of Custody and Supporting Documentation

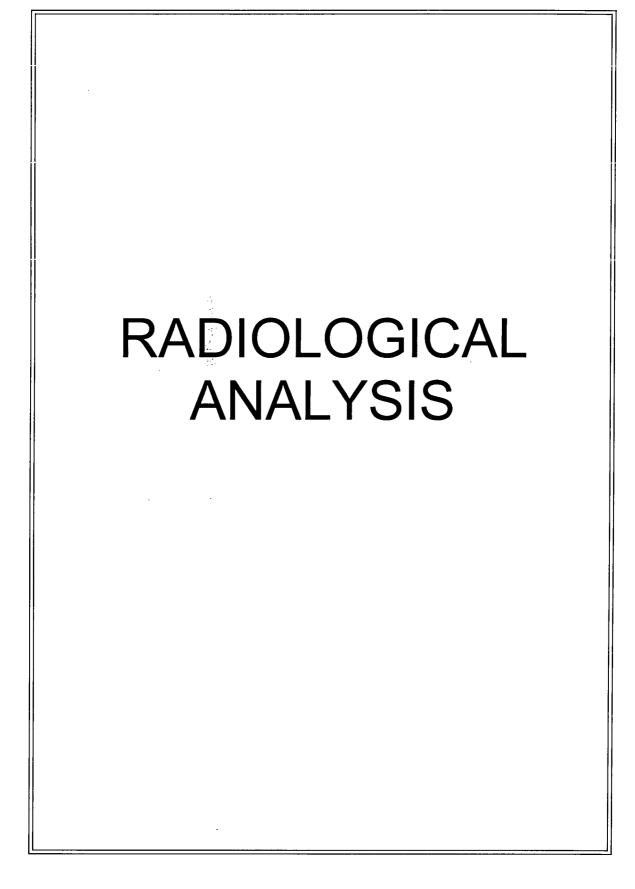
Connecticut Y:					y		•		ain o	f Cus	tody	Form N	o. 2006-00414
<u> </u>	362 Injun Hollow Road, East Hampton, CT 06424  860-267-2556  165702 /												
Project Name: Haddam Ne	ck Decomn	nissioning					Aı	nalyses	Reques	ted		Lab Use Only	
Contact Name & Phone: Jack McCarthy 860-267-2	2556 Ext. 3	3024										Comments:	
Analytical Lab (Name, City General Engineering Labor 2040 Savage Road. Charles 843 556 8171. Attn. Chery	ratories ston SC. 294	107				FSSGAM	FSSALL	Ni-63					
Priority: 30 D. 214 D.	. 🗌 7 D.		Media	Sample	Container Size-				, .				
Sample Designation	Date	Time	Media Code	Type Code	&Type Code		L	Ŀ	L			Comment, Preservation	Lab Sample ID
9106-0011-004F	5/16/06	08:34	SE	С	BP	X		Χ				Transferred from COC 2006-00353	
9106-0011-005F	5/16/06	09:07	SE	С	BP	X		X				Transferred from COC 2006-00353	tion of the state
9106-0011-006F	5/16/06	10:04	SE	С	BP	Х		X				Transferred from COC 2006-00353	
9106-0011-007F ≯	5/16/06	10:28	SE	С	BP	Х		X				Transferred from COC 2006-00353	
9106-0011-008F	5/16/06	10:48	SE	С	BP	Х		X				Transferred from COC 2006-00353	
9106-0011-009F	5/16/06	12:59	SE	С	BP		X					Transferred from COC 2006-00354	
9106-0011-010F	5/16/06	13:44	SE	С	BP	X		X				Transferred from COC 2006-00354	AB III
9106-0011-017F *	5/16/06	14:51	SE	С	BP	Х	<u></u>	X	ļ			Transferred from COC 2006-00354	
9106-0011-017FS ★	5/16/06	14:51	SE	C .	BP	X		X	<u></u>	<u>l</u>		Transferred from COC 2006-00354	
NOTES: PO #: 002332 MSR #: 06-0878SWP#NA \( \subseteq LTP QA \) Radwaste QA \( \subseteq Non QA \) Samples Shipped Via: \( \subseteq Fed Ex \) Container Tenn: \( \subseteq Deg. \( \subseteq \subse													
* See GEL SRR Form	۸.			-								LIMIU	Custody Sealed? Y □ N □
1) Relinquished By JAIME RICARTE				wo	Date/Time (1/2=1700 083S			<b>73</b> 5	☐ Other	Custody Seal			
3) Relinquished By		Date/Tim	ie	4) Recei	ived By	•			Date/	Time		Bill of Lading #	C.N. C.Y.
5) Relinquished By		Date/Tim	ie	6) Recei	ived By				Date/	Time		7910 2328 7517	

Figure 1. Sample Check-in List
Date/Time Received: U 20 04 0835.
SDG#:MSR#06-0877
1 5 700
Ompping Comments
1. Custody Seals on simpping commune interest
2. Custody Seals dated and signed? Yes [ No [ ]
3. Chain-of-Custody record present? Yes [/] No []
4. Cooler temperature 21°C
5. Vermiculite/packing materials is:  Wet [] Dry [] NA
6. Number of samples in shipping container:
7. Sample holding times exceeded? Yes [] No [/
8. Samples have:
custody sealsappropriate sample labels
9. Samples are:
in good conditionleaking
brokenhave air bubbles
10. Were any anomalies identified in sample receipt?  Yes [] No []
11. Description of anomalies (include sample numbers):
2 Samples without Identifiable Tabels-Sample 10
dale, d fine. See GET SRR for IDS and resolution.
Sample Custodian/Laboratory . Ulago Date: 6 20 06
Telephoned to:OnBy



# SAMPLE RECEIPT & REVIEW FORM

PATORIES				PM use only 165702%			
Client: Conn. Yantoe	•		-	SDG/ARCOC/Work Order:			
Date Received: 10 22 0	)			PM(A) Review (ensure non-conforming items are resolved prior to signing):			
				Con of the			
Received By: (W)				- John			
				/ /			
Sample Receipt Criteria	Yes	Y	lg	Comments/Qualifiers (Required for Non-Conforming Items)			
•		1	1				
. Shipping containers received inta	act /	+	╁	Circle Applicable: seals broken damaged container leaking container other (describe)			
and sealed?	~ /	1	}				
Samples requiring cold	1	1	<del>                                     </del>	Circle Coolant # ice bags blue ice dry ice (none) other describe			
2 preservation within (4 +/- 2 C)?	.		i				
Record preservation method.	- 1		•	AI'C			
Chain of custody documents	1	Y-2					
included with shipment?		ا على الا الو الورار					
Sample containers intact and				Circle Applicable: seals broken darnaged container leaking container other (describe)			
sealed?	1/	1					
Samples requiring chemical				Sample ID's, containers affected and observed pH:			
preservation at proper pH?							
VOA vials free of headspace				Sample ID's and containers affected:			
(defined as < 6mm bubble)?	_ [ .	1					
Are Encore containers present?							
7 (If yes, immediately deliver to	1						
VOA laboratory)		7.	_				
8 Samples received within holding	11	F		ld's and tests affected:			
time?		Á					
9 Sample ID's on COC match ID's	l i	Ł		Sample ID's and containers affected: *			
on bottles?			$\leftarrow$	Cannot lead IDs on Samples tor-01773			
Date & time on COC match date	1		/	Cannot read 10's on samples for-017FS Sample ID's affected: -008F -017FS Cannot read date/time on-007F			
& time on bottles?				Cunnot read date / time on - ou   F			
Number of containers received	1 1	الم الم	ľ	затри и s arrected:			
match number indicated on COC?		di (a					
COC form is properly signed in							
relinquished/received sections?	1/1						
	* P	w A	r thi	or Hammond (CY), these samples plus -017 F will			
Air Bill ,Tracking #'s, &	be ve	coll	ecte	ed. GEL to dispose in accordance with contract.			
Additional Comments				ed. GEL to dispose inaccordancy with contract.			
	<del>                                     </del>	<del>- 1</del>		770 000			
	Non- Regulated	Regulated		RSO RAD Receipt # If > x2 area background is observed on samples identified as "non-			
Suspected Hazard Information	Non- gulat	ang		egulated/non-radioactive", contact the Radiation Safety group for further			
	ಜ	ಜ	.== 1	nvestigation.			
Radiological Classification?		10	) N	Maximum Counts Observed*: COM 40			
PCB Regulated?		7	-	Comments:			
Shipped as DOT Hazardous				land Clark Clark			
Material? If yes, contact Waste	/			lazard Class Shipped:			
Manager or ESH Manager.			· · ·				
PM (or PMA) review of Hazard clas	siticatio	n:		Initials Date: Co 2206			



#### Radiochemistry Case Narrative Connecticut Yankee Atomic Power Co. (YANK) Work Order 165702

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

Product:	Alphaspec Am241, Cm, Solid ALL FSS
110000	111911112 111112 111, 21111, 2011111 1122 1 22

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: 542293

Prep Batch Number: 541985

Dry Soil Prep GL-RAD-A-021 Batch Number: 541837

Sample ID	Client ID
165702005	9106-0011-009F
1201121832	Method Blank (MB)
1201121833	165557001(1000-0000-119-C-1C-01) Sample Duplicate (DUP)
1201121834	165557001(1000-0000-119-C-1C-01) Matrix Spike (MS)
1201121835	Laboratory Control Sample (LCS)

#### **SOP Reference**

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

#### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

#### **Sample Geometry**

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

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

#### **Blank Information**

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

#### **Designated QC**

The following sample was used for QC: 165557001 (1000-0000-119-C-1C-01).

#### **QC** Information

All of the QC samples met the required acceptance limits.

#### **Technical Information:**

#### **Holding Time**

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

#### **Preparation Information**

All preparation criteria have been met for these analyses.

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

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

#### **Miscellaneous Information:**

#### **NCR** Documentation

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

#### **Manual Integration**

No manual integrations were performed on data in this batch.

#### **Additional Comments**

The Cm-233/234 blank result is greater than the MDA but less than the detection limit.

#### **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: 542294

Prep Batch Number: 541985

Dry Soil Prep GL-RAD-A-021 Batch Number: 541837

Sample ID	Client ID
165702005	9106-0011-009F
1201121836	Method Blank (MB)
1201121837	165557001(1000-0000-119-C-1C-01) Sample Duplicate (DUP)
1201121838	165557001(1000-0000-119-C-1C-01) Matrix Spike (MS)
1201121839	Laboratory Control Sample (LCS)

#### **SOP Reference**

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

#### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

#### Sample Geometry

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

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

#### **Blank Information**

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

#### **Designated QC**

The following sample was used for QC: 165557001 (1000-0000-119-C-1C-01).

#### **QC** Information

All of the QC samples met the required acceptance limits.

#### **Technical Information:**

#### **Holding Time**

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

#### **Preparation Information**

All preparation criteria have been met for these analyses.

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

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

#### **Miscellaneous Information:**

#### **NCR Documentation**

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

#### **Manual Integration**

No manual integrations were performed on data in this batch.

#### **Additional Comments**

Additional comments were not required for this sample set.

#### **Qualifier information**

Manual qualifiers were not required.

#### Method/Analysis Information

Product:	Liquid Scint Pu241, 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: 542295

Prep Batch Number: 541985

Dry Soil Prep GL-RAD-A-021 Batch Number: 541837

Sample ID	Client ID
165702005	9106-0011-009F
1201121840	Method Blank (MB)
1201121841	165557001(1000-0000-119-C-1C-01) Sample Duplicate (DUP)
1201121842	165557001(1000-0000-119-C-1C-01) Matrix Spike (MS)
1201121843	Laboratory Control Sample (LCS)

#### **SOP Reference**

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

#### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

#### Sample Geometry

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

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

#### **Blank Information**

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

#### **Designated QC**

The following sample was used for QC: 165557001 (1000-0000-119-C-1C-01).

#### **QC** Information

All of the QC samples met the required acceptance limits.

#### **Technical Information:**

#### **Holding Time**

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

#### **Preparation Information**

All preparation criteria have been met for these analyses.

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

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

#### **Miscellaneous Information:**

#### **NCR** Documentation

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

SDG.

#### **Manual Integration**

No manual integrations were performed on data in this batch.

#### **Additional Comments**

Additional comments were not required for this sample set.

#### **Qualifier information**

Manual qualifiers were not required.

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

Product: Gamma, Solid-FSS GAM & ALL FSS 226 Ingrowth Waived

Analytical Method: EML HASL 300, 4.5.2.3

Prep Method: Dry Soil Prep

Analytical Batch Number: 541904

Prep Batch Number: 541837

Sample ID	Client ID
165702001	9106-0011-004F
165702002	9106-0011-005F
165702003	9106-0011-006F
165702004	9106-0011-008F
165702005	9106-0011-009F
165702006	9106-0011-010F
165702007	9106-0011-017F
1201120872	Method Blank (MB)
1201120873	165614001(9106-0011-011F) Sample Duplicate (DUP)
1201120874	Laboratory Control Sample (LCS)

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 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: 165614001 (9106-0011-011F).

#### **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

Sample 1201120872 (MB) recounted due to a suspected blank false positive. Since the reason for the recount was due to a counting irregularity specific to the detector, the rest of batch was not recounted.

#### **Miscellaneous Information:**

#### **NCR Documentation**

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

#### **Additional Comments**

The relative percent difference for sample 1201120873 (9106-0011-011F) for Ac-228 and Tl-208 did not meet the duplication criteria. However, when a relative error ratio is calculated, precision is shown at 2.06 for Ac-228 and .9919 for Tl-208.

#### **Qualifier information**

Qualifier	Reason	Analyte	Sample
UI	Data rejected due to low abundance.	Cesium-134	165702002
			165702004
			165702005
			165702007

#### **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: 545299

Prep Batch Number: 541985

Dry Soil Prep GL-RAD-A-021 Batch Number: 541837

Sample ID	Client ID
165702005	9106-0011-009F
1201128844	Method Blank (MB)
1201128845	165011040(1000-0000-120-C-1C-03) Sample Duplicate (DUP)
1201128846	165011040(1000-0000-120-C-1C-03) Matrix Spike (MS)
1201128847	Laboratory Control Sample (LCS)

#### **SOP Reference**

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

#### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

#### Sample Geometry

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

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

#### **Blank Information**

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

#### Designated QC

The following sample was used for QC: 165011040 (1000-0000-120-C-1C-03).

#### **QC** Information

Refer to Non-Conformance Report.

#### **Technical Information:**

#### **Holding Time**

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

#### **Preparation Information**

All preparation criteria have been met for these analyses.

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

The batch was reprepped due to a low matrix spike recovery.

#### **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. The following NCR was generated for this SDG: NCR 335049 was generated due to RDL less than MDA and Failed Recovery for MS/PS. 1. Samples 165011031, 165011033, 165011034, 165011035, 165011036, 165011037, 165011039, 165011042, 165011043, and duplicate 1201128845 did not meet the detection limit. 2. The matrix spike, 1201128846, did not meet the recovery requirement due to the matrix of the sample. 1. Client was contacted and granted relief to report results. 2. The batch was previously prepped with similar results. Client was contacted and granted relief to report results.

#### **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: 542571

Sample ID	Client ID
165702005	9106-0011-009F
1201122396	Method Blank (MB)
1201122397	165702005(9106-0011-009F) Sample Duplicate (DUP)
1201122398	165702005(9106-0011-009F) Matrix Spike (MS)
1201122399	Laboratory Control Sample (LCS)

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-005 REV# 13.

#### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

#### **Sample Geometry**

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

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

#### **Blank Information**

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

#### **Designated OC**

The following sample was used for QC: 165702005 (9106-0011-009F).

#### **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:	Liquid Scint Fe55, Solid-ALL FSS

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: 542567

Prep Batch Number: 541985

Dry Soil Prep GL-RAD-A-021 Batch Number: 541837

Sample ID	Client ID
165702005	9106-0011-009F
1201122392	Method Blank (MB)
1201122393	165614008(9106-0011-003F) Sample Duplicate (DUP)
1201122394	165614008(9106-0011-003F) Matrix Spike (MS)
1201122395	Laboratory Control Sample (LCS)

#### **SOP Reference**

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

#### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

#### Sample Geometry

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

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

#### **Blank Information**

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

#### **Designated QC**

The following sample was used for QC: 165614008 (9106-0011-003F).

#### **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:	Liquid Scint Ni63, Solid-ALL FSS
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:	542563
Prep Batch Number:	541985
Dry Soil Prep GL-RAD-A-021 Batch Number:	541837

Sample ID	Client ID
165702001	9106-0011-004F
165702002	9106-0011-005F
165702003	9106-0011-006F
165702004	9106-0011-008F
165702005	9106-0011-009F
165702006	9106-0011-010F
165702007	9106-0011-017F
1201122381	Method Blank (MB)
1201122382	165614008(9106-0011-003F) Sample Duplicate (DUP)
1201122383	165614008(9106-0011-003F) Matrix Spike (MS)
1201122384	Laboratory Control Sample (LCS)

#### **SOP Reference**

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

#### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### Standards Information

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

#### Sample Geometry

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

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

#### **Blank Information**

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

#### Designated QC

The following sample was used for QC: 165614008 (9106-0011-003F).

#### **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-HTD2, ALL FSS

Analytical Method: EPA 906.0 Modified

Analytical Batch Number: 542573

Sample ID	Client ID
165702005	9106-0011-009F
1201122404	Method Blank (MB)
1201122405	165702005(9106-0011-009F) Sample Duplicate (DUP)
1201122406	165702005(9106-0011-009F) Matrix Spike (MS)
1201122407	Laboratory Control Sample (LCS)

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-002 REV# 12.

#### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

#### **Sample Geometry**

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

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

#### **Blank Information**

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

#### **Designated QC**

The following sample was used for QC: 165702005 (9106-0011-009F).

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

Analytical Method: EPA EERF C-01 Modified

Analytical Batch Number: 542575

Sample ID	Client ID
165702005	9106-0011-009F
1201122408	Method Blank (MB)
1201122409	165702005(9106-0011-009F) Sample Duplicate (DUP)
1201122410	165702005(9106-0011-009F) Matrix Spike (MS)
1201122411	Laboratory Control Sample (LCS)

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-003 REV# 8.

#### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

#### Sample Geometry

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

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

#### **Blank Information**

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

#### **Designated OC**

The following sample was used for QC: 165702005 (9106-0011-009F).

#### **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.

#### **Certification Statement**

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

#### **Review Validation:**

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

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

Reviewer/Date:	1		36e	U st	4-	مو <sup>ا 14</sup> ار	
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General Engineering Laboratories Form GEL-NCR Rev. 06/05

NCR Report No.: 335049 Revision No.: 1

	COMPANY - WIDE NONC	ONFORMANCE REPOR	<b>кт</b>
Mo.Day Yr. 14-JUL-06	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: GFPC	Test / Method: EPA 905.0 Modified	Matrix Type: Solid	Client Code: YANK
Batch ID: 545299	Sample Numbers: See Below		
Potentially affected work order(s) Application Issues:	(SDG): 165011(MSR#06-0828),165614(	MSR#06-0877),165702(MSR#0	06-0877)
RDL less than MDA			
Failed Recovery for MS/PS			
Specification and Requirements Nonconformance Description:		NRG Disposition:	
1. Samples 165011031, 16501103: 165011036, 165011037, 16501103 duplicate 1201128845 did not meet 2. The matrix spike, 1201128846, c due to the matrix of the sample.	9, 165011042, 165011043, and		granted relief to report results.  prepped with similar results. Client was to report results.  .

Director:

Originator's Name:

14-JUL-06

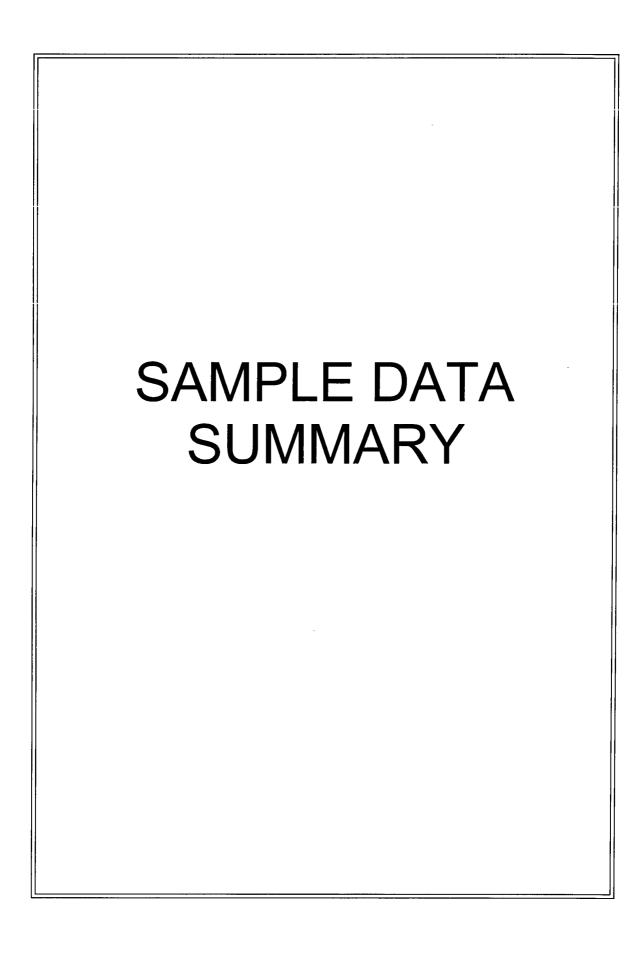
Melanie Aycock

**Quality Review:** 

Data Validator/Group Leader:

14-JUL-06

Heather Anderson



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

# Certificate of Analysis Report for

YANK001 Connecticut Yankee Atomic Power Co.

Client SDG: MSR#06-0877 GEL Work Order: 165702

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

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

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

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

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

Reviewed by

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: Project:

Mr. Jack McCarthy Soils PO# 002332

Client Sample ID:

Sample ID:

Moisture:

Matrix: Collect Date: Receive Date: Collector:

9106-0011-004F 165702001 SE

16-MAY-06 22-JUN-06 Client 22%

Project: Client ID: Vol. Recv.:

YANK01204 YANK001

Report Date: July 14, 2006

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analys	st Date	Time Batch	Mtd
Rad Gamma Spec Analys	is										
Gamma,Solid-FSS GAM	& ALL FSS	226 Ingro	wth								
Waived		Ū									
Actinium-228		0.607	+/-0.238	0.0458	+/-0.238	0.100	pCi/g	MJH1	06/29/0	6 1856 541904	1 1
Americium-241	U	-0.02	+/-0.0786	0.0661	+/-0.0786	0.137	pCi/g				
Bismuth-212		0.623	+/-0.372	0.121	+/-0.372	0.259	pCi/g				
Bismuth-214		0.380	+/-0.0874	0.0294	+/-0.0874	0.0625	pCi/g				
Cesium-134	U	0.0263	+/-0.0259	0.0214	+/-0.0259	0.0454	pCi/g				
Cesium-137		0.102	+/-0.0485	0.0152	+/-0.0485	0.0325	pCi/g				
Cobalt-60	U	-0.0119	+/-0.0205	0.0163	+/-0.0205	0.0359	pCi/g				
Europium-152	U	-0.031	+/-0.0487	0.0417	+/-0.0487	0.0875	pCi/g				
Europium-154	U	-0.00968	+/-0.064	0.0459	+/-0.064	0.101	pCi/g				
Europium-155	U	0.0364	+/-0.0585	0.0493	+/-0.0585	0.102	pCi/g				
Lead-212		0.621	+/-0.0718	0.0243	+/-0.0718	0.0506	pCi/g				
Lead-214		0.426	+/-0.0869	0.0317	+/-0.0869	0.0664	pCi/g				
Manganese-54	U	0.0148	+/-0.0198	0.018	+/-0.0198	0.0385	pCi/g				
Niobium-94	U	0.00668	+/-0.0177	0.0159	+/-0.0177	0.0337	pCi/g				
Potassium-40		10.5	+/-0.991	0.133	+/-0.991	0.299	pCi/g				
Radium-226		0.380	+/-0.0874	0.0294	+/-0.0874	0.0625	pCi/g				
Silver-108m	U	0.00233	+/-0.0179	0.0137	+/-0.0179	0.0291	pCi/g				
Thallium-208		0.203	+/-0.0407	0.0152	+/-0.0407	0.0325	pCi/g				
Rad Liquid Scintillation A	analysis			•							
Liquid Scint Ni63, Solid-	ALL FSS										
Nickel-63	U	5.93	+/-7.27	5.91	+/-7.27	12.2	pCi/g	SLN1	07/02/06	5 2225 542563	2

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	06/22/06	1856	541837

The following Analytical Methods were performed

Method	Description
1	EML HASL 300, 4.5.2.3
2	DOE RESL Ni-1, Modified

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## **Certificate of Analysis**

Company: Connecticut Yankee Atomic Power

Address: 362 Injun Hollow Rd

East Hampton, Connecticut 06424

Contact:

Mr. Jack McCarthy Soils PO# 002332

Project:

Client Sample ID: Sample ID:

9106-0011-004F

165702001

Project: Client ID:

Report Date: July 14, 2006

YANK01204 YANK001 Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
Surrogate/Tracer recover	ry Test				Recovery%	Acc	eptable Limits		
Carrier/Tracer Recovery	Liqui	d Scint Ni	63, Solid-ALL FS		82	(	25%-125%)		

#### Notes:

The Qualifiers in this report are defined as follows:

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

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

## **Certificate of Analysis**

Company: Connecticut Yankee Atomic Power

362 Injun Hollow Rd Address:

East Hampton, Connecticut 06424

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

Client Sample ID:

Sample ID: Matrix:

Collect Date: Receive Date:

Collector: Moisture:

9106-0011-005F

165702002

16-MAY-06 22-JUN-06

Client 34.2% YANK01204

Report Date: July 14, 2006

Project: Client ID: YANK001 Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
Rad Gamma Spec Anal	ysis								
Gamma,Solid-FSS GA	IM & ALL FSS	226 Ingro	wth						
Waived									
Actinium-228		0.883	+/-0.154	0.0538	+/-0.154	0.114	pCi/g	MJH1 06/29/	06 1856 541904 1
Americium-241	U	0.0145	+/-0.126	0.0837	+/-0.126	0.172	pCi/g		
Bismuth-212		0.536	+/-0.266	0.108	+/-0.266	0.229	pCi/g		
Bismuth-214		0.575	+/-0.0758	0.0258	+/-0.0758	0.0542	pCi/g		
Cesium-134	UI	0.00	+/-0.044	0.0205	+/-0.044	0.0428	pCi/g		
Cesium-137		0.213	+/-0.0403	0.014	+/-0.0403	0.0295	pCi/g		
Cobalt-60	•	0.152	+/-0.0402	0.0155	+/-0.0402	0.0336	pCi/g		
Europium-152	U	-0.0488	+/-0.0452	0.0349	+/-0.0452	0.0728	pCi/g		
Europium-154	U	0.00347	+/-0.0907	0.0441	+/-0.0907	0.0949	pCi/g		
Europium-155	U	0.0433	+/-0.0626	0.0399	+/-0.0626	0.0822	pCi/g		
Lead-212		0.943	+/-0.0563	0.0219	+/-0.0563	0.0451	pCi/g		
Lead-214		0.651	+/-0.0794	0.0278	+/-0.0794	0.0577	pCi/g		
Manganese-54	U	0.00985	+/-0.0194	0.0165	+/-0.0194	0.0347	pCi/g		
Niobium-94	U	0.00161	+/-0.0158	0.0132	+/-0.0158	0.0278	pCi/g		
Potassium-40		14.1	+/-0.798	0.127	+/-0.798	0.279	pCi/g		
Radium-226		0.575	+/-0.0758	0.0258	+/-0.0758	0.0542	pCi/g		
Silver-108m	U	-0.00605	+/0.0149	0.0127	+/-0.0149	0.0264	pCi/g		
Thallium-208		0.295	+/-0.0417	0.0154	+/-0.0417	0.0322	pCi/g		
Rad Liquid Scintillation	ı Analysis								
Liquid Scint Ni63, Solid	d-ALL FSS								
Nickel-63	U	5.96	+/-6.70	5.43	+/-6.70	11.2	pCi/g	SLN1 07/02/	06 2257 542563 2

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	06/22/06	1856	541837

The following Analytical Methods were performed

Method	Description			
1	EML HASL 300, 4.5.2.3			
2	DOE RESL Ni-1, Modified			
Surrogate/T	racer 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 Soils PO# 002332

Project:

Client Commis ID

Client Sample ID: Sample ID:

9106-0011-005F 165702002

Proiect: Client ID: YANK01204

YANK001

Report Date: July 14, 2006

Vol. Recv.:

**Parameter Oualifier** Result LC TPU Units Uncertainty MDA **DF** Analyst Date Time Batch Mtd **Acceptable Limits** Surrogate/Tracer recovery Test Recovery% Liquid Scint Ni63, Solid-ALL FS 78 Carrier/Tracer Recovery (25%-125%)

#### Notes:

The Qualifiers in this report are defined as follows:

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B Target analyte was detected in the associated blank
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- H Analytical holding time was exceeded
- J Value is estimated
- N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- Ul 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
- APD 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

2.44

+/-6.31

Mr. Jack McCarthy

Contact: Project:

Soils PO# 002332

Client Sample ID:

Sample ID: Matrix: Collect Date:

Receive Date: Collector: Moisture:

9106-0011-006F

165702003

16-MAY-06 22-JUN-06

Client 25.2% Report Date: July 14, 2006

Project: Client ID: Vol. Recv.:

YANK01204 YANK001

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
Rad Gamma Spec Analy	sis								
Gamma,Solid-FSS GAN	A & ALL FSS	226 Ingro	wth						
Waived									
Actinium-228		0.739	+/-0.232	0.0872	+/-0.232	0.195	pCi/g	MJH1 06/29/0	06 1856 541904 1
Americium-241	U	0.0115	+/0.0393	0.0354	+/-0.0393	0.0737	pCi/g		
Bismuth-212		0.727	+/-0.379	0.237	+/-0.379	0.513	pCi/g		
Bismuth-214		0.573	+/-0.140	0.0491	+/-0.140	0.107	pCi/g		
Cesium-134	U	0.0632	+/-0.0496	0.0346	+/-0.0496	0.0751	pCi/g		
Cesium-137		0.322	+/-0.084	0.0285	+/-0.084	0.0619	pCi/g		•
Cobalt-60	U	0.0199	+/-0.0404	0.0358	+/-0.0404	0.0793	pCi/g		
Europium-152	U	0.0264	+/-0.0729	0.0652	+/-0.0729	0.139	pCi/g		
Europium-154	U	-0.0269	+/-0.0913	0.0721	+/-0.0913	0.165	pCi/g		
Europium-155	U	0.0195	+/-0.0671	0.0592	+/-0.0671	0.124	pCi/g		
Lead-212		0.718	+/-0.116	0.0342	+/-0.116	0.0724	pCi/g		
Lead-214		0.533	+/-0.130	0.0457	+/-0.130	0.0976	pCi/g		
Manganese-54	U	-0.021	+/-0.0402	0.0276	+/-0.0402	0.0609	pCi/g		
Niobium-94	U	0.0188	+/-0.0286	0.0254	+/-0.0286	0.0551	pCi/g		
Potassium-40		12.0	+/-1.43	0.206	+/-1.43	0.489	pCi/g		
Radium-226		0.573	+/-0.140	0.0491	+/-0.140	0.107	pCi/g		
Silver-108m	U	-0.0184	+/-0.0254	0.0203	+/-0.0254	0.044	pCi/g		
Thallium-208		0.190	+/-0.0741	0.0282	+/-0.0741	0.0609	pCi/g		
Rad Liquid Scintillation	Analysis								

The following Prep Methods were performed

Liquid Scint Ni63, Solid-ALL FSS

Nickel-63

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	06/22/06	1856	541837

+/-6.31

10.8

pCi/g

SLN1 07/02/06 2329 542563 2

5.21

The following Analytical Methods were performed

Method	Description			
1	EML HASL 300, 4.5.2.3			
2	DOE RESL Ni-1, Modified			
Surrogate/T	racer 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 Soils PO# 002332

Project:

OF 10 1 TD

Client Sample ID: Sample ID:

9106-0011-006F

165702003

Project: Client ID: YANK01204

Report Date: July 14, 2006

Client ID: YANK001 Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
Surrogate/Tracer recovery Test				Recovery%	Acc	eptable Limits			
Carrier/Tracer Recovery	Liqui	d Scint Ni	63, Solid-ALL FS		78	(	(25%–125%)		

#### Notes:

The Qualifiers in this report are defined as follows:

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B Target analyte was detected in the associated blank
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- H Analytical holding time was exceeded
- J Value is estimated

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

- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
- h Preparation or preservation holding time was exceeded

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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

Client Sample ID:

Sample ID: Matrix: Collect Date: Receive Date: Collector:

Moisture:

9106-0011-008F 165702004 SE

16-MAY-06 22-JUN-06 Client 29.2%

Report Date: July 14, 2006

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst D	ate Time Batch	Mtd
Rad Gamma Spec Analy	ysis				· ·					
Gamma,Solid-FSS GA	M & ALL FSS	3 226 Ingro	wth							
Waived										
Actinium-228		0.811	+/-0.188	0.0856	+/-0.188	0.182	pCi/g	MJH1 06	/29/06 1856 54190	4 1
Americium-241	U	0.064	+/-0.0836	0.0821	+/-0.0836	0.170	pCi/g			
Bismuth-212		0.555	+/-0.301	0.165	+/-0.301	0.351	pCi/g			
Bismuth-214		0.576	+/-0.0945	0.0381	+/-0.0945	0.0807	pCi/g			
Cesium-134	UI	0.00	+/-0.0492	0.0272	+/-0.0492	0.0576	pCi/g			
Cesium-137		0.156	+/-0.0394	0.0213	+/-0.0394	0.0452	pCi/g			
Cobalt-60		0.153	+/-0.0496	0.0241	+/-0.0496	0.0526	pCi/g			
Europium-152	U	-0.0549	+/-0.0587	0.048	+/-0.0587	0.101	pCi/g			
Europium-154	U	0.0372	+/-0.0811	0.0717	+/-0.0811	0.155	pCi/g			
Europium-155	U	0.0916	+/-0.0628	0.0588	+/-0.0628	0.121	pCi/g			
Lead-212		0.871	+/-0.068	0.0308	+/-0.068	0.064	pCi/g			
Lead-214		0.560	+/-0.083	0.0352	+/-0.083	0.074	pCi/g			
Manganese-54	U	0.0375	+/-0.029	0.0238	+/-0.029	0.0506	pCi/g			
Niobium-94	U	-0.00392	+/-0.0207	0.0175	+/-0.0207	0.0375	pCi/g			
Potassium-40		13.7	+/-1.09	0.147	+/-1.09	0.338	pCi/g			
Radium-226		0.576	+/-0.0945	0.0381	+/-0.0945	0.0807	pCi/g			
Silver-108m	U	-0.0129	+/-0.0197	0.0159	+/-0.0197	0.0338	pCi/g			
Thallium-208		0.244	+/-0.0486	0.0207	+/-0.0486	0.0438	pCi/g			
Rad Liquid Scintillation	Analysis									
Liquid Scint Ni63, Solia	-ALL FSS									
Nickel-63	U	-0.523	+/-6.52	5.49	+/-6.52	11.3	pCi/g	SLN1 07/	/03/06 0001 54256	3 2
Rad Liquid Scintillation Liquid Scint Ni63, Solia	-ALL FSS						. •	SLN1 07/	/03/06 0001	54256

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	06/22/06	1856	541837

The following Analytical Methods were performed

Method	Description			
1	EML HASL 300, 4.5.2.3			_
2	DOE RESL Ni-1, Modified			
Surrogate/T	racer recovery Test	Pacovery®	Accentable 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 Soils PO# 002332

Project:

Client Sample ID:

Sample ID:

9106-0011-008F

165702004

Project: Client ID:

Report Date: July 14, 2006

YANK01204 YANK001 Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
Surrogate/Tracer recover	y Test				Recovery%	Acc	eptable Limits		
Carrier/Tracer Recovery	Liqui	d Scint Ni	63, Solid-ALL FS		83	(	(25%–125%)		

#### Notes:

The Qualifiers in this report are defined as follows:

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

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## **Certificate of Analysis**

Company: Connecticut Yankee Atomic Power

362 Injun Hollow Rd Address:

East Hampton, Connecticut 06424

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

Client Sample ID:

Sample ID: Matrix: Collect Date:

Receive Date: Collector: Moisture:

9106-0011-009F

165702005 SE

16-MAY-06 22-JUN-06 Client 22.5%

Report Date: July 14, 2006

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

	Moisture:			22.5%								
Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analy	st Date	Time	Batch	Mtd
Rad Alpha Spec Analys	sis									-		
Alphaspec Am241, Cm	, Solid ALL FS	SS										
Americium-241	U	0.00565	+/-0.0112	0.00	+/-0.0112	0.0157	pCi/g	LCW1	06/29/0	06 1420	542293	1
Curium-242	U	0.00	+/-0.0138	0.00	+/-0.0138	0.019	pCi/g					
Curium-243/244	U	0.00	+/-0.0114	0.00	+/-0.0114	0.0158	pCi/g					
Alphaspec Pu, Solid-A	ALL FSS											
Plutonium-238	U	0.0056	+/-0.011	0.00	+/-0.011	0.0152	pCi/g	LCW	06/28/0	06 2303	542294	2
Plutonium-239/240	U	0.00425	+/-0.0113	0.00638	+/-0.0113	0.0279	pCi/g					
Liquid Scint Pu241, Sc	olid-ALL FSS											
Plutonium-241	U	0.203	+/-0.846	0.814	+/-0.847	1.66	pCi/g	LCW1	07/03/0	06 1424	542295	3
Rad Gamma Spec Anal	lysis											
Gamma,Solid-FSS GA	1M & ALL FSS	3 226 Ingro	wth									
Waived												
Actinium-228		0.793	+/-0.169	0.0643	+/-0.169	0.138	pCi/g	MJH1	06/29/0	06 1857	541904	4
Americium-241	U	0.0054	+/-0.104	0.070	+/-0.104	0.145	pCi/g					·
Bismuth-212		0.822	+/-0.243	0.117	+/-0.243	0.252	pCi/g					
Bismuth-214		0.420	+/-0.0689	0.0285	+/-0.0689	0.0608	pCi/g					
Cesium-134	UI	0.00	+/-0.0362	0.025	+/-0.0362	0.0528	pCi/g					
Cesium-137		0.0623	+/-0.0326	0.0167	+/-0.0326	0.0357	pCi/g					
Cobalt-60	U	0.0342	+/-0.0424	0.0167	+/-0.0424	0.037	pCi/g					
Europium-152	U	0.0271	+/-0.0555		+/-0.0555	0.0955	pCi/g					
Europium-154	U	0.0294	+/-0.0574		+/-0.0574	0.112	pCi/g					
Europium-155	U	0.0564	+/-0.0511		+/-0.0511	0.101	pCi/g					
Lead-212		0.692	+/-0.0563		+/-0.0563	0.0516	pCi/g					
Lead-214		0.545	+/-0.0736		+/-0.0736	0.0604	pCi/g					
Manganese-54	_	-0.00673	+/-0.0202		+/-0.0202	0.0371	pCi/g					
Niobium-94	U	0.00329	+/-0.0174		+/-0.0174	0.0319	pCi/g					
Potassium-40		12.6	+/-0.890	0.122	+/-0.890	0.279	pCi/g					
Radium-226		0.420	+/-0.0689		+/-0.0689	0.0608	pCi/g					
Silver-108m	U	0.0108	+/-0.0152		+/-0.0152	0.0298	pCi/g					
Thallium-208		0.228	+/-0.0432	0.0161	+/-0.0432	0.0343	pCi/g					
Rad Gas Flow Proporti	_	3										
GFPC, Sr90, solid-AL												
Strontium-90	U	0.00341	+/-0.00736	0.00602 -	+/-0.00736	0.0126	pCi/g	BXF1	07/09/0	6 2207	545299	5
Rad Liquid Scintillation	n Analysis											
LSC, Tritium Dist, Soli	d-HTD2,ALL											
Tritium	U	2.71	+/-6.22	5.11	+/-6.22	10.6	pCi/g	EGD1	07/04/0	6 2315	542573	7

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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

Client Sample ID: Sample ID:

9106-0011-009F 165702005

Report Date: July 14, 2006

Proiect: YANK0120 Client ID: YANK001 Vol. Recv.: YANK01204

							v 01. 100 v		
Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
Rad Liquid Scintillat	ion Analysis								
Liquid Scint C14, So	olid All,FSS								
Carbon-14	U	-0.067	+/-0.0804	0.0686	+/-0.0804	0.139	pCi/g	ATH2 07/01/0	6 1716 542575 8
Liquid Scint Fe55, S	olid-ALL FSS								
Iron-55	U	-21.3	+/-23.6	19.8	+/-23.9	41.4	pCi/g	SLN1 07/03/0	6 1850 542567 9
Liquid Scint Ni63, Se	olid-ALL FSS								
Nickel-63	U	0.859	+/-5.21	4.34	+/-5.21	8.97	pCi/g	SLN1 07/03/0	6 0033 542563 10
Liquid Scint Tc99, S	olid–ALL FSS								
Technetium-99	U	0.242	+/-0.197	0.160	+/-0.197	0.327	pCi/g	EGD1 07/03/0	6 1118 542571 11

The following Pren Methods were performed

Method	Description Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	06/22/06	1856	541837

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

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits	
Americium-243	Alphaspec Am241, Cm, Solid ALL	95	(15%-125%)	
Plutonium-242	Alphaspec Pu, Solid-ALL FSS	86	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Pu241, Solid-ALL FS	93	(25%-125%)	
Carrier/Tracer Recovery	GFPC, Sr90, solid-ALL FSS	72	(25%-125%)	
Carrier/Tracer Recovery	Liquid Scint Fe55, Solid-ALL FS	68	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Ni63, Solid-ALL FS	88	(25%-125%)	

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## **Certificate of Analysis**

Company:

Connecticut Yankee Atomic Power

Address:

362 Injun Hollow Rd

Contact:

East Hampton, Connecticut 06424

Mr. Jack McCarthy Soils PO# 002332

Project:

Client Sample ID: Sample ID:

9106-0011-009F 165702005

Project: Client ID:

Report Date: July 14, 2006

YANK01204

YANK001 Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
Carrier/Tracer Recovery	Liquid Scint Tc99, Solid-ALL FS			76	(	(15%-125%)			

#### Notes:

The Qualifiers in this report are defined as follows:

- A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported
- > Result is greater than value reported
- Α The TIC is a suspected aldol-condensation product
- Target analyte was detected in the associated blank В
- 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
- Analytical holding time was exceeded
- Value is estimated
- N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
- 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
- QC Samples were not spiked with this compound
- RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
- Preparation or preservation holding time was exceeded

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

Contact:

East Hampton, Connecticut 06424

Mr. Jack McCarthy

Project:

Soils PO# 002332

Client Sample ID:

Sample ID:

Matrix:

Collect Date: Receive Date: Collector:

Moisture:

9106-0011-010F

165702006 SE

16-MAY-06 22-JUN-06

Client 22.8% Report Date: July 14, 2006

Project: Client ID: Vol. Recv.:

YANK01204 YANK001

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analys	t Date	Time Batch	Mtd
Rad Gamma Spec Anal	ysis										
Gamma,Solid-FSS GA	M & ALL FSS	226 Ingro	wth								
Waived		_									
Actinium-228		0.726	+/-0.221	0.0645	+/-0.221	0.139	pCi/g	MJH1	06/29/0	6 1857 541904	1
Americium-241	U	-0.145	+/-0.115	0.0857	+/-0.115	0.176	pCi/g				
Bismuth-212		0.470	+/-0.216	0.155	+/-0.216	0.331	pCi/g				
Bismuth-214		0.419	+/-0.122	0.0323	+/-0.122	0.0687	pCi/g				
Cesium-134	U	0.0337	+/-0.0389	0.0261	+/-0.0389	0.0552	pCi/g				
Cesium-137	U	0.0371	+/-0.0335	0.0215	+/-0.0335	0.0454	pCi/g				
Cobalt-60	U	-0.0119	+/-0.0241	0.0192	+/-0.0241	0.0424	pCi/g				
Europium-152	U	-0.0146	+/-0.0532	0.0464	+/-0.0532	0.0973	pCi/g				
Europium-154	U	0.0466	+/-0.0744	0.0599	+/-0.0744	0.131	pCi/g				
Europium-155	U	0.00414	+/-0.0572	0.051	+/-0.0572	0.105	pCi/g				
Lead-212		0.686	+/-0.0855	0.0278	+/-0.0855	0.0577	pCi/g		•		
Lead-214		0.513	+/-0.0862	0.0327	+/-0.0862	0.0687	pCi/g				
Manganese-54	U	0.0175	+/-0.018	0.0181	+/-0.018	0.0389	pCi/g				
Niobium-94	U -	-0.00975	+/-0.0207	0.0169	+/-0.0207	0.036	pCi/g				
Potassium-40		12.4	+/-1.30	0.149	+/-1.30	0.339	pCi/g				
Radium-226		0.419	+/-0.122	0.0323	+/-0.122	0.0687	pCi/g				
Silver-108m	U -	-0.00572	+/-0.0186	0.016	+/-0.0186	0.0337	pCi/g				
Thallium-208		0.244	+/-0.0597	0.0189	+/-0.0597	0.040	pCi/g				
Rad Liquid Scintillation	n Analysis										
Liquid Scint Ni63, Solid	d-ALL FSS										
Nickel-63	U	6.11	+/-6.69	5.41	+/-6.69	11.2	pCi/g	SLN1	07/03/0	6 0104 542563	2

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	06/22/06	1856	541837

The following Analytical Methods were performed Description

1	EML HASL 300, 4.5.2.3
2	DOE RESL Ni-1, Modified

Method

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

Client Sample ID:

Sample ID:

9106-0011-010F 165702006

Project: Client ID:

YANK01204

Report Date: July 14, 2006

YANK001 Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF .	Analyst Date	Time Batch Mtd
Surrogate/Tracer recover	y Test				Recovery%	Acc	ceptable Limits			
Carrier/Tracer Recovery	Liqui	d Scint Ni	63, Solid-ALL FS		87		(25%-125%)			

#### Notes:

The Qualifiers in this report are defined as follows:

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

Cliant Sample ID

Client Sample ID: Sample ID: Matrix:

Matrix:
Collect Date:
Receive Date:
Collector:
Moisture:

9106-0011-017F

165702007 SE 16-MAY-06 22-JUN-06

Client 34.8%

Report Date: July 14, 2006

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

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst l	Date Time Batch Mte
Rad Gamma Spec Anal	lysis								
Gamma,Solid-FSS GA	1M & ALL FSS	3 226 Ingro	wth						
Waived									
Actinium-228		0.919	+/-0.207	0.0716	+/-0.207	0.153	pCi/g	MJH1 0	6/29/06 1857 541904 1
Americium-241	U	0.0486	+/-0.111	0.0867	+/-0.111	0.178	pCi/g		
Bismuth-212		0.620	+/-0.266	0.163	+/-0.266	0.346	pCi/g		
Bismuth-214		0.748	+/-0.115	0.0364	+/-0.115	0.077	pCi/g		
Cesium-134	UI	0.00	+/-0.0398	0.028	+/-0.0398	0.059	pCi/g		
Cesium-137		0.370	+/-0.0609	0.0218	+/-0.0609	0.0461	pCi/g		
Cobalt-60		0.0722	+/-0.0326	0.0215	+/-0.0326	0.0469	pCi/g		
Europium-152	U	-0.0155	+/-0.0696	0.0567	+/-0.0696	0.118	pCi/g		
Europium-154	U	0.0654	+/-0.0809	0.0713	+/-0.0809	0.153	pCi/g		
Europium-155	U	-0.00839	+/-0.0717	0.0613	+/-0.0717	0.126	pCi/g		
Lead-212		1.02	+/-0.0741	0.0332	+/-0.0741	0.0686	pCi/g		
Lead-214		0.741	+/-0.110	0.0406	+/-0.110	0.0845	pCi/g		
Manganese-54	U	-0.00693	+/-0.0323	0.0229	+/-0.0323	0.0486	pCi/g		
Niobium-94	U	0.00746	+/-0.024	0.0181	+/-0.024	0.0384	pCi/g		
Potassium-40		14.2	+/-1.10	0.181	+/-1.10	0.401	pCi/g		
Radium-226		0.748	+/-0.115	0.0364	+/-0.115	0.077	pCi/g		
Silver-108m	U	0.0117	+/-0.0189	0.0184	+/-0.0189	0.0387	pCi/g		
Thallium-208		0.352	+/-0.056	0.0201	+/-0.056	0.0425	pCi/g		
Rad Liquid Scintillation	n Analysis								
Liquid Scint Ni63, Soli	=								
Nickel-63	u ALL 155 U	1.70	+/-6.96	5.79	+/-6.96	12.0	pCi/g	SLN1 0	7/03/06 0136 542563 2
MICKET-03	U	1.70	17-0.90	3.19	T/-0.90	12.0	pCI/g	SLIVI U	1/03/00 0130 342303 2

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	06/22/06	1856	541837

The following Analytical Methods were performed

Method	Description	
1	EML HASL 300, 4.5.2.3	
2	DOE RESL Ni-1, Modified	

Surrogate/Tracer recovery Test Recovery% Acceptable Limits

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## **Certificate of Analysis**

Company:

Connecticut Yankee Atomic Power

Address: 3

362 Injun Hollow Rd

East Hampton, Connecticut 06424

Contact: Project:

Mr. Jack McCarthy Soils PO# 002332

G1: G

Client Sample ID: Sample ID:

165702007

9106-0011-017F

Project: Client ID: YANK01204

Report Date: July 14, 2006

Client ID: YANK001 Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
Surrogate/Tracer recover	ry Test	Test		]	Recovery%	Acceptable Limits			
Carrier/Tracer Recovery	Liqui	d Scint Ni	63, Solid-ALL FS		79	(	25%-125%)		

#### Notes:

The Qualifiers in this report are defined as follows:

- \* A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B Target analyte was detected in the associated blank
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- H Analytical holding time was exceeded
- J Value is estimated

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

- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
- h Preparation or preservation holding time was exceeded



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**QC Summary** 

Client:

**Connecticut Yankee Atomic Power** 

362 Injun Hollow Rd

Report Date: July 14, 2006 Page 1 of 9

.

East Hampton, Connecticut

Contact:

Mr. Jack McCarthy

Workorder: 165702

Parmname		NOM	Sample	Qual	QC	Units 1	RPD%	REC%	Range Anlst	Date Time
Rad Alpha Spec Batch 542293										
QC1201121833 16555700	1 DUP									
Americium-241		U	0.0069		0.0442	pCi/g	146		(0% - 100%) LCW1	06/29/06 14:20
		Uncert:	+/-0.013		+/-0.0412					
		TPU:	+/-0.013		+/-0.0417					
Curium-242		U	0.00685	U	-0.00258	pCi/g	442		(0% - 100%)	
		Uncert:	+/-0.0134		+/-0.0217					
		TPU:	+/-0.0135		+/-0.0217					
Curium-243/244		U	0.00332	U	0.0176	pCi/g	137		(0% - 100%)	
		Uncert:	+/-0.0132		+/-0.0282					
		TPU:	+/-0.0132		+/-0.0283					
QC1201121835 LCS										
Americium-241		2.68			2.84	pCi/g		106	(75%-125%)	
		Uncert:			+/-0.266					
		TPU:			+/-0.426					
Curium-242				U	0.00	pCi/g				
		Uncert:			+/-0.0129					
		TPU:			+/-0.0129					
Curium-243/244		3.26			3.05	pCi/g		94	(75%-125%)	
		Uncert:			+/-0.276					
		TPU:			+/-0.452					
QC1201121832 MB										
Americium-241				U	0.0049	pCi/g				
		Uncert:			+/-0.0157					
		TPU:			+/-0.0157					
Curium-242				U	0.00	pCi/g				
		Uncert:			+/-0.0141					
		TPU:			+/-0.0141					
Curium-243/244					0.0424	pCi/g				
		Uncert:			+/-0.034					
		TPU:			+/-0.0343					
QC1201121834 165557001	MS									
Americium-241		2.73 U	0.0069		2.70	pCi/g		99	(75%-125%)	
		Uncert:	+/-0.013		+/-0.250					
		TPU:	+/-0.013		+/-0.398					
Curium-242		U	0.00685	U	0.00644	pCi/g				
		Uncert:	+/-0.0134		+/-0.0126					
		TPU:	+/-0.0135		+/-0.0126					
Curium-243/244		3.33 U	0.00332		3.12	pCi/g		94	(75%-125%)	
		Uncert:	+/-0.0132		+/-0.269	, ,			,	
		TPU:	+/-0.0132		+/-0.447					
Batch 542294										
QC1201121837 165557001	DUP									
Plutonium-238	201	U	0.0117	U	0.0162	pCi/g	32		(0% - 100%) CW1	06/28/06 23:03

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# **QC Summary**

Workorder:

165702

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Parmname	NOM	Sample (	Qual	QC	Units	RPD%	REC%	6 Range Anlst	Date Time
Rad Alpha Spec									
Batch 542294									
	Uncert:	+/-0.0336		+/-0.0281					
	TPU:	+/-0.0336		+/-0.0281					
Plutonium-239/240	U U	0.00369	U	0.0159	pCi/g	125		(0% - 100%)	
11410114111 2337210	Uncert:	+/-0.0147	Ü	+/-0.0221	PO# E	, 123		(070 10070)	
	TPU:	+/-0.0147		+/-0.0221					
QC1201121839 LCS	110.	77 0.01 17		·/ 0.0221					
Plutonium-238			U	0.00893	pCi/g	;		(75%-125%)	06/28/06 23:03
	Uncert:			+/-0.0143				,	
	TPU:			+/-0.0143					
Plutonium-239/240	2.48			2.10	pCi/g	;	85	(75%-125%)	
	Uncert:			+/-0.202				,	
	TPU:			+/-0.302					
QC1201121836 MB									
Plutonium-238			U	-0.00137	pCi/g				06/28/06 23:03
	Uncert:			+/-0.0115					
	TPU:			+/-0.0115					
Plutonium-239/240			U	0.00435	pCi/g				
	Uncert:			+/-0.0115					
	TPU:			+/-0.0115					
QC1201121838 165557001 M	IS								
Plutonium-238	U	0.0117		0.0336	pCi/g			(75%-125%)	06/28/06 23:03
	Uncert:	+/-0.0336		+/-0.0295					
	TPU:	+/-0.0336		+/-0.0297					
Plutonium-239/240	2.52 U	0.00369		2.28	pCi/g		91	(75%-125%)	
	Uncert:	+/-0.0147		+/-0.242					
	TPU:	+/-0.0147		+/-0.355					
Batch 542295									
QC1201121841 165557001 D	UP								
Plutonium-241	Ū	0.395	U	1.16	pCi/g	0		(0% - 100%) LCWI	07/03/06 16:27
	Uncert:	+/-1.29		+/-1.89					
	TPU:	+/-1.29		+/-1.89					
QC1201121843 LCS									
Plutonium-241	35.0			27.3	pCi/g		78	(75%-125%)	07/03/06 18:31
	Uncert:			+/-1.43					
	TPU:			+/-3.02					
QC1201121840 MB									
Plutonium-241			U	0.499	pCi/g				07/03/06 15:26
	Uncert:			+/-0.891					
	TPU:			+/-0.893					
QC1201121842 165557001 M									
Plutonium-241	35.3 U	0.395		31.7	pCi/g		90	(75%-125%)	07/03/06 17:29
	Uncert:	+/-1.29		+/-1.58					
	TPU:	+/-1.29		+/-3.43					
Rad Gamma Spec									
Batch 541904									
QC1201120873 165614001 D	UP								
		0.669		0.385	pCi/g	54		(0% - 100%) MJH1	06/20/06 18:58
Actinium-228		0.007		0.363	PCng	27		(070 - 10070) WIJIII	00/29/00 10.30
Actinium-228	Uncert:	+/-0.127		+/-0.239	peng	54		(076 - 10076) WISTI	00/29/00 18.38

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# **QC Summary**

Workorder:

165702

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC% Range Anlst	Date Time
Rad Gamma Spec								
Batch 541904								
	TPU:	+/-0.127						
Americium-241	U	0.0549	U	0.0237	pCi/g	g 80	(0% - 100%)	
	Uncert:	+/-0.0804		+/-0.0384				
•	TPU:	+/-0.0804		+/-0.0384				
Bismuth-212		0.401	U	0.334	pCi/g	; 18	(0% - 100%)	
	Uncert:	+/-0.220		+/-0.239				
	TPU:	+/-0.220		+/-0.239				
Bismuth-214		0.473		0.489	pCi/g	3	(0% - 100%)	
	Uncert:	+/-0.0699		+/-0.112				
	TPU:	+/-0.0699		+/-0.112				
Cesium-134	U	0.0328	U	0.0258	pCi/g	24	(0% - 100%)	
	Uncert:	+/-0.020		+/-0.0337				
	TPU:	+/-0.020		+/-0.0337				
Cesium-137	U	0.0157	U	-0.0084	pCi/g	660	(0% - 100%)	
	Uncert:	+/-0.0158		+/-0.0301				
	TPU:	+/-0.0158		+/-0.0301				
Cobalt-60	U	0.0117	U	-0.0145	pCi/g	1840	(0% - 100%)	
	Uncert:	+/-0.017		+/-0.0289				
	TPU:	+/-0.017		+/-0.0289				
Europium-152	U	0.0317	U	-0.0192	pCi/g	813	(0% - 100%)	
	Uncert:	+/-0.0426		+/-0.0634				
	TPU:	+/-0.0426		+/-0.0634				
Europium-154	U	-0.0318	U	0.0556	pCi/g	733	(0% - 100%)	
	Uncert:	+/-0.0551		+/-0.0814				
	TPU:	+/-0.0551		+/-0.0814				
Europium-155	U	0.0426	U	0.0126	pCi/g	109	(0% - 100%)	
	Uncert:	+/-0.0446		+/-0.0591				
	TPU:	+/-0.0446		+/-0.0591				
Lead-212		0.609		0.501	pCi/g	20	(0% - 20%)	
	Uncert:	+/-0.0496		+/-0.0722				
	TPU:	+/-0.0496		+/-0.0722				
Lead-214		0.467		0.430	pCi/g	8	(0% - 100%)	
	Uncert:	+/-0.0614		+/-0.106				
	TPU:	+/-0.0614		+/-0.106				
Manganese-54	U	0.0136	U	0.0196	pCi/g	36	(0% - 100%)	
	Uncert:	+/-0.0175		+/-0.0316				
	TPU:	+/-0.0175		+/-0.0316				
Niobium-94	U	0.00856	U	-0.0061	pCi/g	1190	(0% - 100%)	
	Uncert:	+/-0.0147		+/-0.0263				
	TPU:	+/-0.0147		+/-0.0263				
Potassium-40		12.5		12.2	pCi/g	3	(0% - 20%)	
	Uncert:	+/-0.763		+/-1.23				
	TPU:	+/-0.763		+/-1.23				
Radium-226		0.473		0.489	pCi/g	3	(0% - 100%)	
	Uncert:	+/-0.0699		+/-0.112				
	TPU:	+/-0.0699		+/-0.112				
Silver-108m	U	0.00554	U	0.00226	pCi/g	84	(0% - 100%)	
	Uncert:	+/-0.0136		+/-0.0231				

# **GENERAL ENGINEERING LABORATORIES, LLC** 2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## **QC Summary**

Workorder:	165702
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Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range Anlst	Date Time
Rad Gamma Spec								
Batch 541904								
	TPU:	+/-0.0136	+/-0.0231					
Thallium-208		0.164	0.203	pCi/g	21		(0% - 100%)	
	Uncert:	+/-0.0418	+/-0.0645				,	
	TPU:	+/-0.0418	+/-0.0645					
QC1201120874 LCS								
Actinium-228		U	0.257	pCi/g				06/29/06 18:58
	Uncert:		+/-0.387					
	TPU:		+/-0.387	•				
Americium-241	23.4		24.6	pCi/g		105	(75%-125%)	
	Uncert:		+/-2.02					
	TPU:		+/-2.02					
Bismuth-212		U	-0.084	pCi/g				
	Uncert:		+/-0.708					
	TPU:		+/-0.708					
Bismuth-214		U	-0.00724	pCi/g				
	Uncert:		+/-0.183					
	TPU:		+/-0.183					
Cesium-134		U	-0.00761	pCi/g				
	Uncert:		+/-0.101	1 - 0				
	TPU:		+/-0.101					
Cesium-137	9.62		10.0	pCi/g		104	(75%-125%)	
	Uncert:		+/-0.921	r 0			(,	
	TPU:		+/-0.921					
Cobalt-60	14.9		15.1	pCi/g		102	(75%-125%)	
	Uncert:		+/-0.935	r 5			(1270 12270)	
	TPU:		+/-0.935					
Europium-152	110.	U	-0.234	pCi/g				
Suropium 152	Uncert:	J	+/-0.226	po"5				
	TPU:		+/-0.226					
Europium-154	110.	U	-0.105	pCi/g				
Europium 154	Uncert:	O	+/-0.229	peng				
	TPU:		+/-0.229					
Europium-155	IFU.	U	-0.0941	pCi/g				
Luropium-133	Uncert:	O	+/-0.288	peng				
	TPU:		+/-0.288					
Lead-212	IFU.	U	0.0458	pCi/g				
Sedu-212	Uncert:	O	+/-0.141	peng				
		•	+/-0.141					
Lead-214	TPU:	U	-0.0295	nCi/a				
Leau-214	Umanet	U		pCi/g				
	Uncert:		+/-0.158					
Manganaga 54	TPU:	· U	+/-0.158	-C:I-				
Manganese-54	**	. 0	-0.0537	pCi/g				
	Uncert:		+/-0.0955					
Nijeliane 04	TPU:	• •	+/-0.0955	0:1				
Niobium-94	••	U	0.00301	pCi/g				
	Uncert:		+/-0.0829					
B · · · · 40	TPU:	• •	+/-0.0829	~				
Potassium-40		U	0.0392	pCi/g				

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## **QC Summary**

		QC Su	mmai y			
Workorder: 165702					Page 5 of 9	
Parmname	NOM	Sample Qual	QC	Units RPD%	REC% Range Anlst	Date Time
Rad Gamma Spec Batch 541904						
	Uncert:		+/-0.911			
	TPU:		+/-0.911			
Radium-226		U	-0.00724	pCi/g	(75%-125%)	
	Uncert:		+/-0.183			
	TPU:		+/-0.183			
Silver-108m		U	0.133	pCi/g		
	Uncert:		+/-0.0861			
TI 11: 000	TPU:	• •	+/-0.0861	G.7		
Thallium-208	17	U	-0.0458	pCi/g		
	Uncert:		+/-0.0936			
QC1201120872 MB	TPU:		+/-0.0936			
Actinium-228		U	0.0661	pCi/g		07/02/06 19:56
	Uncert:	_	+/-0.109	F 4 " 8	·	07702700 19.50
	TPU:		+/-0.109			
Americium-241		U	-0.132	pCi/g		
	Uncert:		+/-0.103			
	TPU:		+/-0.103			
Bismuth-212		U	0.0987	pCi/g		
	Uncert:		+/-0.140			
	TPU:		+/-0.140			
Bismuth-214		U	0.0297	pCi/g		
	Uncert:		+/-0.0399			
	TPU:		+/-0.0399	A+1		
Cesium-134	T 7	U	0.0152	pCi/g		
	Uncert:		+/-0.0208			
Cesium-137	TPU:	U	+/-0.0208 0.00321	nCila		
Cesium-137	Uncert:	U	+/-0.014	pCi/g		
	TPU:		+/-0.014			
Cobalt-60	11 ().	U	0.0147	pCi/g		
000411 00	Uncert:	· ·	+/-0.0117	P 0 B		
	TPU:		+/-0.0117			
Europium-152		U	-0.0287	pCi/g		
	Uncert:		+/-0.0501			
	TPU:	,\	+/-0.0501			
Europium-154		U	0.0195	pCi/g		
	Uncert:		+/-0.0444			
	TPU:		+/-0.0444			
Europium-155		U	0.00022	pCi/g		
	Uncert:		+/-0.0525			
	TPU:		+/-0.0525			
Lead-212		, U	0.0228	pCi/g		
	Uncert:		+/-0.038			
Land 214	TPU:	7.7	+/-0.038	≖C:/σ		
Lead-214	Uncert:	U	0.00181 +/-0.0453	pCi/g		
	TPU:		+/-0.0453			

# **GENERAL ENGINEERING LABORATORIES, LLC** 2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## **QC Summary**

Red Camma Spec Batch	Workorder: 1	65702				Page 6 of 9						
Manganese-54	Parmname			NOM	Sample (	Qual	QC	Units	RPD%	REC%	Range Anlst	Date Time
Uncert:	Rad Gamma Spec Batch 541	1904										
Uncert:	Manganese-54					II	0.00971	nCi/	σ			
TPU:	Wanganese-54			Uncert:		Ü		po.	6			
Nobium-94												
Content	Niobium-94					U		pCi/	g			
Polassium-40				Uncert:			+/-0.0157	_				
Uncert:				TPU:			+/-0.0157					
TPU:	Potassium-40					U	0.346	pCi/	g			
Radium-226							+/-0.237					
Uncert				TPU:								
TPU:	Radium-226					U		pCi/	g .			
Company												
Uncert:				TPU:								
Thallium-208	Silver-108m					U		pCi/	g			
Thallium-208												
Uncert:				TPU:				0:/				
TPU: +/-0.0188  Rad Gas Flow Batch 545299  QC1201128845 165011040 DUP Strontium-90	Thallium-208			**		U		pC1/	g			
Rad Gas Flow Batch 545299  Strontium-90												
Strontium-90	D . C . D.			IPU:			+/-0.0188					
Strontium-90  U 0.00424 U -0.00211 pCi/g 0 (0% - 100%) BXF1 07/09/06 22:06  TPU: +/-0.00511 +/-0.00864  TPU: +/-0.00511 +/-0.00864  QC1201128847 LCS Strontium-90  0.874		5299										
Uncert: +/-0.00511 +/-0.00864 TPU: +/-0.00511 +/-0.00864  QC1201128847 LCS Strontium-90	QC1201128845	165011040	DUP									
TPU: +/-0.00511 +/-0.00864 QC1201128847 LCS Strontium-90  0.874  Uncert: +/-0.0548  TPU: +/-0.0587  QC1201128844 MB Strontium-90  Uncert: +/-0.0587  QC1201128846 165011040 MS Strontium-90  2.60 U 0.00424 1.75 PCi/g 67* (75%-125%) 07/09/06 12:06  Uncert: +/-0.00503  TPU: +/-0.00503  TPU: +/-0.00503  TPU: +/-0.00503  QC1201128846 165011040 MS Strontium-90  2.60 U 0.00424 1.75 PCi/g 67* (75%-125%) 07/09/06 14:48  Uncert: +/-0.00511 +/-0.155  TPU: +/-0.00511 +/-0.164  Rad Liquid Scintillation 3atch 542563  QC1201122382 165614008 DUP Nickel-63  U -0.464 U 1.22 PCi/g 0 (0% - 100%) SLN1 07/03/06 02:39  Uncert: +/-5.78 +/-7.42  QC1201122384 LCS Nickel-63  450 372 PCi/g 83 (75%-125%) 07/03/06 03:43  Uncert: +/-13.2  TPU: +/-17.2  QC1201122381 MB	Strontium-90					U		pCi/	g 0		(0% - 100%) BXF1	07/09/06 22:06
QC1201128847												
Strontium-90  0.874  Uncert:				TPU:	+/-0.00511		+/-0.00864					
Uncert: +/-0.0548 TPU: +/-0.0587  QC1201128844 MB  Strontium-90 U 0.00281 pCi/g 07/09/06 22:06  Uncert: +/-0.00503 TPU: +/-0.00503  TPU: +/-0.00503  TPU: +/-0.00503  TPU: +/-0.00503  TPU: +/-0.00503  QC1201128846 165011040 MS  Strontium-90 2.60 U 0.00424 1.75 pCi/g 67* (75%-125%) 07/09/06 14:48  Uncert: +/-0.00511 +/-0.155  TPU: +/-0.00511 +/-0.164  Rad Liquid Scintillation 3atch 542563  QC1201122382 165614008 DUP  Nickel-63 U -0.464 U 1.22 pCi/g 0 (0% - 100%) SLN1 07/03/06 02:39  Uncert: +/-5.78 +/-7.42  TPU: +/-5.78 +/-7.42  QC1201122384 LCS  Nickel-63 450 372 pCi/g 83 (75%-125%) 07/03/06 03:43  Uncert: +/-13.2  TPU: +/-17.2  QC1201122381 MB	•	LCS		0.074			0.710	0.7		0.3	(750/ 1250/)	07/00/06 12 20
TPU: +/-0.0587  QC1201128844 MB Strontium-90 U 0.00281 pCi/g 07/09/06 22:06  Uncert: +/-0.00503  TPU: +/-0.00503  QC1201128846 165011040 MS Strontium-90 2.60 U 0.00424 1.75 pCi/g 67* (75%-125%) 07/09/06 14:48  Uncert: +/-0.00511 +/-0.155  TPU: +/-0.00511 +/-0.164  Rad Liquid Scintillation 3atch 542563  QC1201122382 165614008 DUP Nickel-63 U -0.464 U 1.22 pCi/g 0 (0% - 100%) SLN1 07/03/06 02:39  Uncert: +/-5.78 +/-7.42  TPU: +/-5.78 +/-7.42  QC1201122384 LCS Nickel-63 450 372 pCi/g 83 (75%-125%) 07/03/06 03:43  Uncert: +/-13.2  TPU: +/-13.2  TPU: +/-17.2	Strontium-90							pCi/	g	82	(/3%-125%)	07/09/06 13:30
QC1201128844   MB   Strontium-90												
Strontium-90  U 0.00281 pCi/g  Uncert: +/-0.00503  TPU: +/-0.00503  TPU: +/-0.00503  QC1201128846 165011040 MS  Strontium-90  2.60 U 0.00424 1.75 pCi/g  Uncert: +/-0.00511 +/-0.155  TPU: +/-0.00511 +/-0.164  Rad Liquid Scintillation Batch 542563  QC1201122382 165614008 DUP  Nickel-63  U -0.464 U 1.22 pCi/g 0 (0% - 100%) SLN1 07/03/06 02:39  Uncert: +/-5.78 +/-7.42  TPU: +/-5.78 +/-7.42  QC1201122384 LCS  Nickel-63  450  372  QC1201122384 DCS  Vuncert: +/-13.2  TPU: +/-13.2  TPU: +/-17.2	0.01201120014	) (D		IPU:			+/-0.0587					
Uncert: +/-0.00503 TPU: +/-0.00503  QC1201128846 165011040 MS Strontium-90		мв				T I	0.00281	nCi/e	ī			07/09/06 22:06
TPU: +/-0.00503  QC1201128846 165011040 MS Strontium-90	Silonium-90			Uncert		U		peng	5		%	07/07/00 22:00
QC1201128846 165011040 MS Strontium-90  2.60 U 0.00424 1.75 pCi/g 67* (75%-125%) 07/09/06 14:48 Uncert: +/-0.00511 +/-0.164  Rad Liquid Scintillation Batch 542563  QC1201122382 165614008 DUP Nickel-63  U -0.464 U 1.22 pCi/g 0 (0% - 100%) SLN1 07/03/06 02:39 Uncert: +/-5.78 +/-7.42 TPU: +/-5.78 +/-7.42  QC1201122384 LCS Nickel-63  450 372 pCi/g 83 (75%-125%) 07/03/06 03:43 Uncert: +/-13.2 TPU: +/-17.2  QC1201122381 MB												
Strontium-90  2.60 U 0.00424 1.75 pCi/g 67* (75%-125%) 07/09/06 14:48  Uncert: +/-0.00511 +/-0.155  TPU: +/-0.00511 +/-0.164  Rad Liquid Scintillation Batch 542563  QC1201122382 165614008 DUP Nickel-63  U -0.464 U 1.22 pCi/g 0 (0% - 100%) SLN1 07/03/06 02:39  Uncert: +/-5.78 +/-7.42  TPU: +/-5.78 +/-7.42  QC1201122384 LCS Nickel-63  450  Uncert: +/-13.2  TPU: +/-17.2  QC1201122381 MB	OC1201128846	165011040	MS	110.			17-0.00303					
Uncert: +/-0.00511 +/-0.155 TPU: +/-0.00511 +/-0.164  Rad Liquid Scintillation Batch 542563  QC1201122382 165614008 DUP Nickel-63  U -0.464 U 1.22 pCi/g 0 (0% - 100%) SLN1 07/03/06 02:39 Uncert: +/-5.78 +/-7.42 TPU: +/-5.78 +/-7.42 QC1201122384 LCS Nickel-63  450 Uncert: +/-13.2 TPU: +/-13.2 TPU: +/-17.2 QC1201122381 MB	Strontium-90	105011575		2.60	0.00424		1.75	pCi/g	g	67*	(75%-125%)	07/09/06 14:48
Rad Liquid Scintillation Batch 542563  QC1201122382 165614008 DUP  Nickel-63  U -0.464 U 1.22 pCi/g 0 (0% - 100%) SLN1 07/03/06 02:39  Uncert: +/-5.78 +/-7.42  TPU: +/-5.78 +/-7.42  QC1201122384 LCS  Nickel-63  450  Uncert: +/-13.2  TPU: +/-17.2  QC1201122381 MB				-	+/-0.00511		+/-0.155		-			
Satch 542563  QC1201122382 165614008 DUP  Nickel-63  U -0.464 U 1.22 pCi/g 0 (0% - 100%) SLN1 07/03/06 02:39  Uncert: +/-5.78 +/-7.42  TPU: +/-5.78 +/-7.42  QC1201122384 LCS  Nickel-63  450  Uncert: +/-13.2  TPU: +/-17.2  QC1201122381 MB				TPU:	+/-0.00511		+/-0.164					
QC1201122382 165614008 DUP Nickel-63  U -0.464 U 1.22 pCi/g 0 (0% - 100%) SLN1 07/03/06 02:39 Uncert: +/-5.78 +/-7.42 TPU: +/-5.78 +/-7.42 QC1201122384 LCS Nickel-63  450 Uncert: +/-13.2 TPU: +/-17.2 QC1201122381 MB	-											
Nickel-63  U -0.464 U 1.22 pCi/g 0 (0% - 100%) SLN1 07/03/06 02:39  Uncert: +/-5.78 +/-7.42  TPU: +/-5.78 +/-7.42  QC1201122384 LCS Nickel-63  450 Uncert: +/-13.2  TPU: +/-17.2  QC1201122381 MB			DUD									
Uncert: +/-5.78 +/-7.42 TPU: +/-5.78 +/-7.42  QC1201122384 LCS Nickel-63 450 372 pCi/g 83 (75%-125%) 07/03/06 03:43 Uncert: +/-13.2 TPU: +/-17.2  QC1201122381 MB		165614008	DUP		0.464	<b>T</b> I	1 22	-C:/	. 0		(00/ 1000/) SI NI	07/02/06 02:20
QC1201122384 LCS Nickel-63 450 372 pCi/g 83 (75%-125%) 07/03/06 03:43 Uncert: +/-13.2 TPU: +/-17.2  QC1201122381 MB	Nicket-03					U		pCi/§	3 0		(0% - 100%) SLINI	07/03/00 02:39
QC1201122384 LCS Nickel-63 450 372 pCi/g 83 (75%-125%) 07/03/06 03:43 Uncert: +/-13.2 TPU: +/-17.2												
Nickel-63 450 372 pCi/g 83 (75%-125%) 07/03/06 03:43 Uncert: +/-13.2 TPU: +/-17.2	OC1201122384	LCS		IFU.	17-3.76		17-7.42					
Uncert: +/-13.2 TPU: +/-17.2 QC1201122381 MB		LCS		450			372	pCi/s	,	83	(75%-125%)	07/03/06 03:43
TPU: +/-17.2 QC1201122381 MB								P - " (			( 2	
QC1201122381 MB												
Nickel-63 U 4.76 pCi/g 07/03/06 02:08	QC1201122381	MB					,					
	Nickel-63					U	4.76	pCi/į	g			07/03/06 02:08

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## **QC** Summary

Workorder: 165702

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Parmname			NOM	Sample (	Qual	QC	Units	RPD%	REC%	Range Anlst	Date Time
Rad Liquid Scintilla Batch 542	tion 2563										
			Uncert: TPU:			+/-5.21 +/-5.21					
QC1201122383 Nickel-63	165614008	MS	451 U Uncert: TPU:	-0.464 +/-5.78 +/-5.78		360 +/-13.1 +/-16.9	pCi/į	3	80	(75%-125%)	07/03/06 03:11
Batch 542	2567		IPO.	77-3.76		₹/-10.9					
QC1201122393 Iron-55	165614008	DUP	U Uncert:	-11.6 +/-25.9	U	-16.3 +/-22.8	pCi/g	g 0		(0% - 100%) SLNI	07/03/06 19:22
QC1201122395	LCS		TPU:	+/-26.0		+/-22.9					
Iron-55	203		571 Uncert: TPU:			562 +/-59.5 +/-102	pCi/g	3	98	(75%-125%)	07/03/06 19:55
QC1201122392 Iron-55	МВ		Uncert:		U	-12.4 +/-38.9	pCi/g	2			07/03/06 19:06
QC1201122394 Iron-55	165614008	MS	TPU: 608 U Uncert:	-11.6 +/-25.9		+/-39.0 611 +/-46.4	pCi/g	7	100	(75%-125%)	07/03/06 19:38
Batch 542	2571		TPU:	+/-26.0		+/-99.9					
QC1201122397		DHD									
Technetium-99	103702003	DOF	U Uncert: TPU:	0.242 +/-0.197 +/-0.197	U	-0.0687 +/-0.182 +/-0.182	pCi/g	g 0		(0% - 100%) EGD1	07/03/06 12:22
QC1201122399 Technetium-99	LCS		12.8 Uncert: TPU:			12.2 +/-0.344 +/-0.460	pCi/g	Ş	96	(75%-125%)	07/03/06 13:25
QC1201122396 Technetium-99	МВ		Uncert: TPU:		U	0.0899 +/-0.167 +/-0.167	pCi/g	5			07/03/06 11:50
QC1201122398 Technetium-99	165702005	MS	13.1 U Uncert:	0.242 +/-0.197		13.1 +/-0.403	pCi/g	3	100	(75%-125%)	07/03/06 12:53
Batch 542	2573		TPU:	+/-0.197		+/-0.518					
QC1201122405 Tritium	165702005	DUP	U Uncert: TPU:	2.71 +/-6.22 +/-6.22	U	4.56 +/-6.50 +/-6.50	pCi/g	, 0		(0% - 100%) EGD1	07/05/06 04:00
QC1201122407 Tritium	LCS		61.0 Uncert: TPU:			62.7 +/-8.39 +/-8.46	pCi/g	;	103	(75%-125%)	07/05/06 05:03

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## **QC Summary**

Workorder: 165

165702

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Parmname	NOM	Sample (	Qual	QC	Units	RPD%	REC%	Range Anlst	Date Time
Rad Liquid Scintillation Batch 542573									
QC1201122404 MB									
Tritium			U	8.19	pCi/	g			07/05/06 03:28
	Uncert:			+/-6.12					
	TPU:			+/-6.12					
QC1201122406 165702005 MS									
Tritium	63.4 U	2.71		71.0	pCi/	g	112	(75%-125%)	07/05/06 04:32
	Uncert:	+/-6.22		+/-8.48					
	TPU:	+/-6.22		+/-8.57					
Batch 542575									
QC1201122409 165702005 DUP									
Carbon-14	U	-0.067	U	-0.0775	pCi/	g 0		(0% - 100%) ATH2	07/01/06 20:22
	Uncert:	+/-0.0804		+/-0.0785	•	C		,	
	TPU:	+/-0.0804		+/-0.0785					
QC1201122411 LCS	110.	, 5,555		, ,,,,,,,,					
Carbon-14	6.92			7.00	pCi/s	g	101	(75%-125%)	07/01/06 23:28
	Uncert:			+/-0.171	•			,	
	TPU:			+/-0.203					
QC1201122408 MB									
Carbon-14			U	-0.00305	pCi/s	g			07/01/06 18:49
	Uncert:			+/-0.0817		-			
	TPU:			+/-0.0817					
QC1201122410 165702005 MS	· -•								
Carbon-14	7.14 U	-0.067		7.14	pCi/g	g	100	(75%-125%)	07/01/06 21:55
	Uncert:	+/-0.0804		+/-0.174					
	TPU:	+/-0.0804		+/-0.207					

#### Notes:

The Qualifiers in this report are defined as follows:

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

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## **QC Summary**

Page 9 of 9 NOM Sample Qual QC Units RPD% REC% Range Anlst Date Time **Parmname** 

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.

165702

Workorder:

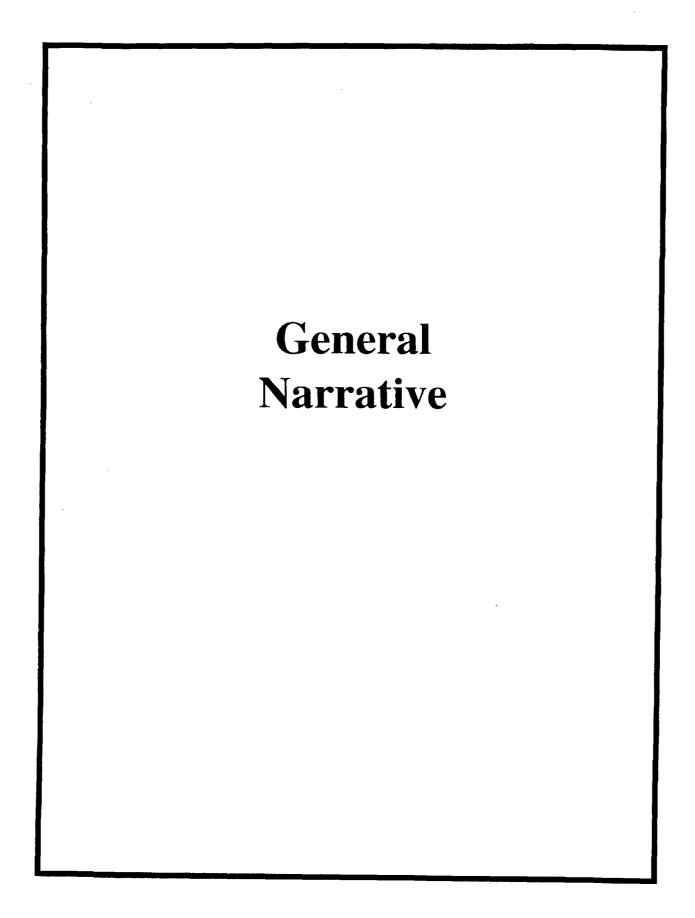
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

<sup>\*\*</sup> Indicates analyte is a surrogate compound.

<sup>^</sup> The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptence 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.

# **Table of Contents**

General Narrative	1
Chain of Custody and Supporting Documentation	4
Radiological Analysis	8
Sample Data Summary	13
Quality Control Data	21



#### **CASE NARRATIVE**

For

**CONNECTICUT YANKEE** 

RE: Soil PO# 002332

Work Order: 166656 SDG: MSR #06-960

July 21, 2006

### **Laboratory Identification:**

General Engineering Laboratories, LLC

#### **Mailing Address:**

P.O. Box 30712 Charleston, South Carolina 29417

#### **Express Mail Delivery and Shipping Address:**

2040 Savage Road Charleston, South Carolina 29407

#### **Telephone Number:**

(843) 556-8171

### **Summary:**

#### Sample receipt

The sample(s) for this Project arrived at General Engineering Laboratories, LLC, (GEL) in Charleston, South Carolina on July 7, 2006. All sample containers arrived without any visible signs of tampering or breakage. The chain of custody contained the proper documentation and signatures.

The laboratory received the following sample(s):

Sample ID	Client Sample ID
166656001	9106-0011-017F
166656002	9106-0011-017FS
166656003	9106-0011-007FS

## **Items of Note:**

There are no items of note.

### Case Narrative:

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are listed below by analytical parameter.

#### **Analytical Request:**

Three soil samples were analyzed for FSSGAM and Ni-63.

#### **Internal Chain of Custody:**

Custody was maintained for the sample(s).

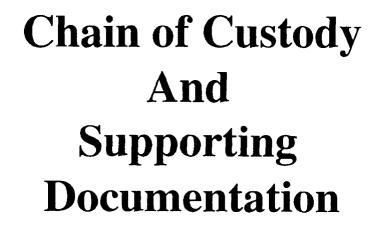
#### Data Package:

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

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

Cheryl Jones

Project Manager



Connecticut Y 362 Injun F	ankee At Hollow Road, I 860-26	East Hampton,			y Hold	125	(e:/.	C	hain	of (	Custody	/ Form	No. 2006-00442	
Project Name: Haddam N					/ <b>V</b>		Analys	es Re	quest	ed	Lab Use	Only		
Contact Name & Phone:									·*		Comme	nts:		
Analytical Lab (Name, City, State) General Engineering Laboratories 2040 Savage Road. Charleston SC. 29407 843 556 8171. Attn. Cheryl Jones						FSSGAM	FSSALL	Sr-90	Ni-63					
Priority: ☐ 30 D. ⊠ 14 D. ☐ 7 D.			Madia	Sample	Container Size-	<u> </u>								
Sample Designation	Date	Time	Media Code	Type Code	&Type Code						(	Comment, Preservation	Lab Sample ID	
9106-0011-017F	6-27-06	1411	SE	С	BP	X			X				001	
9106-0011-017FS	6-27-06	1411	' SE	C	BP	X			X		Split samp	le obtained from 9106-0000-017F	002	
9106-0011-007FS	5-16-06	1028	SE	С	BP	X			X		Transferre	d from Attachment A	w3	
											-			
							<u> </u>							
	<del> </del>				<u> </u>		1	ا				· · · · · · · · · · · · · · · · · · ·		
NOTES: PO #: 002332 MSR #: 06-960 SSWP# NA									Samples Shipped Via:   ☐ Fed Ex  ☐ UPS  ☐ Hand	Internal Container Temp.: Deg. C  Custody Sealed?  Y □ N □				
1) Relinquished By JAIME RICARTE	7-	Date/Tim		2) Rece	ved By	6	501		— D	Date/Time Custody Seal Int				
3) Relinquished By		Date/Tim	e	4) Recei	ved By			<i>a</i> 01	<u>6</u>	ate/Tin	ne	Bill of Lading #	Y 🗆 N 🗆	

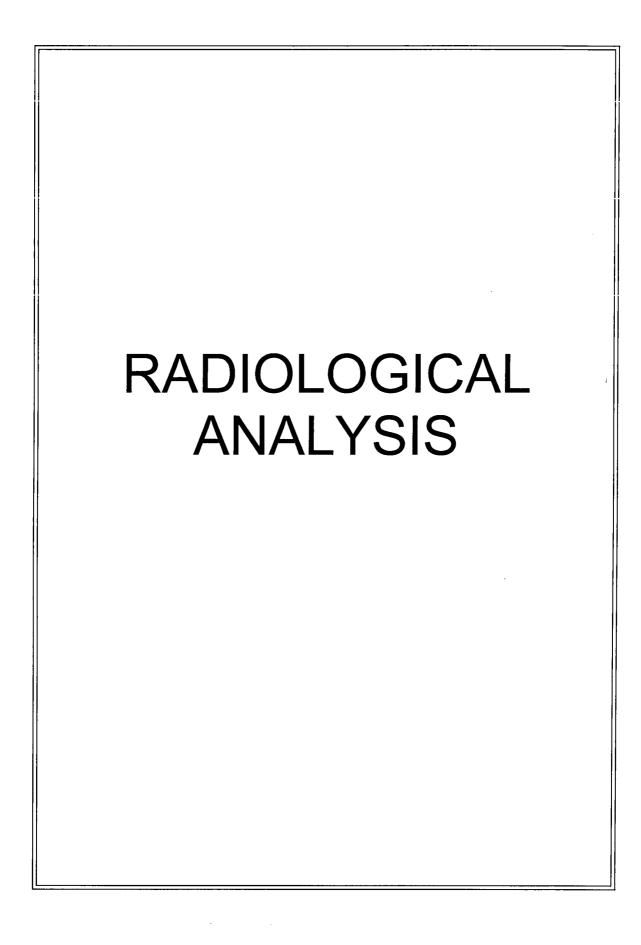
Մ

Figure 1. Sample Check-in	List
Date/Time Received: 7/7/06	
SDG#:	
Work Order Number: 166653 166655/166	656
79/9 8876 4783 - 23°C Shipping Container ID: 7910 4024 2957 - 23°C Chain of Co	200la-00410
1. Custody Seals on shipping container intact?	2006 - 00452 Yes [] No []
2. Custody Seals dated and signed?	Yes [ No [ ]
<ul> <li>3. Chain-of-Custody record present?</li> <li>4. Cooler temperature 23° - 2°</li> </ul>	Yes LINO[]
	- 23.9
<ul> <li>Vermiculite/packing materials is:</li> <li>Number of samples in shipping container: (1) 3 ;</li> </ul>	Wet [W Dry [] (2) 12 (3) 9
7. Sample holding times exceeded?	Yes [ ] No [ ]
8. Samples have: hazard labels custody sealsappropriate sample la	bels
9. Samples are: in good conditionleakingbrokenhave air bubbles	
10. Were any anomalies identified in sample receipt?  11. Description of anomalies (include sample numbers):	Yes [] No F
Sample Control of Annual Control	
Sample Custodian/Laboratory: Marian Sathas	Date: 7/1/06 0900
On By	'



# SAMPLE RECEIPT & REVIEW FORM

Client: ( 000 do Frant )	7 7			111 de 641
- CALLED TICKLE	lask	e e		SDG/ARCOC/Work Order: 166653, 166655, 166656
Date Received: 7/7/06	-			PM(A) Review (ensure non-conforming items are resolved prior to signing):
Received By:				Christian
	<del></del>	T	_	
<b>i</b>	S		١.	' '
Sample Receipt Criteria	Yes	NA A	ž	Comments/Qualifiers (Required for Non-Conforming Items)
			1	
. Shipping containers received inta	ct			Circle Applicable: seals broken damaged container leaking container other (describe)
and sealed?		1 ]		
Samples requiring cold				Circle Coolant # ice bags blue ice dry ice pone other describe
2 preservation within (4 +/- 2 C)?				
Record preservation method.	1	1 1		
3 Chain of custody documents				
included with shipment?	1 1			
Sample containers intact and		, A,		Circle Applicable: seals broken damaged container leaking container other (describe)
sealed?		3		(describe)
Samples requiring chemical	1	7		Sample ID's, containers affected and observed pH:
preservation at proper pH?	1 1			,
VOA viale free of headenace	1			Sample ID's and containers affected:
(defined as < 6mm bubble)?	1 1		ı	
Are Encore containers present?	1		-	
7 (If yes, immediately deliver to	1 1		ı	
VOA laboratory)	1		- [	
Samples received within holding		-	10	d's and tests affected:
8 Itime?				
Comple IDIa and COC and I IDI			S	ample ID's and containers affected:
on bottles?				
Date & time on COC match date		-	S	ample ID's affected:
& time on bottles?				
Number of containers received		<u>.</u>	Sa	mple ID's affected:
match number indicated on COZ?				,
<del> </del>				
COC form is properly signed in				
relinquished/received sections?				
Ain Bill Tracking #15 B				
Air Bill ,Tracking #'s, &				
Additional Comments				
		T =	Inc	O D A D D
	Non- Regulated Regulated	اد د	*16	O RAD Receipt #
Suspected Hazard Information	Non- gulat gulat		ree	> x2 area background is observed on samples identified as "non- culated/non-radioactive", contact the Radiation Safety group for further
Į.	<u> </u>	High	inv	estigation.
Radiological Classification?	<del>-                                     </del>	7		ximum Counts Observed*: (PM) 40
PCB Regulated?	#		_	mments:
Shipped as DOT Hazardous				
Material? If yes, contact Waste			4	zard Class Shipped:
Manager or ESH Manager.	/		UN	#:
PM (or PMA) review of Hazard classi	tication:			Initials Date: 7/7/06
				Daic. +1 +106



# Radiochemistry Case Narrative Connecticut Yankee Atomic Power Co. (YANK) Work Order 166656

# **Method/Analysis Information**

Product: Gamma, Solid-FSS GAM & ALL FSS 226 Ingrowth Waived

Analytical Method: EML HASL 300, 4.5.2.3

Prep Method: Dry Soil Prep

Analytical Batch Number: 546530

Prep Batch Number: 546300

Sample ID	Client ID
166656001	9106-0011-017F
166656002	9106-0011-017FS
166656003	9106-0011-007FS
1201131807	Method Blank (MB)
1201131808	166655001(9106-0015-017A) Sample Duplicate (DUP)
1201131809	Laboratory Control Sample (LCS)

# **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 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: 166655001 (9106-0015-017A).

# **QC** Information

All of the QC samples met the required acceptance limits.

# **Technical Information:**

# **Holding Time**

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

# **Preparation Information**

All preparation criteria have been met for these analyses.

# Sample Re-prep/Re-analysis

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

# Miscellaneous Information:

# **NCR Documentation**

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

#### **Additional Comments**

The sample and the duplicate, 1201131808 (9106-0015-017A), did not meet the relative percent difference requirement for Ra-226, however they do meet the relative error ratio requirement with value of 1.94.

# **Qualifier information**

Qualifier	Reason	Analyte	Sample
UI	Data rejected due to interference	Europium-155	166656002

# **Method/Analysis Information**

Product: Liquid Scint Ni63, Solid-ALL FSS

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: 547198

Prep Batch Number: 546301

Dry Soil Prep GL-RAD-A-021 Batch Number: 546300

Sample ID	Client ID
166656001	9106-0011-017F
166656002	9106-0011-017FS
166656003	9106-0011-007FS
1201133195	Method Blank (MB)
1201133196	166656001(9106-0011-017F) Sample Duplicate (DUP)
1201133197	166656001(9106-0011-017F) Matrix Spike (MS)
1201133198	Laboratory Control Sample (LCS)

# **SOP Reference**

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

#### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

# **Standards Information**

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

# Sample Geometry

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

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

# **Blank Information**

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

# **Designated QC**

The following sample was used for QC: 166656001 (9106-0011-017F).

#### **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.

# **Certification Statement**

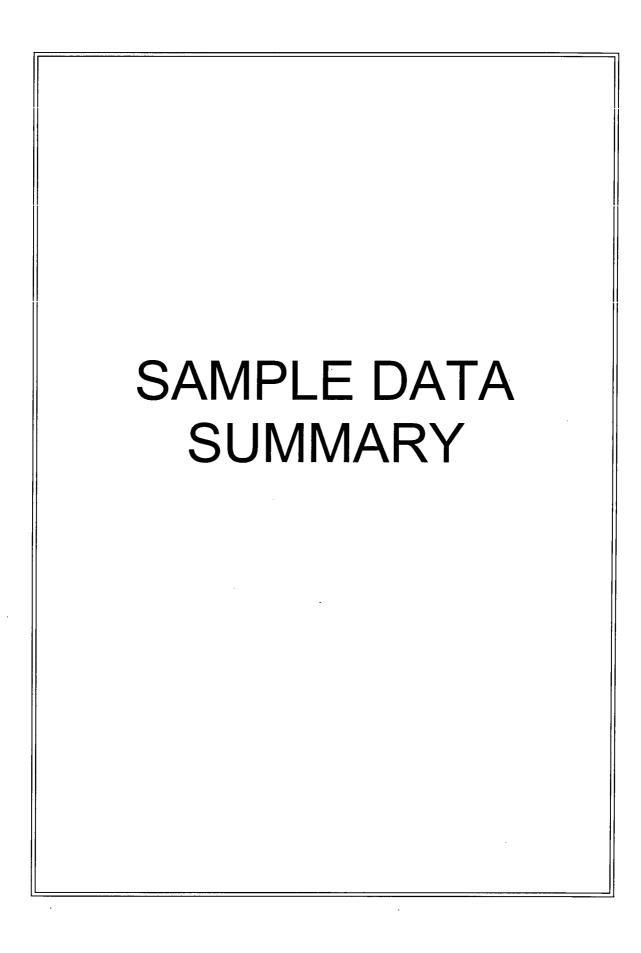
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

#### **Review Validation:**

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

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

	V 1/1 R Lalt # 1/2:16	
Reviewer/Date:	Collect 1214	



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# Certificate of Analysis Report for

YANK001 Connecticut Yankee Atomic Power Co. Client SDG: MSR#06-960 GEL Work Order: 166656

# The Qualifiers in this report are defined as follows:

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

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

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

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

Reviewed by

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# **Certificate of Analysis**

9106-0011-017F 166656001 SE 27-JUN-06 07-JUL-06

Client

24.1%

Company: Connecticut Yankee Atomic Power

Address: 362 Injun Hollow Rd

East Hampton, Connecticut 06424

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

Client Sample ID: Sample ID: Matrix:

Collect Date: Receive Date: Collector:

Moisture:

Report Date: July 20, 2006

Project: Client ID: Vol. Recv.:

YANK01204 YANK001

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst	Date	Time Bate	h Mtd
Rad Gamma Spec Ana	alysis									·	
Gamma,Solid-FSS G	AM & ALL FSS	S 226 Ingro	wth								
Waived		Ũ									
Actinium-228		0.896	+/-0.172	0.0747	+/-0.172	0.163	pCi/g	MJH1	07/17/06	1855 5465	30 1
Americium-241	U	-0.00999	+/-0.115	0.088	+/-0.115	0.182	pCi/g				
Bismuth-212		0.460	+/-0.324	0.176	+/-0.324	0.379	pCi/g				
Bismuth-214		0.643	+/-0.115	0.0447	+/-0.115	0.095	pCi/g				
Cesium-134	U	0.00863	+/-0.0312	0.0266	+/-0.0312	0.0571	pCi/g				
Cesium-137		0.406	+/-0.0779	0.0233	+/-0.0779	0.0497	pCi/g				
Cobalt-60	U	0.00652	+/-0.0302	0.0259	+/-0.0302	0.0569	pCi/g				
Europium-152	U	0.0332	+/-0.0667	0.0578	+/-0.0667	0.122	pCi/g				
Europium-154	U	-0.0432	+/-0.114	0.0772	+/-0.114	0.168	pCi/g				
Europium-155	U	0.049	+/-0.0758	0.0653	+/-0.0758	0.135	pCi/g				
Lead-212		0.848	+/-0.0831	0.0341	+/-0.0831	0.071	pCi/g				
Lead-214		0.610	+/-0.114	0.0418	+/-0.114	0.088	pCi/g				
Manganese-54	U	0.014	+/-0.029	0.0251	+/-0.029	0.0537	pCi/g				
Niobium-94	U	0.0163	+/-0.0242	0.0215	+/-0.0242	0.0459	pCi/g				
Potassium-40		13.4	+/-1.12	0.182	+/-1.12	0.416	pCi/g				
Radium-226		0.643	+/-0.115	0.0447	+/-0.115	0.095	pCi/g				
Silver-108m	U	0.00536	+/-0.0243	0.0204	+/-0.0243	0.0431	pCi/g				
Thallium-208		0.284	+/-0.0528	0.0232	+/-0.0528	0.0494	pCi/g				
Rad Liquid Scintillation	on Analysis										
Liquid Scint Ni63, Sol	id-ALL FSS										
Nickel-63	U	11.8	+/-7.46	5.98	+/-7.47	12.2	pCi/g	SLN1 (	07/15/06	0025 5471	98 2

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	07/09/06	1715	546300

The following Analytical Methods were performed

Method	Description	
1	EML HASL 300, 4.5.2.3	

DOE RESL Ni-1, Modified

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# **Certificate of Analysis**

Company:

Connecticut Yankee Atomic Power

Address:

362 Injun Hollow Rd

East Hampton, Connecticut 06424

Contact: Project:

Mr. Jack McCarthy Soils PO# 002332

Client Sample ID:

Sample ID:

9106-0011-017F

166656001

Project: Client ID:

Vol. Recv.:

Report Date: July 20, 2006

YANK01204 YANK001

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
Surrogate/Tracer recover	ry Test				Recovery%	Acc	eptable Limits		
Carrier/Tracer Recovery	Liqui	d Scint Ni	63, Solid-ALL FS		89	(	25%–125%)		

#### Notes:

The Qualifiers in this report are defined as follows:

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

The above sample is reported on a dry weight basis.

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

Report Date: July 20, 2006

YANK01204 YANK001

Project: Client ID: Vol. Recv.:

# **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

Client Sample ID:

Sample ID: Matrix:

Collect Date: Receive Date: Collector:

9106-0011-017FS

166656002

27-JUN-06 07-JUL-06

Client 21.1%

	Moisture:			21.1%					
Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst I	Date Time Batch Mtd
Rad Gamma Spec Ana	ılysis								
Gamma,Solid-FSS G	AM & ALL FSS	226 Ingro	wth						
Waived		-							
Actinium-228		0.923	+/-0.231	0.0926	+/-0.231	0.202	pCi/g	MJH1 0	7/17/06 1855 546530 1
Americium-241	U	0.0179	+/-0.0435	0.0339	+/-0.0435	0.0701	pCi/g		
Bismuth-212		0.759	+/-0.513	0.188	+/-0.513	0.409	pCi/g		
Bismuth-214		0.871	+/-0.165	0.0485	+/-0.165	0.104	pCi/g		
Cesium-134	U	0.0392	+/-0.0354	0.0328	+/-0.0354	0.0705	pCi/g		
Cesium-137		0.416	+/-0.0873	0.0292	+/-0.0873	0.0625	pCi/g		
Cobalt-60	U	0.0477	+/-0.0504	0.0329	+/-0.0504	0.0722	pCi/g		
Europium-152	U	-0.0181	+/-0.0872	0.064	+/-0.0872	0.135	pCi/g		
Europium-154	U	0.108	+/0.110	0.100	+/-0.110	0.218	pCi/g		
Europium-155	UI	0.147	+/-0.0937	0.0516	+/-0.0937	0.108	pCi/g		
Lead-212		0.893	+/-0.130	0.0357	+/-0.130	0.0747	pCi/g		
Lead-214		0.659	+/-0.140	0.0476	+/-0.140	0.100	pCi/g		
Manganese-54	U	-0.0144	+/-0.0344	0.0282	+/-0.0344	0.0607	pCi/g		
Niobium-94	U	0.0184	+/-0.0311	0.0265	+/-0.0311	0.0567	pCi/g		
Potassium-40		13.9	+/-1.49	0.280	+/-1.49	0.624	pCi/g		
Radium-226		0.871	+/-0.165	0.0485	+/-0.165	0.104	pCi/g		
Silver-108m	U	-0.00687	+/-0.0274	0.0225	+/-0.0274	0.0479	pCi/g		
Thallium-208		0.285	+/-0.0773	0.0236	+/-0.0773	0.051	pCi/g		
Rad Liquid Scintillation	n Analysis			•					
Liquid Scint Ni63, Sol	id–ALL FSS								
Nickel-63	U	11.3	+/-9.38	7.60	+/-9.39	15.6	pCi/g	SLNI 07	7/15/06 0057 547198 2

The following Pren Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	07/09/06	1715	546300

The following Analytical Methods were performed Description

1	EML HASL 300, 4.5.2.3
2	DOE RESL Ni-1, Modified

Method

Test Surrogate/Tracer recovery 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 Soils PO# 002332

Project:

Client Sample ID:

Sample ID:

9106-0011-017FS

166656002

Project: Client ID:

YANK01204

Report Date: July 20, 2006

YANK001 Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
Surrogate/Tracer recover	y Test				Recovery%	Acceptable Limits			
Carrier/Tracer Recovery	Liqui	d Scint Ni	63, Solid-ALL FS		72	(:	25%–125%)		

#### Notes:

The Qualifiers in this report are defined as follows:

- A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported
- > Result is greater than value reported
- The TIC is a suspected aldol-condensation product Α
- В 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
- Н Analytical holding time was exceeded
- J Value is estimated
- N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
- R Sample results are rejected
- 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
- QC Samples were not spiked with this compound
- RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
- Preparation or preservation holding time was exceeded

The above sample is reported on a dry weight basis.

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Report Date: July 20, 2006

YANK01204

YANK001

Project: Client ID:

Vol. Recv.:

# Certificate of Analysis

Connecticut Yankee Atomic Power Company:

362 Injun Hollow Rd Address:

East Hampton, Connecticut 06424

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

Client Sample ID:

Sample ID: Matrix: Collect Date:

Receive Date: Collector: Moisture:

9106-0011-007FS 166656003

SE 16-MAY-06 07-JUL-06

Client 25.2%

Qualifier **Parameter** Result Units Uncertainty LC **TPU** MDA **DF** Analyst Date Time Batch Mtd Rad Gamma Spec Analysis Gamma, Solid-FSS GAM & ALL FSS 226 Ingrowth Waived Actinium-228 1.05 +/-0.183 0.0673 +/-0.183 0.143 pCi/g MJH1 07/17/06 1856 546530 1 Americium-241 -0.093+/-0.0953 0.0693 +/-0.0953 0.142 pCi/g Bismuth-212 +/-0.356 +/-0.356 0.289 pCi/g 0.785 0.137 Bismuth-214 0.569 +/-0.096 0.0368 +/-0.096 0.0769 pCi/g Cesium-134 0.031 +/-0.0402 0.0255 +/-0.0402 0.0533 pCi/g +/-0.0403 pCi/g 0.184 0.0182 +/-0.0403 0.0382 Cesium-137 Cobalt-60 0.0552 +/-0.0375 0.0237 + -0.03750.0506 pCi/g Europium-152 U 0.0584 +/-0.0521 0.0488 +/-0.0521 0.101 pCi/g -0.0506+/-0.0776 0.061 +/-0.0776 Europium-154 U 0.131 pCi/g Europium-155 0.0688 +/-0.0572 0.0491 +/-0.0572 0.101 pCi/g Lead-212 1.02 +/-0.0685 0.0266 +/-0.0685 0.055 pCi/g +/-0.107 0.0314 +/-0.107 pCi/g Lead-214 0.745 0.0654 0.0201 +/-0.0242 Manganese-54 0.00413 +/-0.0242 0.0425 pCi/g Niobium-94 U -0.00316 +/-0.0212 0.0175 +/-0.0212 0.0367 pCi/g Potassium-40 14.1 +/-0.893 0.161 +/-0.893 0.354 pCi/g 0.569 +/-0.096 0.0368 +/-0.096 0.0769 pCi/g Radium-226 Silver-108m 0.00983 +/-0.0197 0.0165 +/-0.0197 0.0345 pCi/g 0.018 +/-0.0496 0.319 +/-0.0496 0.0379 Thallium-208 pCi/g Rad Liquid Scintillation Analysis Liquid Scint Ni63, Solid-ALL FSS 14.0 +/-9.64 7.76 +/-9.66 15.9 SLN1 07/15/06 0128 547198 2 Nickel-63 U pCi/g

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LXM2	07/09/06	1716	546300

The following Analytical Methods were performed

Method	Description			
1	EML HASL 300, 4.5.2.3			
2	DOE RESL Ni-1, Modified			
Surrogate/T	racer recovery Test	Recovery%	Acceptable Limits	

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# **Certificate of Analysis**

Company:

Connecticut Yankee Atomic Power

362 Injun Hollow Rd Address:

East Hampton, Connecticut 06424

Contact:

Mr. Jack McCarthy Soils PO# 002332

Project:

Client Sample ID:

Sample ID:

9106-0011-007FS 166656003

Project: Client ID:

Vol. Recv.:

Report Date: July 20, 2006

YANK01204 YANK001

Parameter	Qualifier Result		Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd	
Surrogate/Tracer recover	ry Test				Recovery%	Acceptable Limits				
Carrier/Tracer Recovery	Liqui	d Scint Ni	63, Solid-ALL FS		71	()	25%-125%)			

#### Notes:

The Qualifiers in this report are defined as follows:

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

The above sample is reported on a dry weight basis.



Report Date: July 20, 2006

Page 1 of 5

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**QC Summary** 

Client:

Connecticut Yankee Atomic Power

362 Injun Hollow Rd

East Hampton, Connecticut

Contact:

Mr. Jack McCarthy

Workorder: 166656

NOM Sample Qual QC Units RPD% REC% Parmname Range Anlst Date Time Rad Gamma Spec Batch 546530 QC1201131808 166655001 DUP Actinium-228 0.880 0.785 pCi/g 7 (0% - 100%) MJH1 07/17/06 19:00 Uncert: +/-0.190 +/-0.261 +/-0.190 +/-0.261 TPU: Americium-241 U 0.0144 U 0.0531 pCi/g 44 (0% - 100%)Uncert: +/-0.0976 +/-0.0519 TPU: +/-0.0976 +/-0.0519 Bismuth-212 67\* (0% - 100%)0.586 1.42 pCi/g Uncert: +/-0.272 +/-0.597 +/-0.597 +/-0.272 TPU: Bismuth-214 0.599 0.695 pCi/g 32 (0% - 100%)Uncert: +/-0.0901 +/-0.165 TPU: +/-0.0901 +/-0.165 Cesium-134 0.0267 U 0.035 pCi/g 24 (0% - 100%)U Uncert: +/-0.0293 +/-0.0628 TPU: +/-0.0293 +/-0.0628 Cesium-137 0.365 0.359 pCi/g 1 (0% - 100%)Uncert: +/-0.050 +/-0.0764 +/-0.050 +/-0.0764 TPU: Cobalt-60 1.02 0.828 pCi/g 20 (0% - 20%) Uncert: +/-0.0748 +/-0.132 +/-0.0748 +/-0.132 TPU: Europium-152 0.0287 U 0.0537 pCi/g 56 (0% - 100%)U Uncert: +/-0.0862 +/-0.0546 +/-0.0862 +/-0.0546 TPU: Europium-154 0.0179 U 0.127 pCi/g 361 (0% - 100%) Uncert: +/-0.0614 +/-0.129 +/-0.0614 +/-0.129 TPU: Europium-155 0.0449 U 0.055 pCi/g 24 (0% - 100%)U Uncert: +/-0.0829 +/-0.109 TPU: +/-0.0829 +/-0.109 Lead-212 0.818 0.756 pCi/g 6 (0% - 20%)Uncert: +/-0.0599 +/-0.0927 TPU: +/-0.0599 +/-0.0927 Lead-214 0.731 0.694 pCi/g 4 (0% - 20%)Uncert: +/-0.087 +/-0.121 +/-0.121 +/-0.087 TPU: Manganese-54 0.0186U 0.0308 pCi/g 49 (0% - 100%)Uncert: +/-0.0224 +/-0.0506 +/-0.0506 TPU: +/-0.0224 Niobium-94 0.0138 0.00511 pCi/g 15 (0% - 100%)U Uncert: +/-0.0188 +/-0.0378 TPU: +/-0.0188 +/-0.0378

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# **QC Summary**

		. <u>v</u>	Ju	11111141 <u>y</u>							
Workorder: 166656								Page 2	of 5		
Parmname	NOM	Sample (	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch 546530											
Potassium-40		13.7		12.6	pCi/	g 5		(0% - 20%)	)		
	Uncert:	+/-0.845		+/-1.23	• ,			ì			
	TPU:	+/-0.845		+/-1.23							
Radium-226		0.599		0.695	pCi/s	g 32		(0% - 100%)	)		
	Uncert:	+/-0.0901		+/-0.165							
	TPU:	+/-0.0901		+/-0.165							
Silver-108m	U	0.00949	U	0.00566	pCi/g	g 71		(0% - 100%)	+		
	Uncert:	+/-0.0173		+/-0.0494							
	TPU:	+/-0.0173		+/-0.0494							
Thallium-208		0.265		0.271	pCi/g	g 6		(0% - 100%)			
	Uncert:	+/-0.0477		+/-0.0726							
	TPU:	+/-0.0477		+/-0.0726							
QC1201131809 LCS											
Actinium-228			U	0.160	pCi/g	g				07/17/0	6 19:01
	Uncert:			+/-0.545							
	TPU:			+/-0.545							
Americium-241	23.4			24.4	pCi/į	g	104	(75%-125%)			
	Uncert:			+/-0.599							
	TPU:			+/-0.599							
Bismuth-212			U	-0.135	pCi/g	g					
	Uncert:			+/-1.00							
	TPU:			+/-1.00							
Bismuth-214			U	-0.106	pCi/g	3					
	Uncert:			+/-0.219							
	TPU:			+/-0.219							
Cesium-134			U	-0.0105	pCi/g	g					
	Uncert:			+/-0.149		•					
	TPU:			+/-0.149							
Cesium-137	9.61			10.8	pCi/g	3	112	(75%-125%)			
	Uncert:			+/-0.468				· · ·			
	TPU:			+/-0.468							
Cobalt-60	14.8			15.5	pCi/g	g	105	(75%-125%)			
	Uncert:			+/-0.660		•		` ,			
	TPU:			+/-0.660							
Europium-152			U	0.0894	pCi/g	<u>y</u>					
•	Uncert:			+/-0.281	1 - 0	,					
	TPU:			+/-0.281							
Europium-154			U	0.0901	pCi/g	<u>,</u>					
•	Uncert:			+/-0.291		,					
	TPU:			+/-0.291							
Europium-155	110.		U	0.0661	pCi/g						
	Uncert:		•	+/-0.236	F	,					
	TPU:			+/-0.236							
Lead-212	110.		U	0.00863	pCi/g						
	Uncert:		-	+/-0.144	r~e	,					
	TPU:			+/-0.144							
Lead-214	110.		U	-0.0928	pCi/g	,					
	Uncert:		-	+/-0.197	Pone	,					
	Officert.			., 0.177							

# **GENERAL ENGINEERING LABORATORIES, LLC** 2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

# **QC Summary**

		QC St	illilliai y				
Workorder: 166656						Page 3 of 5	
Parmname	NOM	Sample Qual	QC	Units RPD%	REC%	Range Anlst	Date Time
Rad Gamma Spec Batch 546530							
2.000	TDI						
Manuara 54	TPU:	U	+/-0.197	-C'I-			
Manganese-54	I I	U	-0.0301	pCi/g			
	Uncert:		+/-0.142				
Nichium 04	TPU:	U	+/-0.142	C:/			
Niobium-94	I I a a seek	U	-0.105	pCi/g			
	Uncert:		+/-0.119				
Potossium 40	TPU:	7.7	+/-0.119	-C:/-			
Potassium-40	**	U	0.577	pCi/g			
	Uncert:		+/-1.17				
D. I'. 226	TPU:		+/-1.17	011		(550/ 1050/)	
Radium-226		U	-0.106	pCi/g		(75%-125%)	
	Uncert:		+/-0.219				
	TPU:		+/-0.219				
Silver-108m		U	-0.0449	pCi/g			
	Uncert:		+/-0.101				
	TPU:		+/-0.101				
Thallium-208		U	-0.0572	pCi/g			
	Uncert:		+/-0.118				
	TPU:		+/-0.118				
QC1201131807 MB							
Actinium-228		U	0.0538	pCi/g			07/17/06 18:57
	Uncert:		+/-0.0733				
	TPU:		+/-0.0733				
Americium-241		U	0.0126	pCi/g			
	Uncert:		+/-0.0946				
	TPU:		+/-0.0946				
Bismuth-212		U	-0.0364	pCi/g			
	Uncert:		+/-0.125				
	TPU:		+/-0.125				
Bismuth-214		U	0.00552	pCi/g			
	Uncert:		+/-0.0416				
	TPU:		+/-0.0416				
Cesium-134		U	0.00875	pCi/g			
	Uncert:		+/-0.0182				
	TPU:		+/-0.0182				
Cesium-137		U	-0.000566	pCi/g		•	
	Uncert:		+/-0.0173				
	TPU:		+/-0.0173				
Cobalt-60		U	-0.015	pCi/g			
	Uncert:		+/-0.0194				
	TPU:		+/-0.0194				
Europium-152	110.	U	0.0584	pCi/g			
K	Uncert:	J	+/-0.053	r 0			
	TPU:		+/-0.053				
Europium-154	110.	U	0.0222	pCi/g			
Daropium 101	Uncert:	O	+/-0.0583	PC#5			
	TPU:		+/-0.0583				
Europium-155	IPU:	U	-0.0079	pCi/g			
Europium-155		U	-0.0079	peng			

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# **QC Summary**

Workorder: 166656

Page 4 of 5

Parmname	NOM	Sample Qu	al QC	Units	RPD%	REC%	6 Range Anl	
	110111	Sample Qu	<u> </u>	Cilità	111 15 /0	REC /	o itange Am	5. Date Hille
Rad Gamma Spec Batch 546530								
	Uncert:		+/-0.0403					
	TPU:		+/-0.0403	0.1				
Lead-212	••		U 0.0336	pCi/	g			
	Uncert:		+/-0.0283					
	TPU:		+/-0.0283	<b>a</b> : (				
Lead-214	**		U 0.0301	pCi/	g			
	Uncert:		+/-0.0341					
	TPU:		+/-0.0341	0.1				
Manganese-54			U 0.0139	pCi/	g			
	Uncert:		+/-0.0175					
	TPU:		+/-0.0175	~				
Niobium-94			U -0.0065	pCi/	g			
	Uncert:		+/-0.0171					
	TPU:		+/-0.0171					
Potassium-40			U 0.122	pCi/s	g			
	Uncert:		+/-0.188					
	TPU:		+/-0.188					
Radium-226			U 0.00552	pCi/s	g			
	Uncert:		+/-0.0416					
	TPU:		+/-0.0416				1	
Silver-108m			U -0.00533	pCi/g	g			
	Uncert:		+/-0.0176					
	TPU:		+/-0.0176					
Thallium-208		1	U 0.000666	pCi/g	g			
	Uncert:		+/-0.0172					
	TPU:		+/-0.0172					
Rad Liquid Scintillation Batch 547198								
QC1201133196 166656001 DUP Nickel-63	••	11.8	U 12.1	pCi/į	g 0		(00/ 1000/) CIN	II 07/15/06 02:31
Nickei-03	U Uncert:	+/-7.46		pCi/§	g 0		(0% - 100%) SLP	11 07/13/06 02:31
			+/-8.89					
0.01201122100 1.00	TPU:	+/-7.47	+/-8.90					
QC1201133198 LCS Nickel-63	574		517	pCi/g	•	90	(75%-125%)	07/15/06 03:35
Nicket-03	Uncert:		+/-17.8	pCi/§	g	90	(7376-12376)	07/13/00 03:33
			+/-24.7					
OC1201122105 MB	TPU:		T/-24.7					
QC1201133195 MB Nickel-63		1	J 13.1	pCi/g	7			07/15/06 02:00
Wicker-05	Uncert:	,	+/-8.80	pc // ¿	5			07/15/00 02:00
	TPU:		+/-8.81					
QC1201133197 166656001 MS	Tru:		17-0.01					
Nickel-63	587 U	11.8	529	pCi/g	or .	gn	(75%-125%)	07/15/06 03:03
THEREI-UJ	Uncert:	+/-7.46	+/-18.9	PCD		70	(73/0/123/0)	07/15/00 05.05
	TPU:	+/-7.47	+/-26.0					
	IPU:	T/-/.4/	r/-20.U					

Notes:

The Qualifiers in this report are defined as follows:

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# **QC Summary**

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

Page 5 of 5

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

166656

- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B Target analyte was detected in the associated blank
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- H Analytical holding time was exceeded
- J Value is estimated

Workorder:

- N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
- h Preparation or preservation holding time was exceeded

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

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.

<sup>\*\*</sup> Indicates analyte is a surrogate compound.

<sup>^</sup> The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptence 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.

General Narrative

# CASE NARRATIVE

For CONNECTICUT YANKEE

RE: Soil PO# 002332

Work Order: 170683 SDG: 170683

# September 6, 2006

# **Laboratory Identification:**

General Engineering Laboratories, LLC

# **Mailing Address:**

P.O. Box 30712

Charleston, South Carolina 29417

# **Express Mail Delivery and Shipping Address:**

2040 Savage Road

Charleston, South Carolina 29407

# **Telephone Number:**

(843) 556-8171

# **Summary:**

# Sample receipt

The sample(s) for this Project arrived at General Engineering Laboratories, LLC, (GEL) in Charleston, South Carolina on August 17, 2006, July 07, 2006, July 13, 2006, July 21, 2006 and June 21, 2006. All sample containers arrived without any visible signs of tampering or breakage. The chain of custody contained the proper documentation and signatures.

The laboratory received the following sample(s):

Sample ID	Client Sample ID
170683001	9106-0011-018F
170683002	9106-0012-005F
170683003	9106-0012-014F
170683004	9106-0013-006F
170683005	9106-0013-005F
170683006	9106-0014-012F
170683007	9106-0014-033F
170683008	9106-0015-018F

170683009 9106-0015-002F 170683010 9106-0001-132F

# **Items of Note:**

At the request of Dale Randall on August 31, 2006, the samples listed above were relogged for various analyses. A list of Sample ID's and requested tests follows.

# Case Narrative:

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are listed below by analytical parameter.

# **Analytical Request:**

Ten soil samples were analyzed for various analyses included in the FSSALL suite.

# **Internal Chain of Custody:**

Custody was maintained for the sample(s).

# Data Package:

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

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

Cheryl Jones

Project Manager

Chyllon

Analysis requ	uest - 8/31/06		Done					To be done	<u> </u>				
Previous GEL ID	CY sample location IDs	FSS Gam	Sr-90	Ni-63	Am	Pu	Sr90	Pu241	Fe55	Ni63	Tc99	НЗ	C14
165614006	9106-0011-018F	×		×	X	Х	X	Х	X		X	Х	X
166653003	9106-0012-005F	x			Х	Х	Х	Х	Χ	Х	X	Х	X
166653010	9106-0012-014F	x			X	X	X	X	Х	X_	X	Х	X
167555007	9106-0013-005F	x			X	X	Х	X	Х	Х	Х	Х	X
167555001	9106-0013-006F	×			Х	X	X	X	Х	Х	Х	Х	X
167014026	9106-0014-012F	х			X	X	Х	X	Х	Х	Х	Х	X
167014042	9106-0014-033F	х			X	Х	Х	X	Х	Х	Х	Х	X
167556010	9106-0015-002F	×	х		Х	Х		X	Х	Х	Х	Х	X
167556007	9106-0015-018F	x	х		X	X		X	X	X	X	Х	X
169489001	9106-0001-132F	х			X	X	Х	X	Х	X	Х	Х	X

RELOGGED AS 170683

List of current GEL Certifications as of 06 September 2006

State	Certification
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)
Idaho	N/A
Illinois	200029
Indiana	C-SC-01
Kansas	E-10332
Kentucky	90129
Maryland	270
Massachusetts	M-SC012
Michigan	9903
Nevada	SC12
New Jersey	SC002
New York	11501
North Carolina	233
North Carolina Drinking W	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania	68-485
South Carolina	10120001/10585001/10120002
Tennessee	02934
Texas	TX213-2006A
U.S. Dept. of Agriculture	S-52597
US Army Corps of Engineer	N/A
Utah	8037697376 GEL
Vermont	N/A
Virginia	00151
Washington	C223

# Chain of Custody And Supporting Documentation

GPP-GGGR-R5104-003-Attachment B-CY-001 Major

Connecticut Y 362 Injun	ankee At Hollow Road, E 860-267	ast Hampton,			y			Ch	ain o	f Cust	ody Form	No	o. 2006-00413																																				
Project Name: Haddam N							A	nalyses	Reques	ited	Lab Use Only																																						
Contact Name & Phone: Jack McCarthy 860-267	-2556 Ext. 3	3024									Comments:																																						
Analytical Lab (Name, City, State) General Engineering Laboratories 2040 Savage Road. Charleston SC. 29407 343 556 8171. Attn. Cheryl Jones		ories n SC. 29407		oratories eston SC. 29407		oratories eston SC. 29407		oratories leston SC. 29407		poratories leston SC. 29407		ng Laboratories I. Charleston SC. 29407 In. Cheryl Jones		ratories ston SC. 29407 /l Jones		oratories eston SC. 29407 yl Jones		ratories ston SC. 29407 yl Jones		ratories eston SC. 29407 yl Jones		ratories eston SC. 29407		oratories eston SC. 29407		oratories eston SC. 29407 yl Jones		atories ston SC. 29407 l Jones		tories on SC. 29407 Jones		tories on SC. 29407 Jones		atories ton SC. 29407		tories on SC. 29407 Jones		tories on SC. 29407 Jones				FSSGAM	FSSALL	Ni-63					
Priority: 🗌 30 D. 🛭 14 I	D. □ 7 D.		Media	Sample Type	Container Size- &Type							165kg	The sale of the sa																																				
Sample Designation	Date	Time	Code	Code	Code				L		Comment, Prese	rvation	, Ind Sample ID																																				
9106-0011-011F	5/17/06	08:15	SE	С	BP	X		X			Transferred from COC																																						
9106-0011-012F	5/17/06	08:41	SE	С	BP	Х		X			Transferred from COC																																						
9106-0011-012FS	5/17/06	08:41	SE	С	BP	Х		Х			Transferred from COC																																						
9106-0011-014F	5/17/06	09:34	SE	С	BP	X		X			Transferred from COC																																						
9106-0011-015F	5/17/06	09:12	SE	С	BP	X		X			Transferred from COC		<b>用的数型数据</b>																																				
9106-0011-018F	5/17/06	10:01	SE	С	BP	X		X			Transferred from COC																																						
9106-0011-002F	5/15/06	14:33	SE	С	BP	X		X			Transferred from COC																																						
9106-0011-003F	5/15/06	14:58	SE	С	BP		X				Transferred from COC	2006-00352																																					
NOTES: PO #: 002332 MSR #: 06- SSWP# NA   LTP QA   Radwaste QA   Non QA   Samples Shipped Via:   Fed Ex   UPS   UPS											litternal Gontainer Feint 24 Deg. C Custody Scaled																																						
1) Relinquished By		Date/Tim	ie .	2) Recei	ved By	1	_		Date/	Time			( Custody Seal																																				
JAIME RICARTE	6-20	0-06/110	0	1	AM.	Sh			H2160	093	Other		infact?																																				
3) Relinquished By	3) Relinquished By Date/Time				4) Received By Date/Time					Dill of Yorking #	Dill of Ladina #																																						
5) Relinquished By		Date/Tim	ie	6) Recei	ved By				Date/	/Time	7910 2328 7:	540 																																					



# SAMPLE RECEIPT & REVIEW FORM

Client: CONA YANKEE ATOMIC SDG/ARCOC/Work Order: PM(A) Review (ensure non-conforming items are resolved prior to signing): Date Received: Received By: Acm Yes Ž Comments/Qualifiers (Required for Non-Conforming Items) Sample Receipt Criteria Circle Applicable: seals broken damaged container leaking container other (describe) Shipping containers received intact and sealed? Circle Coolant # Samples requiring cold 2 preservation within (4 + /- 2 C)? Record preservation method. Chain of custody documents included with shipment? Circle Applicable: seals broken damaged container leaking container other (describe) Sample containers intact and sealed? 5 Samples requiring chemical Sample ID's, containers affected and observed pH: preservation at proper pH? Sample ID's and containers affected: VOA vials free of headspace (defined as < 6mm bubble)?Are Encore containers present? 7 (If yes, immediately deliver to VOA laboratory) Samples received within holding ld's and tests affected: time? Sample ID's on COC match ID's Sample ID's and containers affected: on bottles? Sample ID's affected: Date & time on COC match date & time on bottles? TIME 🍠 DATES Number of containers received match number indicated on COC? COC form is properly signed in relinquished/received sections? 7910 2328 7542 Air Bill, Tracking #'s, & Additional Comments RSO RAD Receipt # Regulated \*If > x2 area background is observed on samples identified as "non-**Suspected Hazard Information** regulated/non-radioactive", contact the Radiation Safety group for further investigation. A Radiological Classification? Maximum Counts Observed\*: CAM 60 **B** [PCB Regulated? Comments: Shipped as DOT Hazardous Hazard Class Shipped: C | Material? If yes, contact Waste Manager or ESH Manager. PM (or PMA) review of Hazard classification: Initials

# Figure 1. Sample Check-in List

Date/Time Received: 6-21-06 0930	
SDG#:	- 0877
Work Order Number: 1656141.	
Shipping Container ID: 7910 2329 2540 Chain of Co	ustody # 2006 - 004/3
1. Custody Seals on shipping container intact?	Yes [4] No []
2. Custody Seals dated and signed?	Yes [ ] No 🖂
3. Chain-of-Custody record present?	Yes [A] No [ ]
4. Cooler temperature 24°C	
5. Vermiculite/packing materials is:	Wet [A] Dry [
6. Number of samples in shipping container: 8	
7. Sample holding times exceeded?	Yes No []
8. Samples have:	
	labels
9. Samples are:	
in good condition leaking	
brokenhave air bubbles	
10. Were any anomalies identified in sample receipt?	Yes [ ] No <b>k</b> ]
Description of anomalies (include sample numbers):	700 [ ] 110 <b>K</b> ]
Sample Custodian/Laboratory: AMuly	Date: 1/21/06 0930
elephoned to:On	By

Connecticut Y 362 Injun	ankee At Hollow Road, E	ast Hampton			y 1601	06	53%	ı	ain o	f Custoo	ly Form	No. 2006-00451
Project Name: Haddam N									Request	ed	Lab Use Only	
Contact Name & Phone: Jack McCarthy 860-267											Comments:	
Analytical Lab (Name, Ci General Engineering Labo 2040 Savage Road. Charle 843 556 8171. Attn. Cher				FSSGAM	FSSALL							
Priority: 🗌 30 D. 🔀 14 I	D. 🗌 7 D.		Madia	Sample	Container Size-							
Sample Designation	Date	Time	Media Code	Type Code	&Type Code	}				}	Comment, Preservation	Lab Sample ID
9106-0012-002F	6/23/06	08:56	SE	С	BP	X					Transferred from COC 2006-00436	001
9106-0012-003F	6/23/06	08:39	SE	C	BP	X	<u> </u>		†		Transferred from COC 2006-00436	002
9106-0012-004F	6/23/06	09:32	SE	С	BP		X				Transferred from COC 2006-00436	016
9106-0012-005F	6/23/06	09:56	SE	С	BP	X					Transferred from COC 2006-00436	003
9106-0012-006F	6/23/06	13:07	SE	С	BP	X			1		Transferred from COC 2006-00436	014
9106-0012-010F	6/23/06	11:08	SE	С	BP		X		T		Transferred from COC 2006-00436	017
9106-0012-013F	6/23/06	10:56	SE	С	BP	X					Transferred from COC 2006-00436	005
9106-0012-013FS	6/23/06	10:56	SE	C	BP	X					Transferred from COC 2006-00436	moco
NOTES: PO#: 002332 MSR #: 06-9962 SSWP# NA   LTP QA   Radwaste QA   Non QA   Samples Shipped Via:   Samples Shipped Via:   Fed Ex   UPS   Hand												Internal Container Temp.: Deg. C Custody Sealed? Y □ N □
1) Relinquished By		Date/Tip	ie	2) Refei	ved By	/-			Date/	Time		Custody Seal
JAIME RIGARTE	400	1 ///	-	5	Ann	= 7/7/06 900			Other	Intact?		
3) Relinquished By	· ·	Date/Tim			ArReceived By				Date		Bill of Lading #	YO NO
5) Relinquished By		Date/Tin	ne	6) Recei	ved By				Date	7919 8876 4783		

Connecticut Y 362 Injun	ankee At Hollow Road, F	ast Hampton			y  lol	ole!	53:/	Cha	ain of Cus	_		No. 2006-00452
Project Name: Haddam N	eck Decomn	nissioning						lyses Requested			b Use Only	
Contact Name & Phone: Jack McCarthy 860-267	3924								Co	omments:	,	
Analytical Lab (Name, Cit General Engineering Labo 2040 Savage Road. Charle 843 556 8171. Attn. Cher				FSSGAM	FSSALL							
Priority: 🗌 30 D. 🔀 14 E	D. 🗌 7 D.		Media	Sample	Container Size-							
Sample Designation	Date	Time	Code	Type Code	&Type Code						Comment, Preservation	Lab Sample ID
9106-0012-007F	6/21/06	09:32	SE	С	BP	X				Tr	ansferred from COC # 2006-00433	657
9106-0012-008F	6/21/06	09:00	SE	С	BP	X				Tr	ansferred from COC # 2006-00433	108
9106-0012-012F	6/21/06	09:19	SE	С	BP	X				Tr	ansferred from COC # 2006-00433	009
9106-0012-014F	6/21/06	10:05	SE	С	BP	X				Tr	ansferred from COC # 2006-00433	Olo
9106-0012-011F	6/21/06	09:51	SE	С	BP	X				Tr	ansferred from COC # 2006-00433	011
9106-0012-015F	6/21/06	14:24	SE	С	BP	X				Tr	ansferred from COC # 2006-00433	012
9106-0012-009F	6/23/06	10:33	SE	C	BP	X					ansferred from COC # 2006-00436	013
9106-0012-009FS	6/23/06	10:33	SE	С	BP	X					ansferred from COC # 2006-00436	014
9106-0012-001F	6/23/06	09:18	SE	С	BP	X				Tr	ansferred from COC # 2006-00436	015
NOTES: PO #: 002332 MSR #: 06-0967 SSWP# NA 🖾 LTP QA 🔲 Radwaste QA 🔲 Non QA Samples Shipped Via: 🖂 Fed Ex UPS												Internal Container Temp.: Deg. C Custody Sealed? Y \( \) \( \) \( \)
1) Relinquished By  Date/Time  2) Received By  Date/Time  7-6-06/1400  Date/Time  7-17/100 96											☐ Other	Custody Seal Intact?
3) Relinquished By		Date/Tim	ie	4) Recei	yed By				Date/Time		Bill of Lading #	Y D N D
5) Relinquished By		Date/Tim	ie	6) Recei	ved By			7927 8782 3129				



# SAMPLE RECEIPT & REVIEW FORM

PM use only SDG/ARCOC/Work Order: 16653, 16655, 16656 Client: PM(A) Review (ensure non-conforming items are resolved prior to signing): Date Received: Received By: ŝ ž Comments/Qualifiers (Required for Non-Conforming Items) Sample Receipt Criteria Circle Applicable: seals broken damaged container leaking container Shipping containers received intact and sealed? dry ice Samples requiring cold Circle Coolant # 2 preservation within (4 + /- 2 C)? Record preservation method. Chain of custody documents included with shipment? Circle Applicable: seals broken damaged consiner leaking container Sample containers intact and sealed? Sample ID's, containers affected and ebserved pH: Samples requiring chemical preservation at proper pH? Sample ID's and containers affected: VOA vials free of headspace (defined as < 6mm bubble)? Are Encore containers present? 7 (If yes, immediately deliver to VOA laboratory) ld's and tests affected: Samples received within holding time? Sample ID's and containers affected: Sample ID's on COC match ID's on bottles? Sample ID's affected: Date & time on COC match date & time on bottles? Sample ID's affected: Number of containers received match number indicated on COE? COC form is properly signed in relinquished/received sections? Air Bill ,Tracking #'s, & Additional Comments RSO RAD Receipt # Regulated \*If > x2 area background is observed on samples identified as "non-Suspected Hazard Information regulated/non-radioactive", contact the Radiation Safety group for further investigation. A Radiological Classification? Maximum Counts Observed\*: 1000 B IPCB Regulated? Comments: Shipped as DOT Hazardous Hazard Class Shipped: C | Material? If yes, contact Waste Manager or ESH Manager. PM (or PMA) review of Hazard classification: Initials Date:

Figure 1. Sample Check-i	n List
Date/Time Received: 7/7/06	
SDG#:	
Work Order Number: 166653 166655 166	0656
79/9 8876 4783 - 23°C Shipping Container ID: 7910 4024 29 37 - 22°C Shipping Container ID: 7917 8782 4114 - 25°C Chain of C	2001-00440
1. Custody Seals on shipping container intact?	2006 - 00452 Yes [-] No [-]
2. Custody Seals dated and signed?	Yes [No []
3. Chain-of-Custody record present?	
4. Cooler temperature 23° - 22	Yes [ ] No [ ]
5. Vermiculite/packing materials is:	
6. Number of samples in shipping container.	Wet [A] Dry [1]
7. Sample holding times exceeded?	Yes [] No []
8. Samples have:	
hazard labels	
custody sealsappropriate sample l.	abels
9. Samples are:	
in good conditionlcsking	
brokenhave air bubbles	
). Were any anomalies identified in sample receipt?	
Description of anomalies (include sample numbers):	Yes [] No []
(include sample numbers):	
A A	
riple Custodian/Laboratory: Marian Jackson	Date: 7/1/06 0900
	y

Page 14 of 108	Connecticut Y	ankee At Iollow Road, E	ast Hampton			у			Ch	ain o	f Cus	stody	Form	No. 2006-00434
10	Project Name: Haddam Ne	ck Decomn	nissioning					Aı	nalyses	Reques	ted		Lab Use Only	
<b>x</b>	Contact Name & Phone: Jack McCarthy 860-267-2	2556 Ext. 1	3924										Comments:	
	Analytical Lab (Name, City General Engineering Labor 2040 Savage Road. Charles 843 556 8171. Attn. Chery	ratories ston SC. 294	107				FSSGAM	FSSALL						
	Priority: 🗌 30 D. 🛛 14 D			Media	Sample Type	Container Size- &Type								
	Sample Designation	Date	Time	Code	Code	Code							Comment, Preservation	Lab Sample ID
54	9106-0013-006F	6/21/06	10:33	SE	C	BP	X							
	9106-0013-003F	6/21/06	10:51	SE	C	BP	X		L					
	9106-0013-002F	6/21/06	10:19	SE	C	BP	X	<u> </u>		<u> </u>	<u> </u>		<u> </u>	
204	9106-0013-002FS	6/21/06	10:19	SE	С	BP	X				<u> </u>		<u> </u>	
	9106-0013-010F	6/21/06	13:56	SE	C	BP	X							
	9106-0013-010FS	6/21/06	13:56	SE	С	BP	X			<u> </u>			<u> </u>	
167	9106-0013-005F	6/21/06	14:40	SE	С	BP	X							
NF	9106-0013-011F	6/21/06	13:35	SE	C	BP	X					<u> </u>		
	NOTES: PO #: 002332 N  1) Relinquished By  Anne Range 3) Relinquished By		Date/Tim	e 45 e	2) Regei	ved By	Radwa	ste QA		Non Q	Time  Time	30	Samples Shipped Via:  Fed Ex UPS Hand  Other  Bill of Lading #	Internal Container Temp.: Q   Deg. C  Custody Sealed? Y   N   Custody Seal Intact?  Y   N
	5) Relinquished By	e	6) Received By Date/Time						7910-5711-1264					

Page 15 of	Connecticut Y 362 Injun			y			No. 2006-00444							
108	Project Name: Haddam N	eck Decomp	nissioning				Analyses Requested Lab					Lab	Use Only	
8	Contact Name & Phone: Jack McCarthy 860-267	-3924										Cor	nments:	
	Analytical Lab (Name, Cir General Engineering Labo 2040 Savage Road. Charle 843 556 8171. Attn. Cher	oratories eston SC. 29 yl Jones	407				FSSGAM	FSSALL						
	Priority: 🗌 30 D. 🛭 14 [	D. 🗌 7 D.		Media	Sample Type	Container Size- &Type								
	Sample Designation	Date	Time	Code	Code	Code							Comment, Preservation	Lab Sample ID
19	9106-0013-007F	6-27-06	10:58	SE	С	BP	X							
[0	9106-0013-014F	6-27-06	09:22	SE	С	BP	X							
ll	9106-0013-015F	6-26-06	15:06	SE	С	BP	X					Tran	sferred from COC 2006-00438	
12	9106-0013-001F	6-23-06	13:32	SE	С	BP	X					Tran	sferred from COC 2006-00437	
16	9106-0013-004F	6-23-06	13:51	SE	С	BP		X				Tran	sferred from COC 2006-00437	
17	9106-0013-009F	6-23-06	14:08	SE	С	BP		X				Tran	sferred from COC 2006-00437	
13	9106-0013-013F	6-23-06	14:38	SE	С	BP	X					Tran	sferred from COC 2006-00437	
14	9106-0013-008F	6-26-06	11:11	SE	С	BP	X					Tran	sferred from COC 2006-00438	
15	9106-0013-012F	6-26-06 .	12:35	SE	C	BP	X					Tran	sferred from COC 2006-00438	
•														
	NOTES: PO #: 002332	MSR #: 06-	1036 SSV	VP# NA	×	LTP QA		Radwa	ste QA		Non Q	A	Samples Shipped Via:  Fed Ex UPS Hand	Internal Container Temp.: 2   Deg. C  Custody Sealed?  Y   N
	1) Relinquished By		e	2) Recei	ved Bv				Date/	Time		1	Custody Seal Intact?	
	JAIME RIGHTS	14 45	I Wi	thiat	CA	7/2	7/21/00 0930				Other			
	3) Relinquished By		e	4) Recei				1100	Date/			Bill of Lading #	YO NO	
1				<del></del>	L								7910 571/1204.	I



# SAMPLE RECEIPT & REVIEW FORM

SDG/ARCOC/Work Order: Client: (') PM(A) Review (ensure non-conforming Items are resolved prior to signing): Date Received: Received By: Yes Comments/Qualiflers (Required for Non-Conforming Items) X ŝ Sample Receipt Criteria Circle Applicable: seals broken damaged compiner leaking container other (describe) Shipping containers received intact and sealed? Samples requiring cold preservation within (4 + /- 2 C)? See ant Shoot Record preservation method. Chain of custody documents included with shipment? Circle Applicable: seals broken damaged container leaking container other (describe) Sample containers intact and sealed? Samples requiring chemical Sample ID's, containers affected and observed plf: preservation at proper pH? Sample ID's and containers affected: VOA vials free of headspace (defined as < 6mm bubble)? Are Encore containers present? (If yes, immediately deliver to VOA laboratory) d's and tests affected: Samples received within holding time? ample 1D's and containers affected: Sample ID's on COC match ID's CON on bottles? Sample ID's affected: Date & time on COC match date & time on bottles? Sample ID's affected: Number of containers received match number indicated on COC? COC form is properly signed in relinquished/received sections? Air Bill ,Tracking #'s, & Additional Comments RSO RAD Receipt # Regulated Regulated \*If > x2 area background is observed on samples identified as "non-**Suspected Hazard Information** regulated/non-radioactive\*, contact the Radiation Safety group for further investigation. A Radiological Classification? Maximum Counts Observed\*: B PCB Regulated? Comments: Shipped as DOT Hazardous Hazard Class Shipped: Material? If yes, contact Waste Manager or ESH Manager. PM (or PMA) review of Hazard classification: Initials



# SAMPLE RECEIPT & REVIEW FORM CONTINUATION FORM

Fed ex #'s	# ch Containe	es, COC#
7910 5711 1209 - 21.0	9	2004-00
1301 - 22°C	8	2006-0044
1194 - 21.0	10	2006-0044
1781 - 91.C	8	2006-100431
1220 - 23°C	9	30DW-D044
(1264) 1 Coder Wout Fedex #	-21C B	2004-00419/00
Chain # 2006-00444:		
Sample # 9106-0013-00	4F Actually rea	ds
9106-0013-0	04F <b>S</b>	
		•
	<del></del>	

Figure 1. Sample Check-in List	
Date/Time Received: 7/21/04 0930.	
SDG#: MSR#06-1035, MSR#06-1036, MSR	±06-1037
Work Order Number: 167555/.	
Shipping Container ID: See Cont. Sheet Chain of Custody	# See Cont. Sheet
1. Custody Seals on shipping container intact?	Yes [ ] No [/]
2. Custody Seals dated and signed?	Yes [] No [] N/7
3. Chain-of-Custody record present?	Yes [ No [ ]
4. Cooler temperature See Cont Sheet.	
5. Vermiculite/packing materials is:	Wet [] Dry [] NA
6. Number of samples in shipping container. See Cont	Sheet.
7. Sample holding times exceeded?	Yes [ ] No [ )
8. Samples have: hazard labels custody sealsappropriate sample labels	3
9. Samples are: in good conditionleakingbrokenhave air bubbles	
<ul> <li>10. Were any anomalies identified in sample receipt?</li> <li>11. Description of anomalies (include sample numbers):</li> </ul>	Yes [] No []
Sample Custodian/Laboratory: K. Weg A	Date: 7/21/06
Telephoned to:OnBv	

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$\stackrel{\sim}{\vdash}$	2
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8	5

**Chain of Custody Form** No. 2006-00456 Connecticut Yankee Atomic Power Company 362 Injun Hollow Road, East Hampton, CT 06424 860-267-2556 Lab Use Only Project Name: Haddam Neck Decommissioning Analyses Requested Contact Name & Phone: Jack McCarthy 860-267-2556 Ext. 3924 Analytical Lab (Name, City, State) FSSGAM General Engineering Laboratories FSSALL 2040 Savage Road. Charleston SC. 29407 843 556 8171. Attn. Chervl Jones Priority: ☐ 30 D. ☒ 14 D. ☐ 7 D. Container Sample Size-Media Type &Type Comment, Preservation Lab Sample ID Sample Designation Date Time Code Code Code Transferred from COC 2006-00407 9106-0014-021F 6/15/06 10:50 X SE C BP 052 9106-0014-030F Transferred from COC 2006-00407 6/15/06 11:20 SE  $\overline{\mathsf{C}}$ BP X Transferred from COC 2006-00407 9106-0014-032F X 6/15/06 09:31 SE C BP Transferred from COC 2006-00409 9106-0014-043F X 6/16/06 08:45 SE Č BP 05 9106-0014-010F X Transferred from COC 2006-00391 6/12/06 14:23 SE C BP Transferred from COC 2006-00391 9106-0014-016F X 6/12/06 14:51 SE  $\overline{\mathsf{C}}$ BP 9106-0014-022F X Transferred from COC 2006-00391 6/12/06 15:12 SE C BP Transferred from COC 2006-00394 9106-0014-013F 6/13/06 15:06 SE C BP X 9106-0014-024F X Transferred from COC 2006-00385 6/07/06 09:58 SE BP Samples Shipped Via: Internal Container NOTES: PO #: 002332 MSR #: 06- SSWP# NA 🛛 LTP QA Radwaste OA ☐ Non QA Fed Ex Temp.: \_\_\_ Deg. C 0488 UPS Hand **Custody Sealed?** Custody Seal Intact? 1) Relinquished By Date/Time Date/Time JAIME RICARTE ☐ Other 7-12-06 /1200 3) Relinquished By Date/Time 4) Received By Bill of Lading # 7921 4950 3967 5) Relinquished By Date/Time 6) Received By Date/Time

Page 20 of 108	Connecticut Y: 362 Injun H	ankee At Iollow Road, E 860-267	ast Hampton,		_	y			Cha	ain of	Cust		Form	No. 2006-00457
<u> </u>	Project Name: Haddam Ne							Ana	yses R	equested	i	L	ib Use Only	
∞ 	Contact Name & Phone: Jack McCarthy 860-267-											C	omments:	
	Analytical Lab (Name, Cit- General Engineering Labor 2040 Savage Road. Charles 843 556 8171. Attn. Chery	ratories ston SC. 294	107				FSSGAM	FSSALL						·.
	Priority: 🗌 30 D. 🔀 14 D	. 🗌 7 D.		Media	Sample Type	Container Size- &Type		.2						
	Sample Designation	Date	Time	Code	Code	Code							Comment, Preservation	Lab Sample ID
010	9106-0014-025F	6/7/06	10:18	SE	C	BP	X					Т	ransferred from COC 2006-00387	
all	9106-0014-031F	6/7/06	10:44	SE	C	BP	X					T	ransferred from COC 2006-00387	
012	9106-0014-017F	6/9/06	07:39	SE	C	BP	X					T	ransferred from COC 2006-00387	
013	9106-0014-023F	6/9/06	08:23	SE	C	BP	X					T	ransferred from COC 2006-00387	
614	9106-0014-035F	6/9/06	09:03	SE	С	BP	X					T	ransferred from COC 2006-00387	<u></u>
142	9106-0014-038F	6/9/06	10:59	SE	C	BP		X				T	ransferred from COC 2006-00387	<u> </u>
015	9106-0014-039F	6/9/06	09:28	SE	C	BP	X					Γ	ransferred from COC 2006-00387	
de	9106-0014-042F	6/9/06	09:53	SE	С	BP	X	<u> </u>				1	ransferred from COC 2006-00387	<u> </u>
013	79106-0014-034F	6/9/06	10:11	SE	C	BP	X					T	ransferred from COC 2006-00387	
<b>V</b> ·	NOTES: PO#: 002332 N	MSR #: 06- <b>୦</b> ዒ '		P# NA	⊠ LTP	QA 🗌	Radw	aste QA		Non Q	QA.		Samples Shipped Via:  Fed Ex UPS Hand	Internal Container Temp.: Deg. C  Custody Sealed?  Y D N D
	1) Relinquished By		Date/Tim	e	2) Recei	ed Bv	Z	1		Date/T	Time		1	Custody Seal Intact?
	JAIME RICARTE	7.	12-06/12		1/1	1	$\mathcal{O}$	nill.		7	106 9	سعدد	Other	
ł	3) Relinquished By		Date/Tim		4) Reger	ved By	7		سي	Date/1		-7 <u>(</u>		YO NO
													Bill of Lading #	)
	5) Relinquished By		Date/Tim	е	6) Recei	ved By				Date/T	Time		7921 4950 3989	

Page 21 of 108	Connecticut Y: 362 Injun H	ankee At Hollow Road, F 860-267	ast Hampton,			у			Cha	ain of	f Cus	stody	y Form	No. 2006-00458
10	Project Name: Haddam Ne							Anal	yses Re	equeste	d	La	ib Use Only	
∞ ∫	Contact Name & Phone: Jack McCarthy 860-267-2	·										C	omments:	
	Analytical Lab (Name, City General Engineering Labor 2040 Savage Road, Charles 843 556 8171. Attn. Chery	ratories ston SC, 294	107				FSSGAM	FSSALL						
	Priority: 🗌 30 D. 🔀 14 D	. □ 7 D.		Media	Sample Type	Container Size- &Type	,1	ำ						
	Sample Designation	Date	Time	Code	Code	Code							Comment, Preservation	Lab Sample ID
Х٤	9106-0014-029F	6/09/06	08:42	SE	С	BP	X					Tı	ansferred from COC 2006-00387	
319	9106-0014-009F	6/13/06	08:44	SE	С	BP	X					Tı	ansferred from COC 2006-00392	
720	9106-0014-028F	6/13/06	08:08	SE	С	BP	X					T	ansferred from COC 2006-00392	
121	9106-0014-028F§	6/13/06	08:08	SE	C	BP	X					T	ransferred from COC 2006-00392	
122	9106-0014-036F	6/13/06	09:38	SE	C	BP	X					T	ransferred from COC 2006-00392	
44	9106-0014-036F 9106-0014-037F	6/13/06	09:12	SE	С	BP		X				T	ansferred from COC 2006-00392	
923	9106-0014-040F	6/13/06	10:42	SE	C	BP	X					T	ransferred from COC 2006-00392	
nl	0106-0014-041E	6/13/06	10:13	SE	C	BP	X					Т	ransferred from COC 2006-00392	
O. K	9106-0014-041FŞ	6/13/06	10:13	SE	C	BP	X				<u> </u>	_ T	ransferred from COC 2006-00392	<u> </u>
שני	NOTES: PO #: 002332 N	MSR #: 06-	SSWI	P# NA	⊠ LTP	QA 🗌	Radw	aste QA	· 🗆	Non C	QA .	-;	Samples Shipped Via:  ☑ Fed Ex ☐ UPS ☐ Hand	Internal Container Temp.: Deg. C  Custody Sealed?  Y \( \text{N} \) \( \text{D} \)
	1) Relinquished By		Date/Tim	e	2) Recei	ved By				Date/	Time		]	Custody Seal Intact?
	JAIME RICARTE	7-		200	M	1110		Tho			3/04	94K	Other	
	3) Relinquished By		Date/Tim		4) Recei	ved By	7			Date/	Time		Bill of Lading #	YO NO
	5) Relinquished By		Date/Tim	e	6) Recei	ved By				Date/	Time		7921 4950 4014	

167014%

Page 22 of	Connecticut Y: 362 Injun H	ankee Ato	ast Hampton,			y			Cha	ain of	f Cus	stody	Form	No. 200	6-00459
801	Project Name: Haddam Ne							Anal	yses Re	equeste	d	La	Use Only 3		
œ́	Contact Name & Phone: Jack McCarthy 860-267-2											G	ninėris į Yra		
	Analytical Lab (Name, City General Engineering Labor 2040 Savage Road. Charles 843 556 8171. Attn. Chery	ratories ston SC, 294	07				FSSGAM	FSSALL							
	Priority: 🗌 30 D. 🔀 14 D	. □ 7 D.		Media	Sample Type	Container Size- &Type		÷			1				
2	Sample Designation	Date	Time	Code	Code	Code							Comment, Preservation	. a Lab	Simplesto
<i>r</i>	9106-0014-012F	6/06/06	12:47	SE	C	BP	X						insferred from COC 2006-00384		
, , , ,	9106-0014-018F	6/06/06	14:45	SE	C	BP		X					ansferred from COC 2006-00384		
<i>,</i> ,	9106-0014-019F	6/06/06	14:25	SE	C	BP	X	ļ				1 -1	ansferred from COC 2006-00384		
,, -	9106-0014-001F	6/09/06	13:37	SE	C	BP	X						ansferred from COC 2006-00392	24.4.2.2	
	9106-0014-002F	6/09/06	14:40	SE_	C	BP BP	$\frac{\lambda}{X}$				<b> </b>	<del> </del>	ansferred from COC 2006-00392	**************************************	
	9106-0014-002FS 9106-0014-005F	6/09/06	14:40	SE		BP	$\frac{\lambda}{X}$	<del> </del>			<b>}</b>		ansferred from COC 2006-00392	1	
الاد	9106-0014-005F 9106-0014-006F	6/09/06	14:12 13:07	SE	C	BP	$\frac{\lambda}{X}$	<del>  </del>		<del> </del>	<del> </del>	<del></del>	ansferred from COC 2006-00392		
031	9106-0014-006F 9106-0014-011F	6/09/06	12:44	SE	c	BP	<del>  ^-</del>	X		<del> </del>	<del> </del>		ansferred from COC 2006-00392	3.000	20.12
76	NOTES: PO #: 002332 N	MSR #: 06-		<del> </del>	C   LTP	· · · · · · · · · · · · · · · · · · ·	Radw	vaste QA	\	Non (	QA	1 1 2 1	Samples Shipped Via:  Fed Ex UPS Hand	Temp.	al Container #IDeg. G dv/Staled?
	1) Relinquished By JAIME RICARTE	7-1	Date/Tim 2-06/12	200	2) Recei	aude	6	Offe		Date/	3/06	0945	Other	Custod	Seal Intacto
	3) Relinquished By		Date/Tim		4) Rock					<b>6</b> ate/			Bill of Lading #		
1	5) Relinquished By		Date/Tim	ne	6) Recei	ved By				Date/	Time		7921 4950 3990		

167014/.

	Connecticut Y: 362 Injun H	ankee Ato Iollow Road, Ea 860-267-	ast Hampton,			y			Cha	ain of	f Custo	ody	Form	No. 2006-00460
ŀ	Project Name: Haddam Ne							Anal	yses R	equeste	d	1 ja	blise Only	
	Contact Name & Phone: Jack McCarthy 860-267-2	· · · · · · · · · · · · · · · · · · ·										17	minents:	
	Analytical Lab (Name, City General Engineering Labor 2040 Savage Road. Charles 843 556 8171. Attn. Chery	ratories ston SC. 294	07			I	FSSGAM	FSSALL						
	Priority: 30 D. 2 14 D	). 🔲 7 D.		Media	Sample	Container Size-	,	.4						
ار	Sample Designation	Date	Time	Code	Type Code	&Type Code	ļ _		'				Comment, Preservation	Lab Sample IID
1	9106-0014-003F	6/14/06	08:46	SE	С	BP		X				Tra	insferred from COC 2006-00396	
33	9106-0014- <b>00</b> 7F	6/14/06	09:13	SE	С	BP	Х					Tra	insferred from COC 2006-00396	
	9106-0014 <b>-0</b> 08F	6/14/06	07:34	SE	С	BP	Х						ansferred from COC 2006-00396	
35	9106-0014 <b>-0</b> 08FS	6/14/06	07:34	SE	С	BP	X					Tr	ansferred from COC 2006-00396	
4	9106-0014-014F	6/14/06	10:23	SE	C	BP	X					Tr	ansferred from COC 2006-00396	
												1_		
							<u> </u>					$oldsymbol{\perp}$		
		<u> </u>				<u></u> .		<u> </u>		<u> </u>	<del>  _   _   _   _   _   _   _   _   _   _</del>	↓_		
i		<u> </u>	· <del>· · · · · · · ·</del>	L		<u> </u>	L	<u> </u>	L	<u> </u>	Ll.			
	NOTES: PO #: 002332 N		SSWI A4	P# NA	⊠ LTP	QA 🗌	Radw	aste QA		Non (	QA		Samples Shipped Via:  ☑ Fed Ex ☐ UPS ☐ Hand	Internal Container : Temp 1 tog C Constody Sealed?
	1) Relinquished By  JAIME RIGARTE	7-12	Date/Tim		2) Recei	iyed By	6	Who	> >	Date	Time 3/06 C	94	Other	Custody-Seal Intacts
i	3) Relinquished By		Date/Tim	ie	4) Rock	ived By	7			Ďate/	Time		Bill of Lading #	
	5) Relinquished By		Date/Tim	e	6) Recei	ived By				Date/	Time		7921 4950 3978	

Doco 2/	Connecticut Y: 362 Injun H	ankee Ate	East Hampton,			y			Ch	ain of	f Cus	tody	Form	No. 2006-00461
3	Project Name: Haddam Ne							Anal	rses R	equested	1_	La	h (Use Only	
00	Contact Name & Phone: Jack McCarthy 860-267-2											Co	mmenis	
	Analytical Lab (Name, City General Engineering Labor 2040 Savage Road. Charles 843 556 8171. Attn. Chery	ratories eston SC. 294	107				FSSGAM	FSSALL	:					
	Priority: 🗌 30 D. 🔀 14 D	). 🔲 7 D.		Media	Sample Type	Container Size- &Type			Í					
I	Sample Designation	Date	Time	Code	Code	Code							Comment, Preservation	Lab Sample ID
		6/14/06	11:39	SE	С	BP	X					Tra	ansferred from COC 2006-00396	
38	9106-0014-020F	6/14/06	13:10	SE	С	BP	Х					Tra	ansferred from COC 2006-00396	
79	9106-0014-026F	6/14/06	13:53	SE	С	BP	X					1	ansferred from COC 2006-00396	
48	9106-0014-027F	6/14/06	14:26	SE	С	BP	X					<del>   </del>	ansferred from COC 2006-00396	
/XX	LQ106_0014_027FS	6/14/06	14:26	SE	C	BP	X					Tr	ansferred from COC 2006-00396	
212	9106-0014-033F	6/14/06	15:04	SE	С	BP	X			1	<u> </u>	<del>    -   -                              </del>		
. • • 		1		1	1			1	-	<del></del>		$\sqcup$	<del></del>	
ì		-		<del></del>	<del></del>	<del></del>	<b></b>	-		-		1		
ì		1	L	1	<u></u>	<u></u>	<u></u>	1	1	<u></u>		Ш_	<del></del>	
ļ	NOTES: PO #: 002332 N	MSR #: 06- <i>0</i> 92		P# NA	⊠ LTP	QA 🗌	Radw	vaste QA	, <u> </u>	] Non Q	QΑ		Samples Shipped Via:  Fed Ex UPS Hand	Tatemal Container Terrip Deg C Custody Sealed?
!	1) Relinquished By SAIME RIVARTE	7-12	Date/Tim 2-06/120		2) Recon	ived By	The state of the s	The			Time	094	Other	Y N D Eustody Seal Listact
į	3) Relinquished By		Date/Tim	ne	4), Pecei	ived By				Bate/	7/06 Time		Bill of Lading #	YO NE
ļ	5) Relinquished By		Date/Tim	ne	6) Recei	ived By				Date/	Time		7921 4950 3978	Comment of the commen



# SAMPLE RECEIPT & REVIEW FORM

Sumple Received By:    Sample Received By:   Sample Received intact and sealed?   Circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applicable: seals broken damaged concliner leaking container of the circle Applica	PATORIES.					PM use only					
Sample Receipt Criteria    Simple Receipt Criteria   Simple Receipt Criteria   Simple Receipt Criteria   Simple Receipt Criteria   Simple Receipt Criteria   Simple Receipt Criteria   Simple Receipt Criteria   Simple Receipt Criteria   Simple Receipt Criteria   Simple Receipt Criteria   Simple Receipt Criteria   Simple Receipt Criteria   Simple Receipt Criteria   Simple Receipt Criteria   Simple Receipt Criteria   Simple Receipt Receip	Client: VANK					SDG/ARCOC/Work Order: 16764					
Sample Receipt Criteria    Sample Receipt Criteria   S   Z   Comments/Qualifiers (Required for Non-Conforming Hengs)						PM(A) Review (ensure non-conforming items are resolved prior to signing):					
Sample Receipt Criteria    Shipping containers received intact and sealed?		·				Chystyn					
Shipping containers received intact and sealed?  Samples requiring cold preservation within (4 +/- 2 C)? Record preservation within (4 +/- 2 C)? Remples requiring chemical preservation at proper pH?  Samples requiring chemical preservation at proper pH?  VOA vials free of headspace (defined as < 6mm bubble)?  Are Encore containers present?  (If yes, immediately deliver to VOA laboratory)  Sample ID's and consistent affected:  Sample ID's affected:  Samples Total Containers received within the preserved on samples identified as "aon-regulated/non-radioactive", contact the Radiation Safety group for further investigation.  Maximum Counte Observed*:  Hazard Class Shipped:  UN#:	Received by:				_						
Samples requiring cold	Sample Receipt Criteria	1	S .	A A	N <sub>o</sub>	Comments/Qualifiers (Required for Non-Conforming Items)					
2 Samples requiring Gold 2 Preservation within (4 +/- 2 C)? 2 Record preservation method. 3 Chain of custody documents included with shipment? 4 Sample containers intact and sealed? 5 Samples requiring chemical preservation at proper pH? 6 VOA vials free of headspace (defined as < 6mm bubble)? 6 Are Encore containers present? 7 (If yes, immediately deliver to VOA laboratory) 7 (If yes, immediately deliver to VOA laboratory) 8 Sample ID's and containers affected: 9 Sample ID's af		act	1			Circle Applicable: seals broken damaged container leaking container other (describe)					
Sample containers intact and sealed?  Samples requiring chemical preservation at proper pH?  VOA vials free of headspace (defined as < 6mm bubble)?  Are Encore containers present? (If yes, immediately deliver to VOA laboratory)  Samples received within holding time?  Sample ID's on COC match ID's on bottles?  Date & time on COC match date & time on bottles?  Number of containers received match number indicated on COC?  COC form is properly signed in relinquished/received sections?  Air Bill _Pracking #'s, & Additional Comments  Suspected Hazard Information  Suspected Hazard Information  Telephone Source (Sample ID's affected:  **If yes, a properly signed in relinquished/received sections?  Air Bill _Pracking #'s, & Additional Comments  **If yes, contact the Radiation Safety group for further investigation.  Maximum Counts Observed **:  **If yes, contact Waste Manager or ESH Manager.  **If yes, contact Waste Manager or ESH Manager.  **If yes, contact Waste Manager.  **If yes, contact waste Manager.  **If yes in does in displaying a fifected:  **Sample ID's and containers affected:  **Sample ID's affected:  **If yes in the indicated of the i	2 preservation within (4 +/- 2 C)? Record preservation method.					Circle Coolant # ice bags blue ice dry ice none other describ					
Samples requiring chemical preservation at proper pH?  VOA vials free of headspace (defined as < 6mm bubble)?  Are Encore containers present?  (If yes, immediately deliver to VOA laboratory)  Sample ID's on COC match ID's on bottles?  Sample ID's and containers affected:  Sample ID's affecte	included with shipment?		_	197							
Sample ID's and containers affected:	sealed?			3							
Gefined as < 6mm bubble?						Sample ID's, containers affected and observed pH:					
Sample ID's and containers affected:   Sample ID's and containers affected:   Sample ID's and containers affected:   Sample ID's affected:   Sample						Sample ID's and containers affected:					
Sample ID's on COC match ID's on bottles?  Date & time on COC match date & time on bottles?  Number of containers received match number indicated on COC?  COC form is properly signed in relinquished/received sections?  Air Bill _Pracking #'s, & Additional Comments  Suspected Hazard Information  Suspected Hazard Information  For Regulated?  Radiological Classification?  PCB Regulated?  Sample ID's affected:  Sa	7 (If yes, immediately deliver to										
Date & time on COC match date & time on bottles?  Number of containers received match number indicated on COC?  COC form is properly signed in relinquished/received sections?  Air Bill	A 1 -				7	ld'a and tests affected:					
**Sample ID's affected:    Sample ID's affected:   Sample ID's affected:	7 1				-	Sample ID's and containers affected:					
match number indicated on COC?  COC form is properly signed in relinquished/received sections?  Air Bill Pracking #'s, & Additional Comments  Suspected Hazard Information  Radiological Classification?  PCB Regulated?  Shipped as DOT Hazardous  Material? If yes, contact Waste  Manager or ESH Manager.  Manager or ESH Manager.  Manager or ESH Manager.  Manager or ESH Manager.  Marian Marian Manager or ESH Manager.  Marian Marian Manager or ESH Manager.  Marian Marian Marian Manager.  Marian Marian Marian Marian Manager.  Marian Marian Marian Manager.  Marian Marian Marian Marian Marian Manager.  Marian	<b>V</b> I	V			S	Sample ID's affected:					
Air Bill Pracking #'s, & Additional Comments  Suspected Hazard Information  Radiological Classification?  PCB Regulated?  Shipped as DOT Hazardous Material? If yes, contact Waste Manager or ESH Manager.  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.  Maximum Counts Observed*:  Comments:  Hazard Class Shipped: UN#:					S	ample ID's affected:					
Additional Comments  Suspected Hazard Information  Radiological Classification?  PCB Regulated?  Shipped as DOT Hazardous Material? If yes, contact Waste Manager or ESH Manager.  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.  Maximum Counts Observed*:  Comments:  Hazard Class Shipped: UN#:					1						
Suspected Hazard Information    Sample   Suspected Hazard Information   Sample   Suspected Hazard Information   Sample   Suspected Hazard Information   Sample   Suspected Hazard Information   Safety group for further investigation.    Radiological Classification?   Maximum Counts Observed*:	Air Bill , Fracking #'s, & Additional Comments										
PCB Regulated?  Shipped as DOT Hazardous  Material? If yes, contact Waste  Manager or ESH Manager.  PM (or PMA) and the state of the st		Non- Regulated	Regulated	4	*I re	f > x2 area background is observed on samples identified as "non-gulated/non-radioactive", contact the Radiation Safety group for further					
Comments: Shipped as DOT Hazardous Material? If yes, contact Waste Manager or ESH Manager.  Hazard Class Shipped: UN#:	Radiological Classification?										
Material? If yes, contact Waste Manager or ESH Manager.  Hazard Class Shipped: UN#:	PCB Regulated?										
PM (or DMA) with GN	Material? If yes, contact Waste		1								
PM (or PMA) review of Hazard classification: Initials (12) Plate: 71 CALL											

	Figure 1. Sample Check-in List
Oate/Tim	e Received: 7/13/06 0945.
SDG#:	MSR#06-0988
	der Number: 167014
voja Oj	Container ID: 7921 4950 3789 Chain of Custody # 2006 - 00456
	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 24°C
5.	Vermiculite/packing materials is: Wet [   Dry [ ]
6.	Number of samples in shipping container:
7.	Sample holding times exceeded?  Yes [] No []
9. Sai	mples are:in good conditionleakingbrokenhave air bubbles
	Were any anomalies identified in sample receipt?  Description of anomalies (include sample numbers):
Sample (	Custodian/Laboratory: Marion When Date: 1/13/06 094
Telephor	ned to:OnBy

Figure 1. Sample Check-in	ı List
Date/Time Received: 7/13/06 0945	
SDG#: MSR#06-09	88
Work Order Number: 167614  7921 4850 397.8	
	ustody # 2006-60457
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 24°C	
5. Vermiculite/packing materials is:	Wet [] Dry []
6. Number of samples in shipping container:	2
7. Sample holding times exceeded?	Yes [ No [ ]
8. Samples have:	
hazard labels	
custody sealsappropriate sample l	abels
9. Samples are:	
honken	
have air bubbles	
Were any anomalies identified in sample receipt?	Yes [] No H
Description of anomalies (include sample numbers):	1∞ [ ] 140 [J
mple Custodian/Laboratory:	/
ephoned to:	Date: 7/18/06 0948
UIL	Зу

Figure 1. Sample Check-i	n List
Date/Time Received: 7/13/06 0945 .	
SDG#: MSR#06-0988	
Work Order Number: 167014	
Shipping Container ID: 7921 4950 3967 Chain of C	iustody #_ 2006 -00458
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 24°C	
5. Vermiculite/packing materials is:	Wet [ Dry [ ]
6. Number of samples in shipping container. 9	
7. Sample holding times exceeded?	Yes [ ] No [ ]
8. Samples have:	
nazard labels	
custody sealsappropriate sample	labels
9. Samples are:	
in good conditionleaking	
brokenhave air bubbles	
and the sample receipt?	Yes [] No L
11. Description of anomalies (include sample numbers):	
Sample Custodian/Laboratory: Marian Jathers	_ Date: 7/13/01 Nout
Telephoned to:On	By

# Figure 1. Sample Check-in List Date/Time Received: 15P#06-0988 SDG#: 167014 Work Order Number Shipping Container ID: Chain of Custody # 2006 Custody Seals on shipping container intact? Yes [ No [ ] Custody Seals dated and signed? Yes [ ] No [ ] Chain-of-Custody record present? Cooler temperature\_ 5. Vermiculite/packing materials is: Wet [ Dry [ ] Number of samples in shipping container 6. 7. Sample holding times exceeded? Yes [ No [ ] 8. Samples have: hazard labels custody seals appropriate sample labels 9. Samples are: in good condition leaking broken have air bubbles 10. Were any anomalies identified in sample receipt? Yes [] No [] Description of anomalies (include sample numbers): Sample Custodian/Laboratory: Telephoned to:

Figure 1. Sample Check-in List
Date/Time Received: 7/13/06 0945
Date/Time Received: 7/1400 07/10  SDG#: USR#06-0988  Work Order Number: UGFOLF
Shipping Container ID: 3978 Chain of Custody # 2006-00460 - 0046
1. Custody Seals on shipping container intact? Yes [ ] No [ ]
2. Custody Seals dated and signed? Yes [] No []
3. Chain-of-Custody record present?  Yes LTNo []  A Cooler temperature 2.300
6. Number of samples in shipping container:  7. Sample holding times exceeded?  Yes [-] No []
8. Samples have:
9. Samples are:
in good conditionleakingbrokenhave air bubbles
10. Were any anomalies identified in sample receipt? Yes [] No []
11. Description of anomalies (include sample numbers):
Sample Custodian/Laboratory: Marian Salter Date: 7/13/06 0018
Felephoned to: On By

Page 31 C		Yankee At Hollow Road, I 860-26	East Hampton			y			Ch	ain o	f Cu	_	y Form	No. 2006-00443
1.0	Project Name: Haddam I							Anal	yses Re	queste	i	Lal	Use Only	
80	Contact Name & Phone: Jack McCarthy 860-267				i '						Co	nments:		
	Analytical Lab (Name, City, State) General Engineering Laboratories 2040 Savage Road. Charleston SC. 29407 843 556 8171. Attn. Cheryl Jones						FSSGAM	FSSALL	Sr-90	Ni-63				
	Priority: ☐ 30 D. ☑ 14 D. ☐ 7 D.			Media	Sample Type	Container Size- &Type			. !				Comment, Preservation	Lab Sample ID
٠	Sample Designation	Date	Time	Code	Code	Code		ļ <u>.</u>					Comment, Preservation	Lab Sample 10
١	9106-0015-022F	6-27-06	16:24	SE	C	BP	X	ļ	X					<u> </u>
	9106-0015-023F	6-27-06	16:03	SE	C	BP	X		X	<u> </u>				<del></del>
3	9106-0015-024F	6-27-06	15:42	SE	C	BP	X	ļ	X	<del> </del>				+
7	9106-0015-026F	6-27-06	14:58	SE	С	BP	X	<u> </u>	X	ļ				<del></del>
5	9106-0015-027F	6-27-06	15:17	SE	C	BP	$\frac{x}{x}$		X		<del>                                     </del>	-		<del> </del>
	9106-0015-028F	6-27-06	14:31	SE	C	BP	X		X	<del> </del>	<del>                                     </del>			
	9106-0015-018F	6-27-06	17:18	SE	C	BP	X	<del> </del>	X		<del>}</del> }-			
•	9106-0015-025F	6-27-06	16:43	SE SE	C	BP BP	<del>  ^</del>	X		<del> </del> -	-	-		<del> </del>
1	9106-0015-021F	6-27-06	17:01	SE	C	BP	<del> </del>		<del> </del>	<del>                                     </del>	┼─┼-			<del></del>
	NOTES: PO #: 002332	MSR #: 06-,	L WP# NA		LTP QA		Radwa	iste QA		Non (	)A	Samples Shipped Via:  Fed Ex UPS Hand	Internal Container Temp.: 22 Deg. C Custody Sealed? Y \( \text{N} \)	
	1) Relinquished By		Date/Tim	ved By				Date	Time		7_	Custody Seal Intact?		
	JAIME RICARTS	7-7	,	145	I V	ببدئاتها	416	_	7/21	<i>σ</i> ω.		S	☐ Other	
	3) Relinquished By Date/Tir				4) Recei	ved By	5		<u></u>		Time		Bill of Lading #	YO NO
i	<u></u>				<del></del>	<u></u>							7910 5711 130	<i>I</i> -

Page 32 of 108	Connecticut ` 362 Injur	Yankee A Hollow Road, 1 860-26	East Hampton			ıy			Ch	ain o	f Cu	stod	ly Form	No. 2006-00448
Ξ	Project Name: Haddam 1	Neck Decom	missioning					Anal	yses Re	quested		La	hillse Only	
∞	Contact Name & Phone: Jack McCarthy 860-26	7-3924										(C)	mmenis:	
	Analytical Lab (Name, C General Engineering Lab 2040 Savage Road Char 843 556 8171. Attn. Che	oratories leston SC, 29	407				FSSGAM	SSALL	Sr-90					
	Priority: 30 D. 2 14	-	1	Media	Sample Type	Container Size- &Type	H	Щ						
<b>.</b>	Sample Designation	Date	Time	Code	Code	Code	'	2.5	<u> </u>				Comment, Preservation	Lab Sample ID
8	9106-0015-011F 9106-0015-012F	6-28-06	14:39	SE	C	BP	Х		Х					
19.		6-28-06	10:58	SE	C	BP	X		Х					
10	9106-0015-013F 9106-0015-014F	6-28-06	10:04	SE	С	BP	Х		X					
	9106-0015-014F	6-28-06	09:05	SE	С	BP	Х		Х					
•	9106-0015-015F	6-28-06	08:25	SE	С	BP		Х	<u> </u>					Meson in the second
	9106-0015-017F	6-28-06	08:46	SE	С	BP	Х	L	X					
4	9106-0015-017F	6-28-06	09:47	SE	С	BP	Х		X					
4	9106-0015-019F	6-28-06 6-28-06	09:25	SE	С	BP	Х		Х					
פ	7100-0013-0201	0-28-06	07:59	SE	С	BP	Х		X					
	NOTES: PO #: 002332	MSR #: 06-	1 lo 37 ssv	L WP# NA		LTP QA		Radwa	aste QA		Non Ç	QΑ	Samples Shipped Via:  ☑ Fed Ex ☐ UPS ☐ Hand	Internal Container Femp: 1 Deg. C Gustody: Sealed?
i	1) Relinquished By		Date/Tim	2) Received By Date/Time									Y □ N ⊿ Custody Seal Intact?	
1	JAIME RIGHTE	7-3		45	1 2	1 -		. 1	712.1	_			Other	Custody Sear Intact/
	3) Relinquished By	Date/Tim									Bill of Lading #	YO NO		

Page 55 01	Connecticut 362 Inju	Yankee At in Hollow Road, I 860-26	East Hampton			у			Cha	ain of C	Custo	dy Form	No. 2006-00447
_	Project Name: Haddam Ne			T	Ţ			Ana	lyses Re	quested	<b>資</b>	ab Use Only	
ž	Contact Name & Phone: Jack McCarthy 860-267-	3924									(0	omments:	
	Analytical Lab (Name, City General Engineering Labor 2040 Savage Road. Charles 843 556 8171. Attn. Chery		·		FSSGAM	FSSALL	Sr-90						
	Priority: 🗌 30 D. 🛭 14	r	Media	Sample Type	Container Size- &Type								
_	Sample Designation	Date	Time	Code	Code	Code		1.5	1			Comment, Preservation	≪ Lab Sample ID
9	9106-0015-001F	6-28-06	13:36	SE	С	BP	X		X				
٥	9106-0015-002F	6-28-06	14:15	SE	С	BP	Х		X				
İ	9106-0015-003F	6-28-06	13:15	SE	С	BP	Х		X				
0	9106-0015-004F	6-28-06	12:54	SE	С	BP		X					
_	9106-0015-005F	6-28-06	15:47	SE	С	BP	Х	ļ	X				
3	9106-0015-006F	6-28-06	16:10	SE	С	BP	Х		X		$\perp$		
1	9106-0015-007F	6-28-06	11:33	SE	С	BP	Х	ļ	X				
5	9106-0015-008F	6-28-06	11:10	SE	С	BP	Х		Х			•	
6	9106-0015-009F	6-28-06	10:25	SE	С	BP	X	ļ	Х				
1	9106-0015-010F	6-28-06	15:17	SE	C	BP	X	<u> </u>	X	<u> </u>			
	NOTES: PO #; 002332	MSR #: 06-4	1037 <sub>SS</sub> 1	WP# NA	. 🗵	LTP QA		Radw	aste QA	☐ No	on QA	Samples Shipped Via:  Fed Ex UPS Hand	Internal Container Temp: <u>23</u> Deg. C -Custody Sealed? YUNI
	1) Relinquished By  SAME RICARTE.	7.20	Date/Tim	15	2) Recei	Merid	nt		Date/Time			Other	Custody Seal Intact?
	3) Relinquished By	Date/Tim	1e	4) Recei	ved By	)			Date/Tim	ie	Bill of Lading #	YO NO	

Page 34 of 108	Connecticut 362 Inju	Yankee At n Hollow Road, I 860-26	East Hampton,	wer C	ompan 4	ıy			Ch	ain of	f Cu	stody Form	No. 2006-00468
Ť	Project Name: Haddam	Neck Decomi	nissioning			<u> </u>		Anal	yses Re	quested		Lab Use Only	
08	Contact Name & Phone: Jack McCarthy 860-26											Comments.	
	Analytical Lab (Name, C General Engineering Lab 2040 Savage Road, Char 843 556 8171. Attn. Cho	poratories leston SC. 29 eryl Jones	407				FSSGAM	FSSALL	Sr-90				
	Priority: ☐ 30 D. ☒ 14  Sample Designation	D 7 D.	Time	Media Code	Sample Type Code	Container Size- &Type Code						Comment, Preservation	Lab Sample ID
126	9106-0015-005FS	6-28-06	15:47	SE	C	BP	х	<del> </del>	X			Comment, Treservation	Lan Sample II
	9106-0015-012FS	6-28-06	10:58	SE	C	BP	X		$\frac{\lambda}{X}$				
	9106-0015-018FS	-6-27-06	17:18	SE	c	BP	$\frac{\lambda}{X}$		X				
					<u> </u>				_^_				
					<b></b>	<del> </del>							
					<del></del>	<del> </del>	<del> </del>		<b></b>		+-		
[					<u> </u>	<del></del>							
							<del> </del>						The state of the s
ı						<del>                                     </del>	-						
	NOTES: PO #: 002332	MSR #: 06-/	<i>037</i> ssv	VP# NA	×	LTP QA		Radwa	ste QA		Non Q	Samples Shipped Via:  Fed Ex UPS Hand	internal Container Temp: <u>D. I.</u> Deg. C. O. V. Custody Sealed?
ſ	1) Relinquished By		Date/Time	e	2) Recei	ved Rv	~			Date/T	·		YO NO
L	JAIME RUARTE	7.	20-06/1.			aldiah	L	-1.	zilou			Other	Custody Seal Intact?
Γ	3) Relinquished By		Date/Time		4) Recei	ve A By	VT	<del>-11</del>	# 1/1/1	Date/T	130		
L	·			-	., 100001	, carby ()		•		Date/1	ime	Bill of Lading #	YO NO
						<del></del> -						Bill of Lading # 1910 5711 1286	



# SAMPLE RECEIPT & REVIEW FORM

PM use only Client: SDG/ARCOC/Work Order: Date Received: 00 PM(A) Review (ensure non-conforming items are resolved prior to signing): Received By: Yes N. ŝ Sample Receipt Criteria Comments/Qualifiers (Required for Non-Conforming Items) Circle Applicable: seals broken damaged container leaking container other (describe) Shipping containers received intact and sealed? Circle Coolant # ice bags Samples requiring cold other describe) 2 preservation within (4 + 1 - 2 C)? see cont Record preservation method. Chain of custody documents included with shipment? Sample containers intact and Circle Applicable: seals broken damaged container leaking container other (describe) sealed? Samples requiring chemical Sample 1D's, containers affected and observed pH: preservation at proper pH? VOA vials free of headspace Sample ID's and containers affected: (defined as < 6mm bubble)? Are Encore containers present? (If yes, immediately deliver to VOA laboratory) Samples received within holding ld's and tests affected: time? Sample ID's on COC match ID's iample ID's and containers affected: on bottles? Date & time on COC match date Sample ID's affected: & time on bottles? Number of containers received Sample ID's affected: match number indicated on COC? COC form is properly signed in relinquished/received sections? Air Bill ,Tracking #'s. & Additional Comments See Sheet Non-Regulated RSO RAD Receipt # Regulated \*If > x2 area background is observed on samples identified as "non-Suspected Hazard Information regulated/non-radioactive", contact the Radiation Safety group for further investigation. A Radiological Classification? Maximum Counts Observed\*: B PCB Regulated? Comments: Shipped as DOT Hazardous C Material? If yes, contact Waste Hazard Class Shipped: UN#: Manager or ESH Manager. PM (or PMA) review of Hazard classification: Initials

Figure 1. Sample Check-in List	
Date/Time Received: 7/21/00 0930 .	
SDG#: MSR#06-1035, MSR#06-1036, MSR	±06-1037
Work Order Number: 167556	
Shipping Container ID: See Cont. Sheet Chain of Custod	v# 90e cont sheet
1. Custody Seals on shipping container intact?	Yes [ ] No [/
2. Custody Seals dated and signed?	Yes [] No [] NA
3. Chain-of-Custody record present?	Yes [ No [ ]
4. Cooler temperature See Cont Sheet.	
5. Vermiculite/packing materials is:	Wet [] Dry [] MA
6. Number of samples in shipping container: See Cont.	Sheef.
7. Sample holding times exceeded?	Yes [ ] No [ ]
8. Samples have:	
hazard labels	
custody sealsappropriate sample labels	
9. Samples are:	
in good conditionleaking	
brokenhave air bubbles	
O. Were any anomalies identified in sample receipt?	V 12 N
Description of anomalies (include sample numbers):	Yes [] No []
minocis).	
	•
Imple Custodian/Laboratory: K. Ulea H	n aladora
elephoned to: On By	Date: 110100

1



# SAMPLE RECEIPT & REVIEW FORM CONTINUATION FORM

Fed ex #'s	# ch Containers	. COC#
7910 5711 1209 - 21.0	<u>9</u>	2004-00-44
1301 - 22°C	8	2006-00448
1194 - 21.0	10	2006-00447
1781-91.0	8	2006-00434
1220 - 23°C	9	2004-00443
(1264) 1 Coder Word Fedex #-	51.C 8	2004-00-419/0041
Chain # 2004-00444:		
Sample # 9106-0013-00L		
9106-0013-00	04FS	

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Project Name: Haddam Ne	eck Decomn	nissioning					Ana	ılyses F	<b>Request</b>	ed		Lab Use Only	
Contact Name & Phone:								-	-		Sales Single	Comments	
Analytical Lab (Name, City, State) General Engineering Laboratories 2040 Savage Road. Charleston SC. 29407 843 556 8171. Attn. Cheryl Jones						FSSGAM	FSSALL				(*************************************		
Priority: 30 D. 14 D	). 🗌 7 D. 🗵	3 D.		Commits	Container	l Ĕ	<u> </u>						694897.
Sample Designation	Date	Time	Media Code	Sample Type Code	Size- &Type Code							Comment, Preservation	Lab Sample ID
9106-0001-132F			SE	C	BP	Х						······································	
9106-0001-112F	<u> </u>		SE	С	BP	X							
9106-0001-132A			SE	С	BP	Х	1						
9106-0001-132B			SE	С	BP	Х				1			
9106-0001-132C			SE	С	BP	Х							
9106-0001-132D			SE	C	BP	X							
9106-0001-112A			SE	C	BP	X							
9106-0001-112B			SE	С	BP	Х							
9106-0001-112C			SE	С	BP	X							
NOTES: PO#: 002332							Radwa	aste QA Non QA			A	Samples Shipped Via:  Fed Ex UPS Hand	Internal Container Temp: Deg. C Custody Spaled? Y \( \text{N} \) \( \text{N} \)
1) Relinquished By	uished By Date/Ţime 2) F								Date	/Time			Custody Seal
JAIME RICARTS					Suria	X		8/n/c	0/9	15A		Other	Intact?
3) Relinquished By				4) Rece		<del></del>	····			Time		Bill of Lading #	ND ND
5) Relinquished By	Date/Time			6) Rece	ived By			Date/Time			7921 8130 3482		

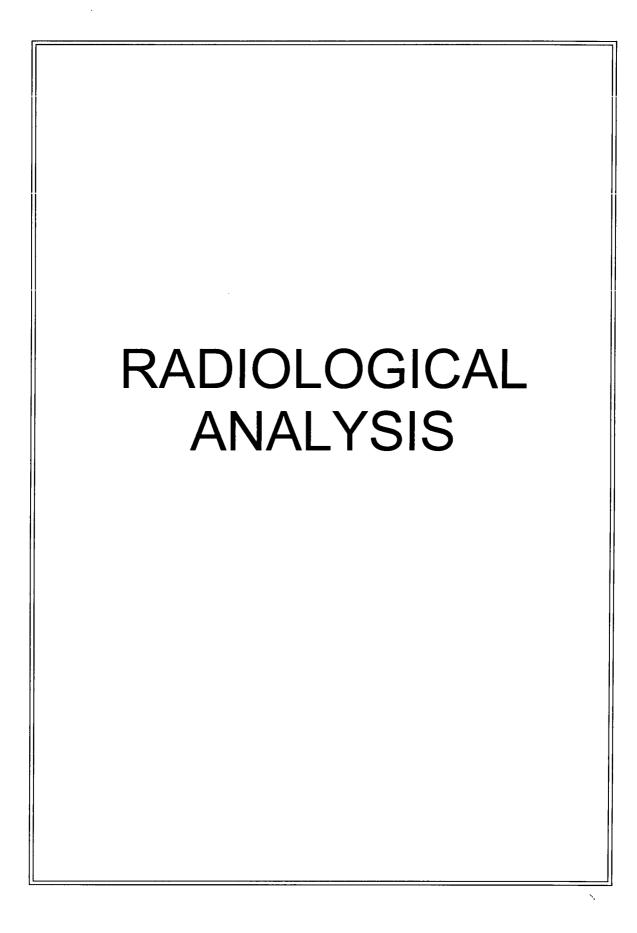
Connecticut Y 362 Injun I	ankee At Hollow Road, E 860-267	East Hampton,	wer C	ompan 4	y			Cha	ain o	f Cus	tody	Form	No. 2006-00497
Project Name: Haddam N							An	alyses I	Request	ied	280	Lab Use Only	
Contact Name & Phone: Jack McCarthy 860-267-	-2556 Ext.	3924									W	Comments:	
Analytical Lab (Name, City, State) General Engineering Laboratories 2040 Savage Road. Charleston SC. 29407 843 556 8171. Attn. Cheryl Jones		407				FSSGAM	FSSALL				e de la companya de l		
Priority: 🔲 30 D. 🔲 14 I	D. 🗌 7 D. 🛭	3 D.			Container	E	1				(		
Sample Designation	Date	Time	Media Code	Sample Type Code	Size- &Type Code							Comment, Preservation	Lab Sample ID
9106-0001-112D			SE	С	BP	X							
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		L	<u>.                                    </u>	L	<u> </u>	<u> </u>	1	L			1		
NOTES: PO #: 002332	MSR #:	06-1130	SSWP#	na 🛚	LTP QA		Radwa	ste QA		Non QA	•	Samples Shipped Via:  Fed Ex UPS Hand	Integral Container Forip: Deg: C: Custopy Sealed? Y'O N
1) Relinquished By	-	Date/Tin	ne	2) Rece					Date	/Time		1_	Custody Seal
JAIME RICARTE.					mi cot			8	17/04	09	154	☐ Other	Intact?
3) Relinquished By	) Relinquished By Date/Time			4) Rece	ived By	Date/Time						Bill of Lading #	YO NO
5) Relinquished By Date/Ti			ne	6) Rece	ived By	Date/Time						7921 8130 3482	

Figure 1. Sample Check	-in List
Date/Time Received: 8/17/06 @ 915A.	
SDG#:MSR#06-1130	
Work Order Number: 169489 1/.	
Shipping Container ID: 792/8/30 3482 Chain of	Custody # 2666-98496
1. Custody Seals on shipping container intact?	Yes [ ] No [+
2. Custody Seals dated and signed?	Yes [ ] No [Y
3. Chain-of-Custody record present?	Yes [ No [ ]
4. Cooler temperature 26.0	1
5. Vermiculite/packing materials is:	Wet [4] Dry [1]
6. Number of samples in shipping container: 10 -	Samples
7. Sample holding times exceeded?	Yes [ ] No [ ]
8. Samples have:	
hazard labels	
custody sealsappropriate sample	e labels
9. Samples are:	
in good conditionleaking	
brokenhave air bubble	s
O. Were any anomalies identified in sample receipt?	Yes [] No [4
Description of anomalies (include sample numbers):	none -
umple Custodian/Laboratory: C. Auri and	
elephoned to:	Date: 8/17/04
	By



# SAMPLE RECEIPT & REVIEW FORM CONTINUATION FORM

	Connecticut Yankee Atomic Power Company -
	[Date] & [TIME]
	9106-132F 8-7-06 & 14:09
_	9106-1320 8-11-06 & 12:58
	9106-132B 8-11-06 É 10:56
	9106-132 A 8.11-06 & 10:05
	9106-132D 8-11-06 É 1340
	9106112F 8-2-06 É 13:54
	9106112 C 8-15-06 & 07:43
	9106 112B 8-14-06 & 14:55
	9106112 A 8-14-06 & 14:23
	9106 112 D 8-15-06 £08:47
COC#	2006-00498 *
	9106001 SUR 8-10-06 & 10:14
	9100=-002 SUR 8-10-06 & 09:35
	9106003 SUR 8-10-06 É 10:53
	9106 00484R 8-10-06 & 12:53
<del></del>	91060058UR 8-10-00 £ 14:09
	9104006 SUR 8-10-00 £ 14:35
·	
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# Radiochemistry Case Narrative Connecticut Yankee Atomic Power Co. (YANK) Work Order 170683

# 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: 565213

Prep Batch Number: 564526

Dry Soil Prep GL-RAD-A-021 Batch Number: 564525

Sample ID	Client ID
170683004	9106-0013-006F
170683005	9106-0013-005F
170683008	9106-0015-018F
170683009	9106-0015-002F
170683010	9106-0001-132F
1201175602	Method Blank (MB)
1201175603	170683004(9106-0013-006F) Sample Duplicate (DUP)
1201175604	170683004(9106-0013-006F) Matrix Spike (MS)
1201175605	Laboratory Control Sample (LCS)

# **SOP Reference**

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

# **Calibration Information:**

# **Calibration Information**

All initial and continuing calibration requirements have been met.

## **Standards Information**

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

# **Sample Geometry**

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

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

#### **Blank Information**

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

# **Designated QC**

The following sample was used for QC: 170683004 (9106-0013-006F).

### QC Information

All of the QC samples met the required acceptance limits.

# **Technical Information:**

### **Holding Time**

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

#### **Preparation Information**

All preparation criteria have been met for these analyses.

# Sample Re-prep/Re-analysis

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

#### **Miscellaneous Information:**

#### **NCR Documentation**

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

### **Manual Integration**

No manual integrations were performed on data in this batch.

#### **Additional Comments**

The sample and the duplicate, 1201175603 (9106-0013-006F) and 170683004 (9106-0013-006F), did not meet the relative percent difference requirement, however they do meet the relative error ratio requirement with value of 2.11.

### **Qualifier information**

Manual qualifiers were not required.

# 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: 567705
Prep Batch Number: 564526
Dry Soil Prep GL-RAD-A-021 Batch Number: 564525

**Sample ID** Client ID 170683001 9106-0011-018F

170683002 9106-0012-005F 170683003 9106-0012-014F 170683006 9106-0014-012F 170683007 9106-0014-033F 1201181287 Method Blank (MB)

1201181288 170683003(9106-0012-014F) Sample Duplicate

(DUP)

1201181289 170683003(9106-0012-014F) Matrix Spike (MS)

1201181290 Laboratory Control Sample (LCS)

#### **SOP Reference**

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

Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 14.

#### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

### **Standards Information**

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

# Sample Geometry

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

### Quality Control (QC) Information:

#### **Blank Information**

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

### **Designated QC**

The following sample was used for QC: 170683003 (9106-0012-014F).

### **QC** Information

All of the QC samples met the required acceptance limits.

### **Technical Information:**

# **Holding Time**

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

# **Preparation Information**

All preparation criteria have been met for these analyses.

# Sample Re-prep/Re-analysis

Batch reprepped due to Thorium interference.

# **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**

The sample and the duplicate, 1201181288 (9106-0012-014F) and 170683003 (9106-0012-014F), did not meet the Am-241 relative percent difference requirement, however they do meet the relative error ratio requirement with a value of 0.512.

# **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:

565210

Prep Batch Number:

564526

Dry Soil Prep GL-RAD-A-021 Batch Number: 564525

Sample ID	Client ID
170683001	9106-0011-018F
170683002	9106-0012-005F
170683003	9106-0012-014F
170683006	9106-0014-012F
170683007	9106-0014-033F
1201175591	Method Blank (MB)
1201175592	170683001(9106-0011-018F) Sample Duplicate (DUP)
1201175593	170683001(9106-0011-018F) Matrix Spike (MS)
1201175594	Laboratory Control Sample (LCS)

### **SOP Reference**

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

# **Calibration Information:**

# **Calibration Information**

All initial and continuing calibration requirements have been met.

# **Standards Information**

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

# **Sample Geometry**

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

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

### **Blank Information**

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

# **Designated QC**

The following sample was used for QC: 170683001 (9106-0011-018F).

# **QC** Information

All of the QC samples met the required acceptance limits.

# **Technical Information:**

#### Holding Time

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

# **Preparation Information**

All preparation criteria have been met for these analyses.

### Sample Re-prep/Re-analysis

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

# **Miscellaneous Information:**

#### **NCR Documentation**

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

# **Manual Integration**

No manual integrations were performed on data in this batch.

# 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: 565214

Prep Batch Number: 564526

Dry Soil Prep GL-RAD-A-021 Batch Number: 564525

Sample ID	Client ID
170683004	9106-0013-006F
170683005	9106-0013-005F
170683008	9106-0015-018F
170683009	9106-0015-002F
170683010	9106-0001-132F
1201175606	Method Blank (MB)
1201175607	170683004(9106-0013-006F) Sample Duplicate (DUP)
1201175608	170683004(9106-0013-006F) Matrix Spike (MS)
1201175609	Laboratory Control Sample (LCS)

### **SOP Reference**

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

# **Calibration Information:**

# **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

# **Sample Geometry**

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

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

### **Blank Information**

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

#### **Designated QC**

The following sample was used for QC: 170683004 (9106-0013-006F).

### **QC** Information

All of the QC samples met the required acceptance limits.

# **Technical Information:**

### **Holding Time**

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

# **Preparation Information**

All preparation criteria have been met for these analyses.

# Sample Re-prep/Re-analysis

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

# **Miscellaneous Information:**

### **NCR Documentation**

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

# **Manual Integration**

No manual integrations were performed on data in this batch.

# **Qualifier information**

Manual qualifiers were not required.

# Method/Analysis Information

Product:	Liquid Scint Pu241, 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: 565216
Prep Batch Number: 564526
Dry Soil Prep GL-RAD-A-021 Batch Number: 564525

Sample ID	Client ID
170683004	9106-0013-006F
170683005	9106-0013-005F
170683008	9106-0015-018F
170683009	9106-0015-002F
170683010	9106-0001-132F
1201175614	Method Blank (MB)
1201175615	170683004(9106-0013-006F) Sample Duplicate (DUP)

1201175616 170683004(9106-0013-006F) Matrix Spike (MS)

1201175617 Laboratory Control Sample (LCS)

### **SOP Reference**

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

### **Calibration Information:**

### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

### **Sample Geometry**

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

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

#### **Blank Information**

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

#### **Designated OC**

The following sample was used for QC: 170683004 (9106-0013-006F).

# **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 1201175614 (MB), 1201175615 (9106-0013-006F), 170683004 (9106-0013-006F), 170683005 (9106-0013-005F), 170683008 (9106-0015-018F), 170683009 (9106-0015-002F) and 170683010 (9106-0001-132F) were recounted due to high MDAs.

# **Miscellaneous Information:**

#### **NCR Documentation**

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

# **Manual Integration**

No manual integrations were performed on data in this batch.

#### Qualifier information

Manual qualifiers were not required.

# Method/Analysis Information

Product: Liquid Scint Pu241, 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: 567883

Prep Batch Number: 564526

Dry Soil Prep GL-RAD-A-021 Batch Number: 564525

Sample ID	Client ID
170683001	9106-0011-018F
170683002	9106-0012-005F
170683003	9106-0012-014F
170683006	9106-0014-012F
170683007	9106-0014-033F
1201181751	Method Blank (MB)
1201181752	170683001(9106-0011-018F) Sample Duplicate (DUP)
1201181753	170683001(9106-0011-018F) Matrix Spike (MS)
1201181754	Laboratory Control Sample (LCS)

# **SOP Reference**

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

# **Calibration Information:**

### **Calibration Information**

All initial and continuing calibration requirements have been met.

# **Standards Information**

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

# Sample Geometry

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

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

# **Blank Information**

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

# Designated QC

The following sample was used for QC: 170683001 (9106-0011-018F).

# **QC** Information

All of the QC samples met the required acceptance limits.

# **Technical Information:**

# Holding Time

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

### **Preparation Information**

All preparation criteria have been met for these analyses.

### Sample Re-prep/Re-analysis

The batch was reprepped due to high MDAs.

### **Miscellaneous Information:**

#### **NCR Documentation**

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

### **Manual Integration**

No manual integrations were performed on data in this batch.

# 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: 565250
Prep Batch Number: 564526

Dry Soil Prep GL-RAD-A-021 Batch Number: 564525

Sample ID	Client ID
170683001	9106-0011 <b>-</b> 018F
170683002	9106-0012-005F
170683003	9106-0012-014F
170683006	9106-0014-012F
170683007	9106-0014-033F
1201175679	Method Blank (MB)
1201175680	170683002(9106-0012-005F) Sample Duplicate (DUP)
1201175681	170683002(9106-0012-005F) Matrix Spike (MS)
1201175682.	Laboratory Control Sample (LCS)

#### **SOP Reference**

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

# **Calibration Information:**

# **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

# **Sample Geometry**

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

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

#### Blank Information

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

#### **Designated QC**

The following sample was used for QC: 170683002 (9106-0012-005F).

# **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 170683001 (9106-0011-018F) and 170683006 (9106-0014-012F) were recounted due to high MDAs.

#### **Chemical Recoveries**

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

# **Miscellaneous Information:**

#### **NCR Documentation**

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

#### **Additional Comments**

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: 565253

Prep Batch Number: 564526 Dry Soil Prep GL-RAD-A-021 Batch Number: 564525

# Sample ID Client ID

170683004 9106-0013-006F 170683005 9106-0013-005F 170683010 9106-0001-132F

1201175686	Method Blank (MB)
1201175687	170683005(9106-0013-005F) Sample Duplicate (DUP)
1201175688	170683005(9106-0013-005F) Matrix Spike (MS)
1201175689	Laboratory Control Sample (LCS)

#### **SOP Reference**

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

#### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

#### **Sample Geometry**

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

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

#### **Blank Information**

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

# **Designated QC**

The following sample was used for QC: 170683005 (9106-0013-005F).

# **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.

# **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: 564445

Sample ID	Client ID
170683004	9106-0013-006F
170683005	9106-0013-005F
170683008	9106-0015-018F
170683009	9106-0015-002F
1201173840	Method Blank (MB)
1201173841	170544018(9304-0002-005F) Sample Duplicate (DUP)
1201173842	170544018(9304-0002-005F) Matrix Spike (MS)
1201173843	Laboratory Control Sample (LCS)

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-005 REV# 13.

### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

# Sample Geometry

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

#### Quality Control (QC) Information:

#### **Blank Information**

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

# Designated QC

The following sample was used for QC: 170544018 (9304-0002-005F).

#### **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.

# **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: 564623

Sample ID	Client ID
170683001	9106-0011-018F
170683002	9106-0012-005F
170683003	9106-0012-014F
170683006	9106-0014-012F
170683007	9106-0014-033F
1201174253	Method Blank (MB)
1201174254	170683001(9106-0011-018F) Sample Duplicate (DUP)
1201174255	170683001(9106-0011-018F) Matrix Spike (MS)
1201174256	Laboratory Control Sample (LCS)

# **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-005 REV# 13.

# **Calibration Information:**

### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

# Sample Geometry

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

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

# **Blank Information**

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

### **Designated QC**

The following sample was used for QC: 170683001 (9106-0011-018F).

#### **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 1201174254 (9106-0011-018F) was recounted due to high MDA.

#### **Miscellaneous Information:**

#### **NCR Documentation**

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

#### 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: 565648

Sample ID	Client ID
170683010	9106-0001-132F
1201176786	Method Blank (MB)
1201176787	170683010(9106-0001-132F) Sample Duplicate (DUP)
1201176788	170683010(9106-0001-132F) Matrix Spike (MS)
1201176789	Laboratory Control Sample (LCS)

# **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-005 REV# 13.

# **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

### Sample Geometry

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

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

### **Blank Information**

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

# **Designated QC**

The following sample was used for QC: 170683010 (9106-0001-132F).

#### **OC** 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.

#### Qualifier information

Manual qualifiers were not required.

# Method/Analysis Information

Product: Li	iquid Scint Fe55, Solid-ALL FSS
-------------	---------------------------------

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: 565287
Prep Batch Number: 564526

Dry Soil Prep GL-RAD-A-021 Batch Number: 564525

Sample ID	Client ID
170683001	9106-0011-018F
170683002	9106-0012-005F
170683003	9106-0012-014F
170683006	9106-0014-012F
170683007	9106-0014-033F
1201175808	Method Blank (MB)
1201175809	170683006(9106-0014-012F) Sample Duplicate (DUP)
1201175810	170683006(9106-0014-012F) Matrix Spike (MS)
1201175811	Laboratory Control Sample (LCS)

# **SOP Reference**

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

# **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

#### Sample Geometry

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

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

#### **Blank Information**

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

#### **Designated OC**

The following sample was used for QC: 170683006 (9106-0014-012F).

#### **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 1201175810 (9106-0014-012F), 170683001 (9106-0011-018F), 170683002 (9106-0012-005F) and 170683006 (9106-0014-012F) were recounted due to the quench number being outside the calibration range.

#### **Miscellaneous Information:**

#### **NCR Documentation**

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

NCR 356906 was generated due to Container scanning event for custody missed. 1. The analyst did not scan the sample 170683001 into the batch prior to analysis, however the samples did remain in their custody at all times. 1. The error has been corrected and the analyst has been instructed on the proper scanning procedures. Reporting results.

# **Qualifier information**

Manual qualifiers were not required.

#### Method/Analysis Information

Product: Liquid Scint Fe55, Solid-ALL FSS

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: 565291
Prep Batch Number: 564526

Dry Soil Prep GL-RAD-A-021 Batch Number: 564525

Sample ID	Client ID
170683004	9106-0013-006F
170683005	9106-0013-005F
170683008	9106-0015-018F
170683009	9106-0015-002F
170683010	9106-0001-132F
1201175818	Method Blank (MB)
1201175819	170683004(9106-0013-006F) Sample Duplicate (DUP)
1201175820	170683004(9106-0013-006F) Matrix Spike (MS)
1201175821	Laboratory Control Sample (LCS)

# **SOP Reference**

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

# **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

# Sample Geometry

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

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

#### **Blank Information**

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

# **Designated QC**

The following sample was used for QC: 170683004 (9106-0013-006F).

#### **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 170683004 (9106-0013-006F) and 170683009 (9106-0015-002F) were recounted due to the quench number being outside the calibration range.

# **Miscellaneous Information:**

# **NCR Documentation**

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

#### Qualifier information

Manual qualifiers were not required.

# **Method/Analysis Information**

Product: Liquid Scint Ni63, Solid-ALL FSS

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: 565289
Prep Batch Number: 564526

Dry Soil Prep GL-RAD-A-021 Batch Number: 564525

Sample ID	Client ID
170683002	9106-0012-005F
170683003	9106-0012-014F
170683006	9106-0014-012F
170683007	9106-0014-033F
1201175814	Method Blank (MB)
1201175815	170683006(9106-0014-012F) Sample Duplicate (DUP)
1201175816	170683006(9106-0014-012F) Matrix Spike (MS)
1201175817	Laboratory Control Sample (LCS)

# **SOP Reference**

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

#### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

# Standards Information

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

#### Sample Geometry

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

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

### **Blank Information**

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

# **Designated QC**

The following sample was used for QC: 170683006 (9106-0014-012F).

# **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.

# **Qualifier information**

Manual qualifiers were not required.

#### Method/Analysis Information

Product:	Liquid Scint Ni63, Solid-ALI	FSS

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: 565293
Prep Batch Number: 564526
Dry Soil Prep GL-RAD-A-021 Batch Number: 564525

Sample ID	Client ID
170683004	9106-0013-006F
170683005	9106-0013-005F
170683008	9106-0015-018F
170683009	9106-0015-002F
170683010	9106-0001-132F
1201175822	Method Blank (MB)
1201175823	170683004(9106-0013-006F) Sample Duplicate (DUP)
1201175824	170683004(9106-0013-006F) Matrix Spike (MS)
1201175825	Laboratory Control Sample (LCS)

# **SOP Reference**

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

### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

#### **Sample Geometry**

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

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

#### **Blank Information**

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

# Designated QC

The following sample was used for QC: 170683004 (9106-0013-006F).

#### 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.

### **Qualifier information**

Manual qualifiers were not required.

# Method/Analysis Information

Product: LSC, Tritium Dist, Solid-HTD2, ALL FSS

Analytical Method: EPA 906.0 Modified

Analytical Batch Number: 564447

Sample ID	Client ID
170683004	9106-0013-006F
170683005	9106-0013-005F
170683008	9106-0015-018F
170683009	9106-0015-002F
1201173844	Method Blank (MB)
1201173845	170544018(9304-0002-005F) Sample Duplicate (DUP)
1201173846	170544018(9304-0002-005F) Matrix Spike (MS)
1201173847	Laboratory Control Sample (LCS)

#### **SOP Reference**

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

#### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

#### Sample Geometry

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

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

#### **Blank Information**

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

#### **Designated QC**

The following sample was used for QC: 170544018 (9304-0002-005F).

#### **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 1201173846 (9304-0002-005F) and 1201173847 (LCS) were recounted due to low/high recovery.

# **Miscellaneous Information:**

### **NCR Documentation**

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

NCR 356177 was generated due to Container scanning event for custody missed. 1. Container scanning event for custody missed: The analyst did not scan the samples into the batch prior to analysis, however the samples did remain in their custody at all times. 1. The error has been corrected and the analyst has been instructed on proper scanning procedures. Reporting results

# Qualifier information

Manual qualifiers were not required.

#### Method/Analysis Information

Product: LSC, Tritium Dist, Solid-HTD2,ALL FSS

Analytical Method: EPA 906.0 Modified

Analytical Batch Number: 564514

Sample ID	Client ID
170683001	9106-0011-018F
170683002	9106-0012-005F
170683003	9106-0012-014F
170683006	9106-0014-012F
170683007	9106-0014-033F
1201174038	Method Blank (MB)
1201174039	170683006(9106-0014-012F) Sample Duplicate (DUP)
1201174040	170683006(9106-0014-012F) Matrix Spike (MS)
1201174041	Laboratory Control Sample (LCS)

#### **SOP Reference**

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

# **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

# Sample Geometry

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

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

#### **Blank Information**

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

# **Designated QC**

The following sample was used for QC: 170683006 (9106-0014-012F).

#### **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.

#### Qualifier information

Manual qualifiers were not required.

#### Method/Analysis Information

Product: LSC, Tritium Dist, Solid-HTD2, ALL FSS

Analytical Method: EPA 906.0 Modified

Analytical Batch Number: 565650

Sample ID	Client ID
170683010	9106-0001-132F
1201176794	Method Blank (MB)
1201176795	170683010(9106-0001-132F) Sample Duplicate (DUP)
1201176796	170683010(9106-0001-132F) Matrix Spike (MS)
1201176797	Laboratory Control Sample (LCS)

#### **SOP Reference**

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

# **Calibration Information:**

### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

# Sample Geometry

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

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

#### **Blank Information**

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

# **Designated QC**

The following sample was used for QC: 170683010 (9106-0001-132F).

#### **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.

# Qualifier information

Manual qualifiers were not required.

#### Method/Analysis Information

Product: Liquid Scint C14, Solid All,FSS

Analytical Method: EPA EERF C-01 Modified

Analytical Batch Number: 564449

Sample ID	Client ID
170683004	9106-0013-006F
170683005	9106-0013-005F
170683008	9106-0015-018F
170683009	9106-0015-002F
1201173848	Method Blank (MB)
1201173849	170544019(9304-0002-008F) Sample Duplicate (DUP)
1201173850	170544019(9304-0002-008F) Matrix Spike (MS)
1201173851	Laboratory Control Sample (LCS)

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-003 REV# 8.

# **Calibration Information:**

### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

# Sample Geometry

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

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

#### **Blank Information**

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

# **Designated QC**

The following sample was used for QC: 170544019 (9304-0002-008F).

#### **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 1201173849 (9304-0002-008F) was recounted due to a negative result greater than three times the error. Samples 170683008 (9106-0015-018F) and 170683009 (9106-0015-002F) were recounted to verify results. Second counts being reported.

# **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.

#### Qualifier information

Manual qualifiers were not required.

#### Method/Analysis Information

Product:	Liquid Scint C14, Solid All, FSS

Analytical Method:

EPA EERF C-01 Modified

Analytical Batch Number: 564520

Sample ID	Client ID
170683001	9106-0011-018F
170683002	9106-0012-005F
170683003	9106-0012-014F
170683006	9106-0014-012F
170683007	9106-0014-033F
1201174056	Method Blank (MB)
1201174057	170683007(9106-0014-033F) Sample Duplicate (DUP)
1201174058	170683007(9106-0014-033F) Matrix Spike (MS)
1201174059	Laboratory Control Sample (LCS)

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-003 REV# 8.

#### **Calibration Information:**

# **Calibration Information**

All initial and continuing calibration requirements have been met.

# **Standards Information**

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

#### Sample Geometry

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

# Quality Control (QC) Information:

#### **Blank Information**

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

#### **Designated QC**

The following sample was used for QC: 170683007 (9106-0014-033F).

#### **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.

# **Qualifier information**

Manual qualifiers were not required.

# Method/Analysis Information

Product:	Liquid Scint C14, Solid All,FSS
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Analytical Method: EPA EERF C-01 Modified

Analytical Batch Number: 565649

Sample ID	Client ID
170683010	9106-0001-132F
1201176790	Method Blank (MB)
1201176791	170683010(9106-0001-132F) Sample Duplicate (DUP)
1201176792	170683010(9106-0001-132F) Matrix Spike (MS)
1201176793	Laboratory Control Sample (LCS)

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-003 REV# 8.

# **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met.

#### **Standards Information**

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

#### **Sample Geometry**

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

#### Quality Control (QC) Information:

#### **Blank Information**

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

#### **Designated OC**

The following sample was used for QC: 170683010 (9106-0001-132F).

#### **OC** 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.

# **Qualifier information**

Manual qualifiers were not required.

# **Certification Statement**

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

# **Review Validation:**

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

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

Reviewer/Date:_	Lunch 9/18/06	

\OC A

General Engineering Laboratories Form GEL-NCR Rev. 06/05

NCR Report No.: 356906

Revision No.:

	COMPANY - WIDE NON	CONFORMANCE REPOR	Т
<b>Mo.Day Yr.</b> 11-SEP-06	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: LSC	Test / Method: DOE RESL Fe-1, Modified	Matrix Type: Solid	Client Code: YANK
Batch ID: 565287	Sample Numbers: See Below		
Potentially affected v	work order(s)(SDG): 170683		
Application Issues:			
Container scanning ev	vent for custody missed		
Specification and Re Nonconformance De		NRG Disposition:	
The analyst did no analysis, however the	ot scan the sample 170683001 into the batch prior to e samples did remain in their custody at all times.	The error has been correct proper scanning procedures.	ed and the analyst has been instructed on the Reporting results.
	t .		
			•
Originator's Name:		Data Validator/Group Leade	er:
Melanie Aycock	11-SEP-06	Heather Anderson 11-5	SEP-06
Quality Review:			

Director:

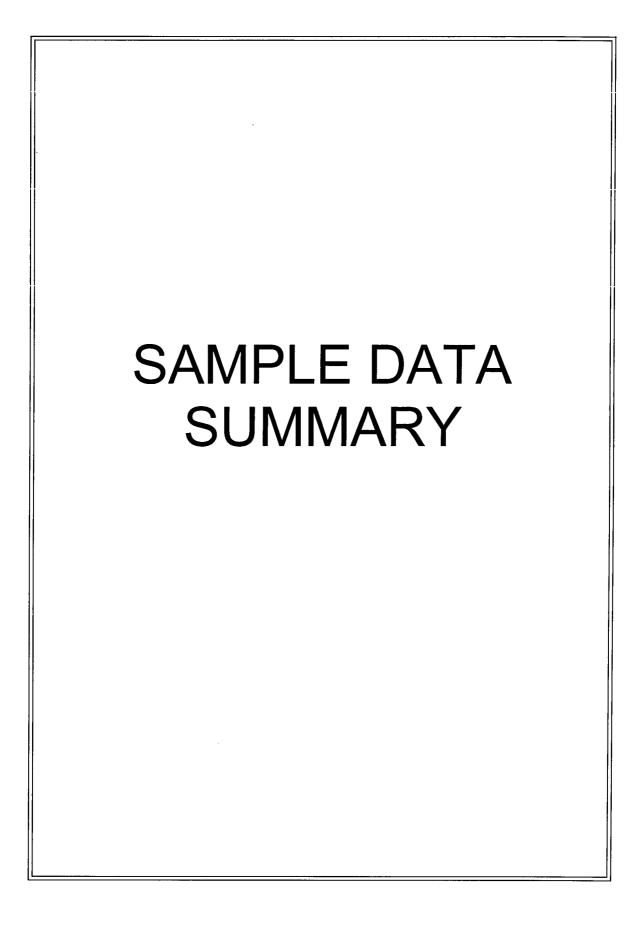
General Engineering Laboratories Form GEL-NCR Rev. 06/05

NCR Report No.: 356177

Revision No.: 1

	COMPANY - WIDE NO	ICONFORMANCE REPO	DRT			
Mo.Day Yr. 08-SEP-06	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process			
Instrument Type: LSC	Test / Method: EPA 906.0 Modified	Matrix Type: Solid	Client Code: YANK			
Batch ID: 564447	Sample Numbers: See Below					
Potentially affected v	work order(s)(SDG): 170543(MSR#06-1172),1705	4(MSR#06-1174),170683				
Application Issues:						
Container scanning ev	vent for custody missed					
Specification and Re Nonconformance De	equirements scription:	NRG Disposition:				
Container scanning	g event for custody missed: The analyst did not sca batch prior to analysis, however the samples did	n 1. The error has been con proper scanning procedur	rected and the analyst has been instructed on es. Reporting results			
			Í			
Originator's Name:		Data Validator/Group Le	ader:			
Kenshalla Oston	08-SEP-06	Melanie Aycock (	08-SEP-06			
Quality Review:						

Director:



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: 170683 GEL Work Order: 170683

# 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.
- ND The analyte concentration is not detected above the detection limit.

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

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

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

Reviewed by

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

Report Date: September 18, 2006

YANK01204

YANK001

Project: Client ID:

Vol. Recv.:

# **Certificate of Analysis**

Company:

Connecticut Yankee Atomic Power

Address:

362 Injun Hollow Rd

East Hampton, Connecticut 06424

Contact: Project:

Mr. Jack McCarthy

Soils PO# 002332

Client Sample ID:

Sample ID:

Matrix:

Collect Date: Receive Date: Collector:

170683001 SE 17-MAY-06

9106-0011-018F

21-JUN-06 Client

	Moisture:			36.3%								
Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst	Date	Time B	Batch P	— Mtd
Rad Alpha Spec Analysis												
Alphaspec Am241, Cm, S	olid ALL FS	SS										
Americium-241	U	0.0277	+/-0.0418	0.0128	+/-0.042	0.0643	pCi/g	TC1	09/14/0	6 0931 5	67705	1
Curium-242	U	0.00666	+/-0.0505	0.037	+/-0.0505	0.138	pCi/g					
Curium-243/244	U	-0.0167	+/-0.0348	0.0388	+/-0.0349	0.117	pCi/g				•	
Alphaspec Pu, Solid-ALI	L FSS											
Plutonium-238	U	-0.148	+/-0.269	0.289	+/-0.270	0.795	pCi/g	MXA 1	09/11/0	6 0919 5	65210	3
Plutonium-239/240	U	0.00321	+/-0.174	0.144	+/-0.174	0.505	pCi/g					
Liquid Scint Pu241, Solid	-ALL FSS											
Plutonium-241	U	9.87	+/-11.1	8.90	+/-11.1	18.6	pCi/g	TC1	09/17/0	6 0214 50	67883	4
<b>Rad Gas Flow Proportion</b>	al Counting	3					, 0					
GFPC, Sr90, solid-ALL												
Strontium-90	U	0.00422	+/-0.0151	0.0123	+/-0.0151	0.0271	pCi/g	KSD1	09/11/0	6 1917 56	65250	6
Rad Liquid Scintillation A	Analysis						. 5					
LSC, Tritium Dist, Solid-	HTD2.ALL	FSS										
Tritium	Ú	3.33	+/-6.35	5.16	+/-6.35	10.9	pCi/g	DFA1	09/05/0	6 1123 56	64514	7
Liquid Scint C14, Solid A	ll.FSS											
Carbon-14	U	0.00	+/-0.0818	0.0686	+/-0.0818	0.140	pCi/g	AXD2	09/06/0	6 0035 56	64520	8
Liquid Scint Fe55, Solid-	-ALL ESS						r - · · 8					Ü
Iron-55	U	0.852	+/-61.3	41.7	+/-61.3	86.4	pCi/g	MXP1	09/10/0	6 1419 56	65287	9
Liquid Scint Tc99, Solid-	-		. 51.5	,	. 01.0	55	F-"5	1.1111	02/10/0	5 1-117 50	00201	,
Technetium-99	U U	0.341	+/-0.291	0.235	+/-0.291	0.485	pCi/g	KXRI	09/06/0	6 1232 56	64623	10
i connectanti //	U	0.571	11 0.271	0.233	1 0.271	0.405	PC"8	IX/XIX I	07/00/01	0 1232 30	J7023	10

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	AXP2	09/01/06	1328	564525

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Am-05-RC Modified
2	DOE EMI, HASI -300, Am-05-RC Modified

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

Contact:

East Hampton, Connecticut 06424

Mr. Jack McCarthy Soils PO# 002332

Project:

Client Sample ID: Sample ID:

9106-0011-018F 170683001

Project: Client ID:

Report Date: September 18, 2006

YANK01204 YANK001 Vol. Recv.:

Parameter	Qualifier Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
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	EPA 905.0 Modified							
7	EPA 906.0 Modified							
8	EPA EERF C-01 Modified							
9	DOE RESL Fe-1, Modified							
10	DOE EML HASL-300, Tc-02-	-RC Modified						

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits	
Americium-243	Alphaspec Am241, Cm, Solid ALL	89	(15%-125%)	-
Plutonium-242	Alphaspec Pu, Solid-ALL FSS	38	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Pu241, Solid-ALL FS	89	(25%-125%)	
Carrier/Tracer Recovery	GFPC, Sr90, solid-ALL FSS	51	(25%–125%)	
Carrier/Tracer Recovery	Liquid Scint Fe55, Solid-ALL FS	75	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Tc99, Solid-ALL FS	78	(15%–125%)	

#### Notes:

The Qualifiers in this report are defined as follows:

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

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# **Certificate of Analysis**

Company: Connecticut Yankee Atomic Power

Address: 362 Injun Hollow Rd

Contact:

East Hampton, Connecticut 06424 Mr. Jack McCarthy

Project:

Soils PO# 002332

Client Sample ID:

Sample ID:

9106-0011-018F

170683001

Report Date: September 18, 2006

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

Parameter

Qualifier

Result Uncertainty LC**TPU**  **MDA** 

Units

**DF** Analyst Date

Time Batch Mtd

The above sample is reported on a dry weight basis.

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

Report Date: September 18, 2006

YANK01204

YANK001

Project: Client ID: Vol. Recv.:

# **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

Client Sample ID:

Sample ID: Matrix:

Collect Date: Receive Date: Collector:

Moisture:

9106-0012-005F

170683002 SE

23-JUN-06 07-JUL-06

Client 23.4%

I <i>LL FS</i> U U U	0.00725 0.000 -0.00297	+/-0.0262 +/-0.0343	0.0156						
บ บ บ	0.00725 0.00		0.0156						
Ŭ U	0.00		0.0156						
Ü		+/-0.0343		+/-0.0262	0.0644	pCi/g	TC1 09/1	14/06 0931 567705	1
	-0.00297		0.00	+/-0.0343	0.0474	pCi/g			
	3.00271	+/-0.0249	0.0111	+/-0.025	0.0557	pCi/g			
U	0.0214	+/-0.203	0.159	+/-0.203	0.498	pCi/g	MXA 09/1	11/06 0919 565210	3
U	0.120	+/-0.237	0.134	+/-0.238	0.449	pCi/g			
L FSS									
U	-10	+/-8.47	7.55	+/-8.47	15.8	pCi/g	TC1 09/1	17/06 0230 567883	4
untin	g								
U	-0.00415	+/-0.016	0.0141	+/-0.016	0.0332	pCi/g	KSD1 09/0	08/06 1803 565250	6
sis									
2,ALL	FSS								
U	4.39	+/-5.57	4.46	+/-5.57	9.42	pCi/g	DFA1 09/0	05/06 1155 564514	7
3									
U	-0.0271	+/-0.0822	0.0694	+/-0.0822	0.141	pCi/g	AXD2 09/0	06/06 0253 564520	8
FSS						1 0			•
U	3.71	+/-50.4	34.5	+/-50.4	71.6	pCi/g	MXP1 09/1	0/06 1435 565287	9
FSS									
U	5.04	+/-7.63	6.28	+/-7.63	12.9	pCi/g	MXP1 09/0	08/06 0035 565289	10
FSS									-
U	0.057	+/-0.270	0.225	+/-0.270	0.464	pCi/g	KXR1 09/0	06/06 1249 564623	11
	U Sis U FSS U FSS U FSS	U -0.00415 sis 2,ALL FSS U 4.39 S U -0.0271 FSS U 3.71 FSS U 5.04 FSS	U -0.00415 +/-0.016  sis 2,ALL FSS U 4.39 +/-5.57 S U -0.0271 +/-0.0822  FSS U 3.71 +/-50.4  FSS U 5.04 +/-7.63	U -0.00415 +/-0.016 0.0141  sis 2,ALL FSS U 4.39 +/-5.57 4.46  U -0.0271 +/-0.0822 0.0694  FSS U 3.71 +/-50.4 34.5  FSS U 5.04 +/-7.63 6.28  FSS	U -0.00415 +/-0.016 0.0141 +/-0.016  sis 2,ALL FSS U -0.0271 +/-0.0822 0.0694 +/-0.0822  FSS U 3.71 +/-50.4 34.5 +/-50.4  FSS U 5.04 +/-7.63 6.28 +/-7.63	U -0.00415 +/-0.016 0.0141 +/-0.016 0.0332  sis  2,ALL FSS  U -0.0271 +/-0.0822 0.0694 +/-0.0822 0.141  FSS  U 3.71 +/-50.4 34.5 +/-50.4 71.6  FSS  U 5.04 +/-7.63 6.28 +/-7.63 12.9	L FSS U -10 +/-8.47 7.55 +/-8.47 15.8 pCi/g  nunting  U -0.00415 +/-0.016 0.0141 +/-0.016 0.0332 pCi/g  sis 2,ALL FSS U 4.39 +/-5.57 4.46 +/-5.57 9.42 pCi/g  S U -0.0271 +/-0.0822 0.0694 +/-0.0822 0.141 pCi/g  FSS U 3.71 +/-50.4 34.5 +/-50.4 71.6 pCi/g  FSS U 5.04 +/-7.63 6.28 +/-7.63 12.9 pCi/g  FSS	U -0.00415 +/-0.016 0.0141 +/-0.016 0.0332 pCi/g KSDI 09/0 sis  2,ALL FSS U -0.0271 +/-0.0822 0.0694 +/-0.0822 0.141 pCi/g AXD2 09/0 FSS U 3.71 +/-50.4 34.5 +/-50.4 71.6 pCi/g MXPI 09/0 FSS U 5.04 +/-7.63 6.28 +/-7.63 12.9 pCi/g MXPI 09/0 FSS	U -0.00415 +/-0.016 0.0141 +/-0.016 0.0332 pCi/g KSD1 09/08/06 1803 565250  sis  2,ALL FSS  U -0.0271 +/-0.0822 0.0694 +/-0.0822 0.141 pCi/g AXD2 09/06/06 0253 564520  FSS  U 3.71 +/-50.4 34.5 +/-50.4 71.6 pCi/g MXP1 09/08/06 0035 565289  FSS  U 5.04 +/-7.63 6.28 +/-7.63 12.9 pCi/g MXP1 09/08/06 0035 565289

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	AXP2	09/01/06	1328	564525
The following	malutical Mathada wana manfaumad				

The following Analytical Methods were performed

Method Description

DOE EML HASL-300, Am-05-RC Modified

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# **Certificate of Analysis**

Company: Connecticut Yankee Atomic Power

362 Injun Hollow Rd Address:

East Hampton, Connecticut 06424

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

Client Sample ID:

Sample ID:

9106-0012-005F 170683002

Project: Client ID:

Report Date: September 18, 2006

YANK001 Vol. Recv.:

YANK01204

Parameter	Qualifier Result Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
2	DOE EML HASL-300, Am-05-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	EPA 905.0 Modified						
7	EPA 906.0 Modified						
8	EPA EERF C-01 Modified						
9	DOE RESL Fe-1, Modified						
10	DOE RESL Ni-1, Modified						
11	DOE EML HASL-300, Tc-02-RC Modified						

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits	
Americium-243	Alphaspec Am241, Cm, Solid ALL	90	(15%-125%)	
Plutonium-242	Alphaspec Pu, Solid-ALL FSS	47	(15%–125%)	
Carrier/Tracer Recovery	Liquid Scint Pu241, Solid-ALL FS	78	(25%-125%)	
Carrier/Tracer Recovery	GFPC, Sr90, solid-ALL FSS	99	(25%-125%)	
Carrier/Tracer Recovery	Liquid Scint Fe55, Solid-ALL FS	67	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Ni63, Solid-ALL FS	85	(25%-125%)	
Carrier/Tracer Recovery	Liquid Scint Tc99, Solid-ALL FS	82	(15%-125%)	

#### Notes:

The Qualifiers in this report are defined as follows:

- A quality control analyte recovery is outside of specified acceptance criteria
- Result is less than value reported
- Result is greater than value reported
- The TIC is a suspected aldol-condensation product Α
- В 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
- Results are reported from a diluted aliquot of the sample D
- Η Analytical holding time was exceeded
- Value is estimated
- N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
- Sample results are rejected
- Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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

Client Sample ID:

Sample ID:

9106-0012-005F

170683002

Project: Client ID: Vol. Recv.:

YANK01204 YANK001

Report Date: September 18, 2006

Parameter

Qualifier

Result Uncertainty LC

**TPU** 

**MDA** 

Units

**DF** Analyst Date Time Batch Mtd

The above sample is reported on a dry weight basis.

QC Samples were not spiked with this compound

RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL

Preparation or preservation holding time was exceeded

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

Contact:

East Hampton, Connecticut 06424

Mr. Jack McCarthy

Project:

Soils PO# 002332

Client Sample ID:

Moisture:

Sample ID:

Matrix:

Collect Date: Receive Date: Collector:

9106-0012-014F

170683003

21-JUN-06

Client 24.1% Project: Client ID: Vol. Recv.:

YANK01204 YANK001

Report Date: September 18, 2006

07-JUL-06

	Moisture.			24.170								
Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analys	t Date	Time Ba	atch !	/Itd
Rad Alpha Spec Analys	sis											
Alphaspec Am241, Cm	, Solid ALL FS	S										
Americium-241	U	0.012	+/-0.0233	0.00	+/-0.0234	0.032	pCi/g	TC1	09/14/	06 0931 56	7705	1
Curium-242	U ·	-0.00814	+/-0.0351	0.0215	+/-0.0351	0.089	pCi/g					
Curium-243/244	U	-0.00571	+/-0.0246	0.0151	+/-0.0246	0.0624	pCi/g					
Alphaspec Pu, Solid-A	ILL FSS											
Plutonium-238	U	-0.00589	+/-0.322	0.272	+/-0.322	0.744	pCi/g	MXA	09/11/	06 0919 56	5210	3
Plutonium-239/240	U	0.0588	+/-0.218	0.147	+/-0.218	0.494	pCi/g	I				
Liquid Scint Pu241, So	lid-ALL FSS											
Plutonium-241	U	4.22	+/-11.5	9.47	+/-11.5	19.8	pCi/g	TC1	09/17/	06 0246 56	7883	4
Rad Gas Flow Proporti	onal Counting	ζ					1 - 8	-				•
GFPC, Sr90, solid-AL	L FSS											
Strontium-90	U	0.0176	+/-0.0191	0.0133	+/-0.0191	0.0316	pCi/g	KSDI	09/08/	06 1803 56	5250	6
Rad Liquid Scintillation	n Analysis						r 8					Ü
LSC, Tritium Dist, Soli	d-HTD2,ALL	FSS										
Tritium	Ú	1.38	+/-6.13	5.08	+/-6.13	10.7	pCi/g	DFA1	09/05/0	06 1226 56	4514	7
Liquid Scint C14, Solia	l All,FSS											
Carbon-14	U	0.00209	+/-0.0745	0.0625	+/-0.0745	0.127	pCi/g	AXD2	09/06/0	06 0501 56	4520	8
Liquid Scint Fe55, Soli	d-ALL FSS											
Iron-55	U	13.9	+/-36.7	24.3	+/-36.7	50.7	pCi/g	MXP1	09/07/0	06 2253 56	5287	9
Liquid Scint Ni63, Solid	d-ALL FSS						, -	•				
Nickel-63	U	4.26	+/-8.20	6.78	+/-8.20	13.9	pCi/g	MXP1	09/08/0	06 0106 56	5289	10
Liquid Scint Tc99, Soli	d-ALL FSS											-
Technetium-99	U	0.269	+/-0.281	0.228	+/-0.281	0.470	pCi/g	KXR1	09/06/0	06 1305 56	4623	11
							_					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	AXP2	09/01/06	1328	564525

The following Analytical Methods were performed

Method Description

DOE EML HASL-300, Am-05-RC Modified

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

> Client Sample ID: Sample ID:

9106-0012-014F

Project: Client ID: 170683003

YANK01204 YANK001

Vol. Recv.:

Report Date: September 18, 2006

Parameter	Qualifier Result Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
2	DOE EML HASL-300, Am-05-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	EPA 905.0 Modified						
7	EPA 906.0 Modified						
8	EPA EERF C-01 Modified						
9	DOE RESL Fe-1, Modified						
10	DOE RESL Ni-1, Modified						
11	DOE EML HASL-300, Tc-02-RC Modified						

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits	
Americium-243	Alphaspec Am241, Cm, Solid ALL	95	(15%–125%)	
Plutonium-242	Alphaspec Pu, Solid-ALL FSS	44	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Pu241, Solid-ALL FS	84	(25%-125%)	
Carrier/Tracer Recovery	GFPC, Sr90, solid-ALL FSS	100	(25%-125%)	
Carrier/Tracer Recovery	Liquid Scint Fe55, Solid-ALL FS	70	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Ni63, Solid-ALL FS	79	(25%-125%)	
Carrier/Tracer Recovery	Liquid Scint Tc99, Solid-ALL FS	81	(15%-125%)	

### Notes:

The Qualifiers in this report are defined as follows:

- A quality control analyte recovery is outside of specified acceptance criteria
- Result is less than value reported <
- Result is greater than value reported >
- The TIC is a suspected aldol-condensation product Α
- Target analyte was detected in the associated blank В
- 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
- Η Analytical holding time was exceeded
- Value is estimated J
- N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
- R Sample results are rejected
- Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. U
- UI Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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 Soils PO# 002332

Project:

30118 PO# 002332

Client Sample ID:

Sample ID:

9106-0012-014F 170683003

Project: Client ID: YANK01204 YANK001

Vol. Recv.:

Parameter

Qualifier

Result Uncertainty

LC

**TPU** 

MDA

Units

DF Analyst Date

Report Date: September 18, 2006

Time Batch Mtd

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.

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

Contact:

East Hampton, Connecticut 06424

Mr. Jack McCarthy

Project:

Soils PO# 002332

Client Sample ID:

Sample ID: Matrix:

9106-0013-006F 170683004

SE

21-JUN-06 21-JUL-06

Collect Date: Receive Date: Collector:

Client

Project: Client ID: Vol. Recv.:

YANK01204 YANK001

Report Date: September 18, 2006

	Conector.			Chent								
Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analys	t Date	Time B	atch N	 1td
Rad Alpha Spec Analys	is											_
Alphaspec Am241, Cm	, Solid ALL FS	S										
Americium-241		0.187	+/-0.170	0.0339	+/-0.172	0.170	pCi/g	MXA	09/12/0	6 0844 56	65213	1
								1				
Curium-242	U	-0.0387	+/-0.0438	0.0836	+/-0.0442	0.313	pCi/g					
Curium-243/244	U	-0.00608	+/-0.118	0.102	+/-0.118	0.308	pCi/g					
Alphaspec Pu, Solid-A	ILL FSS											
Plutonium-238	U	-0.012	+/-0.0236	0.045	+/-0.0236	0.226	pCi/g	MXA	09/11/0	6 0919 56	65214	2
•								1				
Plutonium-239/240	U	-0.0601	+/-0.0526	0.100	+/-0.0531	0.337	pCi/g					
Liquid Scint Pu241, So	lid-ALL FSS											
Plutonium-241	U	16.2	+/-13.4	10.8	+/-13.5	22.3	pCi/g	MXA	09/12/0	6 2245 56	55216	3

**Rad Gas Flow Proportional Counting** GFPC, Sr90, solid-ALL FSS Strontium-90 U 0.000813 +/-0.0187 0.0156 +/-0.0187 0.036 pCi/g KSD1 09/08/06 1932 565253 4 Rad Liquid Scintillation Analysis  $LSC, \ Tritium \ Dist, \ Solid-HTD2, ALL \ FSS$ DFA1 09/05/06 1847 564447 5 Tritium 0.997 +/-4.803.98 +/-4.80pCi/g 8.39

Liquid Scint C14, Solid All,FSS Carbon-14 -0.0199+/-0.109 0.0921 +/-0.109 AXD2 09/06/06 0955 564449 6 U 0.192 pCi/g Liquid Scint Fe55, Solid-ALL FSS Iron-55 33.7 +/-51.9 34.2 +/-52.0 71.2 pCi/g MXP1 09/11/06 1150 565291 7 Liquid Scint Ni63, Solid-ALL FSS 0.395 +/-9.40 7.88 +/-9.40 MXP1 09/08/06 2220 565293 8 Nickel-63 16.2 pCi/g Liquid Scint Tc99, Solid-ALL FSS Technetium-99 -0.0409+/-0.273 0.231 +/-0.273 0.475 pCi/g KXR1 09/06/06 1637 564445 9

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	EPA 905.0 Modified

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# **Certificate of Analysis**

Company:

Connecticut Yankee Atomic Power

Address:

362 Injun Hollow Rd

East Hampton, Connecticut 06424

Contact:

Mr. Jack McCarthy

Project:

Soils PO# 002332

Client Sample ID:

Sample ID:

9106-0013-006F

170683004

Report Date: September 18, 2006

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

Parameter	Qualifier Result Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
5	EPA 906.0 Modified						
6	EPA EERF C-01 Modified						
7	DOE RESL Fe-1, Modified						
8	DOE RESL Ni-1, Modified						
9	DOE EML HASL-300, Tc-02-RC Modified						

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits	•
Americium-243	Alphaspec Am241, Cm, Solid ALL	86	(15%-125%)	
Plutonium-242	Alphaspec Pu, Solid-ALL FSS	60	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Pu241, Solid-ALL FS	72	(25%-125%)	
Carrier/Tracer Recovery	GFPC, Sr90, solid-ALL FSS	100	(25%-125%)	
Carrier/Tracer Recovery	Liquid Scint Fe55, Solid-ALL FS	70	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Ni63, Solid-ALL FS	43	(25%-125%)	
Carrier/Tracer Recovery	Liquid Scint Tc99, Solid-ALL FS	79	(15%-125%)	

#### Notes:

The Qualifiers in this report are defined as follows:

- A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported
- Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- Target analyte was detected in the associated blank
- BD Results are either below the MDC or tracer recovery is low
- Analyte has been confirmed by GC/MS analysis C
- D Results are reported from a diluted aliquot of the sample
- Analytical holding time was exceeded Η
- Value is estimated J
- N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
- R Sample results are rejected
- Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. U
- 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 an "as received" basis.

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# **Certificate of Analysis**

Company:

Connecticut Yankee Atomic Power

Address: 362 Injun Hollow Rd

Contact:

East Hampton, Connecticut 06424

8.33

-1.92

0.0807

U

U

+/-39.2

+/-5.36

+/-0.273

26.6

4.55

Mr. Jack McCarthy

Project:

Soils PO# 002332

Client Sample ID:

Sample ID:

Matrix:

Collect Date: Receive Date: Collector

9106-0013-005F

170683005 ŜË

21-JUN-06 21-JUL-06

Client

Report Date: September 18, 2006

MXP1 09/08/06 0121 565291 7

MXP1 09/08/06 2323 565293 8

KXR1 09/06/06 1654 564445 9

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

	Collector:			Chent					
Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
Rad Alpha Spec Analysis	S								
Alphaspec Am241, Cm,	Solid ALL FS	S							
Americium-241		0.505	+/-0.295	0.0542	+/-0.304	0.224	pCi/g	MXA 09/12/ 1	06 0844 565213 1
Curium-242	U	0.00	+/-0.119	0.00	+/-0.119	0.165	pCi/g		
Curium-243/244	U	0.0327	+/-0.0868	0.0387	+/-0.0869	0.194	pCi/g		
Alphaspec Pu, Solid-AL	LL FSS								
Plutonium-238	U	-0.008	+/-0.0157	0.0299	+/-0.0157	0.150	pCi/g	MXA 09/11/	06 0919 565214 2
Plutonium-239/240	U	-0.0399	+/-0.035	0.0668	+/-0.0352	0.224	pCi/g		
Liquid Scint Pu241, Soli	d-ALL FSS								
Plutonium-241	U	7.84	+/-13.5	11.1	+/-13.5	22.8	pCi/g	MXA 09/12/9	06 2332 565216 3
Rad Gas Flow Proportion	nal Counting								
GFPC, Sr90, solid-ALL	FSS								
Strontium-90	U-(	0.000759	+/-0.0157	0.0133	+/-0.0157	0.0313	pCi/g	KSD1 09/08/	06 1932 565253 4
Rad Liquid Scintillation	Analysis								
LSC, Tritium Dist, Solid	-HTD2,ALL	FSS							
Tritium	U	-0.175	+/-4.77	4.01	+/-4.77	8.45	pCi/g	DFA1 09/05/0	06 1919 564447 5
Liquid Scint C14, Solid	411,FSS								
Carbon-14		-0.0246	+/-0.107	0.0905	+/-0.107	0.188	pCi/g	AXD2 09/06/0	06 1027 564449 6
Liquid Scint Fe55, Solid	-ALL FSS								

+/--39.2

+/-5.36

55.3

9.32

0.468

pCi/g

pCi/g

pCi/g

The following Analytical Methods were performed

Liquid Scint Ni63, Solid-ALL FSS

Liquid Scint Tc99, Solid-ALL FSS

Iron-55

Nickel-63

Technetium-99

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	EPA 905.0 Modified

0.227 +/-0.273

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# **Certificate of Analysis**

Company:

Connecticut Yankee Atomic Power

362 Injun Hollow Rd Address:

Contact:

East Hampton, Connecticut 06424

Mr. Jack McCarthy Soils PO# 002332

Project:

Client Sample ID: Sample ID:

9106-0013-005F

170683005

Project: Client ID:

YANK001 Vol. Recv.:

YANK01204

Report Date: September 18, 2006

Parameter	Qualifier Re	esult Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
5	EPA 906.0 Modified							
6	EPA EERF C-01 Modif	fied						
7	DOE RESL Fe-1, Modi	fied						
8	DOE RESL Ni-1, Modi	fied						
9	DOE EML HASL-300,	Tc-02-RC Modified						

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits	
Americium-243	Alphaspec Am241, Cm, Solid ALL	68	(15%-125%)	
Plutonium-242	Alphaspec Pu, Solid-ALL FSS	86	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Pu241, Solid-ALL FS	71	(25%–125%)	
Carrier/Tracer Recovery	GFPC, Sr90, solid-ALL FSS	101	(25%-125%)	
Carrier/Tracer Recovery	Liquid Scint Fe55, Solid-ALL FS	71	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Ni63, Solid-ALL FS	72	(25%-125%)	
Carrier/Tracer Recovery	Liquid Scint Tc99, Solid-ALL FS	80	(15%-125%)	

#### Notes:

The Qualifiers in this report are defined as follows:

- A quality control analyte recovery is outside of specified acceptance criteria
- Result is less than value reported
- Result is greater than value reported
- The TIC is a suspected aldol-condensation product Α
- В 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
- Analytical holding time was exceeded Η
- Value is estimated J
- N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
- R Sample results are rejected
- Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. U
- UI Gamma Spectroscopy--Uncertain identification
- Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier X
- QC Samples were not spiked with this compound
- RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
- Preparation or preservation holding time was exceeded

The above sample is reported on an "as received" basis.

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# **Certificate of Analysis**

Company:

Connecticut Yankee Atomic Power

Address: 362 Injun Hollow Rd

Contact:

East Hampton, Connecticut 06424

Project:

Strontium-90

Technetium-99

Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid-HTD2,ALL FSS

Mr. Jack McCarthy

Soils PO# 002332

Client Sample ID: Sample ID:

U -0.00246

+/-0.00901

+/-0.281

Matrix: Collect Date: Receive Date: 9106-0014-012F

170683006 ŜÉ

06-JUN-06 13-JUL-06

Project: Client ID: Vol. Recv.:

KSD1 09/11/06 1917 565250 6

KXR1 09/06/06 1321 564623 11

Report Date: September 18, 2006

YANK01204 YANK001

	Collector:			Client								
Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analys	st Date	Time	Batch	Mtd
Rad Alpha Spec Analys	sis											
Alphaspec Am241, Cm	, Solid ALL FS	S										
Americium-241		0.0945	+/-0.0698	0.0158	+/-0.0709	0.0654	pCi/g	TC1	09/14/0	06 0931	567705	1
Curium-242	U	0.0191	+/-0.0374	0.00	+/-0.0375	0.0517	pCi/g					
Curium-243/244	U	0.0473	+/-0.0497	0.0113	+/-0.050	0.0567	pCi/g					
Alphaspec Pu, Solid-A	ALL FSS											
Plutonium-238	U	-0.113	+/-0.329	0.328	+/-0.330	0.930	pCi/g	MXA 1	09/11/0	)6 0919	565210	3
Plutonium-239/240	U	-0.097	+/-0.0951	0.181	+/-0.0963	0.637	pCi/g					
Liquid Scint Pu241, So	olid–ALL FSS											
Plutonium-241	U	4.84	+/-11.6	9.54	+/-11.6	20.0	pCi/g	TC1	09/17/0	06 0302	567883	4
Rad Gas Flow Proporti	onal Counting											
GFPC, Sr90, solid-AL	L FSS											

Tritium 3.44 +/-6.25 5.07 +/-6.25 10.7 pCi/g DFA1 09/05/06 1258 564514 7 Liquid Scint C14, Solid All, FSS Carbon-14 U 0.0486 +/-0.0773 0.064 +/-0.0773 pCi/g AXD2 09/06/06 0635 564520 8 0.130 Liquid Scint Fe55, Solid-ALL FSS Iron-55 -12.6+/-44.5 30.6 +/-44.5 MXP1 09/10/06 1451 565287 9 63.6 pCi/g Liquid Scint Ni63, Solid-ALL FSS +/-7.80 Nickel-63 4.82 6.44 +/-7.80 pCi/g MXP1 09/08/06 0138 565289 10 U 13.2 Liquid Scint Tc99, Solid-ALL FSS

+/-0.281

0.234

0.00776 +/-0.00901

0.0169

0.481

pCi/g

pCi/g

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Am-05-RC Modified
2	DOE EML HASL-300, Am-05-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	EPA 905.0 Modified

U

0.0865

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#### **Certificate of Analysis**

Connecticut Yankee Atomic Power

Address: 362 Injun Hollow Rd

East Hampton, Connecticut 06424

Contact: Mr. Jack McCarthy

Project: Soils PO# 002332

> Client Sample ID: Sample ID:

9106-0014-012F 170683006

Project: Client ID: Vol. Recv.:

Report Date: September 18, 2006

YANK01204 YANK001

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
7	EPA 906.0 Modifie	d							
8	EPA EERF C-01 M	lodified							
9	DOE RESL Fe-1, N	<b>Modified</b>							
10	DOE RESL Ni-1, Modified								
11	DOE EML HASL-	300, Tc-0	2-RC Modified						

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits	
Americium-243	Alphaspec Am241, Cm, Solid ALL	93	(15%-125%)	
Plutonium-242	Alphaspec Pu, Solid-ALL FSS	33	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Pu241, Solid-ALL FS	84	(25%-125%)	
Carrier/Tracer Recovery	GFPC, Sr90, solid-ALL FSS	91	(25%-125%)	
Carrier/Tracer Recovery	Liquid Scint Fe55, Solid-ALL FS	74	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Ni63, Solid-ALL FS	80	(25%-125%)	
Carrier/Tracer Recovery	Liquid Scint Tc99, Solid-ALL FS	79	(15%-125%)	

#### Notes:

The Qualifiers in this report are defined as follows:

- A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported
- Result is greater than value reported
- Α The TIC is a suspected aldol-condensation product
- 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
- Results are reported from a diluted aliquot of the sample
- Η Analytical holding time was exceeded
- Value is estimated
- N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
- Preparation or preservation holding time was exceeded

The above sample is reported on an "as received" basis.

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: Project:

Mr. Jack McCarthy

Soils PO# 002332

Client Sample ID:

Sample ID: Matrix:

Collect Date: Receive Date: Collector:

9106-0014-033F

170683007 SE

14-JUN-06 13-JUL-06

Client

Report Date: September 18, 2006

Project: Client ID: Vol. Recv.:

YANK01204 YANK001

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst	Date Time B	Batch N	 1td
Rad Alpha Spec Analysi	is	* * * * * *									_
Alphaspec Am241, Cm,	Solid ALL FS	SS									
Americium-241		0.0906	+/-0.0692	0.0118	+/-0.0703	0.0594	pCi/g	TC1	09/14/06 0931 5	67705	1
Curium-242	U	0.0195	+/-0.0383	0.00	+/-0.0384	0.053	pCi/g				
Curium-243/244		0.0799	+/-0.0639	0.00	+/-0.0648	0.0361	pCi/g				
Alphaspec Pu, Solid-A	LL FSS										
Plutonium-238	U	-0.0396	+/-0.254	0.229	+/-0.254	0.638	pCi/g	MXA 1	09/11/06 0919 5	65210	3
Plutonium-239/240	U	-0.203	+/-0.182	0.244	+/-0.184	0.666	pCi/g				
Liquid Scint Pu241, Sol	lid-ALL FSS										
Plutonium-241	U	4.34	+/-11.1	9.14	+/-11.1	19.2	pCi/g	TC1	09/17/06 0319 5	67883	4
Rad Gas Flow Proportion	onal Counting	g									
GFPC, Sr90, solid-AL	L FSS										
Strontium-90	U	0.00411	+/-0.0167	0.0133	+/-0.0167	0.0316	pCi/g	KSD1	09/08/06 1803 5	65250	6
Rad Liquid Scintillation	Analysis										
LSC, Tritium Dist, Solid	d-HTD2,ALL	FSS									
Tritium	Ū	3.13	+/-5.10	4.12	+/-5.10	8.71	pCi/g	DFA1	09/05/06 1330 5	64514	7
Liquid Scint C14, Solid	'All.FSS										
Carbon-14	U	0.0995	+/-0.0918	0.075	+/-0.0918	0.153	pCi/g	AXD2(	09/06/06 0807 5	64520	8
Liquid Scint Fe55, Solid	d-ALL FSS										
Iron-55	U	19.3	+/-37.9	24.9	+/-37.9	51.8	pCi/g	MXP1 (	09/07/06 2326 50	65287	9
Liquid Scint Ni63, Solia	I-ALL ESS						1 0				•
Nickel-63	U	4.62	+/-7.14	5.88	+/-7.14	12.1	pCi/g	MXP1 (	09/08/06 0209 56	65289	10
Liquid Scint Tc99, Solid	_	2	, ,,,,	0.00	, ,	12.1	po., g		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	03207	10
Technetium-99	<i>i–all f33</i> U	0.00	+/-0.282	0.236	+/-0.282	0.487	pCi/g	KAD1 (	09/06/06 1338 50	64622	11
i cennetianii 99	U	0.00	17 0.202	0.230	17 0.202	U. <del>1</del> 0/	pCI/g	KAKI (	12/00/00 1336 30	04023	11

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Am-05-RC Modified
2	DOE EML HASL-300, Am-05-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	EPA 905.0 Modified

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### **Certificate of Analysis**

Company: Connecticut Yankee Atomic Power

Address: 362 Injun Hollow Rd

East Hampton, Connecticut 06424

Contact: Mr. Jack McCarthy

Project: Soils PO# 002332

Client Sample ID: Sample ID:

9106-0014-033F 170683007 Project: Client ID: YANK01204

Report Date: September 18, 2006

Client ID: YANK001 Vol. Recv.:

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
7	EPA 906.0 Modifie	d			-				-
8	EPA EERF C-01 M	EPA EERF C-01 Modified							
9	DOE RESL Fe-1, N	DOE RESL Fe-1, Modified							
10	DOE RESL Ni-1, Modified								
11	DOE EML HASL-	300, Tc-02	2-RC Modified					•	

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits	
Americium-243	Alphaspec Am241, Cm, Solid ALL	87	(15%-125%)	
Plutonium-242	Alphaspec Pu, Solid-ALL FSS	41	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Pu241, Solid-ALL FS	89	(25%-125%)	
Carrier/Tracer Recovery	GFPC, Sr90, solid-ALL FSS	99	(25%-125%)	
Carrier/Tracer Recovery	Liquid Scint Fe55, Solid-ALL FS	76	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Ni63, Solid-ALL FS	84	(25%-125%)	
Carrier/Tracer Recovery	Liquid Scint Tc99, Solid-ALL FS	78	(15%–125%)	

#### Notes:

The Qualifiers in this report are defined as follows:

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

The above sample is reported on an "as received" basis.

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

Contact:

East Hampton, Connecticut 06424

Mr. Jack McCarthy

Project:

Soils PO# 002332

Client Sample ID:

Collect Date: Receive Date:

Collector:

9106-0015-018F

27-JUN-06 21-JUL-06

Client

Report Date: September 18, 2006

YANK01204 YANK001 Project: Client ID: Vol. Recv.: Sample ID: Matrix: 170683008 SE

Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
Rad Alpha Spec Analysis									
Alphaspec Am241, Cm, So	lid ALL FSS	5							
Americium-241		0.193	+/-0.166	0.00	+/-0.168	0.101	pCi/g	MXA 09/12/0	06 0844 565213 1
Curium-242	U	0.0784	+/-0.147	0.0655	+/-0.147	0.271	pCi/g		
Curium-243/244	U	0.0942	+/-0.129	0.0474	+/-0.130	0.196	pCi/g		•
Alphaspec Pu, Solid-ALL	FSS								
Plutonium-238	U	0.0325	+/-0.0637	0.00	+/-0.0638	0.0881	pCi/g	MXA 09/11/0	06 0919 565214 2
Plutonium-239/240	U	0.0013	+/-0.0705	0.0582	+/-0.0705	0.204	pCi/g	•	
Liquid Scint Pu241, Solid-	-ALL FSS								
Plutonium-241	U	7.19	+/-12.0	9.91	+/12.1	20.4	pCi/g	MXA 09/13/0	06 0019 565216 3
Rad Liquid Scintillation A	nalysis							·	
LSC, Tritium Dist, Solid-H	HTD2,ALL	FSS							
Tritium	U	-0.686	+/-5.32	4.50	+/-5.32	9.48	pCi/g	DFA1 09/05/0	06 1950 564447 4
Liquid Scint C14, Solid All	,FSS								
Carbon-14	U	0.0572	+/-0.114	0.0942	+/-0.114	0.193	pCi/g	AXD2 09/09/0	6 0331 564449 5
Liquid Scint Fe55, Solid-A	ALL FSS								
Iron-55	U	7.27	+/-37.9	25.6	+/-37.9	53.2	pCi/g	MXP1 09/08/0	6 0137 565291 6
Liquid Scint Ni63, Solid-A	LL FSS								
Nickel-63	U	-2.39	+/-7.60	6.43	+/-7.60	13.2	pCi/g	MXP1 09/09/0	6 0025 565293 7
Liquid Scint Tc99, Solid-A	ALL FSS						- <del>-</del>		
Technetium-99	U	0.132	+/-0.270	0.223	+/-0.270	0.460	pCi/g	KXR1 09/06/0	6 1710 564445 8

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	EPA 906.0 Modified	
5	EPA EERF C-01 Modified	
6	DOE RESL Fe-1, Modified	
7	DOE RESL Ni-1, Modified	

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#### **Certificate of Analysis**

Company: Connecticut Yankee Atomic Power

Address:

362 Injun Hollow Rd

East Hampton, Connecticut 06424

Contact:

Mr. Jack McCarthy Soils PO# 002332

Project:

Client Sample ID: Sample ID:

9106-0015-018F

170683008

YANK01204

Report Date: September 18, 2006

Project: Client ID: YANK001 Vol. Recv.:

Parameter	Qualifier Result Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
8	DOE EMI, HASI -300, Tc-02-RC Modified						<del></del>

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits	
Americium-243	Alphaspec Am241, Cm, Solid ALL	78	(15%-125%)	
Plutonium-242	Alphaspec Pu, Solid-ALL FSS	86	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Pu241, Solid-ALL FS	79	(25%-125%)	
Carrier/Tracer Recovery	Liquid Scint Fe55, Solid-ALL FS	79	(15%–125%)	
Carrier/Tracer Recovery	Liquid Scint Ni63, Solid-ALL FS	47	(25%-125%)	
Carrier/Tracer Recovery	Liquid Scint Tc99, Solid-ALL FS	82	(15%–125%)	

#### Notes:

The Qualifiers in this report are defined as follows:

- A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported
- Result is greater than value reported
- The TIC is a suspected aldol-condensation product Α
- Target analyte was detected in the associated blank В
- 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
- Η 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
- Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier X
- Y QC Samples were not spiked with this compound
- RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
- Preparation or preservation holding time was exceeded

The above sample is reported on an "as received" basis.

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

Report Date: September 18, 2006

YANK01204

YANK001

Project: Client ID: Vol. Recv.:

### **Certificate of Analysis**

Company: Connecticut Yankee Atomic Power

Address:

362 Injun Hollow Rd

East Hampton, Connecticut 06424

Contact: Project:

Mr. Jack McCarthy

Soils PO# 002332

Client Sample ID:

Sample ID: Matrix:

Collect Date: Receive Date: 9106-0015-002F

170683009 SE

28-JUN-06 21-JUL-06

	Collector:			Client				
Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date Time Batch Mtd
Rad Alpha Spec Analys	is							
Alphaspec Am241, Cm,	Solid ALL FS	S						
Americium-241		0.292	+/-0.213	0.0479	+/-0.217	0.198	pCi/g	MXA 09/12/06 0844 565213 1
Curium-242	U	0.0522	+/-0.102	0.00	+/-0.103	0.141	pCi/g	
Curium-243/244	U	0.0289	+/-0.0766	0.0341	+/-0.0767	0.171	pCi/g	
Alphaspec Pu, Solid-A	LL FSS							
Plutonium-238	U	-0.0352	+/-0.0798	0.0658	+/-0.0798	0.231	pCi/g	MXA 09/11/06 0919 565214 2
Plutonium-239/240	U	0.019	+/-0.0758	0.0465	+/-0.0758	0.192	pCi/g	
Liquid Scint Pu241, So.	lid-ALL FSS							
Plutonium-241	U	24.6	+/-16.2	13.0	+/-16.5	26.7	pCi/g	MXA 09/13/06 0106 565216 3
Rad Liquid Scintillation	Analysis							
LSC, Tritium Dist, Solid	d-HTD2,ALL	FSS						
Tritium	U	-1.6	+/-7.22	6.13	+/-7.22	12.9	pCi/g	DFA1 09/05/06 2022 564447 4
Liquid Scint C14, Solid	'All,FSS							
Carbon-14	ŕ	0.207	+/-0.113	0.0898	+/-0.113	0.185	pCi/g	AXD2 09/09/06 0418 564449 5
Liquid Scint Fe55, Solid	d-ALL FSS						1 . 3	
Iron-55	U	10.8	+/-47.1	31.3	+/-47.1	65.2	pCi/g	MXP1 09/11/06 1206 565291 6
Liquid Scint Ni63, Solid	d-ALL FSS							
Nickel-63	U	-3.07	+/-6.78	5.76	+/6.78	11.8	pCi/g	MXP1 09/09/06 0127 565293 7
Liquid Scint Tc99, Solid	_						r 30	,
Technetium-99	U	0.390	+/-0.283	0.227	+/-0.283	0.468	pCi/g	KXR1 09/06/06 1726 564445 8

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	EPA 906.0 Modified
5	EPA EERF C-01 Modified
6	DOE RESL Fe-1, Modified
7	DOE RESL Ni-1, Modified

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#### **Certificate of Analysis**

Connecticut Yankee Atomic Power

Address: 362 Injun Hollow Rd

Contact:

East Hampton, Connecticut 06424

Mr. Jack McCarthy Soils PO# 002332

Project:

Client Sample ID:

Sample ID:

9106-0015-002F

170683009

Report Date: September 18, 2006

Project: Client ID: YANK01204 YANK001

Vol. Recv.:

Parameter	Qualifier 1	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
8	DOE EML HASL-300	0, Tc-02							

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits	
Americium-243	Alphaspec Am241, Cm, Solid ALL	78	(15%-125%)	
Plutonium-242	Alphaspec Pu, Solid-ALL FSS	79	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Pu241, Solid-ALL FS	75	(25%-125%)	
Carrier/Tracer Recovery	Liquid Scint Fe55, Solid-ALL FS	74	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Ni63, Solid-ALL FS	55	(25%-125%)	
Carrier/Tracer Recovery	Liquid Scint Tc99, Solid-ALL FS	80	(15%-125%)	

#### Notes:

The Qualifiers in this report are defined as follows:

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

The above sample is reported on an "as received" basis.

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### **Certificate of Analysis**

Company: Connecticut Yankee Atomic Power

362 Injun Hollow Rd Address:

East Hampton, Connecticut 06424

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

Client Sample ID:

Sample ID: Matrix:

Collect Date: Receive Date: Collector:

9106-0001-132F

170683010 SE 07-AUG-06 17-AUG-06

Client 23.8% Report Date: September 18, 2006

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

	Moisture:			23.8%					
Parameter	Qualifier	Result	Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd
Rad Alpha Spec Analys	is								
Alphaspec Am241, Cm,	, Solid ALL FS	S							
Americium-241		0.160	+/-0.147	0.0296	+/-0.148	0.148	pCi/g	MXA 09/12/06 1	5 0844 565213 1
Curium-242	U	0.00	+/-0.0754	0.00	+/-0.0754	0.104	pCi/g		
Curium-243/244		0.132	+/-0.130	0.00	+/-0.131	0.0896	pCi/g		
Alphaspec Pu, Solid-A	LL FSS							•	
Plutonium-238	U	-0.0279	+/-0.0954	0.0976	+/-0.0955	0.306	pCi/g	MXA 09/11/06	5 0919 565214 2
Plutonium-239/240	U	-0.0591	+/-0.0934	0.0903	+/-0.0934	0.292	pCi/g		
Liquid Scint Pu241, So.	lid-ALL FSS								
Plutonium-241	U	14.0	+/-14.7	12.0	+/-14.8	24.6	pCi/g	MXA 09/13/06	5 0153 565216 3
Rad Gas Flow Proportion	onal Counting	<b>;</b>						•	
GFPC, Sr90, solid-AL	L FSS								
Strontium-90	U	0.00619	+/-0.0168	0.0131	+/-0.0168	0.0311	pCi/g	KSD1 09/08/06	5 1932 565253 4
Rad Liquid Scintillation	ı Analysis								
LSC, Tritium Dist, Solid	d-HTD2,ALL	FSS							
Tritium	U	4.94	+/-7.02	5.55	+/-7.02	12.0	pCi/g	ATH2 09/07/06	0102 565650 5
Liquid Scint C14, Solid	'All,FSS								
Carbon-14		0.324	+/-0.115	0.0889	+/-0.115	0.183	pCi/g	AXD2 09/08/06	0456 565649 6
Liquid Scint Fe55, Soli	d-ALL FSS								
Iron-55	U	-1.92	+/-38.0	25.9	+/-38.0	53.9	pCi/g	MXP1 09/08/06	0210 565291 7
Liquid Scint Ni63, Solid	d-ALL FSS								
Nickel-63	U	0.735	+/-5.83	4.88	+/-5.83	10.0	pCi/g	MXP1 09/09/06	0229 565293 8
Liquid Scint Tc99, Solid	d-ALL FSS								
Technetium-99	U	0.0126	+/-0.193	0.161	+/-0.193	0.330	pCi/g	KXR1 09/12/06	1349 565648 9

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	JMB1	09/05/06	1736	565454

The following Analytical Methods were performed Method Description

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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

Client Sample ID:

9106-0001-132F

Sample ID: 170683010 Report Date: September 18, 2006

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

Parameter	Qualifier Result Uncertainty	LC	TPU	MDA	Units	DF Analyst Date	Time Batch Mtd				
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	EPA 905.0 Modified										
5	EPA 906.0 Modified										
6	EPA EERF C-01 Modified										
7	DOE RESL Fe-1, Modified										
8	DOE RESL Ni-1, Modified										
9	DOE EML HASL-300, Tc-02-RC Modified										

Surrogate/Tracer recovery	Test	Recovery%	Acceptable Limits	
Americium-243	Alphaspec Am241, Cm, Solid ALL	87	(15%-125%)	
Plutonium-242	Alphaspec Pu, Solid-ALL FSS	66	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Pu241, Solid-ALL FS	66	(25%-125%)	
Carrier/Tracer Recovery	GFPC, Sr90, solid-ALL FSS	100	(25%-125%)	
Carrier/Tracer Recovery	Liquid Scint Fe55, Solid-ALL FS	76	(15%-125%)	
Carrier/Tracer Recovery	Liquid Scint Ni63, Solid-ALL FS	72	(25%-125%)	
Carrier/Tracer Recovery	Liquid Scint Tc99, Solid-ALL FS	72	(15%–125%)	

#### Notes:

The Qualifiers in this report are defined as follows:

- A quality control analyte recovery is outside of specified acceptance criteria
- < Result is less than value reported
- Result is greater than value reported
- The TIC is a suspected aldol-condensation product
- В 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
- Analytical holding time was exceeded Η
- Value is estimated
- N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- QC Samples were not spiked with this compound

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

Client Sample ID: Sample ID:

9106-0001-132F 170683010

Report Date: September 18, 2006

Project: Client ID: Vol. Recv.:

YANK01204 YANK001

Parameter

Qualifier

Result Uncertainty LC **TPU**  MDA

Units

**DF** Analyst Date

Time Batch Mtd

The above sample is reported on a dry weight basis.

RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL

Preparation or preservation holding time was exceeded



Report Date: September 18, 2006

Page 1 of 10

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

**QC Summary** 

Client:

Connecticut Yankee Atomic Power

362 Injun Hollow Rd

East Hampton, Connecticut

Contact:

Mr. Jack McCarthy

Workorder: 170683

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range Anlst	Date Time
Rad Alpha Spec Batch 565210									
QC1201175592 170683001 DUP									
Plutonium-238	U	-0.148	U	0.137	pCi/g	5180		(0% - 100%) AXA1	09/11/06 09:19
	Uncert:	+/-0.269		+/-0.303					
DI	TPU:	+/-0.270		+/-0.304	~	201		(001 10001)	
Plutonium-239/240	U	0.00321	U	-0.215	pCi/g	206		(0% - 100%)	
	Uncert:	+/-0.174		+/-0.181					
QC1201175594 LCS	TPU:	+/-0.174		+/-0.183					
Plutonium-238			U	-0.0564	pCi/g	,		(75%-125%)	
Tutomani 250	Uncert:		U	+/-0.446	pe#g	,		(7570-12570)	
	TPU:			+/-0.446					
Plutonium-239/240	12.3			9.42	pCi/g		77	(75%-125%)	
	Uncert:			+/-1.98	r	,		(127012070)	
	TPU:			+/-2.49					
QC1201175591 MB									
Plutonium-238			U	0.117	pCi/g	:			
	Uncert:			+/-0.220					
	TPU:			+/-0.221					
Plutonium-239/240			U	0.0802	pCi/g				
	Uncert:			+/-0.226					
	TPU:			+/-0.226					
QC1201175593 170683001 MS		0.140		0.110	0:1			(750/ 1750/)	
Plutonium-238	U	-0.148	U	0.110	pCi/g			(75%-125%)	
	Uncert:	+/-0.269		+/-0.175					
Plutonium-239/240	TPU: 12.5 U	+/-0.270 0.00321		+/-0.176 11.8	nCi/a		94	(75%-125%)	
1 Iutomum-239/240	Uncert:	+/-0.174		+/-1.70	pCi/g		94	(7370-12370)	
	TPU:	+/-0.174		+/-2.29					
Batch 565213	Tru:	⊤/-U.1/4		77-2.29					
QC1201175603 170683004 DUP Americium-241		0.187		0.163	pCi/g	14		(0% - 100%) AXA1	00/13/04 09:44
Americiani-241	Uncert:	+/-0.170		+/-0.149	pc//g	17		(070 - 10070) MAAT	09/12/00 08:44
	TPU:	+/-0.170		+/-0.149					
Curium-242	U U	-0.0387		0.143	pCi/g	348		(0% - 100%)	
Curium 212	Uncert:	+/-0.0438		+/-0.162	pe#g	540		(070 - 10070)	
	TPU:	+/-0.0442		+/-0.163					
Curium-243/244	U U	-0.00608	U	-0.0487	pCi/g	156		(0% - 100%)	
	Uncert:	+/-0.118	•	+/-0.0768	P08			(0,0 100,0)	
	TPU:	+/-0.118		+/-0.0769					
QC1201175605 LCS									
Americium-241	13.5			12.8	pCi/g		95	(75%-125%)	
	Uncert:			+/-1.24				•	
	TPU:			+/-2.12					

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#### **QC Summary**

Workorder: 170683 Page 2 of 10 Parmname NOM Sample Qual QC Units RPD% REC% Range Anlst Date Time Rad Alpha Spec Batch 565213 Curium-242 U 0.00 pCi/g +/-0.0625 Uncert: +/-0.0625 TPU: Curium-243/244 16.4 15.1 pCi/g 92 (75%-125%) +/-1.35 Uncert: +/-2.44 TPU: QC1201175602 MB Americium-241 U 0.0812 09/12/06 08:44 pCi/g Uncert: +/-0.107 +/-0.108 TPU: Curium-242 U 0.0664 pCi/g Uncert: +/-0.106 TPU: +/-0.107 Curium-243/244 U -0.00886 pCi/g +/-0.0744 Uncert: +/-0.0745 TPU: QC1201175604 170683004 MS Americium-241 13.7 0.187 102 (75%-125%) 09/12/06 08:44 14.1 pCi/g +/-0.170 +/-1.41 Uncert: +/-2.41 +/-0.172 TPU: Curium-242 -0.0387 0.209 pCi/g +/-0.0438 +/-0.205 Uncert: +/-0.0442 +/-0.207 TPU: Curium-243/244 16.7 -0.00608 16.2 pCi/g 97 (75%-125%) U Uncert: +/-0.118 +/-1.52 TPU: +/-0.118 +/-2.71 Batch 565214 QC1201175607 170683004 DUP -0.0415 pCi/g Plutonium-238 -0.012 U 110 (0% - 100%) AXA1 09/11/06 09:19 U Uncert: +/-0.0236 +/-0.0941 +/-0.0236 +/-0.0941 TPU: Plutonium-239/240 -0.0601 U -0.0311 pCi/g (0% - 100%)U Uncert: +/-0.0526 +/-0.0917 TPU: +/-0.0531 +/-0.0917 QC1201175609 LCS Plutonium-238 0.00142 pCi/g (75%-125%) Uncert: +/-0.0772 +/-0.0772 TPU: Plutonium-239/240 12.5 10.7 pCi/g 86 (75%-125%) Uncert: +/-1.21 TPU: +/-1.66 QC1201175606 MB Plutonium-238 U -0.0382 pCi/g Uncert: +/-0.113 TPU: +/-0.113 Plutonium-239/240 U -0.0891 pCi/g Uncert: +/-0.066 TPU: +/-0.0669 QC1201175608 170683004 MS

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### **QC Summary**

Workorder:

170683

Page 3 of 10

							1 age 5 01 10			
Parmname	NOM	Sample (	Qual	QC	Units	RPD%	REC%	Range Anlst	Date Time	
Rad Alpha Spec										
Batch 565214										
Plutonium-238	U	-0.012	U	0.0632	pCi/	g		(75%-125%)		
	Uncert:	+/-0.0236		+/-0.143		-				
	TPU:	+/-0.0236		+/-0.143						
Plutonium-239/240	12.6 U	-0.0601		10.9	pCi/	g	87	(75%-125%)		
	Uncert:	+/-0.0526		+/-1.20						
	TPU:	+/-0.0531		+/-1.66						
Batch 565216										
QC1201175615 170683004 DUP										
Plutonium-241	U	16.2	U	5.89	pCi/s	g 0		(0% - 100%) AXA1	09/13/06 03:26	
	Uncert:	+/-13.4		+/-12.7						
	TPU:	+/-13.5		+/-12.7						
QC1201175617 LCS										
Plutonium-241	341			310	pCi/į	g	91	(75%-125%)	09/12/06 11:26	
	Uncert:			+/-32.9						
0.01201120414 N.D	TPU:			+/-45.2						
QC1201175614 MB Plutonium-241			U	5.70	pCi/į	•			00/12/04 02:20	
i lutomuni-241	Uncert:		U	+/-12.7	pCI/§	3			09/13/06 02:39	
	TPU:			+/-12.7						
QC1201175616 170683004 MS	110.			1/-12.7						
Plutonium-241	344 U	16.2		341	pCi/g	2	99	(75%-125%)	09/12/06 11:10	
	Uncert:	+/-13.4		+/-51.8		,		()		
	TPU:	+/-13.5		+/-66.7						
Batch 567705										
QC1201181288 170683003 DUP										
Americium-241	U	0.012		0.120	pCi/g	164		(0% - 100%) TC1	09/14/06 09:31	
	Uncert:	+/-0.0233		+/-0.0804	F C	2		(		
	TPU:	+/-0.0234		+/-0.082						
Curium-242	U	-0.00814	U	0.00	pCi/g	g 200		(0% - 100%)		
	Uncert:	+/-0.0351		+/-0.0381	, ,					
	TPU:	+/-0.0351		+/-0.0381						
Curium-243/244	U	-0.00571	U	-0.0196	pCi/g	g 110		(0% - 100%)		
	Uncert:	+/-0.0246		+/-0.031						
	TPU:	+/-0.0246		+/-0.031						
QC1201181290 LCS										
Americium-241	5.23			5.41	pCi/g	3	103	(75%-125%)		
	Uncert:			+/-0.508						
C : 242	TPU:			+/-0.878	0:/					
Curium-242	***		U	0.00	pCi/g	5				
	Uncert:			+/-0.0244						
Curium 242/244	TPU:			+/-0.0244	"Cila	_	101	(750/ 1250/)		
Curium-243/244	6.31 Uncert:			6.40 +/-0.553	pCi/g	,	101	(75%-125%)		
QC1201181287 MB	TPU:			+/-1.01						
Americium-241			U	0.00039	pCi/g				09/14/06 09:31	
	Uncert:		-	+/-0.00421	r-"E	,			33.130 03.31	
	TPU:			+/-0.00421						
	110.									

# **GENERAL ENGINEERING LABORATORIES, LLC** 2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## **QC Summary**

Batch	Workorder:	170683			Page 4 of 10									
Series   S	Parmname			NOM	Sample	Qual	QC	Units	RPD%	REC%	Range A	nlst	Date	Time
Curium-243/244	Rad Alpha Spec Batch 56	7705												
Curium-243/244	Curium-242					U	0.00902	pCi/s	g ·					
Curium-243/244				Uncert:			+/-0.0239							
Companies				TPU:			+/-0.0239							
TPU:	Curium-243/244					U		pCi/į	g					
Maricium-241														
Section   Sect				TPU:			+/-0.0238							
Curium-242		170683003	MS		0.012		5.50	0.7		106	(200/ 1200/)		00/14/0	
Curium-242	Americium-241			_				pCi/{	g	106	(75%-125%)		09/14/0	6 09:31
Curium-243/244														
Uncert	0 : 242							C'1						
Curium-243/244	Curium-242					U		pCı/į	3					
Curium-243/244     6.41														
Name	G : 242/244							C:/	_	115	(759/ 1259/)			
TPU:	Curium-243/244							pc//s	3	113	(7370-12370)			
Section   Sect														
OCI201181752   70683001   DUP   Dutonium-241   Uncert:	Ratch 56	7883		IPU:	+/-0.0246		+7-1.13							
Plutonium-24														
Uncert:		170683001	DUP		0.07		2.04	0:1	0		(00/ 1008/)	<b></b>	00/15/0	
TPU:	Plutonium-241					U		pC1/g	3 0		(0% - 100%)	ICI	09/17/0	5 03:51
Plutonium-241														
Plutonium-241	0.0000000000000000000000000000000000000	1.00		TPU:	+/-11.1		+/-10.4							
Uncert:		LCS		135			120	nCi/c		80	(75%_125%)		00/17/0	5 04:24
TPU:	r Iutonium-241							pCi/§	3	07	(73/0-123/0)		09/1//0	3 04.24
Plutonium-241														
Plutonium-241	OC1201191751	MD		IPU:			<del>7</del> /-19.8							
Uncert: +/-9.61 TPU: +/-15.8 TPU: +/-11.1 +/-15.8 TPU: +/-11.1 +/-15.8 TPU: +/-11.1 +/-19.1  Rad Gas Flow Batch 565250  QC1201175680 170683002 DUP Strontium-90		MD				П	1.78	nCi/s	r				09/17/0	5.03-35
TPU:	1 101011101111-2-1			Uncert:		Ü		репр	>				02/1//00	05.55
Main														
Plutonium-241	OC1201181753	170683001	MS	110.			17-2.01							
Uncert:		170002001		142 IJ	9.87		113	pCi/g	ţ	80	(75%-125%)		09/17/06	6 04:08
Rad Gas Flow Batch 565250  QC1201175680 170683002 DUP Strontium-90 U -0.00415 U 0.000131 pCi/g 0 (0% - 100%) KSD1 09/08/06 18:03  Uncert: +/-0.016 +/-0.0253  TPU: +/-0.016 +/-0.0253  QC1201175682 LCS Strontium-90 I.56 I.63 pCi/g 105 (75%-125%) 09/08/06 18:05  Uncert: +/-0.151  TPU: +/-0.155  QC1201175679 MB Strontium-90 WB Strontium-90 II.56 II.56 II.63 pCi/g III.56 II.63 pCi/g III.56 III.63 pCi/g III.56 III.63 pCi/g III.56 III.63 pCi/g III.56 III.63 pCi/g III.65 III				~				r	,		<b>(</b>			
Rad Cas Flow Batch 565250  QC1201175680 170683002 DUP Strontium-90 Uncert: +/-0.016 +/-0.0253  QC1201175682 LCS Strontium-90 I.56 I.63 PCi/g 0 (0% - 100%) KSD1 09/08/06 18:03  QC1201175682 TPU: +/-0.016 +/-0.0253  QC1201175679 MB Strontium-90 Uncert: +/-0.155  QC1201175679 TPU: +/-0.018  QC1201175679 MB Strontium-90 I.56 V O-0.00458 PCi/g DCi/g DCi/g DO/08/06 18:03														
Strontium-90	Rad Gas Flow Batch 565	5250												
Strontium-90	OC1201175680	170683002	DUP											
Uncert: +/-0.016 +/-0.0253 TPU: +/-0.016 +/-0.0253 QC1201175682 LCS Strontium-90		.,,,,,,,,,		П	-0.00415	U	0.000131	pCi/g	. 0		(0% - 100%) K	SDI	09/08/06	5 18:03
QC1201175682 LCS Strontium-90				_				Γ	,		,			
QC1201175682 LCS Strontium-90				TPU:										
Strontium-90	QC1201175682	LCS												
Uncert: +/-0.151 TPU: +/-0.155 QC1201175679 MB Strontium-90 U -0.00458 pCi/g 09/08/06 18:03 Uncert: +/-0.018 TPU: +/-0.018				1.56			1.63	pCi/g	;	105	(75%-125%)		09/08/06	18:05
QC1201175679 MB Strontium-90 U -0.00458 pCi/g 09/08/06 18:03 Uncert: +/-0.018 TPU: +/-0.018 QC1201175681 170683002 MS				Uncert:			+/-0.151	•						
Strontium-90				TPU:			+/-0.155							
Strontium-90	QC1201175679	MB												
Uncert: +/-0.018 TPU: +/-0.018 QC1201175681 170683002 MS						U	-0.00458	pCi/g	5				09/08/06	18:03
QC1201175681 170683002 MS				Uncert:			+/-0.018							
				TPU:			+/-0.018							
Strontium-90 3.13 U -0.00415 2.38 pCi/g 76 (75%-125%) 09/08/06 18:03		170683002	MS											
	Strontium-90			3.13 U	-0.00415		2.38	pCi/g	;	76	(75%-125%)		09/08/06	18:03

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### **QC Summary**

		<u> </u>	, Di	mmary					
Workorder: 170683								Page 5 of 10	
Parmname	NOM	Sample (	Qual	QC	Units	RPD%	REC%	Range Anlst	Date Time
Rad Gas Flow Batch 565250									
	Uncert:	+/-0.016		+/-0.249					
Batch 565253	TPU:	+/-0.016		+/-0.253					
QC1201175687 170683005 DUP		0.000760	• •	0.000063	6:1	0		(00/ 1000/) KED1	00/00/07 10 22
Strontium-90	U Uncert:	-0.000759 +/-0.0157	U	-0.000963 +/-0.0166	pCi/g	g 0		(0% - 100%) KSD1	09/08/06 19:32
	TPU:	+/-0.0157		+/-0.0166					
QC1201175689 LCS	1.57			1.20	C:/-		77	(750/ 1250/)	00/00/06 12:26
Strontium-90	1.57 Uncert:			1.20 +/-0.113	pCi/į	g	//	(75%-125%)	09/09/06 12:26
	TPU:			+/-0.118					
QC1201175686 MB			T 7	0.0217	-67				00/09/07 10 22
Strontium-90	Uncert:		U	-0.0216 +/-0.00992	pCi/į	g			09/08/06 19:32
	TPU:			+/-0.00992					
QC1201175688 170683005 MS									
Strontium-90	3.14 U	-0.000759		2.77	pCi/g	g	88	(75%-125%)	09/08/06 19:31
	Uncert: TPU:	+/-0.0157 +/-0.0157		+/-0.189 +/-0.205					
Rad Liquid Scintillation Batch 564445	110.	7, 010107		., 0.200					
QC1201173841 170544018 DUP									
Technetium-99	U	0.128	U	0.0496	pCi/g	g 0		(0% - 100%) KXRI	09/06/06 17:59
	Uncert: TPU:	+/-0.272 +/-0.272		+/-0.251 +/-0.251					
QC1201173843 LCS		, 0.2, 2							
Technetium-99	12.7			13.0	pCi/g	3	103	(75%-125%)	09/06/06 18:32
	Uncert:			+/-0.501 +/-0.582					
QC1201173840 MB	TPU:			₹/-0.362					
Technetium-99			U	0.0991	pCi/g	3			09/06/06 17:43
	Uncert:			+/-0.243					
QC1201173842 170544018 MS	TPU:			+/-0.243					
Technetium-99	13.1 U	0.128		13.3	pCi/g	g	102	(75%-125%)	09/06/06 18:15
	Uncert:	+/-0.272		+/-0.540					
Batch 564447	TPU:	+/-0.272		+/-0.620					
QC1201173845 170544018 DUP									
Tritium	U	1.53	U	0.760	pCi/g	g 0		(0% - 100%) DFA1	09/05/06 21:25
	Uncert:	+/-6.54		+/-5.24				,	
	TPU:	+/-6.54		+/-5.24					
QC1201173847 LCS Tritium	46.9			44.3	pCi/g		05	(75%-125%)	09/07/06 11:21
THOUSE	Uncert:			+/-8.94	peng	,	93	(13/0-123/0)	0901100 11.21
	TPU:			+/-8.98					
QC1201173844 MB Tritium			U	-0.43	pCi/g	Ţ,			09/05/06 20:54

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### **QC Summary**

Workorder: 170683 Page 6 of 10 NOM Range Anist Sample Qual QC Units RPD% REC% Parmname Date Time Rad Liquid Scintillation Batch 564447 +/-4.67 Uncert: +/-4.67 TPU: QC1201173846 170544018 MS Tritium 54.5 1.53 57.4 pCi/g 105 (75%-125%) 09/07/06 11:05 U Uncert: +/-6.54 +/-10.7 TPU: +/-6.54 +/-10.7 564449 Batch QC1201173849 170544019 DUP -0.0997 -0.0804 Carbon-14 U U pCi/g . 0 (0% - 100%) AXD2 09/09/06 05:04 +/-0.0966  $\pm /-0.108$ Uncert: +/-0.0966 +/-0.108 TPU: QC1201173851 LCS 6.66 Carbon-14 6.26 pCi/g 94 (75%-125%) 09/06/06 13:38 +/-0.258 Uncert: TPU: +/-0.276 OC1201173848 MB Carbon-14 U -0.0326 pCi/g 09/06/06 12:02 Uncert: +/-0.102 TPU: +/-0.102 QC1201173850 170544019 MS Carbon-14 6.86 -0.0997 6.85 pCi/g 100 (75%-125%) 09/06/06 13:07 U Uncert: +/-0.0966 +/-0.273 TPU: +/-0.0966 +/-0.293 564514 Batch QC1201174039 170683006 DUP (0% - 100%) DFA1 09/05/06 14:33 Tritium 3.44 1.46 pCi/g U +/-6.25 +/-5.79 Uncert: TPU: +/-6.25 +/-5.79 QC1201174041 LCS 48.4 53.7 pCı/g 111 (75%-125%) Tritium 09/05/06 15:36 Uncert: +/-7.25 TPU: +/-7.31 QC1201174038 MB U 0.308 pCi/g 09/05/06 14:01 Tritium Uncert: +/-4.66 +/-4.66 TPU: QC1201174040 170683006 MS Tritium 49.1 3.44 61.1 pCi/g 124 (75%-125%) 09/05/06 15:05 U +/-6.25 +/-7.58 Uncert: +/-7.65 TPU: +/-6.25 Batch 564520 QC1201174057 170683007 DUP 0.0995 0.0741 (0% - 100%) AXD2 09/06/06 10:24 Carbon-14 pCi/g U Uncert: +/-0.0918 +/-0.118 +/-0.0918 +/-0.118 TPU: QC1201174059 LCS Carbon-14 6.58 6.51 99 (75%-125%) 09/06/06 11:28 pCi/g +/-0.263 Uncert:

+/-0.282

TPU:

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### **QC Summary**

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Parmname			NOM	Sample (	Qual	QC	Units	RPD%	REC%	Range Anlst	Date Time
Rad Liquid Scintilla Batch 564	ition 4520						-				
QC1201174056 Carbon-14	МВ		Uncert: TPU:		U	-0.0231 +/-0.105 +/-0.105	pCi/į	g			09/06/06 09:53
QC1201174058 Carbon-14	170683007	MS	7.19 U Uncert: TPU:	0.0995 +/-0.0918 +/-0.0918		6.42 +/-0.276 +/-0.293	pCi/į	g	89	(75%-125%)	09/06/06 10:56
Batch 564	4623		11 0.								
QC1201174254 Technetium-99	170683001	DUP	U Uncert: TPU:	0.341 +/-0.291 +/-0.291	U	0.187 +/-0.211 +/-0.211	pCi/į	g 0		(0% - 100%) KXRI	09/08/06 19:42
QC1201174256 Technetium-99	LCS		13.0 Uncert: TPU:			12.2 +/-0.490 +/-0.566	pCi/į	3	94	(75%-125%)	09/06/06 14:43
QC1201174253 Technetium-99	МВ		Uncert: TPU:		U	0.151 +/-0.247 +/-0.247	pCi/į	3			09/06/06 13:54
QC1201174255 Technetium-99	170683001	MS	13.0 U Uncert: TPU:	0.341 +/-0.291 +/-0.291		12.9 +/-0.547 +/-0.623	pCi/į	5	99	(75%-125%)	09/06/06 14:27
Batch 565	5287		11 0.								
QC1201175809 Iron-55		DUP	U Uncert: TPU:	-12.6 +/-44.5 +/-44.5	U	38.3 +/-41.2 +/-41.2	pCi/į	g 0		(0% - 100%) VIXPI	09/07/06 23:59
QC1201175811 Iron-55	LCS		628 Uncert: TPU:			613 +/-56.2 +/-67.5	pCi/g	5	98	(75%-125%)	09/08/06 00:31
QC1201175808 Iron-55	МВ		Uncert: TPU:		U	10.2 +/-35.9 +/-35.9	pCi/g	g			09/07/06 23:42
QC1201175810 Iron-55	170683006	MS	746 U Uncert: TPU:	-12.6 +/-44.5 +/-44.5		675 +/-60.5 +/-73.4	pCi/g	3	91	(75%-125%)	09/10/06 15:07
Batch 565	5289										
QC1201175815 Nickel-63	170683006	DUP	U Uncert: TPU:	4.82 +/-7.80 +/-7.80	U	6.11 +/-9.03 +/-9.03	pCi/g	g 0		(0% - 100%) MXP1	09/08/06 03:13
QC1201175817 Nickel-63	LCS		512			443	pCi/g	<b>;</b>	87	(75%-125%)	09/08/06 04:16

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### **QC Summary**

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Workorder:	170683									Page 8	3 of 10		
Parmname			NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	<u>Time</u>
Rad Liquid Scintilla Batch 56	ation 5289												
			Uncert:			+/-15.2				,			
			TPU:			+/-20.8							
QC1201175814	MB												
Nickel-63					U	5.67	pCi/	g				09/08/0	06 02:41
			Uncert:			+/-7.44							
QC1201175816	170683006	MS	TPU:			+/-7.44							
Nickel-63	170083000	MIS	572 U	4.82		475	pCi/s	g	83	(75%-125%	)	09/08/0	06 03:44
			Uncert:	+/-7.80		+/-15.4	•						
			TPU:	+/-7.80		+/-22.2							
Batch 56	5291												
QC1201175819	170683004	DUP											
Iron-55			U	33.7	U	-4.73	pCi/	g 0		(0% - 100%	MXP1	09/08/0	)6 02:42
			Uncert:	+/-51.9		+/-40.3							
061201126021	1.00		TPU:	+/-52.0	Q	+/-40.3							
QC1201175821 Iron-55	LCS		628			652	pCi/s	ø	104	(75%-125%	)	09/08/0	06 03:15
11011 33			Uncert:			+/-52.2	Pon	ь		(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	,	0370070	.0 05.15
			TPU:			+/-64.9							
QC1201175818	MB												
Iron-55					U	-26.7	pCi/į	g				09/08/0	06 02:26
			Uncert:			+/-35.6							
QC1201175820	170693004	MS	TPU:			+/-35.6							
Iron-55	170003004	IVIS	711 U	33.7		744	pCi/g	g	105	(75%-125%	)	09/08/0	06 02:59
			Uncert:	+/-51.9		+/-60.1		J			•		
			TPU:	+/-52.0		+/-75.2							
Batch 56	5293												
QC1201175823	170683004	DUP											
Nickel-63			U	0.395	U	0.122	pCi/į	g 0		(0% - 100%)	MXP1	09/09/0	06 04:34
			Uncert:	+/-9.40		+/-7.25							
0.01201175025	1.00		TPU:	+/-9.40		+/-7.25							
QC1201175825 Nickel-63	LCS		512			467	pCi/g	7	91	(75%-125%)	1	09/09/0	06 06:38
			Uncert:			+/-15.4	Post	5		(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	•	03,0370	0 00,00
			TPU:			+/-21.5							
QC1201175822	MB												
Nickel-63					U	-2.47	pCi/g	g				09/09/0	6 03:32
			Uncert:			+/-5.58							
001201175924	170692004	MS	TPU:			+/-5.58							
QC1201175824 Nickel-63	170063004	WIS	531 U	0.395		535	pCi/g	2	101	(75%-125%)	)	09/09/0	6 05:36
			Uncert:	+/-9.40		+/-21.6	1	,		`			
			TPU:	+/-9.40		+/-27.8							
Batch 563	5648												
QC1201176787	170683010	DUP											
Technetium-99			U	0.0126	U	0.0841	pCi/g	g 0		(0% - 100%)	KXRI	09/12/0	6 14:53
			Uncert:	+/-0.193		+/-0.206							

+/-0.193

TPU:

+/-0.206

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### **QC Summary**

Workorder: 170683

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Parmname	NOM	Sample (	Qual	QC	Units	RPD%	REC%	Range Anlst	Date Time
Rad Liquid Scintillation	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,								
Batch 565648									
QC1201176789 LCS									
Technetium-99	13.1			13.2	pCi/s	g	101	(75%-125%)	09/12/06 15:56
	Uncert:			+/-0.349					
	TPU:			+/-0.480					
QC1201176786 MB					A.,				
Technetium-99	T. T		U	0.00238	pCi/į	g			09/12/06 14:21
	Uncert:			+/-0.154					
QC1201176788 170683010 MS	TPU:			+/-0.154					
Technetium-99	13.0 U	0.0126		12.1	pCi/s	or .	93	(75%-125%)	09/12/06 15:24
recinician 39	Uncert:	+/-0.193		+/-0.383	pen g	5	75	(7570 12570)	07/12/00 13.24
	TPU:	+/-0.193		+/-0.489					
Batch 565649	110.	77 0.195		17 0.405					
OC120117/701 170/02010 DUB									
QC1201176791 170683010 DUP Carbon-14		0.324		0.204	pCi/s	g 46		(0% - 100%) AXD2	00/00/04 07.20
Carbon-14	Uncert:	+/-0.115		+/-0.112	pc I/ §	5 70		(070 - 10070) AAD2	09/06/00 07.36
	TPU:	+/-0.115		+/-0.112					
QC1201176793 LCS	110.	17-0.113		17-0.112					
Carbon-14	7.27			8.39	pCi/g	2	115	(75%-125%)	09/08/06 09:12
	Uncert:			+/-0.256				,	
	TPU:			+/-0.288					
QC1201176790 MB									
Carbon-14			U	0.0136	pCi/g	3			09/08/06 06:51
	Uncert:			+/-0.109					
	TPU:			+/-0.109					
QC1201176792 170683010 MS	7.00	0.224		7.14	0:1		0.4	(750/ 1050/)	00/00/06 00 00
Carbon-14	7.22	0.324		7.14	pCi/g	3	94	(75%-125%)	09/08/06 08:25
	Uncert:	+/-0.115		+/-0.239					
Batch 565650	TPU:	+/-0.115		+/-0.264					
QC1201176795 170683010 DUP				- 10	011			(00/ 1000/) 1 =====	
Tritium	U	4.94	U	7.42	pCi/g	g 0		(0% - 100%) ATH2	09/07/06 01:36
	Uncert:	+/-7.02		+/-7.37					
001201177707 1 00	TPU:	+/-7.02		+/-7.37					
QC1201176797 LCS Tritium	64.5			64.9	pCi/g		101	(75%-125%)	09/07/06 02:09
· ·	Uncert:			+/-10.8	pcire	,	101	(7370-12370)	09/07/00 02.09
	TPU:			+/-10.8					
QC1201176794 MB	110.			17-10.0					
Tritium			U	4.55	pCi/g	Ţ			09/07/06 01:19
	Uncert:			+/-6.87					
	TPU:			+/-6.87					
QC1201176796 170683010 MS									
Tritium	64.7 U	4.94		67.5	pCi/g	5	104	(75%-125%)	09/07/06 01:52
	Uncert:	+/-7.02		+/-10.9					
	TPU:	+/-7.02		+/-10.9					

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#### **QC Summary**

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

#### Notes:

The Qualifiers in this report are defined as follows:

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

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 acceptence 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.

### DISCHARGE CANAL SURVEY UNIT 9106-0011 RELEASE RECORD

Attachment 2b Split Sample Assessment Forms (2 Pages)

#### Split Sc 4 IF

	Split Sample Assessment Form										
Survey Area #:	9106	Survey Unit #:	UIII I I DISCHARGE CANAL								
Sample Plan or WPIR#: 2006-021								SML #: 9106-0011-012FS			
Sample Description: Comparison of split samples collected from sample measurement location $\frac{\#12}{2}$ and a using gamma spectroscopy by an off-site vendor laboratory. The standard sample was $\frac{9106-001}{2}$ the comparison sample was $\frac{9106-0011-012FS}{2}$ .											
		STANDARI	D					CC	MPARISON	7	
Radionuclide	Activity Value	Standard Error	Resolut	ion	Agree Rar		Activity Value	Standard Error	Comparison Ratio	Acceptable (Y/N)	
Cs-137	-3.48E-03	1.51E-02	0		NONE -		4.06E-02	1.92E-02	-11.67	N/A	
Co-60	3.11E-02	1.49E-02	2		NONE -		1.09E-02	1.98E-02	0.35	N/A	
NI-63	-1.12E+00	3.47E+00	0		NONE -		7.07E+00	3.58E+00	-6.31	N/A	
K-40	1.30E+01	7.00E-01	19		0.75	1.33	1.23E+01	6.10E-01	0.95	Y	
		-			<u>'</u>						
		• .									
Comments/C	orractive A	etions: In co	nciderat	ion	of the C	s 137	Table is r	rovided to	chow accen	tance criteria used	
Co-60 and N	i-63 results,	guidance for	agreem	ent r	anges,	ĺ	Table is provided to show acceptance criteria used to assess split samples.				
obtained fron address resol		•			-		Reso	lution	Agree	Agreement Range	
of acceptabil							4	7	0.50	2.00	
was found to	_	_	ble level	of a	igreemei	nt, no	8	15	0.60	1.66	
further action	is warrante	ed.					16	50	0.75	1.33	
							51	200	0.80	1.25	
						>	200	0.85	1.18		
Performed B	y:		]	Date	»:		Reviewed	l By:		Date:	
Oa	l R	wolf		11	-f-a	6	De	+		11/8/06	

WPIR - Work Plan and Inspection Record

SML - Sample Measurement Location designation

	Split Sample Assessment Form							_
Survey Area#:								
Sample Plan	or WPIR#:	2006-0021				SML #:	9106-0011-	017FS
	a spectrosco	opy by an c	off-site vend		-			#17 and analyzed 06-0011-017F, the
		STANDARI	D			CC	OMPARISO	N
Radionuclide	Activity Value	Standard Error	Resolution	Agreement Range	Activity Value	Standard Error	Comparison Ratio	Acceptable (Y/N)
Cs-137	4.06E-01	3.90E-02	10	0.6 - 1.66	4.16E-01	4.37E-02	1.02	Y
Co-60	6.52E-03	1.51E-02	. 0	NONE -	4.77E-02	2.52E-02	7.32	N
Ni-63	1.18E+01	3.73E+00	3	NONE -	1.13E+01	4.69E+00	0.96	Y
K-40	1.34E+01	5.60E-01	24	0.75 1.33	1.39E+01	7.45E-01	1.04	Y
							-	tance criteria used
USNRC Inspe					to assess split samples.			
resolution rat		-		ation of nce Co-60 has	Reso 4	lution 7	0.50	ement Range 2.00
acceptability a likelyhood t					8	15	0.60	1.66
form, one wo	uld not neco	cassarily expe	ect it to be h	omogenuously	16	50	0.75	1.33
mixed from processing of the sample-split alique. Further, since K-40 was found to be present at an acceptable level of					51	200	0.80	1.25
agreement, no further action is warranted.					>	200	0.85	1.18
Performed By: Date:					Reviewed	l By:		Date:
Oal	Rena	lell	1(	-8-96		7		11/8/06

WPIR - Work Plan and Inspection Record

SML – Sample Measurement Location designation

### DISCHARGE CANAL SURVEY UNIT 9106-0011 RELEASE RECORD

Attachment 2c Preliminary Data Form (1 Pages)

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

Survey Unit:

9106-0011

Survey Unit Name: Discharge Canal

Classification:

2

Survey Media:

Soil

Type of Survey:

Final Status Survey

Type of Measurement:

**Gross Measurement** 

Number of Measurements:

0

Operational DCGL:

1

#### **BASIC STATISTICAL QUANTITIES**

	Cs-137	Co-60	Ni-63
Minimum Value:	-3.48E-03	-1.19E-02	-1.12E+00
Maximum Value:	7.37E-01	1.81E-01	1.40E+01
Mean:	1.77E-01	5.21E-02	4.28E+00
Median:	1.18E-01	2.69E-02	2.76E+00
Standard Deviation:	1.93E-01	6.78E-02	4.56E+00

	RADION	JUCLIDE CO	NCENTRATIO	ON (nCi/a)		IDENTIFIED
Sample Number:	Cs-137	Co-60	Ni-63	Cs-137	Co-60	Ni-63
9106-0011-002F	8.89E-02	2.69E-02	1.53E+00	Y	Y	N
9106-0011-003F	7.37E-01	1.38E-01	-4.64E-01	Y	Y	N
9106-0011-004F	1.02E-01	-1.19E-02	5.93E+00	Y	N	N
9106-0011-005F	2.13E-01	1.52E-01	5.96E+00	Y	Y	N
9106-0011-006F	3.22E-01	1.99E-02	2.44E+00	Y	N	N
9106-0011-007F*	1.84E-01	5.52E-02	1.40E+01	Y	Y	Y
9106-0011-008F	1.56E-01	1.53E-01	-5.23E-01	Y	Y	N
9106-0011-009F	6.23E-02	3.42E-02	8.59E-01	Y	N	N
9106-0011-010F	3.71E-02	-1.19E-02	6.11E+00	Y	N	N
9106-0011-011F	1.57E-02	1.17E-02	9.78E-01	N	N	N
9106-0011-012F	-3.48E-03	3.11E-02	-1.12E+00	N	Y	N
9106-0011-014F	2.49E-02	-4.54E-04	2.76E+00	Y	N	N
9106-0011-015F	1.18E-01	-4.29E-03	8.67E+00	Y	N	Y
9106-0011-017F	4.06E-01	6.52E-03	1.18E+01	Y	N	Y
9106-0011-018F	1.99E-01	1.81E-01	5.22E+00	Y	Y	N

<sup>\*</sup>Denotes sample number mislabelled in MSR #06-960 as 9106-0011-007FS

Performed By: Oal Rendy

Date

11-4-06

Independent Review:

Date: 11 - 8 - 06

### DISCHARGE CANAL SURVEY UNIT 9106-0011 RELEASE RECORD

Attachment 2d Graphical Representation of Data (6 Pages)

### **Quantile Plot For Cesium - 137**

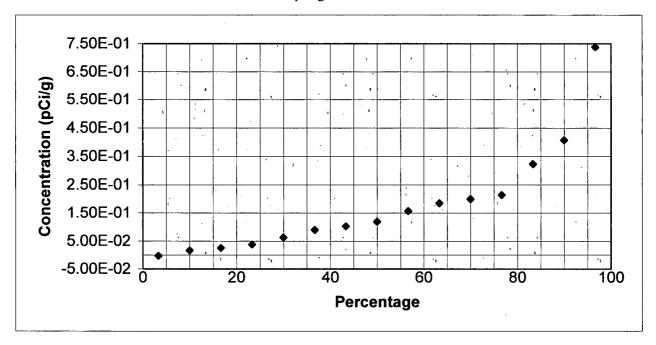
Survey Unit:

9106-0011

Survey Unit Name: Discharge Canal

Mean:

1.77E-01 pCi/g



Cs-137	Rank	Percentage
-3.48E-03	1	3 %
1.57E-02	2	10 %
2.49E-02	3	17 %
3.71E-02	4	23 %
6.23E-02	5	30 %
8.89E-02	6	37 %
1.02E-01	7	43 %
1.18E-01	8	50 %
1.56E-01	9	57 %
1.84E-01	10	63 %
1.99E-01	11	70 %
2.13E-01	12	77 %
3.22E-01	13	83 %
4.06E-01	14	90 %
7.37E-01	15	97 %

Prepared By: Oak Renfall

Reviewed By:

### **Quantile Plot For Cobalt - 60**

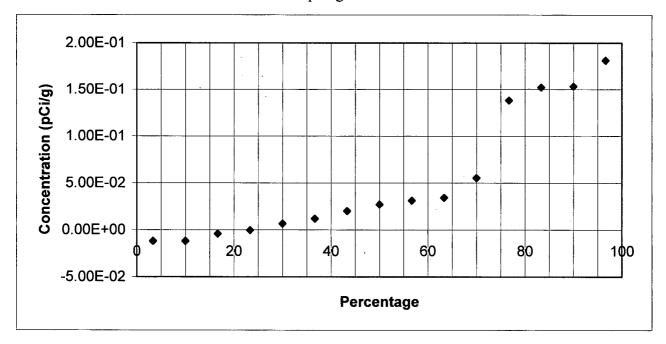
Survey Unit:

9106-0011

Survey Unit Name: Discharge Canal

Mean:

5.21E-02 pCi/g



Co-60	Rank	Percentage
-1.19E-02	1	3 %
-1.19E-02	2	10 %
-4.29E-03	3	17 %
-4.54E-04	4	23 %
6.52E-03	5	30 %
1.17E-02	6	37 %
1.99E-02	7	43 %
2.69E-02	8	50 %
3.11E-02	9	57 %
3.42E-02	10	63 %
5.52E-02	11	70 %
1.38E-01	12	77 %
1.52E-01	13	83 %
1.53E-01	14	90 %
1.81E-01	15	97 %

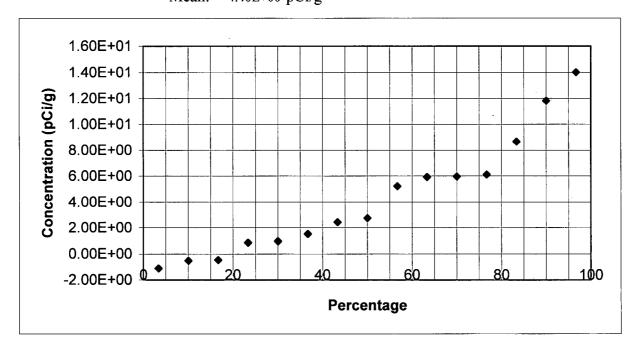
& Raylall

Prepared By:

Date: 11 8 66

### **Quantile Plot For Nickel-63**

Survey Unit: 9106-0011 Survey Unit Name: Discharge Canal Mean: 4.40E+00 pCi/g



Ni-63	Rank	Percentage
-1.12E+00	1	3 %
-5.23E-01	2	10 %
-4.64E-01	3	17 %
8.59E-01	4	23 %
9.78E-01	5	30 %
1.53E+00	6	37 %
2.44E+00	7	43 %
2.76E+00	8	50 %
5.22E+00	9	57 %
5.93E+00	10	63 %
5.96E+00	11	70 %
6.11E+00	12	77 %
8.67E+00	13	83 %
1.18E+01	14	90 %
1.40E+01	15	97 %
1.400701	10	31 70

Prepared By: Dal Rankell

-

e: 11-8-06

Reviewed By:

Date: 11/8/06

### **Frequency Plot For Cesium-137**

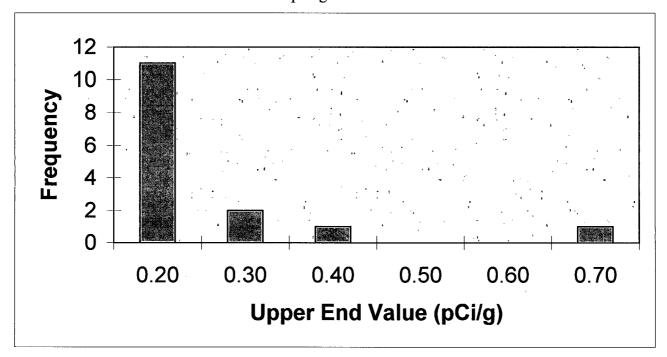
Survey Unit:

9106-0011

Survey Unit Name: Discharge Canal

Mean:

0.177 pCi/g



Upper End	Observation	Observation %
Value	Frequency	Frequency
0.20	11	73%
0.30	2	13%
0.40	1	7%
0.50	0	0%
0.60	0	0%
0.70	1	7%
Total	15	100%

Prepared By:

Date: 1/-3-06

Reviewed By:

Date: 11/8/06

### **Frequency Plot For Cobalt-60**

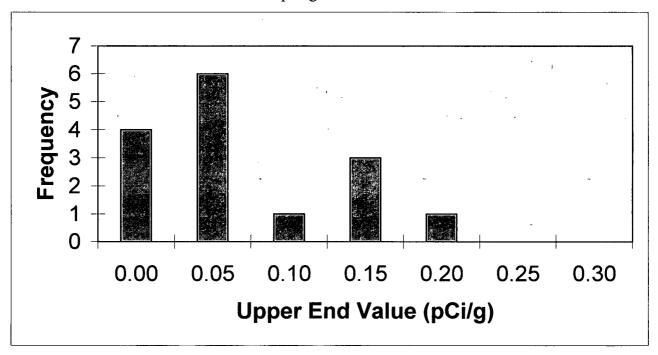
Survey Unit:

9106-0011

Survey Unit Name: Discharge Canal

Mean:

0.052 pCi/g



Upper End Value	Observation Frequency	Observation % Frequency
0.00	4	27%
0.05	6	40%
0.10	1	7%
0.15	3	20%
0.20	1	7%
0.25	0	0%
0.30	0	0%
Total	15	100%

Prepared By:

Reviewed By:

### **Frequency Plot For Nickel-63**

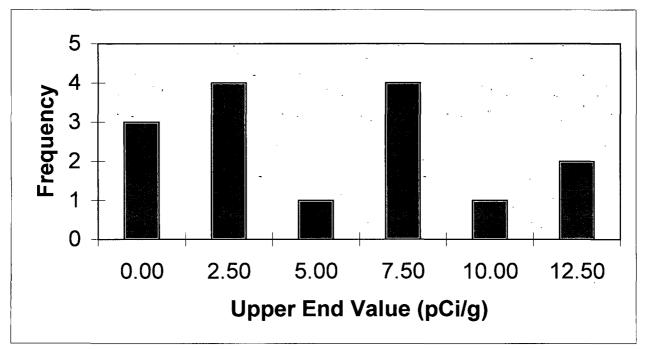
Survey Unit:

9106-0011

Survey Unit Name: Discharge Canal

Mean:

4.400 pCi/g



Upper End	Observation	Observation %
Value	Frequency	Frequency
0.00	3	20%
2.50	4	27%
5.00	1	7%
7.50	4	27%
10.00	1	7%
12.50	2	13%
Total	15	100%

Prepared By: Oal Randall

Reviewed By:

Date: 11/8/06

### DISCHARGE CANAL SURVEY UNIT 9106-0011

### RELEASE RECORD

Attachment 2e Sign Test Calculation (1 Page)

#### Sign Test Calculation Sheet For Multiple Radionuclisdes

Survey Unit Number: 9106-0011 Survey Unit Name: Discharge Canal WP&IR#: 2006-021 TYPE I (α error):0.05 TYPE I (β error):0.05 Classification: 2 Radionuclides: Cs-137 Co-60 Ni-63 Survey Design DCGL (pCi/g): 6.01 2.9 492 Results Cs-137 Results Co-60 Results Ni-63 Weighted Sum (W<sub>s</sub>) DCGL-Result Sign 9.70E-01 8.89E-02 2.69E-02 1.53E+00 3.00E-02 İ 7.37E-01 1.38E-01 -4.64E-01 1.89E-01 8.11E-01 1.02E-01 -1.19E-02 5.93E+00 2.64E-02 9.74E-01 2.13E-01 1.52E-01 5.96E+00 1.10E-01 8.90E-01 3.22E-01 1.99E-02 2.44E+00 7.25E-02 9.28E-01 1.84E-01 5.52E-02 1.40E+01 8.40E-02 9.16E-01 1.56E-01 1.53E-01 -5.23E-01 8.70E-02 9.13E-01 6.23E-02 3.42E-02 8.59E-01 2.65E-02 9.73E-01 3.71E-02 -1.19E-02 6.11E+00 1.47E-02 9.85E-01 1.57E-02 1.17E-02 9.78E-01 9.42E-03 9.91E-01 -3.48E-03 3.11E-02 -1.12E+00 9.08E-03 9.91E-01 2.49E-02 -4.54E-04 2.76E+00 1.01E-02 9.90E-01 1.18E-01 -4.29E-03 8.67E+00 3.79E-02 9.62E-01 4.06E-01 6.52E-03 1.18E+01 1.02E-01 8.98E-01 1.99E-01 1.81E-01 5.22E+00 1.17E-01 8.83E-01 Number of Positive Differences (S+): 15

Critical Value: 11	Survey Unit:	Meets Acceptance Criterion	
Performed By: Dal R	mled	Date:	11-8-06
Independent Review:		Date:	11/8/06

Page 1 of 1

### DISCHARGE CANAL SURVEY UNIT 9106-0011 RELEASE RECORD

Attachment 2f
COMPASS DQA Surface Soil Report with
Retrospective Power Curve
(3 Pages)