



# **Final Status Survey Final Report Phase II**

**Appendix A14**  
*Survey Unit Release Record*  
**9538-0000, Material Storage Area**

**February 2005**



CYAPCO  
FINAL STATUS SURVEY RELEASE RECORD  
MATERIAL STORAGE AREA  
SURVEY UNIT 9538-0000

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**1. SURVEY UNIT DESCRIPTION**

Survey Unit (SU) 9538-0000, (Material Storage Area) is designated as Final Status Survey (FSS) Class 2 and consists of approximately 1,500 m<sup>2</sup> (0.36 acres) of uninhabited, undeveloped, open land located about a 0.85 miles from the center of the Haddam Neck Plant (HNP) Containment Building. Survey Unit 9538-0000 is situated "inside" SU 9524-0000 and located east of SU 9535. As of July 2004, the area topography is a relatively flat open space that was graded and re-seeded to limit erosion.

The reference coordinates associated with SU 9538-0000 are E052 through E056 by S130 through S132 (see 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).

The historic files indicate that this survey unit was originally part of SU 9524-0000, but was subdivided out of this unit in 1999 by Connecticut Yankee to store low-level contaminated soil as a result of the CY Offsite Material Recovery Program (OMRP). During plant operation, SU 9538-0000 and the surrounding area were used by the utility as a resource for fill dirt, a storage area, a landfill area and a shooting range. The public had some limited access to the area in the past; however, access to the area is now limited or restricted due to the close proximity of the Independent Spent Fuel Storage Installation.

**2. CLASSIFICATION BASIS**

The survey unit was classified in accordance with Procedure RPM 5.1-10, "Survey Unit Classification." The historical information and scoping results provide sufficient data to designate SU 9538-0000 as Class 2 in August 2001.

The "Classification Basis Summary" conducted for SU 9538-0000 consisted of:

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

A review of the 10CFR50.75 (g) (1) database report did not identify any associated documents related to FSS. However, a review of historical information provided substantial data pertinent to classification. This survey unit was created as a result of the CY OMRP. The boundaries of the survey unit were defined by a locked chain-link fence that was lined on the inside with a black silt screen. Approximately 2,200 cubic yards of soil from three offsite

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locations was placed into this survey unit between December 1999 and January 2000. Over five hundred fifty (550) samples were collected and analyzed from the three sites during the characterization and remediation efforts. Results of the radiological analyses indicate the average concentration of plant-related radionuclides is well below the Derived Concentration Guideline Level (DCGL), however, several samples indicated concentrations greater than 5% of the corresponding DCGL. In addition to radiological analyses, an assessment of hazardous and regulated materials was performed on the soil from each of the offsite OMRP locations. No hazardous or regulated materials were deemed present in any of the locations. Table 1 provides a statistical overview of the characterization data set for the samples collected during the OMRP.

Table 1 – Basis Statistical Quantities for  
Cesium-137 and Cobalt-60 from the Characterization Survey

Parameter	Cesium-137 (pCi/g)	Cobalt-60 (pCi/g)
Minimum Value:	-0.023	-0.032
Maximum Value:	0.914	0.323
Mean:	0.118	0.006
Median:	0.092	0.004
Standard Deviation:	0.118	0.022
Measurement standard deviation of the weighted sum <sup>(1)</sup> :		0.04

(1) - MARSSIM Section I.11.3 describes the use of the measurement standard deviation of the weighted sum when measured concentrations of the various radionuclides are assumed to be uncorrelated (i.e., there is no fixed ratio between the concentrations).

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

No interviews were performed during the Classification Basis development.

The Site Radiological Release Supervisor performed a visual inspection and walk down during April 2003. It appears that the survey unit was been unaffected by decommissioning activities.

At the time of FSS, the dose impact from groundwater contamination was not considered. These characterization data were sufficient to show that the expected residual radioactivity in the survey unit would be less than site remediation criteria and less than the applicable Base Case DCGL for soil thereby justifying final classification as Class 3. Nevertheless, the survey design maintained the initial designation as a Class 2 to be prudent.

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

The primary objective of the Final Status Survey Plan (FSSP) was to demonstrate that the level of residual radioactivity in SU 9538-0000 did not

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exceed the release criteria specified in the License Termination Plan (LTP), was below the 10 mrem/yr Administrative Level DCGLs, and that the potential dose from residual radioactivity is As Low As Reasonably Achievable (ALARA).

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

The DQO process incorporated hypothesis testing and probabilistic sampling distributions to control decision errors during data analysis. Hypothesis testing is a process based on the scientific method that compares a baseline condition to an alternate condition. The baseline condition is technically known as the null hypothesis. Hypothesis testing rests on the premise that the null hypothesis is true and that sufficient evidence must be provided for rejection. In designing the survey plan, the underlying assumption, or null hypothesis was that residual activity in the survey unit exceeded the release criteria. Rejection of the null hypothesis would satisfy the release criteria objective of the FSS.

The DQO process determined that Cs-137 and Co-60 would be the radionuclides of concern during the 9538-0000 FSS process. Additionally, to provide conservatism, the Baseline DCGLs for radionuclides in soil was reduced by 60% to establish the Administrative Level DCGL. As multiple radionuclides were assumed to be present, the "unity rule" or "sum of the fractions," described by Equation 5-32 of the LTP, was used to show compliance with the release criteria.

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

Laboratory DQOs and analysis results were reported as actual calculated results. Results reported as less than Minimum Detectable Concentration (<MDC) would not be accepted for FSS. Sample report summaries included unique sample identification, analytical method, radionuclide, result and uncertainty of two standard deviations ( $2\sigma$ ), laboratory data qualifiers, units and the required and observed MDC (see Table 2).

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**Table 2 – FSS DCGL Values and Required  
Minimum Detectable Concentrations**

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

(1) The Base Case DCGLs for soil are specified by the LTP in Chapter 6.

(2) The Administrative Level DCGL is 40% of the Base Case DCGL.

(3) The required MDC was 10% of the Administrative Level DCGL.

#### 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. To assist the FSS Radiological Engineers when preparing survey plans for FSS, guidance is provided in Procedure RPM 5.1-11. By design, the FSSP meets the ALARA criteria for soils as specified in Chapter 4 of the LTP.

The LTP specifies that scanning will be performed in a combination of systematic and judgmental measurement for a Class 2 land area and cover 10% to 100% of the area. The fraction of scanning coverage is determined during the DQO process with the total amount, and location(s) based on the likelihood of finding elevated activity during FSS. The survey unit is assumed to contain mostly homogenous media (i.e., the bulk of the returned soil originated from one offsite location as previously discussed). Additional mixing was obtained when the soils were spread out following unloading. Based on the homogeneity of the media and good quality characterization data the scan coverage will

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consist of an area representing 13% or 195 m<sup>2</sup> area of the survey unit. The scan design consisted of seven (7) evenly spaced strips oriented east to west. The length and width of each strip was 27 meters (89 feet) by one (1) meter (3 feet) respectively. In addition, as part of design, were also prescribed for a one meter radius around each random and biased Sample Measurement Location (SML).

During the OMRP, over five hundred fifty (550) samples were collected and analyzed during the characterization and remediation efforts. A compilation of these samples were used to determine the radiological concentration variability for this survey unit.

The characterization data indicated that two (2) of the twenty (20) radionuclides listed in Table 2 could be present in quantities greater than 5% but less than 100% of the applicable Base Case DCGL for soil in this survey unit at the time of FSS. Additionally, sample data associated with the OMRP project identified two Hard-to-Detect (HTD) radionuclides meeting the accepted criteria for detection (i.e., a result greater than two standard deviations uncertainty- $2\sigma$ ). However, the reported concentrations of Ni-63 and Fe-55 were a very low fraction of the applicable Base Case DCGL for soil (<1%). The data collected prior to FSS indicated that the remaining radionuclides listed in Table 2 would not be present in quantities greater than 5% of the applicable Base Case DCGL in this survey unit at the time of FSS. It was unlikely that the aggregate concentration of the remaining radionuclides would exceed 10% of the DCGL; therefore, only Cs-137 and Co-60 was used in the survey planning of SU 9538-0000. The use of the 5% and 10% rule is consistent with the development of surrogate ratio DCGLs as described in the LTP.

Since multiple radionuclides were assumed to be present, the "unity rule" or "sum of the fractions" was used to demonstrate compliance with the release criteria. Therefore, the Operational DCGL is considered to be "1."

Surrogate DCGLs are not required for this survey unit because of the radionuclide specific analysis and radionuclide de-selection in accordance with the 5% and 10% rule.

The Elevated Measurement Comparison (EMC) does not apply to this survey unit since discrete, elevated areas of contamination are not expected.

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

The number of soil samples for FSS was determined in accordance with Procedure RPM 5.1-12, "*Determination of the Number of Surface Samples for FSS*." Survey design specified fifteen (15) surface soil samples for the Sign Test non-parametric statistical testing.

For the FSS, thirteen (13) biased soil SMLs were selected in the original grade below the present overburden.

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Although Procedure RPM 5.1-11 only specified that 5% of the samples be selected for HTD analysis, two (2) soil samples or 13% were randomly selected for HTD radionuclide analysis by using the Microsoft® Excel "RANDBETWEEN" function. Each sample would be sent for a full suite analysis of the HTD radionuclides specified in the LTP, Table 2-12, "Radionuclides Potentially Present at Haddam Neck Plant."

The implementation of survey specific quality control measures as referenced by Procedure RPM 5.1-24, "*Split Sample Assessment for Final Status Survey*," included the collection of two (2) soil samples for "split sample" analysis by the off site laboratory. These locations were selected randomly using the Microsoft® Excel "RANDBETWEEN" function. The number of quality control soil samples was determined to be 13% of fifteen (15) samples, rounded up to the next whole number.

The grid pattern and locations of the soil samples were determined using Visual Sample Plan (VSP) in accordance with Procedure RPM 5.1-14, "*Identifying and Marking Surface Sample Locations for FSS*." 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 location and scan areas were identified using AutoCAD-Lt® a commercially available plotting software with coordinates consistent with the Connecticut State Plane System. These coordinates were integrated with a GPS to locate sample and scan locations in the field. Sample Measurement Locations for the design are listed with the GPS coordinates in Table 3.

Table 3 -Sample Measurement  
Locations (SML) with Associated GPS Coordinates.

Designation	Northing	Easting
9538-0000-001	236227.67	673297.05
9538-0000-002	236197.21	673279.46
9538-0000-003	236197.21	673314.63
9538-0000-004	236197.21	673349.81
9538-0000-005	236166.74	673226.69
9538-0000-006	236166.74	673261.87
9538-0000-007	236166.74	673297.05
9538-0000-008	236166.74	673332.22
9538-0000-009	236166.74	673367.40
9538-0000-010	236136.28	673244.28
9538-0000-011	236136.28	673279.46
9538-0000-012	236136.28	673314.63
9538-0000-013	236136.28	673349.81
9538-0000-014	236105.82	673297.05
9538-0000-015	236105.82	673332.22

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

The Lower Bound of the Gray Region (LBGR) was adjusted in accordance with Procedure RPM 5.1-11 to 0.5 to maintain the relative shift ( $\Delta/\sigma$ ) in the range of 1 and 3. A Prospective Power Curve was generated using the data described in this FSSP and COMPASS, a software package developed under the sponsorship of the USNRC for implementation of the MARSSIM in support of the decommissioning license termination rule (Title 10 CFR 20, Subpart E). The result of the COMPASS computer run shows adequate power for this survey design.

Table 4 provides a synopsis of the FSSP design.

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

Feature	Design Criteria	Basis
Survey Unit Size	1,500 m <sup>2</sup>	Based on AutoCAD and Visual Sample Plan calculations
Number of Measurements	15	Type I ( $\alpha$ ) and Type II ( $\beta$ ) error were 0.05, the LBGR was adjusted to 0.5 to maintain Relative Shift in the range of 1 and 3.
Grid Spacing	10.75 m	Based on triangular grid
Interval Spacing	9.31 m	Based on triangular grid
DCGL	1	Based on satisfying unity rule <sup>(1)</sup>
Scan Survey Coverage	195 m <sup>2</sup> (13%)	Based on likelihood of finding elevated readings in this particular Class 2 survey unit
Scan Investigation Level	Detectable over background	Based on achieving the Administrative Level DCGL

(1) The Operational DCGL was based on achieving an administrative level that was 40% of the soil DCGL and assuming no impact from radioactive contamination in groundwater or from buried concrete debris.

**5. SURVEY IMPLEMENTATION**

Final status survey field activities were conducted under Work Plan and Inspection Record (WP&IR) 24265-000-GEN-0000-00133-000. 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.

Survey activities occurred June 2 through June 24, 2003.

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Seven (7) land areas, Scan Areas 1 through 7, were marked out using GPS coordinates consistent with the Connecticut State Plane System and scanned for elevated readings (see Attachment 2 for Scan Area Results). Scanning was performed with an Eberline E-600 using a SPA-3 sodium iodide detector. The E-600 was operated in the rate-meter mode and used with audio response. The probe was positioned as close to the ground as possible and was moved at a scan speed of about 0.5 meters per second.

Using GPS coordinates, SMLs were identified and marked with a surveyor's flag for identification. At each SML, a one (1) meter radius around the sample flag was scanned for elevated radiation levels.

Fifteen (15) surface soil samples were collected and packaged in accordance with Procedure RPM 5.1-3, "*Collection of Surface and Subsurface Soil, Shoreline Sediment, Asphalt and Liquid samples for Scoping, Characterization and Final Status Survey,*" and FSS design. Samples were controlled, transported, stored, and transferred to the off site laboratory using Chain-of-Custody (COC) protocol in accordance with Procedure RPM 5.1-5, "*Chain of Custody for Scoping, Characterization and Final Status Survey Samples.*"

Two (2) samples (011F and 012F01) were randomly selected for HTD radionuclide analysis.

Thirteen (13) biased samples were collected during the FSS. Survey design required samples be taken to the depth of the original grade.

Two (2) "split samples" were collected at SML 008F and 012F for analysis by the off site laboratory.

**6. SURVEY RESULTS**

No elevated readings were identified during scanning the SMLs or in the scan areas (see Table 5). No further action or investigations were required. All scan area results are provided in Attachment 2.

**Table 5- Scan Area Results**

Scan Area	Highest Logged Reading (cpm)	Investigation Level (MDC-cpm)	Elevated Reading Identification
1	7,210	8,300	-
2	8,050	9,800	-
3	7,110	8,300	-
4	6,590	7,700	-
5	7,400	8,600	-
6	6,560	7,700	-
7	6,750	8,000	-

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The off site laboratory employed for the radiological analyses of samples was STL-Richland, Richland, Washington. The laboratory analyzed the fifteen (15) samples taken for non-parametric statistical testing, the associated duplicates, and biased samples using gamma spectroscopy. Gamma spectroscopy analysis was performed to the required MDC. The results of gamma spectrometry analysis for a majority of the samples indicated Cs-137 at levels consistent with concentrations of Cs-137 found in soil at offsite locations within the vicinity of the HNP as presented in the Health Physics Technical Support Document (TSD) BCY-HP-0063, "*Background Cs-137 Concentration in Soil.*" A summary of the sample results is provided in Table 6.

Table 6- Summary of Soil Sample Results

Sample Number	Cs-137 pCi/g	Co-60 pCi/g	f-DCGL <sup>(1)</sup>
9538-0000-001F	0.001	0.002	0.003
9538-0000-002F	0.092	0.000	0.092
9538-0000-003F	0.058	0.000	0.058
9538-0000-004F	0.054	0.000	0.054
9538-0000-005F	0.000	0.003	0.003
9538-0000-006F	0.107	0.000	0.107
9538-0000-007F	0.057	0.004	0.061
9538-0000-008F	0.051	0.009	0.060
9538-0000-009F	0.050	0.008	0.058
9538-0000-010F	0.049	0.000	0.049
9538-0000-011F	0.079	0.030	0.109
9538-0000-012F	0.040	0.016	0.055
9538-0000-013F	0.069	0.001	0.070
9538-0000-014F	0.065	0.000	0.065
9538-0000-015F	0.035	0.011	0.046

(1) f-DCGL-fraction of the Operational DCGL

The off site laboratory processed the two (2) selected samples, 9538-0000-011F and 012F01 for HTD analysis including alpha spectroscopy, gas proportional counting and liquid scintillation depending on the radionuclide and the measurement method. Strontium-90 was the only HTD radionuclide reported at statistically significant concentrations in the two (2) samples (see Table 7). The highest reported levels in the HTD sample set was in SML 011F. Strontium-90 levels reported in association with Cs-137 and Co-60 were only 0.279 of the Operational DCGL, well below any investigation level. No further action or investigations were required.

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**Table 7-Hard-to-Detect Sample Results pCi/g**

Sample	Sr-90 pCi/g	f-DCGL (1)
9538-0000-011F	0.109	0.17
9538-0000-012F01	0.058	0.09
9538-0000-012F01 (duplicate sample)	0.058	0.093

(1) f-DCGL-fraction of the Administrative Level DCGL.

The offsite laboratory analyzed the thirteen (13) biased samples, collected on the original grade in 9538-0000, using gamma spectroscopy (see Table 8). The analysis was performed to the required MDC. The highest reported level in the biased samples was in SML 002F01. Cesium-137 and Co-60 was only 0.11 of the Operational DCGL. No further action or investigations were required.

**Table 8-Biased Sample Results**

Sample Number	Cs-137 pCi/g	Co-60 pCi/g	f-DCGL (1)
9538-0000-002F01	0.311	0.025	0.115
9538-0000-003F01	0.145	0.013	0.046
9538-0000-004F01	0.161	-0.004	0.051
9538-0000-006F01	0.330	0.021	0.104
9538-0000-007F01	0.294	0.031	0.020
9538-0000-008F01	0.141	0.010	0.045
9538-0000-009F01	0.173	0.025	0.071
9538-0000-010F01	0.200	0.011	0.071
9538-0000-011F01	0.246	-0.003	0.078
9538-0000-012F01	0.130	0.051	0.041
9538-0000-013F01	0.118	0.008	0.043
9538-0000-014F01	0.218	-0.016	0.069
9538-0000-015F01	0.174	-0.001	0.055

(1) f-DCGL-fraction of the Operational DCGL.

## 7. QUALITY CONTROL

The off site laboratory processed the split samples and performed gamma spectroscopy analysis. Thirteen percent (13%) of the samples were selected for analysis, which exceeds the 5% minimum required by the LTP. The data were evaluated using USNRC acceptance criteria specified in Inspection Procedure 84750 as detailed in Procedure RPM 5.1-24, "Split Sample Assessment for Final Status Survey." There was acceptable agreement between field split results. The sample analysis vendor, STL-Richland, Richland, Washington, maintains quality assurance and quality control plans as part of normal operation. Refer to Attachment 2 for data and data quality analysis results.

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**8. INVESTIGATIONS AND RESULTS**

No investigations were performed as the result of FSS in Survey Unit 9538-0000.

**9. REMEDIATION AND RESULTS**

Historically, no remediation 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 change made from the LTP, prior to this FSS, was a decrease in the concentrations for the Base Case DCGL<sub>soils</sub>. The LTP presents DCGLs that correspond to a Total Effective Dose Equivalent (TEDE) of 25 mrem/yr. This survey unit was evaluated against Administrative Level DCGLs that correspond to 10 mrem/yr.

The "at grade" biased samples were not collected from locations 001F01 and 005F01 since these locations were at the original grade.

Samples 9538-0000-011F and 012F01 were mistakenly dried before the tritium (H-3) analysis was performed by the offsite laboratory. Normally, H-3 analysis must be performed prior to the drying of samples for routine gamma spectroscopy analysis. Because the samples were dried, H-3 analysis could not be performed by the off-site laboratory. This is of low concern since tritium is not routinely detected in soils outside of the HNP industrial area and no H-3 was found in adjacent survey unit soil samples. This was documented as a discrepancy in the laboratory report. No further actions were taken.

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

The DQO sample design and data were reviewed in accordance with Procedure RPM 5.1-23, "*Data Quality Assessment*," for completeness and consistency. The sampling design had adequate power as indicated by the Retrospective Power Curve. The Sign Test was performed on the data and compared to the original assumptions of the DQOs. All sample results were less than the release criteria. Therefore, the Sign Test shows that the survey unit passes FSS.

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

The preliminary data review consisted of converting the data into units relative to the release criteria (i.e., pCi/g) and calculating basic statistical quantities (e.g., mean, median, standard deviation).

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For Cs-137, the sample standard deviation was less than the value used for the survey design. This indicates that a sufficient number of samples were collected to achieve the desired power. The range of the data, about 3.7 standard deviations, was not unusually large. The difference between the mean and median was 1% of the standard deviation. The frequency plot indicates that the data is slightly skewed negative.

For Co-60, the sample standard deviation was less than the value used for the survey design. This indicates that a sufficient number of samples were collected to achieve the desired power. The range of the data is about 4.1 standard deviations. The difference between the mean and median was 11% of the standard deviation. The frequency plot indicates that the data is slightly skewed positive.

The frequency plot indicates a distribution of generally standard proportions with outliers both high and low. The "outlier" samples are the results of the area being disturbed or the soil being removed or mixed with other materials.

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

**12. ANOMALIES**

All data is considered valid including negative values, zeros, values reported below the MDC and values reported with uncertainties greater than two standard deviations. Some radionuclides have been reported at low concentrations that are statistically significant at the 95% confidence level, but with a relatively high level of uncertainty.

Gamma spectroscopy results identified several radionuclides meeting the accepted criteria for detection (i.e., a result greater than two standard deviations uncertainty- $2\sigma$ ). Cesium-134 and Am-241 were frequently identified in sample results. The offsite laboratory data qualifier unit shows that these radionuclides were analyzed for and the result was less than the MDC. These very low-level "detections" may be attributed to false positive noise at the lower limit of the measuring technique.

Two (2) samples were submitted to the offsite laboratory and analyzed for HTD radionuclides. One (1) sample, 012F01, was split at the laboratory and analyzed as a "duplicate." The analysis indicates that Sr-90 was the only identified radionuclide in the samples meeting the criteria for acceptance. Typically, the levels and geographical locations of the Sr-90, along with Cs-137, found in the analysis are associated with weapons testing and atmospheric fallout. The amounts identified in the report suggest that this is the origin of the Sr-90 along with certain amounts of Cs-137. The Sr-90 value compares favorably with research conducted in other regional areas concerning fallout resultant from nuclear testing in the past as referenced in EPRI Technical Report 1003030,

MATERIAL STORAGE AREA  
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*"Determining Background Radiation Levels in Support of Decommissioning Nuclear Power Plants."*

These HTD radionuclides do not represent quantities that would increase the requisite number of samples for non-parametric statistical sampling or cause the survey unit to fail to meet the release criteria. Sample analysis did not indicate any anomalies requiring further investigation.

**13. CONCLUSION**

Survey Unit 9538-0000 has met the DQOs of the FSS. For this survey unit, the ALARA criteria for soils as specified in Chapter 4 of the LTP were achieved. The Elevated Measurement Comparison and remediation was not required.

The sample data passed the Sign Test. The null hypothesis was rejected. Evaluation of the data shows that none of the FSS design radionuclides or HTD soil concentration values exceeded the Operational DCGL or unity. No large anomalies were observed in the graphical representation of the data. The survey unit was properly designated as Class 2. The Retrospective Power Curve generated using COMPASS shows adequate power was achieved.

This survey unit is not considered impacted by radioactive contamination in groundwater based on location, topography and current hydro-geologic sampling data as referenced in Health Physics TSD CY-HP-0193, "Assessment of Existing Groundwater Dose for Phase II Release Areas of the Final Status Survey Report."

**14. ATTACHMENTS**

14.1 Attachment 1 – Figures

14.2 Attachment 2 – Sample and Statistical Data

MATERIAL STORAGE AREA  
SURVEY UNIT 9538-0000

RELEASE RECORD

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Attachment 1  
Figures  
(4 Pages)



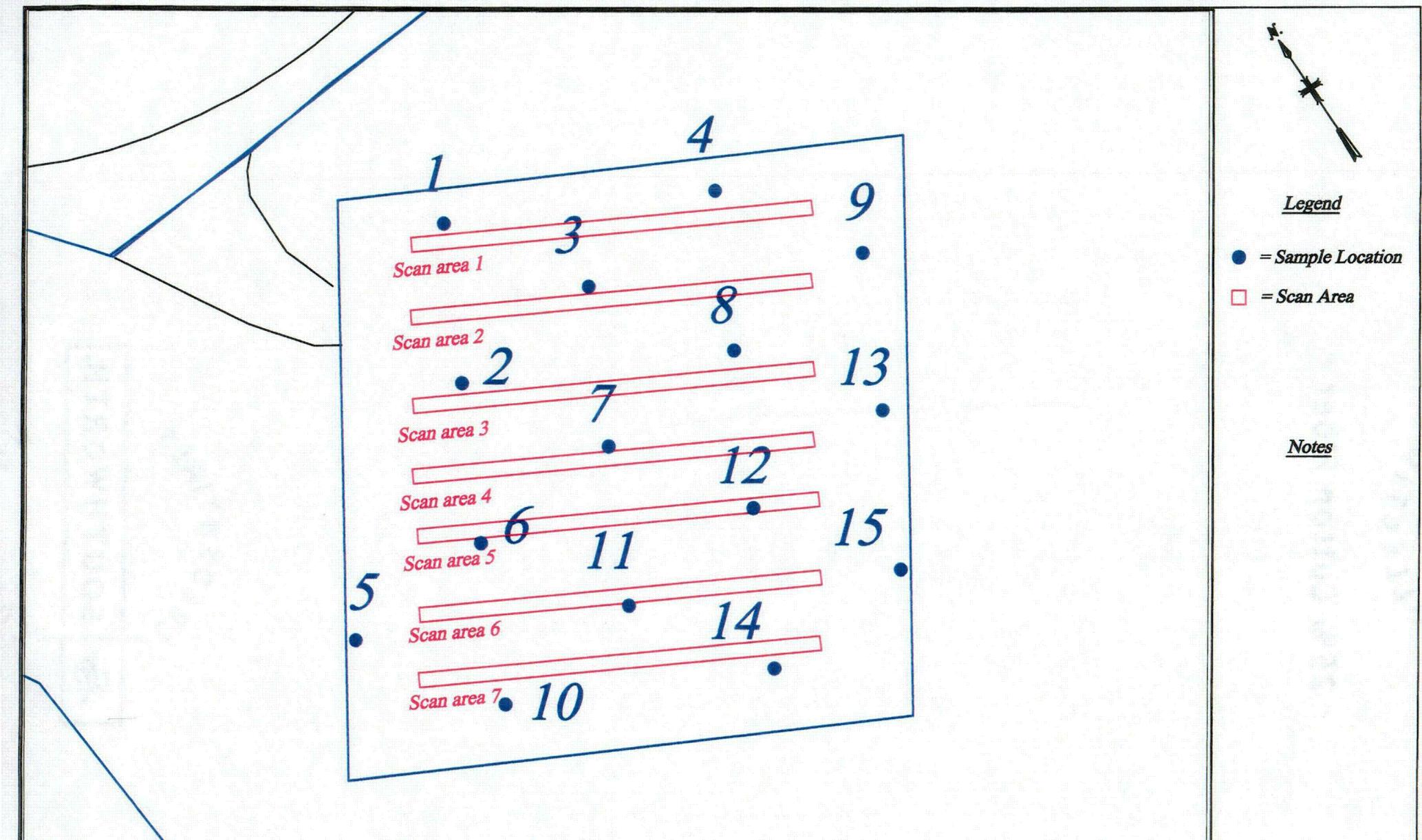
Figure 1



Connecticut Yankee Atomic Power Company  
Site Map With Reference To Survey Unit 9538-0000

Date	Rev
January 2004	0

C01



#### Legend

- = Sample Location
- = Scan Area

#### Notes

Figure 2



Connecticut Yankee Atomic Power Company  
9538-0000 Final Status Survey Design

Date	Rev
January 2004	1

COZ

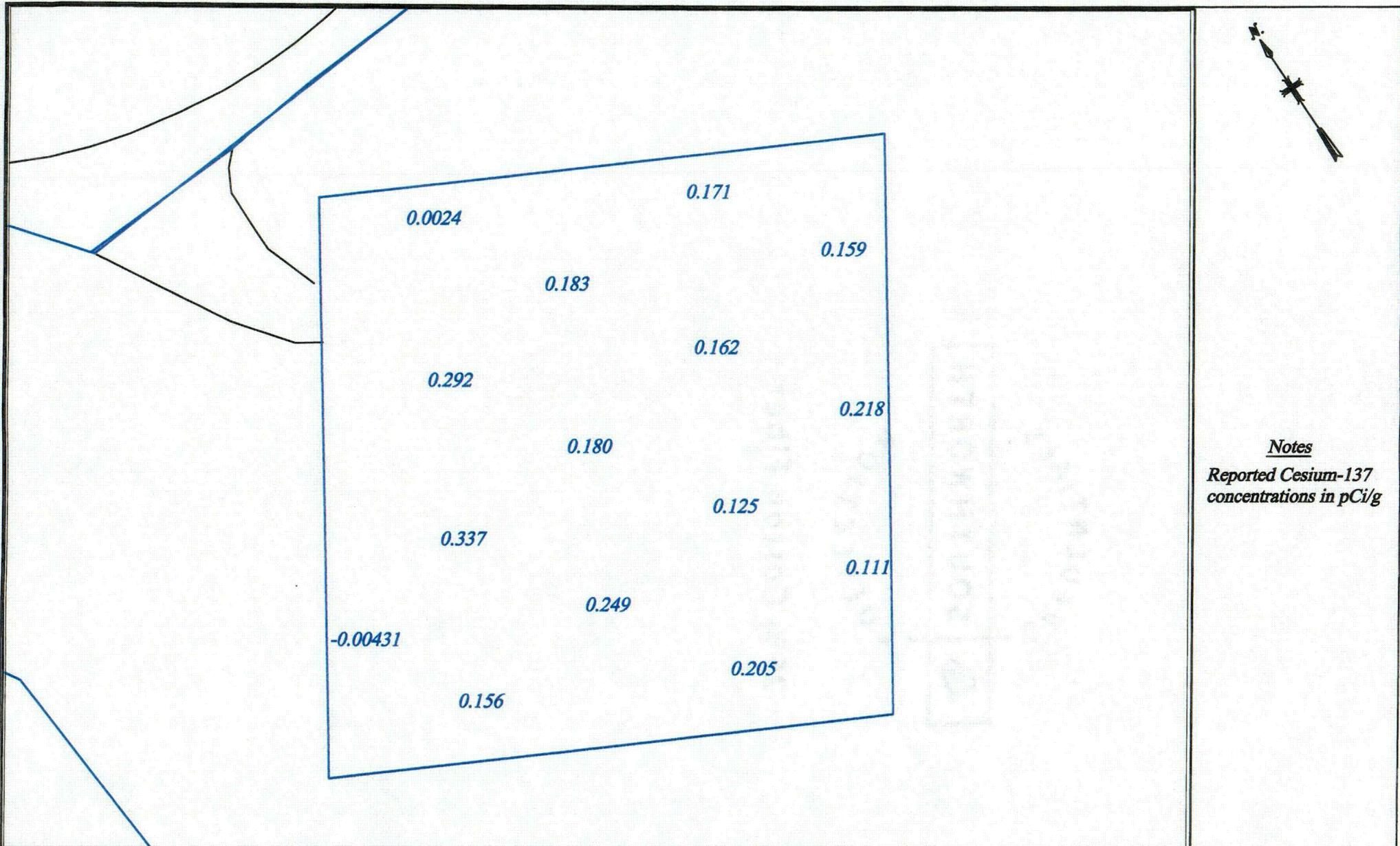


Figure 3



Connecticut Yankee Atomic Power Company  
9538-0000 Final Status Survey Cs-137 Posting Plot

Date	Rev
January 2004	0

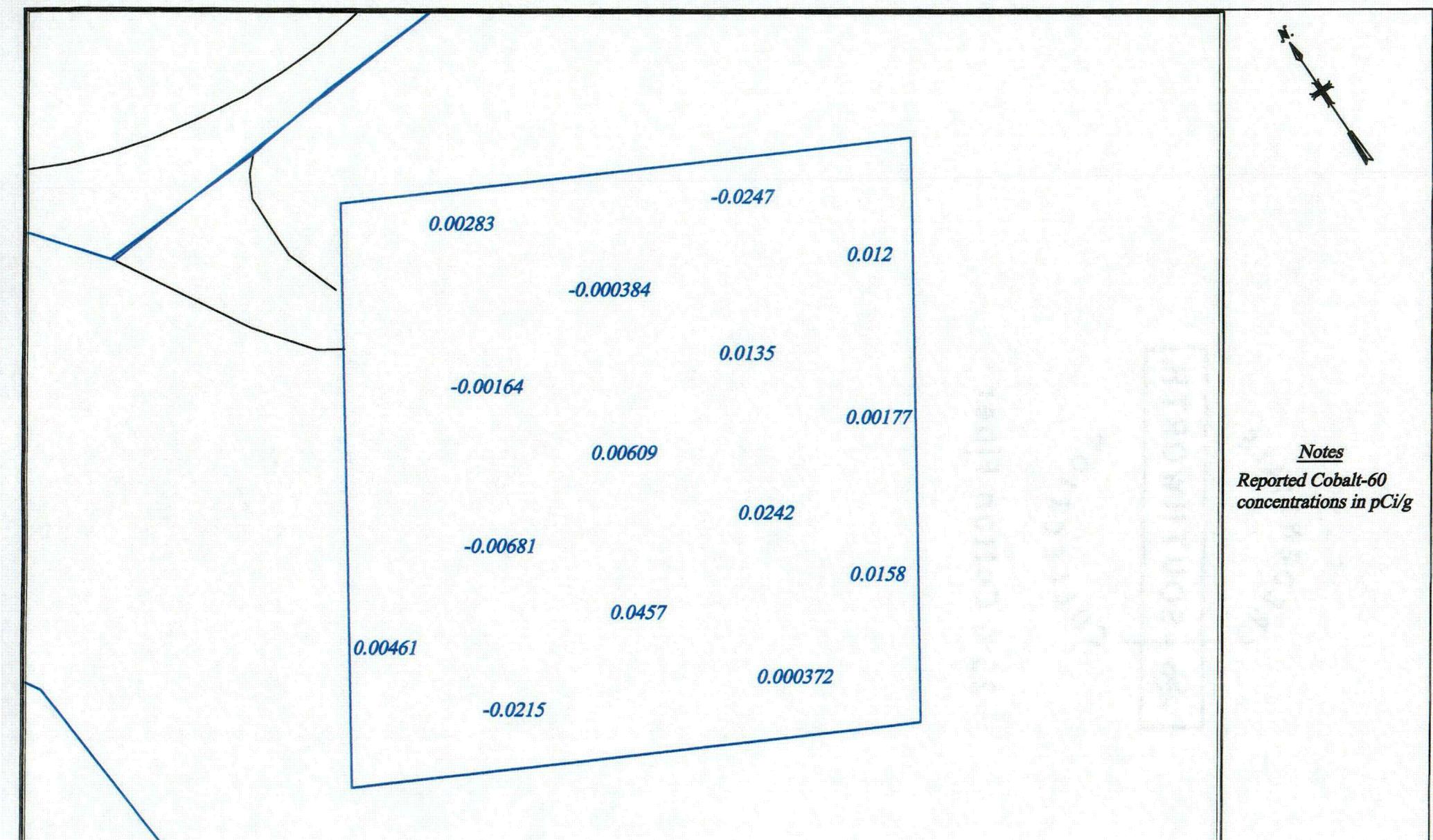


Figure 4



Connecticut Yankee Atomic Power Company  
9538-0000 Final Status Survey Co-60 Posting Plot

Date	Rev
January 2004	0

CO4

MATERIAL STORAGE AREA  
SURVEY UNIT 9538-0000

**RELEASE RECORD**

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Attachment 2  
Sample and Statistical Data

MATERIAL STORAGE AREA  
SURVEY UNIT 9538-0000

RELEASE RECORD

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Attachment 2a  
Gamma Spectroscopy Data  
(100 Pages)

Analytical Data Package Prepared For  
**Bechtel CT Yankee Project**

Radiochemical Analysis By  
**STL Richland**

*2800 G.W. Way, Richland Wa, 99352, (509)-375-3131.*

Assigned Laboratory Code: **STLRL**

*Data Package Contains 100 Pages*

Report No.: **23222**

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
23303		9538-00-001F	J3G020266-27	FRM531AA	9FRM5310	3192332
		9538-00-002F	J3G020266-31	FRM6K1AA	9FRM6K10	3192332
		9538-00-002F01	J3G020266-32	FRM6N1AA	9FRM6N10	3192332
		9538-00-003F	J3G020266-15	FRM4R1AA	9FRM4R10	3192331
		9538-00-003F01	J3G020266-16	FRM4W1AA	9FRM4W10	3192331
		9538-00-004F	J3G020266-13	FRM4K1AA	9FRM4K10	3192331
		9538-00-004F01	J3G020266-14	FRM4M1AA	9FRM4M10	3192331
		9538-00-005F	J3G020266-28	FRM591AA	9FRM5910	3192332
		9538-00-006F	J3G020266-17	FRM4X1AA	9FRM4X10	3192332
		9538-00-006F01	J3G020266-18	FRM401AA	9FRM4010	3192332
		9538-00-007F	J3G020266-1	FRM201AA	9FRM2010	3192331
		9538-00-007F01	J3G020266-2	FRM231AA	9FRM2310	3192331
		9538-00-008F	J3G020266-9	FRM321AA	9FRM3210	3192331
		9538-00-008F01	J3G020266-11	FRM4F1AA	9FRM4F10	3192331
		9538-00-008FS	J3G020266-10	FRM391AA	9FRM3910	3192331
		9538-00-008FS01	J3G020266-12	FRM4G1AA	9FRM4G10	3192331
		9538-00-009F	J3G020266-29	FRM6H1AA	9FRM6H10	3192332
		9538-00-009F01	J3G020266-30	FRM6J1AA	9FRM6J10	3192332
		9538-00-010F	J3G020266-21	FRM481AA	9FRM4810	3192332
		9538-00-010F01	J3G020266-22	FRM491AA	9FRM4910	3192332
		9538-00-011F	J3G020266-19	FRM441AA	9FRM4410	3192332
		9538-00-011F01	J3G020266-20	FRM461AA	9FRM4610	3192332
		9538-00-012F	J3G020266-3	FRM281AA	9FRM2810	3192331
		9538-00-012F01	J3G020266-5	FRM3E1AA	9FRM3E10	3192331
		9538-00-012FS	J3G020266-4	FRM3C1AA	9FRM3C10	3192331
		9538-00-012FS01	J3G020266-6	FRM3G1AA	9FRM3G10	3192331

Report No.: 23222

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
23303	9538-00-013F	J3G020266-23	FRM5C1AA	9FRM5C10	3192332	
	9538-00-013F01	J3G020266-24	FRM5E1AA	9FRM5E10	3192332	
	9538-00-014F	J3G020266-25	FRM5F1AA	9FRM5F10	3192332	
	9538-00-014F01	J3G020266-26	FRM5J1AA	9FRM5J10	3192332	
	9538-00-015F	J3G020266-7	FRM3M1AA	9FRM3M10	3192331	
	9538-00-015F01	J3G020266-8	FRM3X1AA	9FRM3X10	3192331	

## **Certificate of Analysis**

Bechtel Power Corporation  
362 Injun Hollow Road  
East Hampton, CT 06424

July 31, 2003

Attention: Jack McCarthy

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Date Received in Lab	:	July 2, 2003
Sample Type	:	Thirty-two (32) Soil
SDG Number	:	23303
Project Name/Number	:	Haddam Neck Decommissioning
COC Number	:	2003-00159,-00160,-00161,-00162,-00163,-00164,-00165,- 00166
Purchase Order Number	:	24265-FSB-S-00552-AC

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### **CASE NARRATIVE**

#### **I. Introduction**

On July 2, 2003, thirty-two soil samples were received at the STL Richland (STLR) laboratory for radiochemical analysis. Upon receipt, the samples were assigned the STLR identification numbers as described on the cover page of the Analytical Data Package report form. These samples were assigned to Lot Number J3G020266.

#### **II. Sample Receipt**

The samples were received in good condition. Sample receiving noted that the sample ID numbers on the sample containers had two zeros that were not included on the Chain of Custody form in the sample designation number. All other numbers matched and samples were processed.

#### **III. Analytical Results/Methodology**

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analysis was:

Gamma Spectroscopy  
Gamma Spec by method RICH-RC-5017

Severn Trent Laboratories, Inc.  
STL Richland • 2800 George Washington Way, Richland, WA 99352  
Tel 509 375 3131 Fax 509 375 5590 • [www.stlinc.com](http://www.stlinc.com)

#### IV. Quality Control

The analytical result for each analysis performed includes a minimum of one laboratory control sample (LCS), and one reagent blank sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

#### V. Comments

The samples were processed in two separate analysis batches, each of which include a blank, LCS and duplicate sample analysis.

The samples masses received were much larger than in the past and could not be weighed on the laboratory scale. Aliquots taken from various regions of the sample and amounting to half or more of the total sample were processed through the laboratory.

#### Gamma Spectroscopy

##### Gamma Spec by method RICH-RC-5017:

The following results may be false positives as the key-line activity is greater than the MDA but the identification of the radionuclide was rejected by the abundance criteria of the software and/or a non-identified peak at the key-line area is calculated with the radionuclide factors:

<u>Isotopes</u>	<u>Affected Samples</u>
TI-208, Bi-214, Ra-226DA, Ac-228	FRM6K
TI-208, Bi-214	FRM4G
Bi-212, Bi-214	FRM28, FRM4W, FRM44, FRM46
Bi-214, Ra-226DA, Ac-228	FRM5C, FRM53
Bi-214, Ra-226DA	FRM6H
TI-208, Bi-212	FRM20-X,
TI-208, Bi-214	FRM3M, FRM49, FRM5J
Cs-134, Bi-214	FRM4K
Bi-212	FRM20, FRM4X, FRM5F, FRM23, FRM4R
Bi-214	FRM3C, FRM3G, FRM6J
Ac-228	FRM23, FRM4R
TI-208	FRM32, FRM4M, FRM40, FRM59
Bi-212, Ac-228	FRM39
Bi-212, Bi-214, Ra-226DA	FRM5E
Cs-134	FRM20

Except as noted, the LCS, batch blank, sample, and sample duplicate results are within required limits.

Bechtel Power Corporation  
July 15, 2003  
Page 3

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I certify that this Certificate of Analysis 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.

Reviewed and approved:

Theresa H. Kallsen

Theresa H. Kallsen  
Project Management Assistant

### Drinking Water Method Cross References

DRINKING WATER ASTM METHOD CROSS REFERENCES		
Referenced Method	Isotope(s)	STL Richland's SOP number
EPA 901.1	Cs-134, I-131	RICH-RC-5017
EPA 900.0	Alpha & Beta	RICH-RC-5014
EPA 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr89/90	RICH-RC-5006
ASTM D2460	Total Radium	RICH-RC-5027
Standard Method 7500-U-C & ASTM D5174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007
NOTE:		
The Gross Alpha LCS is prepared with Am-241 (unless otherwise specified in the case narrative)		
The Gross Beta LCS is prepared with Sr/Y-90 (unless otherwise specified in the case narrative)		

### Uncertainty Estimation

STL Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship,  $R = \text{constants} * f(x,y,z,...)$ . The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties ( $u_i$ ) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty ( $u_c$ ) multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value ( $S/vn$ ), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

## Report Definitions

Action Lev	An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit.
Batch	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
Bias	Defined by the equation $(Result/Expected)-1$ as defined by ANSI N13.30.
COC No	Chain of Custody Number assigned by the Client or STL Richland.
Count Error (#s)	Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background.
Total Uncert (#s) <i>u<sub>c</sub>-Combined Uncertainty.</i>	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, <i>u<sub>c</sub></i> , the <i>combined uncertainty</i> . The uncertainty is absolute and in the same units as the result.
(#s), Coverage Factor	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
CRDL (RL)	Contractual Required Detection Limit as defined in the Client's Statement Of Work or STL Richland "default" nominal detection limit. Often referred to the reporting level (RL)
Lc	Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. $Lc = (1.645 * \sqrt{2 * (BkgndCnt/BkgndCntMin) / SCntMin}) * (\text{ConvFct} / (\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol}) * \text{IngrFct})$ . For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
Lot-Sample No	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
MDC MDA	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. $MDC = (4.65 * \sqrt{(BkgndCnt/BkgndCntMin) / SCntMin}) + 2.71 / SCntMin) * (\text{ConvFct} / (\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol}) * \text{IngrFct})$ . For LSC methods the batch blank is used as a measure of the background variability.
Primary Detector	The instrument identifier associated with the analysis of the sample aliquot.
Ratio U-234/U-238	The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038.
Rst/MDC	Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Rst/TotUcert	Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Report DB No	Sample Identifier used by the report system. The number is based upon the first five digits of the Work Order Number.
RER	The equation Replicate Error Ratio = $(S-D)/[\sqrt{TPUs^2 + TPUs^2}]$ as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUs is the total uncertainty of the duplicate sample.
SDG	Sample Delivery Group Number assigned by the Client or assigned by STL Richland upon sample receipt.
Sum Rpt Alpha Spec Rst(s)	The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units.
Work Order	The LIMS software assign test specific identifier.
Yield	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

## Sample Results Summary

Date: 31-Jul-03

## STL Richland STRL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 23222

SDG No: 23303

Batch	Client Id Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
<b>3192331 E901.1</b>									
9538-00-003F	FRM4R1AA	ACTINIUM-228	9.47E-01 +/- 2.3E-01	U	pCi/g		3.90E-01		
	AG-108M		-6.73E-03 +/- 2.6E-02	U	pCi/g		4.35E-02	2.86E-01	
	AMERICIUM-241		5.45E-03 +/- 9.1E-02	U	pCi/g		1.52E-01	1.03E+00	
	BISMUTH-212		1.08E+00 +/- 5.1E-01	U	pCi/g		9.79E-01		
	BISMUTH-214		9.88E-01 +/- 1.8E-01		pCi/g		8.87E-02		
	COBALT-60		-3.84E-04 +/- 2.9E-02	U	pCi/g		5.42E-02	1.50E-01	
	CESIUM-134		5.65E-02 +/- 3.8E-02	U	pCi/g		7.30E-02	1.90E-01	
	CESIUM-137		1.83E-01 +/- 5.5E-02	J	pCi/g		5.44E-02	3.20E-01	
	EUROPIUM-152		-7.20E-02 +/- 8.3E-02	U	pCi/g		1.34E-01	4.04E-01	
	EUROPIUM-154		-4.27E-03 +/- 1.0E-01	U	pCi/g		1.85E-01	3.70E-01	
	EUROPIUM-155		7.48E-02 +/- 7.8E-02	U	pCi/g		1.37E-01	1.57E+01	
	POTASSIUM-40		1.14E+01 +/- 1.8E+00		pCi/g		5.68E-01		
	MANGANESE-54		1.19E-02 +/- 3.2E-02	U	pCi/g		5.88E-02	6.96E-01	
	NIOBIUM-94		-1.65E-02 +/- 2.6E-02	U	pCi/g		4.35E-02	2.85E-01	
	LEAD-212		9.12E-01 +/- 1.8E-01		pCi/g		7.95E-02		
	LEAD-214		1.06E+00 +/- 2.1E-01		pCi/g		1.00E-01		
	RADIUM-226		9.88E-01 +/- 1.8E-01		pCi/g		8.87E-02		
	THALLIUM-208		3.11E-01 +/- 7.9E-02		pCi/g		5.04E-02		
<b>9538-00-003F01</b>									
	FRM4W1AA	ACTINIUM-228	8.22E-01 +/- 2.0E-01		pCi/g		1.27E-01		
	AG-108M		-1.40E-02 +/- 2.2E-02	U	pCi/g		3.57E-02	2.86E-01	
	AMERICIUM-241		8.70E-02 +/- 9.8E-02	U	pCi/g		1.71E-01	1.03E+00	
	BISMUTH-212		1.30E+00 +/- 6.3E-01	U	pCi/g		8.71E-01		
	BISMUTH-214		9.34E-01 +/- 1.6E-01	U	pCi/g		2.29E-01		
	COBALT-60		1.32E-02 +/- 2.5E-02	U	pCi/g		5.01E-02	1.50E-01	
	CESIUM-134		5.30E-02 +/- 4.2E-02	U	pCi/g		6.54E-02	1.90E-01	
	CESIUM-137		1.45E-01 +/- 4.5E-02	J	pCi/g		5.87E-02	3.20E-01	
	EUROPIUM-152		-1.24E-02 +/- 6.8E-02	U	pCi/g		1.17E-01	4.04E-01	
	EUROPIUM-154		6.63E-03 +/- 8.4E-02	U	pCi/g		1.56E-01	3.70E-01	
	EUROPIUM-155		1.37E-01 +/- 7.8E-02	U	pCi/g		1.43E-01	1.57E+01	
	POTASSIUM-40		1.08E+01 +/- 1.7E+00		pCi/g		3.51E-01		
	MANGANESE-54		1.40E-02 +/- 3.0E-02	U	pCi/g		5.63E-02	6.96E-01	
	NIOBIUM-94		-9.90E-03 +/- 2.6E-02	U	pCi/g		4.48E-02	2.85E-01	
	LEAD-212		6.97E-01 +/- 1.4E-01		pCi/g		9.64E-02		
	LEAD-214		9.02E-01 +/- 1.8E-01		pCi/g		9.06E-02		
	RADIUM-226		9.34E-01 +/- 1.6E-01		pCi/g		7.80E-02		

STL Richland RER2 - Replicate Error Ratio =  $(S-D)/[\sqrt{(TPUs)+(TPUs)})]$  as defined by ICPT BOA.

rptSTLRchSaSum J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.

mary2 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

## Sample Results Summary

Date: 31-Jul-03

## STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 23222

SDG No: 23303

Batch	Client Id Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
<b>3192331 E901.1</b>									
9538-00-003F01	FRM4W1AA	THALLIUM-208	2.88E-01 +/- 6.3E-02	U	pCi/g		9.50E-02		
9538-00-004F	FRM4K1AA	ACTINIUM-228	7.96E-01 +/- 2.3E-01		pCi/g		1.81E-01		
	AG-108M		1.81E-03 +/- 2.4E-02	U	pCi/g		4.23E-02	2.86E-01	
	AMERICIUM-241		5.46E-02 +/- 6.1E-02	U	pCi/g		1.01E-01	1.03E+00	
	BISMUTH-212		1.02E+00 +/- 5.3E-01	U	pCi/g		1.02E+00		
	BISMUTH-214		9.04E-01 +/- 1.8E-01	U	pCi/g		2.50E-01		
	COBALT-60		-2.47E-02 +/- 2.9E-02	U	pCi/g		4.68E-02	1.50E-01	
	CESIUM-134		9.57E-02 +/- 4.5E-02	U	pCi/g		7.95E-02	1.90E-01	
	CESIUM-137		1.71E-01 +/- 5.0E-02	J	pCi/g		6.08E-02	3.20E-01	
	EUROPIUM-152		-2.12E-02 +/- 9.8E-02	U	pCi/g		1.43E-01	4.04E-01	
	EUROPIUM-154		2.46E-02 +/- 8.6E-02	U	pCi/g		1.62E-01	3.70E-01	
	EUROPIUM-155		9.80E-02 +/- 1.1E-01	U	pCi/g		1.39E-01	1.57E+01	
	POTASSIUM-40		9.69E+00 +/- 1.5E+00		pCi/g		3.94E-01		
	MANGANESE-54		2.31E-03 +/- 3.2E-02	U	pCi/g		5.82E-02	6.96E-01	
	NIOBIA-94		-1.03E-02 +/- 2.7E-02	U	pCi/g		4.64E-02	2.85E-01	
	LEAD-212		9.30E-01 +/- 1.8E-01		pCi/g		7.86E-02		
	LEAD-214		8.70E-01 +/- 1.7E-01		pCi/g		9.90E-02		
	RADIUM-226		9.04E-01 +/- 1.8E-01		pCi/g		9.72E-02		
	THALLIUM-208		3.11E-01 +/- 7.8E-02		pCi/g		5.13E-02		
9538-00-004F01	FRM4M1AA	ACTINIUM-228	6.82E-01 +/- 2.0E-01		pCi/g		1.46E-01		
	AG-108M		-7.99E-03 +/- 2.3E-02	U	pCi/g		3.87E-02	2.86E-01	
	AMERICIUM-241		4.96E-02 +/- 5.7E-02	U	pCi/g		8.81E-02	1.03E+00	
	BISMUTH-212		8.59E-01 +/- 4.6E-01	U	pCi/g		8.79E-01		
	BISMUTH-214		8.02E-01 +/- 1.7E-01		pCi/g		9.09E-02		
	COBALT-60		-4.04E-03 +/- 2.4E-02	U	pCi/g		4.42E-02	1.50E-01	
	CESIUM-134		3.69E-02 +/- 3.0E-02	U	pCi/g		6.00E-02	1.90E-01	
	CESIUM-137		1.61E-01 +/- 6.0E-02	J	pCi/g		4.83E-02	3.20E-01	
	EUROPIUM-152		-1.52E-02 +/- 7.5E-02	U	pCi/g		1.30E-01	4.04E-01	
	EUROPIUM-154		3.21E-02 +/- 8.6E-02	U	pCi/g		1.62E-01	3.70E-01	
	EUROPIUM-155		3.16E-02 +/- 7.3E-02	U	pCi/g		1.26E-01	1.57E+01	
	POTASSIUM-40		8.89E+00 +/- 1.4E+00		pCi/g		3.71E-01		
	MANGANESE-54		-2.87E-02 +/- 3.3E-02	U	pCi/g		5.36E-02	6.96E-01	
	NIOBIA-94		-1.07E-02 +/- 2.4E-02	U	pCi/g		4.05E-02	2.85E-01	
	LEAD-212		7.75E-01 +/- 1.5E-01		pCi/g		7.04E-02		
	LEAD-214		7.50E-01 +/- 1.7E-01		pCi/g		9.43E-02		

STL Richland

RER2 = Replicate Error Ratio =  $(S-D)/[\sqrt{(\text{sq}(TPUs)+\text{sq}(TPUs))}]$  as defined by ICPT BOA.rp1STLRichSaSum  
mary2 V4.04 A97J Qual - No U qualifier has been assigned, and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

**Sample Results Summary**  
**STL Richland STLRL**  
 Ordered by Method, Batch No., Client Sample ID.

Date: 31-Jul-03

Report No. : 23222

SDG No: 23303

Batch	Client Id Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
<b>3192331 E901.1</b>									
	9538-00-004F01	FRM4M1AA RADIUM-226	8.02E-01 +/- 1.7E-01		pCi/g		9.09E-02		
		THALLIUM-208	2.65E-01 +/- 6.2E-02	U	pCi/g		9.67E-02		
	9538-00-007F	FRM201AA ACTINIUM-228	1.06E+00 +/- 2.7E-01		pCi/g		1.94E-01		
		AG-108M	-4.17E-03 +/- 2.7E-02	U	pCi/g		4.55E-02 2.86E-01		
		AMERICIUM-241	7.30E-02 +/- 6.5E-02	U	pCi/g		1.04E-01 1.03E+00		
		BISMUTH-212	1.35E+00 +/- 5.4E-01	U	pCi/g		1.06E+00		
		BISMUTH-214	9.54E-01 +/- 1.9E-01		pCi/g		1.05E-01		
		COBALT-60	6.09E-03 +/- 3.1E-02	U	pCi/g		5.86E-02 1.50E-01		
		CESIUM-134	8.48E-02 +/- 4.2E-02	U	pCi/g		8.29E-02 1.90E-01		
		CESIUM-137	1.80E-01 +/- 5.5E-02	J	pCi/g		6.27E-02 3.20E-01		
		EUROPIUM-152	-3.95E-02 +/- 8.9E-02	U	pCi/g		1.50E-01 4.04E-01		
		EUROPIUM-154	-2.23E-02 +/- 9.9E-02	U	pCi/g		1.75E-01 3.70E-01		
		EUROPIUM-155	2.90E-02 +/- 8.4E-02	U	pCi/g		1.43E-01 1.57E+01		
		POTASSIUM-40	1.07E+01 +/- 1.7E+00		pCi/g		4.13E-01		
		MANGANESE-54	3.54E-03 +/- 3.1E-02	U	pCi/g		5.66E-02 6.96E-01		
		NIOBIIUM-94	-9.72E-03 +/- 2.6E-02	U	pCi/g		4.59E-02 2.85E-01		
		LEAD-212	9.84E-01 +/- 1.9E-01		pCi/g		8.51E-02		
		LEAD-214	1.08E+00 +/- 2.0E-01		pCi/g		9.96E-02		
		RADIUM-226	9.54E-01 +/- 1.9E-01		pCi/g		1.05E-01		
		THALLIUM-208	3.77E-01 +/- 8.3E-02		pCi/g		5.39E-02		
	9538-00-007F DUP	FRM201AC ACTINIUM-228	7.30E-01 +/- 2.3E-01		pCi/g		1.96E-01		
		AG-108M	-5.97E-03 +/- 2.5E-02	U	pCi/g		4.24E-02 2.86E-01		
		AMERICIUM-241	9.94E-03 +/- 6.1E-02	U	pCi/g		9.79E-02 1.03E+00		
		BISMUTH-212	1.19E+00 +/- 7.1E-01	U	pCi/g		1.00E+00		
		BISMUTH-214	1.08E+00 +/- 1.9E-01		pCi/g		9.69E-02		
		COBALT-60	1.29E-02 +/- 3.1E-02	U	pCi/g		5.93E-02 1.50E-01		
		CESIUM-134	4.65E-02 +/- 3.8E-02	U	pCi/g		7.37E-02 1.90E-01		
		CESIUM-137	1.02E-01 +/- 7.0E-02	J	pCi/g		5.67E-02 3.20E-01		
		EUROPIUM-152	-2.26E-02 +/- 7.7E-02	U	pCi/g		1.33E-01 4.04E-01		
		EUROPIUM-154	3.82E-02 +/- 9.0E-02	U	pCi/g		1.70E-01 3.70E-01		
		EUROPIUM-155	1.15E-01 +/- 8.1E-02	U	pCi/g		1.42E-01 1.57E+01		
		POTASSIUM-40	1.12E+01 +/- 1.7E+00		pCi/g		4.16E-01		
		MANGANESE-54	7.38E-03 +/- 3.1E-02	U	pCi/g		5.68E-02 6.96E-01		
		NIOBIIUM-94	-1.59E-02 +/- 2.6E-02	U	pCi/g		4.41E-02 2.85E-01		
		LEAD-212	9.89E-01 +/- 1.9E-01		pCi/g		7.64E-02		

STL Richland      RER2 = Replicate Error Ratio =  $(S-D)/[\sqrt{(\text{sq}(TPUs)+\text{sq}(TPUs))}]$  as defined by ICPT BOA.

rptSTLRchSaSum      J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value Is Estimated.

mary2 V4.04 A97      U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

## Sample Results Summary

Date: 31-Jul-03

## STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 23222

SDG No: 23303

Batch	Client Id Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
<b>3192331 E901.1</b>									
9538-00-007F DUP									
FRM201AC	LEAD-214		1.07E+00 +/- 1.9E-01		pCi/g		9.12E-02		
	RADIUM-226		1.08E+00 +/- 1.9E-01		pCi/g		9.69E-02		
	THALLIUM-208		2.82E-01 +/- 7.6E-02	U	pCi/g		1.10E-01		
9538-00-007F01									
FRM231AA	ACTINIUM-228		8.63E-01 +/- 2.0E-01	U	pCi/g		3.58E-01		
	AG-108M		-4.13E-03 +/- 2.3E-02	U	pCi/g		3.90E-02	2.86E-01	
	AMERICIUM-241		1.19E-02 +/- 5.4E-02	U	pCi/g		8.93E-02	1.03E+00	
	BISMUTH-212		9.56E-01 +/- 4.7E-01	U	pCi/g		9.03E-01		
	BISMUTH-214		8.31E-01 +/- 1.8E-01		pCi/g		8.45E-02		
	COBALT-60		3.12E-02 +/- 3.1E-02	U	pCi/g		6.23E-02	1.50E-01	
	CESIUM-134		5.20E-02 +/- 3.4E-02	U	pCi/g		6.75E-02	1.90E-01	
	CESIUM-137		2.94E-01 +/- 6.1E-02	J	pCi/g		4.93E-02	3.20E-01	
	EUROPIUM-152		-3.94E-02 +/- 7.3E-02	U	pCi/g		1.24E-01	4.04E-01	
	EUROPIUM-154		3.85E-02 +/- 9.3E-02	U	pCi/g		1.75E-01	3.70E-01	
	EUROPIUM-155		-2.79E-03 +/- 7.2E-02	U	pCi/g		1.21E-01	1.57E+01	
	POTASSIUM-40		9.97E+00 +/- 1.6E+00		pCi/g		4.39E-01		
	MANGANESE-54		-7.77E-03 +/- 2.9E-02	U	pCi/g		5.06E-02	6.96E-01	
	NIOBIUM-94		1.94E-02 +/- 2.6E-02	U	pCi/g		5.01E-02	2.85E-01	
	LEAD-212		7.27E-01 +/- 1.5E-01		pCi/g		7.84E-02		
	LEAD-214		7.80E-01 +/- 1.6E-01		pCi/g		9.84E-02		
	RADIUM-226		8.31E-01 +/- 1.8E-01		pCi/g		8.45E-02		
	THALLIUM-208		2.17E-01 +/- 6.6E-02		pCi/g		4.53E-02		
9538-00-008F									
FRM321AA	ACTINIUM-228		6.16E-01 +/- 2.1E-01		pCi/g		1.84E-01		
	AG-108M		-1.12E-02 +/- 2.2E-02	U	pCi/g		3.75E-02	2.86E-01	
	AMERICIUM-241		3.37E-02 +/- 9.2E-02	U	pCi/g		1.58E-01	1.03E+00	
	BISMUTH-212		6.37E-01 +/- 4.0E-01	U	pCi/g		7.80E-01		
	BISMUTH-214		7.29E-01 +/- 1.5E-01		pCi/g		8.31E-02		
	COBALT-60		1.35E-02 +/- 2.6E-02	U	pCi/g		5.20E-02	1.50E-01	
	CESIUM-134		1.38E-02 +/- 3.1E-02	U	pCi/g		5.66E-02	1.90E-01	
	CESIUM-137		1.62E-01 +/- 4.6E-02	J	pCi/g		4.37E-02	3.20E-01	
	EUROPIUM-152		-1.99E-02 +/- 7.8E-02	U	pCi/g		1.12E-01	4.04E-01	
	EUROPIUM-154		-2.26E-02 +/- 7.3E-02	U	pCi/g		1.29E-01	3.70E-01	
	EUROPIUM-155		9.77E-02 +/- 7.4E-02	U	pCi/g		1.35E-01	1.57E+01	
	POTASSIUM-40		1.04E+01 +/- 1.6E+00		pCi/g		4.40E-01		
	MANGANESE-54		1.55E-02 +/- 2.9E-02	U	pCi/g		5.46E-02	6.96E-01	
	NIOBIUM-94		1.90E-03 +/- 2.2E-02	U	pCi/g		4.10E-02	2.85E-01	

STL Richland

rptSTLRchSaSum  
mary2 V4.04 A97RER2 - Replicate Error Ratio =  $(S-D)/[\sqrt{(sq(TPUs)+sq(TPUd))}]$  as defined by ICPT BOA.

J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

## Sample Results Summary

Date: 31-Jul-03

## STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID.

Report No.: 23222

SDG No: 23303

Client Id Batch	Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
<b>3192331 E901.1</b>									
	9538-00-008F	FRM321AA LEAD-212	6.63E-01 +/- 1.3E-01		pCi/g		9.19E-02		
		LEAD-214	7.58E-01 +/- 1.6E-01		pCi/g		8.40E-02		
		RADIUM-226	7.29E-01 +/- 1.5E-01		pCi/g		8.31E-02		
		THALLIUM-208	2.81E-01 +/- 6.3E-02	U	pCi/g		9.76E-02		
<b>9538-00-008F01</b>									
	FRM4F1AA	ACTINIUM-228	8.01E-01 +/- 2.0E-01		pCi/g		1.78E-01		
		AG-108M	2.55E-03 +/- 2.1E-02	U	pCi/g		3.76E-02 2.86E-01		
		AMERICIUM-241	4.10E-02 +/- 9.4E-02	U	pCi/g		1.63E-01 1.03E+00		
		BISMUTH-212	6.69E-01 +/- 5.5E-01	U	pCi/g		8.51E-01		
		BISMUTH-214	7.62E-01 +/- 1.5E-01		pCi/g		8.35E-02		
		COBALT-60	1.02E-02 +/- 2.8E-02	U	pCi/g		5.41E-02 1.50E-01		
		CESIUM-134	4.49E-02 +/- 3.3E-02	U	pCi/g		6.54E-02 1.90E-01		
		CESIUM-137	1.41E-01 +/- 5.8E-02	J	pCi/g		4.87E-02 3.20E-01		
		EUROPIUM-152	-5.06E-02 +/- 8.6E-02	U	pCi/g		1.22E-01 4.04E-01		
		EUROPIUM-154	-1.03E-01 +/- 9.0E-02	U	pCi/g		1.41E-01 3.70E-01		
		EUROPIUM-155	1.56E-02 +/- 7.5E-02	U	pCi/g		1.33E-01 1.57E+01		
		POTASSIUM-40	1.20E+01 +/- 1.8E+00		pCi/g		4.17E-01		
		MANGANESE-54	-2.61E-03 +/- 2.7E-02	U	pCi/g		4.88E-02 6.96E-01		
		NIOBIUM-94	7.75E-03 +/- 2.7E-02	U	pCi/g		4.99E-02 2.85E-01		
		LEAD-212	7.03E-01 +/- 1.4E-01		pCi/g		9.43E-02		
		LEAD-214	8.14E-01 +/- 1.6E-01		pCi/g		8.99E-02		
		RADIUM-226	7.62E-01 +/- 1.5E-01		pCi/g		8.35E-02		
		THALLIUM-208	2.50E-01 +/- 6.3E-02		pCi/g		4.40E-02		
<b>9538-00-008FS</b>									
	FRM391AA	ACTINIUM-228	7.97E-01 +/- 2.3E-01	U	pCi/g		3.49E-01		
		AG-108M	-3.95E-03 +/- 2.2E-02	U	pCi/g		3.69E-02 2.86E-01		
		AMERICIUM-241	-6.18E-02 +/- 8.3E-02	U	pCi/g		1.33E-01 1.03E+00		
		BISMUTH-212	9.47E-01 +/- 4.4E-01	U	pCi/g		8.66E-01		
		BISMUTH-214	8.56E-01 +/- 1.7E-01		pCi/g		8.54E-02		
		COBALT-60	1.41E-02 +/- 3.1E-02	U	pCi/g		5.87E-02 1.50E-01		
		CESIUM-134	1.93E-02 +/- 3.5E-02	U	pCi/g		6.32E-02 1.90E-01		
		CESIUM-137	2.50E-01 +/- 6.2E-02	J	pCi/g		5.68E-02 3.20E-01		
		EUROPIUM-152	-8.15E-02 +/- 7.2E-02	U	pCi/g		1.16E-01 4.04E-01		
		EUROPIUM-154	-1.77E-02 +/- 9.5E-02	U	pCi/g		1.69E-01 3.70E-01		
		EUROPIUM-155	-2.65E-02 +/- 7.1E-02	U	pCi/g		1.19E-01 1.57E+01		
		POTASSIUM-40	1.10E+01 +/- 1.7E+00		pCi/g		3.44E-01		
		MANGANESE-54	-2.07E-02 +/- 3.1E-02	U	pCi/g		5.15E-02 6.96E-01		

STL Richland RER2 - Replicate Error Ratio =  $(S-D)/[\sqrt{(\text{sq}(TPUs)+\text{sq}(TPUs))}]$  as defined by ICPT BOA.  
 rptSTLRchSaSum J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 mary2 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

## Sample Results Summary

Date: 31-Jul-03

## STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 23222

SDG No: 23303

Batch	Client Id Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
<b>3192331 E901.1</b>									
9538-00-008FS									
FRM391AA	NIOBium-94	-2.89E-03	+ - 2.6E-02	U	pCi/g		4.67E-02	2.85E-01	
	LEAD-212	8.36E-01	+ - 1.6E-01		pCi/g		1.03E-01		
	LEAD-214	1.01E+00	+ - 2.0E-01		pCi/g		9.12E-02		
	RADIUM-226	8.56E-01	+ - 1.7E-01		pCi/g		8.54E-02		
	THALLIUM-208	2.76E-01	+ - 7.4E-02		pCi/g		4.35E-02		
9538-00-008FS01									
FRM4G1AA	ACTINIUM-228	7.89E-01	+ - 2.0E-01		pCi/g		1.41E-01		
AG-108M		-6.92E-03	+ - 2.2E-02	U	pCi/g		3.69E-02	2.86E-01	
AMERICIUM-241		6.79E-02	+ - 6.1E-02	U	pCi/g		9.30E-02	1.03E+00	
BISMUTH-212		8.35E-01	+ - 4.7E-01	U	pCi/g		8.51E-01		
BISMUTH-214		7.40E-01	+ - 1.5E-01	U	pCi/g		2.08E-01		
COBALT-60		1.19E-02	+ - 2.9E-02	U	pCi/g		5.58E-02	1.50E-01	
CESIUM-134		4.45E-02	+ - 2.9E-02	U	pCi/g		5.84E-02	1.90E-01	
CESIUM-137		1.94E-01	+ - 5.9E-02	J	pCi/g		4.27E-02	3.20E-01	
EUROPIUM-152		-2.66E-02	+ - 6.7E-02	U	pCi/g		1.14E-01	4.04E-01	
EUROPIUM-154		3.52E-02	+ - 7.6E-02	U	pCi/g		1.49E-01	3.70E-01	
EUROPIUM-155		7.37E-02	+ - 6.9E-02	U	pCi/g		1.24E-01	1.57E+01	
POTASSIUM-40		1.08E+01	+ - 1.6E+00		pCi/g		4.13E-01		
MANGANESE-54		2.03E-04	+ - 2.6E-02	U	pCi/g		4.72E-02	6.96E-01	
NIOBium-94		8.84E-03	+ - 2.0E-02	U	pCi/g		3.94E-02	2.85E-01	
LEAD-212		7.59E-01	+ - 1.4E-01		pCi/g		6.64E-02		
LEAD-214		8.31E-01	+ - 1.6E-01		pCi/g		8.92E-02		
RADIUM-226		7.40E-01	+ - 1.5E-01		pCi/g		8.48E-02		
THALLIUM-208		2.81E-01	+ - 6.9E-02	U	pCi/g		9.08E-02		
9538-00-012F									
FRM281AA	ACTINIUM-228	8.16E-01	+ - 1.9E-01		pCi/g		1.60E-01		
AG-108M		-8.66E-03	+ - 2.2E-02	U	pCi/g		3.69E-02	2.86E-01	
AMERICIUM-241		4.62E-02	+ - 7.9E-02	U	pCi/g		1.36E-01	1.03E+00	
BISMUTH-212		1.02E+00	+ - 5.2E-01	U	pCi/g		8.59E-01		
BISMUTH-214		7.37E-01	+ - 1.5E-01	U	pCi/g		2.03E-01		
COBALT-60		2.42E-02	+ - 3.2E-02	U	pCi/g		6.20E-02	1.50E-01	
CESIUM-134		2.19E-02	+ - 3.2E-02	U	pCi/g		5.95E-02	1.90E-01	
CESIUM-137		1.25E-01	+ - 5.6E-02	J	pCi/g		5.03E-02	3.20E-01	
EUROPIUM-152		4.07E-03	+ - 7.0E-02	U	pCi/g		1.24E-01	4.04E-01	
EUROPIUM-154		-1.31E-02	+ - 9.1E-02	U	pCi/g		1.61E-01	3.70E-01	
EUROPIUM-155		5.21E-03	+ - 6.7E-02	U	pCi/g		1.15E-01	1.57E+01	
POTASSIUM-40		1.05E+01	+ - 1.6E+00		pCi/g		4.10E-01		

STL Richland RER2 - Replicate Error Ratio =  $(S-D)/[\sqrt{(TPUs)+(TPUs)^2}]$  as defined by ICPT BOA.

rptSTLRchSaSum J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value Is Estimated.

mary2 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

**Sample Results Summary**  
**STL Richland STLRL**  
 Ordered by Method, Batch No., Client Sample ID.

Date: 31-Jul-03

Report No. : 23222

SDG No: 23303

Batch	Client Id Work Order	Parameter	Result ± Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
<b>3192331 E901.1</b>									
	9538-00-012F								
	FRM281AA	MANGANESE-54	-1.43E-02 ± 3.0E-02	U	pCi/g		5.01E-02	6.96E-01	
		NIOBIUM-94	1.57E-03 ± 2.4E-02	U	pCi/g		4.35E-02	2.85E-01	
		LEAD-212	8.02E-01 ± 1.5E-01		pCi/g		6.50E-02		
		LEAD-214	8.64E-01 ± 1.8E-01		pCi/g		8.60E-02		
		RADIUM-226	7.37E-01 ± 1.5E-01		pCi/g		8.34E-02		
		THALLIUM-208	2.24E-01 ± 6.8E-02		pCi/g		4.28E-02		
	9538-00-012F01								
	FRM3E1AA	ACTINIUM-228	8.33E-01 ± 1.8E-01		pCi/g		1.19E-01		
		AG-108M	1.27E-03 ± 1.9E-02	U	pCi/g		3.35E-02	2.86E-01	
		AMERICIUM-241	-1.49E-02 ± 5.7E-02	U	pCi/g		8.36E-02	1.03E+00	
		BISMUTH-212	7.57E-01 ± 5.9E-01	U	pCi/g		8.19E-01		
		BISMUTH-214	7.73E-01 ± 1.4E-01		pCi/g		6.90E-02		
		COBALT-60	5.06E-02 ± 2.7E-02	U	pCi/g		5.95E-02	1.50E-01	
		CESIUM-134	4.21E-02 ± 2.9E-02	U	pCi/g		5.76E-02	1.90E-01	
		CESIUM-137	1.30E-01 ± 4.7E-02	J	pCi/g		4.74E-02	3.20E-01	
		EUROPIUM-152	-1.21E-02 ± 6.3E-02	U	pCi/g		1.09E-01	4.04E-01	
		EUROPIUM-154	5.26E-02 ± 7.5E-02	U	pCi/g		1.48E-01	3.70E-01	
		EUROPIUM-155	2.72E-02 ± 6.6E-02	U	pCi/g		1.15E-01	1.57E+01	
		POTASSIUM-40	1.02E+01 ± 1.5E+00		pCi/g		3.11E-01		
		MANGANESE-54	-5.14E-03 ± 2.6E-02	U	pCi/g		4.50E-02	6.96E-01	
		NIOBIUM-94	1.75E-02 ± 2.3E-02	U	pCi/g		4.35E-02	2.85E-01	
		LEAD-212	7.11E-01 ± 1.3E-01		pCi/g		6.04E-02		
		LEAD-214	7.98E-01 ± 1.6E-01		pCi/g		7.83E-02		
		RADIUM-226	7.73E-01 ± 1.4E-01		pCi/g		6.90E-02		
		THALLIUM-208	2.58E-01 ± 5.7E-02		pCi/g		4.52E-02		
	9538-00-012FS								
	FRM3C1AA	ACTINIUM-228	6.80E-01 ± 2.0E-01		pCi/g		1.65E-01		
		AG-108M	7.76E-04 ± 2.0E-02	U	pCi/g		3.55E-02	2.86E-01	
		AMERICIUM-241	-2.42E-02 ± 9.3E-02	U	pCi/g		1.56E-01	1.03E+00	
		BISMUTH-212	6.69E-01 ± 4.3E-01	U	pCi/g		8.44E-01		
		BISMUTH-214	7.17E-01 ± 1.5E-01	U	pCi/g		2.13E-01		
		COBALT-60	1.43E-02 ± 2.6E-02	U	pCi/g		5.27E-02	1.50E-01	
		CESIUM-134	2.01E-02 ± 3.1E-02	U	pCi/g		5.85E-02	1.90E-01	
		CESIUM-137	1.81E-01 ± 5.0E-02	J	pCi/g		5.49E-02	3.20E-01	
		EUROPIUM-152	-1.35E-02 ± 7.0E-02	U	pCi/g		1.20E-01	4.04E-01	
		EUROPIUM-154	2.29E-02 ± 7.1E-02	U	pCi/g		1.39E-01	3.70E-01	
		EUROPIUM-155	9.94E-02 ± 8.0E-02	U	pCi/g		1.45E-01	1.57E+01	

STL Richland      RER2 = Replicate Error Ratio =  $(S-D)/[\sqrt{(sq(TPUs)+sq(TPUs))}]$  as defined by ICPT BOA.

rptSTLRchSaSum  
mary2 V4.04 A97      J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

## Sample Results Summary

Date: 31-Jul-03

## STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID.

Report No.: 23222

SDG No: 23303

Client Id Batch	Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
<b>3192331 E901.1</b>									
9538-00-012FS									
FRM3C1AA	POTASSIUM-40	1.11E+01	+/- 1.7E+00		pCi/g		4.40E-01		
	MANGANESE-54	3.48E-03	+/- 2.9E-02	U	pCi/g		5.19E-02	6.96E-01	
	NIOBIDIUM-94	-1.26E-02	+/- 2.2E-02	U	pCi/g		3.76E-02	2.85E-01	
	LEAD-212	7.56E-01	+/- 1.4E-01		pCi/g		6.94E-02		
	LEAD-214	7.55E-01	+/- 1.5E-01		pCi/g		8.49E-02		
	RADIUM-226	7.17E-01	+/- 1.5E-01		pCi/g		8.10E-02		
	THALLIUM-208	2.37E-01	+/- 7.0E-02		pCi/g		4.01E-02		
9538-00-012FS01									
FRM3G1AA	ACTINIUM-228	6.82E-01	+/- 2.0E-01		pCi/g		1.70E-01		
AG-108M	8.11E-03	+/- 2.2E-02	U	pCi/g			3.92E-02	2.86E-01	
AMERICIUM-241	3.32E-03	+/- 5.7E-02	U	pCi/g			8.58E-02	1.03E+00	
BISMUTH-212	6.91E-01	+/- 4.3E-01	U	pCi/g			8.24E-01		
BISMUTH-214	8.06E-01	+/- 1.4E-01	U	pCi/g			2.17E-01		
COBALT-60	1.02E-02	+/- 2.9E-02	U	pCi/g			5.46E-02	1.50E-01	
CESIUM-134	3.50E-02	+/- 3.1E-02	U	pCi/g			6.13E-02	1.90E-01	
CESIUM-137	1.41E-01	+/- 5.7E-02	J	pCi/g			4.88E-02	3.20E-01	
EUROPIUM-152	9.65E-03	+/- 7.4E-02	U	pCi/g			1.26E-01	4.04E-01	
EUROPIUM-154	-4.30E-02	+/- 7.3E-02	U	pCi/g			1.23E-01	3.70E-01	
EUROPIUM-155	4.80E-02	+/- 7.1E-02	U	pCi/g			1.24E-01	1.57E+01	
POTASSIUM-40	8.72E+00	+/- 1.5E+00		pCi/g			3.51E-01		
MANGANESE-54	-1.46E-04	+/- 2.9E-02	U	pCi/g			5.13E-02	6.96E-01	
NIOBIDIUM-94	-4.98E-03	+/- 2.5E-02	U	pCi/g			4.38E-02	2.85E-01	
LEAD-212	7.56E-01	+/- 1.5E-01		pCi/g			7.07E-02		
LEAD-214	7.74E-01	+/- 1.5E-01		pCi/g			8.59E-02		
RADIUM-226	8.06E-01	+/- 1.4E-01		pCi/g			8.34E-02		
THALLIUM-208	2.72E-01	+/- 5.7E-02		pCi/g			4.02E-02		
9538-00-015F									
FRM3M1AA	ACTINIUM-228	6.30E-01	+/- 2.0E-01		pCi/g		1.41E-01		
AG-108M	-5.23E-03	+/- 2.2E-02	U	pCi/g			3.80E-02	2.86E-01	
AMERICIUM-241	-8.53E-03	+/- 5.5E-02	U	pCi/g			8.42E-02	1.03E+00	
BISMUTH-212	6.86E-01	+/- 4.5E-01	U	pCi/g			8.54E-01		
BISMUTH-214	7.54E-01	+/- 1.5E-01	U	pCi/g			2.09E-01		
COBALT-60	1.58E-02	+/- 2.4E-02	U	pCi/g			4.90E-02	1.50E-01	
CESIUM-134	1.51E-02	+/- 3.1E-02	U	pCi/g			5.75E-02	1.90E-01	
CESIUM-137	1.11E-01	+/- 4.4E-02	J	pCi/g			5.46E-02	3.20E-01	
EUROPIUM-152	-1.24E-02	+/- 7.8E-02	U	pCi/g			1.30E-01	4.04E-01	
EUROPIUM-154	-1.93E-02	+/- 8.8E-02	U	pCi/g			1.56E-01	3.70E-01	

STL Richland

RER2 - Replicate Error Ratio =  $(S-D)/[\sqrt{(TPUs)+(TPUs)})]$  as defined by ICPT BOA.rp1STLRchSaSum  
mary2 V4.04 A97J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

**Sample Results Summary**  
**STL Richland STLRL**  
 Ordered by Method, Batch No., Client Sample ID.

Date: 31-Jul-03

Report No.: 23222

SDG No: 23303

Batch	Client Id Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
<b>3192331 E901.1</b>									
9538-00-015F									
FRM3M1AA	EUROPIUM-155		-3.40E-02 +/- 7.1E-02	U	pCi/g		1.17E-01	1.57E+01	
	POTASSIUM-40		1.02E+01 +/- 1.6E+00		pCi/g		4.64E-01		
	MANGANESE-54		-7.48E-03 +/- 3.1E-02	U	pCi/g		5.39E-02	6.96E-01	
	NIOBium-94		-9.51E-03 +/- 2.4E-02	U	pCi/g		4.09E-02	2.85E-01	
	LEAD-212		6.97E-01 +/- 1.4E-01		pCi/g		7.14E-02		
	LEAD-214		8.75E-01 +/- 1.7E-01		pCi/g		8.11E-02		
	RADIUM-226		7.54E-01 +/- 1.5E-01		pCi/g		8.09E-02		
	THALLIUM-208		2.53E-01 +/- 6.9E-02	U	pCi/g		9.00E-02		
9538-00-015F01									
FRM3X1AA	ACTINIUM-228		6.12E-01 +/- 2.0E-01		pCi/g		1.55E-01		
AG-108M			-3.63E-03 +/- 2.0E-02	U	pCi/g		3.49E-02	2.86E-01	
AMERICIUM-241			2.87E-02 +/- 7.5E-02	U	pCi/g		1.27E-01	1.03E+00	
BISMUTH-212			3.55E-01 +/- 4.0E-01	U	pCi/g		7.37E-01		
BISMUTH-214			6.01E-01 +/- 1.3E-01	U	pCi/g		1.90E-01		
COBALT-60			-1.09E-03 +/- 2.8E-02	U	pCi/g		5.05E-02	1.50E-01	
CESIUM-134			1.87E-02 +/- 3.1E-02	U	pCi/g		5.82E-02	1.90E-01	
CESIUM-137			1.74E-01 +/- 5.1E-02	J	pCi/g		5.04E-02	3.20E-01	
EUROPIUM-152			1.29E-02 +/- 7.8E-02	U	pCi/g		1.22E-01	4.04E-01	
EUROPIUM-154			-2.18E-03 +/- 8.5E-02	U	pCi/g		1.54E-01	3.70E-01	
EUROPIUM-155			-1.54E-02 +/- 6.5E-02	U	pCi/g		1.09E-01	1.57E+01	
POTASSIUM-40			1.07E+01 +/- 1.7E+00		pCi/g		4.09E-01		
MANGANESE-54			-3.23E-03 +/- 3.0E-02	U	pCi/g		5.33E-02	6.96E-01	
NIOBium-94			9.43E-03 +/- 2.4E-02	U	pCi/g		4.50E-02	2.85E-01	
LEAD-212			6.95E-01 +/- 1.4E-01		pCi/g		6.16E-02		
LEAD-214			6.64E-01 +/- 1.6E-01		pCi/g		7.14E-02		
RADIUM-226			6.01E-01 +/- 1.3E-01		pCi/g		8.80E-02		
THALLIUM-208			1.99E-01 +/- 6.6E-02		pCi/g		4.56E-02		
<b>3192332 E901.1</b>									
9538-00-001F									
FRM531AA	ACTINIUM-228		6.10E-01 +/- 1.6E-01	U	pCi/g		2.97E-01		
AG-108M			-1.77E-02 +/- 2.0E-02	U	pCi/g		3.18E-02	2.86E-01	
AMERICIUM-241			2.68E-02 +/- 7.1E-02	U	pCi/g		1.21E-01	1.03E+00	
BISMUTH-212			5.35E-01 +/- 3.6E-01	U	pCi/g		7.21E-01		
BISMUTH-214			5.00E-01 +/- 1.2E-01	U	pCi/g		1.77E-01		
COBALT-60			2.83E-03 +/- 2.3E-02	U	pCi/g		4.49E-02	1.50E-01	
CESIUM-134			-6.80E-03 +/- 3.1E-02	U	pCi/g		5.32E-02	1.90E-01	
CESIUM-137			2.40E-03 +/- 2.7E-02	U	pCi/g		4.83E-02	3.20E-01	

STL Richland RER2 - Replicate Error Ratio =  $(S-D)/[\sqrt{(sq(TPUs)+sq(TPUd))}]$  as defined by ICPT BOA.  
 rptSTLRehSaSum J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 mary2 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

## Sample Results Summary

Date: 31-Jul-03

## STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 23222

SDG No: 23303

Batch	Client Id Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
<b>3192332 E901.1</b>									
	9538-00-001F								
FRM531AA	EUROPIUM-152	-1.69E-02	+/- 6.2E-02	U	pCi/g		1.03E-01	4.04E-01	
	EUROPIUM-154	-7.45E-03	+/- 9.3E-02	U	pCi/g		1.68E-01	3.70E-01	
	EUROPIUM-155	4.42E-02	+/- 6.3E-02	U	pCi/g		1.12E-01	1.57E+01	
	POTASSIUM-40	8.62E+00	+/- 1.5E+00		pCi/g		4.86E-01		
	MANGANESE-54	8.76E-03	+/- 2.7E-02	U	pCi/g		5.06E-02	6.96E-01	
	NIOBIUM-94	1.46E-02	+/- 2.6E-02	U	pCi/g		4.86E-02	2.85E-01	
	LEAD-212	4.98E-01	+/- 1.1E-01		pCi/g		8.55E-02		
	LEAD-214	6.29E-01	+/- 1.3E-01		pCi/g		7.63E-02		
	RADIUM-226	5.00E-01	+/- 1.2E-01	U	pCi/g		1.77E-01		
	THALLIUM-208	2.00E-01	+/- 5.2E-02		pCi/g		4.39E-02		
<b>9538-00-002F</b>									
FRM6K1AA	ACTINIUM-228	7.82E-01	+/- 2.1E-01	U	pCi/g		3.71E-01		
	AG-108M	-1.81E-02	+/- 2.5E-02	U	pCi/g		4.08E-02	2.86E-01	
	AMERICIUM-241	-9.08E-02	+/- 1.0E-01	U	pCi/g		1.64E-01	1.03E+00	
	BISMUTH-212	1.12E+00	+/- 5.0E-01	U	pCi/g		1.01E+00		
	BISMUTH-214	7.76E-01	+/- 1.8E-01	U	pCi/g		2.43E-01		
	COBALT-60	-1.64E-03	+/- 3.0E-02	U	pCi/g		5.66E-02	1.50E-01	
	CESIUM-134	3.88E-02	+/- 3.2E-02	U	pCi/g		6.54E-02	1.90E-01	
	CESIUM-137	2.92E-01	+/- 7.5E-02	J	pCi/g		5.61E-02	3.20E-01	
	EUROPIUM-152	-6.26E-02	+/- 9.5E-02	U	pCi/g		1.33E-01	4.04E-01	
	EUROPIUM-154	6.37E-02	+/- 9.8E-02	U	pCi/g		1.95E-01	3.70E-01	
	EUROPIUM-155	4.31E-02	+/- 8.3E-02	U	pCi/g		1.49E-01	1.57E+01	
	POTASSIUM-40	9.08E+00	+/- 1.5E+00		pCi/g		4.72E-01		
	MANGANESE-54	3.10E-02	+/- 3.5E-02	U	pCi/g		6.81E-02	6.96E-01	
	NIOBIUM-94	-1.00E-03	+/- 2.5E-02	U	pCi/g		4.56E-02	2.85E-01	
	LEAD-212	7.56E-01	+/- 1.5E-01		pCi/g		1.03E-01		
	LEAD-214	9.97E-01	+/- 1.8E-01		pCi/g		1.00E-01		
	RADIUM-226	7.76E-01	+/- 1.8E-01	U	pCi/g		2.43E-01		
	THALLIUM-208	2.14E-01	+/- 6.7E-02	U	pCi/g		1.07E-01		
<b>9538-00-002F01</b>									
FRM6N1AA	ACTINIUM-228	8.29E-01	+/- 1.8E-01		pCi/g		1.57E-01		
	AG-108M	4.73E-03	+/- 2.0E-02	U	pCi/g		3.54E-02	2.86E-01	
	AMERICIUM-241	7.03E-02	+/- 5.5E-02	U	pCi/g		8.58E-02	1.03E+00	
	BISMUTH-212	7.44E-01	+/- 3.7E-01	U	pCi/g		7.34E-01		
	BISMUTH-214	8.23E-01	+/- 1.5E-01		pCi/g		7.21E-02		
	COBALT-60	2.46E-02	+/- 2.2E-02	U	pCi/g		4.67E-02	1.50E-01	
	CESIUM-134	3.53E-02	+/- 2.7E-02	U	pCi/g		5.33E-02	1.90E-01	

STL Richland RER2 - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUs))] as defined by ICPT BOA.

rptSTLRchSaSum J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.

mary2 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

## Sample Results Summary

Date: 31-Jul-03

## STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID.

Report No.: 23222

SDG No: 23303

Client Id Batch	Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
<b>3192332 E901.1</b>									
	9538-00-002F01	FRM6N1AA CESIUM-137	3.11E-01 +/- 7.5E-02	J	pCi/g		4.33E-02	3.20E-01	
		EUROPIUM-152	-4.54E-03 +/- 6.1E-02	U	pCi/g		1.04E-01	4.04E-01	
		EUROPIUM-154	2.36E-04 +/- 6.6E-02	U	pCi/g		1.23E-01	3.70E-01	
		EUROPIUM-155	-2.20E-03 +/- 6.1E-02	U	pCi/g		1.05E-01	1.57E+01	
		POTASSIUM-40	9.72E+00 +/- 1.5E+00		pCi/g		3.22E-01		
		MANGANESE-54	-7.68E-04 +/- 2.5E-02	U	pCi/g		4.47E-02	6.96E-01	
		NIOBium-94	-1.84E-02 +/- 1.9E-02	U	pCi/g		3.14E-02	2.85E-01	
		LEAD-212	6.88E-01 +/- 1.4E-01		pCi/g		5.81E-02		
		LEAD-214	8.09E-01 +/- 1.6E-01		pCi/g		7.54E-02		
		RADIUM-226	8.23E-01 +/- 1.5E-01		pCi/g		7.21E-02		
		THALLIUM-208	2.75E-01 +/- 6.4E-02		pCi/g		4.04E-02		
<b>9538-00-005F</b>									
	FRM591AA	ACTINIUM-228	4.38E-01 +/- 1.8E-01		pCi/g		1.57E-01		
		AG-108M	8.24E-03 +/- 2.0E-02	U	pCi/g		3.65E-02	2.86E-01	
		AMERICIUM-241	-9.58E-03 +/- 8.2E-02	U	pCi/g		1.40E-01	1.03E+00	
		BISMUTH-212	5.04E-01 +/- 3.9E-01	U	pCi/g		7.78E-01		
		BISMUTH-214	5.62E-01 +/- 1.2E-01		pCi/g		7.44E-02		
		COBALT-60	4.61E-03 +/- 2.6E-02	U	pCi/g		5.00E-02	1.50E-01	
		CESIUM-134	1.43E-02 +/- 2.7E-02	U	pCi/g		5.25E-02	1.90E-01	
		CESIUM-137	-4.31E-03 +/- 2.6E-02	U	pCi/g		4.51E-02	3.20E-01	
		EUROPIUM-152	-3.94E-02 +/- 6.4E-02	U	pCi/g		1.06E-01	4.04E-01	
		EUROPIUM-154	4.23E-03 +/- 8.6E-02	U	pCi/g		1.59E-01	3.70E-01	
		EUROPIUM-155	3.81E-02 +/- 6.4E-02	U	pCi/g		1.16E-01	1.57E+01	
		POTASSIUM-40	1.02E+01 +/- 1.6E+00		pCi/g		3.08E-01		
		MANGANESE-54	8.97E-03 +/- 2.3E-02	U	pCi/g		4.48E-02	6.96E-01	
		NIOBium-94	5.30E-03 +/- 2.3E-02	U	pCi/g		4.31E-02	2.85E-01	
		LEAD-212	4.80E-01 +/- 1.1E-01		pCi/g		9.82E-02		
		LEAD-214	5.81E-01 +/- 1.5E-01		pCi/g		7.92E-02		
		RADIUM-226	5.62E-01 +/- 1.2E-01		pCi/g		7.44E-02		
		THALLIUM-208	1.33E-01 +/- 4.5E-02	U	pCi/g		7.52E-02		
<b>9538-00-006F</b>									
	FRM4X1AA	ACTINIUM-228	7.85E-01 +/- 2.2E-01		pCi/g		1.71E-01		
		AG-108M	-2.14E-02 +/- 2.4E-02	U	pCi/g		3.86E-02	2.86E-01	
		AMERICIUM-241	1.93E-02 +/- 8.3E-02	U	pCi/g		1.39E-01	1.03E+00	
		BISMUTH-212	6.98E-01 +/- 4.3E-01	U	pCi/g		8.34E-01		
		BISMUTH-214	7.22E-01 +/- 1.4E-01		pCi/g		8.16E-02		
		COBALT-60	-6.81E-03 +/- 3.0E-02	U	pCi/g		5.30E-02	1.50E-01	

STL Richland RER2 = Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

rptSTLRchSaSum J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
mary2 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

## Sample Results Summary

Date: 31-Jul-03

## STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 23222

SDG No: 23303

Batch	Client Id Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
<b>3192332 E901.1</b>									
9538-00-006F									
FRM4X1AA	CESIUM-134	4.35E-02	+/- 3.6E-02	U	pCi/g		6.85E-02	1.90E-01	
	CESIUM-137	3.37E-01	+/- 7.9E-02		pCi/g		4.81E-02	3.20E-01	
	EUROPIUM-152	-1.27E-02	+/- 7.4E-02	U	pCi/g		1.22E-01	4.04E-01	
	EUROPIUM-154	-2.86E-02	+/- 9.1E-02	U	pCi/g		1.60E-01	3.70E-01	
	EUROPIUM-155	6.11E-02	+/- 6.9E-02	U	pCi/g		1.21E-01	1.57E+01	
	POTASSIUM-40	1.00E+01	+/- 1.6E+00		pCi/g		3.96E-01		
	MANGANESE-54	3.81E-02	+/- 3.3E-02	U	pCi/g		6.33E-02	6.96E-01	
	NIOBIUM-94	-4.06E-03	+/- 2.6E-02	U	pCi/g		4.56E-02	2.85E-01	
	LEAD-212	7.03E-01	+/- 1.5E-01		pCi/g		7.43E-02		
	LEAD-214	8.99E-01	+/- 2.0E-01		pCi/g		8.63E-02		
	RADIUM-226	7.22E-01	+/- 1.4E-01		pCi/g		8.16E-02		
	THALLIUM-208	2.85E-01	+/- 6.3E-02		pCi/g		3.70E-02		
9538-00-006F DUP									
FRM4X1AC	ACTINIUM-228	6.49E-01	+/- 1.9E-01		pCi/g		1.56E-01		
	AG-108M	-1.00E-02	+/- 2.0E-02	U	pCi/g		3.38E-02	2.86E-01	
	AMERICIUM-241	3.74E-02	+/- 5.7E-02	U	pCi/g		9.03E-02	1.03E+00	
	BISMUTH-212	1.09E+00	+/- 6.1E-01	U	pCi/g		8.18E-01		
	BISMUTH-214	8.00E-01	+/- 1.4E-01		pCi/g		8.16E-02		
	COBALT-60	6.63E-03	+/- 2.7E-02	U	pCi/g		5.14E-02	1.50E-01	
	CESIUM-134	3.08E-02	+/- 2.8E-02	U	pCi/g		5.46E-02	1.90E-01	
	CESIUM-137	3.55E-01	+/- 6.9E-02		pCi/g		4.60E-02	3.20E-01	
	EUROPIUM-152	3.23E-02	+/- 6.6E-02	U	pCi/g		1.18E-01	4.04E-01	
	EUROPIUM-154	-1.64E-03	+/- 8.2E-02	U	pCi/g		1.49E-01	3.70E-01	
	EUROPIUM-155	4.24E-02	+/- 7.0E-02	U	pCi/g		1.22E-01	1.57E+01	
	POTASSIUM-40	1.02E+01	+/- 1.5E+00		pCi/g		3.51E-01		
	MANGANESE-54	-2.14E-02	+/- 2.5E-02	U	pCi/g		4.06E-02	6.96E-01	
	NIOBIUM-94	1.18E-04	+/- 2.3E-02	U	pCi/g		4.10E-02	2.85E-01	
	LEAD-212	6.56E-01	+/- 1.3E-01		pCi/g		9.84E-02		
	LEAD-214	8.00E-01	+/- 1.5E-01		pCi/g		8.25E-02		
	RADIUM-226	8.01E-01	+/- 1.4E-01		pCi/g		8.17E-02		
	THALLIUM-208	2.83E-01	+/- 6.5E-02		pCi/g		3.82E-02		
9538-00-006F01									
FRM401AA	ACTINIUM-228	7.64E-01	+/- 2.1E-01		pCi/g		1.33E-01		
	AG-108M	-1.47E-02	+/- 2.2E-02	U	pCi/g		3.56E-02	2.86E-01	
	AMERICIUM-241	8.23E-03	+/- 5.1E-02	U	pCi/g		8.27E-02	1.03E+00	
	BISMUTH-212	6.73E-01	+/- 4.3E-01	U	pCi/g		8.22E-01		
	BISMUTH-214	7.06E-01	+/- 1.5E-01		pCi/g		8.32E-02		

STL Richland RER2 - Replicate Error Ratio =  $(S-D)/[\sqrt{(sq(TPUs)+sq(TPUd))}]$  as defined by ICPT BOA.  
 rptSTLRchSaSum U Qual - Analyzed for, but the result is less than the Mdc/Mda Total Uncert or gamma scan software did not identify the nuclide.  
 mary2 V4.04 A97

## Sample Results Summary

Date: 31-Jul-03

## STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 23222

SDG No: 23303

Batch	Client Id Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
<b>3192332 E901.1</b>									
	9538-00-006F01	FRM401AA COBALT-60	2.07E-02 +/- 2.4E-02	U	pCi/g		4.89E-02	1.50E-01	
		CESIUM-134	3.59E-02 +/- 3.0E-02	U	pCi/g		5.85E-02	1.90E-01	
		CESIUM-137	3.30E-01 +/- 7.2E-02		pCi/g		5.05E-02	3.20E-01	
		EUROPIUM-152	1.76E-02 +/- 6.8E-02	U	pCi/g		1.22E-01	4.04E-01	
		EUROPIUM-154	-2.01E-02 +/- 6.6E-02	U	pCi/g		1.16E-01	3.70E-01	
		EUROPIUM-155	1.10E-01 +/- 7.1E-02	U	pCi/g		1.25E-01	1.57E+01	
		POTASSIUM-40	9.08E+00 +/- 1.4E+00		pCi/g		3.94E-01		
		MANGANESE-54	-9.82E-03 +/- 2.8E-02	U	pCi/g		4.84E-02	6.96E-01	
		NIOBIUM-94	1.47E-02 +/- 2.4E-02	U	pCi/g		4.51E-02	2.85E-01	
		LEAD-212	6.44E-01 +/- 1.3E-01		pCi/g		9.29E-02		
		LEAD-214	9.20E-01 +/- 1.7E-01		pCi/g		8.41E-02		
		RADIUM-226	7.06E-01 +/- 1.5E-01		pCi/g		8.32E-02		
		THALLIUM-208	2.36E-01 +/- 7.8E-02	U	pCi/g		9.52E-02		
<b>9538-00-009F</b>									
	FRM6H1AA ACTINIUM-228		7.26E-01 +/- 2.1E-01		pCi/g		1.50E-01		
		AG-108M	-8.30E-03 +/- 2.0E-02	U	pCi/g		3.40E-02	2.86E-01	
		AMERICIUM-241	5.75E-03 +/- 5.8E-02	U	pCi/g		8.40E-02	1.03E+00	
		BISMUTH-212	7.38E-01 +/- 3.8E-01	U	pCi/g		7.60E-01		
		BISMUTH-214	6.48E-01 +/- 1.5E-01	U	pCi/g		1.97E-01		
		COBALT-60	1.20E-02 +/- 2.5E-02	U	pCi/g		4.96E-02	1.50E-01	
		CESIUM-134	1.71E-02 +/- 2.6E-02	U	pCi/g		5.05E-02	1.90E-01	
		CESIUM-137	1.59E-01 +/- 5.8E-02	J	pCi/g		4.33E-02	3.20E-01	
		EUROPIUM-152	-7.61E-03 +/- 6.7E-02	U	pCi/g		1.07E-01	4.04E-01	
		EUROPIUM-154	4.83E-02 +/- 7.6E-02	U	pCi/g		1.51E-01	3.70E-01	
		EUROPIUM-155	4.28E-02 +/- 6.3E-02	U	pCi/g		1.12E-01	1.57E+01	
		POTASSIUM-40	1.04E+01 +/- 1.6E+00		pCi/g		3.78E-01		
		MANGANESE-54	5.63E-03 +/- 2.5E-02	U	pCi/g		4.59E-02	6.96E-01	
		NIOBIUM-94	-3.71E-03 +/- 2.2E-02	U	pCi/g		3.99E-02	2.85E-01	
		LEAD-212	6.02E-01 +/- 1.3E-01		pCi/g		1.01E-01		
		LEAD-214	6.91E-01 +/- 1.4E-01		pCi/g		8.64E-02		
		RADIUM-226	6.48E-01 +/- 1.5E-01	U	pCi/g		1.97E-01		
		THALLIUM-208	2.09E-01 +/- 5.7E-02		pCi/g		4.19E-02		
<b>9538-00-009F01</b>									
	FRM6J1AA ACTINIUM-228		7.88E-01 +/- 2.1E-01		pCi/g		1.46E-01		
		AG-108M	1.82E-02 +/- 2.3E-02	U	pCi/g		4.23E-02	2.86E-01	
		AMERICIUM-241	1.53E-02 +/- 5.3E-02	U	pCi/g		8.87E-02	1.03E+00	
		BISMUTH-212	9.89E-01 +/- 4.6E-01	U	pCi/g		9.06E-01		

STL Richland RER2 - Replicate Error Ratio =  $(S-D)/[\sqrt{(sq(TPUs)+sq(TPUd))}]$  as defined by ICPT BOA.

rp1STLRchSaSum J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.

mary2 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

## Sample Results Summary

Date: 31-Jul-03

## STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 23222

SDG No: 23303

Batch	Client Id Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
<b>3192332 E901.1</b>									
9538-00-009F01									
	FRM6J1AA	BISMUTH-214	6.91E-01 +/- 1.6E-01	U	pCi/g		2.13E-01		
		COBALT-60	2.45E-02 +/- 2.7E-02	U	pCi/g		5.59E-02 1.50E-01		
		CESIUM-134	2.92E-02 +/- 3.2E-02	U	pCi/g		6.23E-02 1.90E-01		
		CESIUM-137	1.73E-01 +/- 5.6E-02	J	pCi/g		5.09E-02 3.20E-01		
		EUROPIUM-152	-7.30E-03 +/- 7.4E-02	U	pCi/g		1.29E-01 4.04E-01		
		EUROPIUM-154	2.42E-02 +/- 8.0E-02	U	pCi/g		1.52E-01 3.70E-01		
		EUROPIUM-155	4.55E-02 +/- 7.0E-02	U	pCi/g		1.22E-01 1.57E+01		
		POTASSIUM-40	9.91E+00 +/- 1.6E+00		pCi/g		3.67E-01		
		MANGANESE-54	-5.65E-03 +/- 3.0E-02	U	pCi/g		5.28E-02 6.96E-01		
		NIOBIUM-94	-2.90E-02 +/- 2.5E-02	U	pCi/g		3.87E-02 2.85E-01		
		LEAD-212	7.07E-01 +/- 1.5E-01		pCi/g		1.01E-01		
		LEAD-214	8.05E-01 +/- 1.6E-01		pCi/g		8.85E-02		
		RADIUM-226	6.91E-01 +/- 1.6E-01		pCi/g		9.13E-02		
		THALLIUM-208	2.50E-01 +/- 6.6E-02		pCi/g		5.07E-02		
<b>9538-00-010F</b>									
	FRM481AA	ACTINIUM-228	9.07E-01 +/- 2.5E-01		pCi/g		1.99E-01		
		AG-108M	9.62E-03 +/- 2.6E-02	U	pCi/g		4.58E-02 2.86E-01		
		AMERICIUM-241	6.39E-02 +/- 7.2E-02	U	pCi/g		1.09E-01 1.03E+00		
		BISMUTH-212	1.04E+00 +/- 4.6E-01	U	pCi/g		9.40E-01		
		BISMUTH-214	9.96E-01 +/- 1.8E-01		pCi/g		8.86E-02		
		COBALT-60	-2.15E-02 +/- 3.0E-02	U	pCi/g		5.03E-02 1.50E-01		
		CESIUM-134	6.38E-02 +/- 3.8E-02	U	pCi/g		7.57E-02 1.90E-01		
		CESIUM-137	1.56E-01 +/- 5.3E-02	J	pCi/g		5.88E-02 3.20E-01		
		EUROPIUM-152	2.44E-02 +/- 9.1E-02	U	pCi/g		1.47E-01 4.04E-01		
		EUROPIUM-154	7.77E-02 +/- 9.4E-02	U	pCi/g		1.90E-01 3.70E-01		
		EUROPIUM-155	1.19E-01 +/- 8.1E-02	U	pCi/g		1.46E-01 1.57E+01		
		POTASSIUM-40	1.13E+01 +/- 1.8E+00		pCi/g		5.86E-01		
		MANGANESE-54	2.93E-02 +/- 3.4E-02	U	pCi/g		6.55E-02 6.96E-01		
		NIOBIUM-94	7.98E-03 +/- 2.8E-02	U	pCi/g		5.27E-02 2.85E-01		
		LEAD-212	8.98E-01 +/- 1.8E-01		pCi/g		1.12E-01		
		LEAD-214	1.07E+00 +/- 2.1E-01		pCi/g		1.02E-01		
		RADIUM-226	9.96E-01 +/- 1.8E-01		pCi/g		8.86E-02		
		THALLIUM-208	3.80E-01 +/- 7.7E-02		pCi/g		5.08E-02		
<b>9538-00-010F01</b>									
	FRM491AA	ACTINIUM-228	7.75E-01 +/- 2.2E-01		pCi/g		1.71E-01		
		AG-108M	2.13E-02 +/- 2.5E-02	U	pCi/g		4.60E-02 2.86E-01		
		AMERICIUM-241	-4.53E-03 +/- 5.8E-02	U	pCi/g		9.74E-02 1.03E+00		

STL Richland RER2 - Replicate Error Ratio =  $(S-D)/[\sqrt{(sq(TPUs)+sq(TPUs))}]$  as defined by ICPT BOA. rptSTLRchSaSum J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
mary2 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

**Sample Results Summary**  
**STL Richland STLRL**  
 Ordered by Method, Batch No., Client Sample ID.

Date: 31-Jul-03

Report No. : 23222

SDG No: 23303

Batch	Client Id Work Order	Parameter	Result ± Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
<b>3192332 E901.1</b>									
	9538-00-010F01	FRM491AA BISMUTH-212	9.44E-01 ± 4.7E-01	U	pCi/g		9.23E-01		
		BISMUTH-214	8.66E-01 ± 1.7E-01	U	pCi/g		2.43E-01		
		COBALT-60	1.13E-02 ± 2.7E-02	U	pCi/g		5.37E-02 1.50E-01		
		CESIUM-134	5.40E-02 ± 3.5E-02	U	pCi/g		7.06E-02 1.90E-01		
		CESIUM-137	2.00E-01 ± 7.7E-02	J	pCi/g		5.19E-02 3.20E-01		
		EUROPIUM-152	3.86E-02 ± 9.2E-02	U	pCi/g		1.43E-01 4.04E-01		
		EUROPIUM-154	-4.20E-02 ± 8.6E-02	U	pCi/g		1.47E-01 3.70E-01		
		EUROPIUM-155	6.09E-02 ± 7.3E-02	U	pCi/g		1.29E-01 1.57E+01		
		POTASSIUM-40	1.01E+01 ± 1.6E+00		pCi/g		5.50E-01		
		MANGANESE-54	1.30E-02 ± 3.1E-02	U	pCi/g		5.75E-02 6.96E-01		
		NIOBIUM-94	2.81E-03 ± 2.3E-02	U	pCi/g		4.33E-02 2.85E-01		
		LEAD-212	7.55E-01 ± 1.6E-01		pCi/g		8.05E-02		
		LEAD-214	7.77E-01 ± 1.6E-01		pCi/g		1.02E-01		
		RADIUM-226	8.66E-01 ± 1.7E-01		pCi/g		9.12E-02		
		THALLIUM-208	2.20E-01 ± 6.6E-02	U	pCi/g		9.95E-02		
<b>9538-00-011F</b>									
	FRM441AA	ACTINIUM-228	7.68E-01 ± 2.2E-01		pCi/g		1.58E-01		
		AG-108M	-3.72E-03 ± 2.2E-02	U	pCi/g		3.68E-02 2.86E-01		
		AMERICIUM-241	-1.64E-02 ± 7.7E-02	U	pCi/g		1.28E-01 1.03E+00		
		BISMUTH-212	9.27E-01 ± 5.8E-01	U	pCi/g		8.53E-01		
		BISMUTH-214	6.90E-01 ± 1.5E-01	U	pCi/g		1.95E-01		
		COBALT-60	4.57E-02 ± 3.1E-02	U	pCi/g		6.36E-02 1.50E-01		
		CESIUM-134	6.14E-03 ± 3.1E-02	U	pCi/g		5.46E-02 1.90E-01		
		CESIUM-137	2.49E-01 ± 5.4E-02	J	pCi/g		4.57E-02 3.20E-01		
		EUROPIUM-152	1.19E-02 ± 6.2E-02	U	pCi/g		1.11E-01 4.04E-01		
		EUROPIUM-154	3.20E-03 ± 8.1E-02	U	pCi/g		1.48E-01 3.70E-01		
		EUROPIUM-155	3.03E-02 ± 6.3E-02	U	pCi/g		1.09E-01 1.57E+01		
		POTASSIUM-40	9.34E+00 ± 1.5E+00		pCi/g		4.03E-01		
		MANGANESE-54	3.51E-03 ± 2.5E-02	U	pCi/g		4.63E-02 6.96E-01		
		NIOBIUM-94	-9.05E-03 ± 2.5E-02	U	pCi/g		4.37E-02 2.85E-01		
		LEAD-212	5.36E-01 ± 1.4E-01		pCi/g		7.74E-02		
		LEAD-214	7.95E-01 ± 1.7E-01		pCi/g		8.50E-02		
		RADIUM-226	6.90E-01 ± 1.5E-01		pCi/g		7.72E-02		
		THALLIUM-208	2.88E-01 ± 6.5E-02		pCi/g		4.31E-02		
<b>9538-00-011F01</b>									
	FRM461AA	ACTINIUM-228	7.92E-01 ± 2.2E-01		pCi/g		1.88E-01		
		AG-108M	1.18E-02 ± 2.4E-02	U	pCi/g		4.40E-02 2.86E-01		

STL Richland RER2 - Replicate Error Ratio =  $(S-D)/[\sqrt{(sq(TPUs)+sq(TPUd))}]$  as defined by ICPT BOA.  
 rptSTLRchSaSum J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 mary2 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

## Sample Results Summary

Date: 31-Jul-03

## STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID.

Report No.: 23222

SDG No: 23303

Client Id Batch	Work Order	Parameter	Result +/- Uncertainty( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
<b>3192332 E901.1</b>									
9538-00-011F01	FRM461AA	AMERICIUM-241	-1.01E-02 +/- 9.3E-02	U	pCi/g		1.59E-01	1.03E+00	
		BISMUTH-212	9.05E-01 +/- 3.9E-01	U	pCi/g		8.39E-01		
		BISMUTH-214	8.23E-01 +/- 1.7E-01	U	pCi/g		2.37E-01		
		COBALT-60	-2.56E-03 +/- 3.0E-02	U	pCi/g		5.62E-02	1.50E-01	
		CESIUM-134	1.83E-02 +/- 3.4E-02	U	pCi/g		6.39E-02	1.90E-01	
		CESIUM-137	2.46E-01 +/- 5.6E-02	J	pCi/g		6.58E-02	3.20E-01	
		EUROPIUM-152	1.36E-03 +/- 8.8E-02	U	pCi/g		1.33E-01	4.04E-01	
		EUROPIUM-154	4.23E-02 +/- 1.1E-01	U	pCi/g		2.00E-01	3.70E-01	
		EUROPIUM-155	-5.35E-03 +/- 7.8E-02	U	pCi/g		1.35E-01	1.57E+01	
		POTASSIUM-40	1.13E+01 +/- 1.8E+00		pCi/g		4.40E-01		
		MANGANESE-54	2.06E-03 +/- 3.2E-02	U	pCi/g		5.85E-02	6.96E-01	
		NIOBIUM-94	8.95E-03 +/- 2.6E-02	U	pCi/g		4.82E-02	2.85E-01	
		LEAD-212	7.68E-01 +/- 1.5E-01		pCi/g		1.21E-01		
		LEAD-214	7.71E-01 +/- 1.6E-01		pCi/g		8.84E-02		
		RADIUM-226	8.23E-01 +/- 1.7E-01		pCi/g		8.67E-02		
		THALLIUM-208	2.57E-01 +/- 8.1E-02		pCi/g		5.27E-02		
<b>9538-00-013F</b>									
	FRM5C1AA	ACTINIUM-228	7.20E-01 +/- 2.1E-01	U	pCi/g		3.06E-01		
		AG-108M	-1.03E-02 +/- 2.1E-02	U	pCi/g		3.51E-02	2.86E-01	
		AMERICIUM-241	-9.00E-03 +/- 7.3E-02	U	pCi/g		1.21E-01	1.03E+00	
		BISMUTH-212	1.01E+00 +/- 4.5E-01	U	pCi/g		8.58E-01		
		BISMUTH-214	6.26E-01 +/- 1.3E-01	U	pCi/g		1.84E-01		
		COBALT-60	1.77E-03 +/- 2.7E-02	U	pCi/g		5.04E-02	1.50E-01	
		CESIUM-134	3.87E-02 +/- 3.0E-02	U	pCi/g		5.80E-02	1.90E-01	
		CESIUM-137	2.18E-01 +/- 5.4E-02	J	pCi/g		4.79E-02	3.20E-01	
		EUROPIUM-152	-2.67E-02 +/- 6.5E-02	U	pCi/g		1.10E-01	4.04E-01	
		EUROPIUM-154	-3.54E-02 +/- 8.2E-02	U	pCi/g		1.42E-01	3.70E-01	
		EUROPIUM-155	1.66E-02 +/- 6.5E-02	U	pCi/g		1.11E-01	1.57E+01	
		POTASSIUM-40	9.70E+00 +/- 1.5E+00		pCi/g		3.34E-01		
		MANGANESE-54	-1.53E-02 +/- 2.5E-02	U	pCi/g		4.22E-02	6.96E-01	
		NIOBIUM-94	9.89E-03 +/- 2.5E-02	U	pCi/g		4.57E-02	2.85E-01	
		LEAD-212	6.88E-01 +/- 1.4E-01		pCi/g		7.81E-02		
		LEAD-214	8.28E-01 +/- 1.7E-01		pCi/g		7.33E-02		
		RADIUM-226	6.26E-01 +/- 1.3E-01	U	pCi/g		1.84E-01		
		THALLIUM-208	2.09E-01 +/- 5.4E-02		pCi/g		4.04E-02		
<b>9538-00-013F01</b>									
	FRM5E1AA	ACTINIUM-228	8.60E-01 +/- 2.0E-01		pCi/g		1.31E-01		

STL Richland RER2 - Replicate Error Ratio =  $(S-D)/[\sqrt{(sq(TPUs)+sq(TPUd))}]$  as defined by ICPT BOA.

J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value Is Estimated.

U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

## Sample Results Summary

Date: 31-Jul-03

## STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID.

Report No.: 23222

SDG No: 23303

Batch	Client Id Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
3192332 E901.1									
	9538-00-013F01	FRM5E1AA AG-108M	-1.95E-03 +/- 1.9E-02	U	pCi/g		3.33E-02	2.86E-01	
		AMERICIUM-241	-3.22E-02 +/- 8.6E-02	U	pCi/g		1.45E-01	1.03E+00	
		BISMUTH-212	7.73E-01 +/- 5.7E-01	U	pCi/g		7.75E-01		
		BISMUTH-214	7.01E-01 +/- 1.4E-01	U	pCi/g		1.97E-01		
		COBALT-60	7.52E-03 +/- 2.6E-02	U	pCi/g		5.09E-02	1.50E-01	
		CESIUM-134	4.71E-02 +/- 3.1E-02	U	pCi/g		6.10E-02	1.90E-01	
		CESIUM-137	1.18E-01 +/- 5.5E-02	J	pCi/g		4.65E-02	3.20E-01	
		EUROPIUM-152	-1.25E-02 +/- 6.9E-02	U	pCi/g		1.19E-01	4.04E-01	
		EUROPIUM-154	5.01E-03 +/- 7.6E-02	U	pCi/g		1.41E-01	3.70E-01	
		EUROPIUM-155	1.15E-02 +/- 7.3E-02	U	pCi/g		1.27E-01	1.57E+01	
		POTASSIUM-40	9.54E+00 +/- 1.5E+00		pCi/g		4.00E-01		
		MANGANESE-54	-9.92E-03 +/- 2.4E-02	U	pCi/g		4.15E-02	6.96E-01	
		NIOBIIUM-94	2.28E-02 +/- 2.2E-02	U	pCi/g		4.41E-02	2.85E-01	
		LEAD-212	6.91E-01 +/- 1.4E-01		pCi/g		6.69E-02		
		LEAD-214	7.56E-01 +/- 1.5E-01		pCi/g		7.88E-02		
		RADIUM-226	7.01E-01 +/- 1.4E-01	U	pCi/g		1.97E-01		
		THALLIUM-208	2.57E-01 +/- 5.6E-02		pCi/g		3.96E-02		
9538-00-014F									
	FRM5F1AA	ACTINIUM-228	7.23E-01 +/- 1.9E-01		pCi/g		1.53E-01		
		AG-108M	-9.62E-03 +/- 2.1E-02	U	pCi/g		3.55E-02	2.86E-01	
		AMERICIUM-241	-6.77E-02 +/- 5.6E-02	U	pCi/g		8.83E-02	1.03E+00	
		BISMUTH-212	9.37E-01 +/- 4.6E-01	U	pCi/g		7.84E-01		
		BISMUTH-214	8.37E-01 +/- 1.6E-01		pCi/g		7.73E-02		
		COBALT-60	3.72E-04 +/- 2.5E-02	U	pCi/g		4.69E-02	1.50E-01	
		CESIUM-134	3.36E-02 +/- 3.1E-02	U	pCi/g		5.91E-02	1.90E-01	
		CESIUM-137	2.05E-01 +/- 5.7E-02	J	pCi/g		4.78E-02	3.20E-01	
		EUROPIUM-152	3.07E-02 +/- 7.0E-02	U	pCi/g		1.22E-01	4.04E-01	
		EUROPIUM-154	5.31E-03 +/- 7.3E-02	U	pCi/g		1.36E-01	3.70E-01	
		EUROPIUM-155	2.70E-02 +/- 7.0E-02	U	pCi/g		1.23E-01	1.57E+01	
		POTASSIUM-40	1.08E+01 +/- 1.7E+00		pCi/g		3.43E-01		
		MANGANESE-54	-8.01E-03 +/- 2.4E-02	U	pCi/g		4.23E-02	6.96E-01	
		NIOBIIUM-94	2.89E-03 +/- 2.5E-02	U	pCi/g		4.64E-02	2.85E-01	
		LEAD-212	7.73E-01 +/- 1.5E-01		pCi/g		9.36E-02		
		LEAD-214	8.11E-01 +/- 1.6E-01		pCi/g		8.09E-02		
		RADIUM-226	8.37E-01 +/- 1.6E-01		pCi/g		7.73E-02		
		THALLIUM-208	2.91E-01 +/- 6.1E-02		pCi/g		4.41E-02		
9538-00-014F01									

STL Richland RER2 - Replicate Error Ratio =  $(S-D)/[\sqrt{(sq(TPUs)+sq(TPUd))}]$  as defined by ICPT BOA.  
 rptSTLRichSaSum J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 mary2 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

## Sample Results Summary

Date: 31-Jul-03

## STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 23222

SDG No: 23303

Batch	Client Id Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
<b>3192332 E901.1</b>									
<b>9538-00-014F01</b>									
FRM5J1AA	ACTINIUM-228		6.80E-01 +/- 1.8E-01		pCi/g		1.42E-01		
	AG-108M		1.16E-02 +/- 2.2E-02	U	pCi/g		3.91E-02 2.86E-01		
	AMERICIUM-241		4.98E-02 +/- 5.3E-02	U	pCi/g		8.74E-02 1.03E+00		
	BISMUTH-212		3.92E-01 +/- 4.2E-01	U	pCi/g		7.76E-01		
	BISMUTH-214		6.19E-01 +/- 1.5E-01	U	pCi/g		1.93E-01		
	COBALT-60		-1.63E-02 +/- 2.8E-02	U	pCi/g		4.62E-02 1.50E-01		
	CESIUM-134		3.18E-02 +/- 3.3E-02	U	pCi/g		6.38E-02 1.90E-01		
	CESIUM-137		2.18E-01 +/- 5.2E-02	J	pCi/g		5.57E-02 3.20E-01		
	EUROPIUM-152		8.18E-03 +/- 7.0E-02	U	pCi/g		1.24E-01 4.04E-01		
	EUROPIUM-154		-3.65E-02 +/- 6.7E-02	U	pCi/g		1.14E-01 3.70E-01		
	EUROPIUM-155		4.24E-02 +/- 6.9E-02	U	pCi/g		1.19E-01 1.57E+01		
	POTASSIUM-40		9.73E+00 +/- 1.5E+00		pCi/g		4.21E-01		
	MANGANESE-54		1.50E-02 +/- 2.7E-02	U	pCi/g		5.14E-02 6.96E-01		
	NIOBIUM-94		-2.80E-03 +/- 2.2E-02	U	pCi/g		3.88E-02 2.85E-01		
	LEAD-212		5.94E-01 +/- 1.3E-01		pCi/g		8.88E-02		
	LEAD-214		7.83E-01 +/- 1.6E-01		pCi/g		8.16E-02		
	RADIUM-226		6.19E-01 +/- 1.5E-01		pCi/g		8.26E-02		
	THALLIUM-208		1.93E-01 +/- 7.4E-02	U	pCi/g		9.25E-02		

No. of Results: 612

STL Richland RER2 - Replicate Error Ratio =  $(S-D)/[\sqrt{(sq(TPUs)+sq(TPUd))}]$  as defined by ICPT BOA.  
 rptSTLRchSaSum J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value Is Estimated.  
 mary2 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

**QC Results Summary**  
**STL Richland STLRL**  
 Ordered by Method, Batch No, QC Type,.

Date: 31-Jul-03

Report No. : 23222

SDG No.: 23303

Batch Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	Recovery	Bias	MDC MDA
<b>E901.1</b>								
3192331 BLANK QC								
FR4WD1AA	ACTINIUM-228	1.18E-02 +/- 9.4E-02	U	pCi/g				1.85E-01
	AG-108M	-5.76E-03 +/- 2.0E-02	U	pCi/g				3.54E-02
	AMERICIUM-241	2.18E-02 +/- 3.8E-02	U	pCi/g				6.24E-02
	BISMUTH-212	2.12E-01 +/- 4.1E-01	U	pCi/g				8.08E-01
	BISMUTH-214	8.59E-02 +/- 6.7E-02	U	pCi/g				1.35E-01
	COBALT-60	-1.48E-02 +/- 2.9E-02	U	pCi/g				5.06E-02
	CESIUM-134	3.35E-03 +/- 2.9E-02	U	pCi/g				5.56E-02
	CESIUM-137	1.05E-02 +/- 2.1E-02	U	pCi/g				4.52E-02
	EUROPIUM-152	-2.11E-02 +/- 7.0E-02	U	pCi/g				1.23E-01
	EUROPIUM-154	-3.80E-02 +/- 4.7E-02	U	pCi/g				7.25E-02
	EUROPIUM-155	9.28E-03 +/- 4.8E-02	U	pCi/g				8.82E-02
	POTASSIUM-40	-1.71E-01 +/- 3.9E-01	U	pCi/g				8.07E-01
	MANGANESE-54	-2.06E-02 +/- 2.6E-02	U	pCi/g				4.37E-02
	NIOBIUM-94	3.24E-03 +/- 2.2E-02	U	pCi/g				4.41E-02
	LEAD-212	-1.94E-02 +/- 4.7E-02	U	pCi/g				7.34E-02
	LEAD-214	-9.01E-04 +/- 6.1E-02	U	pCi/g				1.13E-01
	RADIUM-226	8.64E-02 +/- 6.7E-02	U	pCi/g				1.36E-01
	THALLIUM-208	1.87E-02 +/- 2.4E-02	U	pCi/g				4.96E-02
3192331 LCS								
FR4WD1AC	CESIUM-137	1.11E+00 +/- 1.7E-01		pCi/g		110%	0.1	5.31E-02
<b>E901.1</b>								
3192332 BLANK QC								
FR4WP1AA	ACTINIUM-228	6.68E-02 +/- 1.3E-01	U	pCi/g				2.58E-01
	AG-108M	-1.05E-02 +/- 2.6E-02	U	pCi/g				4.42E-02
	AMERICIUM-241	-6.85E-02 +/- 6.5E-02	U	pCi/g				1.00E-01
	BISMUTH-212	-1.94E-01 +/- 3.8E-01	U	pCi/g				6.44E-01
	BISMUTH-214	-2.31E-02 +/- 7.0E-02	U	pCi/g				1.23E-01
	COBALT-60	1.53E-02 +/- 3.4E-02	U	pCi/g				7.18E-02
	CESIUM-134	1.49E-02 +/- 3.5E-02	U	pCi/g				6.81E-02
	CESIUM-137	1.19E-02 +/- 3.0E-02	U	pCi/g				5.94E-02
	EUROPIUM-152	-1.06E-02 +/- 7.6E-02	U	pCi/g				1.36E-01
	EUROPIUM-154	-5.94E-02 +/- 8.7E-02	U	pCi/g				1.45E-01
	EUROPIUM-155	5.27E-02 +/- 6.0E-02	U	pCi/g				1.14E-01
	POTASSIUM-40	-1.05E+00 +/- 7.2E-01	U	pCi/g				1.57E+00
	MANGANESE-54	-2.24E-03 +/- 3.1E-02	U	pCi/g				5.84E-02
	NIOBIUM-94	-9.97E-03 +/- 2.7E-02	U	pCi/g				4.89E-02
	LEAD-212	-5.14E-02 +/- 4.4E-02	U	pCi/g				6.96E-02

STL Richland      Bias = (Result/Expected)-1 as defined by ANSI N13.30.  
 rpiSTLRchQcSum U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.  
 mary V4.04 A97

**QC Results Summary**  
**STL Richland STLRL**  
**Ordered by Method, Batch No, QC Type.,**

Date: 31-Jul-03

Report No.: 23222

SDG No.: 23303

Batch	Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	Recovery	Bias	MDC MDA
	FR4WP1AA	LEAD-214	1.16E-02 +/- 5.7E-02	U	pCi/g				1.06E-01
		RADIUM-226	-2.26E-02 +/- 7.0E-02	U	pCi/g				1.23E-01
		THALLIUM-208	1.79E-02 +/- 3.5E-02	U	pCi/g				6.97E-02
3192332 LCS	FR4WP1AC	CESIUM-137	1.12E+00 +/- 1.7E-01		pCi/g		112%	0.1	4.49E-02
<b>No. of Results:</b>	<b>38</b>								

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STL Richland      Bias      - (Result/Expected)-1 as defined by ANSI N13.30.  
 rptSTLRchQcSum    U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.  
 mary V4.04 A97

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/23/2003 10:28:00 AM

Lot-Sample No.: J3G020266-27

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-001F

COC No.: 2003-00166 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detectr
Batch: 3192332	E901.1				Work Order: FRM531AA		Report DB ID: 9FRM5310					
ACTINIUM-228	6.10E-01	U	1.6E-01	1.6E-01	2.97E-01	pCi/g		(2.1) (7.5)	7/28/03 02:22 p	359.8	g	GER6
AG-108M	-1.77E-02	U	2.0E-02	2.0E-02	3.18E-02	pCi/g		-0.56 2.86E-01 -(1.8)	7/28/03 02:22 p	359.8	g	GER6:
AMERICIUM-241	2.68E-02	U	7.1E-02	7.1E-02	1.21E-01	pCi/g		0.22 1.03E+00 0.76	7/28/03 02:22 p	359.8	g	GER6:
BISMUTH-212	5.35E-01	U	3.6E-01	3.6E-01	7.21E-01	pCi/g		0.74 (2.9)	7/28/03 02:22 p	359.8	g	GER6:
BISMUTH-214	5.00E-01	U	1.2E-01	1.2E-01	1.77E-01	pCi/g		(2.8) (8.2)	7/28/03 02:22 p	359.8	g	GER6:
COBALT-60	2.83E-03	U	2.3E-02	2.3E-02	4.49E-02	pCi/g		0.06 1.50E-01 0.24	7/28/03 02:22 p	359.8	g	GER6:
CESIUM-134	-6.80E-03	U	3.1E-02	3.1E-02	5.32E-02	pCi/g		-0.13 1.90E-01 -0.44	7/28/03 02:22 p	359.8	g	GER6:
CESIUM-137	2.40E-03	U	2.7E-02	2.7E-02	4.83E-02	pCi/g		0.05 3.20E-01 0.18	7/28/03 02:22 p	359.8	g	GER6:
EUROPIUM-152	-1.69E-02	U	6.2E-02	6.2E-02	1.03E-01	pCi/g		-0.16 4.04E-01 -0.55	7/28/03 02:22 p	359.8	g	GER6:
EUROPIUM-154	-7.45E-03	U	9.3E-02	9.3E-02	1.68E-01	pCi/g		-0.04 3.70E-01 -0.16	7/28/03 02:22 p	359.8	g	GER6:

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 rptSTLRchSample U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.  
 V4.04 A97

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/23/2003 10:28:00 AM

Lot-Sample No.: J3G020266-27

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-001F

COC No.: 2003-00166 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detecte
EUROPIUM-155	4.42E-02	U	6.3E-02	6.3E-02	1.12E-01	pCi/g		0.4 (1.4)	7/28/03 02:22 p	359.8	g	GER6:
POTASSIUM-40	8.62E+00		1.5E+00	1.5E+00	4.86E-01	pCi/g		(17.8) (11.9)	7/28/03 02:22 p	359.8	g	GER6:
MANGANESE-54	8.76E-03	U	2.7E-02	2.7E-02	5.06E-02	pCi/g		0.17 6.96E-01 0.64	7/28/03 02:22 p	359.8	g	GER6:
NIOBIUM-94	1.46E-02	U	2.6E-02	2.6E-02	4.86E-02	pCi/g		0.3 2.85E-01 (1.1)	7/28/03 02:22 p	359.8	g	GER6:
LEAD-212	4.98E-01		1.1E-01	1.1E-01	8.55E-02	pCi/g		(5.8) (9.3)	7/28/03 02:22 p	359.8	g	GER6:
LEAD-214	6.29E-01		1.3E-01	1.3E-01	7.63E-02	pCi/g		(8.2) (9.4)	7/28/03 02:22 p	359.8	g	GER6:
RADIUM-226	5.00E-01	U	1.2E-01	1.2E-01	1.77E-01	pCi/g		(2.8) (8.2)	7/28/03 02:22 p	359.8	g	GER6:
THALLIUM-208	2.00E-01		5.2E-02	5.2E-02	4.39E-02	pCi/g		(4.5) (7.7)	7/28/03 02:22 p	359.8	g	GER6:

No. of Results: 18      Comments:

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland  
 Lot-Sample No.: J3G020266-31  
 Client Sample ID: 9538-00-002F

SDG: 23303  
 Report No.: 23222  
 COC No.: 2003-00164 R

Collection Date: 6/16/2003 2:10:00 PM  
 Received Date: 7/2/2003 11:00:00 AM  
 Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detectk
Batch: 3192332	E901.1				Work Order: FRM6K1AA		Report DB ID: 9FRM6K10					
ACTINIUM-228	7.82E-01	U	2.1E-01	2.1E-01	3.71E-01	pCi/g		(2.1) (7.3)	7/28/03 04:14 p	310.2	g	GER7:
AG-108M	-1.81E-02	U	2.5E-02	2.5E-02	4.08E-02	pCi/g		-0.44 2.86E-01 (-1.5)	7/28/03 04:14 p	310.2	g	GER7:
AMERICIUM-241	-9.08E-02	U	1.0E-01	1.0E-01	1.64E-01	pCi/g		-0.55 1.03E+00 (-1.8)	7/28/03 04:14 p	310.2	g	GER7:
BISMUTH-212	1.12E+00	U	5.0E-01	5.0E-01	1.01E+00	pCi/g		(1.1) (4.5)	7/28/03 04:14 p	310.2	g	GER7:
BISMUTH-214	7.76E-01	U	1.8E-01	1.8E-01	2.43E-01	pCi/g		(3.2) (8.8)	7/28/03 04:14 p	310.2	g	GER7:
COBALT-60	-1.64E-03	U	3.0E-02	3.0E-02	5.66E-02	pCi/g		-0.03 1.50E-01 -0.11	7/28/03 04:14 p	310.2	g	GER7:
CESIUM-134	3.88E-02	U	3.2E-02	3.2E-02	6.54E-02	pCi/g		0.59 1.90E-01 (2.4)	7/28/03 04:14 p	310.2	g	GER7:
CESIUM-137	2.92E-01	J	7.5E-02	7.5E-02	5.61E-02	pCi/g		(5.2) 3.20E-01 (7.8)	7/28/03 04:14 p	310.2	g	GER7:
EUROPIUM-152	-6.26E-02	U	9.5E-02	9.5E-02	1.33E-01	pCi/g		-0.47 4.04E-01 -(1.3)	7/28/03 04:14 p	310.2	g	GER7:
EUROPIUM-154	6.37E-02	U	9.8E-02	9.8E-02	1.95E-01	pCi/g		0.33 3.70E-01 (1.3)	7/28/03 04:14 p	310.2	g	GER7:

STL Richland MDC|MDA,Lc - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 rp!STLRchSample J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/16/2003 2:10:00 PM

Lot-Sample No.: J3G020266-31

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-002F

COC No.: 2003-00164 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detectr
EUROPIUM-155	4.31E-02	U	8.3E-02	8.3E-02	1.49E-01	pCi/g		0.29	7/28/03 04:14 p		310.2	GER7
POTASSIUM-40	9.08E+00		1.5E+00	1.5E+00	4.72E-01	pCi/g	1.57E+01	(1.)			g	
MANGANESE-54	3.10E-02	U	3.5E-02	3.5E-02	6.81E-02	pCi/g		(19.2)	7/28/03 04:14 p		310.2	GER7
NIOBIUM-94	-1.00E-03	U	2.5E-02	2.5E-02	4.56E-02	pCi/g	6.96E-01	(11.9)			g	
LEAD-212	7.56E-01		1.5E-01	1.5E-01	1.03E-01	pCi/g	2.85E-01	0.46	7/28/03 04:14 p		310.2	GER7
LEAD-214	9.97E-01		1.8E-01	1.8E-01	1.00E-01	pCi/g		-0.02	7/28/03 04:14 p		310.2	GER7
RADIUM-226	7.76E-01	U	1.8E-01	1.8E-01	2.43E-01	pCi/g		(7.3)	7/28/03 04:14 p		310.2	GER7
THALLIUM-208	2.14E-01	U	6.7E-02	6.7E-02	1.07E-01	pCi/g		(10.3)			g	
								(8.8)	7/28/03 04:14 p		310.2	GER7
								(2.)	7/28/03 04:14 p		310.2	GER7
								(6.4)			g	

No. of Results: 18      Comments:

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 rptSTLRchSample J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/16/2003 2:15:00 PM

Lot-Sample No.: J3G020266-32

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-002F01

COC No.: 2003-00164 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detectr
Batch: 3192332	E901.1				Work Order: FRM6N1AA		Report DB ID: 9FRM6N10					
ACTINIUM-228	8.29E-01		1.8E-01	1.8E-01	1.57E-01	pCi/g		(5.3) (9.5)	7/28/03 04:15 p	407.9	GER8: g	
AG-108M	4.73E-03	U	2.0E-02	2.0E-02	3.54E-02	pCi/g		0.13 2.86E-01	7/28/03 04:15 p	407.9	GER8: g	
AMERICIUM-241	7.03E-02	U	5.5E-02	5.5E-02	8.58E-02	pCi/g		0.82 1.03E+00	7/28/03 04:15 p	407.9	GER8: g	
BISMUTH-212	7.44E-01	U	3.7E-01	3.7E-01	7.34E-01	pCi/g		(1.) (4.)	7/28/03 04:15 p	407.9	GER8: g	
BISMUTH-214	8.23E-01		1.5E-01	1.5E-01	7.21E-02	pCi/g		(11.4) (11.1)	7/28/03 04:15 p	407.9	GER8: g	
COBALT-60	2.46E-02	U	2.2E-02	2.2E-02	4.67E-02	pCi/g		0.53 1.50E-01	7/28/03 04:15 p	407.9	GER8: g	
CESIUM-134	3.53E-02	U	2.7E-02	2.7E-02	5.33E-02	pCi/g		0.66 1.90E-01	7/28/03 04:15 p	407.9	GER8: g	
CESIUM-137	3.11E-01	J	7.5E-02	7.5E-02	4.33E-02	pCi/g		(7.2) 3.20E-01	7/28/03 04:15 p	407.9	GER8: g	
EUROPIUM-152	-4.54E-03	U	6.1E-02	6.1E-02	1.04E-01	pCi/g		-0.04 4.04E-01	7/28/03 04:15 p	407.9	GER8: g	
EUROPIUM-154	2.36E-04	U	6.6E-02	6.6E-02	1.23E-01	pCi/g		0. 3.70E-01	7/28/03 04:15 p	407.9	GER8: g	

STL Richland MDC|MDA,Lc - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 rptSTLRchSample J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/16/2003 2:15:00 PM

Lot-Sample No.: J3G020266-32

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-002F01

COC No.: 2003-00164 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detect
EUROPIUM-155	-2.20E-03	U	6.1E-02	6.1E-02	1.05E-01	pCi/g		-0.02	7/28/03 04:15 p		407.9	GER8
POTASSIUM-40	9.72E+00		1.5E+00	1.5E+00	3.22E-01	pCi/g	1.57E+01	-0.07			g	
MANGANESE-54	-7.68E-04	U	2.5E-02	2.5E-02	4.47E-02	pCi/g		(30.2)	7/28/03 04:15 p		407.9	GER8
NIOBIUM-94	-1.84E-02	U	1.9E-02	1.9E-02	3.14E-02	pCi/g	6.96E-01	-0.06			g	
LEAD-212	6.88E-01		1.4E-01	1.4E-01	5.81E-02	pCi/g	2.85E-01	-0.59	7/28/03 04:15 p		407.9	GER8
LEAD-214	8.09E-01		1.6E-01	1.6E-01	7.54E-02	pCi/g		(11.8)	7/28/03 04:15 p		407.9	GER8
RADIUM-226	8.23E-01		1.5E-01	1.5E-01	7.21E-02	pCi/g		(10.2)	7/28/03 04:15 p		407.9	GER8
THALLIUM-208	2.75E-01		6.4E-02	6.4E-02	4.04E-02	pCi/g		(10.7)	7/28/03 04:15 p		407.9	GER8
								(11.1)	7/28/03 04:15 p		g	
								(11.4)	7/28/03 04:15 p		407.9	GER8
								(6.8)	7/28/03 04:15 p		407.9	GER8
								(8.5)			g	

No. of Results: 18      Comments:

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/5/2003 1:50:00 PM

Lot-Sample No.: J3G020266-15

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-003F

COC No.: 2003-00159 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncer(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detector
Batch: 3192331	E901.1				Work Order: FRM4R1AA		Report DB ID: 9FRM4R10					
ACTINIUM-228	9.47E-01	U	2.3E-01	2.3E-01	3.90E-01	pCi/g		(2.4) (8.1)	7/28/03 07:18 a	347.5	GER6: g	
AG-108M	-6.73E-03	U	2.6E-02	2.6E-02	4.35E-02	pCi/g		-0.15 2.86E-01	7/28/03 07:18 a	347.5	GER6: g	
AMERICIUM-241	5.45E-03	U	9.1E-02	9.1E-02	1.52E-01	pCi/g		0.04 1.03E+00	7/28/03 07:18 a	347.5	GER6: g	
BISMUTH-212	1.08E+00	U	5.1E-01	5.1E-01	9.79E-01	pCi/g		(1.1) (4.3)	7/28/03 07:18 a	347.5	GER6: g	
BISMUTH-214	9.88E-01		1.8E-01	1.8E-01	8.87E-02	pCi/g		(11.1) (11.)	7/28/03 07:18 a	347.5	GER6: g	
COBALT-60	-3.84E-04	U	2.9E-02	2.9E-02	5.42E-02	pCi/g		-0.01 1.50E-01	7/28/03 07:18 a	347.5	GER6: g	
CESIUM-134	5.65E-02	U	3.8E-02	3.8E-02	7.30E-02	pCi/g		0.77 1.90E-01	7/28/03 07:18 a	347.5	GER6: g	
CESIUM-137	1.83E-01	J	5.5E-02	5.5E-02	5.44E-02	pCi/g		(3.4) 3.20E-01	7/28/03 07:18 a	347.5	GER6: g	
EUROPIUM-152	-7.20E-02	U	8.3E-02	8.3E-02	1.34E-01	pCi/g		-0.54 4.04E-01	7/28/03 07:18 a	347.5	GER6: g	
EUROPIUM-154	-4.27E-03	U	1.0E-01	1.0E-01	1.85E-01	pCi/g		-0.02 3.70E-01	7/28/03 07:18 a	347.5	GER6: g	

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/5/2003 1:50:00 PM

Lot-Sample No.: J3G020266-15

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-003F

COC No.: 2003-00159 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detect
EUROPIUM-155	7.48E-02	U	7.8E-02	7.8E-02	1.37E-01	pCi/g		0.54 1.57E+01	7/28/03 07:18 a (1.9)	347.5	g	GER6:
POTASSIUM-40	1.14E+01		1.8E+00	1.8E+00	5.68E-01	pCi/g		(20.2) (12.4)	7/28/03 07:18 a	347.5	g	GER6:
MANGANESE-54	1.19E-02	U	3.2E-02	3.2E-02	5.88E-02	pCi/g		0.2 6.96E-01	7/28/03 07:18 a 0.75	347.5	g	GER6:
NIOBIUM-94	-1.65E-02	U	2.6E-02	2.6E-02	4.35E-02	pCi/g		-0.38 2.85E-01	7/28/03 07:18 a -(1.3)	347.5	g	GER6:
LEAD-212	9.12E-01		1.8E-01	1.8E-01	7.95E-02	pCi/g		(11.5) (10.)	7/28/03 07:18 a	347.5	g	GER6:
LEAD-214	1.06E+00		2.1E-01	2.1E-01	1.00E-01	pCi/g		(10.6) (9.9)	7/28/03 07:18 a	347.5	g	GER6:
RADIUM-226	9.88E-01		1.8E-01	1.8E-01	8.87E-02	pCi/g		(11.1) (11.)	7/28/03 07:18 a	347.5	g	GER6:
THALLIUM-208	3.11E-01		7.9E-02	7.9E-02	5.04E-02	pCi/g		(6.2) (7.9)	7/28/03 07:18 a	347.5	g	GER6:

No. of Results: 18      Comments:

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/5/2003 2:14:00 PM

Lot-Sample No.: J3G020266-16

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-003F01

COC No.: 2003-00159 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detect
Batch: 3192331	E901.1				Work Order: FRM4W1AA		Report DB ID: 9FRM4W10					
ACTINIUM-228	8.22E-01		2.0E-01	2.0E-01	1.27E-01	pCi/g		(6.5) (8.2)	7/28/03 07:18 a	385.9	g	GER7
AG-108M	-1.40E-02	U	2.2E-02	2.2E-02	3.57E-02	pCi/g		-0.39 2.86E-01	7/28/03 07:18 a	385.9	g	GER7
AMERICIUM-241	8.70E-02	U	9.8E-02	9.8E-02	1.71E-01	pCi/g		0.51 1.03E+00	7/28/03 07:18 a	385.9	g	GER7
BISMUTH-212	1.30E+00	U	6.3E-01	6.3E-01	8.71E-01	pCi/g		(1.5) (4.1)	7/28/03 07:18 a	385.9	g	GER7
BISMUTH-214	9.34E-01	U	1.6E-01	1.6E-01	2.29E-01	pCi/g		(4.1) (11.5)	7/28/03 07:18 a	385.9	g	GER7
COBALT-60	1.32E-02	U	2.5E-02	2.5E-02	5.01E-02	pCi/g		0.26 1.50E-01	7/28/03 07:18 a	385.9	g	GER7
CESIUM-134	5.30E-02	U	4.2E-02	4.2E-02	6.54E-02	pCi/g		0.81 1.90E-01	7/28/03 07:18 a	385.9	g	GER7
CESIUM-137	1.45E-01	J	4.5E-02	4.5E-02	5.87E-02	pCi/g		(2.5) 3.20E-01	7/28/03 07:18 a	385.9	g	GER7
EUROPIUM-152	-1.24E-02	U	6.8E-02	6.8E-02	1.17E-01	pCi/g		-0.11 4.04E-01	7/28/03 07:18 a	385.9	g	GER7
EUROPIUM-154	6.63E-03	U	8.4E-02	8.4E-02	1.56E-01	pCi/g		0.04 3.70E-01	7/28/03 07:18 a	385.9	g	GER7

STL Richland  
rpt:STLRRchSample  
V4.04 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

Lot-Sample No.: J3G020266-16

Client Sample ID: 9538-00-003F01

SDG: 23303

Report No.: 23222

COC No.: 2003-00159 R

Collection Date: 6/5/2003 2:14:00 PM

Received Date: 7/2/2003 11:00:00 AM

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detect
EUROPIUM-155	1.37E-01	U	7.8E-02	7.8E-02	1.43E-01	pCi/g		0.96 1.57E+01	7/28/03 07:18 a (3.5)	385.9	g	GER7:
POTASSIUM-40	1.08E+01		1.7E+00	1.7E+00	3.51E-01	pCi/g		(30.9) (12.8)	7/28/03 07:18 a	385.9	g	GER7:
MANGANESE-54	1.40E-02	U	3.0E-02	3.0E-02	5.63E-02	pCi/g		0.25 6.96E-01	7/28/03 07:18 a 0.92	385.9	g	GER7:
NIOBIUM-94	-9.90E-03	U	2.6E-02	2.6E-02	4.48E-02	pCi/g		-0.22 2.85E-01	7/28/03 07:18 a -0.76	385.9	g	GER7:
LEAD-212	6.97E-01		1.4E-01	1.4E-01	9.64E-02	pCi/g		(7.2) (9.8)	7/28/03 07:18 a	385.9	g	GER7:
LEAD-214	9.02E-01		1.8E-01	1.8E-01	9.06E-02	pCi/g		(9.9) (10.1)	7/28/03 07:18 a	385.9	g	GER7:
RADIUM-226	9.34E-01		1.6E-01	1.6E-01	7.80E-02	pCi/g		(12.) (11.5)	7/28/03 07:18 a	385.9	g	GER7:
THALLIUM-208	2.88E-01	U	6.3E-02	6.3E-02	9.50E-02	pCi/g		(3.) (9.2)	7/28/03 07:18 a	385.9	g	GER7:

No. of Results: 18

Comments:

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland  
 Lot-Sample No.: J3G020266-13  
 Client Sample ID: 9538-00-004F

SDG: 23303  
 Report No.: 23222  
 COC No.: 2003-00160 R

Collection Date: 6/9/2003 1:40:00 PM  
 Received Date: 7/2/2003 11:00:00 AM  
 Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detect	
Batch: 3192331	E901.1				Work Order: FRM4K1AA	Report DB ID: 9FRM4K10							
ACTINIUM-228	7.96E-01		2.3E-01	2.3E-01	1.81E-01	pCi/g	(4.4)		7/28/03 05:36 a	344.2	GER5:	g	
AG-108M	1.81E-03 U		2.4E-02	2.4E-02	4.23E-02	pCi/g	(7.)	0.04	7/28/03 05:36 a	344.2	GER5:	g	
AMERICIUM-241	5.46E-02 U		6.1E-02	6.1E-02	1.01E-01	pCi/g	2.86E-01	0.15	7/28/03 05:36 a	344.2	GER5:	g	
BISMUTH-212	1.02E+00 U		5.3E-01	5.3E-01	1.02E+00	pCi/g	1.03E+00	0.54	7/28/03 05:36 a	344.2	GER5:	g	
BISMUTH-214	9.04E-01 U		1.8E-01	1.8E-01	2.50E-01	pCi/g	(3.8)	(3.6)	7/28/03 05:36 a	344.2	GER5:	g	
COBALT-60	-2.47E-02 U		2.9E-02	2.9E-02	4.68E-02	pCi/g	(9.9)	-0.53	7/28/03 05:36 a	344.2	GER5:	g	
CESIUM-134	9.57E-02 U		4.5E-02	4.5E-02	7.95E-02	pCi/g	1.50E-01	(1.2)	7/28/03 05:36 a	344.2	GER5:	g	
CESIUM-137	1.71E-01 J		5.0E-02	5.0E-02	6.08E-02	pCi/g	1.90E-01	(4.3)	(2.8)	7/28/03 05:36 a	344.2	GER5:	g
EUROPIUM-152	-2.12E-02 U		9.8E-02	9.8E-02	1.43E-01	pCi/g	3.20E-01	(6.9)	-0.15	7/28/03 05:36 a	344.2	GER5:	g
EUROPIUM-154	2.46E-02 U		8.6E-02	8.6E-02	1.62E-01	pCi/g	4.04E-01	-0.43	0.15	7/28/03 05:36 a	344.2	GER5:	g
							3.70E-01	0.58					

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/9/2003 1:40:00 PM

Lot-Sample No.: J3G020266-13

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-004F

COC No.: 2003-00160 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detect
EUROPIUM-155	9.80E-02	U	1.1E-01	1.1E-01	1.39E-01	pCi/g		0.71 1.57E+01	7/28/03 05:36 a		344.2	GER5:
POTASSIUM-40	9.69E+00		1.5E+00	1.5E+00	3.94E-01	pCi/g		(1.8) (24.6) (12.6)	7/28/03 05:36 a		344.2	GER5:
MANGANESE-54	2.31E-03	U	3.2E-02	3.2E-02	5.82E-02	pCi/g		0.04 6.96E-01	7/28/03 05:36 a		344.2	GER5:
NIOBIUM-94	-1.03E-02	U	2.7E-02	2.7E-02	4.64E-02	pCi/g		-0.22 2.85E-01	7/28/03 05:36 a		344.2	GER5:
LEAD-212	9.30E-01		1.8E-01	1.8E-01	7.86E-02	pCi/g		(11.8) (10.3)	7/28/03 05:36 a		344.2	GER5:
LEAD-214	8.70E-01		1.7E-01	1.7E-01	9.90E-02	pCi/g		(8.8) (10.2)	7/28/03 05:36 a		344.2	GER5:
RADIUM-226	9.04E-01		1.8E-01	1.8E-01	9.72E-02	pCi/g		(9.3) (9.9)	7/28/03 05:36 a		344.2	GER5:
THALLIUM-208	3.11E-01		7.8E-02	7.8E-02	5.13E-02	pCi/g		(6.1) (8.)	7/28/03 05:36 a		344.2	GER5:

No. of Results: 18      Comments:

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/9/2003 2:15:00 PM

Lot-Sample No.: J3G020266-14

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-004F01

COC No.: 2003-00160 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detector
Batch: 3192331	E901.1				Work Order: FRM4M1AA		Report DB ID: 9FRM4M10					
ACTINIUM-228	6.82E-01		2.0E-01	2.0E-01	1.46E-01	pCi/g		(4.7) (6.7)	7/28/03 07:20 a	392.6	g	GER5-
AG-108M	-7.99E-03	U	2.3E-02	2.3E-02	3.87E-02	pCi/g		-0.21 2.86E-01	7/28/03 07:20 a	392.6	g	GER5-
AMERICIUM-241	4.96E-02	U	5.7E-02	5.7E-02	8.81E-02	pCi/g		0.56 1.03E+00	7/28/03 07:20 a	392.6	g	GER5-
BISMUTH-212	8.59E-01	U	4.6E-01	4.6E-01	8.79E-01	pCi/g		0.98 (3.8)	7/28/03 07:20 a	392.6	g	GER5-
BISMUTH-214	8.02E-01		1.7E-01	1.7E-01	9.09E-02	pCi/g		(8.8) (9.3)	7/28/03 07:20 a	392.6	g	GER5-
COBALT-60	-4.04E-03	U	2.4E-02	2.4E-02	4.42E-02	pCi/g		-0.09 1.50E-01	7/28/03 07:20 a	392.6	g	GER5-
CESIUM-134	3.69E-02	U	3.0E-02	3.0E-02	6.00E-02	pCi/g		0.61 1.90E-01	7/28/03 07:20 a	392.6	g	GER5-
CESIUM-137	1.61E-01	J	6.0E-02	6.0E-02	4.83E-02	pCi/g		(3.3) 3.20E-01	7/28/03 07:20 a	392.6	g	GER5-
EUROPIUM-152	-1.52E-02	U	7.5E-02	7.5E-02	1.30E-01	pCi/g		-0.12 4.04E-01	7/28/03 07:20 a	392.6	g	GER5-
EUROPIUM-154	3.21E-02	U	8.6E-02	8.6E-02	1.62E-01	pCi/g		0.2 3.70E-01	7/28/03 07:20 a	392.6	g	GER5-

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

rp1STLRchSample J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.

V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/9/2003 2:15:00 PM

Lot-Sample No.: J3G020266-14

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-004F01

COC No.: 2003-00160 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detector
EUROPIUM-155	3.16E-02	U	7.3E-02	7.3E-02	1.26E-01	pCi/g		0.25	7/28/03 07:20 a	392.6	GER5:	g
POTASSIUM-40	8.89E+00		1.4E+00	1.4E+00	3.71E-01	pCi/g	1.57E+01	0.86 (24.) (12.4)	7/28/03 07:20 a	392.6	GER5:	g
MANGANESE-54	-2.87E-02	U	3.3E-02	3.3E-02	5.36E-02	pCi/g		-0.53 (-1.8)	7/28/03 07:20 a	392.6	GER5:	g
NIOBIUM-94	-1.07E-02	U	2.4E-02	2.4E-02	4.05E-02	pCi/g	6.96E-01	-0.26 (-0.91)	7/28/03 07:20 a	392.6	GER5:	g
LEAD-212	7.75E-01		1.5E-01	1.5E-01	7.04E-02	pCi/g		(11.) (10.4)	7/28/03 07:20 a	392.6	GER5:	g
LEAD-214	7.50E-01		1.7E-01	1.7E-01	9.43E-02	pCi/g		(8.) (9.)	7/28/03 07:20 a	392.6	GER5:	g
RADIUM-226	8.02E-01		1.7E-01	1.7E-01	9.09E-02	pCi/g		(8.8) (9.3)	7/28/03 07:20 a	392.6	GER5:	g
THALLIUM-208	2.65E-01	U	6.2E-02	6.2E-02	9.67E-02	pCi/g		(2.7) (8.5)	7/28/03 07:20 a	392.6	GER5:	g

No. of Results: 18      Comments:

STL Richland      MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 rptSTLRchSample      J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 V4.04 A97      U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name:	STL Richland	SDG:	23303	Collection Date:	6/23/2003 10:35:00 AM
Lot-Sample No.:	J3G020266-28	Report No.:	23222	Received Date:	7/2/2003 11:00:00 AM
Client Sample ID:	9538-00-005F	COC No.:	2003-00166 R	Matrix:	SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detect
Batch: 3192332	E901.1				Work Order: FRM591AA		Report DB ID: 9FRM5910					
ACTINIUM-228	4.38E-01		1.8E-01	1.8E-01	1.57E-01	pCi/g		(2.8) (5.)	7/28/03 02:23 p	356.9	GER7: g	
AG-108M	8.24E-03	U	2.0E-02	2.0E-02	3.65E-02	pCi/g		0.23	7/28/03 02:23 p	356.9	GER7: g	
AMERICIUM-241	-9.58E-03	U	8.2E-02	8.2E-02	1.40E-01	pCi/g		2.86E-01 1.03E+00	-0.07 -0.23	7/28/03 02:23 p	356.9 g	GER7: g
BISMUTH-212	5.04E-01	U	3.9E-01	3.9E-01	7.78E-01	pCi/g		0.65 (2.6)	7/28/03 02:23 p	356.9	GER7: g	
BISMUTH-214	5.62E-01		1.2E-01	1.2E-01	7.44E-02	pCi/g		(7.6) (9.5)	7/28/03 02:23 p	356.9	GER7: g	
COBALT-60	4.61E-03	U	2.6E-02	2.6E-02	5.00E-02	pCi/g		0.09 1.50E-01	7/28/03 02:23 p	356.9	GER7: g	
CESIUM-134	1.43E-02	U	2.7E-02	2.7E-02	5.25E-02	pCi/g		0.27 1.90E-01	7/28/03 02:23 p	356.9	GER7: g	
CESIUM-137	-4.31E-03	U	2.6E-02	2.6E-02	4.51E-02	pCi/g		-0.1 3.20E-01	7/28/03 02:23 p	356.9	GER7: g	
EUROPIUM-152	-3.94E-02	U	6.4E-02	6.4E-02	1.06E-01	pCi/g		-0.37 4.04E-01	7/28/03 02:23 p	356.9	GER7: g	
EUROPIUM-154	4.23E-03	U	8.6E-02	8.6E-02	1.59E-01	pCi/g		0.03 3.70E-01	7/28/03 02:23 p	356.9	GER7: g	

STL Richland MDC|MDA,Lc - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 rptSTLRchSample J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland  
 Lot-Sample No.: J3G020266-28  
 Client Sample ID: 9538-00-005F

SDG: 23303  
 Report No.: 23222  
 COC No.: 2003-00166 R

Collection Date: 6/23/2003 10:35:00 AM  
 Received Date: 7/2/2003 11:00:00 AM  
 Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detect
EUROPIUM-155	3.81E-02	U	6.4E-02	6.4E-02	1.16E-01	pCi/g		0.33 1.57E+01	7/28/03 02:23 p (1.2)	356.9	g	GER7
POTASSIUM-40	1.02E+01		1.6E+00	1.6E+00	3.08E-01	pCi/g		(33.2) (12.7)	7/28/03 02:23 p	356.9	g	GER7
MANGANESE-54	8.97E-03	U	2.3E-02	2.3E-02	4.48E-02	pCi/g		0.2 6.96E-01	7/28/03 02:23 p 0.77	356.9	g	GER7
NIOBIUM-94	5.30E-03	U	2.3E-02	2.3E-02	4.31E-02	pCi/g		0.12 2.85E-01	7/28/03 02:23 p 0.46	356.9	g	GER7
LEAD-212	4.80E-01		1.1E-01	1.1E-01	9.82E-02	pCi/g		(4.9) (8.9)	7/28/03 02:23 p	356.9	g	GER7
LEAD-214	5.81E-01		1.5E-01	1.5E-01	7.92E-02	pCi/g		(7.3) (7.6)	7/28/03 02:23 p	356.9	g	GER7
RADIUM-226	5.62E-01		1.2E-01	1.2E-01	7.44E-02	pCi/g		(7.6) (9.5)	7/28/03 02:23 p	356.9	g	GER7
THALLIUM-208	1.33E-01	U	4.5E-02	4.5E-02	7.52E-02	pCi/g		(1.8) (5.9)	7/28/03 02:23 p	356.9	g	GER7

No. of Results: 18      Comments:

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

Lot-Sample No.: J3G020266-17

Client Sample ID: 9538-00-006F

SDG: 23303

Report No.: 23222

COC No.: 2003-00159 R

Collection Date: 6/5/2003 2:40:00 PM

Received Date: 7/2/2003 11:00:00 AM

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detector
Batch: 3192332	E901.1				Work Order: FRM4X1AA		Report DB ID: 9FRM4X10					
ACTINIUM-228	7.85E-01		2.2E-01	2.2E-01	1.71E-01	pCi/g		(4.6) (7.)	7/28/03 09:01 a	374.2	9	GER6:
AG-108M	-2.14E-02	U	2.4E-02	2.4E-02	3.86E-02	pCi/g		-0.55 2.86E-01 (-1.8)	7/28/03 09:01 a	374.2	9	GER6:
AMERICIUM-241	1.93E-02	U	8.3E-02	8.3E-02	1.39E-01	pCi/g		0.14 1.03E+00 0.47	7/28/03 09:01 a	374.2	9	GER6:
BISMUTH-212	6.98E-01	U	4.3E-01	4.3E-01	8.34E-01	pCi/g		0.84 (3.2)	7/28/03 09:01 a	374.2	9	GER6:
BISMUTH-214	7.22E-01		1.4E-01	1.4E-01	8.16E-02	pCi/g		(8.8) (10.2)	7/28/03 09:01 a	374.2	9	GER6:
COBALT-60	-6.81E-03	U	3.0E-02	3.0E-02	5.30E-02	pCi/g		-0.13 1.50E-01 -0.46	7/28/03 09:01 a	374.2	9	GER6:
CESIUM-134	4.35E-02	U	3.6E-02	3.6E-02	6.85E-02	pCi/g		0.64 1.90E-01 (2.4)	7/28/03 09:01 a	374.2	9	GER6:
CESIUM-137	3.37E-01		7.9E-02	7.9E-02	4.81E-02	pCi/g		(7.) 3.20E-01 (8.5)	7/28/03 09:01 a	374.2	9	GER6:
EUROPIUM-152	-1.27E-02	U	7.4E-02	7.4E-02	1.22E-01	pCi/g		-0.1 4.04E-01 -0.34	7/28/03 09:01 a	374.2	9	GER6:
EUROPIUM-154	-2.86E-02	U	9.1E-02	9.1E-02	1.60E-01	pCi/g		-0.18 3.70E-01 -0.63	7/28/03 09:01 a	374.2	9	GER6:

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/5/2003 2:40:00 PM

Lot-Sample No.: J3G020266-17

Report No. : 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-006F

COC No. : 2003-00159 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error ( $\pm$ s)	Total Uncert( $\pm$ s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detect
EUROPIUM-155	6.11E-02	U	6.9E-02	6.9E-02	1.21E-01	pCi/g		0.51 (1.8)	7/28/03 09:01 a	374.2	9	GER6:
POTASSIUM-40	1.00E+01		1.6E+00	1.6E+00	3.96E-01	pCi/g	1.57E+01	(25.4) (12.6)	7/28/03 09:01 a	374.2	9	GER6:
MANGANESE-54	3.81E-02	U	3.3E-02	3.3E-02	6.33E-02	pCi/g		0.6 (2.3)	7/28/03 09:01 a	374.2	9	GER6:
NIOBIUM-94	-4.06E-03	U	2.6E-02	2.6E-02	4.56E-02	pCi/g	6.96E-01	-0.09 -0.31	7/28/03 09:01 a	374.2	9	GER6:
LEAD-212	7.03E-01		1.5E-01	1.5E-01	7.43E-02	pCi/g	2.85E-01	(9.5) (9.6)	7/28/03 09:01 a	374.2	9	GER6:
LEAD-214	8.99E-01		2.0E-01	2.0E-01	8.63E-02	pCi/g		(10.4) (9.1)	7/28/03 09:01 a	374.2	9	GER6:
RADIUM-226	7.22E-01		1.4E-01	1.4E-01	8.16E-02	pCi/g		(8.8) (10.2)	7/28/03 09:01 a	374.2	9	GER6:
THALLIUM-208	2.85E-01		6.3E-02	6.3E-02	3.70E-02	pCi/g		(7.7) (9.1)	7/28/03 09:01 a	374.2	9	GER6:

No. of Results: 18

Comments:

STL Richland  
rptSTLRchSample  
V4.04 A97MDC|MDA,Lc - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/5/2003 2:46:00 PM

Lot-Sample No.: J3G020266-18

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-006F01

COC No.: 2003-00159 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detect
Batch: 3192332	E901.1				Work Order: FRM401AA		Report DB ID: 9FRM4010					
ACTINIUM-228	7.64E-01		2.1E-01	2.1E-01	1.33E-01	pCi/g		(5.7) (7.2)	7/28/03 10:47 a	411.0	g	GER5
AG-108M	-1.47E-02	U	2.2E-02	2.2E-02	3.56E-02	pCi/g		-0.41 2.86E-01 -(1.4)	7/28/03 10:47 a	411.0	g	GER5
AMERICIUM-241	8.23E-03	U	5.1E-02	5.1E-02	8.27E-02	pCi/g		0.1 1.03E+00 0.32	7/28/03 10:47 a	411.0	g	GER5
BISMUTH-212	6.73E-01	U	4.3E-01	4.3E-01	8.22E-01	pCi/g		0.82 (3.1)	7/28/03 10:47 a	411.0	g	GER5
BISMUTH-214	7.06E-01		1.5E-01	1.5E-01	8.32E-02	pCi/g		(8.5) (9.6)	7/28/03 10:47 a	411.0	g	GER5
COBALT-60	2.07E-02	U	2.4E-02	2.4E-02	4.89E-02	pCi/g		0.42 1.50E-01 (1.7)	7/28/03 10:47 a	411.0	g	GER5
CESIUM-134	3.59E-02	U	3.0E-02	3.0E-02	5.85E-02	pCi/g		0.61 1.90E-01 (2.4)	7/28/03 10:47 a	411.0	g	GER5
CESIUM-137	3.30E-01		7.2E-02	7.2E-02	5.05E-02	pCi/g		(6.5) 3.20E-01 (9.2)	7/28/03 10:47 a	411.0	g	GER5
EUROPIUM-152	1.76E-02	U	6.8E-02	6.8E-02	1.22E-01	pCi/g		0.14 4.04E-01 0.51	7/28/03 10:47 a	411.0	g	GER5
EUROPIUM-154	-2.01E-02	U	6.6E-02	6.6E-02	1.16E-01	pCi/g		-0.17 3.70E-01 -0.61	7/28/03 10:47 a	411.0	g	GER5

STL Richland  
rptSTLRchSample  
V4.04 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name:	STL Richland	SDG:	23303	Collection Date:	6/5/2003 2:46:00 PM
Lot-Sample No.:	J3G020266-18	Report No.:	23222	Received Date:	7/2/2003 11:00:00 AM
Client Sample ID:	9538-00-006F01	COC No.:	2003-00159 R	Matrix:	SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detect
EUROPIUM-155	1.10E-01	U	7.1E-02	7.1E-02	1.25E-01	pCi/g		0.88	7/28/03 10:47 a	411.0	9	GER5!
POTASSIUM-40	9.08E+00		1.4E+00	1.4E+00	3.94E-01	pCi/g	1.57E+01	(3.1) (23.) (12.7)	7/28/03 10:47 a	411.0	9	GER5!
MANGANESE-54	-9.82E-03	U	2.8E-02	2.8E-02	4.84E-02	pCi/g		-0.2	7/28/03 10:47 a	411.0	9	GER5!
NIOBIUM-94	1.47E-02	U	2.4E-02	2.4E-02	4.51E-02	pCi/g	6.96E-01	-0.7 (1.2)	7/28/03 10:47 a	411.0	9	GER5!
LEAD-212	6.44E-01		1.3E-01	1.3E-01	9.29E-02	pCi/g		(6.9) (9.5)	7/28/03 10:47 a	411.0	9	GER5!
LEAD-214	9.20E-01		1.7E-01	1.7E-01	8.41E-02	pCi/g		(10.9) (10.6)	7/28/03 10:47 a	411.0	9	GER5!
RADIUM-226	7.06E-01		1.5E-01	1.5E-01	8.32E-02	pCi/g		(8.5) (9.6)	7/28/03 10:47 a	411.0	9	GER5!
THALLIUM-208	2.36E-01	U	7.8E-02	7.8E-02	9.52E-02	pCi/g		(2.5) (6.1)	7/28/03 10:47 a	411.0	9	GER5!

No. of Results: 18

Comments:

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 rptSTLRchSample J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/10/2003 9:10:00 AM

Lot-Sample No.: J3G020266-1

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-007F

COC No.: 2003-00161 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detect
Batch: 3192331	E901.1				Work Order: FRM201AA		Report DB ID: 9FRM2010					
ACTINIUM-228	1.06E+00		2.7E-01	2.7E-01	1.94E-01	pCi/g		(5.5) (7.7)	7/26/03 06:54 a	340.5	g	GER5:
AG-108M	-4.17E-03 U		2.7E-02	2.7E-02	4.55E-02	pCi/g	2.86E-01	-0.09 -0.31	7/26/03 06:54 a	340.5	g	GER5:
AMERICIUM-241	7.30E-02 U		6.5E-02	6.5E-02	1.04E-01	pCi/g	1.03E+00	0.7 (2.3)	7/26/03 06:54 a	340.5	g	GER5:
BISMUTH-212	1.35E+00 U		5.4E-01	5.4E-01	1.06E+00	pCi/g		(1.3) (5.)	7/26/03 06:54 a	340.5	g	GER5:
BISMUTH-214	9.54E-01		1.9E-01	1.9E-01	1.05E-01	pCi/g		(9.1) (9.9)	7/26/03 06:54 a	340.5	g	GER5:
COBALT-60	6.09E-03 U		3.1E-02	3.1E-02	5.86E-02	pCi/g	1.50E-01	0.1 0.39	7/26/03 06:54 a	340.5	g	GER5:
CESIUM-134	8.48E-02 U		4.2E-02	4.2E-02	8.29E-02	pCi/g	1.90E-01	(1.) (4.1)	7/26/03 06:54 a	340.5	g	GER5:
CESIUM-137	1.80E-01 J		5.5E-02	5.5E-02	6.27E-02	pCi/g	3.20E-01	(2.9) (6.5)	7/26/03 06:54 a	340.5	g	GER5:
EUROPIUM-152	-3.95E-02 U		8.9E-02	8.9E-02	1.50E-01	pCi/g	4.04E-01	-0.26 -0.89	7/26/03 06:54 a	340.5	g	GER5:
EUROPIUM-154	-2.23E-02 U		9.9E-02	9.9E-02	1.75E-01	pCi/g	3.70E-01	-0.13 -0.45	7/26/03 06:54 a	340.5	g	GER5:

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name:	STL Richland	SDG:	23303	Collection Date:	6/10/2003 9:10:00 AM
Lot-Sample No.:	J3G020266-1	Report No.:	23222	Received Date:	7/2/2003 11:00:00 AM
Client Sample ID:	9538-00-007F	COC No.:	2003-00161 R	Matrix:	SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detector
EUROPIUM-155	2.90E-02	U	8.4E-02	8.4E-02	1.43E-01	pCi/g		0.2	7/26/03 06:54 a		340.5	GER5
POTASSIUM-40	1.07E+01		1.7E+00	1.7E+00	4.13E-01	pCi/g	1.57E+01	0.69			340.5	GER5
MANGANESE-54	3.54E-03	U	3.1E-02	3.1E-02	5.66E-02	pCi/g		(25.9) (12.7)	7/26/03 06:54 a		340.5	GER5
NIOBIUM-94	-9.72E-03	U	2.6E-02	2.6E-02	4.59E-02	pCi/g	6.96E-01	0.06	7/26/03 06:54 a		340.5	GER5
LEAD-212	9.84E-01		1.9E-01	1.9E-01	8.51E-02	pCi/g	2.85E-01	0.23 -0.21 -0.74	7/26/03 06:54 a		340.5	GER5
LEAD-214	1.08E+00		2.0E-01	2.0E-01	9.96E-02	pCi/g		(11.6) (10.4)	7/26/03 06:54 a		340.5	GER5
RADIUM-226	9.54E-01		1.9E-01	1.9E-01	1.05E-01	pCi/g		(10.9) (11.1)	7/26/03 06:54 a		340.5	GER5
THALLIUM-208	3.77E-01		8.3E-02	8.3E-02	5.39E-02	pCi/g		(9.1) (9.9) (7.) (9.)	7/26/03 06:54 a		340.5	GER5

No. of Results: 18

Comments:

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 rptSTLRchSample J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/10/2003 9:41:00 AM

Lot-Sample No.: J3G020266-2

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-007F01

COC No.: 2003-00161 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detect
Batch: 3192331	E901.1				Work Order:	FRM231AA	Report DB ID: 9FRM2310					
ACTINIUM-228	8.63E-01	U	2.0E-01	2.0E-01	3.58E-01	pCi/g		(2.4) (8.6)	7/26/03 10:51 a	387.0	9	GER5
AG-108M	-4.13E-03	U	2.3E-02	2.3E-02	3.90E-02	pCi/g		-0.11 2.86E-01	7/26/03 10:51 a	387.0	9	GER5
AMERICIUM-241	1.19E-02	U	5.4E-02	5.4E-02	8.93E-02	pCi/g		0.13 0.44	7/26/03 10:51 a	387.0	9	GER5
BISMUTH-212	9.56E-01	U	4.7E-01	4.7E-01	9.03E-01	pCi/g		(1.1) (4.1)	7/26/03 10:51 a	387.0	9	GER5
BISMUTH-214	8.31E-01		1.8E-01	1.8E-01	8.45E-02	pCi/g		(9.8) (9.3)	7/26/03 10:51 a	387.0	9	GER5
COBALT-60	3.12E-02	U	3.1E-02	3.1E-02	6.23E-02	pCi/g		0.5 1.50E-01	7/26/03 10:51 a	387.0	9	GER5
CESIUM-134	5.20E-02	U	3.4E-02	3.4E-02	6.75E-02	pCi/g		0.77 1.90E-01	7/26/03 10:51 a	387.0	9	GER5
CESIUM-137	2.94E-01	J	6.1E-02	6.1E-02	4.93E-02	pCi/g		(6.) 3.20E-01	7/26/03 10:51 a	387.0	9	GER5
EUROPIUM-152	-3.94E-02	U	7.3E-02	7.3E-02	1.24E-01	pCi/g		-0.32 4.04E-01	7/26/03 10:51 a	387.0	9	GER5
EUROPIUM-154	3.85E-02	U	9.3E-02	9.3E-02	1.75E-01	pCi/g		0.22 3.70E-01	7/26/03 10:51 a	387.0	9	GER5

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland SDG: 23303 Collection Date: 6/10/2003 9:41:00 AM  
 Lot-Sample No.: J3G020266-2 Report No.: 23222 Received Date: 7/2/2003 11:00:00 AM  
 Client Sample ID: 9538-00-007F01 COC No.: 2003-00161 R Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error ( $\pm 2\sigma$ )	Total Uncert ( $\pm 2\sigma$ )	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detect
EUROPIUM-155	-2.79E-03	U	7.2E-02	7.2E-02	1.21E-01	pCi/g		-0.02	7/26/03 10:51 a		387.0	GER5
POTASSIUM-40	9.97E+00		1.6E+00	1.6E+00	4.39E-01	pCi/g	1.57E+01	-0.08	(22.7)	7/26/03 10:51 a	387.0	GER5
MANGANESE-54	-7.77E-03	U	2.9E-02	2.9E-02	5.06E-02	pCi/g		-0.15	7/26/03 10:51 a		387.0	GER5
NIOBIUM-94	1.94E-02	U	2.6E-02	2.6E-02	5.01E-02	pCi/g	6.96E-01	-0.54	0.39	7/26/03 10:51 a	387.0	GER5
LEAD-212	7.27E-01		1.5E-01	1.5E-01	7.84E-02	pCi/g	2.85E-01	(1.5)	(9.3)	7/26/03 10:51 a	387.0	GER5
LEAD-214	7.80E-01		1.6E-01	1.6E-01	9.84E-02	pCi/g		(9.8)	(7.9)	7/26/03 10:51 a	387.0	GER5
RADIUM-226	8.31E-01		1.8E-01	1.8E-01	8.45E-02	pCi/g		(10.)	(9.8)	7/26/03 10:51 a	387.0	GER5
THALLIUM-208	2.17E-01		6.6E-02	6.6E-02	4.53E-02	pCi/g		(4.8)	(9.3)	7/26/03 10:51 a	387.0	GER5
								(6.5)	(4.8)	7/26/03 10:51 a	387.0	GER5

No. of Results: 18

Comments:

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 rptSTLRchSample J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/9/2003 10:04:00 AM

Lot-Sample No.: J3G020266-9

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-008F

COC No.: 2003-00160 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primat Defect
Batch: 3192331	E901.1				Work Order: FRM321AA		Report DB ID: 9FRM3210					
ACTINIUM-228	6.16E-01		2.1E-01	2.1E-01	1.84E-01	pCi/g		(3.3) (5.8)	7/26/03 12:42 p	381.9	g	GER7
AG-108M	-1.12E-02	U	2.2E-02	2.2E-02	3.75E-02	pCi/g		-0.3	7/26/03 12:42 p	381.9	g	GER7
AMERICIUM-241	3.37E-02	U	9.2E-02	9.2E-02	1.58E-01	pCi/g		2.86E-01 1.03E+00	0.21 0.73	381.9	g	GER7
BISMUTH-212	6.37E-01	U	4.0E-01	4.0E-01	7.80E-01	pCi/g		0.82 (3.2)	7/26/03 12:42 p	381.9	g	GER7
BISMUTH-214	7.29E-01		1.5E-01	1.5E-01	8.31E-02	pCi/g		(8.8) (9.7)	7/26/03 12:42 p	381.9	g	GER7
COBALT-60	1.35E-02	U	2.6E-02	2.6E-02	5.20E-02	pCi/g		0.26 1.50E-01	7/26/03 12:42 p	381.9	g	GER7
CESIUM-134	1.38E-02	U	3.1E-02	3.1E-02	5.66E-02	pCi/g		0.24 1.90E-01	7/26/03 12:42 p	381.9	g	GER7
CESIUM-137	1.62E-01	J	4.6E-02	4.6E-02	4.37E-02	pCi/g		(3.7) 3.20E-01	7/26/03 12:42 p	381.9	g	GER7
EUROPIUM-152	-1.99E-02	U	7.8E-02	7.8E-02	1.12E-01	pCi/g		-0.18 4.04E-01	7/26/03 12:42 p	381.9	g	GER7
EUROPIUM-154	-2.26E-02	U	7.3E-02	7.3E-02	1.29E-01	pCi/g		-0.17 3.70E-01	7/26/03 12:42 p	381.9	g	GER7

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/9/2003 10:04:00 AM

Lot-Sample No.: J3G020266-9

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-008F

COC No.: 2003-00160 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detect
EUROPIUM-155	9.77E-02	U	7.4E-02	7.4E-02	1.35E-01	pCi/g		0.72 1.57E+01	7/26/03 12:42 p (2.6)	381.9	g	GER7
POTASSIUM-40	1.04E+01		1.6E+00	1.6E+00	4.40E-01	pCi/g		(23.7) (12.7)	7/26/03 12:42 p	381.9	g	GER7
MANGANESE-54	1.55E-02	U	2.9E-02	2.9E-02	5.46E-02	pCi/g		0.28 6.96E-01	7/26/03 12:42 p (1.)	381.9	g	GER7
NIOBIUM-94	1.90E-03	U	2.2E-02	2.2E-02	4.10E-02	pCi/g		0.05 2.85E-01	7/26/03 12:42 p 0.17	381.9	g	GER7
LEAD-212	6.63E-01		1.3E-01	1.3E-01	9.19E-02	pCi/g		(7.2) (9.8)	7/26/03 12:42 p	381.9	g	GER7
LEAD-214	7.58E-01		1.6E-01	1.6E-01	8.40E-02	pCi/g		(9.) (9.5)	7/26/03 12:42 p	381.9	g	GER7
RADIUM-226	7.29E-01		1.5E-01	1.5E-01	8.31E-02	pCi/g		(8.8) (9.7)	7/26/03 12:42 p	381.9	g	GER7
THALLIUM-208	2.81E-01	U	6.3E-02	6.3E-02	9.76E-02	pCi/g		(2.9) (8.9)	7/26/03 12:42 p	381.9	g	GER7

No. of Results: 18 Comments:

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name:	STL Richland	SDG:	23303	Collection Date:	6/9/2003 10:35:00 AM
Lot-Sample No.:	J3G020266-11	Report No.:	23222	Received Date:	7/2/2003 11:00:00 AM
Client Sample ID:	9538-00-008F01	COC No.:	2003-00160 R	Matrix:	SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detect	
Batch: 3192331	E901.1				Work Order:	FRM4F1AA	Report DB ID: 9FRM4F10						
ACTINIUM-228	8.01E-01		2.0E-01	2.0E-01	1.78E-01	pCi/g	(4.5)		7/28/03 05:32 a	374.7	9	GER7:	
AG-108M	2.55E-03	U	2.1E-02	2.1E-02	3.76E-02	pCi/g	(8.2)			374.7	9	GER7:	
AMERICIUM-241	4.10E-02	U	9.4E-02	9.4E-02	1.63E-01	pCi/g	2.86E-01	0.07	7/28/03 05:32 a	374.7	9	GER7:	
BISMUTH-212	6.69E-01	U	5.5E-01	5.5E-01	8.51E-01	pCi/g	1.03E+00	0.24		374.7	9	GER7:	
BISMUTH-214	7.62E-01		1.5E-01	1.5E-01	8.35E-02	pCi/g	(2.4)		7/28/03 05:32 a	374.7	9	GER7:	
COBALT-60	1.02E-02	U	2.8E-02	2.8E-02	5.41E-02	pCi/g	1.50E-01	0.79	7/28/03 05:32 a	374.7	9	GER7:	
CESIUM-134	4.49E-02	U	3.3E-02	3.3E-02	6.54E-02	pCi/g	1.90E-01	0.69	7/28/03 05:32 a	374.7	9	GER7:	
CESIUM-137	1.41E-01	J	5.8E-02	5.8E-02	4.87E-02	pCi/g	3.20E-01	(2.7)	7/28/03 05:32 a	374.7	9	GER7:	
EUROPIUM-152	-5.06E-02	U	8.6E-02	8.6E-02	1.22E-01	pCi/g	4.04E-01	(2.9)	-0.42	7/28/03 05:32 a	374.7	9	GER7:
EUROPIUM-154	-1.03E-01	U	9.0E-02	9.0E-02	1.41E-01	pCi/g	3.70E-01	(4.9)	-0.73	7/28/03 05:32 a	374.7	9	GER7:

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

Lot-Sample No.: J3G020266-11

Client Sample ID: 9538-00-008F01

SDG: 23303

Report No.: 23222

COC No.: 2003-00160 R

Collection Date: 6/9/2003 10:35:00 AM

Received Date: 7/2/2003 11:00:00 AM

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detect
EUROPIUM-155	1.56E-02	U	7.5E-02	7.5E-02	1.33E-01	pCi/g		0.12	7/28/03 05:32 a		374.7	GER7:
POTASSIUM-40	1.20E+01		1.8E+00	1.8E+00	4.17E-01	pCi/g	1.57E+01	0.41	(28.6)	7/28/03 05:32 a	374.7	GER7:
MANGANESE-54	-2.61E-03	U	2.7E-02	2.7E-02	4.88E-02	pCi/g		(13.2)	(13.2)		374.7	GER7:
NIOBIUM-94	7.75E-03	U	2.7E-02	2.7E-02	4.99E-02	pCi/g	6.96E-01	-0.05	7/28/03 05:32 a		374.7	GER7:
LEAD-212	7.03E-01		1.4E-01	1.4E-01	9.43E-02	pCi/g	2.85E-01	0.16	(7.5)	7/28/03 05:32 a	374.7	GER7:
LEAD-214	8.14E-01		1.6E-01	1.6E-01	8.99E-02	pCi/g		0.57	(10.)		374.7	GER7
RADIUM-226	7.62E-01		1.5E-01	1.5E-01	8.35E-02	pCi/g		(9.1)	7/28/03 05:32 a		374.7	GER7
THALLIUM-208	2.50E-01		6.3E-02	6.3E-02	4.40E-02	pCi/g		(10.1)	(10.1)		374.7	GER7
								(5.7)	7/28/03 05:32 a		374.7	GER7
								(8.)			374.7	GER7

No. of Results: 18      Comments:

---

STL Richland      MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 rptSTLRchSample      J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 V4.04 A97      U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/9/2003 10:04:00 AM

Lot-Sample No.: J3G020266-10

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-008FS

COC No.: 2003-00160 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detect:
Batch: 3192331	E901.1				Work Order: FRM391AA		Report DB ID: 9FRM3910					
ACTINIUM-228	7.97E-01	U	2.3E-01	2.3E-01	3.49E-01	pCi/g		(2.3) (7.1)	7/28/03 05:32 a	372.8	9	GER6
AG-108M	-3.95E-03	U	2.2E-02	2.2E-02	3.69E-02	pCi/g		-0.11 2.86E-01	7/28/03 05:32 a	372.8	9	GER6
AMERICIUM-241	-6.18E-02	U	8.3E-02	8.3E-02	1.33E-01	pCi/g		-0.46 1.03E+00	7/28/03 05:32 a	372.8	9	GER6
BISMUTH-212	9.47E-01	U	4.4E-01	4.4E-01	8.66E-01	pCi/g		(1.1) (4.3)	7/28/03 05:32 a	372.8	9	GER6
BISMUTH-214	8.56E-01		1.7E-01	1.7E-01	8.54E-02	pCi/g		(10.) (9.8)	7/28/03 05:32 a	372.8	9	GER6
COBALT-60	1.41E-02	U	3.1E-02	3.1E-02	5.87E-02	pCi/g		0.24 1.50E-01	7/28/03 05:32 a	372.8	9	GER6
CESIUM-134	1.93E-02	U	3.5E-02	3.5E-02	6.32E-02	pCi/g		0.31 1.90E-01	7/28/03 05:32 a	372.8	9	GER6
CESIUM-137	2.50E-01	J	6.2E-02	6.2E-02	5.68E-02	pCi/g		(1.1) 3.20E-01	7/28/03 05:32 a	372.8	9	GER6
EUROPIUM-152	-8.15E-02	U	7.2E-02	7.2E-02	1.16E-01	pCi/g		-0.7 4.04E-01	7/28/03 05:32 a	372.8	9	GER6
EUROPIUM-154	-1.77E-02	U	9.5E-02	9.5E-02	1.69E-01	pCi/g		-0.1 3.70E-01	7/28/03 05:32 a	372.8	9	GER6

STL Richland MDC|MDA,Lc - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 rptSTLRchSample J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/9/2003 10:04:00 AM

Lot-Sample No.: J3G020266-10

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-008FS

COC No.: 2003-00160 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detect
EUROPIUM-155	-2.65E-02	U	7.1E-02	7.1E-02	1.19E-01	pCi/g		-0.22	7/28/03 05:32 a		372.8	GER6:
POTASSIUM-40	1.10E+01		1.7E+00	1.7E+00	3.44E-01	pCi/g	1.57E+01	-0.75	(32.1) (12.7)	7/28/03 05:32 a	372.8	GER6:
MANGANESE-54	-2.07E-02	U	3.1E-02	3.1E-02	5.15E-02	pCi/g		-0.4	7/28/03 05:32 a		372.8	GER6:
NIOBIUM-94	-2.89E-03	U	2.6E-02	2.6E-02	4.67E-02	pCi/g	6.96E-01	-(1.3)	-0.06	7/28/03 05:32 a	372.8	GER6:
LEAD-212	8.36E-01		1.6E-01	1.6E-01	1.03E-01	pCi/g	2.85E-01	-0.22	(8.1) (10.2)	7/28/03 05:32 a	372.8	GER6:
LEAD-214	1.01E+00		2.0E-01	2.0E-01	9.12E-02	pCi/g		(11.) (10.)	7/28/03 05:32 a		372.8	GER6:
RADIUM-226	8.56E-01		1.7E-01	1.7E-01	8.54E-02	pCi/g		(10.) (9.8)	7/28/03 05:32 a		372.8	GER6:
THALLIUM-208	2.76E-01		7.4E-02	7.4E-02	4.35E-02	pCi/g		(6.4) (7.5)	7/28/03 05:32 a		372.8	GER6:

No. of Results: 18      Comments:

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland  
 Lot-Sample No.: J3G020266-12  
 Client Sample ID: 9538-00-008FS01

SDG: 23303  
 Report No.: 23222  
 COC No.: 2003-00160 R

Collection Date: 6/9/2003 10:35:00 AM  
 Received Date: 7/2/2003 11:00:00 AM  
 Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detector
Batch: 3192331	E901.1				Work Order: FRM4G1AA		Report DB ID: 9FRM4G10					
ACTINIUM-228	7.89E-01		2.0E-01	2.0E-01	1.41E-01	pCi/g		(5.6) (7.9)	7/28/03 05:33 a	352.5	GER8: g	
AG-108M	-6.92E-03	U	2.2E-02	2.2E-02	3.69E-02	pCi/g		-0.19	7/28/03 05:33 a	352.5	GER8: g	
AMERICIUM-241	6.79E-02	U	6.1E-02	6.1E-02	9.30E-02	pCi/g		2.86E-01 -0.63	7/28/03 05:33 a	352.5	GER8: g	
BISMUTH-212	8.35E-01	U	4.7E-01	4.7E-01	8.51E-01	pCi/g		0.98 (3.5)	7/28/03 05:33 a	352.5	GER8: g	
BISMUTH-214	7.40E-01	U	1.5E-01	1.5E-01	2.08E-01	pCi/g		(3.6) (9.9)	7/28/03 05:33 a	352.5	GER8: g	
COBALT-60	1.19E-02	U	2.9E-02	2.9E-02	5.58E-02	pCi/g		0.21 1.50E-01 0.83	7/28/03 05:33 a	352.5	GER8: g	
CESIUM-134	4.45E-02	U	2.9E-02	2.9E-02	5.84E-02	pCi/g		0.76 1.90E-01 (3.1)	7/28/03 05:33 a	352.5	GER8: g	
CESIUM-137	1.94E-01	J	5.9E-02	5.9E-02	4.27E-02	pCi/g		(4.5) 3.20E-01 (6.6)	7/28/03 05:33 a	352.5	GER8: g	
EUROPIUM-152	-2.66E-02	U	6.7E-02	6.7E-02	1.14E-01	pCi/g		-0.23 4.04E-01 -0.79	7/28/03 05:33 a	352.5	GER8: g	
EUROPIUM-154	3.52E-02	U	7.6E-02	7.6E-02	1.49E-01	pCi/g		0.24 3.70E-01 0.93	7/28/03 05:33 a	352.5	GER8: g	

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/9/2003 10:35:00 AM

Lot-Sample No.: J3G020266-12

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-008FS01

COC No.: 2003-00160 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detect
EUROPIUM-155	7.37E-02	U	6.9E-02	6.9E-02	1.24E-01	pCi/g		0.6 (2.1)	7/28/03 05:33 a		352.5	GER8: g
POTASSIUM-40	1.08E+01		1.6E+00	1.6E+00	4.13E-01	pCi/g		(26.2) (13.2)	7/28/03 05:33 a		352.5	GER8: g
MANGANESE-54	2.03E-04	U	2.6E-02	2.6E-02	4.72E-02	pCi/g		0. 0.02	7/28/03 05:33 a		352.5	GER8: g
NIOBIUM-94	8.84E-03	U	2.0E-02	2.0E-02	3.94E-02	pCi/g		0.22 0.87	7/28/03 05:33 a		352.5	GER8: g
LEAD-212	7.59E-01		1.4E-01	1.4E-01	6.64E-02	pCi/g		(11.4) (10.7)	7/28/03 05:33 a		352.5	GER8: g
LEAD-214	8.31E-01		1.6E-01	1.6E-01	8.92E-02	pCi/g		(9.3) (10.1)	7/28/03 05:33 a		352.5	GER8: g
RADIUM-226	7.40E-01		1.5E-01	1.5E-01	8.48E-02	pCi/g		(8.7) (9.9)	7/28/03 05:33 a		352.5	GER8: g
THALLIUM-208	2.81E-01	U	6.9E-02	6.9E-02	9.08E-02	pCi/g		(3.1) (8.1)	7/28/03 05:33 a		352.5	GER8: g

No. of Results: 18

Comments:

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/16/2003 10:25:00 AM

Lot-Sample No.: J3G020266-29

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-009F

COC No.: 2003-00164 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detector
Batch: 3192332	E901.1				Work Order: FRM6H1AA		Report DB ID: 9FRM6H10					
ACTINIUM-228	7.26E-01		2.1E-01	2.1E-01	1.50E-01	pCi/g		(4.8) (7.)	7/28/03 02:25 p	347.4	g	GER8
AG-108M	-8.30E-03	U	2.0E-02	2.0E-02	3.40E-02	pCi/g		-0.24 2.86E-01	7/28/03 02:25 p	347.4	g	GER8
AMERICIUM-241	5.75E-03	U	5.8E-02	5.8E-02	8.40E-02	pCi/g		0.07 1.03E+00	7/28/03 02:25 p	347.4	g	GER8
BISMUTH-212	7.38E-01	U	3.8E-01	3.8E-01	7.60E-01	pCi/g		0.97 (3.9)	7/28/03 02:25 p	347.4	g	GER8
BISMUTH-214	6.48E-01	U	1.5E-01	1.5E-01	1.97E-01	pCi/g		(3.3) (8.9)	7/28/03 02:25 p	347.4	g	GER8
COBALT-60	1.20E-02	U	2.5E-02	2.5E-02	4.96E-02	pCi/g		0.24 1.50E-01	7/28/03 02:25 p	347.4	g	GER8
CESIUM-134	1.71E-02	U	2.6E-02	2.6E-02	5.05E-02	pCi/g		0.34 1.90E-01	7/28/03 02:25 p	347.4	g	GER8
CESIUM-137	1.59E-01	J	5.8E-02	5.8E-02	4.33E-02	pCi/g		(3.7) 3.20E-01	7/28/03 02:25 p	347.4	g	GER8
EUROPIUM-152	-7.61E-03	U	6.7E-02	6.7E-02	1.07E-01	pCi/g		-0.07 4.04E-01	7/28/03 02:25 p	347.4	g	GER8
EUROPIUM-154	4.83E-02	U	7.6E-02	7.6E-02	1.51E-01	pCi/g		0.32 3.70E-01	7/28/03 02:25 p	347.4	g	GER8

STL Richland  
rptSTLRchSample  
V4.04 A97MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

Lot-Sample No.: J3G020266-29

Client Sample ID: 9538-00-009F

SDG: 23303

Report No.: 23222

COC No.: 2003-00164 R

Collection Date: 6/16/2003 10:25:00 AM

Received Date: 7/2/2003 11:00:00 AM

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detectc
EUROPIUM-155	4.28E-02	U	6.3E-02	6.3E-02	1.12E-01	pCi/g		0.38 1.57E+01	7/28/03 02:25 p (1.4)	347.4	g	GER8:
POTASSIUM-40	1.04E+01		1.6E+00	1.6E+00	3.78E-01	pCi/g		(27.5) (13.)	7/28/03 02:25 p	347.4	g	GER8:
MANGANESE-54	5.63E-03	U	2.5E-02	2.5E-02	4.59E-02	pCi/g		0.12 6.96E-01	7/28/03 02:25 p 0.46	347.4	g	GER8:
NIOBIUM-94	-3.71E-03	U	2.2E-02	2.2E-02	3.99E-02	pCi/g		-0.09 2.85E-01	7/28/03 02:25 p -0.33	347.4	g	GER8:
LEAD-212	6.02E-01		1.3E-01	1.3E-01	1.01E-01	pCi/g		(5.9) (9.3)	7/28/03 02:25 p	347.4	g	GER8:
LEAD-214	6.91E-01		1.4E-01	1.4E-01	8.64E-02	pCi/g		(8.) (9.6)	7/28/03 02:25 p	347.4	g	GER8:
RADIUM-226	6.48E-01	U	1.5E-01	1.5E-01	1.97E-01	pCi/g		(3.3) (8.9)	7/28/03 02:25 p	347.4	g	GER8:
THALLIUM-208	2.09E-01		5.7E-02	5.7E-02	4.19E-02	pCi/g		(5.) (7.3)	7/28/03 02:25 p	347.4	g	GER8:

No. of Results: 18

Comments:

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name:	STL Richland	SDG:	23303	Collection Date:	6/16/2003 11:15:00 AM
Lot-Sample No.:	J3G020266-30	Report No.:	23222	Received Date:	7/2/2003 11:00:00 AM
Client Sample ID:	9538-00-009F01	COC No.:	2003-00164 R	Matrix:	SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detectc
Batch: 3192332	E901.1				Work Order: FRM6J1AA		Report DB ID: 9FRM6J10					
ACTINIUM-228	7.88E-01		2.1E-01	2.1E-01	1.46E-01	pCi/g		(5.4) (7.6)	7/28/03 04:19 p	369.2	GER5: g	
AG-108M	1.82E-02	U	2.3E-02	2.3E-02	4.23E-02	pCi/g		0.43 2.86E-01 (1.6)	7/28/03 04:19 p	369.2	GER5: g	
AMERICIUM-241	1.53E-02	U	5.3E-02	5.3E-02	8.87E-02	pCi/g		0.17 1.03E+00 0.58	7/28/03 04:19 p	369.2	GER5: g	
BISMUTH-212	9.89E-01	U	4.6E-01	4.6E-01	9.06E-01	pCi/g		(1.1) (4.3)	7/28/03 04:19 p	369.2	GER5: g	
BISMUTH-214	6.91E-01	U	1.6E-01	1.6E-01	2.13E-01	pCi/g		(3.2) (8.6)	7/28/03 04:19 p	369.2	GER5: g	
COBALT-60	2.45E-02	U	2.7E-02	2.7E-02	5.59E-02	pCi/g		0.44 1.50E-01 (1.8)	7/28/03 04:19 p	369.2	GER5: g	
CESIUM-134	2.92E-02	U	3.2E-02	3.2E-02	6.23E-02	pCi/g		0.47 1.90E-01 (1.8)	7/28/03 04:19 p	369.2	GER5: g	
CESIUM-137	1.73E-01	J	5.6E-02	5.6E-02	5.09E-02	pCi/g		(3.4) 3.20E-01 (6.2)	7/28/03 04:19 p	369.2	GER5: g	
EUROPIUM-152	-7.30E-03	U	7.4E-02	7.4E-02	1.29E-01	pCi/g		-0.06 4.04E-01 -0.2	7/28/03 04:19 p	369.2	GER5: g	
EUROPIUM-154	2.42E-02	U	8.0E-02	8.0E-02	1.52E-01	pCi/g		0.16 3.70E-01 0.61	7/28/03 04:19 p	369.2	GER5: g	

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/16/2003 11:15:00 AM

Lot-Sample No.: J3G020266-30

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-009F01

COC No.: 2003-00164 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncer( 2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detect
EUROPIUM-155	4.55E-02	U	7.0E-02	7.0E-02	1.22E-01	pCi/g		0.37	7/28/03 04:19 p	369.2	GER5:	
POTASSIUM-40	9.91E+00		1.6E+00	1.6E+00	3.67E-01	pCi/g	1.57E+01	(1.3) (27.) (12.6)	7/28/03 04:19 p	369.2	GER5:	
MANGANESE-54	-5.65E-03	U	3.0E-02	3.0E-02	5.28E-02	pCi/g		-0.11	7/28/03 04:19 p	369.2	GER5:	
NIOBIUM-94	-2.90E-02	U	2.5E-02	2.5E-02	3.87E-02	pCi/g	6.96E-01	-0.38	7/28/03 04:19 p	369.2	GER5:	
LEAD-212	7.07E-01		1.5E-01	1.5E-01	1.01E-01	pCi/g	2.85E-01	-0.75 (-2.3) (7.) (9.4)	7/28/03 04:19 p	369.2	GER5:	
LEAD-214	8.05E-01		1.6E-01	1.6E-01	8.85E-02	pCi/g		(9.1) (10.1)	7/28/03 04:19 p	369.2	GER5:	
RADIUM-226	6.91E-01		1.6E-01	1.6E-01	9.13E-02	pCi/g		(7.6) (8.6)	7/28/03 04:19 p	369.2	GER5:	
THALLIUM-208	2.50E-01		6.6E-02	6.6E-02	5.07E-02	pCi/g		(4.9) (7.5)	7/28/03 04:19 p	369.2	GER5:	

No. of Results: 18      Comments:

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 rptSTLRchSample J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/10/2003 2:25:00 PM

Lot-Sample No.: J3G020266-21

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-010F

COC No.: 2003-00162 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detect	
Batch: 3192332	E901.1				Work Order: FRM481AA		Report DB ID: 9FRM4810						
ACTINIUM-228	9.07E-01		2.5E-01	2.5E-01	1.99E-01	pCi/g		(4.5) (7.4)	7/28/03 10:45 a	290.6	9	GER8:	
AG-108M	9.62E-03	U	2.6E-02	2.6E-02	4.58E-02	pCi/g		0.21	7/28/03 10:45 a	290.6	9	GER8:	
AMERICIUM-241	6.39E-02	U	7.2E-02	7.2E-02	1.09E-01	pCi/g		2.86E-01 0.59 (1.8)	7/28/03 10:45 a	290.6	9	GER8:	
BISMUTH-212	1.04E+00	U	4.6E-01	4.6E-01	9.40E-01	pCi/g		(1.1) (4.5)	7/28/03 10:45 a	290.6	9	GER8:	
BISMUTH-214	9.96E-01		1.8E-01	1.8E-01	8.86E-02	pCi/g		(11.2) (11.1)	7/28/03 10:45 a	290.6	9	GER8:	
COBALT-60	-2.15E-02	U	3.0E-02	3.0E-02	5.03E-02	pCi/g		-0.43 1.50E-01 (-1.4)	7/28/03 10:45 a	290.6	9	GER8:	
CESIUM-134	6.38E-02	U	3.8E-02	3.8E-02	7.57E-02	pCi/g		1.90E-01 (3.4)	7/28/03 10:45 a	290.6	9	GER8:	
CESIUM-137	1.56E-01	J	5.3E-02	5.3E-02	5.88E-02	pCi/g		3.20E-01 (2.7)	7/28/03 10:45 a	290.6	9	GER8:	
EUROPIUM-152	2.44E-02	U	9.1E-02	9.1E-02	1.47E-01	pCi/g		4.04E-01 (5.9)	0.17	7/28/03 10:45 a	290.6	9	GER8:
EUROPIUM-154	7.77E-02	U	9.4E-02	9.4E-02	1.90E-01	pCi/g		3.70E-01 (1.7)	0.41	7/28/03 10:45 a	290.6	9	GER8:

STL Richland  
rptSTLRchSample  
V4.04 A97

MDC|MDA,Lc - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM I SAMPLE RESULTS												Date: 31-Jul-03
Lab Name:	STL Richland			SDG:	23303			Collection Date:	6/10/2003 2:25:00 PM			
Lot-Sample No.:	J3G020266-21			Report No. :	23222			Received Date:	7/2/2003 11:00:00 AM			
Client Sample ID:	9538-00-010F			COC No. :	2003-00162 R			Matrix:	SOIL			
Ordered by Client Sample ID, Batch No												
Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detect
EUROPIUM-155	1.19E-01	U	8.1E-02	8.1E-02	1.46E-01	pCi/g		0.81 1.57E+01	7/28/03 10:45 a		290.6	GER8: g
POTASSIUM-40	1.13E+01		1.8E+00	1.8E+00	5.86E-01	pCi/g		(2.9) (19.2) (12.6)	7/28/03 10:45 a		290.6	GER8: g
MANGANESE-54	2.93E-02	U	3.4E-02	3.4E-02	6.55E-02	pCi/g		0.45 6.96E-01	7/28/03 10:45 a		290.6	GER8: g
NIOBIUM-94	7.98E-03	U	2.8E-02	2.8E-02	5.27E-02	pCi/g		0.15 2.85E-01	7/28/03 10:45 a		290.6	GER8: g
LEAD-212	8.98E-01		1.8E-01	1.8E-01	1.12E-01	pCi/g		(8.) (10.2)	7/28/03 10:45 a		290.6	GER8: g
LEAD-214	1.07E+00		2.1E-01	2.1E-01	1.02E-01	pCi/g		(10.5) (10.4)	7/28/03 10:45 a		290.6	GER8: g
RADIUM-226	9.96E-01		1.8E-01	1.8E-01	8.86E-02	pCi/g		(11.2) (11.1)	7/28/03 10:45 a		290.6	GER8: g
THALLIUM-208	3.80E-01		7.7E-02	7.7E-02	5.08E-02	pCi/g		(7.5) (9.9)	7/28/03 10:45 a		290.6	GER8: g

No. of Results: 18      Comments:

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/10/2003 2:40:00 PM

Lot-Sample No.: J3G020266-22

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-010F01

COC No.: 2003-00162 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detectc
Batch: 3192332	E901.1				Work Order: FRM491AA		Report DB ID: 9FRM4910					
ACTINIUM-228	7.75E-01		2.2E-01	2.2E-01	1.71E-01	pCi/g		(4.5) (7.1)	7/28/03 12:36 p	346.3	g	GER5:
AG-108M	2.13E-02 U		2.5E-02	2.5E-02	4.60E-02	pCi/g		0.46 2.86E-01 (1.7)	7/28/03 12:36 p	346.3	g	GER5:
AMERICIUM-241	-4.53E-03 U		5.8E-02	5.8E-02	9.74E-02	pCi/g		-0.05 1.03E+00 -0.16	7/28/03 12:36 p	346.3	g	GER5:
BISMUTH-212	9.44E-01 U		4.7E-01	4.7E-01	9.23E-01	pCi/g		(1.) (4.)	7/28/03 12:36 p	346.3	g	GER5:
BISMUTH-214	8.66E-01 U		1.7E-01	1.7E-01	2.43E-01	pCi/g		(3.6) (9.9)	7/28/03 12:36 p	346.3	g	GER5:
COBALT-60	1.13E-02 U		2.7E-02	2.7E-02	5.37E-02	pCi/g		0.21 1.50E-01 0.83	7/28/03 12:36 p	346.3	g	GER5:
CESIUM-134	5.40E-02 U		3.5E-02	3.5E-02	7.06E-02	pCi/g		0.77 1.90E-01 (3.1)	7/28/03 12:36 p	346.3	g	GER5:
CESIUM-137	2.00E-01 J		7.7E-02	7.7E-02	5.19E-02	pCi/g		(3.9) 3.20E-01 (5.2)	7/28/03 12:36 p	346.3	g	GER5:
EUROPIUM-152	3.86E-02 U		9.2E-02	9.2E-02	1.43E-01	pCi/g		0.27 4.04E-01 0.84	7/28/03 12:36 p	346.3	g	GER5
EUROPIUM-154	-4.20E-02 U		8.6E-02	8.6E-02	1.47E-01	pCi/g		-0.29 3.70E-01 -0.98	7/28/03 12:36 p	346.3	g	GER5

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/10/2003 2:40:00 PM

Lot-Sample No.: J3G020266-22

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-010F01

COC No.: 2003-00162 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detect
EUROPIUM-155	6.09E-02	U	7.3E-02	7.3E-02	1.29E-01	pCi/g		0.47 1.57E+01	7/28/03 12:36 p (1.7)	346.3	g	GER5:
POTASSIUM-40	1.01E+01		1.6E+00	1.6E+00	5.50E-01	pCi/g		(18.3) (12.7)	7/28/03 12:36 p	346.3	g	GER5:
MANGANESE-54	1.30E-02	U	3.1E-02	3.1E-02	5.75E-02	pCi/g		0.23 6.96E-01	7/28/03 12:36 p 0.85	346.3	g	GER5:
NIOBIUM-94	2.81E-03	U	2.3E-02	2.3E-02	4.33E-02	pCi/g		0.06 2.85E-01	7/28/03 12:36 p 0.24	346.3	g	GER5:
LEAD-212	7.55E-01		1.6E-01	1.6E-01	8.05E-02	pCi/g		(9.4) (9.7)	7/28/03 12:36 p	346.3	g	GER5:
LEAD-214	7.77E-01		1.6E-01	1.6E-01	1.02E-01	pCi/g		(7.6) (10.)	7/28/03 12:36 p	346.3	g	GER5:
RADIUM-226	8.66E-01		1.7E-01	1.7E-01	9.12E-02	pCi/g		(9.5) (9.9)	7/28/03 12:36 p	346.3	g	GER5:
THALLIUM-208	2.20E-01	U	6.6E-02	6.6E-02	9.95E-02	pCi/g		(2.2) (6.6)	7/28/03 12:36 p	346.3	g	GER5:

No. of Results: 18

Comments:

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/11/2003 10:49:00 AM

Lot-Sample No.: J3G020266-19

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-011F

COC No.: 2003-00163 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detect	
Batch: 3192332	E901.1				Work Order: FRM441AA		Report DB ID: 9FRM4410						
ACTINIUM-228	7.68E-01		2.2E-01	2.2E-01	1.58E-01	pCi/g		(4.9) (6.9)	7/28/03 10:44 a	409.3	g	GER6	
AG-108M	-3.72E-03 U		2.2E-02	2.2E-02	3.68E-02	pCi/g		-0.1	7/28/03 10:44 a	409.3	g	GER6	
AMERICIUM-241	-1.64E-02 U		7.7E-02	7.7E-02	1.28E-01	pCi/g		2.86E-01 1.03E+00	-0.34 -0.42	7/28/03 10:44 a	409.3	g	GER6
BISMUTH-212	9.27E-01 U		5.8E-01	5.8E-01	8.53E-01	pCi/g		(1.1) (3.2)	7/28/03 10:44 a	409.3	g	GER6	
BISMUTH-214	6.90E-01 U		1.5E-01	1.5E-01	1.95E-01	pCi/g		(3.5) (9.4)	7/28/03 10:44 a	409.3	g	GER6	
COBALT-60	4.57E-02 U		3.1E-02	3.1E-02	6.36E-02	pCi/g		0.72 1.50E-01	7/28/03 10:44 a	409.3	g	GER6	
CESIUM-134	6.14E-03 U		3.1E-02	3.1E-02	5.46E-02	pCi/g		0.11 1.90E-01	7/28/03 10:44 a	409.3	g	GER6	
CESIUM-137	2.49E-01 J		5.4E-02	5.4E-02	4.57E-02	pCi/g		(5.5) 3.20E-01	7/28/03 10:44 a	409.3	g	GER6	
EUROPIUM-152	1.19E-02 U		6.2E-02	6.2E-02	1.11E-01	pCi/g		(9.2) 4.04E-01	0.11 0.38	7/28/03 10:44 a	409.3	g	GER6
EUROPIUM-154	3.20E-03 U		8.1E-02	8.1E-02	1.48E-01	pCi/g		0.02 3.70E-01	7/28/03 10:44 a 0.08	409.3	g	GER6	

STL Richland

 rptSTLRchSample  
V4.04 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.

U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/11/2003 10:49:00 AM

Lot-Sample No.: J3G020266-19

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-011F

COC No.: 2003-00163 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detece
EUROPIUM-155	3.03E-02	U	6.3E-02	6.3E-02	1.09E-01	pCi/g		0.28	7/28/03 10:44 a	409.3	g	GER6
POTASSIUM-40	9.34E+00		1.5E+00	1.5E+00	4.03E-01	pCi/g	1.57E+01	0.97	(23.2) (12.4)	409.3	g	GER6
MANGANESE-54	3.51E-03	U	2.5E-02	2.5E-02	4.63E-02	pCi/g		0.08	7/28/03 10:44 a	409.3	g	GER6
NIOBIUM-94	-9.05E-03	U	2.5E-02	2.5E-02	4.37E-02	pCi/g	6.96E-01	0.28	-0.21	409.3	g	GER6
LEAD-212	5.36E-01		1.4E-01	1.4E-01	7.74E-02	pCi/g	2.85E-01	-0.71	(6.9) (7.6)	409.3	g	GER6
LEAD-214	7.95E-01		1.7E-01	1.7E-01	8.50E-02	pCi/g		(9.3) (9.6)	7/28/03 10:44 a	409.3	g	GER6
RADIUM-226	6.90E-01		1.5E-01	1.5E-01	7.72E-02	pCi/g		(8.9) (9.4)	7/28/03 10:44 a	409.3	g	GER6
THALLIUM-208	2.88E-01		6.5E-02	6.5E-02	4.31E-02	pCi/g		(6.7) (8.9)	7/28/03 10:44 a	409.3	g	GER6

No. of Results: 18

Comments:

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/11/2003 1:53:00 PM

Lot-Sample No.: J3G020266-20

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-011F01

COC No.: 2003-00163 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detect
Batch: 3192332	E901.1				Work Order: FRM461AA		Report DB ID: 9FRM4610					
ACTINIUM-228	7.92E-01		2.2E-01	2.2E-01	1.88E-01	pCi/g		(4.2) (7.2)	7/28/03 10:44 a	332.9	g	GER7
AG-108M	1.18E-02	U	2.4E-02	2.4E-02	4.40E-02	pCi/g		0.27	7/28/03 10:44 a	332.9	g	GER7
AMERICIUM-241	-1.01E-02	U	9.3E-02	9.3E-02	1.59E-01	pCi/g		0.98	7/28/03 10:44 a	332.9	g	GER7
BISMUTH-212	9.05E-01	U	3.9E-01	3.9E-01	8.39E-01	pCi/g		-0.06	7/28/03 10:44 a	332.9	g	GER7
BISMUTH-214	8.23E-01	U	1.7E-01	1.7E-01	2.37E-01	pCi/g		-0.22	7/28/03 10:44 a	332.9	g	GER7
COBALT-60	-2.56E-03	U	3.0E-02	3.0E-02	5.62E-02	pCi/g		(1.1) (4.6)	7/28/03 10:44 a	332.9	g	GER7
CESIUM-134	1.83E-02	U	3.4E-02	3.4E-02	6.39E-02	pCi/g		(3.5) (9.6)	7/28/03 10:44 a	332.9	g	GER7
CESIUM-137	2.46E-01	J	5.6E-02	5.6E-02	6.58E-02	pCi/g		(1.1) (3.7)	7/28/03 10:44 a	332.9	g	GER7
EUROPIUM-152	1.36E-03	U	8.8E-02	8.8E-02	1.33E-01	pCi/g		(8.7) 0.01	7/28/03 10:44 a	332.9	g	GER7
EUROPIUM-154	4.23E-02	U	1.1E-01	1.1E-01	2.00E-01	pCi/g		0.03 0.21	7/28/03 10:44 a	332.9	g	GER7
								0.8				

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name:	STL Richland	SDG:	23303	Collection Date:	6/11/2003 1:53:00 PM
Lot-Sample No.:	J3G020266-20	Report No.:	23222	Received Date:	7/2/2003 11:00:00 AM
Client Sample ID:	9538-00-011F01	COC No.:	2003-00163 R	Matrix:	SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncer(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detector
EUROPIUM-155	-5.35E-03	U	7.8E-02	7.8E-02	1.35E-01	pCi/g		-0.04	7/28/03 10:44 a	332.9	g	GER7
POTASSIUM-40	1.13E+01		1.8E+00	1.8E+00	4.40E-01	pCi/g	1.57E+01	-0.14	(25.7)	332.9	g	GER7
MANGANESE-54	2.06E-03	U	3.2E-02	3.2E-02	5.85E-02	pCi/g		0.04	7/28/03 10:44 a	332.9	g	GER7
NIOBIUM-94	8.95E-03	U	2.6E-02	2.6E-02	4.82E-02	pCi/g	6.96E-01	0.13	0.19	332.9	g	GER7
LEAD-212	7.68E-01		1.5E-01	1.5E-01	1.21E-01	pCi/g	2.85E-01	0.7	(6.4)	332.9	g	GER7
LEAD-214	7.71E-01		1.6E-01	1.6E-01	8.84E-02	pCi/g		0.7	(10.2)	332.9	g	GER7
RADIUM-226	8.23E-01		1.7E-01	1.7E-01	8.67E-02	pCi/g		0.7	(8.7)	332.9	g	GER7
THALLIUM-208	2.57E-01		8.1E-02	8.1E-02	5.27E-02	pCi/g		0.7	(9.3)	332.9	g	GER7
								0.19	7/28/03 10:44 a	332.9	g	GER7
								(9.5)	7/28/03 10:44 a	332.9	g	GER7
								(9.6)	7/28/03 10:44 a	332.9	g	GER7
								(4.9)	7/28/03 10:44 a	332.9	g	GER7
								(6.4)	7/28/03 10:44 a	332.9	g	GER7

No. of Results: 18      Comments:

STL Richland      MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 rptSTLRchSample      J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 V4.04 A97      U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/10/2003 10:01:00 AM

Lot-Sample No.: J3G020266-3

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-012F

COC No.: 2003-00161 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detector
Batch: 3192331	E901.1				Work Order: FRM281AA		Report DB ID: 9FRM2810					
ACTINIUM-228	8.16E-01		1.9E-01	1.9E-01	1.60E-01	pCi/g		(5.1) (8.6)	7/26/03 10:48 a	375.3	9	GER6
AG-108M	-8.66E-03	U	2.2E-02	2.2E-02	3.69E-02	pCi/g		-0.23	7/26/03 10:48 a	375.3	9	GER6
AMERICIUM-241	4.62E-02	U	7.9E-02	7.9E-02	1.36E-01	pCi/g		2.86E-01 0.34 (1.2)	7/26/03 10:48 a	375.3	9	GER6
BISMUTH-212	1.02E+00	U	5.2E-01	5.2E-01	8.59E-01	pCi/g		(1.2) (3.9)	7/26/03 10:48 a	375.3	9	GER6
BISMUTH-214	7.37E-01	U	1.5E-01	1.5E-01	2.03E-01	pCi/g		(3.6) (9.8)	7/26/03 10:48 a	375.3	9	GER6
COBALT-60	2.42E-02	U	3.2E-02	3.2E-02	6.20E-02	pCi/g		0.39 1.50E-01 (1.5)	7/26/03 10:48 a	375.3	9	GER6
CESIUM-134	2.19E-02	U	3.2E-02	3.2E-02	5.95E-02	pCi/g		0.37 1.90E-01 (1.4)	7/26/03 10:48 a	375.3	9	GER6
CESIUM-137	1.25E-01	J	5.6E-02	5.6E-02	5.03E-02	pCi/g		(2.5) 3.20E-01 (4.4)	7/26/03 10:48 a	375.3	9	GER6
EUROPIUM-152	4.07E-03	U	7.0E-02	7.0E-02	1.24E-01	pCi/g		0.03 4.04E-01 0.12	7/26/03 10:48 a	375.3	9	GER6
EUROPIUM-154	-1.31E-02	U	9.1E-02	9.1E-02	1.61E-01	pCi/g		-0.08 3.70E-01 -0.29	7/26/03 10:48 a	375.3	9	GER6

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/10/2003 10:01:00 AM

Lot-Sample No.: J3G020266-3

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-012F

COC No.: 2003-00161 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detectr
EUROPIUM-155	5.21E-03	U	6.7E-02	6.7E-02	1.15E-01	pCi/g		0.05	7/26/03 10:48 a	375.3	g	GER6
POTASSIUM-40	1.05E+01		1.6E+00	1.6E+00	4.10E-01	pCi/g	1.57E+01	0.15 (25.6) (12.7)	7/26/03 10:48 a	375.3	g	GER6
MANGANESE-54	-1.43E-02	U	3.0E-02	3.0E-02	5.01E-02	pCi/g		-0.29	7/26/03 10:48 a	375.3	g	GER6
NIOBIUM-94	1.57E-03	U	2.4E-02	2.4E-02	4.35E-02	pCi/g	6.96E-01	-0.97 0.04	7/26/03 10:48 a	375.3	g	GER6
LEAD-212	8.02E-01		1.5E-01	1.5E-01	6.50E-02	pCi/g	2.85E-01	0.13 (12.3) (10.4)	7/26/03 10:48 a	375.3	g	GER6
LEAD-214	8.64E-01		1.8E-01	1.8E-01	8.60E-02	pCi/g		(10.) (9.9)	7/26/03 10:48 a	375.3	g	GER6
RADIUM-226	7.37E-01		1.5E-01	1.5E-01	8.34E-02	pCi/g		(8.8) (9.8)	7/26/03 10:48 a	375.3	g	GER6
THALLIUM-208	2.24E-01		6.8E-02	6.8E-02	4.28E-02	pCi/g		(5.2) (6.6)	7/26/03 10:48 a	375.3	g	GER6

No. of Results: 18

Comments:

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/10/2003 10:35:00 AM

Lot-Sample No.: J3G020266-5

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-012F01

COC No.: 2003-00161 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detector
Batch: 3192331	E901.1				Work Order: FRM3E1AA		Report DB ID: 9FRM3E10					
ACTINIUM-228	8.33E-01		1.8E-01	1.8E-01	1.19E-01	pCi/g		(7.)	7/26/03 10:50 a	375.9	GER8	
AG-108M	1.27E-03	U	1.9E-02	1.9E-02	3.35E-02	pCi/g		(9.1)		g		
AMERICIUM-241	-1.49E-02	U	5.7E-02	5.7E-02	8.36E-02	pCi/g		0.04	7/26/03 10:50 a	375.9	GER8	
BISMUTH-212	7.57E-01	U	5.9E-01	5.9E-01	8.19E-01	pCi/g		2.86E-01		g		
BISMUTH-214	7.73E-01		1.4E-01	1.4E-01	6.90E-02	pCi/g		0.13		375.9	GER8	
COBALT-60	5.06E-02	U	2.7E-02	2.7E-02	5.95E-02	pCi/g		1.03E+00		g		
CESIUM-134	4.21E-02	U	2.9E-02	2.9E-02	5.76E-02	pCi/g		0.92	7/26/03 10:50 a	375.9	GER8	
CESIUM-137	1.30E-01	J	4.7E-02	4.7E-02	4.74E-02	pCi/g		(2.6)		g		
EUROPIUM-152	-1.21E-02	U	6.3E-02	6.3E-02	1.09E-01	pCi/g		1.90E-01	7/26/03 10:50 a	375.9	GER8	
EUROPIUM-154	5.26E-02	U	7.5E-02	7.5E-02	1.48E-01	pCi/g		3.20E-01		g		
								4.04E-01		375.9	GER8	
								3.70E-01		g		
								0.36	7/26/03 10:50 a	375.9	GER8	
								(1.4)		g		

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/10/2003 10:35:00 AM

Lot-Sample No.: J3G020266-5

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-012F01

COC No.: 2003-00161 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detector
EUROPIUM-155	2.72E-02	U	6.6E-02	6.6E-02	1.15E-01	pCi/g		0.24	7/26/03 10:50 a		375.9	GER8
POTASSIUM-40	1.02E+01		1.5E+00	1.5E+00	3.11E-01	pCi/g	1.57E+01	0.83			9	
MANGANESE-54	-5.14E-03	U	2.6E-02	2.6E-02	4.50E-02	pCi/g		(32.9) (13.3)	7/26/03 10:50 a		375.9	GER8
NIOBIUM-94	1.75E-02	U	2.3E-02	2.3E-02	4.35E-02	pCi/g	6.96E-01	-0.11	7/26/03 10:50 a		9	
LEAD-212	7.11E-01		1.3E-01	1.3E-01	6.04E-02	pCi/g	2.85E-01	-0.4 (1.6) (10.7)	7/26/03 10:50 a		375.9	GER8
LEAD-214	7.98E-01		1.6E-01	1.6E-01	7.83E-02	pCi/g		(10.2) (10.3)	7/26/03 10:50 a		375.9	GER8
RADIUM-226	7.73E-01		1.4E-01	1.4E-01	6.90E-02	pCi/g		(11.2) (11.)	7/26/03 10:50 a		9	
THALLIUM-208	2.58E-01		5.7E-02	5.7E-02	4.52E-02	pCi/g		(5.7) (9.1)	7/26/03 10:50 a		375.9	GER8
											9	

No. of Results: 18      Comments:

 STL Richland  
 rptSTLRchSample  
 V4.04 A97

 MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/10/2003 10:01:00 AM

Lot-Sample No.: J3G020266-4

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-012FS

COC No.: 2003-00161 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detector
Batch: 3192331	E901.1				Work Order: FRM3C1AA		Report DB ID: 9FRM3C10					
ACTINIUM-228	6.80E-01		2.0E-01	2.0E-01	1.65E-01	pCi/g		(4.1) (6.7)	7/26/03 10:49 a	370.8	g	GER7:
AG-108M	7.76E-04	U	2.0E-02	2.0E-02	3.55E-02	pCi/g		0.02 2.86E-01	7/26/03 10:49 a	370.8	g	GER7:
AMERICIUM-241	-2.42E-02	U	9.3E-02	9.3E-02	1.56E-01	pCi/g		-0.15 1.03E+00	7/26/03 10:49 a	370.8	g	GER7:
BISMUTH-212	6.69E-01	U	4.3E-01	4.3E-01	8.44E-01	pCi/g		0.79 (3.1)	7/26/03 10:49 a	370.8	g	GER7:
BISMUTH-214	7.17E-01	U	1.5E-01	1.5E-01	2.13E-01	pCi/g		(3.4) (9.9)	7/26/03 10:49 a	370.8	g	GER7:
COBALT-60	1.43E-02	U	2.6E-02	2.6E-02	5.27E-02	pCi/g		0.27 1.50E-01	7/26/03 10:49 a	370.8	g	GER7:
CESIUM-134	2.01E-02	U	3.1E-02	3.1E-02	5.85E-02	pCi/g		0.34 1.90E-01	7/26/03 10:49 a	370.8	g	GER7:
CESIUM-137	1.81E-01	J	5.0E-02	5.0E-02	5.49E-02	pCi/g		(3.3) 3.20E-01	7/26/03 10:49 a	370.8	g	GER7:
EUROPIUM-152	-1.35E-02	U	7.0E-02	7.0E-02	1.20E-01	pCi/g		-0.11 4.04E-01	7/26/03 10:49 a	370.8	g	GER7:
EUROPIUM-154	2.29E-02	U	7.1E-02	7.1E-02	1.39E-01	pCi/g		0.16 3.70E-01	7/26/03 10:49 a	370.8	g	GER7:

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland  
 Lot-Sample No.: J3G020266-4  
 Client Sample ID: 9538-00-012FS

SDG: 23303

Collection Date: 6/10/2003 10:01:00 AM

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

COC No.: 2003-00161 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detect	
EUROPIUM-155	9.94E-02	U	8.0E-02	8.0E-02	1.45E-01	pCi/g		0.69	7/26/03 10:49 a		370.8	GER7	
POTASSIUM-40	1.11E+01		1.7E+00	1.7E+00	4.40E-01	pCi/g	1.57E+01	(2.5)	(25.3)	7/26/03 10:49 a	g	370.8	GER7
MANGANESE-54	3.48E-03	U	2.9E-02	2.9E-02	5.19E-02	pCi/g		0.07	7/26/03 10:49 a		370.8	GER7	
NIOBIUM-94	-1.26E-02	U	2.2E-02	2.2E-02	3.76E-02	pCi/g	6.96E-01	0.24	-0.34	7/26/03 10:49 a	g	370.8	GER7
LEAD-212	7.56E-01		1.4E-01	1.4E-01	6.94E-02	pCi/g	2.85E-01	(1.1)	(10.9)	7/26/03 10:49 a	g	370.8	GER7.
LEAD-214	7.55E-01		1.5E-01	1.5E-01	8.49E-02	pCi/g		(8.9)	(10.1)	7/26/03 10:49 a	g	370.8	GER7.
RADIUM-226	7.17E-01		1.5E-01	1.5E-01	8.10E-02	pCi/g		(8.8)	(9.9)	7/26/03 10:49 a	g	370.8	GER7.
THALLIUM-208	2.37E-01		7.0E-02	7.0E-02	4.01E-02	pCi/g		(5.9)	(6.8)	7/26/03 10:49 a	g	370.8	GER7.

No. of Results: 18

Comments:

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/10/2003 10:35:00 AM

Lot-Sample No.: J3G020266-6

Report No. : 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-012FS01

COC No. : 2003-00161 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detectr
Batch: 3192331	E901.1				Work Order: FRM3G1AA		Report DB ID: 9FRM3G10					
ACTINIUM-228	6.82E-01		2.0E-01	2.0E-01	1.70E-01	pCi/g		(4.) (6.8)	7/28/03 09:03 a	387.9	g	GER5
AG-108M	8.11E-03	U	2.2E-02	2.2E-02	3.92E-02	pCi/g		0.21	7/28/03 09:03 a	387.9	g	GER5
AMERICIUM-241	3.32E-03	U	5.7E-02	5.7E-02	8.58E-02	pCi/g		0.04 1.03E+00	7/28/03 09:03 a	387.9	g	GER5
BISMUTH-212	6.91E-01	U	4.3E-01	4.3E-01	8.24E-01	pCi/g		0.84 (3.2)	7/28/03 09:03 a	387.9	g	GER5
BISMUTH-214	8.06E-01	U	1.4E-01	1.4E-01	2.17E-01	pCi/g		(3.7) (11.2)	7/28/03 09:03 a	387.9	g	GER5
COBALT-60	1.02E-02	U	2.9E-02	2.9E-02	5.46E-02	pCi/g		0.19	7/28/03 09:03 a	387.9	g	GER5
CESIUM-134	3.50E-02	U	3.1E-02	3.1E-02	6.13E-02	pCi/g		1.50E-01 1.90E-01	7/28/03 09:03 a	387.9	g	GER5
CESIUM-137	1.41E-01	J	5.7E-02	5.7E-02	4.88E-02	pCi/g		(2.9) 3.20E-01	7/28/03 09:03 a	387.9	g	GER5
EUROPIUM-152	9.65E-03	U	7.4E-02	7.4E-02	1.26E-01	pCi/g		0.08 4.04E-01	7/28/03 09:03 a	387.9	g	GER5
EUROPIUM-154	-4.30E-02	U	7.3E-02	7.3E-02	1.23E-01	pCi/g		-0.35 3.70E-01	7/28/03 09:03 a	387.9	g	GER5

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/10/2003 10:35:00 AM

Lot-Sample No.: J3G020266-6

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-012FS01

COC No.: 2003-00161 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detect
EUROPIUM-155	4.80E-02	U	7.1E-02	7.1E-02	1.24E-01	pCi/g		0.39 1.57E+01	7/28/03 09:03 a (1.3)	387.9	g	GER5
POTASSIUM-40	8.72E+00		1.5E+00	1.5E+00	3.51E-01	pCi/g		(24.9) (11.9)	7/28/03 09:03 a	387.9	g	GER5
MANGANESE-54	-1.46E-04	U	2.9E-02	2.9E-02	5.13E-02	pCi/g		0. 6.96E-01	7/28/03 09:03 a	387.9	g	GER5
NIOBIUM-94	-4.98E-03	U	2.5E-02	2.5E-02	4.38E-02	pCi/g		-0.11 2.85E-01	7/28/03 09:03 a	387.9	g	GER5
LEAD-212	7.56E-01		1.5E-01	1.5E-01	7.07E-02	pCi/g		(10.7) (10.2)	7/28/03 09:03 a	387.9	g	GER5
LEAD-214	7.74E-01		1.5E-01	1.5E-01	8.59E-02	pCi/g		(9.) (10.)	7/28/03 09:03 a	387.9	g	GER5
RADIUM-226	8.06E-01		1.4E-01	1.4E-01	8.34E-02	pCi/g		(9.7) (11.2)	7/28/03 09:03 a	387.9	g	GER5
THALLIUM-208	2.72E-01		5.7E-02	5.7E-02	4.02E-02	pCi/g		(6.8) (9.5)	7/28/03 09:03 a	387.9	g	GER5

No. of Results: 18

Comments:

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/17/2003 10:39:00 AM

Lot-Sample No.: J3G020266-23

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-013F

COC No.: 2003-00165 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detece
Batch: 3192332	E901.1				Work Order: FRM5C1AA		Report DB ID: 9FRM5C10					
ACTINIUM-228	7.20E-01	U	2.1E-01	2.1E-01	3.06E-01	pCi/g	(2.4)	(7.)	7/28/03 12:33 p	414.2	g	GER6:
AG-108M	-1.03E-02	U	2.1E-02	2.1E-02	3.51E-02	pCi/g	2.86E-01	-0.29	7/28/03 12:33 p	414.2	g	GER6:
AMERICIUM-241	-9.00E-03	U	7.3E-02	7.3E-02	1.21E-01	pCi/g	1.03E+00	-0.07	7/28/03 12:33 p	414.2	g	GER6:
BISMUTH-212	1.01E+00	U	4.5E-01	4.5E-01	8.58E-01	pCi/g	(1.2)	(4.5)	7/28/03 12:33 p	414.2	g	GER6:
BISMUTH-214	6.26E-01	U	1.3E-01	1.3E-01	1.84E-01	pCi/g	(3.4)	(9.7)	7/28/03 12:33 p	414.2	g	GER6:
COBALT-60	1.77E-03	U	2.7E-02	2.7E-02	5.04E-02	pCi/g	1.50E-01	0.04	7/28/03 12:33 p	414.2	g	GER6:
CESIUM-134	3.87E-02	U	3.0E-02	3.0E-02	5.80E-02	pCi/g	1.90E-01	0.67	7/28/03 12:33 p	414.2	g	GER6:
CESIUM-137	2.18E-01	J	5.4E-02	5.4E-02	4.79E-02	pCi/g	3.20E-01	(2.6)	7/28/03 12:33 p	414.2	g	GER6:
EUROPIUM-152	-2.67E-02	U	6.5E-02	6.5E-02	1.10E-01	pCi/g	4.04E-01	(4.5)	7/28/03 12:33 p	414.2	g	GER6:
EUROPIUM-154	-3.54E-02	U	8.2E-02	8.2E-02	1.42E-01	pCi/g	3.70E-01	-0.24	7/28/03 12:33 p	414.2	g	GER6:
								-0.83				
								-0.25				
								-0.86				

STL Richland

rptSTLRchSample

V4.04 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/17/2003 10:39:00 AM

Lot-Sample No.: J3G020266-23

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-013F

COC No.: 2003-00165 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detector
EUROPIUM-155	1.66E-02	U	6.5E-02	6.5E-02	1.11E-01	pCi/g		0.15	7/28/03 12:33 p		414.2	GER6-
POTASSIUM-40	9.70E+00		1.5E+00	1.5E+00	3.34E-01	pCi/g	1.57E+01	0.51			414.2	GER6-
MANGANESE-54	-1.53E-02	U	2.5E-02	2.5E-02	4.22E-02	pCi/g		(29.)	7/28/03 12:33 p		414.2	GER6-
NIOBIUM-94	9.89E-03	U	2.5E-02	2.5E-02	4.57E-02	pCi/g	6.96E-01	(12.8)			414.2	GER6-
LEAD-212	6.88E-01		1.4E-01	1.4E-01	7.81E-02	pCi/g		-0.36	7/28/03 12:33 p		414.2	GER6-
LEAD-214	8.28E-01		1.7E-01	1.7E-01	7.33E-02	pCi/g	2.85E-01	(-1.2)			414.2	GER6-
RADIUM-226	6.26E-01	U	1.3E-01	1.3E-01	1.84E-01	pCi/g		0.22	7/28/03 12:33 p		414.2	GER6-
THALLIUM-208	2.09E-01		5.4E-02	5.4E-02	4.04E-02	pCi/g		(8.8)	7/28/03 12:33 p		414.2	GER6-
								(9.7)			414.2	GER6-
								(11.3)	7/28/03 12:33 p		414.2	GER6-
								(9.9)			414.2	GER6-
								(3.4)	7/28/03 12:33 p		414.2	GER6-
								(9.7)			414.2	GER6-
								(5.2)	7/28/03 12:33 p		414.2	GER6-
								(7.7)			414.2	GER6-

No. of Results: 18

Comments:

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/17/2003 10:53:00 AM

Lot-Sample No.: J3G020266-24

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-013F01

COC No.: 2003-00165 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detect:
Batch: 3192332	E901.1				Work Order: FRM5E1AA		Report DB ID: 9FRM5E10					
ACTINIUM-228	8.60E-01		2.0E-01	2.0E-01	1.31E-01	pCi/g		(6.6) (8.6)	7/28/03 12:33 p	404.4	9	GER7:
AG-108M	-1.95E-03	U	1.9E-02	1.9E-02	3.33E-02	pCi/g		-0.06 2.86E-01	7/28/03 12:33 p	404.4	9	GER7:
AMERICIUM-241	-3.22E-02	U	8.6E-02	8.6E-02	1.45E-01	pCi/g		-0.22 1.03E+00	7/28/03 12:33 p	404.4	9	GER7:
BISMUTH-212	7.73E-01	U	5.7E-01	5.7E-01	7.75E-01	pCi/g		1. (2.7)	7/28/03 12:33 p	404.4	9	GER7:
BISMUTH-214	7.01E-01	U	1.4E-01	1.4E-01	1.97E-01	pCi/g		(3.6) (10.3)	7/28/03 12:33 p	404.4	9	GER7:
COBALT-60	7.52E-03	U	2.6E-02	2.6E-02	5.09E-02	pCi/g		0.15 1.50E-01	7/28/03 12:33 p	404.4	9	GER7:
CESIUM-134	4.71E-02	U	3.1E-02	3.1E-02	6.10E-02	pCi/g		0.77 1.90E-01	7/28/03 12:33 p	404.4	9	GER7:
CESIUM-137	1.18E-01	J	5.5E-02	5.5E-02	4.65E-02	pCi/g		(3.1) (2.5)	7/28/03 12:33 p	404.4	9	GER7:
EUROPIUM-152	-1.25E-02	U	6.9E-02	6.9E-02	1.19E-01	pCi/g		3.20E-01 4.04E-01	7/28/03 12:33 p	404.4	9	GER7:
EUROPIUM-154	5.01E-03	U	7.6E-02	7.6E-02	1.41E-01	pCi/g		0.04 3.70E-01	7/28/03 12:33 p	404.4	9	GER7:

STL Richland  
rp!STLRchSample  
V4.04 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/17/2003 10:53:00 AM

Lot-Sample No.: J3G020266-24

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-013F01

COC No.: 2003-00165 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detect
EUROPIUM-155	1.15E-02	U	7.3E-02	7.3E-02	1.27E-01	pCi/g		0.09	7/28/03 12:33 p		404.4	GER7:
POTASSIUM-40	9.54E+00		1.5E+00	1.5E+00	4.00E-01	pCi/g	1.57E+01	0.32			g	
MANGANESE-54	-9.92E-03	U	2.4E-02	2.4E-02	4.15E-02	pCi/g		(23.8)	7/28/03 12:33 p		404.4	GER7:
NIOBIUM-94	2.28E-02	U	2.2E-02	2.2E-02	4.41E-02	pCi/g	6.96E-01	-0.24	7/28/03 12:33 p		404.4	GER7:
LEAD-212	6.91E-01		1.4E-01	1.4E-01	6.69E-02	pCi/g	2.85E-01	-0.82			g	
LEAD-214	7.56E-01		1.5E-01	1.5E-01	7.88E-02	pCi/g		0.52	7/28/03 12:33 p		404.4	GER7:
RADIUM-226	7.01E-01	U	1.4E-01	1.4E-01	1.97E-01	pCi/g		(2.1)			404.4	GER7:
THALLIUM-208	2.57E-01		5.6E-02	5.6E-02	3.96E-02	pCi/g		(10.3)	7/28/03 12:33 p		404.4	GER7:
								(10.)			g	
								(9.6)	7/28/03 12:33 p		404.4	GER7:
								(10.3)			g	
								(3.6)	7/28/03 12:33 p		404.4	GER7:
								(10.3)			g	
								(6.5)	7/28/03 12:33 p		404.4	GER7:
								(9.2)			g	

No. of Results: 18

Comments:

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/17/2003 1:26:00 PM

Lot-Sample No.: J3G020266-25

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-014F

COC No.: 2003-00165 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detecti
Batch: 3192332	E901.1				Work Order: FRM5F1AA		Report DB ID: 9FRM5F10					
ACTINIUM-228	7.23E-01		1.9E-01	1.9E-01	1.53E-01	pCi/g		(4.7) (7.7)	7/28/03 12:34 p	354.3	GER8	
AG-108M	-9.62E-03 U		2.1E-02	2.1E-02	3.55E-02	pCi/g		-0.27	7/28/03 12:34 p	354.3	GER8	
AMERICIUM-241	-6.77E-02 U		5.6E-02	5.6E-02	8.83E-02	pCi/g		-0.91	7/28/03 12:34 p	354.3	GER8	
BISMUTH-212	9.37E-01 U		4.6E-01	4.6E-01	7.84E-01	pCi/g		-0.77 (-2.4)	7/28/03 12:34 p	354.3	GER8	
BISMUTH-214	8.37E-01		1.6E-01	1.6E-01	7.73E-02	pCi/g		(10.8) (10.7)	7/28/03 12:34 p	354.3	GER8	
COBALT-60	3.72E-04 U		2.5E-02	2.5E-02	4.69E-02	pCi/g		0.01 0.03	7/28/03 12:34 p	354.3	GER8	
CESIUM-134	3.36E-02 U		3.1E-02	3.1E-02	5.91E-02	pCi/g		0.57 (2.2)	7/28/03 12:34 p	354.3	GER8	
CESIUM-137	2.05E-01 J		5.7E-02	5.7E-02	4.78E-02	pCi/g		(4.3) 3.20E-01 (7.2)	7/28/03 12:34 p	354.3	GER8	
EUROPIUM-152	3.07E-02 U		7.0E-02	7.0E-02	1.22E-01	pCi/g		0.25	7/28/03 12:34 p	354.3	GER8	
EUROPIUM-154	5.31E-03 U		7.3E-02	7.3E-02	1.36E-01	pCi/g		0.87 0.04 3.70E-01 0.15	7/28/03 12:34 p	354.3	GER8	

STL Richland

rptSTLRchSample

V4.04 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.

U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/17/2003 1:26:00 PM

Lot-Sample No.: J3G020266-25

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-014F

COC No.: 2003-00165 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detect
EUROPIUM-155	2.70E-02	U	7.0E-02	7.0E-02	1.23E-01	pCi/g		0.22	7/28/03 12:34 p		354.3	GER8 <sup>t</sup>
POTASSIUM-40	1.08E+01		1.7E+00	1.7E+00	3.43E-01	pCi/g	1.57E+01	0.77			g	
MANGANESE-54	-8.01E-03	U	2.4E-02	2.4E-02	4.23E-02	pCi/g		(31.4) (13.)	7/28/03 12:34 p		354.3	GER8 <sup>t</sup>
NIOBIUM-94	2.89E-03	U	2.5E-02	2.5E-02	4.64E-02	pCi/g	6.96E-01	-0.19 -0.67	7/28/03 12:34 p		g	
LEAD-212	7.73E-01		1.5E-01	1.5E-01	9.36E-02	pCi/g	2.85E-01	0.06 0.23	7/28/03 12:34 p		354.3	GER8 <sup>t</sup>
LEAD-214	8.11E-01		1.6E-01	1.6E-01	8.09E-02	pCi/g		(8.3) (10.5)	7/28/03 12:34 p		354.3	GER8 <sup>t</sup>
RADIUM-226	8.37E-01		1.6E-01	1.6E-01	7.73E-02	pCi/g		(10.) (10.1)	7/28/03 12:34 p		354.3	GER8 <sup>t</sup>
THALLIUM-208	2.91E-01		6.1E-02	6.1E-02	4.41E-02	pCi/g		(10.8) (10.7)	7/28/03 12:34 p		354.3	GER8 <sup>t</sup>
								(6.6) (9.5)	7/28/03 12:34 p		g	

No. of Results: 18

Comments:

STL Richland MDC|MDA,Lc - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 rptSTLRchSample J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name:	STL Richland	SDG:	23303	Collection Date:	6/17/2003 1:50:00 PM
Lot-Sample No.:	J3G020266-26	Report No. :	23222	Received Date:	7/2/2003 11:00:00 AM
Client Sample ID:	9538-00-014F01	COC No. :	2003-00165 R	Matrix:	SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error(2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detectc
Batch: 3192332	E901.1				Work Order:	FRM5J1AA	Report DB ID: 9FRM5J10					
ACTINIUM-228	6.80E-01		1.8E-01	1.8E-01	1.42E-01	pCi/g		(4.8) (7.4)	7/28/03 02:24 p	398.4	g	GER5:
AG-108M	1.16E-02	U	2.2E-02	2.2E-02	3.91E-02	pCi/g		0.3	7/28/03 02:24 p	398.4	g	GER5:
AMERICIUM-241	4.98E-02	U	5.3E-02	5.3E-02	8.74E-02	pCi/g		2.86E-01 1.03E+00	(1.1) (1.9)	398.4	g	GER5:
BISMUTH-212	3.92E-01	U	4.2E-01	4.2E-01	7.76E-01	pCi/g		0.5 (1.9)	7/28/03 02:24 p	398.4	g	GER5:
BISMUTH-214	6.19E-01	U	1.5E-01	1.5E-01	1.93E-01	pCi/g		(3.2) (8.4)	7/28/03 02:24 p	398.4	g	GER5:
COBALT-60	-1.63E-02	U	2.8E-02	2.8E-02	4.62E-02	pCi/g		-0.35 1.50E-01	7/28/03 02:24 p	398.4	g	GER5:
CESIUM-134	3.18E-02	U	3.3E-02	3.3E-02	6.38E-02	pCi/g		0.5 1.90E-01	7/28/03 02:24 p	398.4	g	GER5:
CESIUM-137	2.18E-01	J	5.2E-02	5.2E-02	5.57E-02	pCi/g		(3.9) 3.20E-01	7/28/03 02:24 p	398.4	g	GER5:
EUROPIUM-152	8.18E-03	U	7.0E-02	7.0E-02	1.24E-01	pCi/g		0.07 4.04E-01	7/28/03 02:24 p	398.4	g	GER5:
EUROPIUM-154	-3.65E-02	U	6.7E-02	6.7E-02	1.14E-01	pCi/g		-0.32 3.70E-01	7/28/03 02:24 p	398.4	g	GER5:

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 rptSTLRchSample J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 V4.04 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/17/2003 1:50:00 PM

Lot-Sample No.: J3G020266-26

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-014F01

COC No.: 2003-00165 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detect
EUROPIUM-155	4.24E-02	U	6.9E-02	6.9E-02	1.19E-01	pCi/g		0.36 (1.2)	7/28/03 02:24 p	398.4	g	GER5
POTASSIUM-40	9.73E+00		1.5E+00	1.5E+00	4.21E-01	pCi/g	1.57E+01	(23.1) (12.6)	7/28/03 02:24 p	398.4	g	GER5
MANGANESE-54	1.50E-02	U	2.7E-02	2.7E-02	5.14E-02	pCi/g		0.29 (1.1)	7/28/03 02:24 p	398.4	g	GER5
NIOBIUM-94	-2.80E-03	U	2.2E-02	2.2E-02	3.88E-02	pCi/g	6.96E-01	-0.07 -0.26	7/28/03 02:24 p	398.4	g	GER5
LEAD-212	5.94E-01		1.3E-01	1.3E-01	8.88E-02	pCi/g	2.85E-01	(6.7) (9.5)	7/28/03 02:24 p	398.4	g	GER5
LEAD-214	7.83E-01		1.6E-01	1.6E-01	8.16E-02	pCi/g		(9.6) (9.7)	7/28/03 02:24 p	398.4	g	GER5
RADIUM-226	6.19E-01		1.5E-01	1.5E-01	8.26E-02	pCi/g		(7.5) (8.4)	7/28/03 02:24 p	398.4	g	GER5
THALLIUM-208	1.93E-01	U	7.4E-02	7.4E-02	9.25E-02	pCi/g		(2.1) (5.2)	7/28/03 02:24 p	398.4	g	GER5

No. of Results: 18 Comments:

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/10/2003 1:40:00 PM

Lot-Sample No.: J3G020266-7

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-015F

COC No.: 2003-00161 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert (2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detect
Batch: 3192331	E901.1				Work Order: FRM3M1AA		Report DB ID: 9FRM3M10					
ACTINIUM-228	6.30E-01		2.0E-01	2.0E-01	1.41E-01 pCi/g			(4.5) (6.4)	7/26/03 12:43 p	394.2	g	GER5
AG-108M	-5.23E-03 U		2.2E-02	2.2E-02	3.80E-02 pCi/g			-0.14 2.86E-01	7/26/03 12:43 p	394.2	g	GER5
AMERICIUM-241	-8.53E-03 U		5.5E-02	5.5E-02	8.42E-02 pCi/g			-0.47 -0.1 1.03E+00	7/26/03 12:43 p	394.2	g	GER5
BISMUTH-212	6.86E-01 U		4.5E-01	4.5E-01	8.54E-01 pCi/g			0.8 (3.1)	7/26/03 12:43 p	394.2	g	GER5
BISMUTH-214	7.54E-01 U		1.5E-01	1.5E-01	2.09E-01 pCi/g			(3.6) (10.)	7/26/03 12:43 p	394.2	g	GER5
COBALT-60	1.58E-02 U		2.4E-02	2.4E-02	4.90E-02 pCi/g			0.32 1.50E-01	7/26/03 12:43 p	394.2	g	GER5
CESIUM-134	1.51E-02 U		3.1E-02	3.1E-02	5.75E-02 pCi/g			0.26 1.90E-01	7/26/03 12:43 p	394.2	g	GER5
CESIUM-137	1.11E-01 J		4.4E-02	4.4E-02	5.46E-02 pCi/g			0.99 3.20E-01	7/26/03 12:43 p	394.2	g	GER5
EUROPIUM-152	-1.24E-02 U		7.8E-02	7.8E-02	1.30E-01 pCi/g			(2.) -0.1 4.04E-01	7/26/03 12:43 p	394.2	g	GER5
EUROPIUM-154	-1.93E-02 U		8.8E-02	8.8E-02	1.56E-01 pCi/g			(5.1) -0.32 -0.12 3.70E-01	7/26/03 12:43 p	394.2	g	GER5

## FORM I

Date: 31-Jul-03

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/10/2003 1:40:00 PM

Lot-Sample No.: J3G020266-7

Report No. : 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-015F

COC No. : 2003-00161 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error(2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detecte
EUROPIUM-155	-3.40E-02	U	7.1E-02	7.1E-02	1.17E-01	pCi/g		-0.29	7/26/03 12:43 p		394.2	GER5
POTASSIUM-40	1.02E+01		1.6E+00	1.6E+00	4.64E-01	pCi/g	1.57E+01	-0.96			g	
MANGANESE-54	-7.48E-03	U	3.1E-02	3.1E-02	5.39E-02	pCi/g		(21.9)	7/26/03 12:43 p		394.2	GER5
NIOBIUM-94	-9.51E-03	U	2.4E-02	2.4E-02	4.09E-02	pCi/g	6.96E-01	-0.14			g	
LEAD-212	6.97E-01		1.4E-01	1.4E-01	7.14E-02	pCi/g		-0.48			394.2	GER5
LEAD-214	8.75E-01		1.7E-01	1.7E-01	8.11E-02	pCi/g		-0.23	7/26/03 12:43 p		394.2	GER5
RADIUM-226	7.54E-01		1.5E-01	1.5E-01	8.09E-02	pCi/g		-0.81			394.2	GER5
THALLIUM-208	2.53E-01	U	6.9E-02	6.9E-02	9.00E-02	pCi/g		(9.8)	7/26/03 12:43 p		394.2	GER5
								(10.)			g	
								(10.8)	7/26/03 12:43 p		394.2	GER5
								(10.)			g	
								(9.3)	7/26/03 12:43 p		394.2	GER5
								(10.)			g	
								(2.8)	7/26/03 12:43 p		394.2	GER5
								(7.3)			g	

No. of Results: 18      Comments:

STL Richland

rptSTLRchSample  
V4.04 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

**FORM 1**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name:	STL Richland	SDG:	23303	Collection Date:	6/10/2003 2:01:00 PM
Lot-Sample No.:	J3G020266-8	Report No.:	23222	Received Date:	7/2/2003 11:00:00 AM
Client Sample ID:	9538-00-015F01	COC No.:	2003-00161 R	Matrix:	SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detece
Batch: 3192331	E901.1				Work Order: FRM3X1AA		Report DB ID: 9FRM3X10					
ACTINIUM-228	6.12E-01		2.0E-01	2.0E-01	1.55E-01	pCi/g		(4.)	7/26/03 12:41 p	387.6	GER6:	
								(6.)		g		
AG-108M	-3.63E-03	U	2.0E-02	2.0E-02	3.49E-02	pCi/g		-0.1	7/26/03 12:41 p	387.6	GER6:	
							2.86E-01	-0.35		g		
AMERICIUM-241	2.87E-02	U	7.5E-02	7.5E-02	1.27E-01	pCi/g		0.23	7/26/03 12:41 p	387.6	GER6:	
							1.03E+00	0.77		g		
BISMUTH-212	3.55E-01	U	4.0E-01	4.0E-01	7.37E-01	pCi/g		0.48	7/26/03 12:41 p	387.6	GER6:	
								(1.8)		g		
BISMUTH-214	6.01E-01	U	1.3E-01	1.3E-01	1.90E-01	pCi/g		(3.2)	7/26/03 12:41 p	387.6	GER6:	
								(9.1)		g		
COBALT-60	-1.09E-03	U	2.8E-02	2.8E-02	5.05E-02	pCi/g		-0.02	7/26/03 12:41 p	387.6	GER6:	
							1.50E-01	-0.08		g		
CESIUM-134	1.87E-02	U	3.1E-02	3.1E-02	5.82E-02	pCi/g		0.32	7/26/03 12:41 p	387.6	GER6:	
							1.90E-01	(1.2)		g		
CESIUM-137	1.74E-01	J	5.1E-02	5.1E-02	5.04E-02	pCi/g		(3.5)	7/26/03 12:41 p	387.6	GER6:	
							3.20E-01	(6.8)		g		
EUROPIUM-152	1.29E-02	U	7.8E-02	7.8E-02	1.22E-01	pCi/g		0.11	7/26/03 12:41 p	387.6	GER6:	
							4.04E-01	0.33		g		
EUROPIUM-154	-2.18E-03	U	8.5E-02	8.5E-02	1.54E-01	pCi/g		-0.01	7/26/03 12:41 p	387.6	GER6:	
							3.70E-01	-0.05		g		

**FORM I**  
**SAMPLE RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/10/2003 2:01:00 PM

Lot-Sample No.: J3G020266-8

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-015F01

COC No.: 2003-00161 R

Matrix: SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detect
EUROPIUM-155	-1.54E-02	U	6.5E-02	6.5E-02	1.09E-01	pCi/g		-0.14	7/26/03 12:41 p	387.6	g	GER6
POTASSIUM-40	1.07E+01		1.7E+00	1.7E+00	4.09E-01	pCi/g	1.57E+01	-0.47 (26.1) (12.9)	7/26/03 12:41 p	387.6	g	GER6
MANGANESE-54	-3.23E-03	U	3.0E-02	3.0E-02	5.33E-02	pCi/g		-0.06	7/26/03 12:41 p	387.6	g	GER6
NIOBIUM-94	9.43E-03	U	2.4E-02	2.4E-02	4.50E-02	pCi/g	6.96E-01	-0.21 0.21	7/26/03 12:41 p	387.6	g	GER6
LEAD-212	6.95E-01		1.4E-01	1.4E-01	6.16E-02	pCi/g	2.85E-01	0.78 (11.3) (10.1)	7/26/03 12:41 p	387.6	g	GER6
LEAD-214	6.64E-01		1.6E-01	1.6E-01	7.14E-02	pCi/g		(9.3) (8.3)	7/26/03 12:41 p	387.6	g	GER6
RADIUM-226	6.01E-01		1.3E-01	1.3E-01	8.80E-02	pCi/g		(6.8) (9.1)	7/26/03 12:41 p	387.6	g	GER6
THALLIUM-208	1.99E-01		6.6E-02	6.6E-02	4.56E-02	pCi/g		(4.4) (6.)	7/26/03 12:41 p	387.6	g	GER6

No. of Results: 18

Comments:

## FORM II

Date: 31-Jul-03

## DUPLICATE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/5/2003 2:40:00 PM

Lot-Sample No.: J3G020266-17

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-006F DUP

COC No.: 2003-00159 R

Matrix: SOIL

Parameter	Result, Orig Rst	Result, Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 3192332	E901.1				Work Order: FRM4X1AC	Report DB ID: FRM4X1CR		Orig Sa DB ID: 9FRM4X10				
ACTINIUM-228	6.49E-01		1.9E-01	1.9E-01	1.56E-01	pCi/g		(4.1)	7/28/03 09:01 a	374.6	GER8\$1.	
	7.85E-01			RER2 0.9				(6.9)		g		
AG-108M	-1.00E-02	U	2.0E-02	2.0E-02	3.38E-02	pCi/g		-0.3	7/28/03 09:01 a	374.6	GER8\$1	
	-2.14E-02	U		RER2 0.7				-0.99		g		
AMERICIUM-241	3.74E-02	U	5.7E-02	5.7E-02	9.03E-02	pCi/g		0.41	7/28/03 09:01 a	374.6	GER8\$1	
	1.93E-02	U		RER2 0.4				(1.3)		g		
BISMUTH-212	1.09E+00	U	6.1E-01	6.1E-01	8.18E-01	pCi/g		(1.3)	7/28/03 09:01 a	374.6	GER8\$1	
	6.98E-01	U		RER2 1.0				(3.6)		g		
BISMUTH-214	8.00E-01		1.4E-01	1.4E-01	8.16E-02	pCi/g		(9.8)	7/28/03 09:01 a	374.6	GER8\$1	
	7.22E-01			RER2 0.8				(11.5)		g		
COBALT-60	6.63E-03	U	2.7E-02	2.7E-02	5.14E-02	pCi/g		0.13	7/28/03 09:01 a	374.6	GER8\$1	
	-6.81E-03	U		RER2 0.7				1.50E-01		g		
CESIUM-134	3.08E-02	U	2.8E-02	2.8E-02	5.46E-02	pCi/g		0.56	7/28/03 09:01 a	374.6	GER8\$1	
	4.35E-02	U		RER2 0.6				1.90E-01		g		
CESIUM-137	3.55E-01		6.9E-02	6.9E-02	4.60E-02	pCi/g		(7.7)	7/28/03 09:01 a	374.6	GER8\$1	
	3.37E-01			RER2 0.3				3.20E-01		g		
EUROPIUM-152	3.23E-02	U	6.6E-02	6.6E-02	1.18E-01	pCi/g		0.27	7/28/03 09:01 a	374.6	GER8\$1	
	-1.27E-02	U		RER2 0.9				4.04E-01		g		
EUROPIUM-154	-1.64E-03	U	8.2E-02	8.2E-02	1.49E-01	pCi/g		-0.01	7/28/03 09:01 a	374.6	GER8\$1	
	-2.86E-02	U		RER2 0.4				3.70E-01		g		
EUROPIUM-155	4.24E-02	U	7.0E-02	7.0E-02	1.22E-01	pCi/g		0.35	7/28/03 09:01 a	374.6	GER8\$1	
	6.11E-02	U		RER2 0.4				1.57E+01		g		

STL Richland      RER2 - Replicate Error Ratio =  $(S-D)/[\sqrt{(sq(TPUs)+sq(TPUd))}]$  as defined by ICPT BOA.

rptSTLRchDupV4.0 MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

4 A97      U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

## FORM II

Date: 31-Jul-03

## DUPLICATE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/5/2003 2:40:00 PM

Lot-Sample No.: J3G020266-17

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-006F DUP

COC No.: 2003-00159 R

Matrix: SOIL

Parameter	Result, Orig Rst	Result, Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
POTASSIUM-40	1.02E+01		1.5E+00	1.5E+00	3.51E-01	pCi/g		(29.1)	7/28/03 09:01 a	374.6	g	GER8\$1
	1.00E+01		RER2 0.2					(13.2)				
MANGANESE-54	-2.14E-02	U	2.5E-02	2.5E-02	4.06E-02	pCi/g		-0.53	7/28/03 09:01 a	374.6	g	GER8\$1
	3.81E-02	U	RER2 2.9					6.96E-01				
NIOBIUM-94	1.18E-04	U	2.3E-02	2.3E-02	4.10E-02	pCi/g		0.	7/28/03 09:01 a	374.6	g	GER8\$1
	-4.06E-03	U	RER2 0.2					2.85E-01				
LEAD-212	6.56E-01		1.3E-01	1.3E-01	9.84E-02	pCi/g		(6.7)	7/28/03 09:01 a	374.6	g	GER8\$1
	7.03E-01		RER2 0.5					(9.8)				
LEAD-214	8.00E-01		1.5E-01	1.5E-01	8.25E-02	pCi/g		(9.7)	7/28/03 09:01 a	374.6	g	GER8\$1
	8.99E-01		RER2 0.8					(10.9)				
RADON-226	8.01E-01		1.4E-01	1.4E-01	8.17E-02	pCi/g		(9.8)	7/28/03 09:01 a	374.6	g	GER8\$1
	7.22E-01		RER2 0.8					(11.5)				
THALLIUM-208	2.83E-01		6.5E-02	6.5E-02	3.82E-02	pCi/g		(7.4)	7/28/03 09:01 a	374.6	g	GER8\$1
	2.85E-01		RER2 0.0					(8.7)				

No. of Results: 18 Comments:

STL Richland RER2 - Replicate Error Ratio =  $(S-D)/[\sqrt{(sq(TPUs)+sq(TPUd))}]$  as defined by ICPT BOA.

rp!STLRchDupV4.0 MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

4 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

## FORM II

Date: 31-Jul-03

## DUPLICATE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/10/2003 9:10:00 AM

Lot-Sample No.: J3G020266-1

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-007F DUP

COC No.: 2003-00161 R

Matrix: SOIL

Parameter	Result, Orig Rst	Count Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 3192331	E901.1				Work Order: FRM201AC			Report DB ID: FRM201CR	Orig Sa DB ID: 9FRM2010			
ACTINIUM-228	7.30E-01		2.3E-01	2.3E-01	1.96E-01	pCi/g		(3.7)	7/26/03 08:42 a	361.5	g	GER5\$1
	1.06E+00			RER2 1.8				(6.5)			g	
AG-108M	-5.97E-03	U	2.5E-02	2.5E-02	4.24E-02	pCi/g		-0.14	7/26/03 08:42 a	361.5	g	GER5\$1
	-4.17E-03	U		RER2 0.1				-0.48			g	
AMERICIUM-241	9.94E-03	U	6.1E-02	6.1E-02	9.79E-02	pCi/g		0.1	7/26/03 08:42 a	361.5	g	GER5\$1
	7.30E-02	U		RER2 1.4				0.33			g	
BISMUTH-212	1.19E+00	U	7.1E-01	7.1E-01	1.00E+00	pCi/g		(1.2)	7/26/03 08:42 a	361.5	g	GER5\$1
	1.35E+00	U		RER2 0.3				(3.4)			g	
BISMUTH-214	1.08E+00		1.9E-01	1.9E-01	9.69E-02	pCi/g		(11.2)	7/26/03 08:42 a	361.5	g	GER5\$1
	9.54E-01			RER2 1.0				(11.6)			g	
COBALT-60	1.29E-02	U	3.1E-02	3.1E-02	5.93E-02	pCi/g		0.22	7/26/03 08:42 a	361.5	g	GER5\$1
	6.09E-03	U		RER2 0.3				0.83			g	
CESIUM-134	4.65E-02	U	3.8E-02	3.8E-02	7.37E-02	pCi/g		0.63	7/26/03 08:42 a	361.5	g	GER5\$1
	8.48E-02	U		RER2 1.4				(2.4)			g	
CESIUM-137	1.02E-01	J	7.0E-02	7.0E-02	5.67E-02	pCi/g		(1.8)	7/26/03 08:42 a	361.5	g	GER5\$1
	1.80E-01	J		RER2 1.7				(2.9)			g	
EUROPIUM-152	-2.26E-02	U	7.7E-02	7.7E-02	1.33E-01	pCi/g		-0.17	7/26/03 08:42 a	361.5	g	GER5\$1
	-3.95E-02	U		RER2 0.3				-0.58			g	
EUROPIUM-154	3.82E-02	U	9.0E-02	9.0E-02	1.70E-01	pCi/g		0.22	7/26/03 08:42 a	361.5	g	GER5\$1
	-2.23E-02	U		RER2 0.9				0.85			g	
EUROPIUM-155	1.15E-01	U	8.1E-02	8.1E-02	1.42E-01	pCi/g		0.81	7/26/03 08:42 a	361.5	g	GER5\$1
	2.90E-02	U		RER2 1.5				(2.8)			g	

STL Richland RER2 - Replicate Error Ratio =  $(S-D)/[\sqrt{(TPUs)+(TPUs)})]$  as defined by ICPT BOA.

rp1STLRchDupV4.0 MDC|MDA,Lc - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

4 A97 J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.

U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

## FORM II

Date: 31-Jul-03

## DUPLICATE RESULTS

Lab Name: STL Richland

SDG: 23303

Collection Date: 6/10/2003 9:10:00 AM

Lot-Sample No.: J3G020266-1

Report No.: 23222

Received Date: 7/2/2003 11:00:00 AM

Client Sample ID: 9538-00-007F DUP

COC No.: 2003-00161 R

Matrix: SOIL

Parameter	Result, Org Rst	Count Qual	Count Error (2 s)	Total Uncert (2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primary Detector
POTASSIUM-40	1.12E+01		1.7E+00	1.7E+00	4.16E-01	pCi/g		(27.)	7/26/03 08:42 a		361.5	GER5\$1
	1.07E+01		RER2 0.4					(12.9)			g	
MANGANESE-54	7.38E-03	U	3.1E-02	3.1E-02	5.68E-02	pCi/g		0.13	7/26/03 08:42 a		361.5	GER5\$1
	3.54E-03	U	RER2 0.2			6.96E-01		0.48			g	
NIOBIUM-94	-1.59E-02	U	2.6E-02	2.6E-02	4.41E-02	pCi/g		-0.36	7/26/03 08:42 a		361.5	GER5\$1
	-9.72E-03	U	RER2 0.3			2.85E-01		-(1.2)			g	
LEAD-212	9.89E-01		1.9E-01	1.9E-01	7.64E-02	pCi/g		(12.9)	7/26/03 08:42 a		361.5	GER5\$1
	9.84E-01		RER2 0.0					(10.6)			g	
LEAD-214	1.07E+00		1.9E-01	1.9E-01	9.12E-02	pCi/g		(11.7)	7/26/03 08:42 a		361.5	GER5\$1
	1.08E+00		RER2 0.1					(11.)			g	
RADON-226	1.08E+00		1.9E-01	1.9E-01	9.69E-02	pCi/g		(11.2)	7/26/03 08:42 a		361.5	GER5\$1
	9.54E-01		RER2 1.0					(11.6)			g	
THALLIUM-208	2.82E-01	U	7.6E-02	7.6E-02	1.10E-01	pCi/g		(2.6)	7/26/03 08:42 a		361.5	GER5\$1
	3.77E-01	U	RER2 1.7					(7.4)			g	

No. of Results: 18 Comments:

STL Richland RER2 - Replicate Error Ratio =  $(S-D)/[\sqrt{(\text{sq}(TPUs)+\text{sq}(TPUs))}]$  as defined by ICPT BOA.

rptSTLRchDupV4.0 MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

4 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

**FORM II**  
**BLANK RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Matrix: SOIL

Report No.: 23222

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primary Detector
Batch: 3192331	E901.1				Work Order: FR4WD1AA	Report DB ID: FR4WD1AB						
ACTINIUM-228	1.18E-02	U	9.4E-02	9.4E-02	1.85E-01	pCi/g		0.06 0.25	7/28/03 07:18 a	200.0	g	GER8\$1
AG-108M	-5.76E-03	U	2.0E-02	2.0E-02	3.54E-02	pCi/g		-0.16 -0.57	7/28/03 07:18 a	200.0	g	GER8\$1
AMERICIUM-241	2.18E-02	U	3.8E-02	3.8E-02	6.24E-02	pCi/g		0.35 (1.1)	7/28/03 07:18 a	200.0	g	GER8\$1
BISMUTH-212	2.12E-01	U	4.1E-01	4.1E-01	8.08E-01	pCi/g		0.26 (1.)	7/28/03 07:18 a	200.0	g	GER8\$1
BISMUTH-214	8.59E-02	U	6.7E-02	6.7E-02	1.35E-01	pCi/g		0.63 (2.6)	7/28/03 07:18 a	200.0	g	GER8\$1
COBALT-60	-1.48E-02	U	2.9E-02	2.9E-02	5.06E-02	pCi/g		-0.29 -(1.)	7/28/03 07:18 a	200.0	g	GER8\$1
CESIUM-134	3.35E-03	U	2.9E-02	2.9E-02	5.56E-02	pCi/g		0.06 1.87E-01	7/28/03 07:18 a	200.0	g	GER8\$1
CESIUM-137	1.05E-02	U	2.1E-02	2.1E-02	4.52E-02	pCi/g		0.23 3.16E-01	7/28/03 07:18 a	200.0	g	GER8\$1
EUROPIUM-152	-2.11E-02	U	7.0E-02	7.0E-02	1.23E-01	pCi/g		-0.17 4.04E-01	7/28/03 07:18 a	200.0	g	GER8\$1
EUROPIUM-154	-3.80E-02	U	4.7E-02	4.7E-02	7.25E-02	pCi/g		-0.52 3.72E-01	7/28/03 07:18 a	200.0	g	GER8\$1
EUROPIUM-155	9.28E-03	U	4.8E-02	4.8E-02	8.82E-02	pCi/g		0.11 1.57E+01	7/28/03 07:18 a	200.0	g	GER8\$1
POTASSIUM-40	-1.71E-01	U	3.9E-01	3.9E-01	8.07E-01	pCi/g		-0.21 -0.87	7/28/03 07:18 a	200.0	g	GER8\$1

**FORM II**  
**BLANK RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Matrix: SOIL

Report No.: 23222

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
MANGANESE-54	-2.06E-02	U	2.6E-02	2.6E-02	4.37E-02	pCi/g 6.96E-01		-0.47 -(1.6)	7/28/03 07:18 a	200.0	g	GER8\$1
NIOBIUM-94	3.24E-03	U	2.2E-02	2.2E-02	4.41E-02	pCi/g 2.85E-01		0.07 0.3	7/28/03 07:18 a	200.0	g	GER8\$1
LEAD-212	-1.94E-02	U	4.7E-02	4.7E-02	7.34E-02	pCi/g		-0.26 -0.83	7/28/03 07:18 a	200.0	g	GER8\$1
LEAD-214	-9.01E-04	U	6.1E-02	6.1E-02	1.13E-01	pCi/g		-0.01 -0.03	7/28/03 07:18 a	200.0	g	GER8\$1
RADIUM-226	8.64E-02	U	6.7E-02	6.7E-02	1.36E-01	pCi/g		0.64 (2.6)	7/28/03 07:18 a	200.0	g	GER8\$1
THALLIUM-208	1.87E-02	U	2.4E-02	2.4E-02	4.96E-02	pCi/g		0.38 (1.6)	7/28/03 07:18 a	200.0	g	GER8\$1
Batch: 3192332	E901.1				Work Order:	FR4WP1AA	Report DB ID:	FR4WP1AB				
ACTINIUM-228	6.68E-02	U	1.3E-01	1.3E-01	2.58E-01	pCi/g		0.26 (1.)	7/28/03 05:02 p	200.0	g	GER6\$1
AG-108M	-1.05E-02	U	2.6E-02	2.6E-02	4.42E-02	pCi/g		-0.24 -0.81	7/28/03 05:02 p	200.0	g	GER6\$1
AMERICIUM-241	-6.85E-02	U	6.5E-02	6.5E-02	1.00E-01	pCi/g		-0.68 (-2.1)	7/28/03 05:02 p	200.0	g	GER6\$1
BISMUTH-212	-1.94E-01	U	3.8E-01	3.8E-01	6.44E-01	pCi/g		-0.3 (-1.)	7/28/03 05:02 p	200.0	g	GER6\$1
BISMUTH-214	-2.31E-02	U	7.0E-02	7.0E-02	1.23E-01	pCi/g		-0.19 -0.66	7/28/03 05:02 p	200.0	g	GER6\$1
COBALT-60	1.53E-02	U	3.4E-02	3.4E-02	7.18E-02	pCi/g 1.52E-01		0.21 0.9	7/28/03 05:02 p	200.0	g	GER6\$1

**FORM II**  
**BLANK RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland  
Matrix: SOIL

SDG: 23303  
Report No.: 23222

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
CESIUM-134	1.49E-02	U	3.5E-02	3.5E-02	6.81E-02	pCi/g		0.22	7/28/03 05:02 p	200.0	g	GER6\$1
						1.87E-01		0.86				
CESIUM-137	1.19E-02	U	3.0E-02	3.0E-02	5.94E-02	pCi/g		0.2	7/28/03 05:02 p	200.0	g	GER6\$1
						3.16E-01		0.79				
EUROPIUM-152	-1.06E-02	U	7.6E-02	7.6E-02	1.36E-01	pCi/g		-0.08	7/28/03 05:02 p	200.0	g	GER6\$1
						4.04E-01		-0.28				
EUROPIUM-154	-5.94E-02	U	8.7E-02	8.7E-02	1.45E-01	pCi/g		-0.41	7/28/03 05:02 p	200.0	g	GER6\$1
						3.72E-01		-(1.4)				
EUROPIUM-155	5.27E-02	U	6.0E-02	6.0E-02	1.14E-01	pCi/g		0.46	7/28/03 05:02 p	200.0	g	GER6\$1
						1.57E+01		(1.8)				
POTASSIUM-40	-1.05E+00	U	7.2E-01	7.2E-01	1.57E+00	pCi/g		-0.67	7/28/03 05:02 p	200.0	g	GER6\$1
								-(2.9)				
MANGANESE-54	-2.24E-03	U	3.1E-02	3.1E-02	5.84E-02	pCi/g		-0.04	7/28/03 05:02 p	200.0	g	GER6\$1
						6.96E-01		-0.14				
NIOBIUM-94	-9.97E-03	U	2.7E-02	2.7E-02	4.89E-02	pCi/g		-0.2	7/28/03 05:02 p	200.0	g	GER6\$1
						2.85E-01		-0.73				
LEAD-212	-5.14E-02	U	4.4E-02	4.4E-02	6.96E-02	pCi/g		-0.74	7/28/03 05:02 p	200.0	g	GER6\$1
								-(2.4)				
LEAD-214	1.16E-02	U	5.7E-02	5.7E-02	1.06E-01	pCi/g		0.11	7/28/03 05:02 p	200.0	g	GER6\$1
								0.4				
RADIUM-226	-2.26E-02	U	7.0E-02	7.0E-02	1.23E-01	pCi/g		-0.18	7/28/03 05:02 p	200.0	g	GER6\$1
								-0.65				
THALLIUM-208	1.79E-02	U	3.5E-02	3.5E-02	6.97E-02	pCi/g		0.26	7/28/03 05:02 p	200.0	g	GER6\$1
								(1.)				

STL Richland  
rpISTLRchBlank  
V4.04 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

**FORM II**  
**BLANK RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Matrix: SOIL

Report No.: 23222

Parameter	Result	Qual	Count Error(2 s)	Total Uncert(2 s)	MDC MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
No. of Results:	36	Comments:										

**FORM II**  
**LCS RESULTS**

Date: 31-Jul-03

Lab Name: STL Richland

SDG: 23303

Matrix: SOIL

Report No.: 23222

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 3192331	E901.1				Work Order: FR4WD1AC			Report DB ID: FR4WD1CS					
CESIUM-137	1.11E+00		1.7E-01	1.7E-01	5.31E-02 pCi/g			1.01E+00	3.5E-02	110%	7/28/03 09:01 a	200.0	GER7\$1
						Rec Limits:	70	130	0.1			g	
Batch: 3192332	E901.1				Work Order: FR4WP1AC			Report DB ID: FR4WP1CS					
CESIUM-137	1.12E+00		1.7E-01	1.7E-01	4.49E-02 pCi/g			1.00E+00	3.5E-02	112%	7/28/03 06:06 p	200.3	GER8\$1
						Rec Limits:	70	130	0.1			g	

No. of Results: 2      Comments:

MATERIAL STORAGE AREA  
SURVEY UNIT 9538-0000

RELEASE RECORD

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Attachment 2b  
Hard-to-Detect Data  
(23 Pages)

Analytical Data Package Prepared For  
**Connecticut Yankee**  
 Haddam Neck Decommissioning  
 Radiochemical Analysis By  
**STL Richland**  
**2800 G.W. Way, Richland Wa, 99352, (509)-375-3131.**  
 Assigned Laboratory Code: **STLR**  
*Data Package Contains \_\_\_\_\_ Pages*  
**Report No.: 25187**

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
25129		9525-0000-009F(FPQXK)	J4B050367-3	F86X11AG	9F86X110	4037328
		9525-0000-009F(FPQXK)	J4B050367-3	F86X11AH	9F86X110	4037329
		9525-0000-009F(FPQXK)	J4B050367-3	F86X11AE	9F86X110	4037330
		9525-0000-009F(FPQXK)	J4B050367-3	F86X11AJ	9F86X110	4037332
		9525-0000-009F(FPQXK)	J4B050367-3	F86X11AC	9F86X110	4037333
		9525-0000-009F(FPQXK)	J4B050367-3	F86X11AA	9F86X110	4037334
		9525-0000-009F(FPQXK)	J4B050367-3	F86X11AF	9F86X110	4037336
		9525-0000-009F(FPQXK)	J4B050367-3	F86X11AK	9F86X110	4037339
		9525-0000-009F(FPQXK)	J4B050367-3	F86X11AP	9F86X110	4041404
		9525-0000-012F(FPQXQ)	J4B050367-4	F86021AE	9F860210	4037328
		9525-0000-012F(FPQXQ)	J4B050367-4	F86021AF	9F860210	4037329
		9525-0000-012F(FPQXQ)	J4B050367-4	F86021AD	9F860210	4037330
		9525-0000-012F(FPQXQ)	J4B050367-4	F86021AG	9F860210	4037332
		9525-0000-012F(FPQXQ)	J4B050367-4	F86021AC	9F860210	4037333
		9525-0000-012F(FPQXQ)	J4B050367-4	F86021AA	9F860210	4037334
		9525-0000-012F(FPQXQ)	J4B050367-4	F86021AK	9F860210	4037336
		9525-0000-012F(FPQXQ)	J4B050367-4	F86021AN	9F860210	4041404
		9538-0000-012F01(FRM3E)	J4B050367-2	F86W41AG	9F86W410	4037328
		9538-0000-012F01(FRM3E)	J4B050367-2	F86W41AH	9F86W410	4037329
		9538-0000-012F01(FRM3E)	J4B050367-2	F86W41AE	9F86W410	4037330
		9538-0000-012F01(FRM3E)	J4B050367-2	F86W41AC	9F86W410	4037333
		9538-0000-012F01(FRM3E)	J4B050367-2	F86W41AA	9F86W410	4037334
		9538-0000-012F01(FRM3E)	J4B050367-2	F86W41AF	9F86W410	4037336
		9538-0000-012F01(FRM3E)	J4B050367-2	F86W41AK	9F86W410	4037339
		9538-0000-012F01(FRM3E)	J4B050367-2	F86W41AN	9F86W410	4041404
		953800000-011F(FRM44)	J4B050367-1	F856C1AF	9F856C10	4037328

Report No.: 25187

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
25129		953800000-011F(FRM44)	J4B050367-1	F856C1AG	9F856C10	4037329
		953800000-011F(FRM44)	J4B050367-1	F856C1AD	9F856C10	4037330
		953800000-011F(FRM44)	J4B050367-1	F856C1AC	9F856C10	4037333
		953800000-011F(FRM44)	J4B050367-1	F856C1AA	9F856C10	4037334
		953800000-011F(FRM44)	J4B050367-1	F856C1AL	9F856C10	4037336
		953800000-011F(FRM44)	J4B050367-1	F856C1AJ	9F856C10	4037339
		953800000-011F(FRM44)	J4B050367-1	F856C1AP	9F856C10	4041404

STL Richland  
2800 George Washington Way  
Richland, WA 99352

Tel: 509 375 3131 Fax: 509 375 5590  
[www.stl-inc.com](http://www.stl-inc.com)

## Certificate of Analysis

Connecticut Yankee Atomic Power Company  
362 Injun Hollow Road  
East Hampton, CT 06424

March 16, 2004

Attention: Pete Hollenbeck

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Date Received in Lab	:	February 5, 2004
Number of Samples	:	Eight (8)
SDG Number	:	25129
Project Name/Number	:	Haddam Neck Decommissioning
COC Number	:	E-mail request
Purchase Order Number	:	002133 LTP QA
MSR	:	04-0307

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### CASE NARRATIVE

#### I. Introduction

On February 5, 2004, STL-Richland received a request to analyze eight soil samples that had already been received at the STL Richland (STLR) laboratory. Upon receipt, the samples were assigned the STLR identification numbers as described on the cover page of the Analytical Data Package report form. The samples were assigned to Lot Number J4B050367.

#### II. Sample Receipt

The samples were received in good condition and no anomalies were noted during check-in.

#### III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were:

Alpha Spectroscopy  
Americium-241 by method RICH-RC-5080  
Curium-243/244 by method RICH-RC-5080  
Plutonium-238, -239/240 by method RICH-RC-5010  
Gas Proportional Counting  
Strontium-90 by method RICH-RC-5006

Connecticut Yankee Atomic Power Company  
March 16, 2004  
Page 2

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Liquid Scintillation Counting  
Carbon-14 by method RICH-RC-5022  
Iron-55 by method RICH-RC-5074  
Nickel-63 by method RICH-RC-5069  
Plutonium-241 by method RICH-RC-5010  
Technetium-99 by method RICH-RC-5078  
Tritium by method RICH-RC-5037  
Gamma Spectroscopy  
Gamma by method RICH-RC-5017

#### IV. Quality Control

The analytical result for each analysis performed includes a minimum of one laboratory control sample (LCS), and one reagent blank sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

#### V. Comments

Americium-241 by method RICH-RC-5080:

Sample 9525-0000-012F failed due to a low tracer recovery of 4%. The sample will be reanalyzed and reported upon completion. Except as noted, the LCS, batch blank, sample and sample duplicate results are within acceptance limits.

Curium-243/244 by method RICH-RC-5080:

Sample 9525-0000-012F failed due to a low tracer recovery of 4%. The sample will be reanalyzed and reported upon completion. Except as noted, the LCS, batch blank, sample and sample duplicate results are within acceptance limits.

Plutonium-238, -239/240 by method RICH-RC-5010:

The LCS, batch blank, sample and sample duplicate results are within acceptance limits.

Strontium-90 by method RICH-RC-5006:

Sample 9525-0000-009F MDA does not meet the CRDL. A small aliquot was taken due to a high radiation screen. Except as noted, the LCS, batch blank, sample and sample duplicate results are within acceptance limits.

Carbon-14 by method RICH-RC-5022:

The LCS, batch blank, sample and sample duplicate results are within acceptance limits.

Connecticut Yankee Atomic Power Company  
March 16, 2004  
Page 3

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Iron-55 by method RICH-RC-5074:

Samples 9525-0000-009F has a tracer yield of 138% due to matrix effect (indigenous iron in the soil). Except as noted, the LCS, batch blank, sample and sample duplicate results are within acceptance limits.

Nickel-63 by method RICH-RC-5069:

The LCS, batch blank, sample and sample duplicate results are within acceptance limits.

Plutonium-241 by method RICH-RC-5010:

The LCS, batch blank, samples and sample duplicate results are within acceptance limits.

Technetium-99 by method RICH-RC-5078:

The LCS, batch blank, samples, sample duplicate and are within acceptance limits.

Tritium by method RICH-RC-5037:

Samples 9538-0000-011F and 9538-0000-012F01 were previously dried in order to run the gamma analysis therefore the H-3 analysis is unable to be run. Sample 9525-0000-009F and 9525-0000-012 F are asphalt samples and were therefore leached with dead water and the dead water was counted for H-3. The LCS, batch blank, sample and sample duplicate results are within acceptance limits.

Gamma by method RICH-RC-5017:

The samples that were requested to be analyzed as four separate samples were previously dried, ground, and analyzed as two samples. There was no way to analyze these samples as four separate samples therefore the gamma analysis was not run.

I certify that this Certificate of Analysis 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.

Reviewed and approved:

Theresa H. Kallsen

Theresa H. Kallsen  
Project Management Assistant

### Drinking Water Method Cross References

DRINKING WATER ASTM METHOD CROSS REFERENCES		
Referenced Method	Isotope(s)	STL Richland's SOP number
EPA 901.1	Cs-134, I-131	RICH-RC-5017
EPA 900.0	Alpha & Beta	RICH-RC-5014
EPA 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr89/90	RICH-RC-5006
ASTM D2460	Total Radium	RICH-RC-5027
Standard Method 7500-U-C & ASTM D5174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007
NOTE:		
The Gross Alpha LCS is prepared with Am-241 (unless otherwise specified in the case narrative)		
The Gross Beta LCS is prepared with Sr/Y-90 (unless otherwise specified in the case narrative)		

### Uncertainty Estimation

STL Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship,  $R = \text{constants} * f(x,y,z,\dots)$ . The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties ( $u_i$ ) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty ( $u_c$ ) multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value ( $S/vn$ ), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

## Report Definitions

Action Lev	An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit.
Batch	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
Bias	Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30.
COC No	Chain of Custody Number assigned by the Client or STL Richland.
Count Error (#s)	Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background.
Total Uncert (#s) <i>u<sub>c</sub>-Combined Uncertainty.</i>	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, <i>u<sub>c</sub></i> the combined uncertainty. The uncertainty is absolute and in the same units as the result.
(#s), Coverage Factor	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
CRDL (RL)	Contractual Required Detection Limit as defined in the Client's Statement Of Work or STL Richland "default" nominal detection limit. Often referred to the reporting level (RL)
Lc	Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. $Lc = (1.645 * \text{Sqrt}(2 * (\text{BkgndCnt} / \text{BkgndCntMin}) / \text{SCntMin})) * (\text{ConvFct} / (\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol}) * \text{IngrFct})$ . For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
Lot-Sample No	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
MDC MDA	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. $MDC = (4.65 * \text{Sqr}((\text{BkgndCnt} / \text{BkgndCntMin}) / \text{SCntMin}) + 2.71 / \text{SCntMin}) * (\text{ConvFct} / (\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol}) * \text{IngrFct})$ . For LSC methods the batch blank is used as a measure of the background variability.
Primary Detector	The instrument identifier associated with the analysis of the sample aliquot.
Ratio U-234/U-238	The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038.
Rst/MDC	Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Rst/TotUcert	Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Report DB No	Sample Identifier used by the report system. The number is based upon the first five digits of the Work Order Number.
RER	The equation Replicate Error Ratio = $(S - D) / [\sqrt{(\text{TPUs}^2 + \text{TPUD}^2)}]$ as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUD is the total uncertainty of the duplicate sample.
SDG	Sample Delivery Group Number assigned by the Client or assigned by STL Richland upon sample receipt.
Sum Rpt Alpha Spec Rst(s)	The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units.
Work Order	The LIMS software assign test specific identifier.
Yield	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

**Sample Results Summary**

Date: 16-Mar-04

**STL Richland STLR**

Ordered by Method, Batch No., Client Sample ID.

Report No. : 25187

SDG No: 25129

Client Id Batch	Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
<b>4037329 FBXZ</b>									
	9525-0000-009F(FPQXK) F86X11AH FE-55		1.73E+01 +/- 1.78E+01	U	pCi/g	138%	2.98E+01	1.10E+03	
	9525-0000-012F(FPQXQ) F86021AF FE-55		-4.76E+00 +/- 2.97E+01	U	pCi/g	63%	5.85E+01	1.10E+03	
	9538-0000-012F01(FRM3E) F86W41AH FE-55		-5.62E+00 +/- 8.24E+00	U	pCi/g	109%	1.57E+01	1.10E+03	
	95380000-011F(FRM44) F856C1AG FE-55		-1.20E+01 +/- 1.37E+01	U	pCi/g	64%	2.22E+01	1.10E+03	
	95380000-011F(FRM44) DUP F856C1AN FE-55		-9.32E+00 +/- 1.23E+01	U	pCi/g	70%	2.09E+01	1.10E+03	
<b>4037330 CMUD</b>									
	9525-0000-009F(FPQXK) F86X11AE SR-90		2.30E-01 +/- 1.02E-01		pCi/g	63%	1.56E-01	6.00E-02	
	9525-0000-012F(FPQXQ) F86021AD SR-90		4.56E-02 +/- 1.84E-02	J	pCi/g	68%	2.81E-02	6.00E-02	
	9538-0000-012F01(FRM3E) F86W41AE SR-90		5.77E-02 +/- 2.41E-02	J	pCi/g	52%	3.71E-02	6.00E-02	
	9538-0000-012F01(FRM3E) DUP F86W41AL SR-90		5.82E-02 +/- 2.36E-02	J	pCi/g	54%	3.53E-02	6.00E-02	
	95380000-011F(FRM44) F856C1AD SR-90		1.09E-01 +/- 3.00E-02		pCi/g	50%	3.49E-02	6.00E-02	
<b>4037339 RICHRC5080</b>									
	9525-0000-009F(FPQXK) F86X11AK AM-241		1.18E-02 +/- 2.37E-02	U	pCi/g	68%	3.20E-02	1.03E+00	
	CM-242		4.09E-02 +/- 8.21E-02	U	pCi/g	68%	1.11E-01		
	CM-243/244		-2.43E-03 +/- 4.89E-03	U	pCi/g	68%	5.83E-02	1.16E+00	
	9525-0000-009F(FPQXK) DUP F86X11AN AM-241		2.41E-02 +/- 3.45E-02	U	pCi/g	69%	3.27E-02	1.03E+00	
	CM-242		-8.36E-03 +/- 1.68E-02	U	pCi/g	69%	2.00E-01		
	CM-243/244		0.00E+00 +/- 3.05E-02	U	pCi/g	69%	3.37E-02	1.16E+00	
	9538-0000-012F01(FRM3E) F86W41AK AM-241		1.34E-02 +/- 2.14E-02	U	pCi/g	68%	3.56E-02	1.03E+00	
	CM-242		0.00E+00 +/- 5.62E-02	U	pCi/g	68%	6.22E-02		
	CM-243/244		6.11E-03 +/- 1.56E-02	U	pCi/g	68%	3.66E-02	1.16E+00	
	95380000-011F(FRM44) F856C1AJ AM-241		1.65E-02 +/- 2.36E-02	U	pCi/g	65%	2.24E-02	1.03E+00	
	CM-242		0.00E+00 +/- 6.27E-02	U	pCi/g	65%	6.94E-02		
	CM-243/244		0.00E+00 +/- 2.08E-02	U	pCi/g	65%	2.30E-02	1.16E+00	
<b>4041404 RICHRC5010</b>									

STL Richland

RER2 - Replicate Error Ratio =  $(S-D)/[\sqrt{(sq(TPUs)+sq(TPUd))}]$  as defined by ICPT BOA.

rpt!STL.RchSaSum  
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J Qual - No U< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

**Sample Results Summary**

Date: 16-Mar-04

**STL Richland STLR**

Ordered by Method, Batch No., Client Sample ID.

Report No. : 25187

SDG No: 25129

Client Id Batch	Work Order	Parameter	Result +/- Uncertainty( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
<b>4041404 RICHRC5010</b>									
9525-0000-009F(FPQXK)									
F86X11AP	PU-238		0.00E+00 +/- 2.71E-02	U	pCi/g	61%	3.00E-02	1.18E+00	
	PU239/40		1.10E-02 +/- 2.21E-02	U	pCi/g	61%	2.98E-02	1.07E+00	
9525-0000-012F(FPQXQ)									
F86021AN	PU-238		0.00E+00 +/- 1.39E-02	U	pCi/g	58%	1.54E-02	1.18E+00	
	PU239/40		-1.13E-03 +/- 2.27E-03	U	pCi/g	58%	2.71E-02	1.07E+00	
9538-0000-012F01(FRM3E)									
F86W41AN	PU-238		0.00E+00 +/- 1.29E-02	U	pCi/g	64%	1.42E-02	1.18E+00	
	PU239/40		-1.05E-03 +/- 2.10E-03	U	pCi/g	64%	2.50E-02	1.07E+00	
9538-0000-012F01(FRM3E) DUP									
F86W41AP	PU-238		4.84E-03 +/- 1.24E-02	U	pCi/g	56%	2.90E-02	1.18E+00	
	PU239/40		-3.61E-03 +/- 4.22E-03	U	pCi/g	56%	3.80E-02	1.07E+00	
953800000-011F(FRM44)									
F856C1AP	PU-238		0.00E+00 +/- 1.26E-02	U	pCi/g	64%	1.39E-02	1.18E+00	
	PU239/40		5.10E-03 +/- 1.02E-02	U	pCi/g	64%	1.38E-02	1.07E+00	
<b>4037328 RICHRC5069</b>									
9525-0000-009F(FPQXK)									
F86X11AG	NI-63		1.16E+00 +/- 3.91E+00	U	pCi/g	97%	5.67E+00	2.89E+01	
9525-0000-012F(FPQXQ)									
F86021AE	NI-63		3.92E-01 +/- 3.72E+00	U	pCi/g	95%	5.71E+00	2.89E+01	
9538-0000-012F01(FRM3E)									
F86W41AG	NI-63		3.83E+00 +/- 4.03E+00	U	pCi/g	93%	5.53E+00	2.89E+01	
953800000-011F(FRM44)									
F856C1AF	NI-63		2.39E-01 +/- 4.22E+00	U	pCi/g	84%	6.26E+00	2.89E+01	
953800000-011F(FRM44) DUP									
F856C1AM	NI-63		4.61E+00 +/- 4.50E+00	U	pCi/g	85%	6.15E+00	2.89E+01	
<b>4037332 RICHRC5037</b>									
9525-0000-009F(FPQXK)									
F86X11AJ	H-3		-3.11E-02 +/- 1.28E+00	U	pCi/g	100%	3.02E+00	1.65E+01	
9525-0000-009F(FPQXK) DUP									
F86X11AL	H-3		1.28E-01 +/- 1.28E+00	U	pCi/g	100%	2.97E+00	1.65E+01	
9525-0000-012F(FPQXQ)									
F86021AG	H-3		-4.80E-01 +/- 1.23E+00	U	pCi/g	100%	2.95E+00	1.65E+01	
<b>4037333 RICHRC5078</b>									
9525-0000-009F(FPQXK)									
F86X11AC	TC-99		-6.42E-02 +/- 1.47E-01	U	pCi/g	100%	2.40E-01	5.04E-01	
9525-0000-009F(FPQXK) DUP									
F86X11AM	TC-99		-1.86E-01 +/- 1.46E-01	U	pCi/g	100%	2.50E-01	5.04E-01	
9525-0000-012F(FPQXQ)									

STL Richland      RER2 = Replicate Error Ratio = (S-D)/[sqrt((sq(TPUs)+sq(TPUd)))] as defined by ICPT BOA.  
 rptSTLRchSaSum      U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.  
 mary2 V4.07 A97

**Sample Results Summary**

Date: 16-Mar-04

**STL Richland STLR**

Ordered by Method, Batch No., Client Sample ID.

Report No.: 25187

SDG No: 25129

Client Id Batch	Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
4037333 RICHRC5078									
9525-0000-012F(FPQXQ)									
F86021AC TC-99			2.38E-02 +/- 1.49E-01	U	pCi/g	100%	2.35E-01	5.04E-01	
9538-0000-012F01(FRM3E)									
F86W41AC TC-99			-5.40E-02 +/- 1.54E-01	U	pCi/g	100%	2.54E-01	5.04E-01	
953800000-011F(FRM44)									
F856C1AC TC-99			6.66E-02 +/- 1.61E-01	U	pCi/g	100%	2.56E-01	5.04E-01	
4037334 RICHRC5022									
9525-0000-009F(FPQXK)									
F86X11AA C-14			4.05E-02 +/- 7.64E-02	U	pCi/g	100%	1.39E-01	2.26E-01	
9525-0000-012F(FPQXQ)									
F86021AA C-14			-7.23E-03 +/- 7.52E-02	U	pCi/g	100%	1.39E-01	2.26E-01	
9525-0000-012F(FPQXQ) DUP									
F86021AM C-14			1.66E-02 +/- 7.58E-02	U	pCi/g	100%	1.39E-01	2.26E-01	
9538-0000-012F01(FRM3E)									
F86W41AA C-14			4.98E-02 +/- 7.65E-02	U	pCi/g	100%	1.38E-01	2.26E-01	
953800000-011F(FRM44)									
F856C1AA C-14			4.48E-02 +/- 7.64E-02	U	pCi/g	100%	1.38E-01	2.26E-01	
4037336 RICHRC5010									
9525-0000-009F(FPQXK)									
F86X11AF PU-241			1.90E-01 +/- 1.35E+00	U	pCi/g	61%	2.41E+00	3.48E+01	
9525-0000-012F(FPQXQ)									
F86021AK PU-241			-2.52E-01 +/- 6.71E-01	U	pCi/g	58%	1.23E+00	3.48E+01	
9538-0000-012F01(FRM3E)									
F86W41AF PU-241			-2.63E-01 +/- 6.21E-01	U	pCi/g	64%	1.14E+00	3.48E+01	
9538-0000-012F01(FRM3E) DUP									
F86W41AM PU-241			2.54E-02 +/- 7.24E-01	U	pCi/g	56%	1.30E+00	3.48E+01	
953800000-011F(FRM44)									
F856C1AL PU-241			3.49E-01 +/- 8.35E-01	U	pCi/g	64%	1.11E+00	3.48E+01	
No. of Results: 55									

**QC Results Summary**  
**STL Richland STLR**  
 Ordered by Method, Batch No, QC Type,.

Date: 16-Mar-04

Report No. : 25187

SDG No.: 25129

Batch	Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	Recovery	Bias	MDC MDA
<b>FBXZ</b>									
4037329	BLANK QC								
F87RF1AA	FE-55		-4.31E+00 +/- 5.48E+00	U	pCi/g	78%			1.01E+01
<b>CMUD</b>									
4037330	BLANK QC								
F87RK1AA	SR-90		5.06E-02 +/- 1.78E-02	J	pCi/g	74%			2.55E-02
4037330	LCS								
F87RK1AC	SR-90		5.14E-01 +/- 8.27E-02		pCi/g	68%	111%	0.1	2.69E-02
<b>RICHRC5080</b>									
4037339	BLANK QC								
F87VF1AA	AM-241		0.00E+00 +/- 2.70E-02	U	pCi/g	43%			2.98E-02
	CM-242		-7.63E-03 +/- 1.53E-02	U	pCi/g	43%			1.82E-01
	CM-243/244		-4.54E-03 +/- 6.49E-03	U	pCi/g	43%			6.41E-02
4037339	LCS								
F87VF1AC	AM-241		4.95E+00 +/- 1.00E+00		pCi/g	63%	109%	0.1	1.93E-02
<b>RICHRC5010</b>									
4041404	BLANK QC								
F9DGE1AA	PU-238		0.00E+00 +/- 1.35E-02	U	pCi/g	61%			1.49E-02
	PU239/40		0.00E+00 +/- 1.34E-02	U	pCi/g	61%			1.49E-02
4041404	LCS								
F9DGE1AC	PU239/40		4.54E-01 +/- 1.33E-01	J	pCi/g	54%	98%	0.0	3.03E-02
<b>RICHRC5069</b>									
4037328	BLANK QC								
F87RC1AA	NI-63		1.86E+00 +/- 4.13E+00	U	pCi/g	89%			6.33E+00
4037328	LCS								
F87RC1AC	NI-63		4.81E+02 +/- 7.61E+01		pCi/g	80%	94%	-0.1	7.68E+00
<b>RICHRC5037</b>									
4037332	BLANK QC								
F87RX1AA	H-3		-8.46E-02 +/- 1.22E-01	U	pCi/g	100%			3.00E-01
4037332	LCS								
F87RX1AC	H-3		6.43E+00 +/- 4.18E-01	J	pCi/g	100%	90%	-0.1	3.05E-01
<b>RICHRC5078</b>									
4037333	MATRIX SPIKE								
F86021AL	TC-99		2.33E+01 +/- 1.54E+00		pCi/g	100%	91%	-0.1	2.37E-01
4037333	BLANK QC								
F87R11AA	TC-99		-9.99E-02 +/- 1.51E-01	U	pCi/g	100%			2.50E-01
4037333	LCS								
F87R11AC	TC-99		1.29E+01 +/- 9.17E-01	J	pCi/g	100%	95%	0.0	2.52E-01
<b>RICHRC5022</b>									
4037334	BLANK QC								
F87R71AA	C-14		4.66E-02 +/- 7.66E-02	U	pCi/g	100%			1.39E-01
4037334	LCS								

STL Richland Bias - (Result/Expected)-1 as defined by ANSI N13.30.

rp!STLRLchQcSum J Qual - No U|< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 mary V4.07 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

**QC Results Summary**  
**STL Richland STLR**  
 Ordered by Method, Batch No, QC Type.,

Date: 16-Mar-04

Report No.: 25187

SDG No.: 25129

Batch	Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Yield	Recovery	Bias	MDC MDA
	F87R71AC	C-14	2.76E+00 +/- 1.54E-01		pCi/g	100%	102%	0.0	1.39E-01
RICHRC5010	4037336	BLANK QC							
	F87R91AA	PU-241	2.16E-01 +/- 6.81E-01	U	pCi/g	61%			1.20E+00
	4037336	LCS							
	F87R91AC	PU-241	2.16E+01 +/- 2.19E+00	J	pCi/g	54%	92%	-0.1	1.36E+00
No. of Results: 22									

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STL Richland      Bias      - (Result/Expected)-1 as defined by ANSI N13.30.  
 rpt(STLRchQcSum  
 mary V4.07 A97      J Qual - No U< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

**FORM I**  
**SAMPLE RESULTS**

Date: 16-Mar-04

Lab Name: STL Richland

SDG: 25129

Collection Date: 6/11/2003 10:49:00 AM

Lot-Sample No.: J4B050367-2

Report No.: 25187

Received Date: 2/5/2004 3:00:00 PM

Client Sample ID: 9538-0000-012F01(FRM3E)

COC No.:

Matrix: SOIL

Haddam Neck Decommissioning

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count	Total	MDC MDA,	Rpt Unit,	Yield	Rst/MDC,	Analysis,	Total Sa	Aliquot	Primar
				Uncert(2 s)	Action Lev	Lc.	CRDL(RL)	Rst/TotUncert	Prep Date	Size	Size	Detect
Batch: 4037328	RICHRC5069				Work Order: F86W41AG		Report DB ID: 9F86W410					
NI-63	3.83E+00	U	2.34E+00	4.03E+00	5.53E+00	pCi/g	93%	0.69	3/5/04 09:27 a	0.2507	G	LSC
					2.68E+00		2.89E+01	(1.9)				
Batch: 4037329	FBXZ				Work Order: F86W41AH		Report DB ID: 9F86W410					
FE-55	-5.62E+00	U		8.24E+00	1.57E+01	pCi/g	109%	-0.36	3/5/04 08:56 p	0.1254	G	LSC
					7.39E+00		1.10E+03	-(1.4)				
Batch: 4037330	CMUD				Work Order: F86W41AE		Report DB ID: 9F86W410					
SR-90	5.77E-02	J	2.20E-02	2.41E-02	3.71E-02	pCi/g	52%	(1.6)	3/3/04 09:07 a	10.01	G	GPC
					1.71E-02		6.00E-02	(4.8)				
Batch: 4037333	RICHRC5078				Work Order: F86W41AC		Report DB ID: 9F86W410					
TC-99	-5.40E-02	U	1.07E-01	1.54E-01	2.54E-01	pCi/g	100%	-0.21	3/12/04 06:51 a	5.0	G	LSC
					1.22E-01		5.04E-01	-0.7				
Batch: 4037334	RICHRC5022				Work Order: F86W41AA		Report DB ID: 9F86W410					
C-14	4.98E-02	U	5.93E-02	7.65E-02	1.38E-01	pCi/g	100%	0.36	3/4/04 04:03 a	5.007	G	LSC
					6.79E-02		2.26E-01	(1.3)				
Batch: 4037336	RICHRC5010				Work Order: F86W41AF		Report DB ID: 9F86W410					
PU-241	-2.63E-01	U	4.60E-01	6.21E-01	1.14E+00	pCi/g	64%	-0.23	2/28/04 06:42 a	2.01	G	LSC
					5.47E-01		3.48E+01	-0.85				
Batch: 4037339	RICHRC5080				Work Order: F86W41AK		Report DB ID: 9F86W410					
AM-241	1.34E-02	U	2.12E-02	2.14E-02	3.56E-02	pCi/g	68%	0.38	3/2/04 07:34 p	2.0	G	ALP1
					7.74E-03		1.03E+00	(1.3)				

STL RICHLAND

STL Richland  
rptSTLRchSample  
V4.07 A97

MDC|MDA,Lc - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
J Qual - No U|< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

**FORM I**  
**SAMPLE RESULTS**

Date: 16-Mar-04

Lab Name: STL Richland

SDG: 25129

Collection Date: 6/11/2003 10:49:00 AM

Lot-Sample No.: J4B050367-2

Report No.: 25187

Received Date: 2/5/2004 3:00:00 PM

Client Sample ID: 9538-0000-012F01(FRM3E)

COC No.:

Matrix: SOIL

Haddam Neck Decommissioning

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primar Detectc
CM-242	0.00E+00	U	0.00E+00	5.62E-02	6.22E-02	pCi/g	68%	0.	3/2/04 07:34 p		2.0	ALP12
CM-243/244	6.11E-03	U	1.56E-02	1.56E-02	3.66E-02	pCi/g	68%	0.17	3/2/04 07:34 p		2.0	ALP12
					7.95E-03		1.16E+00	0.78			G	
Batch: 4041404	RICHRC5010			Work Order: F86W41AN			Report DB ID: 9F86W410					
PU-238	0.00E+00	U	0.00E+00	1.29E-02	1.42E-02	pCi/g	64%	0.	2/25/04 12:39 p		2.01	ALP4
					1.18E+00		0.				G	
PU239/40	-1.05E-03	U	2.09E-03	2.10E-03	2.50E-02	pCi/g	64%	-0.04	2/25/04 12:39 p		2.01	ALP4
					5.44E-03		1.07E+00	-1.			G	

No. of Results: 11      Comments:

STL

STL Richland  
RICHLAND  
rptSTLRchSample  
V4.07 A97

MDC|MDA,Lc - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
J Qual - No U|< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

## FORM I

Date: 16-Mar-04

## SAMPLE RESULTS

Lab Name: STL Richland

SDG: 25129

Collection Date: 6/10/2003 10:35:00 AM

Lot-Sample No.: J4B050367-1

Report No.: 25187

Received Date: 2/5/2004 3:00:00 PM

Client Sample ID: 953800000-011F(FRM44)

COC No.:

Matrix: SOIL

Haddam Neck Decommissioning

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count	Total	MDC MDA,	Rpt Unit,	Yield	Rst/MDC,	Analysis,	Total Sa	Aliquot	Primar
				Uncert(2 s)	Action Lev	Lc	CRDL(RL)	Rst/TotUncert	Prep Date	Size	Size	Detect
Batch: 4037328	RICHRC5069				Work Order: F856C1AF		Report DB ID: 9F856C10					
NI-63	2.39E-01	U	2.51E+00	4.22E+00	6.26E+00	pCi/g	84%	0.04	3/5/04 09:27 a	0.2503	G	LSC!
					3.03E+00		2.89E+01	0.11				
Batch: 4037329	FBXZ				Work Order: F856C1AG		Report DB ID: 9F856C10					
FE-55	-1.20E+01	U		1.37E+01	2.22E+01	pCi/g	64%	-0.54	3/5/04 08:56 p	0.1252	G	LSC!
					1.05E+01		1.10E+03	-(1.8)				
Batch: 4037330	CMUD				Work Order: F856C1AD		Report DB ID: 9F856C10					
SR-90	1.09E-01		2.48E-02	3.00E-02	3.49E-02	pCi/g	50%	(3.1)	3/3/04 09:07 a	10.0	G	GPC2
					1.58E-02		6.00E-02	(7.3)				
Batch: 4037333	RICHRC5078				Work Order: F856C1AC		Report DB ID: 9F856C10					
TC-99	6.66E-02	U	1.11E-01	1.61E-01	2.56E-01	pCi/g	100%	0.26	3/12/04 06:51 a	5.0	G	LSC!
					1.23E-01		5.04E-01	0.83				
Batch: 4037334	RICHRC5022				Work Order: F856C1AA		Report DB ID: 9F856C10					
C-14	4.48E-02	U	5.93E-02	7.64E-02	1.38E-01	pCi/g	100%	0.32	3/4/04 04:03 a	5.005	G	LSC!
					6.79E-02		2.26E-01	(1.2)				
Batch: 4037336	RICHRC5010				Work Order: F856C1AL		Report DB ID: 9F856C10					
PU-241	3.49E-01	U	4.69E-01	6.35E-01	1.11E+00	pCi/g	64%	0.32	2/28/04 06:42 a	2.07	G	LSC!
					5.30E-01		3.48E+01	(1.1)				
Batch: 4037339	RICHRC5080				Work Order: F856C1AJ		Report DB ID: 9F856C10					
AM-241	1.65E-02	U	2.34E-02	2.36E-02	2.24E-02	pCi/g	65%	0.74	3/2/04 07:33 p	2.01	G	ALP1!
					1.03E+00		(1.4)					

**FORM I**  
**SAMPLE RESULTS**

Date: 16-Mar-04

Lab Name: STL Richland

SDG: 25129

Collection Date: 6/10/2003 10:35:00 AM

Lot-Sample No.: J4B050367-1

Report No.: 25187

Received Date: 2/5/2004 3:00:00 PM

Client Sample ID: 953800000-011F(FRM44)

COC No.:

Matrix: SOIL

Haddam Neck Decommissioning

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primar Detect
CM-242	0.00E+00	U	0.00E+00	6.27E-02	6.94E-02	pCi/g	65%	0. 0.	3/2/04 07:33 p	2.01 G	ALP12	
CM-243/244	0.00E+00	U	0.00E+00	2.08E-02	2.30E-02	pCi/g	65%	0. 1.16E+00	3/2/04 07:33 p	2.01 G	ALP12	
Batch: 4041404	RICHRC5010			Work Order: F856C1AP		Report DB ID: 9F856C10						
PU-238	0.00E+00	U	0.00E+00	1.26E-02	1.39E-02	pCi/g	64% 1.18E+00	0. 0.	2/25/04 12:38 p	2.07 G	ALP4	
PU239/40	5.10E-03	U	1.02E-02	1.02E-02	1.38E-02	pCi/g	64% 1.07E+00	0.37 1.	2/25/04 12:38 p	2.07 G	ALP4	

No. of Results: 11      Comments:

STL  
RICHLAND

STL Richland  
Rpt(STLRchSample  
V4.07 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
J Qual - No U< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

## FORM II

Date: 16-Mar-04

## DUPLICATE RESULTS

Lab Name: STL Richland

SDG: 25129

Collection Date: 6/11/2003 10:49:00 AM

Lot-Sample No.: J4B050367-2

Report No.: 25187

Received Date: 2/5/2004 3:00:00 PM

Client Sample ID: 9538-0000-012F01(FRM3E) DUP

COC No.:

Matrix: SOIL

Parameter	Result, Orig Rst	Result, Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 4037330	CMUD				Work Order: F86W41AL		Report DB ID: F86W41LR	Orig Sa DB ID: 9F86W410			
SR-90	5.82E-02	J	2.14E-02	2.36E-02	3.53E-02	pCi/g	54% (1.6)	3/3/04 09:07 a		10.02	GPC2C
	5.77E-02	J	RER2 0.0			6.00E-02	(4.9)			G	
Batch: 4037336	RICHRC5010				Work Order: F86W41AM		Report DB ID: F86W41MR	Orig Sa DB ID: 9F86W410			
PU-241	2.54E-02	U	5.36E-01	7.24E-01	1.30E+00	pCi/g	56% 0.02	2/28/04 06:42 a		2.02	LSC7
	-2.63E-01	U	RER2 0.6			3.48E+01	0.07			G	
Batch: 4041404	RICHRC5010				Work Order: F86W41AP		Report DB ID: F86W41PR	Orig Sa DB ID: 9F86W410			
PU-238	4.84E-03	U	1.23E-02	1.24E-02	2.90E-02	pCi/g	56% 0.17	2/25/04 12:39 p		2.02	ALP45
	0.00E+00	U	RER2 0.5			1.18E+00	0.78			G	
PU239/40	-3.61E-03	U	4.17E-03	4.22E-03	3.80E-02	pCi/g	56% -0.1	2/25/04 12:39 p		2.02	ALP45
	-1.05E-03	U	RER2 1.1			1.07E+00	-(1.7)			G	

Alpha Spec Result Sum = 1.2E-03

No. of Results: 4 Comments:

STL  
RICHLAND

STL Richland      RER2 - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUD))] as defined by ICPT BOA.  
 rpiSTLRchDupV4.0 MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 7 A97 J Qual - No U|c qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
 U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

## FORM II

Date: 16-Mar-04

## DUPLICATE RESULTS

Lab Name: STL Richland SDG: 25129 Collection Date: 6/10/2003 10:35:00 AM  
 Lot-Sample No.: J4B050367-1 Report No.: 25187 Received Date: 2/5/2004 3:00:00 PM  
 Client Sample ID: 953800000-011F(FRM44) DUP COC No.: Matrix: SOIL

Parameter	Result, Orig Rst	Result, Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 4037328	RICHRC5069				Work Order: F856C1AM		Report DB ID: F856C1MR		Orig Sa DB ID: 9F856C10			
NI-63	4.61E+00	U	2.59E+00	4.50E+00	6.15E+00	pCi/g	85%	0.75	3/5/04 09:27 a	0.2506	LSC5	
	2.39E-01	U		RER2 1.4			2.89E+01	(2.1)		G		
Batch: 4037329	FBXZ				Work Order: F856C1AN		Report DB ID: F856C1NR		Orig Sa DB ID: 9F856C10			
FE-65	-9.32E+00	U		1.23E+01	2.09E+01	pCi/g	70%	-0.45	3/5/04 08:56 p	0.1253	LSC7	
	-1.20E+01	U		RER2 0.3			1.10E+03	-(1.5)		G		

24 No. of Results: 2 Comments:

STL RICHLAND

STL Richland  
 rptSTLRchDupV4.0  
 7 A97

RER2 - Replicate Error Ratio =  $(S-D)/[\sqrt{(sq(TPUs)+sq(TPUd))}]$  as defined by ICPT BOA.  
 MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

**FORM II**  
**BLANK RESULTS**

Date: 16-Mar-04

Lab Name: STL Richland

SDG: 25129

Matrix: SOIL

Report No.: 25187

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 4037334	RICHRC5022				Work Order: F87R71AA			Report DB ID: F87R71AB				
C-14	4.66E-02	U	5.95E-02	7.66E-02	1.39E-01	pCi/g	100%	0.33	3/4/04 04:03 a	5.0	G	LSC5
					6.83E-02	2.26E-01		(1.2)				
Batch: 4037328	RICHRC5069				Work Order: F87RC1AA			Report DB ID: F87RC1AB				
NI-63	1.86E+00	U	2.50E+00	4.13E+00	6.33E+00	pCi/g	89%	0.29	3/5/04 09:27 a	0.25	G	LSC5
					3.07E+00	2.89E+01		0.9				
Batch: 4037339	RICHRC5080				Work Order: F87VF1AA			Report DB ID: F87VF1AB				
AM-241	0.00E+00	U	0.00E+00	2.70E-02	2.98E-02	pCi/g	43%	0.	3/2/04 07:35 p	2.0	G	ALP131
						1.03E+00		0.				
CM-242	-7.63E-03	U	1.53E-02	1.53E-02	1.82E-01	pCi/g	43%	-0.04	3/2/04 07:35 p	2.0	G	ALP131
						3.97E-02		-0.99				
CM-243/244	-4.54E-03	U	6.42E-03	6.49E-03	6.41E-02	pCi/g	43%	-0.07	3/2/04 07:35 p	2.0	G	ALP131
						1.67E-02	1.16E+00	-(1.4)				
Batch: 4041404	RICHRC5010				Work Order: F9DGE1AA			Report DB ID: F9DGE1AB				
PU-238	0.00E+00	U	0.00E+00	1.35E-02	1.49E-02	pCi/g	61%	0.	2/25/04 09:05 p	2.0	G	ALP41
						1.18E+00		0.				
PU239/40	0.00E+00	U	0.00E+00	1.34E-02	1.49E-02	pCi/g	61%	0.	2/25/04 09:05 p	2.0	G	ALP41
						1.07E+00		0.				
Batch: 4037336	RICHRC5010				Work Order: F87R91AA			Report DB ID: F87R91AB				
PU-241	2.16E-01	U	5.04E-01	6.81E-01	1.20E+00	pCi/g	61%	0.18	2/28/04 06:42 a	20	G	LSC7
						5.76E-01	3.48E+01	0.63				
Batch: 4037333	RICHRC5078				Work Order: F87R11AA			Report DB ID: F87R11AB				

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STL Richland  
RptStLRCBlnk  
V4.07 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

**FORM II**  
**BLANK RESULTS**

Date: 16-Mar-04

Lab Name: STL Richland

SDG: 25129

Matrix: SOIL

Report No.: 25187

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
TC-99	-9.99E-02	U	1.04E-01	1.51E-01	2.50E-01 1.20E-01	pCi/g 2.00E+01	100%	-0.4 -(1.3)	3/12/04 06:51 a	5.0 G		LSC4
Batch: 4037332	RICHRC5037				Work Order: F87RX1AA	Report DB ID: F87RX1AB						
H-3	-8.46E-02	U	1.13E-01	1.22E-01	3.00E-01 1.38E-01	pCi/g 1.65E+01	100%	-0.28 -(1.4)	3/7/04 01:01 p	10.0 G		LSC3
Batch: 4037330	CMUD				Work Order: F87RK1AA	Report DB ID: F87RK1AB						
SR-90	5.06E-02	J	1.54E-02	1.78E-02	2.55E-02 1.18E-02	pCi/g 6.00E-02	74%	(2.) (5.7)	3/3/04 09:07 a	10.0 G		GPC3B
Batch: 4037329	FBXZ				Work Order: F87RF1AA	Report DB ID: F87RF1AB						
FE-55	-4.31E+00	U		5.48E+00	1.01E+01 4.75E+00	pCi/g 1.10E+03	78%	-0.43 -(1.6)	3/5/04 08:56 p	0.25 G		LSC7

No. of Results: 12      Comments:

STL RICHLAND

STL Richland  
RptStLRchBlank  
V4.07 A97

MDC|MDA,Lc - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
J Qual - No U|< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.  
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

**FORM II**  
**LCS RESULTS**

Date: 16-Mar-04

Lab Name: STL Richland

SDG: 25129

Matrix: SOIL

Report No.: 25187

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector	
Batch: 4037334	RICHRC5022				Work Order: F87R71AC			Report DB ID: F87R71CS						
C-14	2.76E+00		9.37E-02	1.54E-01	1.39E-01	pCi/g		100%	2.71E+00	8.74E-02	102%	3/4/04 04:03 a	5.0	LSC5
							Rec Limits:	70	130	0.0		G		
Batch: 4037328	RICHRC5069				Work Order: F87RC1AC			Report DB ID: F87RC1CS						
NI-63	4.81E+02		9.61E+00	7.61E+01	7.68E+00	pCi/g		80%	5.09E+02	1.71E+01	94%	3/5/04 09:27 a	0.25	LSC5
							Rec Limits:	70	130	-0.1		G		
Batch: 4037339	RICHRC5080				Work Order: F87VF1AC			Report DB ID: F87VF1CS						
AM-241	4.95E+00		3.75E-01	1.00E+00	1.93E-02	pCi/g		63%	4.55E+00	1.53E-01	109%	3/2/04 07:36 p	2.0	ALP132
							Rec Limits:	70	130	0.1		G		
Batch: 4041404	RICHRC5010				Work Order: F9DGE1AC			Report DB ID: F9DGE1CS						
PU239/40	4.54E-01		1.07E-01	1.33E-01	3.03E-02	pCi/g		54%	4.61E-01	2.33E-02	98%	2/25/04 09:06 p	2.0	ALP43
							Rec Limits:	70	130	0.0		G		
Batch: 4037336	RICHRC5010				Work Order: F87R91AC			Report DB ID: F87R91CS						
PU-241	2.16E+01		1.11E+00	2.19E+00	1.36E+00	pCi/g		54%	2.34E+01	1.06E+00	92%	2/28/04 06:42 a	2.0	LSC7
							Rec Limits:	70	130	-0.1		G		
Batch: 4037333	RICHRC5078				Work Order: F87R11AC			Report DB ID: F87R11CS						
TC-99	1.29E+01		3.28E-01	9.17E-01	2.52E-01	pCi/g		100%	1.36E+01	3.04E-01	95%	3/12/04 06:51 a	5.0	LSC4
							Rec Limits:	70	130	0.0		G		
Batch: 4037332	RICHRC5037				Work Order: F87RX1AC			Report DB ID: F87RX1CS						
H-3	6.43E+00		3.62E-01	4.18E-01	3.05E-01	pCi/g		100%	7.15E+00	2.46E-01	90%	3/7/04 01:44 p	10.0	LSC3
							Rec Limits:	70	130	-0.1		G		
Batch: 4037330	CMUD				Work Order: F87RK1AC			Report DB ID: F87RK1CS						

Bias = (Result/Expected)-1 as defined by ANSI N13.30.

**FORM II**  
**LCS RESULTS**

Date: 16-Mar-04

Lab Name: STL Richland

SDG: 25129

Matrix: SOIL

Report No.: 25187

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Allquot Size	Primary Detector
SR-90	5.14E-01		3.62E-02	8.27E-02	2.69E-02	pCi/g	68%	4.63E-01	5.63E-03	111%	3/3/04 09:07 a	10.0	GPC3C
					Rec Limits:		70	130	0.1			G	
Batch: 4037329	FBXZ			Work Order: F87RF1AC			Report DB ID: F87RF1CS						
FE-55	5.38E+01			1.24E+01	1.05E+01	pCi/g	74%	6.37E+01	3.39E+00	84%	3/5/04 08:56 p	0.25	LSC7
				Rec Limits:			70	130	-0.2			G	

No. of Results: 9      Comments:

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STL  
RICHLAND

STL Richland      Bias - (Result/Expected)-1 as defined by ANSI N13.30.  
rptSTLRchLes  
V4.07 A97

**FORM II**  
**MATRIX SPIKE RESULTS**

Date: 16-Mar-04

Lab Name: STL Richland

SDG: 25129

Lot-Sample No.: J4B050367-4

Report No.: 25187

Matrix: SOIL

Parameter	SpikeResult, Orig Rst	Count Qual	Total Error (2 s)	Total Uncert(2 s)	MDC MDA	Rpt Unit, CRDL	Rec- over	Exp- ected	Exp Uncert	Analysis, Prep Date	Aliquot Size	Primary Detector	
Batch: 4037333	RICHRC5078				Work Order: F86021AL	Report DB ID: F86021LW				Orig Sa DB ID: 9F860210			
TC-99	2.33E+01		4.16E-01	1.54E+00	2.37E-01	pCi/g	100%	90.96%	2.56E+01	5.75E-01	3/12/04 06:51 a	5.3	LSC4
	2.38E-02		RER2									G	

No. of Results: 1      Comments:

29

STL  
RICHLAND

STL Richland  
rptSTLRchMs  
V4.07 A97

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUs))] as defined by ICPT BOA.  
Bias - (Result/Expected)-1 as defined by ANSI N13.30.

MATERIAL STORAGE AREA

SURVEY UNIT 9538-0000

RELEASE RECORD

---

Attachment 2c  
Sample and Scan Area Data  
(2 Pages)

**Survey Release Record Scan Area Results**  
**Survey Unit 9538-0000**

**9538-0000 SCAN AREA 1 & 2 REPORT**

Survey Location	Background (cpm)	Action Level (cpm)	Reading (gross cpm)	Log Date	Log Time	E-600 S/N	Probe S/N
9538-00-001-BC-001 log 1	-	0	7220	6/23/2003	14:51:00	1112	1010
9538-00-001-BC-002 log 2	-	0	6930	6/23/2003	14:51:00	1112	1010
3	-	0	6690	6/23/2003	14:56:00	1112	1010
9538-00-001-SC-001 log 4	7220	8433	7320	6/23/2003	14:56:00	1112	1010
9538-00-001-SC-002 log 5	6930	8118	7180	6/23/2003	15:00:00	1112	1010
6	-	0	6590	6/23/2003	15:07:00	1112	1010
9538-00-002-BC-002 log 7	-	0	7110	6/23/2003	15:08:00	1112	1010
9538-00-002-BC-001 log 8	-	0	8050	6/23/2003	15:13:00	1112	1010
9538-00-002-SC-001 log 9	8050	9330	7510	6/23/2003	15:17:00	1112	1010
9538-00-002-SC-002 log 10	7110	8313	8140	6/23/2003	15:20:00	1112	1010

**9538-0000 SCAN AREA 3 -7 REPORT**

Survey Location	Background (cpm)	Action Level (cpm)	Reading (gross cpm)	Log Date	Log Time	E-600 S/N	Probe S/N
9538-00-003-BC-0001	-	0	6110	6/24/2003	11:00:00	1112	1002
Disregard 12	-	0	6670	6/24/2003	11:05:00	1112	1002
9538-00-003-SC-0001	6110	7226	6420	6/24/2003	11:05:00	1112	1002
9538-00-003-BC-0002	-	0	7120	6/24/2003	11:06:00	1112	1002
9538-00-003-SC-0002	7120	8324	7010	6/24/2003	11:09:00	1112	1002
9538-00-004-BC-0001	-	0	6600	6/24/2003	11:14:00	1112	1002
9538-00-004-SC-0001	6600	7759	6840	6/24/2003	11:17:00	1112	1002
9538-00-004-BC-0002	-	0	6560	6/24/2003	11:17:00	1112	1002
9538-00-004-SC-0002	6560	7716	6300	6/24/2003	11:20:00	1112	1002
9538-00-005-BC-0001	-	0	7410	6/24/2003	13:30:00	1112	1002
9538-00-005-SC-0001	7410	8639	7160	6/24/2003	13:34:00	1112	1002
9538-00-005-BC-0002	-	0	6300	6/24/2003	13:34:00	1112	1002
9538-00-005-SC-0002	6300	7433	6630	6/24/2003	13:38:00	1112	1002
9538-00-006-BC-0001	-	0	6570	6/24/2003	13:39:00	1112	1002
9538-00-006-SC-0001	6570	7727	6690	6/24/2003	13:42:00	1112	1002
9538-00-006-BC-0002	-	0	6460	6/24/2003	13:42:00	1112	1002
9538-00-006-SC-0002	6460	7607	6910	6/24/2003	13:46:00	1112	1002
9538-00-007-BC-0001	-	0	6750	6/24/2003	13:47:00	1112	1002
9538-00-007-SC-0001	6750	7923	7400	6/24/2003	13:50:00	1112	1002
9538-00-007-BC-0002	-	0	6770	6/24/2003	13:50:00	1112	1002
9538-00-007-SC-0002	6770	7944	6930	6/24/2003	13:53:00	1112	1002

**9538-0000 SAMPLE AREA SCANS-030605**

Survey Location	Background (cpm)	Action Level (cpm)	Reading (gross cpm)	Log Date	Log Time	E-600 S/N	Probe S/N
9538-00-003-BL-0001	-	0	8,100	6/5/2003	9:41:00	1105	1006
9538-00-003-SL-0001	8,100	9,384	8,390	6/5/2003	9:45:00	1105	1006
9538-00-001-BL-0001	-	0	7,460	6/5/2003	13:36:00	1105	1006
9538-00-001-SL-0001	7,460	8,693	7,880	6/5/2003	13:38:00	1105	1006
9538-00-004-BL-0001	-	0	7,730	6/5/2003	13:40:00	1105	1006
9538-00-004-SL-0001	7,730	8,985	8,010	6/5/2003	13:43:00	1105	1006
9538-00-009-BL-0001	-	0	8,290	6/5/2003	13:45:00	1105	1006
9538-00-009-SL-0001	8,290	9,589	8,340	6/5/2003	13:48:00	1105	1006
9538-00-008-BL-0001	-	0	8,470	6/5/2003	13:49:00	1105	1006

**Survey Release Record Scan Area Results**  
**Survey Unit 9538-0000**

Survey Location	Background (cpm)	Action Level (cpm)	Reading (gross cpm)	Log Date	Log Time	E-600 S/N	Probe S/N
9538-00-008-SL-0001	8,470	9,783	8,640	6/5/2003	13:52:00	1105	1006
9538-00-007-BL-0001	-	0	8,580	6/5/2003	13:53:00	1105	1006
9538-00-007-SL-0001	8,580	9,902	8,300	6/5/2003	13:57:00	1105	1006
9538-00-006-BL-0001	-	0	8,380	6/5/2003	13:58:00	1105	1006
9538-00-006-SL-0001	8,380	9,686	9,030	6/5/2003	14:01:00	1105	1006
9538-00-005-BL-0001	-	0	6,630	6/5/2003	14:02:00	1105	1006
9538-00-005-SL-0001	6,630	7,792	6,530	6/5/2003	14:05:00	1105	1006
9538-00-002-BL-0001	-	0	7,510	6/5/2003	14:06:00	1105	1006
9538-00-002-SL-0001	7,510	8,747	7,840	6/5/2003	14:09:00	1105	1006

**9538-0000 SAMPLE AREA SCANS-030609**

Survey Location	Background (cpm)	Action Level (cpm)	Reading (gross cpm)	Log Date	Log Time	E-600 S/N	Probe S/N
9538-00-013-BL-0001	-	0	6840	6/9/2003	9:58:00	1105	1006
9538-00-013-SL-0001	6840	8020	7120	6/9/2003	10:02:00	1105	1006
9538-00-012-BL-0001	-	0	7170	6/9/2003	10:03:00	1105	1006
9538-00-012-SL-0001	7170	8378	8120	6/9/2003	10:06:00	1105	1006
9538-00-011-BL-0001	-	0	7580	6/9/2003	10:07:00	1105	1006
9538-00-011-SL-0001	7580	8823	7900	6/9/2003	10:11:00	1105	1006
9538-00-010-BL-0001	-	0	7800	6/9/2003	10:12:00	1105	1006
9538-00-010-SL-0001	7800	9060	7830	6/9/2003	10:15:00	1105	1006
9538-00-014-BL-0001	-	0	8000	6/9/2003	10:17:00	1105	1006
9538-00-014-SL-0001	8000	9276	8240	6/9/2003	10:20:00	1105	1006
9538-00-015-BL-0001	-	0	6630	6/9/2003	10:21:00	1105	1006
9538-00-015-SL-0001	6630	7792	6860	6/9/2003	10:23:00	1105	1006

MATERIAL STORAGE AREA  
SURVEY UNIT 9538-0000

RELEASE RECORD

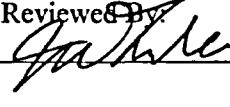
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Attachment 2d  
Split Sample Assessment Forms  
(2 Pages)

### Split Sample Assessment Form

Survey Area#: 9538	Survey Unit #: 0000	Survey Unit name: Material Storage Area						
Sample Plan or WPIR#: 24265-000-GEN-0000-00133-000					SML#: 9538-0000-008			
<p><b>Sample Description:</b> Comparison of split samples collected to depth (beyond 15 cm) from sample measurement location #8 and analyzed using gamma spectroscopy by off-site Vendor Laboratory. The standard sample was 9538-0000-008F01, the comparison sample was 9538-0000-008FS01.</p>								
<b>STANDARD</b>					<b>COMPARISON</b>			
Radionuclide	Activity Value	Standard Error	Resolution	Agreement Range	Activity Value	Standard Error	Comparison Ratio	Acceptable (Y/N)
Cs-137	1.41E-1	2.90E-2	5	0.5-2.0	1.94E-1	2.95E-2	1.4	Y
Comments/Corrective Actions: N/A					Table is provided to show acceptance criteria used to assess split samples.			
					<u>Resolution</u> 4 - 7 8 - 15 16 - 50 51 - 200 >200	<u>Agreement Range</u> 0.5 - 2.0 0.6 - 1.66 0.75 - 1.33 0.80 - 1.25 0.85 - 1.18		
Performed By: 	Date 1.11.05	Reviewed By: 	Date 2/17/05					

### Split Sample Assessment Form

Survey Area#: 9538	Survey Unit #: 0000	Survey Unit name: Material Storage Area							
Sample Plan or WPIR#: 24265-000-GEN-0000-00133-000					SML#: 9538-0000-012				
<p><b>Sample Description:</b> Comparison of split samples collected from sample measurement location #12 and analyzed using gamma spectroscopy by off-site Vendor Laboratory. The standard sample was 9538-0000-012F, the comparison sample was 9538-0000-012FS.</p>									
<b>STANDARD</b>					<b>COMPARISON</b>				
Radionuclide	Activity Value	Standard Error	Resolution	Agreement Range	Activity Value	Standard Error	Comparison Ratio	Acceptable (Y/N)	
Cs-137	1.25E-1	2.80E-2	5	0.5-2.0	1.81E-1	2.50E-2	1.5	Y	
Comments/Corrective Actions: N/A					Table is provided to show acceptance criteria used to assess split samples.				
					<u>Resolution</u> 4 - 7              0.5 - 2.0	<u>Agreement Range</u> 8 - 15              0.6 - 1.66			
					16 - 50              0.75 - 1.33	51 - 200              0.80 - 1.25			
					>200              0.85 - 1.18				
Performed By: 	Date 11.03-	Reviewed By: 	Date: 2/17/05 -						

MATERIAL STORAGE AREA  
SURVEY UNIT 9538-0000  

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RELEASE RECORD

Attachment 2e  
Preliminary Data Review Form  
(1 Page)

## PRELIMINARY DATA REVIEW FORM

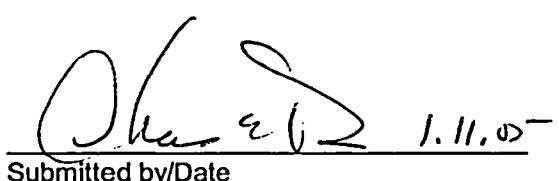
Survey Unit: 9538-0000  
 Survey Unit Name: Material Storage Area  
 Classification: 2  
 Survey Media: Soil  
 Type of Survey: Final Status Survey  
 Type of Measurement: Radionuclide Specific  
 Number of Measurements: 15  
 Operational DCGL: 1

## BASIC STATISTICAL QUANTITIES

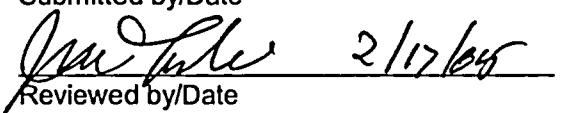
RANGE		Cs-137	Co-60
	Minimum Value:	-4.31E-03	-2.47E-02
	Maximum Value:	3.37E-01	4.57E-02
	Mean:	1.70E-01	4.79E-03
	Median:	1.71E-01	2.83E-03
	Standard Deviation:	9.15E-02	1.71E-02

## RADIONUCLIDE CONCENTRATION (pCi/g)

NUMBER	Cs-137	Identified?	Co-60	Identified?
9538-0000-001F	2.40E-03		2.83E-03	
9538-0000-002F	2.92E-01	Y	-1.64E-03	
9538-0000-003F	1.83E-01	Y	-3.84E-04	
9538-0000-004F	1.71E-01	Y	-2.47E-02	
9538-0000-005F	-4.31E-03		4.61E-03	
9538-0000-006F	3.37E-01	Y	-6.81E-03	
9538-0000-007F	1.80E-01	Y	6.09E-03	
9538-0000-008F	1.62E-01	Y	1.35E-02	
9538-0000-009F	1.59E-01	Y	1.20E-02	
9538-0000-010F	1.56E-01	Y	-2.15E-02	
9538-0000-011F	2.49E-01	Y	4.57E-02	Y
9538-0000-012F	1.25E-01	Y	2.42E-02	
9538-0000-013F	2.18E-01	Y	1.77E-03	
9538-0000-014F	2.05E-01	Y	3.72E-04	
9538-0000-015F	1.11E-01	Y	1.58E-02	


 Submitted by/Date

1.11.05


 Reviewed by/Date

2/17/05

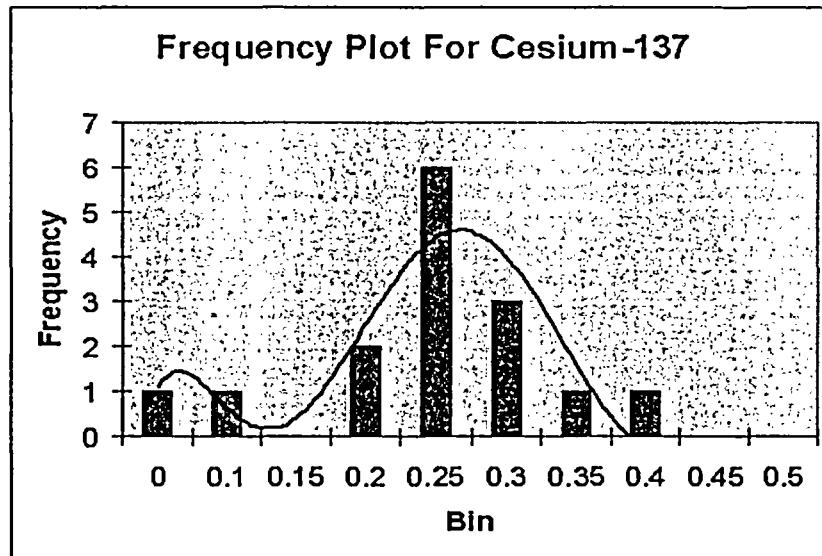
MATERIAL STORAGE AREA  
SURVEY UNIT 9538-0000

RELEASE RECORD

Attachment 2f  
Graphical Representation of Data  
(4 Pages)

Frequency Plot for  
Cesium-137

Survey Unit: 9538-0000  
Survey Unit Name: Material Storage Area



Upper End Value	Observation Frequency	Observation Frequency
0	1	7%
0.1	1	7%
0.15	0	0%
0.2	2	13%
0.25	6	40%
0.3	3	20%
0.35	1	7%
0.4	1	7%
0.45	0	0%
0.5	0	0%
Total:	15	100%

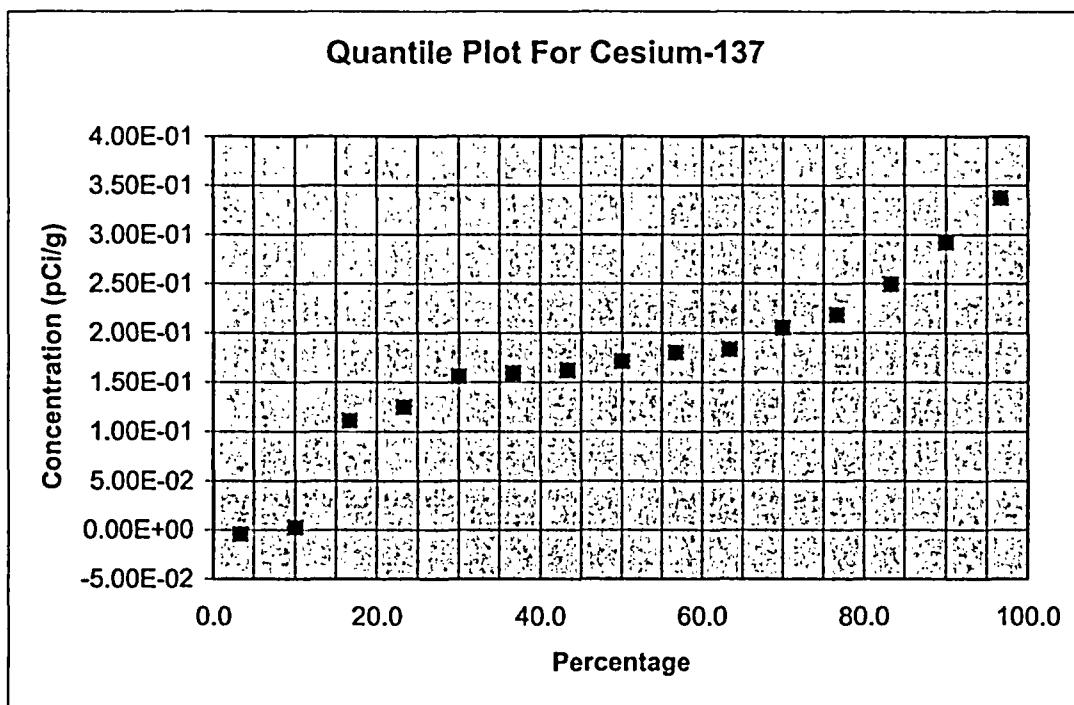
Submitted by/Date

Jay 1.11.05

Reviewed by/Date

## DATA FREQUENCY PLOT

Survey Unit: 9538-0000  
Survey Unit Name: Material Storage Area



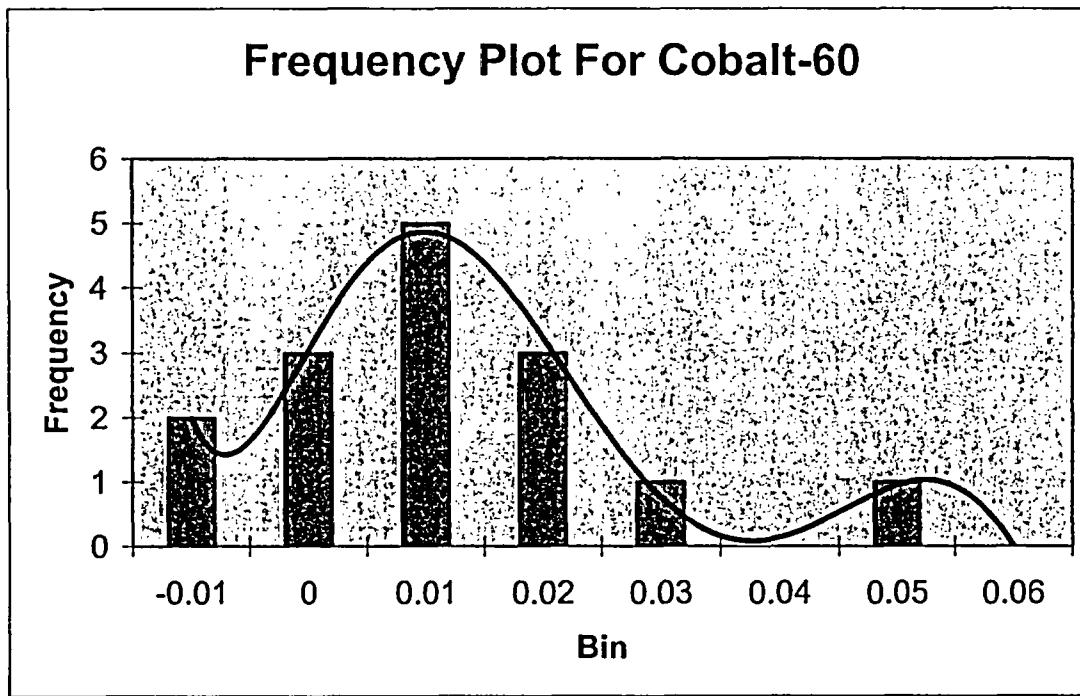
Cs-137	Rank	Percentage
-4.31E-03	1	3%
2.40E-03	2	10%
1.11E-01	3	17%
1.25E-01	4	23%
1.56E-01	5	30%
1.59E-01	6	37%
1.62E-01	7	43%
1.71E-01	8	50%
1.80E-01	9	57%
1.83E-01	10	63%
2.05E-01	11	70%
2.18E-01	12	77%
2.49E-01	13	83%
2.92E-01	14	90%
3.37E-01	15	97%

Cur. 1.11.05  
Submitted By/Date

Jewell W 2/17/05  
Reviewed By/Date

**DATA FREQUENCY PLOT**

Survey Unit: 9538-0000  
Survey Unit Name: Material Storage Area



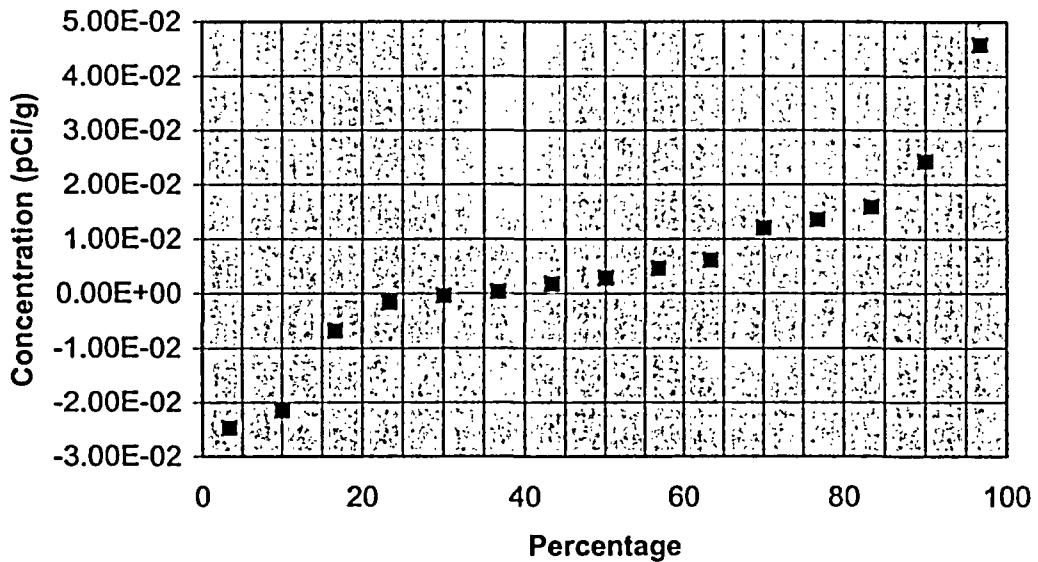
Upper End Value	Observation Frequency	Observation Frequency
-0.01	2	13%
0	3	20%
0.01	5	33%
0.02	3	20%
0.03	1	7%
0.04	0	0%
0.05	1	7%
0.06	0	0%
Total:	15	100%

CJL 1.11.05  
Submitted By/Date  
JFJ 2/17/05  
Reviewed By/Date

## Data Frequency Plot

Survey Unit: 9538-0000  
Survey Unit Name: Material Storage Area

### Quantile Plot For Cobalt-60



Co-60	Rank	Percentage
-2.47E-02	1	3%
-2.15E-02	2	10%
-6.81E-03	3	17%
-1.64E-03	4	23%
-3.84E-04	5	30%
3.72E-04	6	37%
1.77E-03	7	43%
2.83E-03	8	50%
4.61E-03	9	57%
6.09E-03	10	63%
1.20E-02	11	70%
1.35E-02	12	77%
1.58E-02	13	83%
2.42E-02	14	90%
4.57E-02	15	97%

QDR 11.d-  
Submitted by/Date

Jewell 2/17/05  
Reviewed by/Date

MATERIAL STORAGE AREA  
SURVEY UNIT 9538-0000

RELEASE RECORD

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Attachment 2g  
Sign Test Calculation  
(1 Page)

### Sign Test Calculation Sheet For Multiple Radionuclides

Survey Unit Number: 9538-0000				
Survey Unit Name: Material Storage Area				
WP&IR#: 24265-000-GEN-0000-00133-000				
Classification: 2		TYPE I ( $\alpha$ error): 0.05	TYPE II ( $\beta$ error): 0.05	
Radionuclides: Survey Design DCGL (pCi/g):		Cesium-137 3.16	Cobalt-60 1.52	
Results 1 <sup>st</sup> Radionuclide (pCi/g)	Results 2 <sup>nd</sup> Radionuclide (pCi/g)	Weighted sum (W <sub>s</sub> )	1 - W <sub>s</sub>	Sign
2.40E-03	2.83E-03	2.62E-03	9.97E-01	1
2.92E-01	-1.64E-03	9.13E-02	9.09E-01	1
1.83E-01	-3.84E-04	5.77E-02	9.42E-01	1
1.71E-01	-2.47E-02	3.79E-02	9.62E-01	1
-4.31E-03	4.61E-03	1.67E-03	9.98E-01	1
3.37E-01	-6.81E-03	1.02E-01	8.98E-01	1
1.80E-01	6.09E-03	6.10E-02	9.39E-01	1
1.62E-01	1.35E-02	6.01E-02	9.40E-01	1
1.59E-01	1.20E-02	5.82E-02	9.42E-01	1
1.56E-01	-2.15E-02	3.52E-02	9.65E-01	1
2.49E-01	4.57E-02	1.09E-01	8.91E-01	1
1.25E-01	2.42E-02	5.55E-02	9.45E-01	1
2.18E-01	1.77E-03	7.02E-02	9.30E-01	1
2.05E-01	3.72E-04	6.51E-02	9.35E-01	1
1.11E-01	1.58E-02	4.55E-02	9.54E-01	1
Number Of Positive Differences (S+):				15

Critical Value: 11Survey Unit: Meets Acceptance CriterionPerformed By: Charles E. D. Date: 1.11.05Independent Review By: Jacqueline Date: 2/17/05

MATERIAL STORAGE AREA  
SURVEY UNIT 9538-0000

RELEASE RECORD

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Attachment 2h  
COMPASS DQA Surface Soil Report with  
Retrospective Power Curve  
(3 Pages)

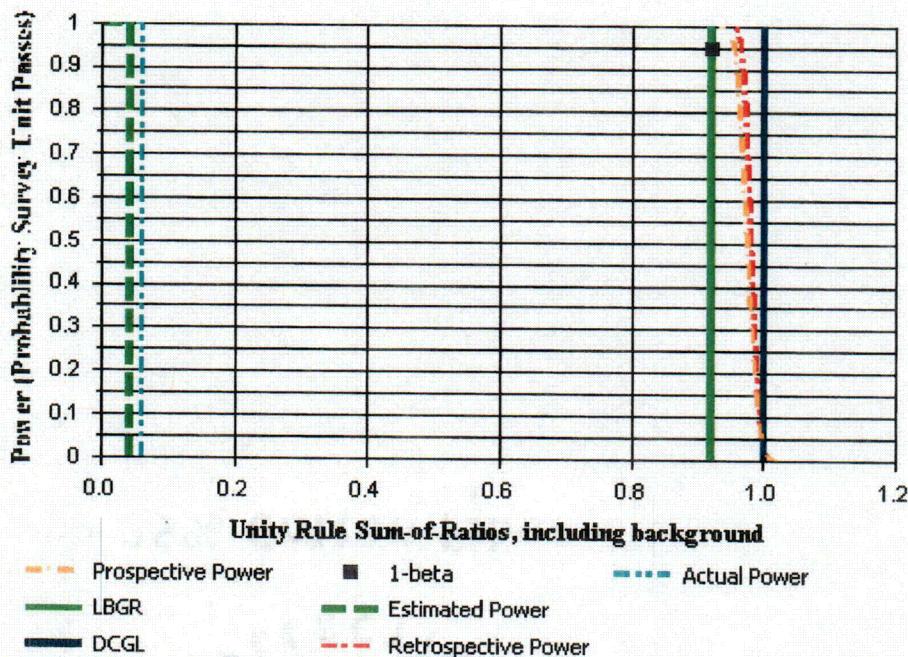


# DQA Surface Soil Report

## Assessment Summary

Site: Survey Unit 9538-0000  
Planner(s): CE Davis  
Survey Unit Name: Materials Storage Area  
Report Number: 1  
Survey Unit Samples: 15  
Reference Area Samples: 0  
Test Performed: Sign      Test Result: Not Performed  
Judgmental Samples: 0      EMC Result: Not Performed  
Assessment Conclusion: **Reject Null Hypothesis (Survey Unit PASSES)**

## Retrospective Power Curve





# DQA Surface Soil Report

## Survey Unit Data

NOTE: Type = "S" Indicates survey unit sample.  
Type = "R" Indicates reference area sample.

Sample Number	Type	Co-60 (pCi/g)	Cs-137 (pCi/g)
9538-0000-001F	S	0	0
9538-0000-002F	S	0	0.29
9538-0000-003F	S	0	0.18
9538-0000-004F	S	-0.02	0.17
9538-0000-005F	S	0	0
9538-0000-006F	S	-0.01	0.34
9538-0000-007F	S	0.01	0.18
9538-0000-008F	S	0.01	0.16
9538-0000-009F	S	0.01	0.16
9538-0000-010F	S	-0.02	0.16
9538-0000-011F	S	0.05	0.25
9538-0000-012F	S	0.02	0.12
9538-0000-013F	S	0	0.22
9538-0000-014F	S	0	0.2
9538-0000-015F	S	0.02	0.11

## Modified Data (Unity Rule SOR)

NOTE: Type = "S" Indicates survey unit sample.  
Type = "R" Indicates reference area sample.

Sample Number	Type	Sum-of-Ratios (SOR)
9538-0000-001F	S	0
9538-0000-002F	S	0.09
9538-0000-003F	S	0.06
9538-0000-004F	S	0.04
9538-0000-005F	S	0
9538-0000-006F	S	0.1
9538-0000-007F	S	0.06
9538-0000-008F	S	0.06
9538-0000-009F	S	0.06
9538-0000-010F	S	0.04
9538-0000-011F	S	0.11
9538-0000-012F	S	0.06
9538-0000-013F	S	0.07
9538-0000-014F	S	0.07
9538-0000-015F	S	0.05



# DQA Surface Soil Report

## Basic Statistical Quantities Summary

Statistic	Survey Unit	Background	DQO Results
Sample Number	15	N/A	N=15
Mean (SOR)	0.06	N/A	0.04
Median (SOR)	0.06	N/A	N/A
Std Dev (SOR)	0.03	N/A	0.04
High Value (SOR)	0.11	N/A	N/A
Low Value (SOR)	0.00	N/A	N/A