

Analytical Data Package Prepared For

Bechtel Hanford

Radiochemical Analysis By

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

Assigned Laboratory Code: STLRL

Data Package Contains 34 Pages

Report No.: 21237

| SDG No. | Order No. | Client Sample ID (List Order) | Lot-Sa No. | Work Order | Report DB ID | Batch No. |
|---------|-----------|-------------------------------|-------------|------------|--------------|-----------|
| W03915 | B00-030 | J008H7 | J2K260144-1 | FDWJ41AE | 9FDWJ410 | 2330350 |
| | | J008H7 | J2K260144-1 | FDWJ41AC | 9FDWJ410 | 2330352 |
| | | J008H7 | J2K260144-1 | FDWJ41AA | 9FDWJ410 | 2330353 |

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CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
 3350 George Washington Way
 Richland, WA 99352

December 17, 2002

Attention: Joan Kessner

| | | |
|-------------------|---|-------------------|
| SAF Number | : | B00-030 |
| Date SDG Closed | : | November 26, 2002 |
| Number of Samples | : | One (1) |
| Sample Type | : | Soil |
| SDG Number | : | W03915 |
| Data Deliverable | : | 21-Day / Summary |

I. Introduction

On November 26, 2002, one soil sample was received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the sample was assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

| <u>STLR ID#</u> | <u>BHI ID#</u> | <u>MATRIX</u> | <u>DATE OF RECEIPT</u> |
|-----------------|----------------|---------------|------------------------|
| FEWJ4 | J008H7 | SOIL | 11/26/02 |

II. 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:

Gas Proportional Counting
 Total Strontium by method RICH-RC-5006
Gamma Spectroscopy
 Gamma Spec by method RICH-RC-5017
Chemical Analyses
 Chromium Hex by EPA method 7196A

Bechtel Hanford, Inc.
December 17, 2002
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III. Quality Control

The analytical results for each analysis performed under SDG W03915 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

IV. Comments

Gas Proportional Counting

Total Strontium by method RICH-RC-5006:

The LCS recovery is at 66% (3.3 sigma). Except as noted, the LCS, batch blank, sample duplicate (J008H7), and sample results are within contractual requirements.

Gamma Spectroscopy

Gamma Spec by method RICH-RC-5017:

The LCS, batch blank, sample duplicate (J008H7), and sample results are within contractual requirements.

Chemical Analyses

Chromium Hex by EPA method 7196A:

The LCS, batch blank, sample duplicate (J008H7), matrix spike (J008H7), color (J008H7 PbCrO4) spike, and sample results are within contractual requirements.

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:



Barbara M. Gillespie
Project Manager

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/\sqrt{n}), 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 $(\text{Result}/\text{Expected})-1$ 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) u_c - Combined Uncertainty. | 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, u_c , 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%. $MDC = (4.65 * \text{Sqrt}((\text{BkgndCnt}/\text{BkgndCntMin})/\text{SCntMin}) + 2.71/\text{SCntMin}) * (\text{ConvFct}/(\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol}) * \text{IngrFct})$. 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 = $(S-D)/[\text{sqrt}(\text{TPUs}^2 + \text{TPUd}^2)]$ 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
STL Richland STLRL
 Ordered by Client Sample ID, Batch No.

Date: 20-Dec-02

Report No. : 21237

SDG No: W03915

| Client ID | Work Order Number | Parameter | Result +- Uncertainty (2s) | Qual | Units | Yield | MDC MDA | RER |
|--------------------|-------------------|-----------|-----------------------------|------|-------|--------|----------|-----|
| J008H7 | FDWJ41AE | CO-60 | 3.11E-02 +- 1.3E-02 | U | pCi/g | | 2.46E-02 | |
| | | CS-137 | 2.97E-01 +- 4.4E-02 | | pCi/g | | 1.81E-02 | |
| | | EU-152 | 1.07E-01 +- 4.9E-02 | U | pCi/g | | 6.00E-02 | |
| | | EU-154 | 2.14E-02 +- 3.6E-02 | U | pCi/g | | 6.25E-02 | |
| | | EU-155 | 2.01E-02 +- 3.2E-02 | U | pCi/g | | 5.51E-02 | |
| J008H7 | FDWJ41AC | STRONTIUM | 2.25E-01 +- 1.0E-01 | | pCi/g | 66.90% | 1.40E-01 | |
| J008H7 | FDWJ41AA | HEXCHROME | 0.00E+00 +- 0.0E+00 | U | mg/kg | N/A | 8.00E-02 | |
| J008H7 DUP | FDWJ41AF | CO-60 | 6.09E-03 +- 1.2E-02 | U | pCi/g | | 2.12E-02 | 2.8 |
| | | CS-137 | 2.77E-01 +- 4.1E-02 | | pCi/g | | 1.89E-02 | 0.7 |
| | | EU-152 | 1.18E-01 +- 5.6E-02 | U | pCi/g | | 5.77E-02 | 0.3 |
| | | EU-154 | 9.94E-03 +- 3.5E-02 | U | pCi/g | | 6.05E-02 | 0.5 |
| | | EU-155 | 5.69E-02 +- 2.7E-02 | U | pCi/g | | 4.55E-02 | 1.7 |
| J008H7 DUP | FDWJ41AG | STRONTIUM | 1.14E-01 +- 8.4E-02 | U | pCi/g | 57.40% | 1.54E-01 | 1.7 |
| J008H7 DUP | FDWJ41JX | HEXCHROME | 0.00E+00 +- 0.0E+00 | U | mg/kg | N/A | 8.00E-02 | |
| Number of Results: | | 14 | | | | | | |

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RER - Replicate Error Ratio = $(S-D)/[\text{sqrt}(\text{sq}(\text{TPUs})+\text{sq}(\text{TPUd}))]$ as defined by ICPT BOA.
 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 QC Type, Batch No.

Date: 20-Dec-02

Report No. : 21237

SDG No.: W03915

| QC Type | Work Order Number | Parameter | Result +- Uncertainty (2s) | Qual | Units | Yield | Recovery | Bias | MDC MDA |
|------------|-------------------|-----------|-----------------------------|------|-------|--------|----------|------|----------|
| BLANK QC | FDXD61AA | CO-60 | 6.36E-03 +- 7.4E-03 | U | pCi/g | | | | 1.42E-02 |
| | | CS-137 | 2.35E-04 +- 6.8E-03 | U | pCi/g | | | | 1.20E-02 |
| | | EU-152 | 1.84E-02 +- 2.0E-02 | U | pCi/g | | | | 3.48E-02 |
| | | EU-154 | -2.06E-02 +- 2.0E-02 | U | pCi/g | | | | 3.23E-02 |
| | | EU-155 | -1.92E-02 +- 1.8E-02 | U | pCi/g | | | | 2.78E-02 |
| BLANK QC | FDXEA1AA | STRONTIUM | 9.83E-03 +- 5.2E-02 | U | pCi/g | 86.60% | | | 1.21E-01 |
| LCS | FDXD61AC | CS-137 | 3.27E-01 +- 6.5E-02 | | pCi/g | | 113.29% | 0.1 | 3.80E-02 |
| | | K-40 | 1.85E+01 +- 2.4E+00 | | pCi/g | | 94.56% | -0.1 | 2.55E-01 |
| | | RA-226 | 1.03E+00 +- 1.6E-01 | | pCi/g | | 89.12% | -0.1 | 6.37E-02 |
| | | RA-228 | 2.10E+00 +- 3.1E-01 | | pCi/g | | 112.05% | 0.1 | 1.13E-01 |
| | | U-238DHP | 8.10E-01 +- 5.5E-01 | | pCi/g | | 77.06% | -0.2 | 6.27E-01 |
| LCS | FDXEA1AC | STRONTIUM | 7.66E-01 +- 2.3E-01 | | pCi/g | 82.50% | 66.78% | -0.3 | 1.18E-01 |
| MATRIX SPI | FDWJ41HS | HEXCHROME | 3.22E+01 +- 0.0E+00 | | mg/kg | N/A | 78.17% | -0.2 | 8.00E-02 |
| LCS | FDXED1AC | HEXCHROME | 3.70E+01 +- 0.0E+00 | | mg/L | N/A | 92.55% | -0.1 | 2.00E-03 |
| BLANK QC | FDXED1AB | HEXCHROME | 0.00E+00 +- 0.0E+00 | U | mg/L | N/A | | | 2.00E-03 |

Number of Results: 15

FORM I

Date: 20-Dec-02

SAMPLE RESULTS

Lab Name: STL Richland

SDG: W03915

Collection Date: 11/25/2002 7:40:00 AM

Lot-Sample No.: J2K260144-1

Report No. : 21237

Received Date: 11/26/2002 8:35:00 AM

Client Sample ID: J008H7

COC No. : B00-030-075

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 | Analy Method, Primary Detector |
|----------------|----------|------|----------------------|--------------------|---------------------|------------------------|----------------|-----------------------|---------------------|---------------|--------------|--------------------------------|
| Batch: 2330350 | | | Work Order: FDWJ41AE | | | Report DB ID: 9FDWJ410 | | | | | | |
| CO-60 | 3.11E-02 | U | 1.3E-02 | 1.3E-02 | 2.46E-02 | pCi/g | | (1.3) | 12/2/02 07:58 p | | 376.4 | GAMMA_GS |
| | | | | | | | 5.00E-02 | (4.6) | | | g | GER4\$1 |
| CS-137 | 2.97E-01 | | 4.4E-02 | 4.4E-02 | 1.81E-02 | pCi/g | | (16.4) | 12/2/02 07:58 p | | 376.4 | GAMMA_GS |
| | | | | | | | 1.00E-01 | (13.4) | | | g | GER4\$1 |
| EU-152 | 1.07E-01 | U | 4.9E-02 | 4.9E-02 | 6.00E-02 | pCi/g | | (1.8) | 12/2/02 07:58 p | | 376.4 | GAMMA_GS |
| | | | | | | | 1.00E-01 | (4.4) | | | g | GER4\$1 |
| EU-154 | 2.14E-02 | U | 3.6E-02 | 3.6E-02 | 6.25E-02 | pCi/g | | 0.34 | 12/2/02 07:58 p | | 376.4 | GAMMA_GS |
| | | | | | | | 1.00E-01 | (1.2) | | | g | GER4\$1 |
| EU-155 | 2.01E-02 | U | 3.2E-02 | 3.2E-02 | 5.51E-02 | pCi/g | | 0.36 | 12/2/02 07:58 p | | 376.4 | GAMMA_GS |
| | | | | | | | 1.00E-01 | (1.2) | | | g | GER4\$1 |
| Batch: 2330352 | | | Work Order: FDWJ41AC | | | Report DB ID: 9FDWJ410 | | | | | | |
| STRONTIUM | 2.25E-01 | | 8.3E-02 | 1.0E-01 | 1.40E-01 | pCi/g | 66.90% | (1.6) | 12/11/02 08:48 a | | 6.0 | SRTOT_SEP_PRECIP |
| | | | | | | | | (4.4) | | | G | GPC31A |
| Batch: 2330353 | | | Work Order: FDWJ41AA | | | Report DB ID: 9FDWJ410 | | | | | | |
| HEXCHROME | 0.00E+00 | U | | 0.0E+00 | 8.00E-02 | mg/kg | N/A | 0. | 12/4/02 | | 2.5 | EPA7196 |
| | | | | | | | | N/A | | | G | |

Number of Results: 7

Comments:

00

FORM II

Date: 20-Dec-02

DUPLICATE RESULTS

Lab Name: STL Richland
 Lot-Sample No.: J2K260144-1
 Client Sample ID: J008H7 DUP

SDG: W03915
 Report No.: 21237
 COC No.: B00-030-075

Collection Date: 11/25/2002 7:40:00 AM
 Received Date: 11/26/2002 8:35:00 AM
 Matrix: SOIL

| Parameter | Result, Orig Rst | 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 | Analy Method, Primary Detector |
|---|------------------|-------|--------------------|--------------------|---------------------|----------------|--------|-----------------------|---------------------|---------------|--------------|--------------------------------|
| Batch: 2330350 Work Order: FDWJ41AF Report DB ID: FDWJ41FR Orig Sa DB ID: 9FDWJ410 | | | | | | | | | | | | |
| CO-60 | 6.09E-03 | U | 1.2E-02 | 1.2E-02 | 2.12E-02 | pCi/g | | 0.29 | 12/2/02 08:13 p | | 376.2 | GAMMA_GS |
| | 3.11E-02 | U RER | 2.8 | | | 5.00E-02 | | (1.) | | | g | GER6\$1 |
| CS-137 | 2.77E-01 | | 4.1E-02 | 4.1E-02 | 1.89E-02 | pCi/g | | (14.6) | 12/2/02 08:13 p | | 376.2 | GAMMA_GS |
| | 2.97E-01 | RER | 0.7 | | | 1.00E-01 | | (13.7) | | | g | GER6\$1 |
| EU-152 | 1.18E-01 | U | 5.6E-02 | 5.6E-02 | 5.77E-02 | pCi/g | | (2.) | 12/2/02 08:13 p | | 376.2 | GAMMA_GS |
| | 1.07E-01 | U RER | 0.3 | | | 1.00E-01 | | (4.2) | | | g | GER6\$1 |
| EU-154 | 9.94E-03 | U | 3.5E-02 | 3.5E-02 | 6.05E-02 | pCi/g | | 0.16 | 12/2/02 08:13 p | | 376.2 | GAMMA_GS |
| | 2.14E-02 | U RER | 0.5 | | | 1.00E-01 | | 0.57 | | | g | GER6\$1 |
| EU-155 | 5.69E-02 | U | 2.7E-02 | 2.7E-02 | 4.55E-02 | pCi/g | | (1.3) | 12/2/02 08:13 p | | 376.2 | GAMMA_GS |
| | 2.01E-02 | U RER | 1.7 | | | 1.00E-01 | | (4.2) | | | g | GER6\$1 |
| Batch: 2330352 Work Order: FDWJ41AG Report DB ID: FDWJ41GR Orig Sa DB ID: 9FDWJ410 | | | | | | | | | | | | |
| STRONTIUM | 1.14E-01 | U | 7.8E-02 | 8.4E-02 | 1.54E-01 | pCi/g | 57.40% | 0.74 | 12/11/02 08:48 a | | 6.0 | SRTOT_SEP_PRECIP |
| | 2.25E-01 | RER | 1.7 | | | | | (2.7) | | | G | GPC31B |
| Batch: 2330353 Work Order: FDWJ41JX Report DB ID: FDWJ41AJR Orig Sa DB ID: 9FDWJ410 | | | | | | | | | | | | |
| HEXCHROME | 0.00E+00 | U | | 0.0E+00 | 8.00E-02 | mg/kg | N/A | 0. | 12/4/02 | | 2.5 | EPA7196 |
| | 0.00E+00 | U RPD | | | | | | N/A | | | G | |

Number of Results: 7

Comments:

60

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RER - Replicate Error Ratio = $(S-D)/[\text{sqrt}(\text{sq}(\text{TPUs})+\text{sq}(\text{TPUd}))]$ 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

Date: 20-Dec-02

BLANK RESULTS

Lab Name: STL Richland

SDG: W03915

Lot-Sample No.: J2K260000-350

Report No. : 21237

Matrix: SOIL

| Parameter | Result | Qual | Count Error (2 s) | Total Uncert(2 s) | MDC MD A, | Rpt Unit, CRDL | Yield | Rst/MDC, Rst/TotUcert | Analysis, Prep Date | Total Sa Size | Aliquot Size | Analy Method, Primary Detector |
|----------------|-----------|----------------------|--------------------|------------------------|-----------|----------------|-------|-----------------------|---------------------|---------------|--------------|--------------------------------|
| Batch: 2330350 | | Work Order: FDXD61AA | | Report DB ID: FDXD61AX | | | | | | | | |
| CO-60 | 6.36E-03 | U | 7.4E-03 | 7.4E-03 | 1.42E-02 | pCi/g | | 0.45 | 12/2/02 08:00 p | | 348.0 | GAMMA_GS |
| | | | | | | | | (1.7) | | | g | GER7\$1 |
| CS-137 | 2.35E-04 | U | 6.8E-03 | 6.8E-03 | 1.20E-02 | pCi/g | | 0.02 | 12/2/02 08:00 p | | 348.0 | GAMMA_GS |
| | | | | | | | | 1.00E-01 | | | g | GER7\$1 |
| EU-152 | 1.84E-02 | U | 2.0E-02 | 2.0E-02 | 3.48E-02 | pCi/g | | 0.53 | 12/2/02 08:00 p | | 348.0 | GAMMA_GS |
| | | | | | | | | (1.9) | | | g | GER7\$1 |
| EU-154 | -2.06E-02 | U | 2.0E-02 | 2.0E-02 | 3.23E-02 | pCi/g | | -0.64 | 12/2/02 08:00 p | | 348.0 | GAMMA_GS |
| | | | | | | | | (-2.) | | | g | GER7\$1 |
| EU-155 | -1.92E-02 | U | 1.8E-02 | 1.8E-02 | 2.78E-02 | pCi/g | | -0.69 | 12/2/02 08:00 p | | 348.0 | GAMMA_GS |
| | | | | | | | | (-2.2) | | | g | GER7\$1 |

Number of Results: 5

Comments:

10

FORM II

Date: 20-Dec-02

BLANK RESULTS

Lab Name: STL Richland

SDG: W03915

Lot-Sample No.: J2K260000-352

Report No. : 21237

Matrix: SOIL

| Parameter | Result | Qual | Count Error (2 s) | Total Uncert(2 s) | MDC MD A, | Rpt Unit, CRDL | Yield | Rst/MDC, Rst/TotUncert | Analysis, Prep Date | Total Sa Size | Aliquot Size | Analy Method, Primary Detector |
|----------------|----------------------|------|------------------------|--------------------|-----------|----------------|--------|------------------------|---------------------|---------------|--------------|--------------------------------|
| Batch: 2330352 | Work Order: FDXEA1AA | | Report DB ID: FDXEA1AB | | | | | | | | | |
| STRONTIUM | 9.83E-03 | U | 5.2E-02 | 5.2E-02 | 1.21E-01 | pCi/g | 86.60% | 0.08 | 12/11/02 08:48 a | | 6.0 | SRTOT_SEP_PRECIP |
| | | | | | 5.62E-02 | | | 0.38 | | | G | GPC31C |

Number of Results: 1

Comments:

11

FORM II

Date: 20-Dec-02

BLANK RESULTS

Lab Name: STL Richland

SDG: W03915

Lot-Sample No.: J2K260144-

Report No. : 21237

Matrix: WATER

| Parameter | Result | Qual | Count Error (2 s) | Total Uncert(2 s) | MDC MD A, | Rpt Unit, CRDL | Yield | Rst/MDC, Rst/TotUcert | Analysis, Prep Date | Total Sa Size | Aliquot Size | Analy Method, Primary Detector |
|----------------|----------------------|------|--------------------|------------------------|-----------|----------------|-------|-----------------------|---------------------|---------------|--------------|--------------------------------|
| Batch: 2330353 | Work Order: FDXED1AB | | | Report DB ID: FDXED1AB | | | | | | | | |
| HEXCHROME | 0.00E+00 | U | | 0.0E+00 | 2.00E-03 | mg/L | N/A | 0. N/A | 12/4/02 | | 100.0 ML | EPA7196 |

Number of Results: 1

Comments:

12

FORM II
LCS RESULTS

Date: 20-Dec-02

Lab Name: STL Richland
Lot-Sample No.: J2K260000-350

SDG: W03915
Report No. : 21237

Matrix: SOIL

| Parameter | Result | Count Qual | Count Error (2 s) | Total Uncert(2 s) | MDC MD | Report Unit | Yield | Expected | Expected Uncert | Recovery, Bias | Analysis, Prep Date | Aliquot Size | Analy Method, Primary Defector |
|----------------|----------------------|------------------------|--------------------|-------------------|----------|-------------|-------------|----------|-----------------|----------------|---------------------|--------------|--------------------------------|
| Batch: 2330350 | Work Order: FDXD61AC | Report DB ID: FDXD61CM | | | | | | | | | | | |
| CS-137 | 3.27E-01 | | 6.5E-02 | 6.5E-02 | 3.80E-02 | pCi/g | | 2.88E-01 | 1.3E-02 | 113.29% | 12/2/02 08:00 p | 200.01 | GAMMA_GS |
| | | | | | | | Rec Limits: | 70. | 130. | 0.1 | | g | GER5\$1 |
| K-40 | 1.85E+01 | | 2.4E+00 | 2.4E+00 | 2.55E-01 | pCi/g | | 1.95E+01 | 1.9E+00 | 94.56% | 12/2/02 08:00 p | 200.01 | GAMMA_GS |
| | | | | | | | Rec Limits: | 70. | 130. | -0.1 | | g | GER5\$1 |
| RA-226 | 1.03E+00 | | 1.6E-01 | 1.6E-01 | 6.37E-02 | pCi/g | | 1.15E+00 | 5.2E-02 | 89.12% | 12/2/02 08:00 p | 200.01 | GAMMA_GS |
| | | | | | | | Rec Limits: | 70. | 130. | -0.1 | | g | GER5\$1 |
| RA-228 | 2.10E+00 | | 3.1E-01 | 3.1E-01 | 1.13E-01 | pCi/g | | 1.87E+00 | 9.6E-02 | 112.05% | 12/2/02 08:00 p | 200.01 | GAMMA_GS |
| | | | | | | | Rec Limits: | 70. | 130. | 0.1 | | g | GER5\$1 |
| U-238DHP | 8.10E-01 | | 5.5E-01 | 5.5E-01 | 6.27E-01 | pCi/g | | 1.05E+00 | 5.4E-02 | 77.06% | 12/2/02 08:00 p | 200.01 | GAMMA_GS |
| | | | | | | | Rec Limits: | | | -0.2 | | g | GER5\$1 |

Number of Results: 5

Comments:

13

FORM II
LCS RESULTS

Date: 20-Dec-02

Lab Name: **STL Richland**
Lot-Sample No.: **J2K260000-352**

SDG: **W03915**
Report No. : **21237**

Matrix: **SOIL**

| Parameter | Result | Count Qual | Count Error (2s) | Total Uncert(2 s) | MDC MD | Report Unif | Yield | Expected | Expected Uncert | Recovery, Bias | Analysis, Prep Date | Alliquot Size | Analy Method, Primary Detector |
|----------------|---------------------|-----------------------|-------------------|-------------------|----------|-------------|-------------|----------|-----------------|----------------|---------------------|---------------|--------------------------------|
| Batch: 2330352 | Work Order: FDXE1AC | Report DB ID: FDXE1CS | | | | | | | | | | | |
| STRONTIUM | 7.66E-01 | | 1.1E-01 | 2.3E-01 | 1.18E-01 | pCi/g | 82.50% | 1.15E+00 | 2.3E-02 | 66.78% | 12/11/02 08:48 a | 6.0 | SRTOT_SEP_PRECIP |
| | | | | | | | Rec Limits: | 70. | 130. | -0.3 | | G | GPC31D |

Number of Results: 1

Comments:

14

FORM II
LCS RESULTS

Date: 20-Dec-02

Lab Name: STL Richland

SDG: W03915

Lot-Sample No.: J2K260144-

Report No. : 21237

Matrix: WATER

| Parameter | Result | Count Qual | Count Error (2s) | Total Uncert(2 s) | MDC MD | Report Unit | Yield | Expected | Expected Uncert | Recovery, Bias | Analysis, Prep Date | Aliquot Size | Analy Method, Primary Detector |
|----------------|----------------------|------------------------|-------------------|-------------------|----------|-------------|-------------|----------|-----------------|----------------|---------------------|--------------|--------------------------------|
| Batch: 2330353 | Work Order: FDXED1AC | Report DB ID: FDXED1AC | | | | | | | | | | | |
| HEXCHROME | 3.70E+01 | | | 0.0E+00 | 2.00E-03 | mg/L | N/A | 4.00E+01 | | 92.55% | 12/4/02 | 100.0 | EPA7196 |
| | | | | | | | Rec Limits: | | | -0.1 | | ML | |

Number of Results: 1

Comments:

15

FORM II
MATRIX SPIKE RESULTS

Date: 20-Dec-02

Lab Name: STL Richland

SDG: W03915

Lot-Sample No.: J2K260144-1

Report No. : 21237

Matrix: SOIL

| Parameter | SpikeResult, Orig Rst | Qual | Count Error (2 s) | Total Uncert(2 s) | MDC MD | Rpt Unit, CRDL | Yield | Rec- overy | Exp- ected | Exp Uncert | Analysis, Prep Date | Aliquot Size | Analy Method, Primary Detector |
|----------------|--------------------------|------|-----------------------|------------------------|----------|-------------------------|-------|---------------|---------------|---------------|------------------------|-----------------|-----------------------------------|
| Batch: 2330353 | Work Order: FDWJ41HS | | | Report DB ID: FDWJ41HW | | Orig Sa DB ID: 9FDWJ410 | | | | | | | |
| HEXCHROME | 3.22E+01 | | | 0.0E+00 | 8.00E-02 | mg/kg | N/A | 78.17% | 4.12E+01 | | 12/4/02 | 2.5 | EPA7196 |
| | 0.00E+00 | RPD | 2.0 | | | | | | | | | G | |

Number of Results: 1

Comments:

16

Data Review Checklist
RADIOCHEMISTRY
First Level Review

Lot Number: J2K260144
 Client ID: BH1
 Due Date: 12-17-02
 QC Batch Number: 2330350
 Method Test Parameter: Gamma
 Matrix: Soil
 SDG Number: w03915

| Review Item | Yes (✓) | No (✓) | N/A (✓) |
|--|---------|--------|---------|
| A. COC | | | |
| 1. Is the ICOC page complete (includes all applicable analysts, dates, SOP numbers and revisions)? | ✓ | | |
| B. QC Batch | | | |
| 1. Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet? | ✓ | | |
| 2. Are the QC appropriate for the analysis included in the batch? | ✓ | | |
| 3. Is the Analytical Batch Worksheets complete (includes, as appropriate, volumes, count times, etc.)? | ✓ | | |
| 4. Does the Worksheets include a Tracer Vial label for each sample? | | | ✓ |
| C. QC & Samples | | | |
| 1. Is the blank result, yield and MDA within contract limits? | ✓ | | |
| 2. Is the LCS result, yield and MDA within contract limits? | ✓ | | |
| 3. Are the MS/MSD results, yields and MDAs within contract limits? | | | ✓ |
| 4. Are the duplicate results, yields and MDAs within contract limits? | ✓ | | |
| 5. Are the sample yields and MDAs within contract limits? | ✓ | | |
| D. Raw Data | | | |
| 1. Were results calculated in the correct units? | ✓ | | |
| 2. Were analysis volumes entered correctly? | ✓ | | |
| 3. Were yields entered correctly? | | | ✓ |
| 4. Were spectra reviewed/meet contractual requirements? | ✓ | | |
| 5. Were raw counts reviewed for anomalies? | | | ✓ |
| E. Other | | | |
| 1. Are all Nonconformances included and noted? | | | ✓ |
| 2. Are all required forms filled out? | ✓ | | |
| 3. Was the correct methodology used? | ✓ | | |
| 4. Was transcription checked? | ✓ | | |
| 5. Were all calculations checked at a minimum frequency? | ✓ | | |
| 6. Are worksheet entries complete and correct? | ✓ | | |

Comments on any "No" response: Eu-152 result > mda, ID rejected by abundance
CRITERIA

First Level Review: [Signature] Date: 12-4-02

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 2330350

| Review Item | Yes (✓) | No (✓) | N/A (✓) |
|---|---------|--------|---------|
| A. Sample Analysis | | | |
| 1. Are the sample yields within acceptance criteria? | | | ✓ |
| 2. Is the sample Minimum Detectable Activity < the Contract Detection Limit? | ✓ | | |
| 3. Are the correct isotopes reported? | ✓ | | |
| B. QC Samples | | | |
| 1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit? | ✓ | | |
| 2. Does the blank result meet the Contract criteria? | ✓ | | |
| 3. Is the blank result < the Contract Detection Limit? | ✓ | | |
| 4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit? | | | ✓ |
| 5. Is the LCS recovery with contract acceptance criteria? | ✓ | | |
| 7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit? | ✓ | | |
| 8. Do the MS/MSD results and yields meet acceptance criteria? | | | ✓ |
| 9. Do the duplicate sample results and yields meet acceptance criteria? | ✓ | | |
| C. Other | | | |
| 1. Are all Nonconformances included and noted? | | | ✓ |
| 2. Are all required forms filled out? | ✓ | | |
| 3. Was the correct methodology used? | ✓ | | |
| 4. Was transcription checked? | ✓ | | |
| 5. Were all calculations checked at a minimum frequency? | ✓ | | |
| 6. Were units checked? | ✓ | | |

Comments on any "No" response: _____

Second Level Review: Ben M. Dillinger Date: 12/4/02

Data Review Checklist
RADIOCHEMISTRY
First Level Review

Lot Number: J2K260144
 Client ID: BS#1
 Due Date: 10/17/02
 QC Batch Number: 2330352
 Method Test Parameter: TH - TSP
 Matrix: SPL
 SDG Number: W05915

P

| Review Item | Yes (✓) | No (✓) | N/A (✓) |
|--|---------|--------|---------|
| A. COC | | | |
| 1. Is the ICOC page complete (includes all applicable analysts, dates, SOP numbers and revisions)? | ✓ | | |
| B. QC Batch | | | |
| 1. Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet? | ✓ | | |
| 2. Are the QC appropriate for the analysis included in the batch? | ✓ | | |
| 3. Is the Analytical Batch Worksheets complete (includes, as appropriate, volumes, count times, etc.)? | ✓ | | |
| 4. Does the Worksheets include a Tracer Vial label for each sample? | ✓ | | |
| C. QC & Samples | | | |
| 1. Is the blank result, yield and MDA within contract limits? | ✓ | | |
| 2. Is the LCS result, yield and MDA within contract limits? | ✓ | | |
| 3. Are the MS/MSD results, yields and MDAs within contract limits? | | | ✓ |
| 4. Are the duplicate results, yields and MDAs within contract limits? | ✓ | | |
| 5. Are the sample yields and MDAs within contract limits? | ✓ | | |
| D. Raw Data | | | |
| 1. Were results calculated in the correct units? | ✓ | | |
| 2. Were analysis volumes entered correctly? | ✓ | | |
| 3. Were yields entered correctly? | | | |
| 4. Were spectra reviewed/meet contractual requirements? | | | ✓ |
| 5. Were raw counts reviewed for anomalies? | ✓ | | |
| E. Other | | | |
| 1. Are all Nonconformances included and noted? | | | ✓ |
| 2. Are all required forms filled out? | ✓ | | |
| 3. Was the correct methodology used? | ✓ | | |
| 4. Was transcription checked? | ✓ | | |
| 5. Were all calculations checked at a minimum frequency? | ✓ | | |
| 6. Are worksheet entries complete and correct? | ✓ | | |

Comments on any "No" response: _____

First Level Review: Pam Anderson Date: 12-11-02



STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 2330 352

| Review Item | Yes (✓) | No (✓) | N/A (✓) |
|---|---------|--------|---------|
| A. Sample Analysis | | | |
| 1. Are the sample yields within acceptance criteria? | ✓ | | |
| 2. Is the sample Minimum Detectable Activity < the Contract Detection Limit? | ✓ | | |
| 3. Are the correct isotopes reported? | ✓ | | |
| B. QC Samples | | | |
| 1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit? | ✓ | | |
| 2. Does the blank result meet the Contract criteria? | ✓ | | |
| 3. Is the blank result < the Contract Detection Limit? | ✓ | | |
| 4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit? | | | ✓ |
| 5. Is the LCS recovery with contract acceptance criteria? | | ✓ | |
| 7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit? | ✓ | | |
| 8. Do the MS/MSD results and yields meet acceptance criteria? | | | ✓ |
| 9. Do the duplicate sample results and yields meet acceptance criteria? | ✓ | | |
| C. Other | | | |
| 1. Are all Nonconformances included and noted? | | | ✓ |
| 2. Are all required forms filled out? | ✓ | | |
| 3. Was the correct methodology used? | ✓ | | |
| 4. Was transcription checked? | | | ✓ |
| 5. Were all calculations checked at a minimum frequency? | | | ✓ |
| 6. Were units checked? | ✓ | | |

Comments on any "No" response: _____

Second Level Review: John Scott Date: 12/12/02

SEVERN**TRENT****SERVICES**

Richland Laboratory
Data Review Check List
METALS

BHI

| Work Order Number(s): FDWJ4 | | | | |
|--|------------|-----------|------------|-------------------------------------|
| Lab Sample Numbers or SDG: W03915 Batch 2330353 | | | | |
| Method/Test/Parameter: Cr+6 in Soil RI0HWC 5005 R6 | | | | |
| Review Item | Yes (✓) | No (✓) | N/A (✓) | 2 nd Level Review (✓) |
| A. Initial Calibration | | | | |
| 1. Performed at required frequency with required number of levels? | ✓ | | | ✓ |
| 2. Correlation coefficient within QC limits? | ✓ | | | ✓ |
| 3. Initial calibration verification (ICV) analyzed immediately after calibration and results within QC limits? | ✓ | | | ✓ |
| 4. Initial calibration blank(ICB) analyzed immediately after ICV and concentrations of all parameters ≤ reporting limit? | ✓ | | | ✓ |
| B. Continuing Calibration | | | | |
| 1. CCV analyzed at required frequency and all parameters within QC limits? | ✓ | | | ✓ |
| 2. CCB analyzed at required frequency and all results ≤ reporting limit? | ✓ | | | ✓ |
| C. Sample Analysis | | | | |
| 1. Were any samples with concentrations above the linear range for any parameter diluted and reanalyzed? | ✓ | | | ✓ |
| 2. Were all sample holding times met? | ✓ | | | ✓ |
| D. QC Samples | | | | |
| 1. All results for the preparation blank below limits? | ✓ | | | ✓ |
| 2. MS or MS/MSD recoveries within QC limits and %RPD (for MSD) acceptable? | ✓ | | | ✓ |
| 3. LCS percent recovery within QC limits and %RPD (for LCSD) acceptable? | ✓ | | | ✓ |
| 4. Analytical spikes within QC limits where applicable? | ✓ | | | ✓ |
| 5. ICP only: One serial dilution performed per SDG? | | | ✓ | ✓ |
| 6. ICP only: CRDL standard (CRI or CRA) analyzed at required frequency? | | | ✓ | ✓ |
| 7. ICP only: Interference check samples (ICSA, ICSAB) and HICAL analyzed at the required frequencies and within QC limits? | | | ✓ | ✓ |

Data Review Checklist
~~RADIO~~CHEMISTRY
Second Level Review

QC Batch Number: 2330353

| Review Item | Yes (✓) | No (✓) | N/A (✓) |
|---|---------|--------|---------|
| A. Sample Analysis | | | |
| 1. Are the sample yields within acceptance criteria? | | | ✓ |
| 2. Is the sample Minimum Detectable Activity < the Contract Detection Limit? | | | ✓ |
| 3. Are the correct isotopes reported? | | | ✓ |
| B. QC Samples | | | |
| 1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit? | | | ✓ |
| 2. Does the blank result meet the Contract criteria? | ✓ | | |
| 3. Is the blank result < the Contract Detection Limit? | ✓ | | |
| 4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit? | | | ✓ |
| 5. Is the LCS recovery with contract acceptance criteria? | ✓ | | |
| 7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit? | | | ✓ |
| 8. Do the MS/MSD results and yields meet acceptance criteria? | ✓ | | |
| 9. Do the duplicate sample results and yields meet acceptance criteria? | ✓ | | |
| C. Other | | | |
| 1. Are all Nonconformances included and noted? | | | ✓ |
| 2. Are all required forms filled out? | ✓ | | |
| 3. Was the correct methodology used? | ✓ | | |
| 4. Was transcription checked? | ✓ | | |
| 5. Were all calculations checked at a minimum frequency? | ✓ | | |
| 6. Were units checked? | ✓ | | |

Comments on any "No" response: _____

Second Level Review: 32 m. bign Date: 12/17/02

CHAIN OF CUSTODY

Q-21058

| | | | | | | | |
|---|------------------------------------|--|----------------------------------|---|--------------------------------------|----------------------------|-------------|
| Bechtel Hanford Inc. | | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | | | B00-030-075 | Page 1 of 1 |
| Collector MT Stankovich | Company Contact Mike Stankovich | Telephone No. 531-7620 | Project Coordinator TRENT, SJ | | Price Code 8L | Data Turnaround 21 Days | |
| Project Designation 100 F Area - Full Protocol | | Sampling Location 116-F-6 Shlw. Zone Verification | | SAF No. B00-030 | Air Quality <input type="checkbox"/> | | |
| Ice Chest No. ERC 97.079 | Field Logbook No. EL-1535-7 | COA K116FG2000 | | Method of Shipment Hand Delivered/Govt Vehicle | | | |
| Shipped To Severn Trent Incorporated, Richland | | Offsite Property No. NA | | Bill of Lading/Air Bill No. NA | | | |

| | | | | | | | | | | | |
|---|---------------------|---------|--------|------|------|--|--|--|--|--|--|
| POSSIBLE SAMPLE HAZARDS/REMARKS Radioactive Tix TO J204m1 Special Handling and/or Storage cool 4°C | Preservation | Cool 4C | None | None | None | | | | | | |
| | Type of Container | aG | P | aG | P | | | | | | |
| | No. of Container(s) | 1 | 1 | 1 | 1 | | | | | | |
| | Volume | 60mL | 1000mL | 60mL | 20mL | | | | | | |

| | | | | | | | | | | | | |
|--------------|----------|-------------|-------------|---------------------|---------------------------------------|---|---------------------------------|--|--|--|--|--|
| SD6 | | Due 12-17 | | Chromium Hex - 7196 | See item (1) in Special Instructions. | Strontium-89,90 - Total Sr, N: [redacted] | Activity Scan ND 10-27-02 | | | | | |
| W03915 | | J2K260144 | | | | | | | | | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | |
| J008H7 EDWJ4 | SOIL | 11-25-02 | 0740 | ✓ | ✓ | ✓ | ✓ | | | | | |

| | | | | | | | | |
|--|----------------------------|--|----------------------------|--|--|--|--|---|
| CHAIN OF POSSESSION | | | | SPECIAL INSTRUCTIONS | | | | Matrix * S=Soil SB=Sediment SO=Solid SF=Sedg W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Time WI=Wipe L=Liquid V=Vegetation X=Other |
| Relinquished By/Removed From [Signature] 11-25-02 | Date/Time 1445 | Received By/Stored In 3B/3728 | Date/Time 11-25-02 1445 | (1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155} | | | | |
| Relinquished By/Removed From 3B 3728 | Date/Time 11-26-02 0800 | Received By/Stored In R. Keller | Date/Time 11-26-02 0800 | Personnel not available to relinquish samples from the 3728 Ref # 3B on 11/26/02 | | | | |
| Relinquished By/Removed From R. Keller | Date/Time 11-26-02 0835 | Received By/Stored In T. Heidelberg | Date/Time 11-26-02 0835 | | | | | |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time | | | | | |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time | | | | | |

| | | | |
|---------------------------------|-----------------|-------------|-----------|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

VMS Gamma Spectroscopy Report generated 16-SEP-2002 14:32:11

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP RCF10490 DET1 750ML9001360_75
 Sample ID : J004M1 Project Number : T16-F-6
 RFC Number : RCF10490 SAF Number : B00-029
 Sample Quantity : 1.17700E+03 GRAMS
 Sample Type : Soil Sample Geometry :
 Sample Date : 12-SEP-2002 08:20:00 Acquisition date : 16-SEP-2002 14:01:51
 Decay time : 4 05:41:51.85 % dead time : 0.0%
 Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:00.76
 Energy cal. time : 14-FEB-2002 16:05:03 Effic. cal. time : 3-APR-2002 13:21:12.
 Detector name : BEGE 3820 Counting geometry: 750 ml >900<1360
 Peak Sensitivity : 3.00000
 Efficiency Type : EMPIRICA Energy tolerance: 2.00000

Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|------------|------------------------|----------------------|-------------------|-----------|---------|
| K-40 | 1.663E+01 | 2.139E+00 | 4.678E-01 | 4.430E-02 | 35.543 |
| CO-60 | 2.126E-01 | 5.157E-02 | 5.732E-02 | 5.234E-03 | 3.709 |
| CS-137 | 1.827E+00 | 2.242E-01 | 7.257E-02 | 7.011E-03 | 25.182 |
| EU-152 | 3.183E+00 | 2.277E-01 | 1.248E-01 | 1.468E-02 | 25.512 |
| EU-154 | 3.103E-01 | 7.589E-02 | 9.056E-02 | 8.926E-03 | 3.426 |
| EU-155 (5) | 4.651E-03 | 7.265E-02 | → 1.233E-01 | 1.353E-02 | 0.038 |
| TL-208 | 1.541E-01 | 8.201E-02 | 6.502E-01 | 6.318E-02 | 0.237 |
| PB-212 | 5.501E-01 | 1.003E-01 | 9.942E-02 | 1.093E-02 | 5.533 |
| PB-214 | 5.815E-01 | 1.151E-01 | 1.200E-01 | 1.185E-02 | 4.845 |
| AC-228 | 4.299E-01 | 3.128E-01 | 0.000E+00 | 0.000E+00 | 0.000 |
| TH-234 (5) | 7.642E-01 | 5.315E-01 | → 9.307E-01 | 3.860E-01 | 0.821 |
| U-235 | 8.327E-02 | 6.568E-02 | 6.393E-02 | 6.239E-03 | 1.303 |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line Activity (pCi/GRAM) | K.L. Ided | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------------------|--------------|-----------|-------------------|-----------|---------|
| BI-212 | 3.943E-01 | | 6.736E-01 | 1.068E+00 | 1.155E-01 | 0.369 |
| BI-214 | 5.423E-01 | + | 1.688E-01 | 2.272E-01 | 2.319E-02 | 2.387 |
| RA-226 | 1.224E+00 | + | 1.176E+00 | 1.313E+00 | 1.179E-01 | 0.932 |
| AM-241 | 5.864E-02 | | 7.127E-02 | 1.239E-01 | 1.439E-02 | 0.473 |

Approved by: *[Signature]*
PSide

Approval Date: 9 / 12 / 02

Sample Check-in List

Date/Time Received: 11-26 0835
 Client: BHI SDG #: W03915 NA [] SAF #: B00-030 NA []
 Work Order Number: J2K260144 Chain of Custody # B00-030-075
 Shipping Container ID: ERC 97-079 Air Bill # na

1. Custody Seals on shipping container intact? NA [] Yes [] No []
2. Custody Seals dated and signed? NA [] Yes [] No []
3. Chain of Custody record present? Yes [] No []
4. Cooler temperature: 2° NA [] 5. Vermiculite/packing materials is NA [] Wet [] Dry []
6. Number of samples in shipping container: 4
7. Sample holding times exceeded? NA [] Yes [] No []
8. Samples have:
 tape hazard labels
 custody seals appropriate samples labels
9. Samples are:
 in good condition leaking
 broken have air bubbles
 (Only for samples requiring head space)
10. Sample pH taken? NA [] pH<2 [] pH>2 []
11. Sample Location, Sample Collector Listed? * Yes [] No []
 *For documentation only. No corrective action needed.
12. Were any anomalies identified in sample receipt? Yes [] No []
13. Description of anomalies (include sample numbers): _____

Sample Custodian: Stidder Date: 11-26-02

| Client Sample ID | Analysis Requested | Condition | Comments/Action |
|------------------|--------------------|-----------|-----------------|
| | | | |
| | | | |

Client Informed on _____ by _____ Person contacted _____

[] No action necessary; process as is.

Project Manager _____ Date _____

11/26/2002 12:27:11 PM

Sample Preparation/Analysis

Balance Id: PB 3001-5

127642, BECHTEL HANFORD, INC.
Bechtel Hanford, Inc.

AX Gamma PrpRC5013/5017
TA Gamma by HPGE
SI CLIENT: HANFORD

PRIORITY

Pipet #: N/A

Report Due: 12/17/2002

W03915

Sep1 DT/Tm Tech:

Batch: 2330350

SOIL

pCi/g

PM, Quote: BG1, 27038

Sep2 DT/Tm Tech:

SEQ Batch, Test: None All Tests: 2330350 AXTA, 2330352 CHTH, 2330353 DWEA, 2330354 88OV.

Prep Tech: KB

| Work Order, Lot, Sample Date/Time | Total Amt/Unit | Initial Air/Quot Amt/Unit | QC Tracer Prep Date | QC Vial 2 Prep Date | Dish Size | Ppt or Geometry | Count Time Min | Detector Id | Count On Off (24hr) Circle | CR Analyst, Init/Date |
|---------------------------------------|----------------|---------------------------|-----------------------|---------------------|-----------|-----------------|----------------|-------------|------------------------------|-----------------------|
| 1 FDWJ4-1-AE J2K260144-1-SAMP | 376.4 | | | | | S200 600 G4 | | | 12/3 0558 | 12/2/2002 KB |
| 11/25/2002 07:40 | | | AmtRec: LP,2X60G,20ML | #Containers: 4 | | | | | Alpha: 1.35E+01 pCi/g | Beta: 2.41E+01 pCi/g |
| 2 FDWJ4-1-AF-X J2K260144-1-DUP | 376.2 | | | | | G6 | | | 12/3 0613 | |
| 11/25/2002 07:40 | | | AmtRec: LP,2X60G,20ML | #Containers: 4 | | | | | Alpha: 1.35E+01 pCi/g | Beta: 2.41E+01 pCi/g |
| 3 FDXD6-1-AA-BX J2K260000-350-MBLK | 348.0 | | | | | G7 | | | 12/3 0600 | |
| 11/25/2002 07:40 | | | AmtRec: | #Containers: 1 | | | | | Alpha: | Beta: |
| 4 FDXD6-1-AC-CM J2K260000-350-MLCS | 200.01 | | | | | G5 | | | 12/3 0600 | |
| 11/25/2002 07:40 | | | AmtRec: | #Containers: 1 | | | | | Alpha: | Beta: |

Comments:

All Clients for Batch:

127642, BECHTEL HANFORD, INC.

Bechtel Hanford, Inc.

BG1, 27038

FDWJ41AE-SAMP Constituent List:

| | | | | | | | | | | | |
|--------|--------------|-------|------|------|------|--------|--------------|-------|------|------|------|
| Co-60 | RDL:5.00E-02 | pCi/g | LCL: | UCL: | RPD: | Cs-137 | RDL:1.00E-01 | pCi/g | LCL: | UCL: | RPD: |
| Eu-152 | RDL:1.00E-01 | pCi/g | LCL: | UCL: | RPD: | Eu-154 | RDL:1.00E-01 | pCi/g | LCL: | UCL: | RPD: |
| Eu-155 | RDL:1.00E-01 | pCi/g | LCL: | UCL: | RPD: | | | | | | |

FDXD61AA-MBLK:

| | | | | | | | | | | | |
|--------|--------------|-------|------|------|------|--------|--------------|-------|------|------|------|
| Co-60 | RDL:5.00E-02 | pCi/g | LCL: | UCL: | RPD: | Cs-137 | RDL:1.00E-01 | pCi/g | LCL: | UCL: | RPD: |
| Eu-152 | RDL:1.00E-01 | pCi/g | LCL: | UCL: | RPD: | Eu-154 | RDL:1.00E-01 | pCi/g | LCL: | UCL: | RPD: |
| Eu-155 | RDL:1.00E-01 | pCi/g | LCL: | UCL: | RPD: | | | | | | |

FDXD61AC-MLCS:

11/26/2002 12:27:12 PM

Sample Preparation/Analysis

Balance Id:

AX Gamma PrpRC5013/5017
TA Gamma by HPGE
SI CLIENT: HANFORD

PRIORITY

Pipet #: _____

Report Due: 12/17/2002

Sep1 DT/Tm Tech:

Batch: 2330350

pCi/g

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech:

| Work Order, Lot, Sample Date/Time | Total Amt/Unit | Initial Aliquot Amt/Unit | QC Tracer Prep Date | QC Vial 2 Prep Date | Dish Size | Ppt or Geometry | Count Time Min | Detector Id | Count On Off (24hr) Circle | CR Analyst, Init/Date | |
|--------------------------------------|-------------------|-----------------------------|------------------------|------------------------|--------------|--------------------|-------------------|----------------|---------------------------------|--------------------------|--------|
| Cs-137 | RDL:0.1 | pCi/g | LCL:70 | UCL:130 | RPD:35 | K-40 | RDL:-- | pCi/g | LCL:70 | UCL:130 | RPD:35 |
| Ra-226 | RDL:0.1 | pCi/g | LCL:70 | UCL:130 | RPD:35 | RA-228 | RDL:0.2 | pCi/g | LCL:70 | UCL:130 | RPD:35 |
| RA-228DA | RDL:0.2 | pCi/g | LCL:70 | UCL:130 | RPD:35 | U-238 | RDL: | pCi/g | LCL:70 | UCL:130 | RPD:35 |

FDWJ41AE-SAMP Calc Info:

Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

FDXD61AA-MBLK:

Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

FDXD61AC-MLCS:

Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

12/4/02 7:41:54 AM

ICOC Fraction Transfer/Status Report

ByDate: 11/4/02, 12/5/02, Batch: '2330350', User: *All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

| Q Batch | Work Ord | CurStatus | Accepting | Comments |
|---------|----------|-----------|--------------------|----------------------|
| 2330350 | | | | |
| AC | CalcC | BELSITOB | 12/2/02 2:48:04 PM | |
| SC | | WagarR | IsBatched | 11/26/02 12:27:07 PM |
| SC | | BELSITOB | Prep1C | 12/2/02 2:48:04 PM |
| SC | | BELSITOB | Prep1C | 12/2/02 2:48:08 PM |
| SC | | DAWKINSO | InCnt1 | 12/2/02 4:30:23 PM |
| SC | | BlackCL | CalcC | 12/3/02 9:50:31 AM |
| AC | | BELSITOB | 12/2/02 2:48:08 PM | |
| AC | | DAWKINSO | 12/2/02 4:30:23 PM | |
| AC | | BlackCL | 12/3/02 9:50:31 AM | |

AC: Accepting Entry; SC: Status Change

STL Richland
Richland Wa.

12/3/02 9:14:57 AM

Sample Preparation/Analysis

Balance Id:1120373922

127642, BECHTEL HANFORD, INC.
Bechtel Hanford, Inc.

CH Sr-Total PrpRC5013, SepRC5006
TH Total Strontium by GPC
SI CLIENT: HANFORD

Pipet #: NA

Report Due: 12/17/2002 **W03915**

PRIORITY

Sep1 DT/Tm Tech: 12/10/02

3:50 PM

Batch: 2330352 SOIL

pCi/g

PM, Quote: BG1, 27038

Sep2 DT/Tm Tech: NA

SEQ Batch, Test: None

Prep Tech: ,WAGNERJ

| Work Order, Lot, Sample Date/Time | Total Amt/Unit | Initial Aliquot Amt/Unit | QC Tracer Prep Date | QC Vial 2 Prep Date | Dish Size | Ppt or Geometry | Count Time Min | Detector Id | Count On Off (24hr) Circle | CR Analyst, Init/Date |
|-------------------------------------|----------------|--------------------------|------------------------------------|---------------------|-----------|-----------------|----------------|-------------|---|-----------------------|
| 1 FDWJ4-1-AC J2K260144-1-SAMP | 6.0g,in | | SRTA8219 10/03/02 09/19/02.r | | | | | | | 12/1/02 |
| 11/25/2002 07:40 | | AmtRec: LP,2X60G,20ML | #Containers: 4 | | | | | | Scr Rst: Alpha: 1.35E+01 pCi/g Beta: 2.41E+01 pCi/g | |
| 2 FDWJ4-1-AG-X J2K260144-1-DUP | 6.0g,in | | SRTA8220 10/03/02 09/19/02.r | | | | | | | 12/1/02 |
| 11/25/2002 07:40 | | AmtRec: LP,2X60G,20ML | #Containers: 4 | | | | | | Scr Rst: Alpha: 1.35E+01 pCi/g Beta: 2.41E+01 pCi/g | |
| 3 FDXEA-1-AA-B J2K260000-352-BLK | 6.0g,in | | SRTA8221 10/03/02 09/19/02.r | | | | | | | 12/1/02 |
| 11/25/2002 07:40 | | AmtRec: | #Containers: 1 | | | | | | Scr Rst: Alpha: Beta: | |
| 4 FDXEA-1-AC-C J2K260000-352-LCS | 6.0g,in | | STSB0648 09/16/02 06/03/02.r | | | | | | | 12/1/02 |
| 11/25/2002 07:40 | | AmtRec: | #Containers: 1 | | | | | | Scr Rst: Alpha: Beta: | |

Comments:

All Clients for Batch:

127642, BECHTEL HANFORD, INC.

Bechtel Hanford, Inc.

, BG1, 27038

FDWJ41AC-SAMP Constituent List:

| | | | | | |
|---------------|-------|-------|--------|---------|--------|
| Sr-90 | RDL:1 | pCi/g | LCL:70 | UCL:130 | RPD:35 |
| FDXEA1AA-BLK: | | | | | |
| Sr-90 | RDL:1 | pCi/g | LCL: | UCL: | RPD: |
| FDXEA1AC-LCS: | | | | | |
| Sr-90 | RDL:1 | pCi/g | LCL:70 | UCL:130 | RPD:35 |

FDWJ41AC-SAMP Calc Info:

STL Richland Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2
Richland Wa. r - Reference date, ec-Enrichment Cell, ct-Cocktalled Added

ICOC Fraction Transfer/Status Report

ByDate: 11/11/02, 12/12/02, Batch: '2330352', User: *All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

| Q Batch | Work Ord | CurStatus | Accepting | Comments |
|----------------|----------|-----------|----------------------|----------------------|
| 2330352 | | | | |
| AC | CalcC | BELSITOB | 11/27/02 3:29:12 PM | |
| SC | | WagarR | IsBatched | 11/26/02 12:27:07 PM |
| SC | | BELSITOB | InPrep | 11/27/02 3:29:12 PM |
| SC | | BELSITOB | InPrep | 11/27/02 3:29:19 PM |
| SC | | BELSITOB | Prep1C | 12/2/02 2:48:17 PM |
| SC | | WAGNERJ | InPrep2 | 12/3/02 8:54:52 AM |
| SC | | WAGNERJ | Prep2C | 12/4/02 8:43:57 AM |
| SC | | FABREM | InSep1 | 12/4/02 3:30:03 PM |
| SC | | FABREM | Sep1C | 12/10/02 7:03:45 PM |
| SC | | DAWKINSO | InCnt1 | 12/10/02 10:41:31 PM |
| SC | | BlackCL | CalcC | 12/11/02 10:38:08 AM |
| AC | | BELSITOB | 11/27/02 3:29:19 PM | |
| AC | | BELSITOB | 12/2/02 2:48:17 PM | |
| AC | | WAGNERJ | 12/3/02 8:54:52 AM | |
| AC | | WAGNERJ | 12/4/02 8:43:57 AM | |
| AC | | FABREM | 12/4/02 3:30:03 PM | |
| AC | | FABREM | 12/10/02 7:03:45 PM | |
| AC | | DAWKINSO | 12/10/02 10:41:31 PM | |
| AC | | BlackCL | 12/11/02 10:38:08 | |

AC: Accepting Entry; SC: Status Change

11/26/2002 12:27:12 PM

Sample Preparation/Analysis

Balance Id: _____

127642, BECHTEL HANFORD, INC.
Bechtel Hanford, Inc.

DW Alkaline Digestion by method 3060A
EA Chromium, Hexavalent (7196A)
SI CLIENT: HANFORD

PRIORITY

Pipet #: _____

Report Due: 12/17/2002 *WOODRIS*

Sep1 DT/Tm Tech: _____

Batch: 2330353 SOIL mg/kg

PM, Quote: BG1, 27038

Sep2 DT/Tm Tech: _____

SEQ Batch, Test: None

Prep Tech: _____

| Work Order, Lot, Sample Date/Time | Total Amt/Unit | Initial Aliquot Amt/Unit | QC Tracer Prep Date | QC Vial 2 Prep Date | Dish Size | Ppt or Geometry | Count Time Min | Detector Id | Count On Off (24hr) Circle | CR Analyst, Init/Date |
|--------------------------------------|-------------------|-----------------------------|------------------------|------------------------|--------------|--------------------|-------------------|----------------|---------------------------------|--------------------------|
|--------------------------------------|-------------------|-----------------------------|------------------------|------------------------|--------------|--------------------|-------------------|----------------|---------------------------------|--------------------------|

1 FDWJ4-1-AA
J2K260144-1-SAMP

11/25/2002 07:40 AmtRec: LP,2X60G,20ML #Containers: 4 Scr Rst: Alpha: 1.35E+01 pCi/g Beta: 2.41E+01 pCi/g

2 FDWJ4-1-AH-S
J2K260144-1-MS

11/25/2002 07:40 AmtRec: LP,2X60G,20ML #Containers: 4 Scr Rst: Alpha: 1.35E+01 pCi/g Beta: 2.41E+01 pCi/g

3 FDWJ4-1-AJ-X
J2K260144-1-DUP

11/25/2002 07:40 AmtRec: LP,2X60G,20ML #Containers: 4 Scr Rst: Alpha: 1.35E+01 pCi/g Beta: 2.41E+01 pCi/g

4 FDWJ4-1-AK-S
J2K260144-1-MS

11/25/2002 07:40 AmtRec: LP,2X60G,20ML #Containers: 4 Scr Rst: Alpha: 1.35E+01 pCi/g Beta: 2.41E+01 pCi/g

5 FDXED-1-AA-B
J2K260000-353-BLK

11/25/2002 07:40 AmtRec: #Containers: 1 Scr Rst: Alpha: Beta:

6 FDXED-1-AC-C
J2K260000-353-LCS

11/25/2002 07:40 AmtRec: #Containers: 1 Scr Rst: Alpha: Beta:

