# FINAL REPORT FOR ANALYSIS OF THE 100 K EAST BASIN BOREHOLE WASTE SITE; C8797, INTERVALS 1, 5, 8, 11, 18, and 19

## Sample Group No. ATL-20150964 Rev. 0

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**Date Published**
October 2, 2015

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# 222-S LABORATORY

# FINAL REPORT FOR ANALYSIS OF THE 100 K EAST BASIN BOREHOLE WASTE SITE; C8797, INTERVALS 1, 5, 8, 11, 18, and 19

## 1.0 INTRODUCTION

This final report presents the analytical results for six solid samples taken between July 23, 2015 and August 17, 2015 from the 100 K East Basin Characterization Borehole C8797. The samples were analyzed in accordance with F15-027, *Sampling Authorization Form, 100-KE Characterization Boreholes – Soil* (SAF); ATL-MP-1011, *ATL Quality Assurance Project Plan for 222-S Laboratory* (QAPP); SGW-54226, *Sampling Instruction for Supplementary Characterization of UPR-100-K-1 and 116-KE-3 Waste Sites (SGW)*; SW-846, *Test Methods for Evaluating Solid Waste:* Physical/Chemical Methods; and the additional guidance given by the customer point of contact.

Because the 222-S Laboratory facility was designed to analyze hazardous and complex tank waste samples, most SW-846 test methods performed at the 222-S Laboratory contain deviations that are listed in an appendix in the analytical procedures. All other known deviations or variances from SW-846 are documented in this narrative. The following attachments are included in this report.

| | |
|---|---|
| Attachment 1 | Data Summary Report |
| Attachment 2 | Analysis Date and Holding Time Report |
| Attachment 3 | Correspondence |
| Attachment 4 | Receipt Paperwork |
| Attachment 5 | Photograph |

## 2.0 SAMPLE RECEIPT

Six samples were received at the 222-S Laboratory on August 27, 2015. The samples were received in good condition, with adequate paperwork.

## 3.0 ANALYTICAL RESULTS SUMMARY

The Data Summary Report (Attachment 1) presents the final analytical results for the requested analytes listed in the SAF and SGW.

The “Det Limit” column in Attachment 1 contains the method detection limit for inorganic analytes or minimum detectable activity for radionuclides.

In Attachment 1, the column labeled “A#” indicates the aliquot class or the method used for sample preparation before analysis. The aliquot classes are defined as follows:

- "A" indicates samples were prepared by SW-846 3050B acid digest.
- "E" indicates samples were prepared by a strong nitric acid digest.
- "WR" indicates samples were prepared by a water digest.

The "Qual Flags" column in Attachment 1 contains data qualifier flags from FEAD CP-15383, *Common Requirements of the Format for Electronic Analytical Data*, which are defined as follows:

- "U" for all results is used to indicate that the reported result was less than the calculated detection limit.
- "B" for inorganic analytes indicates a result above the method detection limit and below the quantitation level.
- "B" for isotopic analytes indicates a normalized blank result greater than 20% of the sample result.
- "C" for inorganic results indicates a normalized blank result greater than 20% of the sample result.

Manual calculations using rounded results from the Data Summary Report (Attachment 1) or result calculation forms may differ slightly from the actual results derived from the raw data.

## 3.1 INORGANIC ANALYSES

### 3.1.1 Percent Water-Thermogravimetric Analysis

The percent weight loss was measured using TGA. The % weight loss is reported as % water in Attachment 1 with the assumption that all weight loss below 250 °C was due to water loss. There were no notable issues, and all quality control (QC) requirements in the SGW and the QAPP were met.

The analysis was perform in lieu of ASTM D2216 due to exposure concerns. (See Attachment 3)

### 3.1.2 Inductively Coupled Plasma/Atomic Emission Spectroscopy

The ICP/AES analysis was performed on an acid-digested aliquot of the solid sample. The analysis met the holding time requirement. This analysis was performed, with the client's permission, in lieu of SW-846 7196 for hexavalent chromium, which was requested in the SGW. (Attachment 3 and SAF)

Chromium was detected in the preparation blank at a concentration level below the estimated quantitation limit and less than 20% of all but one sample result. This result has been flagged with "C". Since both the sample and blank result were below the quantitation limit, the usability of the data was not affected.

All other QC requirements listed in the SGW and the QAPP were met.

### 3.1.3 Inductively Coupled Plasma/Mass Spectroscopy

The ICP/MS analysis was performed on acid-digested aliquots of the solid sample. Uranium isotopes $^{233}U$, $^{234}U$, $^{235}U$, and $^{238}U$ were analyzed using this method.

Due to the large dilution needed to obtain an acceptable recovery for the internal standard, the reporting limits requested in the SGW for $^{233}U$ and $^{234}U$ were not meet. The results for the other isotopes were above the quantitation limit and therefore meet this requirement. All other QC requirements listed in the SGW and the QAPP were met.

For actinide analysis, direct is the most accurate type of calibration; however, standard material is not commercially available for all isotopes of interest. Concentrations of those isotopes without available standards are estimated based on the instrument's response to another isotope of the same element, which is known as "isotopic substitution" and is an indirect method of calibration. Direct calibration standards were used for $^{235}U$ and $^{238}U$. Isotopic substitution calibrations were performed for $^{233}U$ and $^{234}U$ as listed in the table below.

**Table 1. Inductively Coupled Plasma/Mass Spectroscopy Standards and Spikes**

| Standard Type | Isotopes |
|---|---|
| Direct calibration standards | $^{235}U$, $^{238}U$ |
| Matrix spike, laboratory control standard, and calibration verification standards | $^{235}U$, $^{238}U$ |
| Isotope substitution | $^{233}U$ ($^{238}U$), $^{234}U$ ($^{235}U$) |

## 3.2 RADIOCHEMISTRY ANALYSES

### 3.2.1 Gamma Energy Analysis

With the exception of the four $^{137}Cs$, results above the quantitation limit, the reporting limits requested in the SGW could not be obtained. This was due the radiological activity of the sample, which restricted the aliquot size. There were no other notable issues, and all other QC requirements in the SGW and the QAPP were met.

The laboratory also performed a GEA screen. These results were reported separately.

### 3.2.2 Strontium-89/90

The $^{89/90}Sr$ analysis was performed on a strong acid-digested of the sample. The requested reporting limit for $^{89/90}Sr$ listed in the SGW was not met for two samples. The results for the other samples were above the quantitation limit and therefore meet this requirement. All other QC requirements listed in the SGW and the QAPP were met.

### 3.2.3 Americium-241

The $^{241}Am$ analysis was performed on a strong acid digest aliquots of the samples. All QC requirements listed in the SGW and the QAPP were met.

### 3.2.4 Plutonium-238 and Plutonium-239/240

The $^{238}$Pu and $^{239/240}$Pu analysis was performed on a strong acid digest of the samples. The required reporting limit for $^{238}$Pu was not met for four of the samples. The MDAs of these four samples ranged from 1.3 pCi/g to 1.5 pCi/g. All but one of the $^{239/240}$Pu results meet the reporting limit requirement. The preparation blank result for $^{239/240}$Pu of 6.32E-07was more than 20% of four sample results which have been flagged with a "B". Since the blank result was below the required reporting limit analysis was not performed.

### 3.2.5 Technicium-99

The $^{99}$Tc analysis by liquid scintillation counting (LSC) was performed on a strong acid-digested aliquot. All QC requirements in the SGW and the QAPP were met.

### 3.2.6 Carbon-14

The analysis of $^{14}$C by LSC was performed on a direct subsample. There were no notable issues, and all QC requirements in the SGW and the QAPP were met.

### 3.2.7 Tritium

The analysis of $^{3}$H by LSC was performed on a water-digested aliquot. There were no notable issues, and all QC requirements in the SGW and the QAPP were met.

### 3.2.8 Iodine-129

Analysis for $^{129}$I by low energy gamma spectroscopy was performed on a fusion digest and chemical separation of the sample. The reporting limit listed in the SGW was met. There were no other notable issues, and all other QC requirements in the SGW and the QAPP were met.

## 4.0 PROCEDURES

Table 2 lists the procedures used in preparation and analysis of the samples contained in this report.

**Table 2. Analytical Procedures**

| Analysis | Preparation Method | Analysis Procedure |
|---|---|---|
| **Inorganic Analyses** | | |
| Appearance | Direct | LA-519-151, Rev. L-2 |
| TGA – Gravimetric/DSC | Direct | LA-514-115, Rev. H-1 |
| ICP/AES – Metals | Acid digest – LA-505-163, Rev. I-2; SW-846 3050B | LA-505-174, Rev. B-4 |
| ICP/MS – Actinides | Acid digest – LA-505-163, Rev. I-2; SW-846 3050B | LA-506-103, Rev. D-0 |
| **Radiochemical Analyses** | | |
| GEA | Separation – LA-548-121, Rev. K-1 | LA-508-167, Rev. B-2 |

| Analysis | Preparation Method | Analysis Procedure |
|---|---|---|
| $^{89/90}$Sr – GPC | Separation – LA-220-103, Rev. L-1<br>Acid digest – LA-544-101, Rev. I-2 | LA-508-124, Rev. 3-0 |
| $^{241}$Am – AEA | Separation – LA-543-102, Rev. A-1<br>Acid digest – LA-544-101, Rev. I-2 | LA-508-168, Rev. B-1 |
| $^{238, 239/240}$Pu – AEA | Separation – LA-543-102, Rev. A-1<br>Acid digest – LA-544-101, Rev. I-2 | LA-508-168, Rev. B-1 |
| $^{99}$Tc – LCS | Separation – LA-438-101, Rev. M-1<br>Acid digest – LA-544-101, Rev. I-2 | LA-508-122, Rev. A-1 |
| $^{14}$C – LCS | Separation – LA-348-104, Rev. K-3 | LA-508-122, Rev. A-1 |
| $^{3}$H – LCS | Separation – LA-218-116, Rev. B-2<br>Water digest – LA-544-113, Rev. A-1 | LA-508-122, Rev. A-1 |
| $^{129}$I – LEPD | Separation- LA-378-104, Rev. G-0 | LA-508-167, Rev. B-2 |

## 5.0 REFERENCES

ATL-MP-1011, 2014, *ATL Quality Assurance Project Plan for 222-S Laboratory*, Rev. 12-4, Advanced Technologies and Laboratories International, Inc., Richland, Washington.

F15-027, *Sampling Authorization Form*, 100-KE Characterization Boreholes - Soil, Rev. 1, CH2M Hill Plateau Remediation Company, Richland, Washington.

FEAD CP-15383, *Common Requirements of the Format for Electronic Analytical Data*, Rev. 8, Fluor Hanford Inc., Richland, Washington.

SGW-54226, 2013, *Sampling Instruction for Supplementary Characterization of UPR-100-K-1 and 116-KE-3 Waste Sites*, Rev. 0, U.S. Department of Energy, Richland Operation Office, Richland, Washington.

SW-846, 1986, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, Third Edition, as amended, U.S. Environmental Protection Agency, Washington, D.C.

Attachment 1

# DATA SUMMARY REPORT

# Data Summary Report

**Sample Group: 20150964**

**SDG Number: 222S20150964**

**Customer Sample ID: B31VF5**

**Sample Portion: Acid Digest**

| Sample# | R | A# | CAS # | Analyte | Unit | STD % | Blank | Result | Duplicate | Average | RPD % | Spk Rec % | Det Limit | Cnt Err % | Qual Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Am241,Cm243 by TRU-Spec Resin | | | | | | | | | | | | | | | |
| S15M000246 | | E | 14596-10-2 | Americium-241 | uCi/g | 111 | <2.44E-07 | <2.08E-07 | <2.31E-07 | n/a | | n/a | 2.08E-07 | | U |
| Env Sr-89/90 for Solids | | | | | | | | | | | | | | | |
| S15M000246 | | E | SR-89/90 | Strontium-89/90 | uCi/g | 104 | <1.10E-05 | <2.70E-06 | <2.65E-06 | n/a | | n/a | 2.70E-06 | | U |
| ICP-AES | | | | | | | | | | | | | | | |
| S15M000245 | | A | 7440-47-3 | Chromium | ug/g | 101 | 4.28E-03 | 8.10 | 9.37 | 8.73 | 14.6 | 95.9 | 0.407 | | |
| ICP/MS | | | | | | | | | | | | | | | |
| S15M000245 | | A | 13968-55-3 | Uranium-233 | ug/g | n/a | <5.00E-05 | <0.0102 | <0.0103 | n/a | | n/a | 0.0102 | | U |
| S15M000245 | | A | 13966-29-5 | Uranium-234 | ug/g | n/a | <5.40E-06 | <1.10E-03 | <1.12E-03 | n/a | | n/a | 1.10E-03 | | U |
| S15M000245 | | A | 15117-96-1 | Uranium-235 | ug/g | 95.1 | <5.40E-06 | <1.10E-03 | <1.12E-03 | n/a | | 96.5 | 1.10E-03 | | U |
| S15M000245 | | A | U-238 | Uranium-238 | ug/g | 95.7 | <4.18E-05 | 0.479 | 0.481 | 0.480 | 0.408 | 96.8 | 8.50E-03 | | |
| Pu238,239 by TRU-SPEC Resin | | | | | | | | | | | | | | | |
| S15M000246 | | E | PU-239/240 | Plutonium-239/240 | uCi/g | 102 | 5.19E-07 | 6.32E-07 | 5.12E-07 | 5.72E-07 | 21.1 | n/a | 2.36E-07 | 20.35 | B |
| S15M000246 | | E | 13981-16-3 | Plutonium-238 | uCi/g | n/a | <4.00E-07 | <3.52E-07 | <3.75E-07 | n/a | | n/a | 3.52E-07 | | U |
| TRITIUM by COLUMN | | | | | | | | | | | | | | | |
| S15M000247 | | W | 10028-17-8 | Tritium | uCi/g | 89.9 | <2.07E-05 | <2.07E-04 | <1.88E-05 | n/a | | 90.0 | 2.07E-04 | | U |
| Technetium - Liq. Scint. | | | | | | | | | | | | | | | |
| S15M000246 | | E | 14133-76-7 | Technetium-99 | uCi/g | 98.8 | <5.45E-06 | <4.70E-06 | n/a | n/a | n/a | n/a | 4.70E-06 | | U |

**Sample Portion: Parent**

| Sample# | R | A# | CAS # | Analyte | Unit | STD % | Blank | Result | Duplicate | Average | RPD % | Spk Rec % | Det Limit | Cnt Err % | Qual Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % Water by TGA | | | | | | | | | | | | | | | |
| S15M000076 | | | %WATER | Percent water | % | 96.6 | n/a | 2.46 | 2.20 | 2.33 | 11.4 | n/a | 0.0100 | | |
| Carbon 14 by LSC | | | | | | | | | | | | | | | |
| S15M000076 | | | 14762-75-5 | Carbon-14 | uCi/g | 95.2 | <7.96E-07 | <7.96E-07 | <8.05E-07 | n/a | | 101 | 7.96E-07 | | U |
| GEA | | | | | | | | | | | | | | | |
| S15M000076 | | | 10198-40-0 | Cobalt-60 | uCi/g | 97.2 | <1.08E-07 | <8.41E-08 | n/a | n/a | n/a | n/a | 8.41E-08 | | U |
| S15M000076 | | | 10045-97-3 | Cesium-137 | uCi/g | 98.6 | <1.42E-07 | <8.50E-08 | n/a | n/a | n/a | n/a | 8.50E-08 | | U |
| S15M000076 | | | 14683-23-9 | Europium-152 | uCi/g | n/a | <2.65E-07 | <2.31E-07 | n/a | n/a | n/a | n/a | 2.31E-07 | | U |
| S15M000076 | | | 15585-10-1 | Europium-154 | uCi/g | n/a | <3.04E-07 | <2.21E-07 | n/a | n/a | n/a | n/a | 2.21E-07 | | U |

NA = Not Analyzed, ND = Not Detected

C - Inorganic Blank Contamination

U - < Det Limit

B - Rad Chem Blank Contamination

B - Inorganic Estimated

## Data Summary Report

**Sample Group: 20150964**

**SDG Number: 222S20150964**

**Customer Sample ID: B31VF5**

**Sample Portion: Parent**

| Sample# R | A# | CAS # | Analyte | Unit | STD % | Blank | Result | Duplicate | Average | RPD % | Spk Rec % | Det Limit | Cnt Err % | Qual Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GEA | | | | | | | | | | | | | | |
| S15M000076 | | 14391-16-3 | Europium-155 | uCi/g | n/a | <1.91E-07 | <2.16E-07 | n/a | n/a | n/a | n/a | 2.16E-07 | | U |

NA = Not Analyzed, ND = Not Detected

C - Inorganic Blank Contamination

U - < Det Limit

B - Rad Chem Blank Contamination

B - Inorganic Estimated

## Data Summary Report

**Sample Group: 20150964**

**SDG Number: 222S20150964**

**Customer Sample ID: B31VH7**

**Sample Portion: Acid Digest**

| Sample# | R | A# | CAS # | Analyte | Unit | STD % | Blank | Result | Duplicate | Average | RPD % | Spk Rec % | Det Limit | Cnt Err % | Qual Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Am241,Cm243 by TRU-Spec Resin | | | | | | | | | | | | | | | |
| S15M000249 | | E | 14596-10-2 | Americium-241 | uCi/g | 111 | <2.44E-07 | 5.50E-04 | n/a | n/a | n/a | n/a | 1.06E-06 | 1.24 | |
| Env Sr-89/90 for Solids | | | | | | | | | | | | | | | |
| S15M000249 | | E | SR-89/90 | Strontium-89/90 | uCi/g | 104 | <1.10E-05 | 7.14E-03 | n/a | n/a | n/a | n/a | 2.63E-06 | 1.019 | |
| ICP-AES | | | | | | | | | | | | | | | |
| S15M000248 | | A | 7440-47-3 | Chromium | ug/g | 101 | 4.28E-03 | 5.04 | n/a | n/a | n/a | n/a | 0.394 | | |
| ICP/MS | | | | | | | | | | | | | | | |
| S15M000248 | | A | 13968-55-3 | Uranium-233 | ug/g | n/a | <5.00E-05 | <9.84E-03 | n/a | n/a | n/a | n/a | 9.84E-03 | | U |
| S15M000248 | | A | 13966-29-5 | Uranium-234 | ug/g | n/a | <5.40E-06 | <1.06E-03 | n/a | n/a | n/a | n/a | 1.06E-03 | | U |
| S15M000248 | | A | 15117-96-1 | Uranium-235 | ug/g | 95.1 | <5.40E-06 | 0.0249 | n/a | n/a | n/a | n/a | 1.06E-03 | | |
| S15M000248 | | A | U-238 | Uranium-238 | ug/g | 95.7 | <4.18E-05 | 3.48 | n/a | n/a | n/a | n/a | 8.23E-03 | | |
| Pu238,239 by TRU-SPEC Resin | | | | | | | | | | | | | | | |
| S15M000249 | | E | PU-239/240 | Plutonium-239/240 | uCi/g | 102 | 5.19E-07 | 5.54E-04 | n/a | n/a | n/a | n/a | 7.98E-07 | 1.18 | |
| S15M000249 | | E | 13981-16-3 | Plutonium-238 | uCi/g | n/a | <4.00E-07 | 6.65E-05 | n/a | n/a | n/a | n/a | 1.36E-06 | 3.50 | |
| TRITIUM by COLUMN | | | | | | | | | | | | | | | |
| S15M000250 | | W | 10028-17-8 | Tritium | uCi/g | 89.9 | <2.07E-05 | <2.02E-05 | n/a | n/a | n/a | n/a | 2.02E-05 | | U |
| Technetium - Liq. Scint. | | | | | | | | | | | | | | | |
| S15M000249 | | E | 14133-76-7 | Technetium-99 | uCi/g | 98.8 | <5.45E-06 | <7.16E-06 | <8.88E-06 | n/a | | n/a | 7.16E-06 | | U |

**Sample Portion: Parent**

| Sample# | R | A# | CAS # | Analyte | Unit | STD % | Blank | Result | Duplicate | Average | RPD % | Spk Rec % | Det Limit | Cnt Err % | Qual Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % Water by TGA | | | | | | | | | | | | | | | |
| S15M000077 | | | %WATER | Percent water | % | 103 | n/a | 6.95 | 6.84 | 6.90 | 1.64 | n/a | 0.0100 | | |
| Carbon 14 by LSC | | | | | | | | | | | | | | | |
| S15M000077 | | | 14762-75-5 | Carbon-14 | uCi/g | 95.2 | <7.96E-07 | <7.83E-07 | n/a | n/a | n/a | n/a | 7.83E-07 | | U |
| GEA | | | | | | | | | | | | | | | |
| S15M000077 | | | 10198-40-0 | Cobalt-60 | uCi/g | 97.2 | <1.08E-07 | <1.23E-06 | 8.20E-07 | n/a | | n/a | 1.23E-06 | | U |
| S15M000077 | | | 10045-97-3 | Cesium-137 | uCi/g | 98.6 | <1.42E-07 | 4.14E-03 | 4.06E-03 | 4.10E-03 | 1.89 | n/a | 3.02E-06 | 0.13 | |
| S15M000077 | | | 14683-23-9 | Europium-152 | uCi/g | n/a | <2.65E-07 | <8.69E-06 | <1.15E-05 | n/a | | n/a | 8.69E-06 | | U |
| S15M000077 | | | 15585-10-1 | Europium-154 | uCi/g | n/a | <3.04E-07 | 1.04E-05 | 9.97E-06 | 1.02E-05 | 4.00 | n/a | 2.86E-06 | 9.57 | |

NA = Not Analyzed, ND = Not Detected

C - Inorganic Blank Contamination  U - < Det Limit  B - Rad Chem Blank Contamination  B - Inorganic Estimated

## Data Summary Report

**Sample Group: 20150964**

**SDG Number: 222S20150964**

**Customer Sample ID: B31VH7**

**Sample Portion: Parent**

| Sample# R | A# | CAS # | Analyte | Unit | STD % | Blank | Result | Duplicate | Average | RPD % | Spk Rec % | Det Limit | Cnt Err % | Qual Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GEA | | | | | | | | | | | | | | |
| S15M000077 | | 14391-16-3 | Europium-155 | uCi/g | n/a | <1.91E-07 | <8.90E-06 | <1.22E-05 | n/a | | n/a | 8.90E-06 | | U |

NA = Not Analyzed, ND = Not Detected

C - Inorganic Blank Contamination

U - < Det Limit

B - Rad Chem Blank Contamination

B - Inorganic Estimated

## Data Summary Report

**Sample Group: 20150964**

**SDG Number: 222S20150964**

**Customer Sample ID: B31VJ6**

**Sample Portion: Acid Digest**

| Sample# | R | A# | CAS # | Analyte | Unit | STD % | Blank | Result | Duplicate | Average | RPD % | Spk Rec % | Det Limit | Cnt Err % | Qual Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Am241,Cm243 by TRU-Spec Resin | | | | | | | | | | | | | | | |
| S15M000255 | | E | 14596-10-2 | Americium-241 | uCi/g | 111 | <2.44E-07 | 1.67E-05 | n/a | n/a | n/a | n/a | 9.46E-07 | 7.00 | |
| Env Sr-89/90 for Solids | | | | | | | | | | | | | | | |
| S15M000255 | | E | SR-89/90 | Strontium-89/90 | uCi/g | 104 | <1.10E-05 | 4.03E-05 | n/a | n/a | n/a | n/a | 2.64E-06 | 16.581 | |
| ICP-AES | | | | | | | | | | | | | | | |
| S15M000254 | | A | 7440-47-3 | Chromium | ug/g | 101 | 4.28E-03 | 3.25 | n/a | n/a | n/a | n/a | 0.396 | | CB |
| ICP/MS | | | | | | | | | | | | | | | |
| S15M000254 | | A | 13968-55-3 | Uranium-233 | ug/g | n/a | <5.00E-05 | <9.90E-03 | n/a | n/a | n/a | n/a | 9.90E-03 | | U |
| S15M000254 | | A | 13966-29-5 | Uranium-234 | ug/g | n/a | <5.40E-06 | <1.07E-03 | n/a | n/a | n/a | n/a | 1.07E-03 | | U |
| S15M000254 | | A | 15117-96-1 | Uranium-235 | ug/g | 95.1 | <5.40E-06 | <1.07E-03 | n/a | n/a | n/a | n/a | 1.07E-03 | | U |
| S15M000254 | | A | U-238 | Uranium-238 | ug/g | 95.7 | <4.18E-05 | 0.532 | n/a | n/a | n/a | n/a | 8.27E-03 | | |
| Pu238,239 by TRU-SPEC Resin | | | | | | | | | | | | | | | |
| S15M000255 | | E | PU-239/240 | Plutonium-239/240 | uCi/g | 102 | 5.19E-07 | 1.82E-05 | n/a | n/a | n/a | n/a | 1.17E-06 | 6.73 | |
| S15M000255 | | E | 13981-16-3 | Plutonium-238 | uCi/g | n/a | <4.00E-07 | <1.49E-06 | n/a | n/a | n/a | n/a | 1.49E-06 | | U |
| TRITIUM by COLUMN | | | | | | | | | | | | | | | |
| S15M000256 | | W | 10028-17-8 | Tritium | uCi/g | 89.9 | <2.07E-05 | <1.92E-05 | n/a | n/a | n/a | n/a | 1.92E-05 | | U |
| Technetium - Liq. Scint. | | | | | | | | | | | | | | | |
| S15M000255 | | E | 14133-76-7 | Technetium-99 | uCi/g | 98.8 | <5.45E-06 | <5.44E-06 | n/a | n/a | n/a | n/a | 5.44E-06 | | U |

**Sample Portion: Parent**

| Sample# | R | A# | CAS # | Analyte | Unit | STD % | Blank | Result | Duplicate | Average | RPD % | Spk Rec % | Det Limit | Cnt Err % | Qual Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % Water by TGA | | | | | | | | | | | | | | | |
| S15M000079 | | | %WATER | Percent water | % | 96.6 | n/a | 2.43 | n/a | n/a | n/a | n/a | 0.0100 | | |
| Carbon 14 by LSC | | | | | | | | | | | | | | | |
| S15M000079 | | | 14762-75-5 | Carbon-14 | uCi/g | 95.2 | <7.96E-07 | <1.22E-06 | n/a | n/a | n/a | n/a | 1.22E-06 | | U |
| GEA | | | | | | | | | | | | | | | |
| S15M000079 | | | 10198-40-0 | Cobalt-60 | uCi/g | 97.2 | <1.08E-07 | 6.42E-07 | n/a | n/a | n/a | n/a | 7.83E-08 | 6.03 | |
| S15M000079 | | | 10045-97-3 | Cesium-137 | uCi/g | 98.6 | <1.42E-07 | 5.28E-05 | n/a | n/a | n/a | n/a | 1.28E-07 | 0.32 | |
| S15M000079 | | | 14683-23-9 | Europium-152 | uCi/g | n/a | <2.65E-07 | <3.49E-07 | n/a | n/a | n/a | n/a | 3.49E-07 | | U |
| S15M000079 | | | 15585-10-1 | Europium-154 | uCi/g | n/a | <3.04E-07 | 3.78E-07 | n/a | n/a | n/a | n/a | 1.95E-07 | 21.37 | |

NA = Not Analyzed, ND = Not Detected

C - Inorganic Blank Contamination

U - < Det Limit

B - Rad Chem Blank Contamination

B - Inorganic Estimated

## Data Summary Report

**Sample Group: 20150964**

**SDG Number: 222S20150964**

**Customer Sample ID: B31VJ6**

**Sample Portion: Parent**

| Sample# R | A# | CAS # | Analyte | Unit | STD % | Blank | Result | Duplicate | Average | RPD % | Spk Rec % | Det Limit | Cnt Err % | Qual Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GEA | | | | | | | | | | | | | | |
| S15M000079 | | 14391-16-3 | Europium-155 | uCi/g | n/a | <1.91E-07 | <3.32E-07 | n/a | n/a | n/a | n/a | 3.32E-07 | | U |

NA = Not Analyzed, ND = Not Detected

C - Inorganic Blank Contamination

U - < Det Limit

B - Rad Chem Blank Contamination

B - Inorganic Estimated

## Data Summary Report

**Sample Group: 20150964**

**SDG Number: 222S20150964**

**Customer Sample ID: B31VK5**

**Sample Portion: Acid Digest**

| Sample# | R | A# | CAS # | Analyte | Unit | STD % | Blank | Result | Duplicate | Average | RPD % | Spk Rec % | Det Limit | Cnt Err % | Qual Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Am241,Cm243 by TRU-Spec Resin | | | | | | | | | | | | | | | |
| S15M000258 | | E | 14596-10-2 | Americium-241 | uCi/g | 111 | <2.44E-07 | <9.55E-07 | n/a | n/a | n/a | n/a | 9.55E-07 | | U |
| Env Sr-89/90 for Solids | | | | | | | | | | | | | | | |
| S15M000258 | | E | SR-89/90 | Strontium-89/90 | uCi/g | 104 | <1.10E-05 | <9.25E-06 | n/a | n/a | n/a | n/a | 9.25E-06 | | U |
| ICP-AES | | | | | | | | | | | | | | | |
| S15M000257 | | A | 7440-47-3 | Chromium | ug/g | 101 | 4.28E-03 | 11.5 | n/a | n/a | n/a | n/a | 0.395 | | |
| ICP/MS | | | | | | | | | | | | | | | |
| S15M000257 | | A | 13968-55-3 | Uranium-233 | ug/g | n/a | <5.00E-05 | <9.88E-03 | n/a | n/a | n/a | n/a | 9.88E-03 | | U |
| S15M000257 | | A | 13966-29-5 | Uranium-234 | ug/g | n/a | <5.40E-06 | <1.07E-03 | n/a | n/a | n/a | n/a | 1.07E-03 | | U |
| S15M000257 | | A | 15117-96-1 | Uranium-235 | ug/g | 95.1 | <5.40E-06 | <1.07E-03 | n/a | n/a | n/a | n/a | 1.07E-03 | | U |
| S15M000257 | | A | U-238 | Uranium-238 | ug/g | 95.7 | <4.18E-05 | 0.572 | n/a | n/a | n/a | n/a | 8.26E-03 | | |
| Pu238,239 by TRU-SPEC Resin | | | | | | | | | | | | | | | |
| S15M000258 | | E | PU-239/240 | Plutonium-239/240 | uCi/g | 102 | 5.19E-07 | 1.76E-06 | n/a | n/a | n/a | n/a | 6.45E-07 | 21.70 | B |
| S15M000258 | | E | 13981-16-3 | Plutonium-238 | uCi/g | n/a | <4.00E-07 | <1.32E-06 | n/a | n/a | n/a | n/a | 1.32E-06 | | U |
| TRITIUM by COLUMN | | | | | | | | | | | | | | | |
| S15M000259 | | W | 10028-17-8 | Tritium | uCi/g | 89.9 | <2.07E-05 | <2.03E-05 | n/a | n/a | n/a | n/a | 2.03E-05 | | U |
| Technetium - Liq. Scint. | | | | | | | | | | | | | | | |
| S15M000258 | | E | 14133-76-7 | Technetium-99 | uCi/g | 98.8 | <5.45E-06 | <4.90E-06 | n/a | n/a | n/a | n/a | 4.90E-06 | | U |

**Sample Portion: Parent**

| Sample# | R | A# | CAS # | Analyte | Unit | STD % | Blank | Result | Duplicate | Average | RPD % | Spk Rec % | Det Limit | Cnt Err % | Qual Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % Water by TGA | | | | | | | | | | | | | | | |
| S15M000080 | | | %WATER | Percent water | % | 96.2 | n/a | 3.59 | 3.84 | 3.72 | 6.75 | n/a | 0.0100 | | |
| Carbon 14 by LSC | | | | | | | | | | | | | | | |
| S15M000080 | | | 14762-75-5 | Carbon-14 | uCi/g | 95.2 | <7.96E-07 | <7.52E-07 | n/a | n/a | n/a | n/a | 7.52E-07 | | U |
| GEA | | | | | | | | | | | | | | | |
| S15M000080 | | | 10198-40-0 | Cobalt-60 | uCi/g | 97.2 | <1.08E-07 | <2.09E-07 | n/a | n/a | n/a | n/a | 2.09E-07 | | U |
| S15M000080 | | | 10045-97-3 | Cesium-137 | uCi/g | 98.6 | <1.42E-07 | 2.79E-07 | n/a | n/a | n/a | n/a | 1.77E-07 | 22.19 | |
| S15M000080 | | | 14683-23-9 | Europium-152 | uCi/g | n/a | <2.65E-07 | <4.21E-07 | n/a | n/a | n/a | n/a | 4.21E-07 | | U |
| S15M000080 | | | 15585-10-1 | Europium-154 | uCi/g | n/a | <3.04E-07 | <5.14E-07 | n/a | n/a | n/a | n/a | 5.14E-07 | | U |

NA = Not Analyzed, ND = Not Detected

C - Inorganic Blank Contamination

U - < Det Limit

B - Rad Chem Blank Contamination

B - Inorganic Estimated

## Data Summary Report

**Sample Group: 20150964**

**SDG Number: 222S20150964**

**Customer Sample ID: B31VK5**

**Sample Portion: Parent**

| Sample# R | A# | CAS # | Analyte | Unit | STD % | Blank | Result | Duplicate | Average | RPD % | Spk Rec % | Det Limit | Cnt Err % | Qual Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GEA | | | | | | | | | | | | | | |
| S15M000080 | | 14391-16-3 | Europium-155 | uCi/g | n/a | <1.91E-07 | <6.16E-07 | n/a | n/a | n/a | n/a | 6.16E-07 | | U |

NA = Not Analyzed, ND = Not Detected

C - Inorganic Blank Contamination

U - < Det Limit

B - Rad Chem Blank Contamination

B - Inorganic Estimated

## Data Summary Report

**Sample Group: 20150964**

**SDG Number: 222S20150964**

**Customer Sample ID: B31VM6**

**Sample Portion: Acid Digest**

| Sample# | R | A# | CAS # | Analyte | Unit | STD % | Blank | Result | Duplicate | Average | RPD % | Spk Rec % | Det Limit | Cnt Err % | Qual Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Am241,Cm243 by TRU-Spec Resin | | | | | | | | | | | | | | | |
| S15M000252 | | E | 14596-10-2 | Americium-241 | uCi/g | 111 | <2.44E-07 | <8.76E-07 | n/a | n/a | n/a | n/a | 8.76E-07 | | U |
| Env Sr-89/90 for Solids | | | | | | | | | | | | | | | |
| S15M000252 | | E | SR-89/90 | Strontium-89/90 | uCi/g | 104 | <1.10E-05 | 5.42E-06 | n/a | n/a | n/a | n/a | 2.59E-06 | 78.558 | |
| ICP-AES | | | | | | | | | | | | | | | |
| S15M000251 | | A | 7440-47-3 | Chromium | ug/g | 101 | 4.28E-03 | 16.0 | n/a | n/a | n/a | n/a | 0.399 | | |
| ICP/MS | | | | | | | | | | | | | | | |
| S15M000251 | | A | 13968-55-3 | Uranium-233 | ug/g | n/a | <5.00E-05 | <9.98E-03 | n/a | n/a | n/a | n/a | 9.98E-03 | | U |
| S15M000251 | | A | 13966-29-5 | Uranium-234 | ug/g | n/a | <5.40E-06 | <1.08E-03 | n/a | n/a | n/a | n/a | 1.08E-03 | | U |
| S15M000251 | | A | 15117-96-1 | Uranium-235 | ug/g | 95.1 | <5.40E-06 | 3.71E-03 | n/a | n/a | n/a | n/a | 1.08E-03 | | |
| S15M000251 | | A | U-238 | Uranium-238 | ug/g | 95.7 | <4.18E-05 | 0.874 | n/a | n/a | n/a | n/a | 8.34E-03 | | |
| Pu238,239 by TRU-SPEC Resin | | | | | | | | | | | | | | | |
| S15M000252 | | E | PU-239/240 | Plutonium-239/240 | uCi/g | 102 | 5.19E-07 | 1.98E-06 | n/a | n/a | n/a | n/a | 1.05E-06 | 23.15 | B |
| S15M000252 | | E | 13981-16-3 | Plutonium-238 | uCi/g | n/a | <4.00E-07 | <1.36E-06 | n/a | n/a | n/a | n/a | 1.36E-06 | | U |
| TRITIUM by COLUMN | | | | | | | | | | | | | | | |
| S15M000253 | | W | 10028-17-8 | Tritium | uCi/g | 89.9 | <2.07E-05 | <2.06E-05 | n/a | n/a | n/a | n/a | 2.06E-05 | | U |
| Technetium - Liq. Scint. | | | | | | | | | | | | | | | |
| S15M000252 | | E | 14133-76-7 | Technetium-99 | uCi/g | 98.8 | <5.45E-06 | <4.21E-06 | n/a | n/a | n/a | n/a | 4.21E-06 | | U |

**Sample Portion: Parent**

| Sample# | R | A# | CAS # | Analyte | Unit | STD % | Blank | Result | Duplicate | Average | RPD % | Spk Rec % | Det Limit | Cnt Err % | Qual Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % Water by TGA | | | | | | | | | | | | | | | |
| S15M000078 | | | %WATER | Percent water | % | 96.6 | n/a | 0.752 | n/a | n/a | n/a | n/a | 0.0100 | | |
| Carbon 14 by LSC | | | | | | | | | | | | | | | |
| S15M000078 | | | 14762-75-5 | Carbon-14 | uCi/g | 95.2 | <7.96E-07 | <1.41E-06 | n/a | n/a | n/a | n/a | 1.41E-06 | | U |
| GEA | | | | | | | | | | | | | | | |
| S15M000078 | | | 10198-40-0 | Cobalt-60 | uCi/g | 97.2 | <1.08E-07 | <1.43E-07 | n/a | n/a | n/a | n/a | 1.43E-07 | | U |
| S15M000078 | | | 10045-97-3 | Cesium-137 | uCi/g | 98.6 | <1.42E-07 | <1.86E-07 | n/a | n/a | n/a | n/a | 1.86E-07 | | U |
| S15M000078 | | | 14683-23-9 | Europium-152 | uCi/g | n/a | <2.65E-07 | <3.07E-07 | n/a | n/a | n/a | n/a | 3.07E-07 | | U |
| S15M000078 | | | 15585-10-1 | Europium-154 | uCi/g | n/a | <3.04E-07 | <3.99E-07 | n/a | n/a | n/a | n/a | 3.99E-07 | | U |

NA = Not Analyzed, ND = Not Detected

C - Inorganic Blank Contamination

U - < Det Limit

B - Rad Chem Blank Contamination

B - Inorganic Estimated

## Data Summary Report

**Sample Group: 20150964**

**SDG Number: 222S20150964**

**Customer Sample ID: B31VM6**

**Sample Portion: Parent**

| Sample# R | A# | CAS # | Analyte | Unit | STD % | Blank | Result | Duplicate | Average | RPD % | Spk Rec % | Det Limit | Cnt Err % | Qual Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GEA | | | | | | | | | | | | | | |
| S15M000078 | | 14391-16-3 | Europium-155 | uCi/g | n/a | <1.91E-07 | <2.65E-07 | n/a | n/a | n/a | n/a | 2.65E-07 | | U |

NA = Not Analyzed, ND = Not Detected

C - Inorganic Blank Contamination

U - < Det Limit

B - Rad Chem Blank Contamination

B - Inorganic Estimated

## Data Summary Report

**Sample Group: 20150964**

**SDG Number: 222S20150964**

**Customer Sample ID: B31VM9**

**Sample Portion: Acid Digest**

| Sample# | R | A# | CAS # | Analyte | Unit | STD % | Blank | Result | Duplicate | Average | RPD % | Spk Rec % | Det Limit | Cnt Err % | Qual Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Am241,Cm243 by TRU-Spec Resin | | | | | | | | | | | | | | | |
| S15M000261 | | E | 14596-10-2 | Americium-241 | uCi/g | 111 | <2.44E-07 | 7.22E-07 | n/a | n/a | n/a | n/a | 5.21E-07 | 35.72 | |
| Env Sr-89/90 for Solids | | | | | | | | | | | | | | | |
| S15M000261 | | E | SR-89/90 | Strontium-89/90 | uCi/g | 104 | <1.10E-05 | 3.97E-05 | n/a | n/a | n/a | n/a | 2.65E-06 | 16.796 | |
| ICP-AES | | | | | | | | | | | | | | | |
| S15M000260 | | A | 7440-47-3 | Chromium | ug/g | 101 | 4.28E-03 | 12.5 | n/a | n/a | n/a | n/a | 0.385 | | |
| ICP/MS | | | | | | | | | | | | | | | |
| S15M000260 | | A | 13968-55-3 | Uranium-233 | ug/g | n/a | <5.00E-05 | <9.62E-03 | n/a | n/a | n/a | n/a | 9.62E-03 | | U |
| S15M000260 | | A | 13966-29-5 | Uranium-234 | ug/g | n/a | <5.40E-06 | <1.04E-03 | n/a | n/a | n/a | n/a | 1.04E-03 | | U |
| S15M000260 | | A | 15117-96-1 | Uranium-235 | ug/g | 95.1 | <5.40E-06 | 2.29E-03 | n/a | n/a | n/a | n/a | 1.04E-03 | | |
| S15M000260 | | A | U-238 | Uranium-238 | ug/g | 95.7 | <4.18E-05 | 0.785 | n/a | n/a | n/a | n/a | 8.04E-03 | | |
| Pu238,239 by TRU-SPEC Resin | | | | | | | | | | | | | | | |
| S15M000261 | | E | PU-239/240 | Plutonium-239/240 | uCi/g | 102 | 5.19E-07 | 1.20E-06 | n/a | n/a | n/a | n/a | 1.07E-06 | 33.11 | B |
| S15M000261 | | E | 13981-16-3 | Plutonium-238 | uCi/g | n/a | <4.00E-07 | <1.51E-06 | n/a | n/a | n/a | n/a | 1.51E-06 | | U |
| TRITIUM by COLUMN | | | | | | | | | | | | | | | |
| S15M000262 | | W | 10028-17-8 | Tritium | uCi/g | 89.9 | <2.07E-05 | <2.01E-05 | n/a | n/a | n/a | n/a | 2.01E-05 | | U |
| Technetium - Liq. Scint. | | | | | | | | | | | | | | | |
| S15M000261 | | E | 14133-76-7 | Technetium-99 | uCi/g | 98.8 | <5.45E-06 | <4.74E-06 | n/a | n/a | n/a | n/a | 4.74E-06 | | U |

**Sample Portion: Parent**

| Sample# | R | A# | CAS # | Analyte | Unit | STD % | Blank | Result | Duplicate | Average | RPD % | Spk Rec % | Det Limit | Cnt Err % | Qual Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % Water by TGA | | | | | | | | | | | | | | | |
| S15M000081 | | | %WATER | Percent water | % | 96.2 | n/a | 0.719 | n/a | n/a | n/a | n/a | 0.0100 | | |
| Carbon 14 by LSC | | | | | | | | | | | | | | | |
| S15M000081 | | | 14762-75-5 | Carbon-14 | uCi/g | 95.2 | <7.96E-07 | <7.89E-07 | n/a | n/a | n/a | n/a | 7.89E-07 | | U |
| GEA | | | | | | | | | | | | | | | |
| S15M000081 | | | 10198-40-0 | Cobalt-60 | uCi/g | 97.2 | <1.08E-07 | <1.46E-07 | n/a | n/a | n/a | n/a | 1.46E-07 | | U |
| S15M000081 | | | 10045-97-3 | Cesium-137 | uCi/g | 98.6 | <1.42E-07 | 3.77E-07 | n/a | n/a | n/a | n/a | 1.59E-07 | 16.44 | |
| S15M000081 | | | 14683-23-9 | Europium-152 | uCi/g | n/a | <2.65E-07 | <3.23E-07 | n/a | n/a | n/a | n/a | 3.23E-07 | | U |
| S15M000081 | | | 15585-10-1 | Europium-154 | uCi/g | n/a | <3.04E-07 | <4.36E-07 | n/a | n/a | n/a | n/a | 4.36E-07 | | U |

NA = Not Analyzed, ND = Not Detected

C - Inorganic Blank Contamination

U - < Det Limit

B - Rad Chem Blank Contamination

B - Inorganic Estimated

## Data Summary Report

**Sample Group: 20150964**

**SDG Number: 222S20150964**

**Customer Sample ID: B31VM9**

**Sample Portion: Parent**

| Sample# R | A# | CAS # | Analyte | Unit | STD % | Blank | Result | Duplicate | Average | RPD % | Spk Rec % | Det Limit | Cnt Err % | Qual Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GEA | | | | | | | | | | | | | | |
| S15M000081 | | 14391-16-3 | Europium-155 | uCi/g | n/a | <1.91E-07 | <3.01E-07 | n/a | n/a | n/a | n/a | 3.01E-07 | | U |

NA = Not Analyzed, ND = Not Detected

C - Inorganic Blank Contamination

U - < Det Limit

B - Rad Chem Blank Contamination

B - Inorganic Estimated

Attachment 2

ANALYSIS DATE AND HOLDING TIME REPORT

## Analysis Date Report

| Sample | Customer Sample Id | Method | Prep Method | Sample Date Time | Preparation Date | Analysis Date | Missed Holding Time |
|---|---|---|---|---|---|---|---|
| S15M000246 | B31VF5 | Am-241 by AEA | N/A | 07/23/2015 10:15 | N/A | 09/16/2015 12:17 | No |
| S15M000249 | B31VH7 | Am-241 by AEA | N/A | 07/23/2015 11:35 | N/A | 09/16/2015 12:17 | No |
| S15M000252 | B31VM6 | Am-241 by AEA | N/A | 08/11/2015 14:24 | N/A | 09/16/2015 12:17 | No |
| S15M000255 | B31VJ6 | Am-241 by AEA | N/A | 08/17/2015 10:04 | N/A | 09/16/2015 12:18 | No |
| S15M000258 | B31VK5 | Am-241 by AEA | N/A | 08/17/2015 10:57 | N/A | 09/16/2015 12:18 | No |
| S15M000261 | B31VM9 | Am-241 by AEA | N/A | 08/17/2015 12:44 | N/A | 09/16/2015 12:18 | No |
| S15M000246 | B31VF5 | Americium Separation by Vaccum Box | Acid Digest | 07/23/2015 10:15 | 09/10/2015 13:44 | 09/16/2015 10:36 | N/A |
| S15M000249 | B31VH7 | Americium Separation by Vaccum Box | Acid Digest | 07/23/2015 11:35 | 09/10/2015 13:44 | 09/16/2015 10:36 | N/A |
| S15M000252 | B31VM6 | Americium Separation by Vaccum Box | Acid Digest | 08/11/2015 14:24 | 09/10/2015 13:44 | 09/16/2015 10:36 | N/A |
| S15M000255 | B31VJ6 | Americium Separation by Vaccum Box | Acid Digest | 08/17/2015 10:04 | 09/10/2015 13:44 | 09/16/2015 10:36 | N/A |
| S15M000258 | B31VK5 | Americium Separation by Vaccum Box | Acid Digest | 08/17/2015 10:57 | 09/10/2015 13:44 | 09/16/2015 10:36 | N/A |
| S15M000261 | B31VM9 | Americium Separation by Vaccum Box | Acid Digest | 08/17/2015 12:44 | 09/10/2015 13:44 | 09/16/2015 10:36 | N/A |
| S15M000076 | B31VF5 | Carbon-14 by LSC | N/A | 07/23/2015 10:15 | N/A | 09/14/2015 13:54 | No |
| S15M000077 | B31VH7 | Carbon-14 by LSC | N/A | 07/23/2015 11:35 | N/A | 09/14/2015 13:54 | No |
| S15M000078 | B31VM6 | Carbon-14 by LSC | N/A | 08/11/2015 14:24 | N/A | 09/14/2015 13:54 | No |
| S15M000079 | B31VJ6 | Carbon-14 by LSC | N/A | 08/17/2015 10:04 | N/A | 09/14/2015 13:54 | No |
| S15M000080 | B31VK5 | Carbon-14 by LSC | N/A | 08/17/2015 10:57 | N/A | 09/14/2015 13:54 | No |
| S15M000081 | B31VM9 | Carbon-14 by LSC | N/A | 08/17/2015 12:44 | N/A | 09/14/2015 13:54 | No |
| S15M000076 | B31VF5 | Carbon-14 Separation | N/A | 07/23/2015 10:15 | N/A | 09/14/2015 13:54 | N/A |
| S15M000077 | B31VH7 | Carbon-14 Separation | N/A | 07/23/2015 11:35 | N/A | 09/14/2015 13:54 | N/A |
| S15M000078 | B31VM6 | Carbon-14 Separation | N/A | 08/11/2015 14:24 | N/A | 09/14/2015 13:54 | N/A |
| S15M000079 | B31VJ6 | Carbon-14 Separation | N/A | 08/17/2015 10:04 | N/A | 09/14/2015 13:54 | N/A |
| S15M000080 | B31VK5 | Carbon-14 Separation | N/A | 08/17/2015 10:57 | N/A | 09/14/2015 13:54 | N/A |
| S15M000081 | B31VM9 | Carbon-14 Separation | N/A | 08/17/2015 12:44 | N/A | 09/14/2015 13:54 | N/A |
| S15M000076 | B31VF5 | GEA | N/A | 07/23/2015 10:15 | N/A | 09/01/2015 14:21 | No |
| S15M000077 | B31VH7 | GEA | N/A | 07/23/2015 11:35 | N/A | 09/01/2015 14:15 | No |
| S15M000078 | B31VM6 | GEA | N/A | 08/11/2015 14:24 | N/A | 09/02/2015 08:31 | No |
| S15M000079 | B31VJ6 | GEA | N/A | 08/17/2015 10:04 | N/A | 09/02/2015 08:26 | No |
| S15M000080 | B31VK5 | GEA | N/A | 08/17/2015 10:57 | N/A | 09/02/2015 08:18 | No |
| S15M000081 | B31VM9 | GEA | N/A | 08/17/2015 12:44 | N/A | 09/02/2015 11:07 | No |
| S15M000076 | B31VF5 | GEA Preparation | N/A | 07/23/2015 10:15 | N/A | 09/01/2015 11:20 | N/A |
| S15M000077 | B31VH7 | GEA Preparation | N/A | 07/23/2015 11:35 | N/A | 09/01/2015 11:20 | N/A |
| S15M000078 | B31VM6 | GEA Preparation | N/A | 08/11/2015 14:24 | N/A | 09/01/2015 11:20 | N/A |
| S15M000079 | B31VJ6 | GEA Preparation | N/A | 08/17/2015 10:04 | N/A | 09/01/2015 11:20 | N/A |
| S15M000080 | B31VK5 | GEA Preparation | N/A | 08/17/2015 10:57 | N/A | 09/01/2015 11:20 | N/A |
| S15M000081 | B31VM9 | GEA Preparation | N/A | 08/17/2015 12:44 | N/A | 09/01/2015 11:20 | N/A |
| S15M000245 | B31VF5 | ICP/AES Metals (SW-846 6010C) | Acid Digest (SW-846 3050B) | 07/23/2015 10:15 | 08/31/2015 09:00 | 09/02/2015 12:41 | N/A |
| S15M000248 | B31VH7 | ICP/AES Metals (SW-846 6010C) | Acid Digest (SW-846 3050B) | 07/23/2015 11:35 | 08/31/2015 09:00 | 09/02/2015 13:03 | N/A |
| S15M000251 | B31VM6 | ICP/AES Metals (SW-846 6010C) | Acid Digest (SW-846 3050B) | 08/11/2015 14:24 | 08/31/2015 09:00 | 09/02/2015 13:20 | N/A |
| S15M000254 | B31VJ6 | ICP/AES Metals (SW-846 6010C) | Acid Digest (SW-846 3050B) | 08/17/2015 10:04 | 08/31/2015 09:00 | 09/02/2015 13:26 | N/A |
| S15M000257 | B31VK5 | ICP/AES Metals (SW-846 6010C) | Acid Digest (SW-846 3050B) | 08/17/2015 10:57 | 08/31/2015 09:00 | 09/02/2015 13:32 | N/A |
| S15M000260 | B31VM9 | ICP/AES Metals (SW-846 6010C) | Acid Digest (SW-846 3050B) | 08/17/2015 12:44 | 08/31/2015 09:00 | 09/02/2015 13:38 | N/A |

## Analysis Date Report

| Sample | Customer Sample Id | Method | Prep Method | Sample Date Time | Preparation Date | Analysis Date | Missed Holding Time |
|---|---|---|---|---|---|---|---|
| S15M000076 | B31VF5 | I-129 by LEPD | N/A | 07/23/2015 10:15 | N/A | 09/15/2015 15:15 | No |
| S15M000077 | B31VH7 | I-129 by LEPD | N/A | 07/23/2015 11:35 | N/A | 09/15/2015 15:15 | No |
| S15M000078 | B31VM6 | I-129 by LEPD | N/A | 08/11/2015 14:24 | N/A | 09/15/2015 15:15 | No |
| S15M000079 | B31VJ6 | I-129 by LEPD | N/A | 08/17/2015 10:04 | N/A | 09/15/2015 15:15 | No |
| S15M000080 | B31VK5 | I-129 by LEPD | N/A | 08/17/2015 10:57 | N/A | 09/15/2015 15:15 | No |
| S15M000081 | B31VM9 | I-129 by LEPD | N/A | 08/17/2015 12:44 | N/A | 09/15/2015 15:15 | No |
| S15M000076 | B31VF5 | I-129 Separation/Digest | Fusion Digest | 07/23/2015 10:15 | N/A | 09/15/2015 15:19 | N/A |
| S15M000077 | B31VH7 | I-129 Separation/Digest | Fusion Digest | 07/23/2015 11:35 | N/A | 09/15/2015 15:19 | N/A |
| S15M000078 | B31VM6 | I-129 Separation/Digest | Fusion Digest | 08/11/2015 14:24 | N/A | 09/15/2015 15:19 | N/A |
| S15M000079 | B31VJ6 | I-129 Separation/Digest | Fusion Digest | 08/17/2015 10:04 | N/A | 09/15/2015 15:19 | N/A |
| S15M000080 | B31VK5 | I-129 Separation/Digest | Fusion Digest | 08/17/2015 10:57 | N/A | 09/15/2015 15:19 | N/A |
| S15M000081 | B31VM9 | I-129 Separation/Digest | Fusion Digest | 08/17/2015 12:44 | N/A | 09/15/2015 15:19 | N/A |
| S15M000245 | B31VF5 | ICP/MS Actinides (SW-846 6020A) | Acid Digest (SW-846 3050B) | 07/23/2015 10:15 | 08/31/2015 09:00 | 09/01/2015 11:21 | No |
| S15M000248 | B31VH7 | ICP/MS Actinides (SW-846 6020A) | Acid Digest (SW-846 3050B) | 07/23/2015 11:35 | 08/31/2015 09:00 | 09/01/2015 11:28 | No |
| S15M000251 | B31VM6 | ICP/MS Actinides (SW-846 6020A) | Acid Digest (SW-846 3050B) | 08/11/2015 14:24 | 08/31/2015 09:00 | 09/01/2015 11:32 | No |
| S15M000254 | B31VJ6 | ICP/MS Actinides (SW-846 6020A) | Acid Digest (SW-846 3050B) | 08/17/2015 10:04 | 08/31/2015 09:00 | 09/01/2015 11:35 | No |
| S15M000257 | B31VK5 | ICP/MS Actinides (SW-846 6020A) | Acid Digest (SW-846 3050B) | 08/17/2015 10:57 | 08/31/2015 09:00 | 09/01/2015 11:39 | No |
| S15M000260 | B31VM9 | ICP/MS Actinides (SW-846 6020A) | Acid Digest (SW-846 3050B) | 08/17/2015 12:44 | 08/31/2015 09:00 | 09/01/2015 11:42 | No |
| S15M000246 | B31VF5 | Iso Pu by AEA | N/A | 07/23/2015 10:15 | N/A | 09/16/2015 12:18 | No |
| S15M000249 | B31VH7 | Iso Pu by AEA | N/A | 07/23/2015 11:35 | N/A | 09/16/2015 12:18 | No |
| S15M000252 | B31VM6 | Iso Pu by AEA | N/A | 08/11/2015 14:24 | N/A | 09/16/2015 12:18 | No |
| S15M000255 | B31VJ6 | Iso Pu by AEA | N/A | 08/17/2015 10:04 | N/A | 09/16/2015 12:19 | No |
| S15M000258 | B31VK5 | Iso Pu by AEA | N/A | 08/17/2015 10:57 | N/A | 09/16/2015 12:19 | No |
| S15M000261 | B31VM9 | Iso Pu by AEA | N/A | 08/17/2015 12:44 | N/A | 09/16/2015 12:19 | No |
| S15M000246 | B31VF5 | Iso Pu Separation | Acid Digest | 07/23/2015 10:15 | 09/10/2015 13:44 | 09/16/2015 09:36 | N/A |
| S15M000249 | B31VH7 | Iso Pu Separation | Acid Digest | 07/23/2015 11:35 | 09/10/2015 13:44 | 09/16/2015 09:36 | N/A |
| S15M000252 | B31VM6 | Iso Pu Separation | Acid Digest | 08/11/2015 14:24 | 09/10/2015 13:44 | 09/16/2015 09:36 | N/A |
| S15M000255 | B31VJ6 | Iso Pu Separation | Acid Digest | 08/17/2015 10:04 | 09/10/2015 13:44 | 09/16/2015 09:36 | N/A |
| S15M000258 | B31VK5 | Iso Pu Separation | Acid Digest | 08/17/2015 10:57 | 09/10/2015 13:44 | 09/16/2015 09:36 | N/A |
| S15M000261 | B31VM9 | Iso Pu Separation | Acid Digest | 08/17/2015 12:44 | 09/10/2015 13:44 | 09/16/2015 09:36 | N/A |
| S15M000246 | B31VF5 | Sr-89/90 by GPC | N/A | 07/23/2015 10:15 | N/A | 09/15/2015 11:30 | No |
| S15M000249 | B31VH7 | Sr-89/90 by GPC | N/A | 07/23/2015 11:35 | N/A | 09/15/2015 11:30 | No |
| S15M000252 | B31VM6 | Sr-89/90 by GPC | N/A | 08/11/2015 14:24 | N/A | 09/15/2015 11:30 | No |
| S15M000255 | B31VJ6 | Sr-89/90 by GPC | N/A | 08/17/2015 10:04 | N/A | 09/15/2015 11:30 | No |
| S15M000258 | B31VK5 | Sr-89/90 by GPC | N/A | 08/17/2015 10:57 | N/A | 09/15/2015 11:30 | No |
| S15M000261 | B31VM9 | Sr-89/90 by GPC | N/A | 08/17/2015 12:44 | N/A | 09/15/2015 11:30 | No |
| S15M000246 | B31VF5 | Sr-89/90 Separation | Acid Digest | 07/23/2015 10:15 | 09/10/2015 13:44 | 09/15/2015 11:33 | N/A |
| S15M000249 | B31VH7 | Sr-89/90 Separation | Acid Digest | 07/23/2015 11:35 | 09/10/2015 13:44 | 09/15/2015 11:33 | N/A |
| S15M000252 | B31VM6 | Sr-89/90 Separation | Acid Digest | 08/11/2015 14:24 | 09/10/2015 13:44 | 09/15/2015 11:33 | N/A |
| S15M000255 | B31VJ6 | Sr-89/90 Separation | Acid Digest | 08/17/2015 10:04 | 09/10/2015 13:44 | 09/15/2015 11:33 | N/A |
| S15M000258 | B31VK5 | Sr-89/90 Separation | Acid Digest | 08/17/2015 10:57 | 09/10/2015 13:44 | 09/15/2015 11:33 | N/A |
| S15M000261 | B31VM9 | Sr-89/90 Separation | Acid Digest | 08/17/2015 12:44 | 09/10/2015 13:44 | 09/15/2015 11:33 | N/A |

## Analysis Date Report

| Sample | Customer Sample Id | Method | Prep Method | Sample Date Time | Preparation Date | Analysis Date | Missed Holding Time |
|---|---|---|---|---|---|---|---|
| S15M000246 | B31VF5 | Tc-99 by LSC | N/A | 07/23/2015 10:15 | N/A | 09/08/2015 15:25 | No |
| S15M000249 | B31VH7 | Tc-99 by LSC | N/A | 07/23/2015 11:35 | N/A | 09/08/2015 15:25 | No |
| S15M000252 | B31VM6 | Tc-99 by LSC | N/A | 08/11/2015 14:24 | N/A | 09/08/2015 15:25 | No |
| S15M000255 | B31VJ6 | Tc-99 by LSC | N/A | 08/17/2015 10:04 | N/A | 09/08/2015 15:25 | No |
| S15M000258 | B31VK5 | Tc-99 by LSC | N/A | 08/17/2015 10:57 | N/A | 09/08/2015 15:25 | No |
| S15M000261 | B31VM9 | Tc-99 by LSC | N/A | 08/17/2015 12:44 | N/A | 09/08/2015 15:25 | No |
| S15M000246 | B31VF5 | Tc-99 Separation | Acid Digest | 07/23/2015 10:15 | 09/01/2015 13:50 | 09/08/2015 15:22 | N/A |
| S15M000249 | B31VH7 | Tc-99 Separation | Acid Digest | 07/23/2015 11:35 | 09/01/2015 13:50 | 09/08/2015 15:22 | N/A |
| S15M000252 | B31VM6 | Tc-99 Separation | Acid Digest | 08/11/2015 14:24 | 09/01/2015 13:50 | 09/08/2015 15:22 | N/A |
| S15M000255 | B31VJ6 | Tc-99 Separation | Acid Digest | 08/17/2015 10:04 | 09/01/2015 13:50 | 09/08/2015 15:22 | N/A |
| S15M000258 | B31VK5 | Tc-99 Separation | Acid Digest | 08/17/2015 10:57 | 09/01/2015 13:50 | 09/08/2015 15:22 | N/A |
| S15M000261 | B31VM9 | Tc-99 Separation | Acid Digest | 08/17/2015 12:44 | 09/01/2015 13:50 | 09/08/2015 15:22 | N/A |
| S15M000076 | B31VF5 | TGA-TA | N/A | 07/23/2015 10:15 | N/A | 09/03/2015 09:55 | No |
| S15M000077 | B31VH7 | TGA-TA | N/A | 07/23/2015 11:35 | N/A | 09/01/2015 10:02 | No |
| S15M000078 | B31VM6 | TGA-TA | N/A | 08/11/2015 14:24 | N/A | 09/03/2015 09:55 | No |
| S15M000079 | B31VJ6 | TGA-TA | N/A | 08/17/2015 10:04 | N/A | 09/03/2015 09:55 | No |
| S15M000080 | B31VK5 | TGA-TA | N/A | 08/17/2015 10:57 | N/A | 09/08/2015 09:29 | No |
| S15M000081 | B31VM9 | TGA-TA | N/A | 08/17/2015 12:44 | N/A | 09/08/2015 09:29 | No |
| S15M000247 | B31VF5 | H-3 by LSC | N/A | 07/23/2015 10:15 | N/A | 09/09/2015 14:50 | No |
| S15M000250 | B31VH7 | H-3 by LSC | N/A | 07/23/2015 11:35 | N/A | 09/09/2015 14:50 | No |
| S15M000253 | B31VM6 | H-3 by LSC | N/A | 08/11/2015 14:24 | N/A | 09/09/2015 14:50 | No |
| S15M000256 | B31VJ6 | H-3 by LSC | N/A | 08/17/2015 10:04 | N/A | 09/09/2015 14:50 | No |
| S15M000259 | B31VK5 | H-3 by LSC | N/A | 08/17/2015 10:57 | N/A | 09/09/2015 14:50 | No |
| S15M000262 | B31VM9 | H-3 by LSC | N/A | 08/17/2015 12:44 | N/A | 09/09/2015 14:50 | No |
| S15M000247 | B31VF5 | H-3 Separation by Column | Water Digest | 07/23/2015 10:15 | 09/08/2015 14:23 | 09/09/2015 13:41 | N/A |
| S15M000250 | B31VH7 | H-3 Separation by Column | Water Digest | 07/23/2015 11:35 | 09/08/2015 14:33 | 09/09/2015 13:41 | N/A |
| S15M000253 | B31VM6 | H-3 Separation by Column | Water Digest | 08/11/2015 14:24 | 09/08/2015 14:33 | 09/09/2015 13:41 | N/A |
| S15M000256 | B31VJ6 | H-3 Separation by Column | Water Digest | 08/17/2015 10:04 | 09/08/2015 14:33 | 09/09/2015 13:41 | N/A |
| S15M000259 | B31VK5 | H-3 Separation by Column | Water Digest | 08/17/2015 10:57 | 09/08/2015 14:33 | 09/09/2015 13:41 | N/A |
| S15M000262 | B31VM9 | H-3 Separation by Column | Water Digest | 08/17/2015 12:44 | 09/08/2015 14:33 | 09/09/2015 13:41 | N/A |

Attachment 3

CORRESPONDENCE

## Soto, Edward

**From:** Soto, Edward
**Sent:** Monday, March 02, 2015 10:49 AM
**To:** Hermann, Randy M; Sumner, Laine C; Todak, David
**Cc:** Ritenour, Gerald P
**Subject:** FW: DRAFT for 100-KE Boreholes - Soil

**Follow Up Flag:** Follow up
**Flag Status:** Flagged

In response to the DRAFT for F15-02 (100-KE Characterization Boreholes – Soil) the 222-S laboratory requesting these changes be made to the field sampling requirements:

- Moisture Content – D2216; due to ALARA concerns the laboratory may need to analyze percent water by Thermo-Gravimetric Analyzer (TGA). If sample activity is low enough 222S will perform a gravimetric similar to D2216 (105°C)
- 7196 Metals ICP Hexavalent Chromium; the laboratory currently does not analyze solid matrixes for hexavalent chromium.
- Actinides ICP/MS for Am-241 and I-129; the laboratory analyzes Am-241 by alpha energy analysis (AEA) and I-129 by gamma energy analysis (GEA/LEPD).
- AEA U-233/234, -235, -238; the laboratory analyzes U-233/234, -235, -238 by ICP/MS.

Additional information concerning the sampling event would help us to better evaluate the time needed to complete the analysis; the SAF estimates 30 samples, how many of these will be rad screening samples and what is the total of samples for analysis? With the exception of GEA Screens, the laboratory is planning on analyzing all samples in single batches and reporting them in one report, this will help control cost. Please let me know if you have any questions.

Thanks,

*Edward Soto*

Project Coordinator
Advanced Technologies and Laboratories International, Inc.
contractor to the Office of River Protection
U.S. Department of Energy
(509) 372-0666
edward_soto@rl.gov

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**From:** Ayres, Doris E
**Sent:** Friday, February 27, 2015 12:05 PM
**To:** Prichard, Earl A; Hermann, Randy M; Baechler, Michael A; Heather Shaffer (heather.shaffer@gel.com); Jayna Awalt ; 'SANDRA.SEGER@TESTAMERICAINC.COM'; Menjivar, Carolina E; Ritenour, Gerald P
**Cc:** Todak, David; Sumner, Laine C
**Subject:** DRAFT for 100-KE Boreholes - Soil

Randy and Earl –

Please find attached the DRAFT for F15-02 (100-KE Characterization Boreholes – Soil). Please send all comments or questions to Laine Sumner and copy Dave Todak by COB Monday, March 2. Laine will be covering for Dave while he is out of the office for the next few weeks.

Labs please review what we have assigned to you and let us know if we have the proper method and proper volumes. Please provide your comments or questions to Laine by COB Monday, March 2 also.

Thanks

Doris

Attachment 4

RECEIPT PAPERWORK

| 222-S | SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST | ATS-LO-090-101 Rev DG-0 |
|---|---|---|

Date Samples Received: 8.27.15 Total Number of Samples: 6 Group #: 20150964

Sample Custodian: TM Colloch IH Technician: N/A

**Sample Custodian to Complete:**

| Action | Yes | No | N/A | Comments |
|---|---|---|---|---|
| RSR provided? | ✓ | | | |
| Verify GKI is complete | | | ✓ | ☐ In Project File |
| Received from an alpha facility? | ✓ | | | ☑ Contact PC for approval to release |
| Check that outer custody seal is intact, if present | ✓ | | | |
| Record cooler temperature in centigrade, as appropriate | ✓ | 21°C | | ☐ Check if no cooler and/or no ice |
| Samples are intact and in good condition | ✓ | | | If No, provide comments below |
| RSA/COC provided and complete containing the following information? | | | | |
| • Client name and client sample number | ✓ | | | |
| • Date and time of sampling | ✓ | | | |
| • Sampling location or origin | ✓ | | | |
| • Container type, size, and number | ✓ | | | |
| • Preservatives (if used) noted on the COC/RSA and sample bottles | | | ✓ | |
| • Analysis request is clear | ✓ | | | |
| • Signature of persons relinquishing and receiving samples | ✓ | | | |
| • Date and/or time of sample custody exchange | ✓ | | | |
| Verify that sample numbers on containers match the COC and/or RSA | ✓ | | | |
| Samples stored properly (e.g., refrigeration) | ✓ | | | |

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? Yes PC/SC Initials TAM Date 8/27/15

If No, comment on communication and resolution:

100 KE Borehole Soils

**Number of IH Samples Received:**

| | | | | |
|---|---|---|---|---|
| Aldehyde Screen: | Amines: | Ammonia: | Aromatic HC: | Asbestos: |
| Beryllium: | Be-Bulk: | Be-Filter: | Be-Wipe | 1,3-Butadiene: |
| Formaldehyde: | Furans: | Mercury: | Methanol: | Nitrosamines: |
| Nitrous Oxide: | Pyridines: | SVOA: | VOA: | Other-IH: |

A-6005-302 (REV 4)

OCTOBER 2, 2015

**CH2MHill Plateau Remediation Company**

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

F15-027-141 PAGE 1 OF 1

| | | | |
|---|---|---|---|
| **COLLECTOR** E.L. Kauer/CHPRC | **COMPANY CONTACT** TODAK, D | **TELEPHONE NO.** 376-6427 | **PROJECT COORDINATOR** TODAK, D |
| **SAMPLING LOCATION** C8797, Interval 1 | **PROJECT DESIGNATION** 100-KE Characterization Boreholes - Soil | | **SAF NO.** F15-027 |
| **ICE CHEST NO.** 6605-116 | **FIELD LOGBOOK NO.** HNF-N-645 3 pg 15 | **ACTUAL SAMPLE DEPTH** 20.0-21.50 FT | **COA** 303581 |
| **SHIPPED TO** ~~GEL Laboratories, LLC~~ 222-S 20. 8/27/15 | **OFFSITE PROPERTY NO.** N/A | | **BILL OF LADING/AIR BILL NO.** N/A |

**PRICE CODE** 8C **DATA TURNAROUND** 15 Days / 15 Days

**AIR QUALITY** ☐

**METHOD OF SHIPMENT** FEDERAL EXPRESS

**ORIGINAL**

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

**POSSIBLE SAMPLE HAZARDS/ REMARKS**
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

**SPECIAL HANDLING AND/OR STORAGE**
RADIOACTIVE TIE TO: B31VF4

| | |
|---|---|
| **PRESERVATION** | None |
| **HOLDING TIME** | None |
| **TYPE OF CONTAINER** | P |
| **NO. OF CONTAINER(S)** | 1 |
| **VOLUME** | 125mL |
| **SAMPLE ANALYSIS** | SEE ITEM (1) IN SPECIAL INSTRUCTIONS |

20150964 ✓
SIJM000076 ✓
OMNI
MARS

| SAMPLE NO. | MATRIX* | SAMPLE DATE | SAMPLE TIME | |
|---|---|---|---|---|
| B31VF5 | SOIL | 7-23-15 ✓ | 10.15 ✓ | ✓ |

**CHAIN OF POSSESSION**

| RELINQUISHED BY/REMOVED FROM | DATE/TIME | RECEIVED BY/STORED IN | DATE/TIME |
|---|---|---|---|
| E.L. Kauer/CHPRC | JUL 23 2015 1330 | SSU #2 | JUL 23 2015 1330 |
| SSU #2 | 8/27/15 0940 | L.D. Wahlquist (CHPRC) | 8/27/15 0940 |
| L.D. Wahlquist (CHPRC) | 8/27/15 1025 | TA McCloud | 8/27/15 1025 |
| | | | |
| | | | |
| | | | |
| | | | |

**SIGN/ PRINT NAMES**

**SPECIAL INSTRUCTIONS**

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt. TRV;-15-113
(1) Moisture Content - D2216; 6010_METALS_ICP: COMMON {Chromium}; 7196_CR6: COMMON; GAMMA_GS: COMMON; C14_LSC: COMMON; AMCMISO_IE_PRECIP_AEA: COMMON; I129_SEP_LEPS_GS: COMMON; PUISO_PLATE_AEA: COMMON; SRTOT_SEP_PRECIP_GPC: COMMON; TC99_EIE_LSC: COMMON; TRITIUM_DIST_LSC: COMMON; UISO_IE_PRECIP_AEA: COMMON;

| | | | |
|---|---|---|---|
| **LABORATORY SECTION** | **RECEIVED BY** | **TITLE** | **DATE/TIME** |
| **FINAL SAMPLE DISPOSITION** | **DISPOSAL METHOD** | **DISPOSED BY** | **DATE/TIME** |

**PRINTED ON** 6/19/2015 **FSR ID = FSR1266** **TRVL NUM = TRVL-15-113**



A-6003-618 (REV 2)

OCTOBER 2, 2015

| CH2MHill Plateau Remediation Company | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | | F15-027-153 | PAGE 1 OF 1 |
|---|---|---|---|---|---|
| COLLECTOR E.L. Kauer/CHPRC | COMPANY CONTACT TODAK, D | TELEPHONE NO. 376-6427 | PROJECT COORDINATOR TODAK, D | PRICE CODE 8C | DATA TURNAROUND |
| SAMPLING LOCATION C8797, Interval 5 | PROJECT DESIGNATION 100-KE Characterization Boreholes - Soil | | SAF NO. F15-027 | AIR QUALITY ☐ | 15 Days / 15 Days |
| ICE CHEST NO. GWS-116 | FIELD LOGBOOK NO. HNF-N-645 3 pg 15 | ACTUAL SAMPLE DEPTH 26.7 - 27.7 FT | COA 303581 | METHOD OF SHIPMENT FEDERAL EXPRESS | ORIGINAL |
| SHIPPED TO ~~GEL Laboratories, LLC~~ LW 8/27/15 222-S | OFFSITE PROPERTY NO. N/A | | BILL OF LADING/AIR BILL NO. N/A | | |

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

**POSSIBLE SAMPLE HAZARDS/ REMARKS**
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

**SPECIAL HANDLING AND/OR STORAGE**
RADIOACTIVE TIE TO: B31VH6

| | |
|---|---|
| PRESERVATION | None |
| HOLDING TIME | None |
| TYPE OF CONTAINER | P |
| NO. OF CONTAINER(S) | 1 |
| VOLUME | 125mL |
| SAMPLE ANALYSIS | SEE ITEM (1) IN SPECIAL INSTRUCTIONS |

20150964 ✓
S15M000077 ✓
OMNI
MARS

| SAMPLE NO. | MATRIX* | SAMPLE DATE | SAMPLE TIME | |
|---|---|---|---|---|
| B31VH7 | SOIL | 7-23-15 ✓ | 1135 ✓ | ✓ |

| CHAIN OF POSSESSION | | SIGN/ PRINT NAMES | |
|---|---|---|---|
| RELINQUISHED BY/REMOVED FROM E.L. Kauer/CHPRC | DATE/TIME JUL 23 2015 1336 | RECEIVED BY/STORED IN SSU #2 | DATE/TIME JUL 23 2015 1330 |
| RELINQUISHED BY/REMOVED FROM SSU #2 | DATE/TIME 8/27/15 0940 | RECEIVED BY/STORED IN L.D. Wall L.D. Wall (CHPRC) | DATE/TIME 8/27/15 0940 |
| RELINQUISHED BY/REMOVED FROM L.D. Wall L.D. Wall (CHPRC) | DATE/TIME 8/27/15 1025 | RECEIVED BY/STORED IN TAM Gilock | DATE/TIME 8/27/15 1025 |
| RELINQUISHED BY/REMOVED FROM | DATE/TIME | RECEIVED BY/STORED IN | DATE/TIME |
| RELINQUISHED BY/REMOVED FROM | DATE/TIME | RECEIVED BY/STORED IN | DATE/TIME |
| RELINQUISHED BY/REMOVED FROM | DATE/TIME | RECEIVED BY/STORED IN | DATE/TIME |
| RELINQUISHED BY/REMOVED FROM | DATE/TIME | RECEIVED BY/STORED IN | DATE/TIME |

**SPECIAL INSTRUCTIONS**
** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt. TRV;-15-113
(1) Moisture Content - D2216; 6010_METALS_ICP: COMMON {Chromium}; 7196_CR6: COMMON; GAMMA_GS: COMMON; C14_LSC: COMMON; AMCMISO_IE_PRECIP_AEA: COMMON; I129_SEP_LEPS_GS: COMMON; PUISO_PLATE_AEA: COMMON; SRTOT_SEP_PRECIP_GPC: COMMON; TC99_EIE_LSC: COMMON; TRITIUM_DIST_LSC: COMMON; UISO_IE_PRECIP_AEA: COMMON;

| | | | |
|---|---|---|---|
| LABORATORY SECTION | RECEIVED BY | TITLE | DATE/TIME |
| FINAL SAMPLE DISPOSITION | DISPOSAL METHOD | DISPOSED BY | DATE/TIME |

PRINTED ON 6/19/2015 FSR ID = FSR1270 TRVL NUM = TRVL-15-113



A-6003-618 (REV 2)

OCTOBER 2, 2015

**CH2MHill Plateau Remediation Company**

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

F15-027-162 | PAGE 1 OF 1

| | | | |
|---|---|---|---|
| **COLLECTOR** E.L. Kauer/CHPRC | **COMPANY CONTACT** TODAK, D | **TELEPHONE NO.** 376-6427 | **PROJECT COORDINATOR** TODAK, D |
| **SAMPLING LOCATION** C8797, Interval 8 | **PROJECT DESIGNATION** 100-KE Characterization Boreholes - Soil | | **SAF NO.** F15-027 |
| **ICE CHEST NO.** GWS-116 | **FIELD LOGBOOK NO.** HNF-N-645 3 Pg 17 | **ACTUAL SAMPLE DEPTH** 33.1-34.8 | **COA** 303581 |
| **SHIPPED TO** GEL Laboratories, LLC 222-S 8/27/15 | **OFFSITE PROPERTY NO.** N/A | | **BILL OF LADING/AIR BILL NO.** N/A |

**PRICE CODE** 8C | **DATA TURNAROUND** 15 Days / 15 Days

**AIR QUALITY** ☐ | **METHOD OF SHIPMENT** FEDERAL EXPRESS

**ORIGINAL**

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

**POSSIBLE SAMPLE HAZARDS/ REMARKS**
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

**SPECIAL HANDLING AND/OR STORAGE**
RADIOACTIVE TIE TO: B31VJ5

| | |
|---|---|
| **PRESERVATION** | None |
| **HOLDING TIME** | None |
| **TYPE OF CONTAINER** | P |
| **NO. OF CONTAINER(S)** | 1 |
| **VOLUME** | 125mL |
| **SAMPLE ANALYSIS** | SEE ITEM (1) IN SPECIAL INSTRUCTIONS |

20150964 ✓
SISM000079 ✓
OMNI
MARS

| SAMPLE NO. | MATRIX* | SAMPLE DATE | SAMPLE TIME | |
|---|---|---|---|---|
| B31VJ6 | SOIL | 8-17-15 | 1004 | ✓ |

**CHAIN OF POSSESSION**

| RELINQUISHED BY/REMOVED FROM | DATE/TIME | RECEIVED BY/STORED IN | DATE/TIME |
|---|---|---|---|
| E.L. Kauer/CHPRC | AUG 17 2015 1334 | 5SU #2 | AUG 17 2015 1334 |
| 5SU #2 | 8/27/15 0940 | L.D. Wall & D. Wall (CHPRC) | 8/27/15 0940 |
| L.D. Wall & D. Wall (CHPRC) | 8/27/15 1024 | T.A. McGlock | 8/27/15 1024 |
| | | | |
| | | | |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt. TRV;-15-113
(1) Moisture Content - D2216; 6010_METALS_ICP: COMMON {Chromium}; 7196_CR6: COMMON; GAMMA_GS: COMMON; C14_LSC: COMMON; AMCMISO_IE_PRECIP_AEA: COMMON; I129_SEP_LEPS_GS: COMMON; PUISO_PLATE_AEA: COMMON; SRTOT_SEP_PRECIP_GPC: COMMON; TC99_EIE_LSC: COMMON; TRITIUM_DIST_LSC: COMMON; UISO_IE_PRECIP_AEA: COMMON;

| | | | |
|---|---|---|---|
| **LABORATORY SECTION** | **RECEIVED BY** | **TITLE** | **DATE/TIME** |
| **FINAL SAMPLE DISPOSITION** | **DISPOSAL METHOD** | **DISPOSED BY** | **DATE/TIME** |

**PRINTED ON** 6/19/2015 | **FSR ID = FSR1273** | **TRVL NUM = TRVL-15-113** | F-6803-618 (REV 2)

OCTOBER 2, 2015

**CH2MHill Plateau Remediation Company** | **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** | **F15-027-171** | **PAGE 1 OF 1**

| | | | |
|---|---|---|---|
| **COLLECTOR** E.L. Kauer/CHPRC | **COMPANY CONTACT** TODAK, D | **TELEPHONE NO.** 376-6427 | **PROJECT COORDINATOR** TODAK, D |
| **SAMPLING LOCATION** C8797, Interval 11 | **PROJECT DESIGNATION** 100-KE Characterization Boreholes - Soil | | **SAF NO.** F15-027 |
| **ICE CHEST NO.** GWS-116 | **FIELD LOGBOOK NO.** HNF-N-645 3 Pg 17 | **ACTUAL SAMPLE DEPTH** 41.8 - 43.7 FT | **COA** 303581 |
| **SHIPPED TO** ~~GEL Laboratories, LLC~~ 222-S RW: 8/27/15 | **OFFSITE PROPERTY NO.** N/A | | **BILL OF LADING/AIR BILL NO.** N/A |

**PRICE CODE** 8C — **DATA TURNAROUND** — **AIR QUALITY** ☐ — 15 Days / 15 Days

**METHOD OF SHIPMENT** FEDERAL EXPRESS

**ORIGINAL**

20150964
SISM000080
OMNI
MARS

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

**POSSIBLE SAMPLE HAZARDS/ REMARKS**
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

**SPECIAL HANDLING AND/OR STORAGE**
RADIOACTIVE TIE TO: B31VK4

| | |
|---|---|
| **PRESERVATION** | None |
| **HOLDING TIME** | None |
| **TYPE OF CONTAINER** | P |
| **NO. OF CONTAINER(S)** | 1 |
| **VOLUME** | 125mL |
| **SAMPLE ANALYSIS** | SEE ITEM (1) IN SPECIAL INSTRUCTIONS |

| SAMPLE NO. | MATRIX* | SAMPLE DATE | SAMPLE TIME | |
|---|---|---|---|---|
| B31VK5 | SOIL | 8-17-15 | 1057 | |

**CHAIN OF POSSESSION** / **SIGN/ PRINT NAMES**

| RELINQUISHED BY/REMOVED FROM | DATE/TIME | RECEIVED BY/STORED IN | DATE/TIME |
|---|---|---|---|
| E.L. Kauer/CHPRC | AUG 17 2015 1371 | 55W #2 | AUG 17 2015 1371 |
| 55W #2 | 8/27/15 0940 | L.D. Kauer/R.D. Wood (CHPRC) | 8/27/15 0940 |
| L.D. Kauer/R.D. Wood (CHPRC) | 8/27/15 1025 | T.M. Todak | 8/27/15 1025 |
| | | | |
| | | | |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**
** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt. TRV;-15-113
(1) Moisture Content - D2216; 6010_METALS_ICP: COMMON {Chromium}; 7196_CR6: COMMON; GAMMA_GS: COMMON; C14_LSC: COMMON; AMCMISO_IE_PRECIP_AEA: COMMON; I129_SEP_LEPS_GS: COMMON; PUISO_PLATE_AEA: COMMON; SRTOT_SEP_PRECIP_GPC: COMMON; TC99_EIE_LSC: COMMON; TRITIUM_DIST_LSC: COMMON; UISO_IE_PRECIP_AEA: COMMON;

| | | | |
|---|---|---|---|
| **LABORATORY SECTION** | **RECEIVED BY** | **TITLE** | **DATE/TIME** |
| **FINAL SAMPLE DISPOSITION** | **DISPOSAL METHOD** | **DISPOSED BY** | **DATE/TIME** |

**PRINTED ON** 6/19/2015 — **FSR ID = FSR1276** — **TRVL NUM = TRVL-15-113** — A-6003-618 (REV 2)

| CH2MHill Plateau Remediation Company | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | | F15-027-192 | PAGE 1 OF 1 |
|---|---|---|---|---|---|
| COLLECTOR: D. Wight | COMPANY CONTACT: TODAK, D | TELEPHONE NO.: 376-6427 | PROJECT COORDINATOR: TODAK, D | PRICE CODE: 8C | DATA TURNAROUND: 15 Days / 15 Days |
| SAMPLING LOCATION: C8797, Interval 18 | PROJECT DESIGNATION: 100-KE Characterization Boreholes - Soil | | SAF NO.: F15-027 | AIR QUALITY: ☐ | |
| ICE CHEST NO.: GWS-116 | FIELD LOGBOOK NO.: HNF-N-645 3-16 | ACTUAL SAMPLE DEPTH: 66.8 → 69.1 FT | COA: 303581 | METHOD OF SHIPMENT: FEDERAL EXPRESS | ORIGINAL |
| SHIPPED TO: ~~GEL Laboratories, LLC~~ 222-S | OFFSITE PROPERTY NO.: N/A | | BILL OF LADING/AIR BILL NO.: N/A | | |

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

**POSSIBLE SAMPLE HAZARDS/ REMARKS**
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

**SPECIAL HANDLING AND/OR STORAGE**
RADIOACTIVE TIE TO: B31VM5

| | |
|---|---|
| PRESERVATION | None |
| HOLDING TIME | None |
| TYPE OF CONTAINER | P |
| NO. OF CONTAINER(S) | 1 |
| VOLUME | 125mL |
| SAMPLE ANALYSIS | SEE ITEM (1) IN SPECIAL INSTRUCTIONS |

20150964 ✓
S15M000078 ✓
OMNI
MARS

| SAMPLE NO. | MATRIX* | SAMPLE DATE | SAMPLE TIME | |
|---|---|---|---|---|
| B31VM6 | SOIL | 8/11/15 ✓ | 1424 ✓ | ✓ |

**CHAIN OF POSSESSION** / **SIGN/ PRINT NAMES**

| RELINQUISHED BY/REMOVED FROM | DATE/TIME | RECEIVED BY/STORED IN | DATE/TIME |
|---|---|---|---|
| D. Wight [signature] | 8/11/15 1500 | SSU#2 | 8/11/15 1500 |
| SSU#2 | 8/27/15 0940 | L.D. WALL (L.D. WALL (CHPRC) | 8/27/15 0940 |
| L.D. WALL (L.D. WALL (CHPRC) | 8/27/15 1025 | TA McGlock [signature] | 8/27/15 1028 ✓ |
| | | | |
| | | | |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**
** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt. TRV;-15-113
(1) Moisture Content - D2216; 6010_METALS_ICP: COMMON {Chromium}; 7196_CR6: COMMON; GAMMA_GS: COMMON; C14_LSC: COMMON; AMCMISO_IE_PRECIP_AEA: COMMON; I129_SEP_LEPS_GS: COMMON; PUISO_PLATE_AEA: COMMON; SRTOT_SEP_PRECIP_GPC: COMMON; TC99_EIE_LSC: COMMON; TRITIUM_DIST_LSC: COMMON; UISO_IE_PRECIP_AEA: COMMON;

| LABORATORY SECTION | RECEIVED BY | TITLE | DATE/TIME |
|---|---|---|---|
| FINAL SAMPLE DISPOSITION | DISPOSAL METHOD | DISPOSED BY | DATE/TIME |

PRINTED ON 6/19/2015 FSR ID = FSR1283 TRVL NUM = TRVL-15-113


4-6003-618 (REV 2)

OCTOBER 2, 2015

**CH2MHill Plateau Remediation Company**

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

F15-027-195 PAGE 1 OF 1

| | | | |
|---|---|---|---|
| **COLLECTOR** E.L. Kauer/CHPRC | **COMPANY CONTACT** TODAK, D | **TELEPHONE NO.** 376-6427 | **PROJECT COORDINATOR** TODAK, D |
| **PRICE CODE** 8C | **DATA TURNAROUND** 15 Days / 15 Days | | |
| **SAMPLING LOCATION** C8797, Interval 19 | **PROJECT DESIGNATION** 100-KE Characterization Boreholes - Soil | **SAF NO.** F15-027 | **AIR QUALITY** ☐ |
| **ICE CHEST NO.** GWS-116 | **FIELD LOGBOOK NO.** HNF-N-645 3 & 17 | **ACTUAL SAMPLE DEPTH** 69.5-70.6 FT | **COA** 303581 |
| **METHOD OF SHIPMENT** FEDERAL EXPRESS | **ORIGINAL** | | |
| **SHIPPED TO** GEL Laboratories, LLC 222-S 8/27/15 | **OFFSITE PROPERTY NO.** N/A | **BILL OF LADING/AIR BILL NO.** N/A | |

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

**POSSIBLE SAMPLE HAZARDS/ REMARKS**
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

| | |
|---|---|
| **PRESERVATION** | None |
| **HOLDING TIME** | None |
| **TYPE OF CONTAINER** | P |
| **NO. OF CONTAINER(S)** | 1 |
| **VOLUME** | 125mL |
| **SAMPLE ANALYSIS** | SEE ITEM (1) IN SPECIAL INSTRUCTIONS |

20150964 ✓
S15M000081 ✓
OMNI
MARS

**SPECIAL HANDLING AND/OR STORAGE**
RADIOACTIVE TIE TO: B31VM8

| SAMPLE NO. | MATRIX* | SAMPLE DATE | SAMPLE TIME | |
|---|---|---|---|---|
| B31VM9 | SOIL | AUG 17 2015 ✓ | 1244 ✓ | ✓ |

**CHAIN OF POSSESSION**

| RELINQUISHED BY/REMOVED FROM | DATE/TIME | RECEIVED BY/STORED IN | DATE/TIME |
|---|---|---|---|
| E.L. Kauer/CHPRC | AUG 17 2015 1735 | SSU #2 | AUG 17 2015 1735 |
| SSU #2 | 8/27/15 0940 | L.D. WALL/D. WALL (CHPRC) | 8/07/15 0940 |
| L.D. WALL/D. WALL (CHPRC) | 8/07/15 1028 | TAM Collock | 8/27/15 1025 |
| | | | |
| | | | |
| | | | |
| | | | |

**SIGN/ PRINT NAMES**

**SPECIAL INSTRUCTIONS**
** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt. TRV;-15-113
(1) Moisture Content - D2216; 6010_METALS_ICP: COMMON {Chromium}; 7196_CR6: COMMON; GAMMA_GS: COMMON; C14_LSC: COMMON; AMCMISO_IE_PRECIP_AEA: COMMON; I129_SEP_LEPS_GS: COMMON; PUISO_PLATE_AEA: COMMON; SRTOT_SEP_PRECIP_GPC: COMMON; TC99_EIE_LSC: COMMON; TRITIUM_DIST_LSC: COMMON; UISO_IE_PRECIP_AEA: COMMON;

| | | | |
|---|---|---|---|
| **LABORATORY SECTION** | **RECEIVED BY** | **TITLE** | **DATE/TIME** |
| **FINAL SAMPLE DISPOSITION** | **DISPOSAL METHOD** | **DISPOSED BY** | **DATE/TIME** |

**PRINTED ON** 6/19/2015 **FSR ID = FSR1284** **TRVL NUM = TRVL-15-113** A-6003-618 (REV 2)

# GENERATOR KNOWLEDGE INFORMATION

1. Chain of Custody Number NA CACN/COA NA Customer Identification Number NA

2. List generator knowledge or description of process that produced sample. Or list description of sample source:
100KE Boreholes

MSDS Available? (•) No ( ) Yes Hanford MSDS No. _____

3. List all waste codes and constituents associated with the waste or media that was sampled, regardless of CERCLA status.

a) Does the sample contain any of the following listed waste codes?

***By checking "unknown" the customer understands that no knowledge is available following a careful search.***

| | List Federal Waste Code(s): | List Constituent(s): | | | |
|---|---|---|---|---|---|
| P Codes: | | | ( ) Yes | (•) No | |
| U Codes: | | | ( ) Yes | (•) No | |
| K Codes: | | | ( ) Yes | (•) No | ( ) Unknown |
| F Codes: | | | ( ) Yes | (•) No | ( ) Unknown |

b) List applicable characteristic waste codes, flash point, pH, constituents, and concentrations as appropriate.

| | | | | | | |
|---|---|---|---|---|---|---|
| D001: | ☐ FP <100°F | ☐ FP ≥100 <140°F | ☐ DOT Oxidizer | ( ) Yes | (•) No | ( ) Unknown |
| D002: | ☐ pH ≤2 | ☐ pH ≥12.5 | ☐ Solid Corrosive (WSC2) | ( ) Yes | (•) No | ( ) Unknown |
| D003: | ☐ Cyanide | ☐ Sulfide | ☐ Water Reactive ☐ Other _____ (i.e., peroxide former, explosive, air reactive) | ( ) Yes | (•) No | ( ) Unknown |
| D004-D043 (Identify applicable waste codes and concentrations): | | | | (•) Yes | ( ) No | ( ) Unknown |

Potential for Chromium >5 mg/L TCLP <75 mg/L TCLP

c) If characteristic, list any known underlying hazardous constituents (UHCs) reasonably expected to be present, and their concentrations that may be present above the LDR treatment standard (40 CFR 268.48):
None

d) List any known Land Disposal Restrictions (LDR) subcategories, if applicable (40 CFR 268.40):
NA

e) List any applicable Washington State dangerous waste codes: (not required if federally regulated)

| | | | | (*State mixture rule for ignitability) | | | |
|---|---|---|---|---|---|---|---|
| WT01: | ( ) Yes | (•) No | ( ) Unknown | WP01: | ( ) Yes | (•) No | ( ) Unknown |
| WT02: | ( ) Yes | (•) No | ( ) Unknown | WP02: | ( ) Yes | (•) No | ( ) Unknown |
| W001: | ( ) Yes | (•) No | ( ) Unknown | WP03: | ( ) Yes | (•) No | ( ) Unknown |
| List constituents and concentrations: | | | | F003:* | ( ) Yes | (•) No | ( ) Unknown |

4. Is this material TSCA regulated for PCBs? ( ) Yes (•) No ( ) Unknown ( ) Analysis Requested

List concentration if applicable: _____

If yes, what is the source of the PCBs? (see TSCA PCB Hanford Site User Guide, DOE/RL-2001-50)

☐ PCB Liquid Waste ☐ PCB Bulk Product Waste ☐ PCB Transformer ≥500 ppm ☐ Unknown
☐ PCB Remediation Waste ☐ PCB R&D Waste ☐ PCB contaminated electrical equipment (capacitor/ballast) <500 ppm
☐ PCB Spill Material ☐ PCB Item ☐ Other PCB Waste (list) _____

5. Is this material TRU? ( ) Yes ( ) No (•) Unknown

6. ACCURACY OF INFORMATION

Based on my inquiry of those individuals immediately responsible for obtaining this information, that to the best of my knowledge, the information entered in this document is true, accurate, and complete.

Print & Sign Bob Cathel Bob Cathel Date 4/29/10



A-6002-990 (REV 1)

Attachment 5

PHOTOGRAPH

S15M000076
B31VF5
S15M000077
01of01
B31VH7
S15M000078
01of01
B31VM6
S15M000079
01of01
S15M000080
01of01
S15M000081
01of01