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**FINAL REPORT FOR THE ARRA SAMPLING OF  
CHEMICALS FROM ROOM 144 ANALYTICAL LAB OF  
BUILDING 234-5Z AT THE PLUTONIUM FINISHING  
PLANT, 2010 - SAMPLE DELIVERY GROUPS  
222S20100687 AND 688**

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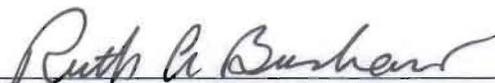


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## 222-S LABORATORY

### FINAL REPORT FOR THE ARRA SAMPLING OF CHEMICALS FROM ROOM 144 ANALYTICAL LAB OF BUILDING 234-5Z AT THE PLUTONIUM FINISHING PLANT, 2010 - SAMPLE DELIVERY GROUPS 222S20100687 AND 688

#### 1.0 INTRODUCTION

This report presents the final results for the 25 samples received between August 19, 2010 and August 30, 2010 from Building 234-5Z at the Plutonium Finishing Plant (PFP). The samples were chemicals collected from Room 144 Analytical Lab. The samples were analyzed in accordance with PFP-LOI-10-0004, *Letter of Instruction for Analysis of Chemicals from Room 144 Analytical Lab of 234-5Z Building* (LOI); Sampling Authorization Forms (SAF) F10-068 and 069; DOE/RL-2004-29, *Sampling and Analysis Plan for the Plutonium Finishing Plant, Above-Grade Structures* (SAP); ATL-MP-1011, *ATL Quality Assurance Project Plan for 222-S Laboratory* (QAPP); SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*; and the additional guidance given by the customer point of contact (POC).

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 Sample Breakdown Diagrams
- Attachment 3 Tentatively Identified Compounds (TIC) Report
- Attachment 4 Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report
- Attachment 5 Surrogate Recoveries
- Attachment 6 Correspondence
- Attachment 7 Receipt Paperwork

#### 2.0 SAMPLE RECEIPT, HANDLING, AND APPEARANCE

Two solid, two organic liquid, and 21 aqueous liquid samples were collected on July 13, 2010 and July 19, 2010, and received at the 222-S Laboratory between August 19 and 30, 2010, in good condition and with adequate paperwork. The customer POC verbally indicated that meeting holding times was not required because of the long delay between sample collection and delivery to the laboratory. Therefore, no holding time report is included in this document.

Solid sample B242B6 contained two small chunks of solids. There was sufficient material to prepare an acid-digested aliquot (using SW-846 Method 3050) and a water leach. The acid digest was used to obtain results for metals by inductively coupled plasma-atomic emission spectroscopy (ICP-AES) and inductively coupled plasma-mass spectrometry (ICP-MS), and all requested radionuclide results. The water leach was used for the requested anions analysis. There was insufficient sample to perform a pH measurement or to perform the mercury analysis.

Solid sample B241X2 appeared to be resin beads. The sample did not completely dissolve in the digestions, so reported results are from the leachable portion of the material on the resin beads.

Samples B24285 and B24298 were identified as organic liquids in a spreadsheet obtained from the customer POC. In addition, during some analyses, sample B24296 behaved like an organic or surfactant material. A pH measurement was obtained on sample B24296, but was not attempted on the other two samples that were identified as organic liquids. The ion chromatography (IC) analysis for anions was not performed on any of these samples.

The laboratory had difficulty performing the ICP and ICP-MS analyses on eight of the liquid samples that were not identified as being organic liquid. Due to the adverse matrix effects, these samples were acid-digested prior to analysis. The digested liquid samples are identified in the sample breakdown diagrams in Attachment 2.

### 3.0 HOLDING TIMES

The samples were collected at least 37 days prior to receipt of the samples at the 222-S Laboratory. Because of this, holding times for nitrate and nitrite (48 hours), chloride and sulfate (28 days), volatile organic analysis (VOA) (14 days), semivolatile organic analysis (SVOA) (14 days), and mercury (28 days) were all missed. The customer was informed of this on August 18, 2010 (see correspondence in Attachment 6). The six-month holding times for metals analysis by ICP and ICP-MS were met.

### 4.0 ANALYTICAL RESULTS SUMMARY

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

The laboratory did not meet the requested detection limits for all metals using the ICP method because of dilutions required to reduce matrix effects or to measure some high concentration analytes in the samples. The metals that missed the detection limit by ICP were analyzed using the ICP-MS method.

For the VOA and SVOA, there were some compounds identified in the samples that were not requested analytes. Non-requested compound results that were calculated using the instrument calibration are included in the Data Summary Report in Attachment 1. Non-requested compound results that were estimated using the National Institute of Standards and Technology (NIST) library or by comparison against spectra of known compounds are considered TICs and are included in Attachment 3.

The "Units" column in Attachment 1 contains the reporting units for the samples. For the solid samples, the units for the blank are not all the same as those for the samples. For anions, metals by ICP and ICP-MS, radionuclides by ICP-MS and mercury, the blank units are  $\mu\text{g/mL}$ . The "Det Limit" column in Attachment 1 contains the method detection limit (MDL) for non-radiochemical analyses or the minimum detectable activity for radionuclides determined by radiochemical methods.

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 solid samples prepared by an acid digest that follows SW-846 Method 3050B.

- “B” indicates liquid samples prepared by an acid digest that follows SW-846 Method 3010A.
- “E” indicates liquid or solid samples prepared by a strong acid digest.
- “O” indicates liquid samples prepared by an extraction or dilution for organic analysis.
- “W” indicates solid samples prepared by a water digest.

Samples without a letter identifier in the “A#” column were analyzed directly with no separate preparation method or with sample preparation performed as a part of the analytical procedure steps.

The “Qual Flags” column in Attachment 1 contains data qualifier flags that are defined as follows:

Inorganic Qualifier flags:

- “B” indicates that the reported result should be considered an estimate because the sample concentration is greater than the MDL but less than the quantitation limit.
- “C” indicates that the analyte was detected in the blank and in the sample, and the blank concentration was greater than 5% of the concentration detected in the sample.
- “M” indicates that the relative percent difference (RPD) between the sample and duplicate results was outside of range listed in the SAP.
- “N” indicates that the MS is outside of range listed in the SAP.
- “U” indicates that the reported result is less than the calculated detection limit.
- “>” indicates that the reported result is outside the calibration range. In this report, this flag is used to indicate that the pH result was <pH 2, which was the low calibration standard value, or greater than 7, which, in some cases, was the high calibration standard.
- “X” is a user defined flag. For this report, this flag was used to indicate a failed serial dilution or a failed laboratory control sample (LCS) recovery was reported for sodium. It was also used to indicate a failed continuing-calibration verification (CCV) standard recovery for chromium. See discussions below.

Radionuclide Qualifier flags:

- “B” indicates that the radionuclide was detected in the blank and in the sample and the blank concentration or activity was greater than 5% of the concentration or activity detected in the sample.
- “U” indicates that the reported result is less than the calculated detection limit.

Organic Qualifier flags in Attachment 1: Data Summary Report:

- “D” indicates that a dilution was required to reduce the sample concentration to be within the calibration range.
- “J” indicates that the reported result should be considered an estimate because it was greater than the MDL but below the quantitation limit.

- “N” indicates a TIC that was matched with the NIST library.
- “P” identifies a TIC that was potentially identified by matching to known spectra of compounds run on the same instrument.
- “T” identifies a matrix spike failure.
- “U” indicates that the reported result is less than the calculated detection limit.
- “X” is a user-defined flag. For this report, this flag is applied to the non-requested acetone results because the recovery of the LCS was outside of the control limits.

Organic Qualifier flags in Attachment 3: TIC Report:

- “J” indicates that the reported result should be considered an estimate because it was greater than the MDL but below the quantitation limit.
- “N” indicates a TIC that was matched with the NIST library.
- “P” identifies a TIC that was potentially identified by matching to known spectra of compounds run on the same instrument.
- “T” identifies a compound as a TIC.

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

## 4.1 INORGANIC ANALYSES

### 4.1.1 pH and Hydrogen Ion Analysis

The pH and hydrogen ion analyses were determined on direct aliquots. The pH LCS measurement and RPD met the acceptance criteria in ATL-MP-1011. This analysis was performed on 19 of the 25 samples received. As stated previously, pH was not measured on solid sample B242B6 due to insufficient material and the two organic liquid samples (B24285 and B24298). In addition, the pH analysis was not performed on the three samples with very high alpha activity (B24290, B24291, and B24297) because of the large sample size required and the hood limitation for alpha sample analysis. For these last three samples, the hydrogen ion concentration was determined in place of the pH measurement.

Results reported as < pH 2 were outside of the calibration range, which was the lower calibration standard value, and “>” flag was applied to the results. The hydrogen ion analysis was performed on these samples. For sample B24286, the pH was reported as 10.48, which was greater than the high calibration standard, and a “>” flag was applied. For this sample, the customer accepted the out-of-range result without reanalysis (see correspondence in Attachment 6).

For the hydrogen ion analysis, the LCS and spike recoveries and the RPDs met the criteria in the SAP. This analysis was performed on 17 of the 25 samples received. It was not performed on the solid samples, the organic liquids, or aqueous samples with a pH > 2. Solid and organic matrices are not applicable for this analysis.

During review of the hydrogen ion data, it was discovered that there were no approved MDLs for this analysis. Typically the lab runs an MDL study and receives approval on the data from a

quality assurance (QA) scientist prior to running samples. In this case, since the method addresses both free  $H^+$  and  $OH^-$ , but is almost exclusively used for  $OH^-$ , it was believed to be fully validated for everything it covers. A set of standards were run and approved by QA after the sample analysis to establish an MDL. It is the Laboratory's opinion that this MDL is representative of the system at the time of the analysis. This was discussed with the customer POC who agreed with the approach and did not request a reanalysis (see correspondence in Attachment 6).

#### **4.1.2 Mercury**

The Hg analysis was performed on acid-digested aliquots. The LCS recoveries, MS recoveries, and RPD met the criteria in the SAP. For one batch of samples, a low level of Hg was detected in the method blank. Since the blank concentration was less than quantitation limit, no reanalysis was required. For samples B24285 and B24287, the concentration in the blank was greater than 5% of the concentration in the samples, so a "C" flag was applied to the sample results. The required detection limit (RDL) in the SAP was met for the one solid sample. However, for the liquid samples, the laboratory was unable to meet the RDL due to the small sample size required due to alpha activity or limited sample amount for performing all requested analyses.

#### **4.1.3 Ion Chromatography**

Ion chromatography analysis was performed on direct aliquots of liquid samples and on water-digested aliquots of the solid samples. As stated previously, this analysis was not performed on the organic liquids.

The LCS and MS recoveries and RPDs met the requirements in the SAP. Low levels of chloride, nitrate, and sulfate were detected in the preparation and method blanks associated with about half of the samples. Since the levels of these analytes in the blanks were below the quantitation limits, no reanalysis was required. For samples with low concentrations of these analytes, the concentration in the blanks was greater than 5% of the sample results and a "C" flag was applied. The results for the affected samples were also "B" flagged to indicate that they should be considered estimates because the concentration was below the quantitation limit. The blank contamination issue was communicated with the customer POC who indicated that "C" flagged result would not affect the use of the data, and no reanalysis was requested (see correspondence in Attachment 6). There were no RDLs listed in the SAP for anions.

#### **4.1.4 Inductively Coupled Plasma-Atomic Emission Spectroscopy**

The ICP-AES analysis was performed on acid-digested aliquots of the solid samples. For the organic liquids, the analysis was performed on a digested aliquot where the sample was ashed prior to digesting with strong acids to ensure organic compounds were broken down and removed. As discussed previously, eight of the other liquid samples exhibited matrix interference when the samples were analyzed with a 2X dilution. These samples were acid-digested using a procedure that follows SW-846 Method 3010C. The remaining aqueous liquid samples were analyzed with an acid dilution.

The requested analytes were aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, nickel, potassium, selenium, silver, sodium, strontium, thallium, vanadium, and zinc. The SAF and the chain of custody forms also requested

uranium. However, this was not listed in the LOI, and total uranium can be closely estimated from the  $^{238}\text{U}$  result reported by ICP-MS. The SAP provided RDLs for barium, beryllium, cadmium, chromium, lead, nickel, and silver. Not all RDLs were met for all samples because of dilutions required based on high concentrations of certain analytes and/or to reduce matrix interference or the requirement to use a smaller sample size due to high alpha activity. Analytes that did not meet the RDL requirement were reanalyzed by ICP-MS.

**Acid-digested solid samples** — For the two solid samples, the LCS recovery met the requirement in the SAP for all reported analytes. No requested analytes were detected in the preparation blank. The RPDs met the requirement in the SAP. The MS recoveries for all analytes, except potassium and sodium met the requirement in the SAP. For sodium, the concentration in the sample was greater than the spike added, so the spike criteria are not applicable. The low MS recovery for potassium is discussed below.

The low level standard (LLS) had low recoveries for chromium (36%) and potassium (35%). The chromium results for both samples (B241X2 and B242B6) were reported as less than the MDL, but this could be due to the low bias indicated by the low LLS recovery. For potassium, the result for B241X2 was sufficiently above the quantitation limit that the low bias indicated by the low LLS recovery did not affect the result. For sample B242B6, the potassium result was less than the MDL, and may be a false non-detect due to the low bias. The MS recovery for potassium was outside of the criteria listed in the SAP, at 62%, possibly due to the low bias. An “N” flag was applied to the potassium results for both samples to indicate the spike failure.

For sodium, the percent difference between the sample and a five-fold serial dilution was 14%, which failed to meet the requirement in the QAPP. A dilution was chosen to obtain the best detection limits for those analytes with RDLs listed in the SAP. Using this dilution, the concentration for sodium was near the upper end of the linear range and the higher solids concentration may have caused a low bias in the sample result. The result for the serial dilution was higher, at  $6.4\text{E}+04$   $\mu\text{g/g}$ . The sample result is flagged with an “X” to indicate this failure.

These issues were reported to the customer POC, who indicated that reported results were acceptable (see correspondence in Attachment 6).

**Ash/acid-digested organic liquid samples** — For the two organic liquid samples (B24285 and B24298), there was insufficient sample available to prepare a duplicate and spike and perform all other requested analyses. Therefore, these samples were prepared in a batch that contained an organic liquid sample from another customer. Because of this, no duplicate or spike results were included in the Data Summary Report in Attachment 1.

The LCS recovery for sodium was 138%, which was outside of the recovery limits of 70% - 130% requested in the SAP. An “X” flag was applied to the sodium result for each sample to indicate the standard recovery failure. The MS recovery for sodium was also outside of the limits at 147% recovery. Sodium and aluminum were detected in the preparation blank. The concentrations of these analytes in the blank were greater than 5% of the results for B24298 and a “C” flag was applied to each result. It is the Laboratory’s opinion that high recoveries and blank contamination are due to sodium and aluminum leaching from the glassware during the digestion with strong acids. A re-preparation and reanalysis would likely cause the same contamination issues. Thallium was inadvertently omitted from the LCS and MS. The recoveries for thallium in the initial calibration verification standard and post-digestion spike

were within the limits in the SAP. These recoveries do not show in the data summary report. The RPDs all met the requirements in the SAP.

The LLS recovery for potassium was low at 51%, which indicates a potential low bias for sample B24298, which was reported as < MDL. For sample B24285, the potassium result was sufficiently above the LLS that the result should not be affected. These issues were presented to the customer POC, and results were accepted without reanalysis (see correspondence in Attachment 6).

**Acid-digested liquid samples** — For eight of the assumed aqueous samples, there was an unknown matrix interference that caused sample uptake issues when analysis was attempted with only an acid dilution. These samples were acid-digested and reanalyzed. The LCS recoveries and RPDs for all reported analytes met the requirement in the SAP. The MS recoveries for all analytes, except antimony, met the requirement in the SAP. For antimony, the recovery was low at 48%. The antimony results for all samples in the batch were flagged with an “N” to indicate the spike failure. This failure may be due to insufficient hydrochloric acid added during the digestion. The sample results were all less than the MDL, but might be biased low. The customer POC indicated that the potential false negative would not affect the use of the data, so the results were accepted (see correspondence in Attachment 6).

The recovery for potassium in the LLS analyzed at the end of the run was low at 62%. The initial LLS recovery was acceptable at 94%, which indicates a potential stability issue by the end of the run. Most samples were all reported as less than the MDL, which might be false negatives. For sample B24292, the sample result was greater than the MDL, but less than the quantitation and was flagged with a “B”. This result might be biased low.

A low level of chromium was detected in the preparation blank. For most samples, chromium was reported from ICP-MS, so this was not an issue. Since the level in the blank was less than the quantitation limit, no reanalysis was required. For sample B24293, the level of chromium in the blank was less than 5% of the sample result, thus no flag was requested.

**Direct analyzed liquid samples** — These samples were actually analyzed using an acid dilution. All LCS recoveries, MS recoveries, and RPDs met the requirements in the SAP. No requested analytes were detected in the blanks.

#### **4.1.5 Inductively Coupled Plasma-Mass Spectrometry**

The ICP-MS analysis was performed on acid-digested aliquots of the solid samples. For the organic liquids, the analysis was performed on a digested aliquot where the sample was ashed prior to digesting with strong acids to ensure organic compounds were broken down and removed. As discussed previously, eight of the other liquid samples exhibited matrix interference when the samples were analyzed with a 2X dilution by ICP. Because of the higher dilution required for the ICP-MS analysis, all of these samples were analyzed with just a dilution for the actinides and six of these eight samples were analyzed with just a dilution for the metals. Samples B24294 and B24296 had significant matrix interference for the ICP-MS metals analysis and were analyzed from the acid digest. These samples were acid-digested using a procedure that follows SW-846 Method 3010C. The remaining aqueous liquid samples were analyzed with an acid dilution.

**Metals analysis** — The SAP provided RDLs for barium, beryllium, cadmium, chromium, lead, nickel, and silver. As stated earlier, not all RDLs were met for all samples using the ICP method and analytes that did not meet the RDL requirement were reanalyzed by ICP-MS. However, some analytes also failed to meet the RDL by ICP-MS because of dilutions required due to high concentrations of other analytes and/or to reduce matrix interference, or small samples sizes required due to high alpha concentrations.

The LCS and spike recoveries all met the requirements in the SAP and the QAPP.

**Sample B24286:** The sample result for chromium was greater than four times the spike added, so the spike criteria were not applicable and an “n/a” was reported instead of the actual spike recovery. The RPD for chromium was greater than 30%, at 33.9%. An “M” flag was applied.

**Sample B24292:** The recovery for chromium in the ending LLS was <70%, which failed to meet the criteria in the QAPP. This indicates a potential low bias for chromium in this sample. The result was flagged with a “B” because it was less than the quantitation limit. The result of 0.0415 µg/mL was much less than the regulatory limit of 5 µg/mL, so it is the Laboratory’s opinion that the potential 30% low bias for this result will not affect the use of the data.

**Samples B24294 and B24296:** Nickel was detected in the preparation blank above the MDL, but less than the quantitation limit, so no reanalysis was required. The blank result was greater than 5% of the sample results, so a “C” flag was applied. The result reported for sample B24294 was only slightly above the RDL; the result reported for B24296 was less than the RDL. These results were presented to the customer POC, who indicated that nickel is not a constituent of concern, and no reanalysis was requested (see correspondence in Attachment 6.)

**Sample B24297:** Barium was detected in the final CCB above the MDL, but less than the quantitation limit, so no reanalysis was required. Since the result in the blank was greater than 5% of the sample results (at 5.1%), a “C” flag was applied. Since the result of 0.181 µg/mL was well below the regulatory limit of 100 µg/mL and the blank was only 0.1% above the allowable criteria, it is the Laboratory’s opinion that the potential high bias indicated by the blank will not affect the use of the data.

**Sample B24299:** The RPD for lead was greater than 30%, but the sample result was less than the quantitation limit, so the criterion was not applicable and no flag was applied.

**Sample B241X2:** The preparation blank contained chromium above the MDL, but below the quantitation limit, so no reanalysis was required. However, the concentration in the blank was greater than 5% of the chromium result for sample B241X2, so a “C” flag was applied.

**Samples B242B4 and B242B8:** The recovery for chromium in the ending CCV was >110%, which failed to meet the criteria in the QAPP. Since a high recovery indicates a potential high bias for sample results, and the results for these samples were less than the MDL, it is the Laboratory’s opinion that there was minimal impact on the use of the data, so the results were reported from this batch. An “X” flag was applied to the chromium results for these two samples to indicate the failed ending CCV.

**Organic liquid samples B24285 and B24298:** The duplicate and MS analyses were performed on another customer’s sample, and the recoveries are not included in Attachment 1. All RPDs and MS recoveries met the requirements in the SAP.

The initial LLS recovery for chromium was greater than 130%, which fails to meet the criteria in the QAPP. This indicates a potential high bias for sample B24285. The result for sample B24298 was sufficiently high that the bias indicated by the high LLS recovery should not affect that result. The LLS at the end of the run met the criteria in the QAPP. Chromium was detected in the initial continuing calibration blank (CCB) above the MDL, but less than the quantitation limit, so no reanalysis was required. The preparation blank result for chromium was greater than the MDL, but less than the quantitation limit, so no re-preparation or reanalysis was required. The preparation blank result was greater than the chromium result for sample B24298 and was approximately 8% of the result for B24285, so a "C" flag was applied to both sample results. The high blanks might be due to the high bias indicated by the high recovery for the initial LLS. The blank was previously analyzed in another analytical batch and was less than the MDL. The results for the two samples from that initial batch were about the same as those reported from the reanalysis batch with the high blank result. However, since the CCV at the end of the initial run failed high, the results could not be reported from that run. Even with the potential high bias indicated by the high blank results, the sample result of 0.420 µg/mL for chromium for sample B24298 was less than the regulatory level of 5 µg/mL. The chromium result for sample B24285 was 10.6 µg/mL. Even if it was corrected for an 8% blank contribution, this result will be greater than the regulatory limit of 5 µg/mL. The preparation blank result for lead was greater than the MDL and the quantitation limit. The lead result in the preparation blank was also higher than the results for both samples and could indicate a false positive result. A "C" flag was applied to the lead results for both samples. Blank results greater than the quantitation limit typically require re-preparation and reanalysis. However, since the lead results for both samples were below the regulatory level of 5 µg/mL, even with the potential high bias, it is the Laboratory's opinion that the potential high bias will not affect the use of the sample results. Nickel was detected in the preparation blank above the MDL, but below the quantitation limit. The blank result was greater than 5% of the result for sample B24298, so a "C" flag was applied. These blank contamination issues were discussed with the customer POC who indicated that the results were acceptable for the use of the data and no reanalysis was requested.

**Actinides analysis** — The requested analytes for the actinides analysis were  $^{237}\text{Np}$ ,  $^{242}\text{Pu}$ ,  $^{233}\text{U}$ ,  $^{234}\text{U}$ ,  $^{235}\text{U}$ , and  $^{238}\text{U}$ . The LCS and MS standards consisted of  $^{237}\text{Np}$ ,  $^{239}\text{Pu}$ ,  $^{235}\text{U}$ , and  $^{238}\text{U}$ . Since  $^{239}\text{Pu}$  was not a requested analyte, it is not included in the data summary report. Most samples met the RDL for  $^{235}\text{U}$  and  $^{238}\text{U}$ . Those that did not meet the RDL had concentrations much greater than the quantitation limit and required a larger dilution. There were eight samples with low concentrations of analytes that required less dilution to meet the RDLs. The other samples failed to meet the RDL because of the large dilutions required based on the high concentrations of actinides or other analytes in the samples.

The LCS recoveries and MS recoveries for all isotopes met the criteria in the SAP. The RPDs all met the requirements in the SAP. All RPDs met the requirements in the SAP and/or QAPP. For sample B24286, the RPD for  $^{234}\text{U}$  was greater than 30%, and for B24290 the RPDs for both  $^{242}\text{Pu}$  and  $^{234}\text{U}$  were greater 30%. However, since the results were less than the quantitation limit, the RPD criteria were not applicable.

For organic liquid samples B24285 and B24298, the duplicate and MS analyses were performed on another customer's sample, and the recoveries are not included in Attachment 1. All RPDs and MS recoveries met the requirements in the SAP.

The initial LLS recovery for  $^{235}\text{U}$  failed high at 130.6% for the batch containing samples B242B6, B241X2, B24293, B242B4, and B242B8. This indicates a possible high bias for

sample B24293. The result for sample B242B6 was much greater than the LLS, so the affect of the high bias should be minimal. The results for the other samples were less than the detection limit and are not affected. The final LLS associated with samples B24280, B24281, B24283, B24288, and B24289 had a low recovery for  $^{235}\text{U}$  at 61%. This indicates a possible low bias for samples B24280 and B24281, which had results approximately 10 times the LLS level. The other sample results should not be affected.

A low level of  $^{234}\text{U}$  was detected in the method blank associated with sample B24287. The concentration in the blank was less than 5% of the sample concentration, so no qualifier flag was required. The blank concentration was also less than the quantitation limit, so no reanalysis was required. A low level of  $^{237}\text{Np}$  was detected in the method blank associated with samples B24279, B24292, B24294, B24295, B24296, B24299, B242B1, and B242B2. For most samples in the batch, the concentration of  $^{237}\text{Np}$  was less than the MDL, so the apparent contamination did not affect the results. For samples B24287 and B24292, the concentration in the blank was greater than 5% of the sample result and a "B" flag was applied. Since the sample concentration was less than the RDL, the use of the result should not be affected. Since the concentration in the blank was below the quantitation limit, no reanalysis was required.

Direct calibration, where a standard containing the isotope and element of interest is used to calibrate the response of the isotope, is the most accurate type of calibration; however, standard reference material is not available for all the isotopes of interest. Concentrations of those isotopes without available standards are estimated based on the instrument's mass-response curve, which is generated by using the intensity/concentration relationship for the available isotope standards. Results estimated in this manner are designated "semi-quantitative." The 222-S Laboratory currently does not have standards available for calibration, calibration checks, or matrix spikes for  $^{242}\text{Pu}$ ,  $^{233}\text{U}$ , or  $^{234}\text{U}$ . The results for these isotopes are all considered semi-quantitative.

## 4.2 RADIOCHEMICAL ANALYSIS

### 4.2.1 Total Alpha/Total Beta

The total alpha/total beta analysis for solid sample B241X2 was performed on acid-digested aliquots using the strong acid digest. For solid sample B242B6, there was insufficient sample to perform the analysis using the strong acid digest, so the analysis was performed using the acid digest that follows SW-846 Method 3050B. The organic liquids were analyzed using the ash/strong acid digest. The remaining liquid samples were analyzed using direct aliquots.

The LCSs and spikes were prepared after the digestion. The LCS recoveries, spike recoveries, and RPDs met the criteria in the SAP. No alpha or beta activity was detected in the method or preparation blanks. For organic liquid samples B24285 and B24298, the duplicate and MS analyses were performed on another customer's sample, and the recoveries are not included in Attachment 1. The RPDs and MS recoveries met the requirements in the SAP.

For most samples, the reported minimum detectable activities (MDA) for gross beta met the RDL requirements in the SAP or the sample results were above the quantitation limit. All alpha results reported below the MDA or quantitation limit met the RDL.

#### 4.2.2 Gamma Energy Analysis

The GEA for solid sample B241X2 was performed on acid-digested aliquots using the strong acid digest. For solid sample B242B6, there was insufficient sample to perform the analysis using the strong acid digest, so the analysis was performed using the acid digest that follows SW-846 Method 3050B. The organic liquids were analyzed using the ash/strong acid digest. The remaining liquid samples were analyzed using direct aliquots. The requested isotopes for GEA were  $^{60}\text{Co}$  and  $^{137}\text{Cs}$ . The LCS recoveries met the criteria in the SAP. No isotopes were detected in the preparation blank. For organic liquid samples B24285 and B24298, the duplicate analysis was performed on another customer's sample, and the RPDs are not included in Attachment 1. The RPDs recoveries met the requirements in the SAP.

For solid sample B241X2, the MDA met the RDL in the SAP. For all other samples, the laboratory was unable to meet the RDL requirements in the SAP. The customer indicated that the missed RDLs would not affect the use of the data (see correspondence in Attachment 6).

#### 4.2.3 Strontium-90

The  $^{90}\text{Sr}$  analysis for solid sample B241X2 was performed on acid-digested aliquots using the strong acid digest. For solid sample B242B6, there was insufficient sample to perform the analysis using the strong acid digest, so the analysis was performed using the acid digest that follows SW-846 Method 3050B. The organic liquids were analyzed using the ash/strong acid digest. The remaining liquid samples were analyzed using direct aliquots.

The LCS recoveries met the criteria in the SAP. For samples with a negative result reported for either the sample or duplicate result, an RPD calculation is not applicable. For sample B24283, the RPD was greater than 30%, but the sample counting uncertainty was greater than 30%, so the criterion was not applicable. For sample B24279, an RPD was not calculated because the duplicate result was below the MDA. For organic liquid samples B24285 and B24298, the duplicate analysis was performed on another customer's sample, and the RPD is not included in Attachment 1. The RPD met the requirements in the SAP.

Solid sample B241X2 was the only sample to meet RDL requirement in the SAP. All others failed to meet the requirement either due to limiting sample size to ensure all analyses could be run or due to limitation based on high alpha activity.

Solid sample B242B6 was analyzed in the same analytical batch as sample B241X2. However, the only preparation blank that was included in the analytical batch was the one prepared for the strong acid digest. Since the SW-846 acid digest blank was not analyzed, the blank result for sample B242B6 is reported as "n/a". The sample result for sample B242B6 had a very high counting uncertainty (863%), and the result should be considered an estimate.

#### 4.2.4 Americium-241

The  $^{241}\text{Am}$  analysis for solid sample B241X2 was performed on acid-digested aliquots using the strong acid digest. For solid sample B242B6, there was insufficient sample to perform the analysis using the strong acid digest, so the analysis was performed using the acid digest that follows SW-846 Method 3050B. The organic liquids were analyzed using the ash/strong acid digest. The remaining liquid samples were analyzed using direct aliquots. The LCS recoveries and RPDs met the criteria in the SAP. For organic liquid samples B24285 and B24298, the

duplicate analysis was performed on another customer's sample, and the RPD is not included in Attachment 1. The RPD met the requirements in the SAP.

No  $^{241}\text{Am}$  activity was detected in the preparation or method blanks. The reported MDAs did not meet the RDL requirement in the SAP because of a small sample size required due to high alpha activity or because of limit sample quantity.

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

The  $^{238}\text{Pu}$  and  $^{239/240}\text{Pu}$  analysis for solid sample B241X2 was performed on acid-digested aliquots using the strong acid digest. For solid sample B242B6, there was insufficient sample to perform the analysis using the strong acid digest, so the analysis was performed using the acid digest that follows SW-846 Method 3050B. The organic liquids were analyzed using the ash/strong acid digest. The remaining liquid samples were analyzed using direct aliquots. The LCS recoveries and RPDs met the criteria in the SAP. For organic liquid samples B24285 and B24298, the duplicate analysis was performed on another customer's sample, and the RPD is not included in Attachment 1. The RPD met the requirements in the SAP.

No  $^{238}\text{Pu}$  or  $^{239/240}\text{Pu}$  activity was detected in the preparation and method blanks. The reported MDAs for only seven samples met the RDL requirement in the SAP. For the other samples, the RDL was missed because of a small sample size required due to high alpha activity or because of limit sample quantity.

### 4.3 ORGANIC ANALYSIS

#### 4.3.1 Volatile Organic Analysis

VOA was performed on a direct aliquot of sample B24285. Because of the high concentration of tributyl phosphate in sample B24298, a very small sample aliquot was diluted in methanol prior to analysis. These samples were identified by the customer POC as organic liquids. This analysis was not requested for any other samples. The only requested compound was carbon tetrachloride.

The LCS recoveries were all within the statistical process control (SPC) limits and the limits in the SAP, except for acetone. The recoveries for vinyl chloride, acetone, and methyl acetate were outside the acceptance limits in the continuing CCV standard. These compounds were not requested, so no reanalysis was requested. No carbon tetrachloride was detected in the blank or the samples.

The MS and MSD recoveries and RPDs between the MS and MSD all met the requirement in the SAP. All surrogate recoveries met the SPC limits. The MS and MSD recoveries and RPD are presented in report included in Attachment 4. Surrogate recoveries are included in Attachment 5.

Acetone, 1-butanol, 2-hexanone, methyl acetate, and toluene were calibrated compounds that were not requested, but were detected in sample B24285. The recovery for acetone was outside of the control limits for the LCS and the result was flagged with an "X". The recoveries for both acetone and methyl acetate were outside of the control limits for the CCV and the results were flagged with a "J". The detected, calibrated compounds were included in the Data Summary Report in Attachment 1. Non-calibrated, TICs were included in Attachment 3.

For sample B24298, toluene and 2-hexanone were detected. These are included in Attachment 1. TICs were also detected and were included in Attachment 3.

#### 4.3.2 Semivolatile Organic Analysis

SVOA was performed on an extracted aliquot for sample B24285 and by dilution in methylene chloride for sample B24298. The analysis was not requested for any other samples. The only requested compound was tributyl phosphate (TBP).

Both samples were identified by the customer POC as organic liquids. Therefore, the first analysis was attempted using a dilution of each sample in methylene chloride. Sample B24285 was chosen for analysis of an MS and MSD. The surrogate, MS, and MSD recoveries all failed to produce acceptable recoveries for this sample, which indicated that the sample matrix was insoluble in methylene chloride. This sample was reanalyzed by extraction. Therefore, there was no MS or MSD recoveries reported in the batch with sample B24298. This information was provided to the customer POC, who indicated that the quality control failures would not affect the use of the data (see correspondence in Attachment 6).

For sample B24298, the LCS recovery for 1,2,4 trichlorobenzene was outside of the SPC limit, but was within the 70% - 130% recovery limits listed in the SAP. No tributyl phosphate was detected in the method blank. The surrogate recoveries are included in Attachment 5. A number of TICs were potentially identified using retention times and reference spectra from known standards that were run on the same instrument. The results were flagged with a "T" to indicate that they are TICs and with a "P" to indicate they were potentially identified by the method discussed above. These and other TICs results were reported in Attachment 3. A "hydrocarbon hump" was observed in the diesel range. Therefore, this sample was analyzed using the NWTPH – Diesel method rather than analyzing for kerosene, as requested.

For sample B24285, the LCS recoveries for 1,2,4 trichlorobenzene and acenaphthene were below the limits of 70% - 130% recovery listed in the SAP, but were within the SPC limits for the method, so no qualifier flag was applied. For the MS and MSD recoveries, all except 2,4-dinitrotoluene and n-nitroso-di-n-propylamine were below the limits of 70% - 130% recovery. With the exception of pyrene in the MS, all were within the SPC limits, so no qualifier flags were applied. A "T" flag was applied to the sample result for pyrene to indicate the spike failure. It is the Laboratory's opinion that the low MS recovery for pyrene was due to a matrix effect from the organic acids that were present in the sample in significant quantities, so a re-extraction and reanalysis was not requested. The MS and MSD recoveries and the RPD are included in Attachment 4. All surrogate recoveries were within the required limits. These are included in Attachment 5. No compounds were detected in the method blank. TIC results are included in Attachment 3. No hydrocarbon TICs were observed, so the request for NWTPH – Kerosene for this sample was cancelled.

#### 4.3.3 NWTH Kerosene/Diesel

The LOI and SAF requested the NWTPH – Kerosene analysis for the two organic liquid samples, if hydrocarbons were identified as TICs in the SVOA. For sample B24285, no hydrocarbons were detected in the SVOA, so this analysis was not performed. For sample B24298, hydrocarbons were detected in the SVOA. A preliminary run for kerosene indicated that the hydrocarbons detected in the sample appeared to be more similar to weathered diesel. Therefore, the sample was reanalyzed using a diesel calibration, LCS, MS, and MSD. Since the

sample contained a very high concentration of TBP, a dilution with methylene chloride was used for the sample preparation, rather than an extraction. The TBP peak eluted within the diesel retention time envelope and required manual subtraction from the total area in the range. Because the TBP peak represented approximately 88% of the total peak area within the diesel range, small variances in the TBP result were likely to lead to a significant error in the calculated diesel concentration. Therefore, the diesel result was “J” flagged. The LCS recovery met the acceptance limits in the test plan and the SAP. The LLS, also referred to as the minimum reporting limit standard, had a high recovery at 171%. It is the Laboratory’s opinion that the diesel concentration in the sample was sufficiently high so as to not be affected by the hump in the chromatogram that caused the high LLS recovery. The MS and MSD recoveries were very high and did not meet the acceptance limits. This could be attributed to the errors associated with subtraction of the TBP peak. However, the concentration of diesel in the sample was more than 4 times the concentration in the spike added, so the criteria are not applicable. The RPD between the MS and MSD met the requirement in the SAP. The MS and MSD recoveries and RPD are included in Attachment 4. All surrogate recoveries were within the required limits. These are included in Attachment 5.

## 5.0 PROCEDURES

Table 2 lists the analytical procedures used for analysis of the PFP A Lab Rm 144 samples.

**Table 1. Analytical Procedures**

Analysis	Preparation Method	Analysis Procedure
<b>Inorganic Analyses</b>		
pH Liquid (9040C) Solid (9045D)	Liquid - Direct Solid – LA-212-105, Rev. H-0	LA-212-106, Rev. H-0-A LA-212-105, Rev. H-0
Hydrogen Ion	Liquid - Direct	LA-211-102, Rev. I-1
Mercury – Cold Vapor Atomic Absorption Liquid (7470A); Solid (7471B)	LA-325-110, Rev. A-0	LA-325-110, Rev. A-0
IC (9056A)	Liquid – Direct Solid - LA-504-101, Rev. M-0	LA-533-107, Rev. I-0 LA-533-115, Rev. J-0
ICP/AES (3010C or 3050B/6010C)	Liquid – Direct or LA-505-158, Rev. J-0 Org. Liq. - LA-544-101, Rev. F-0 Solid - LA-505-163, Rev. G-0	LA-505-161, Rev. J-0-A
ICP/MS: actinides and metals	Liquid – Direct or LA-505-158, Rev. J-0 Org. Liq. - LA-544-101, Rev. F-0 Solid - LA-505-163, Rev. G-0	LA-506-102, Rev. F-1

**Table 2. Analytical Procedures**

Analysis	Preparation Method	Analysis Procedure
<b>Radiochemical Analyses</b>		
Total Alpha/Total Beta	Liquid – LA-508-101, Rev. L-2 Org. Liq. - LA-544-101, Rev. F-0 Solid - LA-544-101, Rev. F-0 and LA-505-163, Rev. G-0	LA-508-101, Rev. L-2
GEA	Liquid – LA-548-121, Rev. I-0 Org. Liq. - LA-544-101, Rev. F-0 Solid - LA-544-101, Rev. F-0 and LA-505-163, Rev. G-0	LA-548-121, Rev. I-0
<sup>90</sup> Sr – Separation/Beta counting	Liquid – LA-220-101, Rev. I-0 Org. Liq. - LA-544-101, Rev. F-0 Solid - LA-544-101, Rev. F-0 and LA-505-163, Rev. G-0	LA-220-104, Rev. I-0 LA-220-101, Rev. I-0 LA-220-103, Rev. J-0
<sup>241</sup> Am – Separation/AEA	Liquid - LA-953-104, Rev. H-1 Org. Liq. - LA-544-101, Rev. F-0 Solid - LA-544-101, Rev. F-0 and LA-505-163, Rev. G-0	LA-953-104, Rev. H-1
<sup>239/240</sup> Pu, <sup>238</sup> Pu – Separation/AEA	Liquid - LA-953-104, Rev. H-1 Org. Liq. - LA-544-101, Rev. F-0 Solid - LA-544-101, Rev. F-0 and LA-505-163, Rev. G-0	LA-953-104, Rev. H-1
<b>Organic Analyses</b>		
VOA (8260C)	Direct	LA-523-118, Rev. H-0
SVOA (8270D)	Dilution: LA-523-149, Rev. A-0 Extraction: LA-523-115, Rev. H-0	LA-523-135, Rev. D-0
NWTPH – Kerosene/Diesel	ATL-2010-TP-117	ATL-2010-TP-117

## 6.0 REFERENCES

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Attachment 1

DATA SUMMARY REPORT

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100687**

**Customer Group or SDG Number: 222S20100687**

**Customer Sample ID: B241X2**

**Sample Portion: Acid Dig**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000377		A	7429-90-5	Aluminum	ug/g	92.2	<0.0300	<11.8	<11.3	n/a	n/a	85.8	11.8	n/a	U
S10M000377		A	7440-38-2	Arsenic	ug/g	93.8	<0.0500	<19.7	<18.8	n/a	n/a	84.1	19.7	n/a	U
S10M000377		A	7440-48-4	Cobalt	ug/g	95.1	<0.0100	<3.94	<3.77	n/a	n/a	87.0	3.94	n/a	U
S10M000377		A	7440-50-8	Copper	ug/g	96.9	<5.00E-03	<1.97	<1.88	n/a	n/a	86.7	1.97	n/a	U
S10M000377		A	7440-09-7	Potassium	ug/g	80.7	<0.500	<197	<188	n/a	n/a	62.3	197	n/a	UN
S10M000377		A	7439-96-5	Manganese	ug/g	93.2	<3.00E-03	<1.18	<1.13	n/a	n/a	84.5	1.18	n/a	U
S10M000377		A	7440-23-5	Sodium	ug/g	103	<0.100	5.62E+04	5.36E+04	5.49E+04	4.76	-427	39.4	n/a	X
S10M000377		A	7440-36-0	Antimony	ug/g	90.9	<0.0500	<19.7	<18.8	n/a	n/a	78.9	19.7	n/a	U
S10M000377		A	7782-49-2	Selenium	ug/g	97.5	<0.100	<39.4	<37.7	n/a	n/a	88.9	39.4	n/a	U
S10M000377		A	7440-24-6	Strontium	ug/g	97.0	<3.00E-03	1.28	<1.13	n/a	n/a	85.5	1.18	n/a	B
S10M000377		A	7440-28-0	Thallium	ug/g	92.5	<0.100	<39.4	<37.7	n/a	n/a	73.1	39.4	n/a	U
S10M000377		A	7440-62-2	Vanadium	ug/g	96.7	<5.00E-03	<1.97	<1.88	n/a	n/a	87.3	1.97	n/a	U
S10M000377		A	7440-66-6	Zinc	ug/g	92.7	<5.00E-03	<1.97	2.01	n/a	n/a	85.5	1.97	n/a	U
S10M000377		A	7440-22-4	Silver	ug/g	105	<2.00E-04	<0.0373	<0.0357	n/a	n/a	102	0.0373	n/a	U
S10M000377		A	7440-39-3	Barium	ug/g	104	<1.60E-03	4.79	4.81	4.80	0.600	101	0.299	n/a	
S10M000377		A	7440-41-7	Beryllium	ug/g	107	<1.80E-03	<0.336	<0.322	n/a	n/a	103	0.336	n/a	U
S10M000377		A	7440-43-9	Cadmium	ug/g	104	<3.00E-04	0.0693	<0.0536	n/a	n/a	102	0.0560	n/a	B
S10M000377		A	7440-47-3	Chromium	ug/g	104	7.05E-03	4.18	4.71	4.44	12.0	98.4	1.31	n/a	CB
S10M000377		A	7439-92-1	Lead	ug/g	98.9	<1.50E-03	<0.280	0.285	n/a	n/a	95.9	0.280	n/a	U
S10M000377		A	7440-02-0	Nickel	ug/g	97.6	<1.20E-03	0.308	<0.214	n/a	n/a	95.7	0.224	n/a	B

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000371			7439-97-6	Mercury	ug/g	108	<1.00E-04	<0.0393	<0.0401	n/a	n/a	99.8	0.0393	n/a	U
S10M000371			PH	pH	unitless	n/a	n/a	11.0	11.1	11.1	0.722	n/a	0.0100	n/a	

**Sample Portion: Water Dig**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
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NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range  
 X - Comment

U - < Det Limit  
 > - WetChem Outside Calibration Range

B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100687**

**Customer Group or SDG Number: 222S20100687**

**Customer Sample ID: B241X2**

**Sample Portion: Water Dig**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000375		W	16984-48-8	Fluoride	ug/g	103	<1.61E-03	1.37	1.36	1.37	0.289	98.7	0.307	n/a	B
S10M000375		W	16887-00-6	Chloride	ug/g	103	0.0135	129	129	129	0.270	99.0	1.90	n/a	
S10M000375		W	14797-65-0	Nitrite	ug/g	101	<0.0192	5.46	4.77	5.11	13.4	97.0	3.66	n/a	B
S10M000375		W	14808-79-8	Sulfate	ug/g	104	<0.0187	8.21	8.86	8.54	7.55	100	3.56	n/a	B
S10M000375		W	338-70-5	Oxalate	ug/g	100	<0.0231	18.7	19.2	18.9	2.53	98.2	4.40	n/a	B
S10M000375		W	14797-55-8	Nitrate	ug/g	104	0.0535	13.3	14.6	14.0	9.25	97.6	3.96	n/a	CB

N - Spike Outside Range  
 X - Comment

U - < Det Limit  
 > - WetChem Outside Calibration Range

B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

NA = Not Analyzed, ND = Not Detected  
 C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100687**

**Customer Group or SDG Number: 222S20100687**

**Customer Sample ID: B242B6**

**Sample Portion: Acid Dig**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000376		A	7440-22-4	Silver	ug/g	83.5	<5.00E-03	<1.08	n/a	n/a	n/a	n/a	1.08	n/a	U
S10M000376		A	7429-90-5	Aluminum	ug/g	92.2	<0.0300	590	n/a	n/a	n/a	n/a	6.46	n/a	
S10M000376		A	7440-38-2	Arsenic	ug/g	93.8	<0.0500	<10.8	n/a	n/a	n/a	n/a	10.8	n/a	U
S10M000376		A	7440-39-3	Barium	ug/g	97.1	<3.00E-03	21.5	n/a	n/a	n/a	n/a	0.646	n/a	
S10M000376		A	7440-41-7	Beryllium	ug/g	103	<1.00E-03	<0.215	n/a	n/a	n/a	n/a	0.215	n/a	U
S10M000376		A	7440-48-4	Cobalt	ug/g	95.1	<0.0100	<2.15	n/a	n/a	n/a	n/a	2.15	n/a	U
S10M000376		A	7440-47-3	Chromium	ug/g	94.2	<5.00E-03	<1.08	n/a	n/a	n/a	n/a	1.08	n/a	U
S10M000376		A	7440-50-8	Copper	ug/g	96.9	<5.00E-03	<1.08	n/a	n/a	n/a	n/a	1.08	n/a	U
S10M000376		A	7440-09-7	Potassium	ug/g	80.7	<0.500	1.33E+03	n/a	n/a	n/a	n/a	108	n/a	N
S10M000376		A	7439-96-5	Manganese	ug/g	93.2	<3.00E-03	1.60	n/a	n/a	n/a	n/a	0.646	n/a	B
S10M000376		A	7440-23-5	Sodium	ug/g	103	<0.100	121	n/a	n/a	n/a	n/a	21.5	n/a	B
S10M000376		A	7439-92-1	Lead	ug/g	92.6	<0.0500	<10.8	n/a	n/a	n/a	n/a	10.8	n/a	U
S10M000376		A	7440-36-0	Antimony	ug/g	90.9	<0.0500	<10.8	n/a	n/a	n/a	n/a	10.8	n/a	U
S10M000376		A	7782-49-2	Selenium	ug/g	97.5	<0.100	<21.5	n/a	n/a	n/a	n/a	21.5	n/a	U
S10M000376		A	7440-24-6	Strontium	ug/g	97.0	<3.00E-03	<0.646	n/a	n/a	n/a	n/a	0.646	n/a	U
S10M000376		A	7440-28-0	Thallium	ug/g	92.5	<0.100	<21.5	n/a	n/a	n/a	n/a	21.5	n/a	U
S10M000376		A	7440-62-2	Vanadium	ug/g	96.7	<5.00E-03	<1.08	n/a	n/a	n/a	n/a	1.08	n/a	U
S10M000376		A	7440-66-6	Zinc	ug/g	92.7	<5.00E-03	7.57	n/a	n/a	n/a	n/a	1.08	n/a	B
S10M000376		A	7440-43-9	Cadmium	ug/g	104	<3.00E-04	<0.0323	n/a	n/a	n/a	n/a	0.0323	n/a	U
S10M000376		A	7440-02-0	Nickel	ug/g	97.6	<1.20E-03	0.930	n/a	n/a	n/a	n/a	0.129	n/a	B

**Sample Portion: Water Dig**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000374		W	16984-48-8	Fluoride	ug/g	103	<1.61E-03	47.1	n/a	n/a	n/a	n/a	15.3	n/a	B
S10M000374		W	16887-00-6	Chloride	ug/g	103	0.0135	<94.9	n/a	n/a	n/a	n/a	94.9	n/a	U
S10M000374		W	14797-65-0	Nitrite	ug/g	101	<0.0192	<182	n/a	n/a	n/a	n/a	182	n/a	U
S10M000374		W	14808-79-8	Sulfate	ug/g	104	<0.0187	521	n/a	n/a	n/a	n/a	178	n/a	B
S10M000374		W	338-70-5	Oxalate	ug/g	100	<0.0231	<220	n/a	n/a	n/a	n/a	220	n/a	U

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range  
 X - Comment

U - < Det Limit  
 > - WetChem Outside Calibration Range

B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes**  
**PFP A Lab Rm 144**  
**Data Summary Report**

**Sample Group: 20100687**

**Customer Group or SDG Number: 222S20100687**

**Customer Sample ID: B242B6**

**Sample Portion: Water Dig**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000374		W	14797-55-8	Nitrate	ug/g	104	0.0535	1.24E+05	n/a	n/a	n/a	n/a	198	n/a	

N - Spike Outside Range  
X - Comment

U - < Det Limit  
> - WetChem Outside Calibration Range

B - Inorganic Estimated  
M - Inorganic RPD Outside Range

NA = Not Analyzed, ND = Not Detected  
C - Inorganic Blank Contamination

**Inorganic Analytes**  
**PFP A Lab Rm 144**  
**Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24279**

**Sample Portion: Acid Digest**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000479		B	7429-90-5	Aluminum	ug/mL	83.4	<0.0300	<0.150	n/a	n/a	n/a	n/a	0.150	n/a	U
S10M000479		B	7440-38-2	Arsenic	ug/mL	82.8	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000479		B	7440-41-7	Beryllium	ug/mL	91.8	<1.00E-03	8.02E-03	n/a	n/a	n/a	n/a	5.00E-03	n/a	B
S10M000479		B	7440-43-9	Cadmium	ug/mL	81.3	<5.00E-03	2.31	n/a	n/a	n/a	n/a	0.0250	n/a	
S10M000479		B	7440-48-4	Cobalt	ug/mL	82.3	<0.0100	<0.0500	n/a	n/a	n/a	n/a	0.0500	n/a	U
S10M000479		B	7440-50-8	Copper	ug/mL	89.9	<5.00E-03	0.419	n/a	n/a	n/a	n/a	0.0250	n/a	
S10M000479		B	7440-09-7	Potassium	ug/mL	76.7	<0.500	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000479		B	7439-96-5	Manganese	ug/mL	82.1	<3.00E-03	<0.0150	n/a	n/a	n/a	n/a	0.0150	n/a	U
S10M000479		B	7440-23-5	Sodium	ug/mL	91.9	<0.100	1.75	n/a	n/a	n/a	n/a	0.500	n/a	B
S10M000479		B	7439-92-1	Lead	ug/mL	81.4	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000479		B	7440-36-0	Antimony	ug/mL	80.1	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	UN
S10M000479		B	7782-49-2	Selenium	ug/mL	87.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000479		B	7440-24-6	Strontium	ug/mL	88.5	<3.00E-03	<0.0150	n/a	n/a	n/a	n/a	0.0150	n/a	U
S10M000479		B	7440-28-0	Thallium	ug/mL	90.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000479		B	7440-62-2	Vanadium	ug/mL	85.1	<5.00E-03	<0.0250	n/a	n/a	n/a	n/a	0.0250	n/a	U
S10M000479		B	7440-66-6	Zinc	ug/mL	82.2	<5.00E-03	1.77	n/a	n/a	n/a	n/a	0.0250	n/a	

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000395			7439-97-6	Mercury	ug/mL	102	<1.00E-04	<2.00E-03	<2.00E-03	n/a	n/a	82.8	2.00E-03	n/a	U
S10M000395			16984-48-8	Fluoride	ug/mL	97.5	<6.16E-03	<0.123	<0.123	n/a	n/a	86.4	0.123	n/a	U
S10M000395			16887-00-6	Chloride	ug/mL	101	0.0191	0.469	0.370	0.420	23.7	101	0.0620	n/a	CB
S10M000395			14797-65-0	Nitrite	ug/mL	95.8	<0.0400	<0.800	<0.800	n/a	n/a	91.4	0.800	n/a	U
S10M000395			14797-55-8	Nitrate	ug/mL	98.3	<0.0162	<0.324	<0.324	n/a	n/a	92.6	0.324	n/a	U
S10M000395			14808-79-8	Sulfate	ug/mL	104	<0.0219	0.766	0.854	0.810	10.8	103	0.438	n/a	B
S10M000395			338-70-5	Oxalate	ug/mL	98.9	<0.105	<2.10	<2.10	n/a	n/a	101	2.10	n/a	U
S10M000395			7440-22-4	Silver	ug/mL	103	<2.00E-06	<8.00E-04	n/a	n/a	n/a	n/a	8.00E-04	n/a	U
S10M000395			7440-39-3	Barium	ug/mL	102	<1.60E-05	<6.40E-03	n/a	n/a	n/a	n/a	6.40E-03	n/a	U

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range  
 X - Comment

U - < Det Limit  
 > - WetChem Outside Calibration Range

B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24279**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000395			7440-47-3	Chromium	ug/mL	99.3	<7.00E-05	0.481	n/a	n/a	n/a	n/a	0.0280	n/a	
S10M000395			7440-02-0	Nickel	ug/mL	98.5	<1.20E-05	<4.80E-03	<4.80E-03	n/a	n/a	99.8	4.80E-03	n/a	U
S10M000395			PH	pH	unitless	n/a	n/a	3.48	n/a	n/a	n/a	n/a	0.0100	n/a	

N - Spike Outside Range  
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 M - Inorganic RPD Outside Range

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 C - Inorganic Blank Contamination

**Inorganic Analytes**  
**PFP A Lab Rm 144**  
**Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24280**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000386			7439-97-6	Mercury	ug/mL	105	<1.00E-04	2.06E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	B
S10M000386				Hydrogren Ion	M	94.4	<1.00E-04	3.49	3.54	3.52	1.42	102	0.0100	n/a	
S10M000386			16984-48-8	Fluoride	ug/mL	99.0	<6.16E-03	55.0	n/a	n/a	n/a	n/a	6.16	n/a	B
S10M000386			16887-00-6	Chloride	ug/mL	104	0.0126	688	n/a	n/a	n/a	n/a	3.10	n/a	
S10M000386			14797-65-0	Nitrite	ug/mL	96.6	<0.0400	<40.0	n/a	n/a	n/a	n/a	40.0	n/a	U
S10M000386			14797-55-8	Nitrate	ug/mL	98.8	0.0198	5.24E+04	n/a	n/a	n/a	n/a	162	n/a	
S10M000386			14808-79-8	Sulfate	ug/mL	105	0.0891	1.49E+05	n/a	n/a	n/a	n/a	219	n/a	
S10M000386			338-70-5	Oxalate	ug/mL	101	<0.105	<105	n/a	n/a	n/a	n/a	105	n/a	U
S10M000386			7429-90-5	Aluminum	ug/mL	101	<0.0300	621	n/a	n/a	n/a	n/a	7.50	n/a	
S10M000386			7440-38-2	Arsenic	ug/mL	104	<0.0500	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000386			7440-48-4	Cobalt	ug/mL	100	<0.0100	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000386			7440-47-3	Chromium	ug/mL	101	<5.00E-03	61.0	n/a	n/a	n/a	n/a	1.25	n/a	
S10M000386			7440-50-8	Copper	ug/mL	102	<5.00E-03	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000386			7440-09-7	Potassium	ug/mL	107	<0.500	<125	n/a	n/a	n/a	n/a	125	n/a	U
S10M000386			7439-96-5	Manganese	ug/mL	98.7	<3.00E-03	<0.750	n/a	n/a	n/a	n/a	0.750	n/a	U
S10M000386			7440-23-5	Sodium	ug/mL	95.1	<0.100	3.35E+03	n/a	n/a	n/a	n/a	25.0	n/a	
S10M000386			7440-36-0	Antimony	ug/mL	100	<0.0500	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000386			7782-49-2	Selenium	ug/mL	103	<0.100	<25.0	n/a	n/a	n/a	n/a	25.0	n/a	U
S10M000386			7440-24-6	Strontium	ug/mL	101	<3.00E-03	<0.750	n/a	n/a	n/a	n/a	0.750	n/a	U
S10M000386			7440-28-0	Thallium	ug/mL	102	<0.100	<25.0	n/a	n/a	n/a	n/a	25.0	n/a	U
S10M000386			7440-62-2	Vanadium	ug/mL	101	<5.00E-03	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000386			7440-66-6	Zinc	ug/mL	99.1	<5.00E-03	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000386			7440-22-4	Silver	ug/mL	101	<2.00E-06	0.0243	n/a	n/a	n/a	n/a	8.00E-04	n/a	
S10M000386			7440-39-3	Barium	ug/mL	100	<1.60E-05	0.0331	n/a	n/a	n/a	n/a	0.0200	n/a	B
S10M000386			7440-41-7	Beryllium	ug/mL	103	<1.80E-05	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000386			7440-43-9	Cadmium	ug/mL	101	<9.00E-06	<3.60E-03	n/a	n/a	n/a	n/a	3.60E-03	n/a	U
S10M000386			7439-92-1	Lead	ug/mL	98.1	<1.50E-05	<6.00E-03	n/a	n/a	n/a	n/a	6.00E-03	n/a	U
S10M000386			7440-02-0	Nickel	ug/mL	97.7	<1.20E-05	0.374	n/a	n/a	n/a	n/a	6.00E-03	n/a	

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B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes**  
**PFP A Lab Rm 144**  
**Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24280**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000386			PH	pH	unitless	n/a	n/a	<2.00	<2.00	n/a	n/a	n/a	2.00	n/a	>

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**Inorganic Analytes**  
**PFP A Lab Rm 144**  
**Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24281**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000387			7439-97-6	Mercury	ug/mL	100	1.05E-04	<2.00E-03	<2.00E-03	n/a	n/a	95.8	2.00E-03	n/a	U
S10M000387				Hydrogren Ion	M	94.4	<1.00E-04	4.65	n/a	n/a	n/a	n/a	0.0100	n/a	
S10M000387			16984-48-8	Fluoride	ug/mL	99.0	<6.16E-03	85.7	n/a	n/a	n/a	n/a	6.16	n/a	
S10M000387			16887-00-6	Chloride	ug/mL	104	0.0126	5.97E+03	n/a	n/a	n/a	n/a	31.0	n/a	
S10M000387			14797-65-0	Nitrite	ug/mL	96.6	<0.0400	<40.0	n/a	n/a	n/a	n/a	40.0	n/a	U
S10M000387			14797-55-8	Nitrate	ug/mL	98.8	0.0198	2.58E+05	n/a	n/a	n/a	n/a	1.62E+03	n/a	
S10M000387			14808-79-8	Sulfate	ug/mL	105	0.0891	1.30E+04	n/a	n/a	n/a	n/a	21.9	n/a	
S10M000387			338-70-5	Oxalate	ug/mL	101	<0.105	<105	n/a	n/a	n/a	n/a	105	n/a	U
S10M000387			7429-90-5	Aluminum	ug/mL	101	<0.0300	1.00	n/a	n/a	n/a	n/a	0.750	n/a	B
S10M000387			7440-38-2	Arsenic	ug/mL	104	<0.0500	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000387			7440-48-4	Cobalt	ug/mL	100	<0.0100	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000387			7440-50-8	Copper	ug/mL	102	<5.00E-03	<0.125	n/a	n/a	n/a	n/a	0.125	n/a	U
S10M000387			7440-09-7	Potassium	ug/mL	107	<0.500	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000387			7439-96-5	Manganese	ug/mL	98.7	<3.00E-03	0.144	n/a	n/a	n/a	n/a	0.0750	n/a	B
S10M000387			7440-23-5	Sodium	ug/mL	95.1	<0.100	11.0	n/a	n/a	n/a	n/a	2.50	n/a	
S10M000387			7440-36-0	Antimony	ug/mL	100	<0.0500	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000387			7782-49-2	Selenium	ug/mL	103	<0.100	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000387			7440-24-6	Strontium	ug/mL	101	<3.00E-03	<0.0750	n/a	n/a	n/a	n/a	0.0750	n/a	U
S10M000387			7440-28-0	Thallium	ug/mL	102	<0.100	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000387			7440-62-2	Vanadium	ug/mL	101	<5.00E-03	<0.125	n/a	n/a	n/a	n/a	0.125	n/a	U
S10M000387			7440-66-6	Zinc	ug/mL	99.1	<5.00E-03	<0.125	n/a	n/a	n/a	n/a	0.125	n/a	U
S10M000387			7440-22-4	Silver	ug/mL	101	<2.00E-06	0.392	n/a	n/a	n/a	n/a	8.00E-04	n/a	
S10M000387			7440-39-3	Barium	ug/mL	100	<1.60E-05	0.0296	n/a	n/a	n/a	n/a	6.40E-03	n/a	B
S10M000387			7440-41-7	Beryllium	ug/mL	103	<1.80E-05	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000387			7440-43-9	Cadmium	ug/mL	101	<9.00E-06	<3.60E-03	n/a	n/a	n/a	n/a	3.60E-03	n/a	U
S10M000387			7440-47-3	Chromium	ug/mL	101	<7.00E-05	0.0388	n/a	n/a	n/a	n/a	0.0280	n/a	B
S10M000387			7439-92-1	Lead	ug/mL	98.1	<1.50E-05	<6.00E-03	n/a	n/a	n/a	n/a	6.00E-03	n/a	U
S10M000387			7440-02-0	Nickel	ug/mL	97.7	<1.20E-05	0.0310	n/a	n/a	n/a	n/a	6.00E-03	n/a	B

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 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24281**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000387			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

N - Spike Outside Range  
 X - Comment

U - < Det Limit  
 > - WetChem Outside Calibration Range

B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

NA = Not Analyzed, ND = Not Detected  
 C - Inorganic Blank Contamination

**Inorganic Analytes**  
**PFP A Lab Rm 144**  
**Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24283**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000388			7439-97-6	Mercury	ug/mL	100	1.05E-04	<2.00E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	U
S10M000388				Hydrogren Ion	M	94.4	<1.00E-04	0.180	n/a	n/a	n/a	n/a	5.00E-03	n/a	
S10M000388			16984-48-8	Fluoride	ug/mL	99.0	<6.16E-03	<6.16	<61.6	n/a	n/a	96.7	6.16	n/a	U
S10M000388			16887-00-6	Chloride	ug/mL	104	0.0126	1.20E+04	1.19E+04	1.20E+04	0.645	94.5	31.0	n/a	
S10M000388			14797-65-0	Nitrite	ug/mL	96.6	<0.0400	<40.0	<400	n/a	n/a	101	40.0	n/a	U
S10M000388			14797-55-8	Nitrate	ug/mL	98.8	0.0198	31.9	31.8	31.9	0.309	95.4	16.2	n/a	CB
S10M000388			14808-79-8	Sulfate	ug/mL	105	0.0891	93.9	102	98.0	8.48	102	21.9	n/a	CB
S10M000388			338-70-5	Oxalate	ug/mL	101	<0.105	<1.05E+02	<1.05E+03	n/a	n/a	98.2	105	n/a	U
S10M000388			7429-90-5	Aluminum	ug/mL	101	<0.0300	0.591	n/a	n/a	n/a	n/a	0.300	n/a	B
S10M000388			7440-38-2	Arsenic	ug/mL	104	<0.0500	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000388			7440-48-4	Cobalt	ug/mL	100	<0.0100	<0.100	n/a	n/a	n/a	n/a	0.100	n/a	U
S10M000388			7440-50-8	Copper	ug/mL	102	<5.00E-03	0.136	n/a	n/a	n/a	n/a	0.0500	n/a	B
S10M000388			7440-09-7	Potassium	ug/mL	107	<0.500	<5.00	n/a	n/a	n/a	n/a	5.00	n/a	U
S10M000388			7439-96-5	Manganese	ug/mL	98.7	<3.00E-03	0.0364	n/a	n/a	n/a	n/a	0.0300	n/a	B
S10M000388			7440-23-5	Sodium	ug/mL	95.1	<0.100	1.65	n/a	n/a	n/a	n/a	1.00	n/a	B
S10M000388			7440-36-0	Antimony	ug/mL	100	<0.0500	1.97	n/a	n/a	n/a	n/a	0.500	n/a	B
S10M000388			7782-49-2	Selenium	ug/mL	103	<0.100	<1.00	n/a	n/a	n/a	n/a	1.00	n/a	U
S10M000388			7440-24-6	Strontium	ug/mL	101	<3.00E-03	<0.0300	n/a	n/a	n/a	n/a	0.0300	n/a	U
S10M000388			7440-28-0	Thallium	ug/mL	102	<0.100	<1.00	n/a	n/a	n/a	n/a	1.00	n/a	U
S10M000388			7440-62-2	Vanadium	ug/mL	101	<5.00E-03	<0.0500	n/a	n/a	n/a	n/a	0.0500	n/a	U
S10M000388			7440-66-6	Zinc	ug/mL	99.1	<5.00E-03	<0.0500	n/a	n/a	n/a	n/a	0.0500	n/a	U
S10M000388			7440-22-4	Silver	ug/mL	101	<2.00E-06	<8.00E-04	n/a	n/a	n/a	n/a	8.00E-04	n/a	U
S10M000388			7440-39-3	Barium	ug/mL	100	<1.60E-05	<6.40E-03	n/a	n/a	n/a	n/a	6.40E-03	n/a	U
S10M000388			7440-41-7	Beryllium	ug/mL	103	<1.80E-05	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000388			7440-43-9	Cadmium	ug/mL	101	<9.00E-06	9.08E-03	n/a	n/a	n/a	n/a	3.60E-03	n/a	B
S10M000388			7440-47-3	Chromium	ug/mL	101	<7.00E-05	3.44	n/a	n/a	n/a	n/a	0.0280	n/a	
S10M000388			7439-92-1	Lead	ug/mL	98.1	<1.50E-05	0.0346	n/a	n/a	n/a	n/a	6.00E-03	n/a	B
S10M000388			7440-02-0	Nickel	ug/mL	97.7	<1.20E-05	0.336	n/a	n/a	n/a	n/a	6.00E-03	n/a	

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range  
 X - Comment

U - < Det Limit  
 > - WetChem Outside Calibration Range

B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes**  
**PFP A Lab Rm 144**  
**Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24283**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000388			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

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**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24285**

**Sample Portion: Env Dig**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000384		E	7429-90-5	Aluminum	ug/mL	99.4	18.2	4.09E+03	n/a	n/a	n/a	n/a	3.75	n/a	
S10M000384		E	7440-38-2	Arsenic	ug/mL	92.5	<6.25	<6.25	n/a	n/a	n/a	n/a	6.25	n/a	U
S10M000384		E	7440-48-4	Cobalt	ug/mL	93.9	<1.25	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000384		E	7440-50-8	Copper	ug/mL	95.0	<0.625	<0.625	n/a	n/a	n/a	n/a	0.625	n/a	U
S10M000384		E	7440-09-7	Potassium	ug/mL	81.2	<62.5	9.31E+03	n/a	n/a	n/a	n/a	62.5	n/a	
S10M000384		E	7439-96-5	Manganese	ug/mL	92.5	<0.375	0.865	n/a	n/a	n/a	n/a	0.375	n/a	B
S10M000384		E	7440-23-5	Sodium	ug/mL	138	32.6	759	n/a	n/a	n/a	n/a	12.5	n/a	X
S10M000384		E	7440-36-0	Antimony	ug/mL	86.7	<6.25	<6.25	n/a	n/a	n/a	n/a	6.25	n/a	U
S10M000384		E	7782-49-2	Selenium	ug/mL	89.5	<12.5	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000384		E	7440-24-6	Strontium	ug/mL	95.8	<0.375	0.736	n/a	n/a	n/a	n/a	0.375	n/a	B
S10M000384		E	7440-28-0	Thallium	ug/mL	n/a	<12.5	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000384		E	7440-62-2	Vanadium	ug/mL	95.7	<0.625	<0.625	n/a	n/a	n/a	n/a	0.625	n/a	U
S10M000384		E	7440-66-6	Zinc	ug/mL	93.0	<0.625	40.2	n/a	n/a	n/a	n/a	0.625	n/a	
S10M000384		E	7440-22-4	Silver	ug/mL	85.2	<0.0100	<0.0100	n/a	n/a	n/a	n/a	0.0100	n/a	U
S10M000384		E	7440-39-3	Barium	ug/mL	102	<1.60E-03	6.34	6.32	6.33	0.455	99.0	0.200	n/a	
S10M000384		E	7440-41-7	Beryllium	ug/mL	105	<1.80E-03	<0.225	<0.225	n/a	n/a	105	0.225	n/a	U
S10M000384		E	7440-43-9	Cadmium	ug/mL	102	<6.00E-04	<0.0750	<0.0750	n/a	n/a	99.5	0.0750	n/a	U
S10M000384		E	7440-47-3	Chromium	ug/mL	104	0.869	10.6	n/a	n/a	n/a	n/a	0.0875	n/a	C
S10M000384		E	7439-92-1	Lead	ug/mL	99.2	1.12	0.885	n/a	n/a	n/a	n/a	0.0388	n/a	C
S10M000384		E	7440-02-0	Nickel	ug/mL	95.2	0.104	11.6	n/a	n/a	n/a	n/a	0.0150	n/a	

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000378			7439-97-6	Mercury	ug/mL	100	1.05E-04	4.50E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	CB

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U - < Det Limit  
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B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24286**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000389			7439-97-6	Mercury	ug/mL	100	1.05E-04	<2.00E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	U
S10M000389			16984-48-8	Fluoride	ug/mL	99.0	<6.16E-03	<6.16	n/a	n/a	n/a	n/a	6.16	n/a	U
S10M000389			16887-00-6	Chloride	ug/mL	104	0.0126	19.4	n/a	n/a	n/a	n/a	3.10	n/a	CB
S10M000389			14797-65-0	Nitrite	ug/mL	96.6	<0.0400	<40.0	n/a	n/a	n/a	n/a	40.0	n/a	U
S10M000389			14797-55-8	Nitrate	ug/mL	98.8	0.0198	24.1	n/a	n/a	n/a	n/a	16.2	n/a	CB
S10M000389			14808-79-8	Sulfate	ug/mL	105	0.0891	109	n/a	n/a	n/a	n/a	21.9	n/a	CB
S10M000389			338-70-5	Oxalate	ug/mL	101	<0.105	<105	n/a	n/a	n/a	n/a	105	n/a	
S10M000389			7429-90-5	Aluminum	ug/mL	95.6	<0.0300	<7.50	n/a	n/a	n/a	n/a	7.50	n/a	U
S10M000389			7440-38-2	Arsenic	ug/mL	104	<0.0500	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000389			7440-48-4	Cobalt	ug/mL	94.5	<0.0100	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000389			7440-50-8	Copper	ug/mL	98.5	<5.00E-03	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000389			7440-09-7	Potassium	ug/mL	99.5	<0.500	<125	n/a	n/a	n/a	n/a	125	n/a	U
S10M000389			7439-96-5	Manganese	ug/mL	93.7	<3.00E-03	<0.750	n/a	n/a	n/a	n/a	0.750	n/a	U
S10M000389			7440-23-5	Sodium	ug/mL	93.1	<0.100	7.11E+04	n/a	n/a	n/a	n/a	25.0	n/a	
S10M000389			7440-36-0	Antimony	ug/mL	96.0	<0.0500	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000389			7782-49-2	Selenium	ug/mL	111	<0.100	<25.0	n/a	n/a	n/a	n/a	25.0	n/a	U
S10M000389			7440-24-6	Strontium	ug/mL	97.5	<3.00E-03	<0.750	n/a	n/a	n/a	n/a	0.750	n/a	U
S10M000389			7440-28-0	Thallium	ug/mL	99.5	<0.100	<25.0	n/a	n/a	n/a	n/a	25.0	n/a	U
S10M000389			7440-62-2	Vanadium	ug/mL	96.8	<5.00E-03	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000389			7440-66-6	Zinc	ug/mL	94.0	<5.00E-03	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000389			7440-22-4	Silver	ug/mL	101	<2.00E-06	<8.00E-04	<8.00E-04	n/a	n/a	93.9	8.00E-04	n/a	U
S10M000389			7440-39-3	Barium	ug/mL	100	<1.60E-05	0.0359	0.0372	0.0365	3.75	106	0.0200	n/a	B
S10M000389			7440-41-7	Beryllium	ug/mL	103	<1.80E-05	<7.20E-03	<7.20E-03	n/a	n/a	94.1	7.20E-03	n/a	U
S10M000389			7440-43-9	Cadmium	ug/mL	101	<9.00E-06	<3.60E-03	<3.60E-03	n/a	n/a	93.8	3.60E-03	n/a	U
S10M000389			7440-47-3	Chromium	ug/mL	101	<7.00E-05	2.01	2.83	2.42	33.9	n/a	0.0280	n/a	M
S10M000389			7439-92-1	Lead	ug/mL	98.1	<1.50E-05	<6.00E-03	<6.00E-03	n/a	n/a	106	6.00E-03	n/a	U
S10M000389			7440-02-0	Nickel	ug/mL	97.7	<1.20E-05	6.88E-03	<3.00E-03	n/a	n/a	88.8	3.00E-03	n/a	B
S10M000389			PH	pH	unitless	n/a	n/a	10.5	10.5	10.5	0.191	n/a	0.0100	n/a	>

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U - < Det Limit  
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B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24287**

**Sample Portion: Acid Digest**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000480		B	7429-90-5	Aluminum	ug/mL	83.4	<0.0300	0.814	n/a	n/a	n/a	n/a	0.462	n/a	B
S10M000480		B	7440-38-2	Arsenic	ug/mL	82.8	<0.0500	<0.769	n/a	n/a	n/a	n/a	0.769	n/a	U
S10M000480		B	7440-48-4	Cobalt	ug/mL	82.3	<0.0100	<0.154	n/a	n/a	n/a	n/a	0.154	n/a	U
S10M000480		B	7440-50-8	Copper	ug/mL	89.9	<5.00E-03	<0.0769	n/a	n/a	n/a	n/a	0.0769	n/a	U
S10M000480		B	7440-09-7	Potassium	ug/mL	76.7	<0.500	<7.69	n/a	n/a	n/a	n/a	7.69	n/a	U
S10M000480		B	7439-96-5	Manganese	ug/mL	82.1	<3.00E-03	<0.0462	n/a	n/a	n/a	n/a	0.0462	n/a	U
S10M000480		B	7440-23-5	Sodium	ug/mL	91.9	<0.100	29.0	n/a	n/a	n/a	n/a	1.54	n/a	
S10M000480		B	7440-36-0	Antimony	ug/mL	80.1	<0.0500	<0.769	n/a	n/a	n/a	n/a	0.769	n/a	UN
S10M000480		B	7782-49-2	Selenium	ug/mL	87.5	<0.100	<1.54	n/a	n/a	n/a	n/a	1.54	n/a	U
S10M000480		B	7440-24-6	Strontium	ug/mL	88.5	<3.00E-03	0.0635	n/a	n/a	n/a	n/a	0.0462	n/a	B
S10M000480		B	7440-28-0	Thallium	ug/mL	90.5	<0.100	<1.54	n/a	n/a	n/a	n/a	1.54	n/a	U
S10M000480		B	7440-62-2	Vanadium	ug/mL	85.1	<5.00E-03	<0.0769	n/a	n/a	n/a	n/a	0.0769	n/a	U
S10M000480		B	7440-66-6	Zinc	ug/mL	82.2	<5.00E-03	0.0839	n/a	n/a	n/a	n/a	0.0769	n/a	B

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000396			7439-97-6	Mercury	ug/mL	100	1.05E-04	0.0414	n/a	n/a	n/a	n/a	0.0154	n/a	CB
S10M000396				Hydrogren Ion	M	99.7	<1.00E-03	7.86	7.82	7.84	0.510	99.3	0.200	n/a	
S10M000396			16984-48-8	Fluoride	ug/mL	99.1	<6.16E-03	<616	n/a	n/a	n/a	n/a	616	n/a	U
S10M000396			16887-00-6	Chloride	ug/mL	102	<3.10E-03	2.92E+05	n/a	n/a	n/a	n/a	310	n/a	
S10M000396			14797-65-0	Nitrite	ug/mL	95.0	<0.0400	<4.00E+03	n/a	n/a	n/a	n/a	4.00E+03	n/a	U
S10M000396			14797-55-8	Nitrate	ug/mL	95.9	<0.0162	<1.62E+03	n/a	n/a	n/a	n/a	1.62E+03	n/a	U
S10M000396			14808-79-8	Sulfate	ug/mL	103	<0.0219	3.65E+03	n/a	n/a	n/a	n/a	2.19E+03	n/a	B
S10M000396			338-70-5	Oxalate	ug/mL	98.1	<0.105	<1.05E+04	n/a	n/a	n/a	n/a	1.05E+04	n/a	U
S10M000396			7440-22-4	Silver	ug/mL	99.0	<8.00E-06	<8.00E-04	<8.00E-04	n/a	n/a	92.6	8.00E-04	n/a	U
S10M000396			7440-39-3	Barium	ug/mL	102	<1.60E-05	0.0160	n/a	n/a	n/a	n/a	6.40E-03	n/a	B
S10M000396			7440-41-7	Beryllium	ug/mL	98.1	<1.80E-05	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000396			7440-43-9	Cadmium	ug/mL	101	<6.00E-06	0.0113	n/a	n/a	n/a	n/a	2.40E-03	n/a	B

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U - < Det Limit  
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B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24287**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000396			7440-47-3	Chromium	ug/mL	99.3	<7.00E-05	0.162	n/a	n/a	n/a	n/a	0.0280	n/a	B
S10M000396			7439-92-1	Lead	ug/mL	105	<3.10E-05	<3.10E-03	<3.10E-03	n/a	n/a	104	3.10E-03	n/a	U
S10M000396			7440-02-0	Nickel	ug/mL	91.2	<1.20E-05	<1.20E-03	<1.20E-03	n/a	n/a	87.1	1.20E-03	n/a	U
S10M000396			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

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 C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24288**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000390			7439-97-6	Mercury	ug/mL	105	<1.00E-04	7.90E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	B
S10M000390				Hydrogren Ion	M	94.4	<1.00E-04	2.55	n/a	n/a	n/a	n/a	5.00E-03	n/a	
S10M000390			16984-48-8	Fluoride	ug/mL	99.0	<6.16E-03	<6.16	n/a	n/a	n/a	n/a	6.16	n/a	U
S10M000390			16887-00-6	Chloride	ug/mL	104	0.0126	298	n/a	n/a	n/a	n/a	3.10	n/a	
S10M000390			14797-65-0	Nitrite	ug/mL	96.6	<0.0400	<40.0	n/a	n/a	n/a	n/a	40.0	n/a	U
S10M000390			14797-55-8	Nitrate	ug/mL	98.8	0.0198	1.06E+05	n/a	n/a	n/a	n/a	162	n/a	
S10M000390			14808-79-8	Sulfate	ug/mL	105	0.0891	2.20E+03	n/a	n/a	n/a	n/a	21.9	n/a	
S10M000390			338-70-5	Oxalate	ug/mL	101	<0.105	154	n/a	n/a	n/a	n/a	105	n/a	B
S10M000390			7429-90-5	Aluminum	ug/mL	95.6	<0.0300	123	n/a	n/a	n/a	n/a	3.75	n/a	
S10M000390			7440-38-2	Arsenic	ug/mL	104	<0.0500	<6.25	n/a	n/a	n/a	n/a	6.25	n/a	U
S10M000390			7440-48-4	Cobalt	ug/mL	94.5	<0.0100	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000390			7440-47-3	Chromium	ug/mL	94.0	<5.00E-03	48.3	n/a	n/a	n/a	n/a	0.625	n/a	
S10M000390			7440-50-8	Copper	ug/mL	98.5	<5.00E-03	47.5	n/a	n/a	n/a	n/a	0.625	n/a	
S10M000390			7440-09-7	Potassium	ug/mL	99.5	<0.500	272	n/a	n/a	n/a	n/a	62.5	n/a	B
S10M000390			7439-96-5	Manganese	ug/mL	93.7	<3.00E-03	21.1	n/a	n/a	n/a	n/a	0.375	n/a	
S10M000390			7440-23-5	Sodium	ug/mL	93.1	<0.100	1.42E+04	n/a	n/a	n/a	n/a	12.5	n/a	
S10M000390			7440-02-0	Nickel	ug/mL	93.6	<0.0200	41.5	n/a	n/a	n/a	n/a	2.50	n/a	
S10M000390			7440-36-0	Antimony	ug/mL	96.0	<0.0500	<6.25	n/a	n/a	n/a	n/a	6.25	n/a	U
S10M000390			7782-49-2	Selenium	ug/mL	111	<0.100	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000390			7440-24-6	Strontium	ug/mL	97.5	<3.00E-03	0.723	n/a	n/a	n/a	n/a	0.375	n/a	B
S10M000390			7440-28-0	Thallium	ug/mL	99.5	<0.100	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000390			7440-62-2	Vanadium	ug/mL	96.8	<5.00E-03	<0.625	n/a	n/a	n/a	n/a	0.625	n/a	U
S10M000390			7440-66-6	Zinc	ug/mL	94.0	<5.00E-03	466	n/a	n/a	n/a	n/a	0.625	n/a	
S10M000390			7440-22-4	Silver	ug/mL	101	<2.00E-06	0.103	n/a	n/a	n/a	n/a	8.00E-04	n/a	
S10M000390			7440-39-3	Barium	ug/mL	100	<1.60E-05	1.33	n/a	n/a	n/a	n/a	6.40E-03	n/a	
S10M000390			7440-41-7	Beryllium	ug/mL	103	<1.80E-05	0.0102	n/a	n/a	n/a	n/a	7.20E-03	n/a	B
S10M000390			7440-43-9	Cadmium	ug/mL	101	<9.00E-06	12.1	n/a	n/a	n/a	n/a	0.180	n/a	
S10M000390			7439-92-1	Lead	ug/mL	98.1	<1.50E-05	8.98	n/a	n/a	n/a	n/a	0.300	n/a	

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range  
 X - Comment

U - < Det Limit  
 > - WetChem Outside Calibration Range

B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes**  
**PFP A Lab Rm 144**  
**Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24288**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000390			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

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**Inorganic Analytes**  
**PFP A Lab Rm 144**  
**Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24289**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000391			7439-97-6	Mercury	ug/mL	105	<1.00E-04	0.0507	0.0509	0.0508	0.276	112	2.00E-03	n/a	
S10M000391				Hydrogren Ion	M	99.7	<1.00E-03	0.770	n/a	n/a	n/a	n/a	0.0170	n/a	
S10M000391			16984-48-8	Fluoride	ug/mL	99.0	<6.16E-03	193	n/a	n/a	n/a	n/a	6.16	n/a	
S10M000391			16887-00-6	Chloride	ug/mL	104	0.0126	432	n/a	n/a	n/a	n/a	3.10	n/a	
S10M000391			14797-65-0	Nitrite	ug/mL	96.6	<0.0400	<40.0	n/a	n/a	n/a	n/a	40.0	n/a	U
S10M000391			14797-55-8	Nitrate	ug/mL	98.8	0.0198	2.56E+04	n/a	n/a	n/a	n/a	162	n/a	
S10M000391			14808-79-8	Sulfate	ug/mL	105	0.0891	1.77E+05	n/a	n/a	n/a	n/a	219	n/a	
S10M000391			338-70-5	Oxalate	ug/mL	101	<0.105	<105	n/a	n/a	n/a	n/a	105	n/a	U
S10M000391			7429-90-5	Aluminum	ug/mL	95.6	<0.0300	5.06E+04	n/a	n/a	n/a	n/a	7.50	n/a	
S10M000391			7440-38-2	Arsenic	ug/mL	104	<0.0500	33.0	n/a	n/a	n/a	n/a	12.5	n/a	B
S10M000391			7440-48-4	Cobalt	ug/mL	94.5	<0.0100	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000391			7440-50-8	Copper	ug/mL	98.5	<5.00E-03	17.2	n/a	n/a	n/a	n/a	1.25	n/a	
S10M000391			7440-09-7	Potassium	ug/mL	99.5	<0.500	1.91E+03	n/a	n/a	n/a	n/a	125	n/a	
S10M000391			7439-96-5	Manganese	ug/mL	93.7	<3.00E-03	147	n/a	n/a	n/a	n/a	0.750	n/a	
S10M000391			7440-23-5	Sodium	ug/mL	93.1	<0.100	8.18E+03	n/a	n/a	n/a	n/a	25.0	n/a	
S10M000391			7440-02-0	Nickel	ug/mL	93.6	<0.0200	73.3	n/a	n/a	n/a	n/a	5.00	n/a	
S10M000391			7440-36-0	Antimony	ug/mL	96.0	<0.0500	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000391			7782-49-2	Selenium	ug/mL	111	<0.100	<25.0	n/a	n/a	n/a	n/a	25.0	n/a	U
S10M000391			7440-24-6	Strontium	ug/mL	97.5	<3.00E-03	<0.750	n/a	n/a	n/a	n/a	0.750	n/a	U
S10M000391			7440-28-0	Thallium	ug/mL	99.5	<0.100	<25.0	n/a	n/a	n/a	n/a	25.0	n/a	U
S10M000391			7440-62-2	Vanadium	ug/mL	96.8	<5.00E-03	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000391			7440-66-6	Zinc	ug/mL	94.0	<5.00E-03	159	n/a	n/a	n/a	n/a	1.25	n/a	
S10M000391			7440-22-4	Silver	ug/mL	101	<2.00E-06	0.0223	n/a	n/a	n/a	n/a	8.00E-04	n/a	
S10M000391			7440-39-3	Barium	ug/mL	100	<1.60E-05	<6.40E-03	n/a	n/a	n/a	n/a	6.40E-03	n/a	U
S10M000391			7440-41-7	Beryllium	ug/mL	103	<1.80E-05	0.0613	n/a	n/a	n/a	n/a	7.20E-03	n/a	B
S10M000391			7440-43-9	Cadmium	ug/mL	101	<9.00E-06	2.53	n/a	n/a	n/a	n/a	3.60E-03	n/a	
S10M000391			7440-47-3	Chromium	ug/mL	101	<7.00E-05	57.5	n/a	n/a	n/a	n/a	0.700	n/a	
S10M000391			7439-92-1	Lead	ug/mL	98.1	<1.50E-05	6.25E-03	n/a	n/a	n/a	n/a	6.00E-03	n/a	B

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**Inorganic Analytes**  
**PFP A Lab Rm 144**  
**Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24289**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000391			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

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**Inorganic Analytes**  
**PFP A Lab Rm 144**  
**Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24290**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000392			7439-97-6	Mercury	ug/mL	105	<1.00E-04	3.59	n/a	n/a	n/a	n/a	0.0200	n/a	
S10M000392				Hydrogren Ion	ug/mL	96.5	<0.0100	0.830	n/a	n/a	n/a	n/a	0.0100	n/a	
S10M000392			16984-48-8	Fluoride	ug/mL	99.0	<6.16E-03	1.68E+03	n/a	n/a	n/a	n/a	6.16	n/a	
S10M000392			16887-00-6	Chloride	ug/mL	104	0.0126	7.39E+04	n/a	n/a	n/a	n/a	310	n/a	
S10M000392			14797-65-0	Nitrite	ug/mL	96.6	<0.0400	<40.0	n/a	n/a	n/a	n/a	40.0	n/a	U
S10M000392			14797-55-8	Nitrate	ug/mL	98.8	0.0198	2.09E+05	n/a	n/a	n/a	n/a	162	n/a	
S10M000392			14808-79-8	Sulfate	ug/mL	105	0.0891	9.54E+03	n/a	n/a	n/a	n/a	21.9	n/a	
S10M000392			338-70-5	Oxalate	ug/mL	101	<0.105	153	n/a	n/a	n/a	n/a	105	n/a	B
S10M000392			7429-90-5	Aluminum	ug/mL	101	<0.0300	3.47E+03	n/a	n/a	n/a	n/a	6.00	n/a	
S10M000392			7440-38-2	Arsenic	ug/mL	104	<0.0500	<10.0	n/a	n/a	n/a	n/a	10.0	n/a	U
S10M000392			7440-39-3	Barium	ug/mL	102	<3.00E-03	17.4	n/a	n/a	n/a	n/a	0.600	n/a	
S10M000392			7440-41-7	Beryllium	ug/mL	97.8	<1.00E-03	3.21	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000392			7440-43-9	Cadmium	ug/mL	100	<5.00E-03	24.6	n/a	n/a	n/a	n/a	1.00	n/a	
S10M000392			7440-48-4	Cobalt	ug/mL	100	<0.0100	7.34	n/a	n/a	n/a	n/a	2.00	n/a	B
S10M000392			7440-47-3	Chromium	ug/mL	101	<5.00E-03	826	n/a	n/a	n/a	n/a	1.00	n/a	
S10M000392			7440-50-8	Copper	ug/mL	102	<5.00E-03	108	n/a	n/a	n/a	n/a	1.00	n/a	
S10M000392			7440-09-7	Potassium	ug/mL	107	<0.500	1.48E+04	n/a	n/a	n/a	n/a	100	n/a	
S10M000392			7439-96-5	Manganese	ug/mL	98.7	<3.00E-03	687	n/a	n/a	n/a	n/a	0.600	n/a	
S10M000392			7440-23-5	Sodium	ug/mL	95.1	<0.100	2.22E+04	n/a	n/a	n/a	n/a	20.0	n/a	
S10M000392			7440-02-0	Nickel	ug/mL	99.5	<0.0200	446	n/a	n/a	n/a	n/a	4.00	n/a	
S10M000392			7440-36-0	Antimony	ug/mL	100	<0.0500	<10.0	n/a	n/a	n/a	n/a	10.0	n/a	U
S10M000392			7782-49-2	Selenium	ug/mL	103	<0.100	<20.0	n/a	n/a	n/a	n/a	20.0	n/a	U
S10M000392			7440-24-6	Strontium	ug/mL	101	<3.00E-03	2.41	n/a	n/a	n/a	n/a	0.600	n/a	B
S10M000392			7440-28-0	Thallium	ug/mL	102	<0.100	<20.0	n/a	n/a	n/a	n/a	20.0	n/a	U
S10M000392			7440-62-2	Vanadium	ug/mL	101	<5.00E-03	19.3	n/a	n/a	n/a	n/a	1.00	n/a	
S10M000392			7440-66-6	Zinc	ug/mL	99.1	<5.00E-03	5.00E+04	n/a	n/a	n/a	n/a	1.00	n/a	
S10M000392			7440-22-4	Silver	ug/mL	101	<2.00E-06	5.72	n/a	n/a	n/a	n/a	8.00E-04	n/a	
S10M000392			7439-92-1	Lead	ug/mL	102	<1.50E-05	67.3	n/a	n/a	n/a	n/a	1.50	n/a	

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**Inorganic Analytes**  
**PFP A Lab Rm 144**  
**Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24291**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000393			7439-97-6	Mercury	ug/mL	105	<1.00E-04	0.598	n/a	n/a	n/a	n/a	6.00E-03	n/a	
S10M000393				Hydrogren Ion	ug/mL	96.5	<0.0100	0.650	0.660	0.655	1.53	99.2	0.0100	n/a	
S10M000393			16984-48-8	Fluoride	ug/mL	99.0	<6.16E-03	465	n/a	n/a	n/a	n/a	6.16	n/a	
S10M000393			16887-00-6	Chloride	ug/mL	104	0.0126	1.45E+04	n/a	n/a	n/a	n/a	31.0	n/a	
S10M000393			14797-65-0	Nitrite	ug/mL	96.6	<0.0400	<40.0	n/a	n/a	n/a	n/a	40.0	n/a	U
S10M000393			14797-55-8	Nitrate	ug/mL	98.8	0.0198	5.45E+04	n/a	n/a	n/a	n/a	162	n/a	
S10M000393			14808-79-8	Sulfate	ug/mL	105	0.0891	1.62E+04	n/a	n/a	n/a	n/a	21.9	n/a	
S10M000393			338-70-5	Oxalate	ug/mL	101	<0.105	<105	n/a	n/a	n/a	n/a	105	n/a	U
S10M000393			7429-90-5	Aluminum	ug/mL	101	<0.0300	1.82E+03	n/a	n/a	n/a	n/a	1.20	n/a	
S10M000393			7440-38-2	Arsenic	ug/mL	104	<0.0500	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	U
S10M000393			7440-39-3	Barium	ug/mL	102	<3.00E-03	3.46	n/a	n/a	n/a	n/a	0.120	n/a	
S10M000393			7440-41-7	Beryllium	ug/mL	97.8	<1.00E-03	0.563	n/a	n/a	n/a	n/a	0.0400	n/a	
S10M000393			7440-43-9	Cadmium	ug/mL	100	<5.00E-03	4.19	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000393			7440-48-4	Cobalt	ug/mL	100	<0.0100	1.30	n/a	n/a	n/a	n/a	0.400	n/a	B
S10M000393			7440-47-3	Chromium	ug/mL	101	<5.00E-03	161	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000393			7440-50-8	Copper	ug/mL	102	<5.00E-03	17.9	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000393			7440-09-7	Potassium	ug/mL	107	<0.500	2.94E+03	n/a	n/a	n/a	n/a	20.0	n/a	
S10M000393			7439-96-5	Manganese	ug/mL	98.7	<3.00E-03	115	n/a	n/a	n/a	n/a	0.120	n/a	
S10M000393			7440-23-5	Sodium	ug/mL	95.1	<0.100	5.58E+03	n/a	n/a	n/a	n/a	4.00	n/a	
S10M000393			7440-36-0	Antimony	ug/mL	100	<0.0500	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	U
S10M000393			7782-49-2	Selenium	ug/mL	103	<0.100	<4.00	n/a	n/a	n/a	n/a	4.00	n/a	U
S10M000393			7440-24-6	Strontium	ug/mL	101	<3.00E-03	0.654	n/a	n/a	n/a	n/a	0.120	n/a	B
S10M000393			7440-28-0	Thallium	ug/mL	102	<0.100	<4.00	n/a	n/a	n/a	n/a	4.00	n/a	U
S10M000393			7440-62-2	Vanadium	ug/mL	101	<5.00E-03	5.25	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000393			7440-66-6	Zinc	ug/mL	99.1	<5.00E-03	9.68E+03	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000393			7440-22-4	Silver	ug/mL	99.0	<8.00E-06	1.08	n/a	n/a	n/a	n/a	0.160	n/a	B
S10M000393			7439-92-1	Lead	ug/mL	105	<3.10E-05	7.15	n/a	n/a	n/a	n/a	0.620	n/a	
S10M000393			7440-02-0	Nickel	ug/mL	91.2	<1.20E-05	67.7	n/a	n/a	n/a	n/a	0.240	n/a	

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N - Spike Outside Range  
 X - Comment

U - < Det Limit  
 > - WetChem Outside Calibration Range

B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes**  
**PFP A Lab Rm 144**  
**Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24292**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000397			7439-97-6	Mercury	ug/mL	102	<1.00E-04	<2.00E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	U
S10M000397			16984-48-8	Fluoride	ug/mL	99.1	<6.16E-03	5.01E+03	n/a	n/a	n/a	n/a	12.3	n/a	
S10M000397			16887-00-6	Chloride	ug/mL	102	<3.10E-03	19.1	n/a	n/a	n/a	n/a	3.10	n/a	CB
S10M000397			14797-65-0	Nitrite	ug/mL	95.0	<0.0400	<40.0	n/a	n/a	n/a	n/a	40.0	n/a	U
S10M000397			14797-55-8	Nitrate	ug/mL	95.9	<0.0162	<16.2	n/a	n/a	n/a	n/a	16.2	n/a	U
S10M000397			14808-79-8	Sulfate	ug/mL	103	<0.0219	<21.9	n/a	n/a	n/a	n/a	21.9	n/a	U
S10M000397			338-70-5	Oxalate	ug/mL	98.1	<0.105	6.42E+03	n/a	n/a	n/a	n/a	105	n/a	
S10M000397			7429-90-5	Aluminum	ug/mL	102	<0.0300	<3.00	n/a	n/a	n/a	n/a	3.00	n/a	U
S10M000397			7440-38-2	Arsenic	ug/mL	97.0	<0.0500	<5.00	n/a	n/a	n/a	n/a	5.00	n/a	U
S10M000397			7440-48-4	Cobalt	ug/mL	101	<0.0100	<1.00	n/a	n/a	n/a	n/a	1.00	n/a	U
S10M000397			7440-50-8	Copper	ug/mL	103	<5.00E-03	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000397			7440-09-7	Potassium	ug/mL	105	<0.500	<50.0	n/a	n/a	n/a	n/a	50.0	n/a	U
S10M000397			7439-96-5	Manganese	ug/mL	98.7	<3.00E-03	<0.300	n/a	n/a	n/a	n/a	0.300	n/a	U
S10M000397			7440-23-5	Sodium	ug/mL	104	<0.100	9.58E+03	n/a	n/a	n/a	n/a	10.0	n/a	
S10M000397			7440-36-0	Antimony	ug/mL	95.7	<0.0500	<5.00	n/a	n/a	n/a	n/a	5.00	n/a	U
S10M000397			7782-49-2	Selenium	ug/mL	101	<0.100	<10.0	n/a	n/a	n/a	n/a	10.0	n/a	U
S10M000397			7440-24-6	Strontium	ug/mL	101	<3.00E-03	<0.300	n/a	n/a	n/a	n/a	0.300	n/a	U
S10M000397			7440-28-0	Thallium	ug/mL	101	<0.100	<10.0	n/a	n/a	n/a	n/a	10.0	n/a	U
S10M000397			7440-62-2	Vanadium	ug/mL	101	<5.00E-03	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000397			7440-66-6	Zinc	ug/mL	98.9	<5.00E-03	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000397			7440-22-4	Silver	ug/mL	103	<2.00E-06	<8.00E-04	n/a	n/a	n/a	n/a	8.00E-04	n/a	U
S10M000397			7440-39-3	Barium	ug/mL	102	<1.60E-05	<6.40E-03	n/a	n/a	n/a	n/a	6.40E-03	n/a	U
S10M000397			7440-41-7	Beryllium	ug/mL	98.1	<1.80E-05	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000397			7440-43-9	Cadmium	ug/mL	101	<6.00E-06	<2.40E-03	n/a	n/a	n/a	n/a	2.40E-03	n/a	U
S10M000397			7440-47-3	Chromium	ug/mL	99.3	<7.00E-05	0.0415	n/a	n/a	n/a	n/a	0.0280	n/a	B
S10M000397			7439-92-1	Lead	ug/mL	101	<1.50E-05	<6.00E-03	n/a	n/a	n/a	n/a	6.00E-03	n/a	U
S10M000397			7440-02-0	Nickel	ug/mL	98.5	<1.20E-05	<4.80E-03	n/a	n/a	n/a	n/a	4.80E-03	n/a	U
S10M000397			PH	pH	unitless	n/a	n/a	7.99	n/a	n/a	n/a	n/a	0.0100	n/a	

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range  
 X - Comment

U - < Det Limit  
 > - WetChem Outside Calibration Range

B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24293**

**Sample Portion: Acid Digest**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000481		B	7429-90-5	Aluminum	ug/mL	83.4	<0.0300	2.84	n/a	n/a	n/a	n/a	0.150	n/a	
S10M000481		B	7440-38-2	Arsenic	ug/mL	82.8	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000481		B	7440-48-4	Cobalt	ug/mL	82.3	<0.0100	<0.0500	n/a	n/a	n/a	n/a	0.0500	n/a	U
S10M000481		B	7440-47-3	Chromium	ug/mL	81.8	7.29E-03	0.705	n/a	n/a	n/a	n/a	0.0250	n/a	
S10M000481		B	7440-50-8	Copper	ug/mL	89.9	<5.00E-03	0.840	n/a	n/a	n/a	n/a	0.0250	n/a	
S10M000481		B	7440-09-7	Potassium	ug/mL	76.7	<0.500	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000481		B	7439-96-5	Manganese	ug/mL	82.1	<3.00E-03	0.0719	n/a	n/a	n/a	n/a	0.0150	n/a	B
S10M000481		B	7440-23-5	Sodium	ug/mL	91.9	<0.100	23.8	n/a	n/a	n/a	n/a	0.500	n/a	
S10M000481		B	7440-02-0	Nickel	ug/mL	81.4	<0.0200	1.18	n/a	n/a	n/a	n/a	0.100	n/a	
S10M000481		B	7439-92-1	Lead	ug/mL	81.4	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000481		B	7440-36-0	Antimony	ug/mL	80.1	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	UN
S10M000481		B	7782-49-2	Selenium	ug/mL	87.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000481		B	7440-24-6	Strontium	ug/mL	88.5	<3.00E-03	0.106	n/a	n/a	n/a	n/a	0.0150	n/a	B
S10M000481		B	7440-28-0	Thallium	ug/mL	90.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000481		B	7440-62-2	Vanadium	ug/mL	85.1	<5.00E-03	<0.0250	n/a	n/a	n/a	n/a	0.0250	n/a	U
S10M000481		B	7440-66-6	Zinc	ug/mL	82.2	<5.00E-03	19.1	n/a	n/a	n/a	n/a	0.0250	n/a	

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000398			7439-97-6	Mercury	ug/mL	102	<1.00E-04	<2.00E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	U
S10M000398				Hydrogren Ion	M	99.7	<1.00E-03	4.55	n/a	n/a	n/a	n/a	0.100	n/a	
S10M000398			16984-48-8	Fluoride	ug/mL	99.1	<6.16E-03	<61.6	n/a	n/a	n/a	n/a	61.6	n/a	U
S10M000398			16887-00-6	Chloride	ug/mL	102	<3.10E-03	1.23E+05	n/a	n/a	n/a	n/a	310	n/a	
S10M000398			14797-65-0	Nitrite	ug/mL	95.0	<0.0400	<400	n/a	n/a	n/a	n/a	400	n/a	U
S10M000398			14797-55-8	Nitrate	ug/mL	95.9	<0.0162	7.54E+04	n/a	n/a	n/a	n/a	162	n/a	
S10M000398			14808-79-8	Sulfate	ug/mL	103	<0.0219	<219	n/a	n/a	n/a	n/a	219	n/a	U
S10M000398			338-70-5	Oxalate	ug/mL	98.1	<0.105	<1.05E+03	n/a	n/a	n/a	n/a	1.05E+03	n/a	U
S10M000398			7440-22-4	Silver	ug/mL	109	<2.00E-04	<8.00E-04	n/a	n/a	n/a	n/a	8.00E-04	n/a	U

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range  
 X - Comment

U - < Det Limit  
 > - WetChem Outside Calibration Range

B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24293**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000398			7440-39-3	Barium	ug/mL	102	<1.60E-03	0.0138	n/a	n/a	n/a	n/a	6.40E-03	n/a	B
S10M000398			7440-41-7	Beryllium	ug/mL	105	<1.80E-03	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000398			7440-43-9	Cadmium	ug/mL	102	<6.00E-04	<2.40E-03	n/a	n/a	n/a	n/a	2.40E-03	n/a	U
S10M000398			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

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**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24294**

**Sample Portion: Acid Digest**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000482		B	7429-90-5	Aluminum	ug/mL	83.4	<0.0300	3.80	3.79	3.79	0.267	82.2	0.150	n/a	
S10M000482		B	7440-38-2	Arsenic	ug/mL	82.8	<0.0500	<0.250	<0.250	n/a	n/a	81.8	0.250	n/a	U
S10M000482		B	7440-48-4	Cobalt	ug/mL	82.3	<0.0100	<0.0500	<0.0500	n/a	n/a	83.6	0.0500	n/a	U
S10M000482		B	7440-50-8	Copper	ug/mL	89.9	<5.00E-03	<0.0250	<0.0250	n/a	n/a	85.5	0.0250	n/a	U
S10M000482		B	7440-09-7	Potassium	ug/mL	76.7	<0.500	2.78	<2.50	n/a	n/a	82.7	2.50	n/a	B
S10M000482		B	7439-96-5	Manganese	ug/mL	82.1	<3.00E-03	0.131	0.129	0.130	1.46	81.6	0.0150	n/a	B
S10M000482		B	7440-23-5	Sodium	ug/mL	91.9	<0.100	3.00	3.01	3.01	0.304	85.4	0.500	n/a	B
S10M000482		B	7439-92-1	Lead	ug/mL	81.4	<0.0500	<0.250	<0.250	n/a	n/a	84.0	0.250	n/a	U
S10M000482		B	7440-36-0	Antimony	ug/mL	80.1	<0.0500	<0.250	<0.250	n/a	n/a	48.1	0.250	n/a	UN
S10M000482		B	7782-49-2	Selenium	ug/mL	87.5	<0.100	<0.500	<0.500	n/a	n/a	85.3	0.500	n/a	U
S10M000482		B	7440-24-6	Strontium	ug/mL	88.5	<3.00E-03	0.136	0.134	0.135	1.11	84.9	0.0150	n/a	B
S10M000482		B	7440-28-0	Thallium	ug/mL	90.5	<0.100	<0.500	<0.500	n/a	n/a	83.2	0.500	n/a	U
S10M000482		B	7440-62-2	Vanadium	ug/mL	85.1	<5.00E-03	<0.0250	<0.0250	n/a	n/a	84.8	0.0250	n/a	U
S10M000482		B	7440-66-6	Zinc	ug/mL	82.2	<5.00E-03	9.14	8.89	9.02	2.71	80.1	0.0250	n/a	
S10M000482		B	7440-02-0	Nickel	ug/mL	120	2.81E-03	0.0646	0.0676	0.0661	4.50	103	3.00E-03	n/a	C

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000399			7439-97-6	Mercury	ug/mL	102	<1.00E-04	2.04E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	B
S10M000399				Hydrogren Ion	M	99.7	<1.00E-03	7.22	n/a	n/a	n/a	n/a	0.100	n/a	
S10M000399			16984-48-8	Fluoride	ug/mL	99.1	<6.16E-03	<616	n/a	n/a	n/a	n/a	616	n/a	U
S10M000399			16887-00-6	Chloride	ug/mL	102	<3.10E-03	2.71E+05	n/a	n/a	n/a	n/a	310	n/a	
S10M000399			14797-65-0	Nitrite	ug/mL	95.0	<0.0400	<4.00E+03	n/a	n/a	n/a	n/a	4.00E+03	n/a	U
S10M000399			14797-55-8	Nitrate	ug/mL	95.9	<0.0162	<1.62E+03	n/a	n/a	n/a	n/a	1.62E+03	n/a	U
S10M000399			14808-79-8	Sulfate	ug/mL	103	<0.0219	<2.19E+03	n/a	n/a	n/a	n/a	2.19E+03	n/a	U
S10M000399			338-70-5	Oxalate	ug/mL	98.1	<0.105	<1.05E+04	n/a	n/a	n/a	n/a	1.05E+04	n/a	U
S10M000399			7440-22-4	Silver	ug/mL	103	<2.00E-06	<8.00E-04	n/a	n/a	n/a	n/a	8.00E-04	n/a	U
S10M000399			7440-39-3	Barium	ug/mL	102	<1.60E-05	0.0270	n/a	n/a	n/a	n/a	6.40E-03	n/a	B

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 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24294**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000399			7440-41-7	Beryllium	ug/mL	98.1	<1.80E-05	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000399			7440-43-9	Cadmium	ug/mL	101	<6.00E-06	<2.40E-03	n/a	n/a	n/a	n/a	2.40E-03	n/a	U
S10M000399			7440-47-3	Chromium	ug/mL	99.3	<7.00E-05	<0.0280	n/a	n/a	n/a	n/a	0.0280	n/a	U
S10M000399			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

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 X - Comment

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 > - WetChem Outside Calibration Range

B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

NA = Not Analyzed, ND = Not Detected  
 C - Inorganic Blank Contamination

**Inorganic Analytes**  
**PFP A Lab Rm 144**  
**Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24295**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000400			7439-97-6	Mercury	ug/mL	102	<1.00E-04	2.26E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	B
S10M000400			16984-48-8	Fluoride	ug/mL	97.5	<6.16E-03	929	n/a	n/a	n/a	n/a	6.16	n/a	
S10M000400			16887-00-6	Chloride	ug/mL	101	0.0191	39.1	n/a	n/a	n/a	n/a	3.10	n/a	CB
S10M000400			14797-65-0	Nitrite	ug/mL	95.8	<0.0400	<40.0	n/a	n/a	n/a	n/a	40.0	n/a	U
S10M000400			14797-55-8	Nitrate	ug/mL	98.3	<0.0162	186	n/a	n/a	n/a	n/a	16.2	n/a	B
S10M000400			14808-79-8	Sulfate	ug/mL	104	<0.0219	3.60E+03	n/a	n/a	n/a	n/a	21.9	n/a	
S10M000400			338-70-5	Oxalate	ug/mL	98.9	<0.105	1.17E+03	n/a	n/a	n/a	n/a	105	n/a	
S10M000400			7429-90-5	Aluminum	ug/mL	102	<0.0300	<15.0	n/a	n/a	n/a	n/a	15.0	n/a	U
S10M000400			7440-38-2	Arsenic	ug/mL	97.0	<0.0500	<25.0	n/a	n/a	n/a	n/a	25.0	n/a	U
S10M000400			7440-48-4	Cobalt	ug/mL	101	<0.0100	<5.00	n/a	n/a	n/a	n/a	5.00	n/a	U
S10M000400			7440-50-8	Copper	ug/mL	103	<5.00E-03	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000400			7440-09-7	Potassium	ug/mL	105	<0.500	<250	n/a	n/a	n/a	n/a	250	n/a	U
S10M000400			7439-96-5	Manganese	ug/mL	98.7	<3.00E-03	<1.50	n/a	n/a	n/a	n/a	1.50	n/a	U
S10M000400			7440-23-5	Sodium	ug/mL	104	<0.100	1.10E+04	n/a	n/a	n/a	n/a	50.0	n/a	
S10M000400			7440-36-0	Antimony	ug/mL	95.7	<0.0500	<25.0	n/a	n/a	n/a	n/a	25.0	n/a	U
S10M000400			7782-49-2	Selenium	ug/mL	101	<0.100	<50.0	n/a	n/a	n/a	n/a	50.0	n/a	U
S10M000400			7440-24-6	Strontium	ug/mL	101	<3.00E-03	<1.50	n/a	n/a	n/a	n/a	1.50	n/a	U
S10M000400			7440-28-0	Thallium	ug/mL	101	<0.100	<50.0	n/a	n/a	n/a	n/a	50.0	n/a	U
S10M000400			7440-62-2	Vanadium	ug/mL	101	<5.00E-03	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000400			7440-66-6	Zinc	ug/mL	98.9	<5.00E-03	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000400			7440-22-4	Silver	ug/mL	103	<2.00E-06	9.21E-04	n/a	n/a	n/a	n/a	8.00E-04	n/a	B
S10M000400			7440-39-3	Barium	ug/mL	102	<1.60E-05	0.130	n/a	n/a	n/a	n/a	6.40E-03	n/a	
S10M000400			7440-41-7	Beryllium	ug/mL	98.1	<1.80E-05	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000400			7440-43-9	Cadmium	ug/mL	101	<6.00E-06	<2.40E-03	n/a	n/a	n/a	n/a	2.40E-03	n/a	U
S10M000400			7440-47-3	Chromium	ug/mL	99.3	<7.00E-05	1.38	n/a	n/a	n/a	n/a	0.0280	n/a	
S10M000400			7439-92-1	Lead	ug/mL	101	<1.50E-05	0.0348	n/a	n/a	n/a	n/a	6.00E-03	n/a	B
S10M000400			7440-02-0	Nickel	ug/mL	98.5	<1.20E-05	0.602	n/a	n/a	n/a	n/a	4.80E-03	n/a	
S10M000400			PH	pH	unitless	n/a	n/a	8.08	n/a	n/a	n/a	n/a	0.0100	n/a	

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range  
 X - Comment

U - < Det Limit  
 > - WetChem Outside Calibration Range

B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24296**

**Sample Portion: Acid Digest**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000483		B	7429-90-5	Aluminum	ug/mL	83.4	<0.0300	<0.150	n/a	n/a	n/a	n/a	0.150	n/a	U
S10M000483		B	7440-38-2	Arsenic	ug/mL	82.8	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000483		B	7440-48-4	Cobalt	ug/mL	82.3	<0.0100	<0.0500	n/a	n/a	n/a	n/a	0.0500	n/a	U
S10M000483		B	7440-47-3	Chromium	ug/mL	81.8	7.29E-03	0.0403	n/a	n/a	n/a	n/a	0.0250	n/a	CB
S10M000483		B	7440-50-8	Copper	ug/mL	89.9	<5.00E-03	<0.0250	n/a	n/a	n/a	n/a	0.0250	n/a	U
S10M000483		B	7440-09-7	Potassium	ug/mL	76.7	<0.500	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000483		B	7439-96-5	Manganese	ug/mL	82.1	<3.00E-03	<0.0150	n/a	n/a	n/a	n/a	0.0150	n/a	U
S10M000483		B	7440-23-5	Sodium	ug/mL	91.9	<0.100	4.04	n/a	n/a	n/a	n/a	0.500	n/a	B
S10M000483		B	7439-92-1	Lead	ug/mL	81.4	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000483		B	7440-36-0	Antimony	ug/mL	80.1	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	UN
S10M000483		B	7782-49-2	Selenium	ug/mL	87.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000483		B	7440-24-6	Strontium	ug/mL	88.5	<3.00E-03	<0.0150	n/a	n/a	n/a	n/a	0.0150	n/a	U
S10M000483		B	7440-28-0	Thallium	ug/mL	90.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000483		B	7440-62-2	Vanadium	ug/mL	85.1	<5.00E-03	<0.0250	n/a	n/a	n/a	n/a	0.0250	n/a	U
S10M000483		B	7440-66-6	Zinc	ug/mL	82.2	<5.00E-03	0.748	n/a	n/a	n/a	n/a	0.0250	n/a	
S10M000483		B	7440-02-0	Nickel	ug/mL	120	2.81E-03	6.73E-03	n/a	n/a	n/a	n/a	3.00E-03	n/a	CB

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000401			7439-97-6	Mercury	ug/mL	102	<1.00E-04	<2.00E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	U
S10M000401				Hydrogren Ion	M	99.7	<1.00E-03	0.0100	n/a	n/a	n/a	n/a	3.30E-03	n/a	
S10M000401			7440-22-4	Silver	ug/mL	109	<2.00E-04	<8.00E-04	n/a	n/a	n/a	n/a	8.00E-04	n/a	U
S10M000401			7440-39-3	Barium	ug/mL	102	<1.60E-03	<6.40E-03	n/a	n/a	n/a	n/a	6.40E-03	n/a	U
S10M000401			7440-41-7	Beryllium	ug/mL	105	<1.80E-03	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000401			7440-43-9	Cadmium	ug/mL	102	<6.00E-04	<2.40E-03	n/a	n/a	n/a	n/a	2.40E-03	n/a	U
S10M000401			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

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U - < Det Limit  
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B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24297**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000394			7439-97-6	Mercury	ug/mL	105	<1.00E-04	0.0101	n/a	n/a	n/a	n/a	2.00E-03	n/a	B
S10M000394				Hydrogren Ion	ug/mL	96.5	<0.0100	1.30	n/a	n/a	n/a	n/a	0.0100	n/a	
S10M000394			16984-48-8	Fluoride	ug/mL	100	<6.16E-03	<6.16	n/a	n/a	n/a	n/a	6.16	n/a	U
S10M000394			16887-00-6	Chloride	ug/mL	104	0.0114	190	n/a	n/a	n/a	n/a	3.10	n/a	
S10M000394			14797-65-0	Nitrite	ug/mL	96.3	<0.0400	<40.0	n/a	n/a	n/a	n/a	40.0	n/a	U
S10M000394			14797-55-8	Nitrate	ug/mL	97.0	<0.0162	2.62E+04	n/a	n/a	n/a	n/a	162	n/a	
S10M000394			14808-79-8	Sulfate	ug/mL	102	0.102	5.43E+04	n/a	n/a	n/a	n/a	219	n/a	
S10M000394			338-70-5	Oxalate	ug/mL	95.7	<0.105	<105	n/a	n/a	n/a	n/a	105	n/a	U
S10M000394			7440-22-4	Silver	ug/mL	99.9	<5.00E-03	5.43	n/a	n/a	n/a	n/a	0.500	n/a	
S10M000394			7429-90-5	Aluminum	ug/mL	101	<0.0300	<3.00	n/a	n/a	n/a	n/a	3.00	n/a	U
S10M000394			7440-38-2	Arsenic	ug/mL	104	<0.0500	<5.00	n/a	n/a	n/a	n/a	5.00	n/a	U
S10M000394			7440-43-9	Cadmium	ug/mL	100	<5.00E-03	4.06	n/a	n/a	n/a	n/a	0.500	n/a	
S10M000394			7440-48-4	Cobalt	ug/mL	100	<0.0100	3.47	n/a	n/a	n/a	n/a	1.00	n/a	B
S10M000394			7440-50-8	Copper	ug/mL	102	<5.00E-03	10.6	n/a	n/a	n/a	n/a	0.500	n/a	
S10M000394			7440-09-7	Potassium	ug/mL	107	<0.500	<50.0	n/a	n/a	n/a	n/a	50.0	n/a	U
S10M000394			7439-96-5	Manganese	ug/mL	98.7	<3.00E-03	10.3	n/a	n/a	n/a	n/a	0.300	n/a	
S10M000394			7440-23-5	Sodium	ug/mL	95.1	<0.100	60.6	n/a	n/a	n/a	n/a	10.0	n/a	
S10M000394			7440-36-0	Antimony	ug/mL	100	<0.0500	<5.00	n/a	n/a	n/a	n/a	5.00	n/a	U
S10M000394			7782-49-2	Selenium	ug/mL	103	<0.100	23.5	n/a	n/a	n/a	n/a	10.0	n/a	B
S10M000394			7440-24-6	Strontium	ug/mL	101	<3.00E-03	<0.300	n/a	n/a	n/a	n/a	0.300	n/a	U
S10M000394			7440-28-0	Thallium	ug/mL	102	<0.100	11.3	n/a	n/a	n/a	n/a	10.0	n/a	B
S10M000394			7440-62-2	Vanadium	ug/mL	101	<5.00E-03	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000394			7440-66-6	Zinc	ug/mL	99.1	<5.00E-03	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000394			7440-39-3	Barium	ug/mL	101	<1.60E-05	0.181	n/a	n/a	n/a	n/a	6.40E-03	n/a	C
S10M000394			7440-41-7	Beryllium	ug/mL	96.0	<1.80E-05	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000394			7440-47-3	Chromium	ug/mL	96.2	<7.00E-05	0.0519	n/a	n/a	n/a	n/a	0.0280	n/a	B
S10M000394			7439-92-1	Lead	ug/mL	102	<1.50E-05	0.0105	n/a	n/a	n/a	n/a	6.00E-03	n/a	B
S10M000394			7440-02-0	Nickel	ug/mL	97.7	<1.20E-05	0.137	n/a	n/a	n/a	n/a	0.0600	n/a	B

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 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24298**

**Sample Portion: Env Dig**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000385		E	7429-90-5	Aluminum	ug/mL	99.4	18.2	20.2	n/a	n/a	n/a	n/a	3.75	n/a	CB
S10M000385		E	7440-38-2	Arsenic	ug/mL	92.5	<6.25	<6.25	n/a	n/a	n/a	n/a	6.25	n/a	U
S10M000385		E	7440-48-4	Cobalt	ug/mL	93.9	<1.25	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000385		E	7440-50-8	Copper	ug/mL	95.0	<0.625	<0.625	n/a	n/a	n/a	n/a	0.625	n/a	U
S10M000385		E	7440-09-7	Potassium	ug/mL	81.2	<62.5	<62.5	n/a	n/a	n/a	n/a	62.5	n/a	U
S10M000385		E	7439-96-5	Manganese	ug/mL	92.5	<0.375	<0.375	n/a	n/a	n/a	n/a	0.375	n/a	U
S10M000385		E	7440-23-5	Sodium	ug/mL	138	32.6	149	n/a	n/a	n/a	n/a	12.5	n/a	CX
S10M000385		E	7440-36-0	Antimony	ug/mL	86.7	<6.25	<6.25	n/a	n/a	n/a	n/a	6.25	n/a	U
S10M000385		E	7782-49-2	Selenium	ug/mL	89.5	<12.5	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000385		E	7440-24-6	Strontium	ug/mL	95.8	<0.375	0.411	n/a	n/a	n/a	n/a	0.375	n/a	B
S10M000385		E	7440-28-0	Thallium	ug/mL	n/a	<12.5	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000385		E	7440-62-2	Vanadium	ug/mL	95.7	<0.625	<0.625	n/a	n/a	n/a	n/a	0.625	n/a	U
S10M000385		E	7440-66-6	Zinc	ug/mL	93.0	<0.625	0.841	n/a	n/a	n/a	n/a	0.625	n/a	B
S10M000385		E	7440-22-4	Silver	ug/mL	85.2	<0.0100	<0.0100	n/a	n/a	n/a	n/a	0.0100	n/a	U
S10M000385		E	7440-39-3	Barium	ug/mL	102	<1.60E-03	6.27	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000385		E	7440-41-7	Beryllium	ug/mL	105	<1.80E-03	<0.225	n/a	n/a	n/a	n/a	0.225	n/a	U
S10M000385		E	7440-43-9	Cadmium	ug/mL	102	<6.00E-04	<0.0750	n/a	n/a	n/a	n/a	0.0750	n/a	U
S10M000385		E	7440-47-3	Chromium	ug/mL	104	0.869	0.420	n/a	n/a	n/a	n/a	0.0875	n/a	CB
S10M000385		E	7439-92-1	Lead	ug/mL	99.2	1.12	0.585	n/a	n/a	n/a	n/a	0.0388	n/a	C
S10M000385		E	7440-02-0	Nickel	ug/mL	95.2	0.104	0.216	n/a	n/a	n/a	n/a	0.0150	n/a	C

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000379			7439-97-6	Mercury	ug/mL	100	1.05E-04	<2.00E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	U

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B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes**  
**PFP A Lab Rm 144**  
**Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24299**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000402			7439-97-6	Mercury	ug/mL	102	<1.00E-04	2.72E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	B
S10M000402				Hydrogren Ion	M	99.7	<1.00E-03	1.06	n/a	n/a	n/a	n/a	0.100	n/a	
S10M000402			16984-48-8	Fluoride	ug/mL	99.1	<6.16E-03	<30.8	n/a	n/a	n/a	n/a	30.8	n/a	U
S10M000402			16887-00-6	Chloride	ug/mL	102	<3.10E-03	206	n/a	n/a	n/a	n/a	15.5	n/a	CB
S10M000402			14797-65-0	Nitrite	ug/mL	95.0	<0.0400	<200	n/a	n/a	n/a	n/a	200	n/a	U
S10M000402			14797-55-8	Nitrate	ug/mL	95.9	<0.0162	6.48E+04	n/a	n/a	n/a	n/a	81.0	n/a	
S10M000402			14808-79-8	Sulfate	ug/mL	103	<0.0219	<110	n/a	n/a	n/a	n/a	110	n/a	U
S10M000402			338-70-5	Oxalate	ug/mL	98.1	<0.105	<525	n/a	n/a	n/a	n/a	525	n/a	U
S10M000402			7429-90-5	Aluminum	ug/mL	101	<0.0300	0.402	0.410	0.406	1.90	96.5	0.0600	n/a	
S10M000402			7440-38-2	Arsenic	ug/mL	104	<0.0500	<0.100	<0.100	n/a	n/a	102	0.100	n/a	U
S10M000402			7440-48-4	Cobalt	ug/mL	100	<0.0100	<0.0200	<0.0200	n/a	n/a	93.0	0.0200	n/a	U
S10M000402			7440-50-8	Copper	ug/mL	102	<5.00E-03	<0.0100	<0.0100	n/a	n/a	98.3	0.0100	n/a	U
S10M000402			7440-09-7	Potassium	ug/mL	107	<0.500	<1.00	<1.00	n/a	n/a	103	1.00	n/a	U
S10M000402			7439-96-5	Manganese	ug/mL	98.7	<3.00E-03	<6.00E-03	<6.00E-03	n/a	n/a	93.1	6.00E-03	n/a	U
S10M000402			7440-23-5	Sodium	ug/mL	95.1	<0.100	6.01	5.86	5.94	2.63	85.9	0.200	n/a	
S10M000402			7440-02-0	Nickel	ug/mL	99.5	<0.0200	<0.0400	<0.0400	n/a	n/a	91.8	0.0400	n/a	U
S10M000402			7440-36-0	Antimony	ug/mL	100	<0.0500	<0.100	<0.100	n/a	n/a	94.9	0.100	n/a	U
S10M000402			7782-49-2	Selenium	ug/mL	103	<0.100	<0.200	<0.200	n/a	n/a	98.0	0.200	n/a	U
S10M000402			7440-24-6	Strontium	ug/mL	101	<3.00E-03	0.0225	0.0224	0.0225	0.401	96.7	6.00E-03	n/a	B
S10M000402			7440-28-0	Thallium	ug/mL	102	<0.100	<0.200	<0.200	n/a	n/a	93.4	0.200	n/a	U
S10M000402			7440-62-2	Vanadium	ug/mL	101	<5.00E-03	<0.0100	<0.0100	n/a	n/a	93.6	0.0100	n/a	U
S10M000402			7440-66-6	Zinc	ug/mL	99.1	<5.00E-03	1.90	1.88	1.89	1.37	91.0	0.0100	n/a	
S10M000402			7440-22-4	Silver	ug/mL	103	<2.00E-06	1.49E-03	1.78E-03	1.64E-03	17.3	97.5	8.00E-04	n/a	B
S10M000402			7440-39-3	Barium	ug/mL	102	<1.60E-05	9.28E-03	1.14E-02	1.04E-02	20.8	99.4	6.40E-03	n/a	B
S10M000402			7440-41-7	Beryllium	ug/mL	98.1	<1.80E-05	9.53E-03	8.53E-03	9.03E-03	11.1	98.0	7.20E-03	n/a	B
S10M000402			7440-43-9	Cadmium	ug/mL	101	<6.00E-06	9.24E-03	1.10E-02	1.01E-02	17.0	95.6	2.40E-03	n/a	B
S10M000402			7440-47-3	Chromium	ug/mL	99.3	<7.00E-05	<0.0280	<0.0280	n/a	n/a	93.5	0.0280	n/a	U
S10M000402			7439-92-1	Lead	ug/mL	101	<1.50E-05	0.0136	0.0217	0.0176	45.9	98.2	6.00E-03	n/a	B

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U - < Det Limit  
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 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24299**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000402			PH	pH	unitless	n/a	n/a	<2.00	<2.00	n/a	n/a	n/a	2.00	n/a	>

N - Spike Outside Range  
 X - Comment

U - < Det Limit  
 > - WetChem Outside Calibration Range

B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

NA = Not Analyzed, ND = Not Detected  
 C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B242B1**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000403			7439-97-6	Mercury	ug/mL	102	<1.00E-04	<2.00E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	U
S10M000403				Hydrogren Ion	M	99.7	<1.00E-03	12.0	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000403			16984-48-8	Fluoride	ug/mL	99.1	<6.16E-03	<616	n/a	n/a	n/a	n/a	616	n/a	U
S10M000403			16887-00-6	Chloride	ug/mL	102	<3.10E-03	2.27E+03	n/a	n/a	n/a	n/a	310	n/a	CB
S10M000403			14797-65-0	Nitrite	ug/mL	95.0	<0.0400	<4.00E+03	n/a	n/a	n/a	n/a	4.00E+03	n/a	U
S10M000403			14797-55-8	Nitrate	ug/mL	95.9	<0.0162	7.26E+05	n/a	n/a	n/a	n/a	1.62E+03	n/a	
S10M000403			14808-79-8	Sulfate	ug/mL	103	<0.0219	<2.19E+03	n/a	n/a	n/a	n/a	2.19E+03	n/a	U
S10M000403			338-70-5	Oxalate	ug/mL	98.1	<0.105	<1.05E+04	n/a	n/a	n/a	n/a	1.05E+04	n/a	U
S10M000403			7429-90-5	Aluminum	ug/mL	102	<0.0300	33.4	34.1	33.7	2.00	101	3.00	n/a	
S10M000403			7440-38-2	Arsenic	ug/mL	97.0	<0.0500	<5.00	<5.00	n/a	n/a	98.2	5.00	n/a	U
S10M000403			7440-39-3	Barium	ug/mL	101	<3.00E-03	3.61	3.62	3.62	0.0257	101	0.300	n/a	
S10M000403			7440-48-4	Cobalt	ug/mL	101	<0.0100	3.16	3.03	3.09	4.01	99.9	1.00	n/a	B
S10M000403			7440-47-3	Chromium	ug/mL	100	<5.00E-03	936	940	938	0.407	98.3	0.500	n/a	
S10M000403			7440-50-8	Copper	ug/mL	103	<5.00E-03	77.0	77.2	77.1	0.286	99.6	0.500	n/a	
S10M000403			7440-09-7	Potassium	ug/mL	105	<0.500	<50.0	<50.0	n/a	n/a	102	50.0	n/a	U
S10M000403			7439-96-5	Manganese	ug/mL	98.7	<3.00E-03	68.5	68.6	68.5	0.208	99.5	0.300	n/a	
S10M000403			7440-23-5	Sodium	ug/mL	104	<0.100	17.0	15.3	16.1	10.6	101	10.0	n/a	B
S10M000403			7440-02-0	Nickel	ug/mL	99.5	<0.0200	587	590	588	0.544	97.6	2.00	n/a	
S10M000403			7440-36-0	Antimony	ug/mL	95.7	<0.0500	<5.00	<5.00	n/a	n/a	95.5	5.00	n/a	U
S10M000403			7782-49-2	Selenium	ug/mL	101	<0.100	<10.0	<10.0	n/a	n/a	101	10.0	n/a	U
S10M000403			7440-24-6	Strontium	ug/mL	101	<3.00E-03	<0.300	<0.300	n/a	n/a	98.7	0.300	n/a	U
S10M000403			7440-28-0	Thallium	ug/mL	101	<0.100	<10.0	<10.0	n/a	n/a	99.6	10.0	n/a	U
S10M000403			7440-62-2	Vanadium	ug/mL	101	<5.00E-03	1.20	1.30	1.25	7.30	99.7	0.500	n/a	B
S10M000403			7440-66-6	Zinc	ug/mL	98.9	<5.00E-03	282	282	282	0.0959	98.5	0.500	n/a	
S10M000403			7440-22-4	Silver	ug/mL	104	<2.00E-06	0.0630	n/a	n/a	n/a	n/a	8.00E-04	n/a	
S10M000403			7440-41-7	Beryllium	ug/mL	103	<1.80E-05	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000403			7440-43-9	Cadmium	ug/mL	102	<6.00E-06	0.613	n/a	n/a	n/a	n/a	2.40E-03	n/a	
S10M000403			7439-92-1	Lead	ug/mL	99.9	<1.50E-05	164	n/a	n/a	n/a	n/a	6.00E-03	n/a	

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range  
 X - Comment

U - < Det Limit  
 > - WetChem Outside Calibration Range

B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes**  
**PFP A Lab Rm 144**  
**Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B242B1**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000403			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

N - Spike Outside Range  
X - Comment

U - < Det Limit  
> - WetChem Outside Calibration Range

B - Inorganic Estimated  
M - Inorganic RPD Outside Range

NA = Not Analyzed, ND = Not Detected  
C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B242B2**

**Sample Portion: Acid Digest**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000484		B	7429-90-5	Aluminum	ug/mL	83.4	<0.0300	<0.150	n/a	n/a	n/a	n/a	0.150	n/a	U
S10M000484		B	7440-38-2	Arsenic	ug/mL	82.8	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000484		B	7440-48-4	Cobalt	ug/mL	82.3	<0.0100	<0.0500	n/a	n/a	n/a	n/a	0.0500	n/a	U
S10M000484		B	7440-50-8	Copper	ug/mL	89.9	<5.00E-03	<0.0250	n/a	n/a	n/a	n/a	0.0250	n/a	U
S10M000484		B	7440-09-7	Potassium	ug/mL	76.7	<0.500	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000484		B	7439-96-5	Manganese	ug/mL	82.1	<3.00E-03	<0.0150	n/a	n/a	n/a	n/a	0.0150	n/a	U
S10M000484		B	7440-23-5	Sodium	ug/mL	91.9	<0.100	1.78	n/a	n/a	n/a	n/a	0.500	n/a	B
S10M000484		B	7440-36-0	Antimony	ug/mL	80.1	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	UN
S10M000484		B	7782-49-2	Selenium	ug/mL	87.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000484		B	7440-24-6	Strontium	ug/mL	88.5	<3.00E-03	<0.0150	n/a	n/a	n/a	n/a	0.0150	n/a	U
S10M000484		B	7440-28-0	Thallium	ug/mL	90.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000484		B	7440-62-2	Vanadium	ug/mL	85.1	<5.00E-03	<0.0250	n/a	n/a	n/a	n/a	0.0250	n/a	U
S10M000484		B	7440-66-6	Zinc	ug/mL	82.2	<5.00E-03	0.0303	n/a	n/a	n/a	n/a	0.0250	n/a	B

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000404			7439-97-6	Mercury	ug/mL	102	<1.00E-04	<2.00E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	U
S10M000404				Hydrogren Ion	M	99.7	<1.00E-03	14.9	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000404			16984-48-8	Fluoride	ug/mL	99.1	<6.16E-03	<616	n/a	n/a	n/a	n/a	616	n/a	U
S10M000404			16887-00-6	Chloride	ug/mL	102	<3.10E-03	<310	n/a	n/a	n/a	n/a	310	n/a	U
S10M000404			14797-65-0	Nitrite	ug/mL	95.0	<0.0400	<4.00E+03	n/a	n/a	n/a	n/a	4.00E+03	n/a	U
S10M000404			14797-55-8	Nitrate	ug/mL	95.9	<0.0162	8.88E+05	n/a	n/a	n/a	n/a	1.62E+03	n/a	
S10M000404			14808-79-8	Sulfate	ug/mL	103	<0.0219	<2.19E+03	n/a	n/a	n/a	n/a	2.19E+03	n/a	U
S10M000404			338-70-5	Oxalate	ug/mL	98.1	<0.105	<1.05E+04	n/a	n/a	n/a	n/a	1.05E+04	n/a	U
S10M000404			7440-22-4	Silver	ug/mL	104	<2.00E-06	<8.00E-04	n/a	n/a	n/a	n/a	8.00E-04	n/a	U
S10M000404			7440-39-3	Barium	ug/mL	101	<1.60E-05	0.0337	n/a	n/a	n/a	n/a	6.40E-03	n/a	B
S10M000404			7440-41-7	Beryllium	ug/mL	103	<1.80E-05	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000404			7440-43-9	Cadmium	ug/mL	102	<6.00E-06	<2.40E-03	n/a	n/a	n/a	n/a	2.40E-03	n/a	U

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range  
 X - Comment

U - < Det Limit  
 > - WetChem Outside Calibration Range

B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B242B2**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000404			7440-47-3	Chromium	ug/mL	101	<7.00E-05	0.104	n/a	n/a	n/a	n/a	0.0280	n/a	B
S10M000404			7439-92-1	Lead	ug/mL	105	<3.10E-05	<6.20E-03	n/a	n/a	n/a	n/a	6.20E-03	n/a	U
S10M000404			7440-02-0	Nickel	ug/mL	91.2	<1.20E-05	6.14E-03	n/a	n/a	n/a	n/a	2.40E-03	n/a	B
S10M000404			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

N - Spike Outside Range  
 X - Comment

U - < Det Limit  
 > - WetChem Outside Calibration Range

B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

NA = Not Analyzed, ND = Not Detected  
 C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B242B4**

**Sample Portion: Acid Digest**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000485		B	7429-90-5	Aluminum	ug/mL	83.4	<0.0300	0.584	n/a	n/a	n/a	n/a	0.150	n/a	B
S10M000485		B	7440-38-2	Arsenic	ug/mL	82.8	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000485		B	7440-48-4	Cobalt	ug/mL	82.3	<0.0100	<0.0500	n/a	n/a	n/a	n/a	0.0500	n/a	U
S10M000485		B	7440-50-8	Copper	ug/mL	89.9	<5.00E-03	0.0544	n/a	n/a	n/a	n/a	0.0250	n/a	B
S10M000485		B	7440-09-7	Potassium	ug/mL	76.7	<0.500	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000485		B	7439-96-5	Manganese	ug/mL	82.1	<3.00E-03	0.0246	n/a	n/a	n/a	n/a	0.0150	n/a	B
S10M000485		B	7440-23-5	Sodium	ug/mL	91.9	<0.100	8.35	n/a	n/a	n/a	n/a	0.500	n/a	
S10M000485		B	7439-92-1	Lead	ug/mL	81.4	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000485		B	7440-36-0	Antimony	ug/mL	80.1	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	UN
S10M000485		B	7782-49-2	Selenium	ug/mL	87.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000485		B	7440-24-6	Strontium	ug/mL	88.5	<3.00E-03	0.0306	n/a	n/a	n/a	n/a	0.0150	n/a	B
S10M000485		B	7440-28-0	Thallium	ug/mL	90.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000485		B	7440-62-2	Vanadium	ug/mL	85.1	<5.00E-03	<0.0250	n/a	n/a	n/a	n/a	0.0250	n/a	U
S10M000485		B	7440-66-6	Zinc	ug/mL	82.2	<5.00E-03	2.49	n/a	n/a	n/a	n/a	0.0250	n/a	

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000405			7439-97-6	Mercury	ug/mL	102	<1.00E-04	<2.00E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	U
S10M000405				Hydrogren Ion	M	99.7	<1.00E-03	0.640	n/a	n/a	n/a	n/a	0.100	n/a	
S10M000405			16984-48-8	Fluoride	ug/mL	99.1	<6.16E-03	<61.6	n/a	n/a	n/a	n/a	61.6	n/a	U
S10M000405			16887-00-6	Chloride	ug/mL	102	<3.10E-03	242	n/a	n/a	n/a	n/a	31.0	n/a	CB
S10M000405			14797-65-0	Nitrite	ug/mL	95.0	<0.0400	<400	n/a	n/a	n/a	n/a	400	n/a	U
S10M000405			14797-55-8	Nitrate	ug/mL	95.9	<0.0162	3.75E+04	n/a	n/a	n/a	n/a	162	n/a	
S10M000405			14808-79-8	Sulfate	ug/mL	103	<0.0219	<219	n/a	n/a	n/a	n/a	219	n/a	U
S10M000405			338-70-5	Oxalate	ug/mL	98.1	<0.105	<1.05E+03	n/a	n/a	n/a	n/a	1.05E+03	n/a	U
S10M000405			7440-22-4	Silver	ug/mL	109	<2.00E-04	<8.00E-04	n/a	n/a	n/a	n/a	8.00E-04	n/a	U
S10M000405			7440-39-3	Barium	ug/mL	102	<1.60E-03	8.79E-03	n/a	n/a	n/a	n/a	6.40E-03	n/a	B
S10M000405			7440-41-7	Beryllium	ug/mL	105	<1.80E-03	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range  
 X - Comment

U - < Det Limit  
 > - WetChem Outside Calibration Range

B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B242B4**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000405			7440-43-9	Cadmium	ug/mL	102	<6.00E-04	<2.40E-03	n/a	n/a	n/a	n/a	2.40E-03	n/a	U
S10M000405			7440-47-3	Chromium	ug/mL	102	<7.00E-03	<0.0280	n/a	n/a	n/a	n/a	0.0280	n/a	UX
S10M000405			7440-02-0	Nickel	ug/mL	98.5	<1.20E-05	<4.80E-03	n/a	n/a	n/a	n/a	4.80E-03	n/a	U
S10M000405			PH	pH	unitless	n/a	n/a	<2.00	<2.00	n/a	n/a	n/a	2.00	n/a	>

N - Spike Outside Range  
 X - Comment

U - < Det Limit  
 > - WetChem Outside Calibration Range

B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

NA = Not Analyzed, ND = Not Detected  
 C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B242B8**

**Sample Portion: Acid Digest**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000486		B	7429-90-5	Aluminum	ug/mL	83.4	<0.0300	0.608	n/a	n/a	n/a	n/a	0.150	n/a	B
S10M000486		B	7440-38-2	Arsenic	ug/mL	82.8	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000486		B	7440-48-4	Cobalt	ug/mL	82.3	<0.0100	<0.0500	n/a	n/a	n/a	n/a	0.0500	n/a	U
S10M000486		B	7440-50-8	Copper	ug/mL	89.9	<5.00E-03	0.0619	n/a	n/a	n/a	n/a	0.0250	n/a	B
S10M000486		B	7440-09-7	Potassium	ug/mL	76.7	<0.500	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000486		B	7439-96-5	Manganese	ug/mL	82.1	<3.00E-03	0.0272	n/a	n/a	n/a	n/a	0.0150	n/a	B
S10M000486		B	7440-23-5	Sodium	ug/mL	91.9	<0.100	8.18	n/a	n/a	n/a	n/a	0.500	n/a	
S10M000486		B	7439-92-1	Lead	ug/mL	81.4	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000486		B	7440-36-0	Antimony	ug/mL	80.1	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	UN
S10M000486		B	7782-49-2	Selenium	ug/mL	87.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000486		B	7440-24-6	Strontium	ug/mL	88.5	<3.00E-03	0.0183	n/a	n/a	n/a	n/a	0.0150	n/a	B
S10M000486		B	7440-28-0	Thallium	ug/mL	90.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000486		B	7440-62-2	Vanadium	ug/mL	85.1	<5.00E-03	<0.0250	n/a	n/a	n/a	n/a	0.0250	n/a	U
S10M000486		B	7440-66-6	Zinc	ug/mL	82.2	<5.00E-03	0.0825	n/a	n/a	n/a	n/a	0.0250	n/a	B

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000406			7439-97-6	Mercury	ug/mL	102	<1.00E-04	<2.00E-03	<2.00E-03	n/a	n/a	105	2.00E-03	n/a	U
S10M000406				Hydrogren Ion	M	99.7	<1.00E-03	0.640	n/a	n/a	n/a	n/a	0.100	n/a	
S10M000406			16984-48-8	Fluoride	ug/mL	99.1	<6.16E-03	<61.6	n/a	n/a	n/a	n/a	61.6	n/a	U
S10M000406			16887-00-6	Chloride	ug/mL	102	<3.10E-03	220	n/a	n/a	n/a	n/a	31.0	n/a	CB
S10M000406			14797-65-0	Nitrite	ug/mL	95.0	<0.0400	<400	n/a	n/a	n/a	n/a	400	n/a	U
S10M000406			14797-55-8	Nitrate	ug/mL	95.9	<0.0162	3.79E+04	n/a	n/a	n/a	n/a	162	n/a	
S10M000406			14808-79-8	Sulfate	ug/mL	103	<0.0219	<219	n/a	n/a	n/a	n/a	219	n/a	U
S10M000406			338-70-5	Oxalate	ug/mL	98.1	<0.105	<1.05E+03	n/a	n/a	n/a	n/a	1.05E+03	n/a	U
S10M000406			7440-22-4	Silver	ug/mL	109	<2.00E-04	<8.00E-04	n/a	n/a	n/a	n/a	8.00E-04	n/a	U
S10M000406			7440-39-3	Barium	ug/mL	102	<1.60E-03	8.41E-03	n/a	n/a	n/a	n/a	6.40E-03	n/a	B
S10M000406			7440-41-7	Beryllium	ug/mL	105	<1.80E-03	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range  
 X - Comment

U - < Det Limit  
 > - WetChem Outside Calibration Range

B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

C - Inorganic Blank Contamination

**Inorganic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B242B8**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000406			7440-43-9	Cadmium	ug/mL	102	<6.00E-04	<2.40E-03	n/a	n/a	n/a	n/a	2.40E-03	n/a	U
S10M000406			7440-47-3	Chromium	ug/mL	102	<7.00E-03	<0.0280	n/a	n/a	n/a	n/a	0.0280	n/a	UX
S10M000406			7440-02-0	Nickel	ug/mL	98.5	<1.20E-05	<4.80E-03	n/a	n/a	n/a	n/a	4.80E-03	n/a	U
S10M000406			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

N - Spike Outside Range  
 X - Comment

U - < Det Limit  
 > - WetChem Outside Calibration Range

B - Inorganic Estimated  
 M - Inorganic RPD Outside Range

NA = Not Analyzed, ND = Not Detected  
 C - Inorganic Blank Contamination

**Radionuclide Analytes**  
**PFP A Lab Rm 144**  
**Data Summary Report**

**Sample Group: 20100687**

**Customer Group or SDG Number: 222S20100687**

**Customer Sample ID: B241X2**

**Sample Portion: Acid Dig**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000377		A	13968-55-3	Uranium-233	ug/g	n/a	<5.00E-06	<9.33E-04	<8.93E-04	n/a	n/a	n/a	9.33E-04	n/a	U
S10M000377		A	13966-29-5	Uranium-234	ug/g	n/a	<2.50E-06	<4.67E-04	<4.47E-04	n/a	n/a	n/a	4.67E-04	n/a	U
S10M000377		A	15117-96-1	Uranium-235	ug/g	129	<5.00E-06	<9.33E-04	<8.93E-04	n/a	n/a	85.0	9.33E-04	n/a	U
S10M000377		A	13994-20-2	Neptunium-237	ug/g	99.3	<5.00E-05	<9.33E-03	<8.93E-03	n/a	n/a	91.0	9.33E-03	n/a	U
S10M000377		A	U-238	Uranium-238	ug/g	102	<2.50E-04	<0.0467	<0.0447	n/a	n/a	95.7	0.0467	n/a	U
S10M000377		A	13982-10-0	Plutonium-242	ug/g	n/a	<2.00E-06	<3.73E-04	<3.57E-04	n/a	n/a	n/a	3.73E-04	n/a	U

**Sample Portion: Env Dig**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000373		E	12587-46-1	Gross alpha	uCi/g	97.3	<1.65E-05	<1.65E-05	<1.58E-05	n/a	n/a	72.1	1.65E-05	n/a	U
S10M000373		E	12587-47-2	Gross beta	uCi/g	113	<4.91E-05	<5.32E-05	<4.72E-05	n/a	n/a	111	5.32E-05	n/a	U
S10M000373		E	14596-10-2	Americium-241	uCi/g	96.4	0.0	0.0	0.0	n/a	n/a	n/a	8.78E-05	100	U
S10M000373		E	10198-40-0	Cobalt-60	uCi/g	99.4	<2.71E-05	<2.61E-05	<2.55E-05	n/a	n/a	n/a	2.61E-05	n/a	U
S10M000373		E	10045-97-3	Cesium-137	uCi/g	102	<3.35E-05	<3.40E-05	<3.15E-05	n/a	n/a	n/a	3.40E-05	n/a	U
S10M000373		E	PU-239/240	Plutonium-239/240	uCi/g	99.4	0.0	0.0	0.0	n/a	n/a	n/a	6.78E-05	100	U
S10M000373		E	13981-16-3	Plutonium-238	uCi/g	n/a	0.0	0.0	0.0	n/a	n/a	n/a	6.78E-05	100	U
S10M000373		E	SR-89/90	Strontium-89/90	uCi/g	91.9	2.98E-05	-5.08E-07	-2.76E-05	n/a	n/a	n/a	2.68E-05	7683.267	U

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100687**

**Customer Group or SDG Number: 222S20100687**

**Customer Sample ID: B242B6**

**Sample Portion: Acid Dig**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000376		A	12587-46-1	Gross alpha	uCi/g	89.7	<1.05E-04	0.0432	0.0438	0.0435	1.33	92.7	7.82E-05	3.28	
S10M000376		A	12587-47-2	Gross beta	uCi/g	100	<3.59E-04	2.47E-03	2.18E-03	2.33E-03	12.2	109	1.97E-04	15.54	
S10M000376		A	14596-10-2	Americium-241	uCi/g	106	0.0	1.59E-03	1.55E-03	1.57E-03	2.51	n/a	3.78E-04	5.51	
S10M000376		A	10198-40-0	Cobalt-60	uCi/g	98.8	<2.27E-05	<2.21E-03	n/a	n/a	n/a	n/a	2.21E-03	n/a	U
S10M000376		A	10045-97-3	Cesium-137	uCi/g	98.6	<2.91E-05	<3.16E-03	n/a	n/a	n/a	n/a	3.16E-03	n/a	U
S10M000376		A	13968-55-3	Uranium-233	ug/g	n/a	<5.00E-06	<5.38E-04	n/a	n/a	n/a	n/a	5.38E-04	n/a	U
S10M000376		A	13966-29-5	Uranium-234	ug/g	n/a	<2.50E-06	1.05E-03	n/a	n/a	n/a	n/a	2.69E-04	n/a	
S10M000376		A	15117-96-1	Uranium-235	ug/g	129	<5.00E-06	0.0488	n/a	n/a	n/a	n/a	5.38E-04	n/a	
S10M000376		A	13994-20-2	Neptunium-237	ug/g	99.3	<5.00E-05	<5.38E-03	n/a	n/a	n/a	n/a	5.38E-03	n/a	U
S10M000376		A	U-238	Uranium-238	ug/g	102	<2.50E-04	3.97	n/a	n/a	n/a	n/a	0.0269	n/a	
S10M000376		A	13982-10-0	Plutonium-242	ug/g	n/a	<2.00E-06	<2.15E-04	n/a	n/a	n/a	n/a	2.15E-04	n/a	U
S10M000376		A	PU-239/240	Plutonium-239/240	uCi/g	111	0.0	0.0519	0.0506	0.0512	2.54	n/a	2.87E-03	3.26	
S10M000376		A	13981-16-3	Plutonium-238	uCi/g	n/a	0.0	3.30E-03	3.19E-03	3.25E-03	3.60	n/a	2.87E-03	4.94	
S10M000376		A	SR-89/90	Strontium-89/90	uCi/g	91.9	n/a	3.92E-05	n/a	n/a	n/a	n/a	6.91E-04	862.906	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24279**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000395			12587-46-1	Gross alpha	uCi/mL	103	<4.57E-07	<3.23E-05	<6.53E-05	n/a	n/a	97.4	3.23E-05	n/a	U
S10M000395			12587-47-2	Gross beta	uCi/mL	109	<1.93E-06	<1.54E-04	<1.83E-04	n/a	n/a	115	1.54E-04	n/a	U
S10M000395			14596-10-2	Americium-241	uCi/mL	104	0.0	0.0	0.0	n/a	n/a	n/a	3.12E-05	100	U
S10M000395			10198-40-0	Cobalt-60	uCi/mL	92.9	<3.01E-05	<3.18E-05	<2.93E-05	n/a	n/a	n/a	3.18E-05	n/a	U
S10M000395			10045-97-3	Cesium-137	uCi/mL	102	<4.43E-05	<4.55E-05	<4.46E-05	n/a	n/a	n/a	4.55E-05	n/a	U
S10M000395			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000395			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<5.00E-07	n/a	n/a	n/a	n/a	5.00E-07	n/a	U
S10M000395			15117-96-1	Uranium-235	ug/mL	99.3	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000395			13994-20-2	Neptunium-237	ug/mL	95.0	1.46E-07	<1.00E-05	n/a	n/a	n/a	n/a	1.00E-05	n/a	U
S10M000395			U-238	Uranium-238	ug/mL	96.8	<5.00E-07	<5.00E-05	n/a	n/a	n/a	n/a	5.00E-05	n/a	U
S10M000395			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	5.85E-07	n/a	n/a	n/a	n/a	4.00E-07	n/a	
S10M000395			PU-239/240	Plutonium-239/240	uCi/mL	97.7	0.0	0.0	0.0	0.0	0.0	n/a	1.13E-06	100	U
S10M000395			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	0.0	0.0	0.0	n/a	1.13E-06	100	U
S10M000395			SR-89/90	Strontium-89/90	uCi/mL	101	1.86E-05	5.73E-05	3.29E-05	n/a	n/a	n/a	5.44E-05	146.26	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24280**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000386			12587-46-1	Gross alpha	uCi/mL	99.7	<4.73E-06	18.8	n/a	n/a	n/a	n/a	2.05E-03	0.79	
S10M000386			12587-47-2	Gross beta	uCi/mL	107	<4.74E-06	0.934	n/a	n/a	n/a	n/a	5.05E-03	2.89	
S10M000386			14596-10-2	Americium-241	uCi/mL	94.9	0.0	1.13	n/a	n/a	n/a	n/a	1.92	15.22	
S10M000386			10198-40-0	Cobalt-60	uCi/mL	103	<2.57E-05	<2.25E-05	n/a	n/a	n/a	n/a	2.25E-05	n/a	U
S10M000386			10045-97-3	Cesium-137	uCi/mL	105	<3.09E-05	<3.36E-05	n/a	n/a	n/a	n/a	3.36E-05	n/a	U
S10M000386			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<4.00E-03	n/a	n/a	n/a	n/a	4.00E-03	n/a	U
S10M000386			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	5.64E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	
S10M000386			15117-96-1	Uranium-235	ug/mL	96.7	<1.00E-08	0.182	n/a	n/a	n/a	n/a	4.00E-03	n/a	
S10M000386			13994-20-2	Neptunium-237	ug/mL	98.0	<1.00E-07	<0.0400	n/a	n/a	n/a	n/a	0.0400	n/a	U
S10M000386			U-238	Uranium-238	ug/mL	95.1	<5.00E-07	<0.200	n/a	n/a	n/a	n/a	0.200	n/a	U
S10M000386			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	0.0679	n/a	n/a	n/a	n/a	1.60E-03	n/a	
S10M000386			PU-239/240	Plutonium-239/240	uCi/mL	97.8	0.0	20.4	n/a	n/a	n/a	n/a	3.17	5.59	
S10M000386			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	n/a	n/a	n/a	n/a	3.17	100	U
S10M000386			SR-89/90	Strontium-89/90	uCi/mL	105	-6.13E-06	5.27E-04	n/a	n/a	n/a	n/a	4.43E-05	18.791	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24281**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000387			12587-46-1	Gross alpha	uCi/mL	99.7	<4.73E-06	5.47	n/a	n/a	n/a	n/a	5.13E-04	0.73	
S10M000387			12587-47-2	Gross beta	uCi/mL	107	<4.74E-06	0.338	n/a	n/a	n/a	n/a	1.26E-03	2.33	
S10M000387			14596-10-2	Americium-241	uCi/mL	94.9	0.0	0.865	n/a	n/a	n/a	n/a	1.99	16.88	
S10M000387			10198-40-0	Cobalt-60	uCi/mL	103	<2.57E-05	<2.50E-05	n/a	n/a	n/a	n/a	2.50E-05	n/a	U
S10M000387			10045-97-3	Cesium-137	uCi/mL	105	<3.09E-05	<3.06E-05	n/a	n/a	n/a	n/a	3.06E-05	n/a	U
S10M000387			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00E-03	n/a	n/a	n/a	n/a	1.00E-03	n/a	U
S10M000387			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	3.48E-03	n/a	n/a	n/a	n/a	5.00E-04	n/a	
S10M000387			15117-96-1	Uranium-235	ug/mL	96.7	<1.00E-08	0.0372	n/a	n/a	n/a	n/a	1.00E-03	n/a	
S10M000387			13994-20-2	Neptunium-237	ug/mL	98.0	<1.00E-07	<0.0100	n/a	n/a	n/a	n/a	0.0100	n/a	U
S10M000387			U-238	Uranium-238	ug/mL	95.1	<5.00E-07	0.0944	n/a	n/a	n/a	n/a	0.0500	n/a	
S10M000387			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	0.0184	n/a	n/a	n/a	n/a	4.00E-04	n/a	
S10M000387			PU-239/240	Plutonium-239/240	uCi/mL	97.8	0.0	5.36	n/a	n/a	n/a	n/a	3.53	11.62	
S10M000387			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	n/a	n/a	n/a	n/a	3.53	100	U
S10M000387			SR-89/90	Strontium-89/90	uCi/mL	105	-6.13E-06	3.35E-05	n/a	n/a	n/a	n/a	1.60E-04	189.833	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24283**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000388			12587-46-1	Gross alpha	uCi/mL	99.7	<4.73E-06	0.0342	0.0334	0.0338	2.20	94.6	4.66E-05	2.83	
S10M000388			12587-47-2	Gross beta	uCi/mL	107	<4.74E-06	2.62E-03	2.19E-03	2.41E-03	17.9	112	1.15E-04	11	
S10M000388			14596-10-2	Americium-241	uCi/mL	96.9	0.0	4.82E-03	4.82E-03	4.82E-03	0.0209	n/a	2.38E-03	7.92	
S10M000388			10198-40-0	Cobalt-60	uCi/mL	103	<2.57E-05	<2.29E-05	<2.66E-05	n/a	n/a	n/a	2.29E-05	n/a	U
S10M000388			10045-97-3	Cesium-137	uCi/mL	105	<3.09E-05	<3.04E-05	<3.05E-05	n/a	n/a	n/a	3.04E-05	n/a	U
S10M000388			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<0.0200	n/a	n/a	n/a	n/a	0.0200	n/a	U
S10M000388			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	0.250	n/a	n/a	n/a	n/a	0.0100	n/a	
S10M000388			15117-96-1	Uranium-235	ug/mL	96.7	<1.00E-08	22.6	n/a	n/a	n/a	n/a	0.0200	n/a	
S10M000388			13994-20-2	Neptunium-237	ug/mL	98.0	<1.00E-07	<0.200	n/a	n/a	n/a	n/a	0.200	n/a	U
S10M000388			U-238	Uranium-238	ug/mL	95.1	<5.00E-07	22.6	n/a	n/a	n/a	n/a	1.00	n/a	
S10M000388			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	<8.00E-03	n/a	n/a	n/a	n/a	8.00E-03	n/a	U
S10M000388			PU-239/240	Plutonium-239/240	uCi/mL	104	0.0	0.0254	0.0267	0.0261	4.71	n/a	3.03E-03	4.59	
S10M000388			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0114	0.0112	0.0113	2.14	n/a	3.03E-03	5.96	
S10M000388			SR-89/90	Strontium-89/90	uCi/mL	105	-6.13E-06	6.81E-05	9.34E-05	8.07E-05	31.4	n/a	4.20E-05	97.756	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24285**

**Sample Portion: Env Dig**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000384	E		12587-46-1	Gross alpha	uCi/mL	106	<1.45E-05	1.05E-04	n/a	n/a	n/a	n/a	6.78E-06	24.7	
S10M000384	E		12587-47-2	Gross beta	uCi/mL	107	<1.01E-04	4.53E-05	n/a	n/a	n/a	n/a	2.35E-05	74.85	
S10M000384	E		14596-10-2	Americium-241	uCi/mL	97.6	0.0	1.10E-04	n/a	n/a	n/a	n/a	1.84E-04	100	
S10M000384	E		10198-40-0	Cobalt-60	uCi/mL	96.5	<3.04E-05	<3.12E-05	n/a	n/a	n/a	n/a	3.12E-05	n/a	U
S10M000384	E		10045-97-3	Cesium-137	uCi/mL	99.5	<4.39E-05	<4.58E-05	n/a	n/a	n/a	n/a	4.58E-05	n/a	U
S10M000384	E		13968-55-3	Uranium-233	ug/mL	n/a	<1.25E-04	<1.25E-04	n/a	n/a	n/a	n/a	1.25E-04	n/a	U
S10M000384	E		13966-29-5	Uranium-234	ug/mL	n/a	<6.25E-05	1.39E-04	n/a	n/a	n/a	n/a	6.25E-05	n/a	
S10M000384	E		15117-96-1	Uranium-235	ug/mL	103	<1.25E-04	<1.25E-04	n/a	n/a	n/a	n/a	1.25E-04	n/a	U
S10M000384	E		13994-20-2	Neptunium-237	ug/mL	92.5	<1.25E-03	<1.25E-03	n/a	n/a	n/a	n/a	1.25E-03	n/a	U
S10M000384	E		U-238	Uranium-238	ug/mL	97.0	<6.25E-03	0.0234	n/a	n/a	n/a	n/a	6.25E-03	n/a	
S10M000384	E		13982-10-0	Plutonium-242	ug/mL	n/a	<5.00E-05	<5.00E-05	n/a	n/a	n/a	n/a	5.00E-05	n/a	U
S10M000384	E		PU-239/240	Plutonium-239/240	uCi/mL	100	0.0	0.0	n/a	n/a	n/a	n/a	1.14E-04	100	U
S10M000384	E		13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	n/a	n/a	n/a	n/a	1.14E-04	100	U
S10M000384	E		SR-89/90	Strontium-89/90	uCi/mL	100	-1.02E-07	5.58E-06	n/a	n/a	n/a	n/a	7.39E-05	631.912	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes**  
**PFP A Lab Rm 144**  
**Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24286**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000389			12587-46-1	Gross alpha	uCi/mL	99.7	<4.73E-06	5.09E-03	n/a	n/a	n/a	n/a	9.32E-06	3.25	
S10M000389			12587-47-2	Gross beta	uCi/mL	107	<4.74E-06	5.34E-04	n/a	n/a	n/a	n/a	2.30E-05	10.51	
S10M000389			14596-10-2	Americium-241	uCi/mL	96.9	0.0	1.26E-03	n/a	n/a	n/a	n/a	4.62E-04	6.95	
S10M000389			10198-40-0	Cobalt-60	uCi/mL	103	<2.57E-05	<2.54E-05	n/a	n/a	n/a	n/a	2.54E-05	n/a	U
S10M000389			10045-97-3	Cesium-137	uCi/mL	105	<3.09E-05	<3.07E-05	n/a	n/a	n/a	n/a	3.07E-05	n/a	U
S10M000389			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00E-05	<1.00E-05	n/a	n/a	n/a	1.00E-05	n/a	U
S10M000389			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	5.85E-05	1.60E-05	3.72E-05	114	n/a	5.00E-06	n/a	
S10M000389			15117-96-1	Uranium-235	ug/mL	102	<1.00E-08	6.47E-04	6.58E-04	6.52E-04	1.61	101	1.00E-05	n/a	
S10M000389			13994-20-2	Neptunium-237	ug/mL	94.2	<1.00E-07	<1.00E-04	<1.00E-04	n/a	n/a	99.2	1.00E-04	n/a	U
S10M000389			U-238	Uranium-238	ug/mL	99.2	<5.00E-07	0.0927	0.0940	0.0933	1.32	103	5.00E-04	n/a	
S10M000389			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	7.04E-05	5.42E-05	6.23E-05	25.9	n/a	4.00E-06	n/a	
S10M000389			PU-239/240	Plutonium-239/240	uCi/mL	104	0.0	5.75E-03	n/a	n/a	n/a	n/a	5.45E-04	4.23	
S10M000389			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	3.78E-04	n/a	n/a	n/a	n/a	5.45E-04	12.02	
S10M000389			SR-89/90	Strontium-89/90	uCi/mL	105	-6.13E-06	1.04E-05	n/a	n/a	n/a	n/a	1.38E-04	631.912	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24287**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000396			12587-46-1	Gross alpha	uCi/mL	103	<4.57E-07	1.59E-03	n/a	n/a	n/a	n/a	3.23E-05	13.13	
S10M000396			12587-47-2	Gross beta	uCi/mL	109	<1.93E-06	<2.30E-04	n/a	n/a	n/a	n/a	2.30E-04	n/a	U
S10M000396			14596-10-2	Americium-241	uCi/mL	104	0.0	1.76E-04	n/a	n/a	n/a	n/a	4.23E-05	5.73	
S10M000396			10198-40-0	Cobalt-60	uCi/mL	92.9	<3.01E-05	<2.68E-05	n/a	n/a	n/a	n/a	2.68E-05	n/a	U
S10M000396			10045-97-3	Cesium-137	uCi/mL	102	<4.43E-05	<4.62E-05	n/a	n/a	n/a	n/a	4.62E-05	n/a	U
S10M000396			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	3.64E-06	4.34E-06	3.99E-06	17.7	n/a	2.00E-06	n/a	
S10M000396			13966-29-5	Uranium-234	ug/mL	n/a	6.00E-09	3.90E-05	4.91E-05	4.40E-05	23.0	n/a	1.00E-06	n/a	
S10M000396			15117-96-1	Uranium-235	ug/mL	99.1	<1.00E-08	1.17E-03	1.26E-03	1.22E-03	7.89	102	2.00E-06	n/a	
S10M000396			13994-20-2	Neptunium-237	ug/mL	94.9	<1.00E-07	2.59E-05	3.09E-05	2.84E-05	17.3	101	2.00E-05	n/a	B
S10M000396			U-238	Uranium-238	ug/mL	96.7	<5.00E-07	0.121	0.130	0.126	6.85	101	1.00E-04	n/a	
S10M000396			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	6.68E-05	7.24E-05	6.96E-05	8.07	n/a	8.00E-07	n/a	
S10M000396			PU-239/240	Plutonium-239/240	uCi/mL	97.7	0.0	7.27E-03	n/a	n/a	n/a	n/a	3.04E-04	2.87	
S10M000396			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	4.33E-04	n/a	n/a	n/a	n/a	3.04E-04	3.04	
S10M000396			SR-89/90	Strontium-89/90	uCi/mL	101	1.86E-05	3.61E-05	n/a	n/a	n/a	n/a	1.96E-04	223.822	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24288**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000390			12587-46-1	Gross alpha	uCi/mL	99.7	<4.73E-06	13.5	n/a	n/a	n/a	n/a	1.03E-03	0.66	
S10M000390			12587-47-2	Gross beta	uCi/mL	107	<4.74E-06	1.56	n/a	n/a	n/a	n/a	2.52E-03	1.53	
S10M000390			14596-10-2	Americium-241	uCi/mL	94.9	0.0	7.57	n/a	n/a	n/a	n/a	1.29	4.72	
S10M000390			10198-40-0	Cobalt-60	uCi/mL	103	<2.57E-05	<2.58E-05	n/a	n/a	n/a	n/a	2.58E-05	n/a	U
S10M000390			10045-97-3	Cesium-137	uCi/mL	105	<3.09E-05	<3.53E-05	n/a	n/a	n/a	n/a	3.53E-05	n/a	U
S10M000390			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	0.0370	n/a	n/a	n/a	n/a	4.00E-03	n/a	
S10M000390			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	0.0636	0.0533	0.0584	17.6	n/a	2.00E-03	n/a	
S10M000390			15117-96-1	Uranium-235	ug/mL	96.7	<1.00E-08	2.41	2.38	2.39	1.30	93.0	4.00E-03	n/a	
S10M000390			13994-20-2	Neptunium-237	ug/mL	98.0	<1.00E-07	<0.0400	<0.0400	n/a	n/a	94.8	0.0400	n/a	U
S10M000390			U-238	Uranium-238	ug/mL	95.1	<5.00E-07	102	102	102	0.784	98.7	0.200	n/a	
S10M000390			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	0.0318	0.0327	0.0323	2.63	n/a	1.60E-03	n/a	
S10M000390			PU-239/240	Plutonium-239/240	uCi/mL	97.8	0.0	5.68	n/a	n/a	n/a	n/a	0.766	5.36	
S10M000390			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.526	n/a	n/a	n/a	n/a	0.766	14.83	
S10M000390			SR-89/90	Strontium-89/90	uCi/mL	105	-6.13E-06	1.37E-04	n/a	n/a	n/a	n/a	4.20E-05	52.298	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24289**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000391			12587-46-1	Gross alpha	uCi/mL	99.7	<4.73E-06	13.8	n/a	n/a	n/a	n/a	1.03E-03	0.65	
S10M000391			12587-47-2	Gross beta	uCi/mL	107	<4.74E-06	2.03	n/a	n/a	n/a	n/a	2.52E-03	1.32	
S10M000391			14596-10-2	Americium-241	uCi/mL	94.9	0.0	11.1	n/a	n/a	n/a	n/a	1.49	4.32	
S10M000391			10198-40-0	Cobalt-60	uCi/mL	103	<2.57E-05	<2.62E-05	n/a	n/a	n/a	n/a	2.62E-05	n/a	U
S10M000391			10045-97-3	Cesium-137	uCi/mL	105	<3.09E-05	5.43E-05	n/a	n/a	n/a	n/a	3.06E-05	37.38	
S10M000391			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	0.0326	n/a	n/a	n/a	n/a	0.0200	n/a	
S10M000391			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	0.587	n/a	n/a	n/a	n/a	0.0100	n/a	
S10M000391			15117-96-1	Uranium-235	ug/mL	96.7	<1.00E-08	14.8	n/a	n/a	n/a	n/a	0.0200	n/a	
S10M000391			13994-20-2	Neptunium-237	ug/mL	98.0	<1.00E-07	0.798	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000391			U-238	Uranium-238	ug/mL	95.1	<5.00E-07	1.85E+03	n/a	n/a	n/a	n/a	1.00	n/a	
S10M000391			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	0.0545	n/a	n/a	n/a	n/a	8.00E-03	n/a	
S10M000391			PU-239/240	Plutonium-239/240	uCi/mL	97.8	0.0	2.99	n/a	n/a	n/a	n/a	1.14	9.67	
S10M000391			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	n/a	n/a	n/a	n/a	1.14	100	U
S10M000391			SR-89/90	Strontium-89/90	uCi/mL	105	-6.13E-06	5.97E-04	n/a	n/a	n/a	n/a	4.72E-05	17.989	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24290**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000392			12587-46-1	Gross alpha	uCi/mL	97.3	<0.157	1.14E+03	n/a	n/a	n/a	n/a	0.0831	0.69	
S10M000392			12587-47-2	Gross beta	uCi/mL	109	<0.274	172	n/a	n/a	n/a	n/a	0.232	1.37	
S10M000392			14596-10-2	Americium-241	uCi/mL	104	0.0	713	n/a	n/a	n/a	n/a	45.0	3.11	
S10M000392			10198-40-0	Cobalt-60	uCi/mL	103	<0.0335	<0.0359	<0.0344	n/a	n/a	n/a	0.0359	n/a	U
S10M000392			10045-97-3	Cesium-137	uCi/mL	108	<0.0447	<0.0435	<0.0436	n/a	n/a	n/a	0.0435	n/a	U
S10M000392			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<5.00	n/a	n/a	n/a	n/a	5.00	n/a	U
S10M000392			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	2.97	7.01	4.99	81.1	n/a	2.50	n/a	
S10M000392			15117-96-1	Uranium-235	ug/mL	104	<1.00E-08	202	188	195	7.03	104	5.00	n/a	
S10M000392			13994-20-2	Neptunium-237	ug/mL	96.7	<1.00E-07	<50.0	<50.0	n/a	n/a	99.7	50.0	n/a	U
S10M000392			U-238	Uranium-238	ug/mL	97.7	<5.00E-07	1.75E+04	1.76E+04	1.76E+04	0.568	101	250	n/a	
S10M000392			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	8.37	5.60	6.99	39.7	n/a	2.00	n/a	
S10M000392			PU-239/240	Plutonium-239/240	uCi/mL	97.9	0.0	383	n/a	n/a	n/a	n/a	22.6	4.61	
S10M000392			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	47.2	n/a	n/a	n/a	n/a	22.6	7.5	
S10M000392			SR-89/90	Strontium-89/90	uCi/mL	101	-1.71E-05	1.54E-05	n/a	n/a	n/a	n/a	1.22E-04	355.044	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24291**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000393			12587-46-1	Gross alpha	uCi/mL	97.3	<0.157	153	n/a	n/a	n/a	n/a	0.0166	0.84	
S10M000393			12587-47-2	Gross beta	uCi/mL	109	<0.274	24.1	n/a	n/a	n/a	n/a	0.0464	1.64	
S10M000393			14596-10-2	Americium-241	uCi/mL	104	0.0	112	n/a	n/a	n/a	n/a	6.59	2.91	
S10M000393			10198-40-0	Cobalt-60	uCi/mL	101	<2.76E-05	<2.78E-04	n/a	n/a	n/a	n/a	2.78E-04	n/a	U
S10M000393			10045-97-3	Cesium-137	uCi/mL	102	<3.20E-05	<3.64E-04	n/a	n/a	n/a	n/a	3.64E-04	n/a	U
S10M000393			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00	n/a	n/a	n/a	n/a	1.00	n/a	U
S10M000393			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	1.47	n/a	n/a	n/a	n/a	0.500	n/a	
S10M000393			15117-96-1	Uranium-235	ug/mL	104	<1.00E-08	28.5	n/a	n/a	n/a	n/a	1.00	n/a	
S10M000393			13994-20-2	Neptunium-237	ug/mL	96.7	<1.00E-07	19.4	n/a	n/a	n/a	n/a	10.0	n/a	
S10M000393			U-238	Uranium-238	ug/mL	97.7	<5.00E-07	2.80E+03	n/a	n/a	n/a	n/a	50.0	n/a	
S10M000393			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	0.479	n/a	n/a	n/a	n/a	0.400	n/a	
S10M000393			PU-239/240	Plutonium-239/240	uCi/mL	99.9	0.0	37.7	n/a	n/a	n/a	n/a	2.72	3.65	
S10M000393			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	5.16	n/a	n/a	n/a	n/a	2.72	6.92	
S10M000393			SR-89/90	Strontium-89/90	uCi/mL	101	-1.71E-05	-7.91E-07	n/a	n/a	n/a	n/a	4.21E-05	7738.622	U

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24292**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000397			12587-46-1	Gross alpha	uCi/mL	103	<4.57E-07	<3.23E-05	n/a	n/a	n/a	n/a	3.23E-05	n/a	U
S10M000397			12587-47-2	Gross beta	uCi/mL	109	<1.93E-06	<1.71E-04	n/a	n/a	n/a	n/a	1.71E-04	n/a	U
S10M000397			14596-10-2	Americium-241	uCi/mL	104	0.0	0.0	n/a	n/a	n/a	n/a	3.37E-05	100	U
S10M000397			10198-40-0	Cobalt-60	uCi/mL	92.9	<3.01E-05	<2.65E-05	n/a	n/a	n/a	n/a	2.65E-05	n/a	U
S10M000397			10045-97-3	Cesium-137	uCi/mL	102	<4.43E-05	<4.49E-05	n/a	n/a	n/a	n/a	4.49E-05	n/a	U
S10M000397			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000397			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<5.00E-07	n/a	n/a	n/a	n/a	5.00E-07	n/a	U
S10M000397			15117-96-1	Uranium-235	ug/mL	99.3	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000397			13994-20-2	Neptunium-237	ug/mL	95.0	1.46E-07	5.13E-05	n/a	n/a	n/a	n/a	1.00E-05	n/a	B
S10M000397			U-238	Uranium-238	ug/mL	96.8	<5.00E-07	<5.00E-05	n/a	n/a	n/a	n/a	5.00E-05	n/a	U
S10M000397			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	5.08E-07	n/a	n/a	n/a	n/a	4.00E-07	n/a	
S10M000397			PU-239/240	Plutonium-239/240	uCi/mL	97.7	0.0	0.0	n/a	n/a	n/a	n/a	1.41E-06	100	U
S10M000397			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	n/a	n/a	n/a	n/a	1.41E-06	100	U
S10M000397			SR-89/90	Strontium-89/90	uCi/mL	101	1.86E-05	2.65E-05	n/a	n/a	n/a	n/a	1.86E-04	307.884	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24293**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000398			12587-46-1	Gross alpha	uCi/mL	103	<4.57E-07	<4.18E-05	n/a	n/a	n/a	n/a	4.18E-05	n/a	U
S10M000398			12587-47-2	Gross beta	uCi/mL	109	<1.93E-06	<1.66E-04	n/a	n/a	n/a	n/a	1.66E-04	n/a	U
S10M000398			14596-10-2	Americium-241	uCi/mL	104	0.0	0.0	n/a	n/a	n/a	n/a	3.36E-05	100	U
S10M000398			10198-40-0	Cobalt-60	uCi/mL	92.9	<3.01E-05	<3.20E-05	n/a	n/a	n/a	n/a	3.20E-05	n/a	U
S10M000398			10045-97-3	Cesium-137	uCi/mL	102	<4.43E-05	<4.43E-05	n/a	n/a	n/a	n/a	4.43E-05	n/a	U
S10M000398			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<5.00E-06	<5.00E-06	n/a	n/a	n/a	5.00E-06	n/a	U
S10M000398			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<2.50E-06	<2.50E-06	n/a	n/a	n/a	2.50E-06	n/a	U
S10M000398			15117-96-1	Uranium-235	ug/mL	98.0	<1.00E-08	1.17E-05	8.92E-06	1.03E-05	27.1	98.5	5.00E-06	n/a	
S10M000398			13994-20-2	Neptunium-237	ug/mL	94.6	<1.00E-07	<5.00E-05	<5.00E-05	n/a	n/a	99.5	5.00E-05	n/a	U
S10M000398			U-238	Uranium-238	ug/mL	95.3	<5.00E-07	1.54E-03	1.84E-03	1.69E-03	18.0	99.3	2.50E-04	n/a	
S10M000398			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	<2.00E-06	<2.00E-06	n/a	n/a	n/a	2.00E-06	n/a	U
S10M000398			PU-239/240	Plutonium-239/240	uCi/mL	97.7	0.0	6.70E-06	n/a	n/a	n/a	n/a	2.38E-06	8.31	
S10M000398			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	3.05E-06	n/a	n/a	n/a	n/a	2.38E-06	11.54	
S10M000398			SR-89/90	Strontium-89/90	uCi/mL	101	1.86E-05	-1.90E-05	n/a	n/a	n/a	n/a	5.70E-05	426.968	U

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24294**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000399			12587-46-1	Gross alpha	uCi/mL	103	<4.57E-07	<4.18E-05	n/a	n/a	n/a	n/a	4.18E-05	n/a	U
S10M000399			12587-47-2	Gross beta	uCi/mL	109	<1.93E-06	<1.24E-04	n/a	n/a	n/a	n/a	1.24E-04	n/a	U
S10M000399			14596-10-2	Americium-241	uCi/mL	104	0.0	0.0	n/a	n/a	n/a	n/a	3.56E-05	100	U
S10M000399			10198-40-0	Cobalt-60	uCi/mL	92.9	<3.01E-05	<2.90E-05	n/a	n/a	n/a	n/a	2.90E-05	n/a	U
S10M000399			10045-97-3	Cesium-137	uCi/mL	102	<4.43E-05	<4.42E-05	n/a	n/a	n/a	n/a	4.42E-05	n/a	U
S10M000399			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000399			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<5.00E-07	n/a	n/a	n/a	n/a	5.00E-07	n/a	U
S10M000399			15117-96-1	Uranium-235	ug/mL	99.3	<1.00E-08	1.29E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	
S10M000399			13994-20-2	Neptunium-237	ug/mL	95.0	1.46E-07	<1.00E-05	n/a	n/a	n/a	n/a	1.00E-05	n/a	U
S10M000399			U-238	Uranium-238	ug/mL	96.8	<5.00E-07	1.73E-04	n/a	n/a	n/a	n/a	5.00E-05	n/a	
S10M000399			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	<4.00E-07	n/a	n/a	n/a	n/a	4.00E-07	n/a	U
S10M000399			PU-239/240	Plutonium-239/240	uCi/mL	97.7	0.0	0.0	n/a	n/a	n/a	n/a	1.55E-06	100	U
S10M000399			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	n/a	n/a	n/a	n/a	1.55E-06	100	U
S10M000399			SR-89/90	Strontium-89/90	uCi/mL	101	1.86E-05	3.87E-05	n/a	n/a	n/a	n/a	2.10E-04	223.822	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24295**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000400			12587-46-1	Gross alpha	uCi/mL	103	<4.57E-07	<5.81E-05	n/a	n/a	n/a	n/a	5.81E-05	n/a	U
S10M000400			12587-47-2	Gross beta	uCi/mL	109	<1.93E-06	<1.24E-04	n/a	n/a	n/a	n/a	1.24E-04	n/a	U
S10M000400			14596-10-2	Americium-241	uCi/mL	104	0.0	0.0	n/a	n/a	n/a	n/a	3.39E-05	100	U
S10M000400			10198-40-0	Cobalt-60	uCi/mL	92.9	<3.01E-05	<3.23E-05	n/a	n/a	n/a	n/a	3.23E-05	n/a	U
S10M000400			10045-97-3	Cesium-137	uCi/mL	102	<4.43E-05	<4.43E-05	n/a	n/a	n/a	n/a	4.43E-05	n/a	U
S10M000400			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000400			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<5.00E-07	n/a	n/a	n/a	n/a	5.00E-07	n/a	U
S10M000400			15117-96-1	Uranium-235	ug/mL	99.3	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000400			13994-20-2	Neptunium-237	ug/mL	95.0	1.46E-07	<1.00E-05	n/a	n/a	n/a	n/a	1.00E-05	n/a	U
S10M000400			U-238	Uranium-238	ug/mL	96.8	<5.00E-07	1.23E-04	n/a	n/a	n/a	n/a	5.00E-05	n/a	
S10M000400			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	<4.00E-07	n/a	n/a	n/a	n/a	4.00E-07	n/a	U
S10M000400			PU-239/240	Plutonium-239/240	uCi/mL	97.7	0.0	0.0	n/a	n/a	n/a	n/a	1.54E-06	100	U
S10M000400			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	n/a	n/a	n/a	n/a	1.54E-06	100	U
S10M000400			SR-89/90	Strontium-89/90	uCi/mL	101	1.86E-05	-4.16E-05	n/a	n/a	n/a	n/a	4.96E-05	164.961	U

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24296**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000401			12587-46-1	Gross alpha	uCi/mL	101	<4.66E-05	<5.16E-05	n/a	n/a	n/a	n/a	5.16E-05	n/a	U
S10M000401			12587-47-2	Gross beta	uCi/mL	105	<1.41E-04	<1.24E-04	n/a	n/a	n/a	n/a	1.24E-04	n/a	U
S10M000401			14596-10-2	Americium-241	uCi/mL	101	0.0	0.0	n/a	n/a	n/a	n/a	3.57E-05	100	U
S10M000401			10198-40-0	Cobalt-60	uCi/mL	98.6	<2.69E-05	<2.52E-05	n/a	n/a	n/a	n/a	2.52E-05	n/a	U
S10M000401			10045-97-3	Cesium-137	uCi/mL	102	<3.07E-05	<3.11E-05	n/a	n/a	n/a	n/a	3.11E-05	n/a	U
S10M000401			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000401			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<5.00E-07	n/a	n/a	n/a	n/a	5.00E-07	n/a	U
S10M000401			15117-96-1	Uranium-235	ug/mL	99.3	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000401			13994-20-2	Neptunium-237	ug/mL	95.0	1.46E-07	<1.00E-05	n/a	n/a	n/a	n/a	1.00E-05	n/a	U
S10M000401			U-238	Uranium-238	ug/mL	96.8	<5.00E-07	<5.00E-05	n/a	n/a	n/a	n/a	5.00E-05	n/a	U
S10M000401			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	<4.00E-07	n/a	n/a	n/a	n/a	4.00E-07	n/a	U
S10M000401			PU-239/240	Plutonium-239/240	uCi/mL	96.3	0.0	0.0	0.0	n/a	n/a	n/a	1.45E-06	100	U
S10M000401			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	0.0	n/a	n/a	n/a	1.45E-06	100	U
S10M000401			SR-89/90	Strontium-89/90	uCi/mL	97.9	-1.85E-05	-9.61E-06	n/a	n/a	n/a	n/a	4.62E-05	690.862	U

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24297**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000394			12587-46-1	Gross alpha	uCi/mL	97.3	<0.157	1.06E+03	1.06E+03	1.06E+03	0.0941	98.0	0.0831	0.71	
S10M000394			12587-47-2	Gross beta	uCi/mL	109	<0.274	63.3	62.1	62.7	1.93	115	0.232	2.34	
S10M000394			14596-10-2	Americium-241	uCi/mL	104	0.0	127	126	126	1.28	n/a	14.7	4.02	
S10M000394			10198-40-0	Cobalt-60	uCi/mL	101	<2.76E-05	<3.02E-04	<2.98E-04	n/a	n/a	n/a	3.02E-04	n/a	U
S10M000394			10045-97-3	Cesium-137	uCi/mL	102	<3.20E-05	<5.07E-04	<4.59E-04	n/a	n/a	n/a	5.07E-04	n/a	U
S10M000394			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000394			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	0.374	n/a	n/a	n/a	n/a	0.250	n/a	
S10M000394			15117-96-1	Uranium-235	ug/mL	104	<1.00E-08	6.34	n/a	n/a	n/a	n/a	0.500	n/a	
S10M000394			13994-20-2	Neptunium-237	ug/mL	96.7	<1.00E-07	8.31	n/a	n/a	n/a	n/a	5.00	n/a	
S10M000394			U-238	Uranium-238	ug/mL	97.7	<5.00E-07	<25.0	n/a	n/a	n/a	n/a	25.0	n/a	U
S10M000394			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	8.42	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000394			PU-239/240	Plutonium-239/240	uCi/mL	99.9	0.0	1.02E+03	1.02E+03	1.02E+03	0.0332	n/a	71.0	3.48	
S10M000394			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	56.7	53.0	54.9	6.80	n/a	71.0	9.1	
S10M000394			SR-89/90	Strontium-89/90	uCi/mL	101	-1.71E-05	-6.44E-05	-1.58E-05	n/a	n/a	n/a	3.64E-05	73.394	U

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24298**

**Sample Portion: Env Dig**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000385		E	12587-46-1	Gross alpha	uCi/mL	106	<1.45E-05	<1.30E-05	n/a	n/a	n/a	n/a	1.30E-05	n/a	U
S10M000385		E	12587-47-2	Gross beta	uCi/mL	107	<1.01E-04	8.29E-05	n/a	n/a	n/a	n/a	2.35E-05	38.86	
S10M000385		E	14596-10-2	Americium-241	uCi/mL	97.6	0.0	0.0	n/a	n/a	n/a	n/a	1.55E-04	100	U
S10M000385		E	10198-40-0	Cobalt-60	uCi/mL	96.5	<3.04E-05	<2.92E-05	n/a	n/a	n/a	n/a	2.92E-05	n/a	U
S10M000385		E	10045-97-3	Cesium-137	uCi/mL	99.5	<4.39E-05	<4.52E-05	n/a	n/a	n/a	n/a	4.52E-05	n/a	U
S10M000385		E	13968-55-3	Uranium-233	ug/mL	n/a	<1.25E-04	<1.25E-04	n/a	n/a	n/a	n/a	1.25E-04	n/a	U
S10M000385		E	13966-29-5	Uranium-234	ug/mL	n/a	<6.25E-05	<6.25E-05	n/a	n/a	n/a	n/a	6.25E-05	n/a	U
S10M000385		E	15117-96-1	Uranium-235	ug/mL	103	<1.25E-04	<1.25E-04	n/a	n/a	n/a	n/a	1.25E-04	n/a	U
S10M000385		E	13994-20-2	Neptunium-237	ug/mL	92.5	<1.25E-03	<1.25E-03	n/a	n/a	n/a	n/a	1.25E-03	n/a	U
S10M000385		E	U-238	Uranium-238	ug/mL	97.0	<6.25E-03	<6.25E-03	n/a	n/a	n/a	n/a	6.25E-03	n/a	U
S10M000385		E	13982-10-0	Plutonium-242	ug/mL	n/a	<5.00E-05	<5.00E-05	n/a	n/a	n/a	n/a	5.00E-05	n/a	U
S10M000385		E	PU-239/240	Plutonium-239/240	uCi/mL	100	0.0	0.0	n/a	n/a	n/a	n/a	1.14E-04	100	U
S10M000385		E	13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	n/a	n/a	n/a	n/a	1.14E-04	100	U
S10M000385		E	SR-89/90	Strontium-89/90	uCi/mL	100	-1.02E-07	3.25E-05	n/a	n/a	n/a	n/a	2.37E-05	114.357	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24299**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000402			12587-46-1	Gross alpha	uCi/mL	101	<4.66E-05	<4.66E-05	<5.16E-05	n/a	n/a	96.2	4.66E-05	n/a	U
S10M000402			12587-47-2	Gross beta	uCi/mL	105	<1.41E-04	<1.15E-04	<1.67E-04	n/a	n/a	114	1.15E-04	n/a	U
S10M000402			14596-10-2	Americium-241	uCi/mL	101	0.0	0.0	0.0	n/a	n/a	n/a	3.26E-05	100	U
S10M000402			10198-40-0	Cobalt-60	uCi/mL	98.6	<2.69E-05	<2.36E-05	<2.74E-05	n/a	n/a	n/a	2.36E-05	n/a	U
S10M000402			10045-97-3	Cesium-137	uCi/mL	102	<3.07E-05	<2.97E-05	<3.34E-05	n/a	n/a	n/a	2.97E-05	n/a	U
S10M000402			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000402			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<5.00E-07	n/a	n/a	n/a	n/a	5.00E-07	n/a	U
S10M000402			15117-96-1	Uranium-235	ug/mL	99.3	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000402			13994-20-2	Neptunium-237	ug/mL	95.0	1.46E-07	<1.00E-05	n/a	n/a	n/a	n/a	1.00E-05	n/a	U
S10M000402			U-238	Uranium-238	ug/mL	96.8	<5.00E-07	<5.00E-05	n/a	n/a	n/a	n/a	5.00E-05	n/a	U
S10M000402			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	7.37E-07	n/a	n/a	n/a	n/a	4.00E-07	n/a	
S10M000402			PU-239/240	Plutonium-239/240	uCi/mL	104	0.0	0.0	0.0	0.0	0.0	n/a	9.47E-07	100	U
S10M000402			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	0.0	0.0	0.0	n/a	9.47E-07	100	U
S10M000402			SR-89/90	Strontium-89/90	uCi/mL	97.9	-1.85E-05	-1.51E-05	-6.73E-06	n/a	n/a	n/a	4.50E-05	426.968	U

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B242B1**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000403			12587-46-1	Gross alpha	uCi/mL	101	<4.66E-05	7.99E-05	n/a	n/a	n/a	n/a	4.66E-05	104.9	
S10M000403			12587-47-2	Gross beta	uCi/mL	105	<1.41E-04	<1.41E-04	n/a	n/a	n/a	n/a	1.41E-04	n/a	U
S10M000403			14596-10-2	Americium-241	uCi/mL	101	0.0	4.06E-05	n/a	n/a	n/a	n/a	3.25E-05	10.33	
S10M000403			10198-40-0	Cobalt-60	uCi/mL	98.6	<2.69E-05	<2.54E-05	n/a	n/a	n/a	n/a	2.54E-05	n/a	U
S10M000403			10045-97-3	Cesium-137	uCi/mL	102	<3.07E-05	<3.18E-05	n/a	n/a	n/a	n/a	3.18E-05	n/a	U
S10M000403			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000403			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<5.00E-07	n/a	n/a	n/a	n/a	5.00E-07	n/a	U
S10M000403			15117-96-1	Uranium-235	ug/mL	99.3	<1.00E-08	2.30E-05	n/a	n/a	n/a	n/a	1.00E-06	n/a	
S10M000403			13994-20-2	Neptunium-237	ug/mL	95.0	1.46E-07	<1.00E-05	n/a	n/a	n/a	n/a	1.00E-05	n/a	U
S10M000403			U-238	Uranium-238	ug/mL	96.8	<5.00E-07	2.79E-03	n/a	n/a	n/a	n/a	5.00E-05	n/a	
S10M000403			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	4.25E-06	n/a	n/a	n/a	n/a	4.00E-07	n/a	
S10M000403			PU-239/240	Plutonium-239/240	uCi/mL	104	0.0	6.11E-05	n/a	n/a	n/a	n/a	3.41E-06	3.3	
S10M000403			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	9.62E-06	n/a	n/a	n/a	n/a	3.41E-06	5.18	
S10M000403			SR-89/90	Strontium-89/90	uCi/mL	97.9	-1.85E-05	1.63E-05	n/a	n/a	n/a	n/a	1.47E-04	413.061	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B242B2**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000404			12587-46-1	Gross alpha	uCi/mL	101	<4.66E-05	<9.24E-05	n/a	n/a	n/a	n/a	9.24E-05	n/a	U
S10M000404			12587-47-2	Gross beta	uCi/mL	105	<1.41E-04	<1.79E-04	n/a	n/a	n/a	n/a	1.79E-04	n/a	U
S10M000404			14596-10-2	Americium-241	uCi/mL	101	0.0	0.0	n/a	n/a	n/a	n/a	3.37E-05	100	U
S10M000404			10198-40-0	Cobalt-60	uCi/mL	98.6	<2.69E-05	<2.60E-05	n/a	n/a	n/a	n/a	2.60E-05	n/a	U
S10M000404			10045-97-3	Cesium-137	uCi/mL	102	<3.07E-05	<3.26E-05	n/a	n/a	n/a	n/a	3.26E-05	n/a	U
S10M000404			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000404			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<5.00E-07	n/a	n/a	n/a	n/a	5.00E-07	n/a	U
S10M000404			15117-96-1	Uranium-235	ug/mL	99.3	<1.00E-08	2.42E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	
S10M000404			13994-20-2	Neptunium-237	ug/mL	95.0	1.46E-07	<1.00E-05	n/a	n/a	n/a	n/a	1.00E-05	n/a	U
S10M000404			U-238	Uranium-238	ug/mL	96.8	<5.00E-07	1.39E-04	n/a	n/a	n/a	n/a	5.00E-05	n/a	
S10M000404			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	7.99E-07	n/a	n/a	n/a	n/a	4.00E-07	n/a	
S10M000404			PU-239/240	Plutonium-239/240	uCi/mL	104	0.0	4.93E-05	n/a	n/a	n/a	n/a	2.87E-06	3.35	
S10M000404			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	3.11E-06	n/a	n/a	n/a	n/a	2.87E-06	8	
S10M000404			SR-89/90	Strontium-89/90	uCi/mL	97.9	-1.85E-05	-2.11E-05	n/a	n/a	n/a	n/a	4.58E-05	307.656	U

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B242B4**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000405			12587-46-1	Gross alpha	uCi/mL	101	<4.66E-05	<4.66E-05	n/a	n/a	n/a	n/a	4.66E-05	n/a	U
S10M000405			12587-47-2	Gross beta	uCi/mL	105	<1.41E-04	<1.56E-04	n/a	n/a	n/a	n/a	1.56E-04	n/a	U
S10M000405			14596-10-2	Americium-241	uCi/mL	101	0.0	0.0	n/a	n/a	n/a	n/a	3.13E-05	100	U
S10M000405			10198-40-0	Cobalt-60	uCi/mL	98.6	<2.69E-05	<2.47E-05	n/a	n/a	n/a	n/a	2.47E-05	n/a	U
S10M000405			10045-97-3	Cesium-137	uCi/mL	102	<3.07E-05	<3.26E-05	n/a	n/a	n/a	n/a	3.26E-05	n/a	U
S10M000405			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<5.00E-06	n/a	n/a	n/a	n/a	5.00E-06	n/a	U
S10M000405			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<2.50E-06	n/a	n/a	n/a	n/a	2.50E-06	n/a	U
S10M000405			15117-96-1	Uranium-235	ug/mL	98.0	<1.00E-08	<5.00E-06	n/a	n/a	n/a	n/a	5.00E-06	n/a	U
S10M000405			13994-20-2	Neptunium-237	ug/mL	94.6	<1.00E-07	<5.00E-05	n/a	n/a	n/a	n/a	5.00E-05	n/a	U
S10M000405			U-238	Uranium-238	ug/mL	95.3	<5.00E-07	<2.50E-04	n/a	n/a	n/a	n/a	2.50E-04	n/a	U
S10M000405			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	<2.00E-06	n/a	n/a	n/a	n/a	2.00E-06	n/a	U
S10M000405			PU-239/240	Plutonium-239/240	uCi/mL	104	0.0	0.0	n/a	n/a	n/a	n/a	9.36E-07	100	U
S10M000405			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	n/a	n/a	n/a	n/a	9.36E-07	100	U
S10M000405			SR-89/90	Strontium-89/90	uCi/mL	97.9	-1.85E-05	7.76E-06	n/a	n/a	n/a	n/a	1.37E-04	862.906	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Radionuclide Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B242B8**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000406			12587-46-1	Gross alpha	uCi/mL	101	<4.66E-05	<5.16E-05	n/a	n/a	n/a	n/a	5.16E-05	n/a	U
S10M000406			12587-47-2	Gross beta	uCi/mL	105	<1.41E-04	<1.24E-04	n/a	n/a	n/a	n/a	1.24E-04	n/a	U
S10M000406			14596-10-2	Americium-241	uCi/mL	101	0.0	0.0	n/a	n/a	n/a	n/a	3.41E-05	100	U
S10M000406			10198-40-0	Cobalt-60	uCi/mL	98.6	<2.69E-05	<2.27E-05	n/a	n/a	n/a	n/a	2.27E-05	n/a	U
S10M000406			10045-97-3	Cesium-137	uCi/mL	102	<3.07E-05	<3.20E-05	n/a	n/a	n/a	n/a	3.20E-05	n/a	U
S10M000406			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<5.00E-06	n/a	n/a	n/a	n/a	5.00E-06	n/a	U
S10M000406			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<2.50E-06	n/a	n/a	n/a	n/a	2.50E-06	n/a	U
S10M000406			15117-96-1	Uranium-235	ug/mL	98.0	<1.00E-08	<5.00E-06	n/a	n/a	n/a	n/a	5.00E-06	n/a	U
S10M000406			13994-20-2	Neptunium-237	ug/mL	94.6	<1.00E-07	<5.00E-05	n/a	n/a	n/a	n/a	5.00E-05	n/a	U
S10M000406			U-238	Uranium-238	ug/mL	95.3	<5.00E-07	<2.50E-04	n/a	n/a	n/a	n/a	2.50E-04	n/a	U
S10M000406			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	<2.00E-06	n/a	n/a	n/a	n/a	2.00E-06	n/a	U
S10M000406			PU-239/240	Plutonium-239/240	uCi/mL	104	0.0	0.0	n/a	n/a	n/a	n/a	8.22E-07	100	U
S10M000406			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	n/a	n/a	n/a	n/a	8.22E-07	100	U
S10M000406			SR-89/90	Strontium-89/90	uCi/mL	97.9	-1.85E-05	-1.26E-05	n/a	n/a	n/a	n/a	4.66E-05	528.233	U

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

**Organic Analytes  
 PFP A Lab Rm 144  
 Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24285**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000378			75-35-4	1,1-Dichloroethene	ug/L	86.9	<0.172	<3.44	n/a	n/a	n/a	86.0	3.44	n/a	U
S10M000378			71-36-3	1-Butanol	ug/L	76.6	<1.15	907	n/a	n/a	n/a	n/a	23.0	n/a	
S10M000378			591-78-6	2-Hexanone	ug/L	86.5	<0.454	58.0	n/a	n/a	n/a	n/a	9.09	n/a	J
S10M000378			67-64-1	Acetone	ug/L	59.2	<0.573	51.1	n/a	n/a	n/a	n/a	11.5	n/a	JX
S10M000378			71-43-2	Benzene	ug/L	98.9	<0.0163	<0.326	n/a	n/a	n/a	104	0.326	n/a	U
S10M000378			56-23-5	Carbon tetrachloride	ug/L	n/a	<0.0479	<0.958	n/a	n/a	n/a	n/a	0.958	n/a	U
S10M000378			108-90-7	Chlorobenzene	ug/L	92.7	<0.0320	<0.640	n/a	n/a	n/a	92.9	0.640	n/a	U
S10M000378			108-88-3	Toluene	ug/L	96.6	<0.0522	1.65	n/a	n/a	n/a	97.8	1.04	n/a	J
S10M000378			79-01-6	Trichloroethene	ug/L	97.0	<0.0378	<0.756	n/a	n/a	n/a	93.6	0.756	n/a	U
S10M000378			79-20-9	Methyl Acetate	ug/L	n/a	<0.0993	387	n/a	n/a	n/a	n/a	1.99	n/a	J

**Sample Portion: SVOC Extr**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000380		O	120-82-1	1,2,4-Trichlorobenzene	ug/L	50.8	<357	<357	n/a	n/a	n/a	44.5	357	n/a	U
S10M000380		O	121-14-2	2,4-Dinitrotoluene	ug/L	72.1	<189	<189	n/a	n/a	n/a	73.6	189	n/a	U
S10M000380		O	83-32-9	Acenaphthene	ug/L	64.6	<353	<353	n/a	n/a	n/a	51.2	353	n/a	U
S10M000380		O	59-50-7	4-Chloro-3-methylphenol	ug/L	75.0	<243	<243	n/a	n/a	n/a	59.5	243	n/a	U
S10M000380		O	95-57-8	2-Chlorophenol	ug/L	71.2	<334	<334	n/a	n/a	n/a	55.9	334	n/a	U
S10M000380		O	84-74-2	Di-n-butylphthalate	ug/L	n/a	n/a	450	n/a	n/a	n/a	n/a	209	n/a	J
S10M000380		O	621-64-7	N-Nitroso-di-n-dipropylamine	ug/L	78.6	<334	<334	n/a	n/a	n/a	72.8	334	n/a	U
S10M000380		O	129-00-0	Pyrene	ug/L	79.8	<222	<222	n/a	n/a	n/a	60.1	222	n/a	UT
S10M000380		O	126-73-8	Tributyl phosphate	ug/L	n/a	<89.2	1.28E+05	n/a	n/a	n/a	n/a	892	n/a	D

NA = Not Analyzed, ND = Not Detected

J - Organic Estimated  
 X - Comment

D - Dilution

U - < Det Limit

T - Organic Spike Outside Range

**Organic Analytes**  
**PFP A Lab Rm 144**  
**Data Summary Report**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24298**

**Sample Portion: Parent**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000379			75-35-4	1,1-Dichloroethene	ug/L	86.9	<0.172	<1.72E+04	n/a	n/a	n/a	n/a	1.72E+04	n/a	U
S10M000379			591-78-6	2-Hexanone	ug/L	86.5	<0.454	5.73E+04	n/a	n/a	n/a	n/a	4.54E+04	n/a	J
S10M000379			71-43-2	Benzene	ug/L	98.9	<0.0163	<1.63E+03	n/a	n/a	n/a	n/a	1.63E+03	n/a	U
S10M000379			56-23-5	Carbon tetrachloride	ug/L	n/a	<0.0479	<4.79E+03	n/a	n/a	n/a	n/a	4.79E+03	n/a	U
S10M000379			108-90-7	Chlorobenzene	ug/L	92.7	<0.0320	<3.20E+03	n/a	n/a	n/a	n/a	3.20E+03	n/a	U
S10M000379			108-88-3	Toluene	ug/L	96.6	<0.0522	8.52E+03	n/a	n/a	n/a	n/a	5.22E+03	n/a	J
S10M000379			79-01-6	Trichloroethene	ug/L	97.0	<0.0378	<3.78E+03	n/a	n/a	n/a	n/a	3.78E+03	n/a	U

**Sample Portion: SVOC Extr**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000381			120-82-1	1,2,4-Trichlorobenzene	ug/kg	89.4	<7.74E+04	<5.69E+04	n/a	n/a	n/a	n/a	5.69E+04	n/a	U
S10M000381			121-14-2	2,4-Dinitrotoluene	ug/kg	94.3	<3.81E+04	<2.80E+04	n/a	n/a	n/a	n/a	2.80E+04	n/a	U
S10M000381			83-32-9	Acenaphthene	ug/kg	92.3	<1.76E+04	<1.29E+04	n/a	n/a	n/a	n/a	1.29E+04	n/a	U
S10M000381			59-50-7	4-Chloro-3-methylphenol	ug/kg	83.0	<4.32E+04	<3.18E+04	n/a	n/a	n/a	n/a	3.18E+04	n/a	U
S10M000381			95-57-8	2-Chlorophenol	ug/kg	91.6	<6.65E+04	<4.89E+04	n/a	n/a	n/a	n/a	4.89E+04	n/a	U
S10M000381			621-64-7	N-Nitroso-di-n-dipropylamine	ug/kg	88.8	<5.81E+04	<4.27E+04	n/a	n/a	n/a	n/a	4.27E+04	n/a	U
S10M000381			129-00-0	Pyrene	ug/kg	107	<6.29E+04	<4.62E+04	n/a	n/a	n/a	n/a	4.62E+04	n/a	U
S10M000381			126-73-8	Tributyl phosphate	ug/kg	n/a	<1.08E+05	6.08E+08	n/a	n/a	n/a	n/a	3.96E+07	n/a	DX

NA = Not Analyzed, ND = Not Detected

J - Organic Estimated  
 X - Comment

D - Dilution

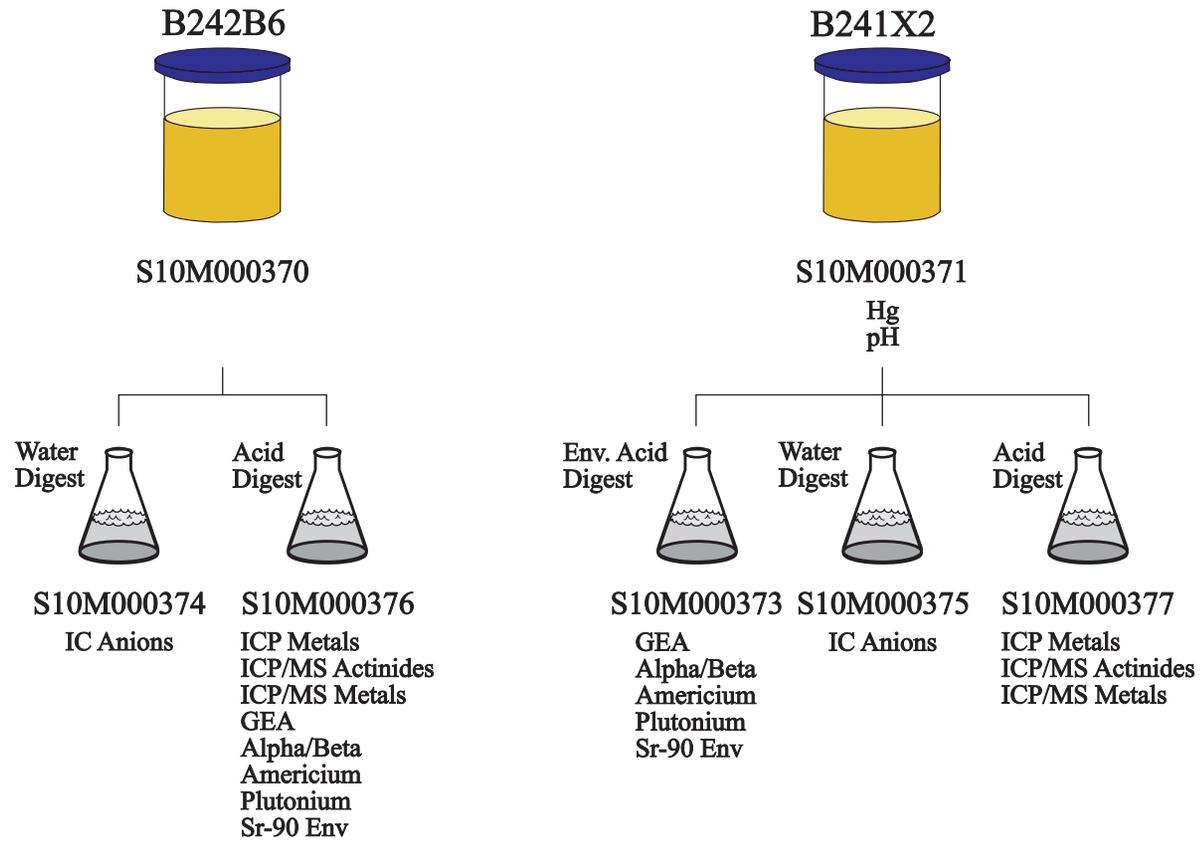
U - < Det Limit

T - Organic Spike Outside Range

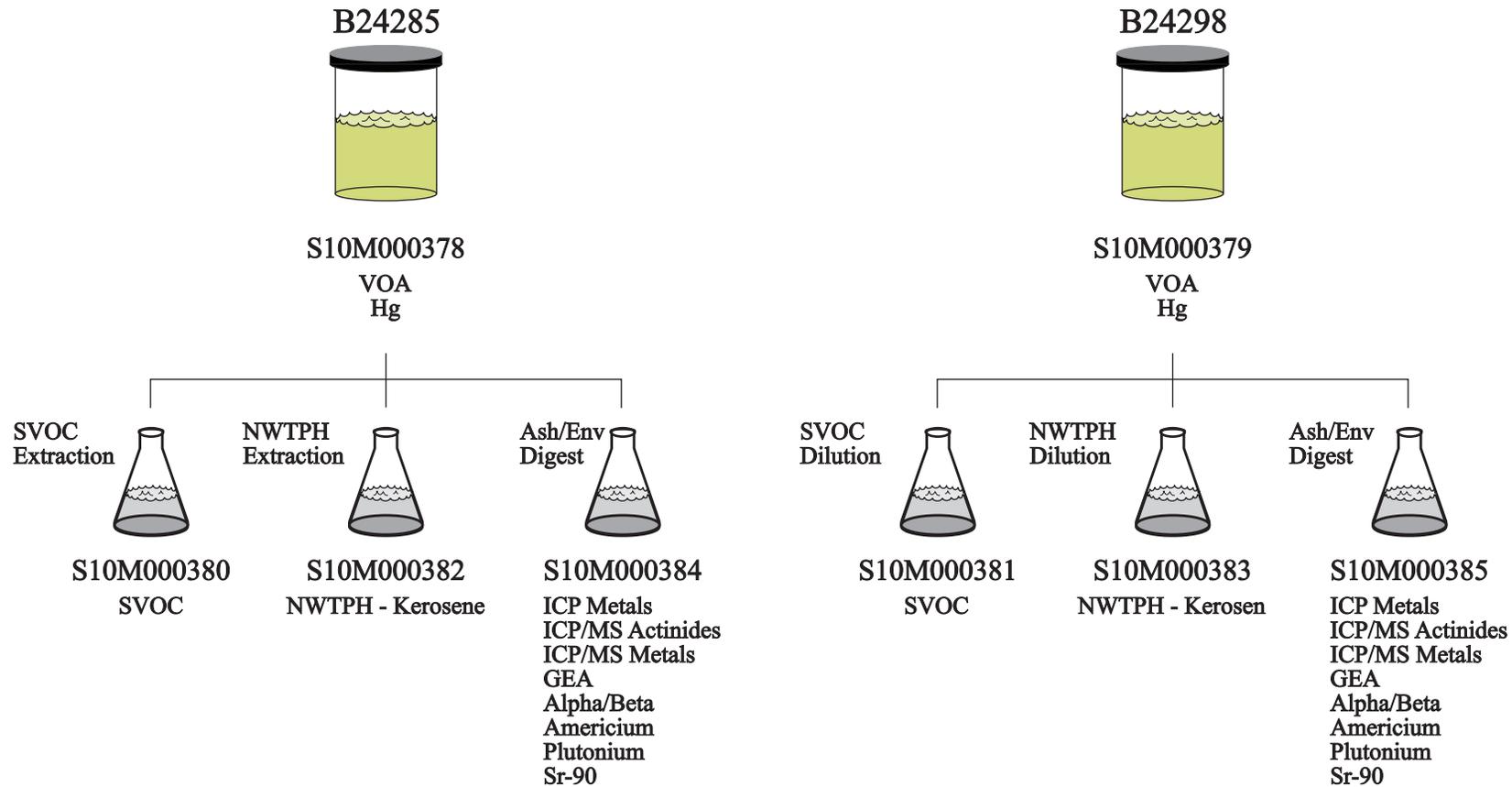
Attachment 2

SAMPLE BREAKDOWN DIAGRAMS

PFP A Lab Rm 144  
SAF: F10-068  
SDG 222S20100687

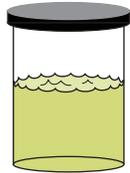


PFP A Lab Rm 144  
SAF: F10-069  
SDG 222S20100688



PFP A Lab Rm 144  
SAF: F10-069  
SDG 222S20100688

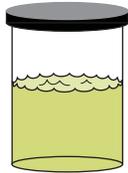
B24280



S10M000386

Hg  
pH  
H+  
IC Anions  
ICP Metals  
ICP/MS Actinides  
ICP/MS Metals  
GEA  
Alpha/Beta  
Americium  
Plutonium  
Sr-90 Env

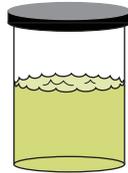
B24281



S10M000387

Hg  
pH  
H+  
IC Anions  
ICP Metals  
ICP/MS Actinides  
ICP/MS Metals  
GEA  
Alpha/Beta  
Americium  
Plutonium  
Sr-90 Env

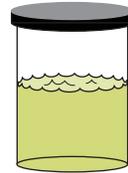
B24283



S10M000388

Hg  
pH  
H+  
IC Anions  
ICP Metals  
ICP/MS Actinides  
ICP/MS Metals  
GEA  
Alpha/Beta  
Americium  
Plutonium  
Sr-90 Env

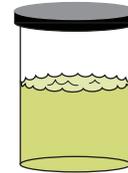
B24286



S10M000389

Hg  
pH  
IC Anions  
ICP Metals  
ICP/MS Actinides  
ICP/MS Metals  
GEA  
Alpha/Beta  
Americium  
Plutonium  
Sr-90 Env

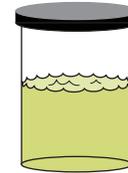
B24288



S10M000390

Hg  
pH  
H+  
IC Anions  
ICP Metals  
ICP/MS Actinides  
ICP/MS Metals  
GEA  
Alpha/Beta  
Americium  
Plutonium  
Sr-90 Env

B24289

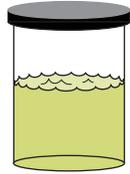


S10M000391

Hg  
pH  
H+  
IC Anions  
ICP Metals  
ICP/MS Actinides  
ICP/MS Metals  
GEA  
Alpha/Beta  
Americium  
Plutonium  
Sr-90 Env

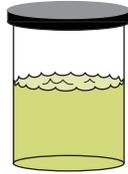
PFP A Lab Rm 144  
SAF: F10-069  
SDG 222S20100688

B24290



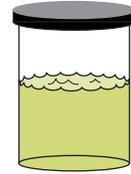
S10M000392  
Hg  
H+  
IC Anions  
ICP Metals  
ICP/MS Actinides  
ICP/MS Metals  
GEA  
Alpha/Beta  
Americium  
Plutonium  
Sr-90 Env

B24291



S10M000393  
Hg  
H+  
IC Anions  
ICP Metals  
ICP/MS Actinides  
ICP/MS Metals  
GEA  
Alpha/Beta  
Americium  
Plutonium  
Sr-90 Env

B24297



S10M000394  
Hg  
H+  
IC Anions  
ICP Metals  
ICP/MS Actinides  
ICP/MS Metals  
GEA  
Alpha/Beta  
Americium  
Plutonium  
Sr-90 Env

PFP A Lab Rm 144  
SAF: F10-069  
SDG 222S20100688

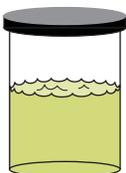
B24279



S10M000395

Hg  
pH  
IC Anions  
ICP/MS Actinides  
ICP/MS Metals  
GEA  
Alpha/Beta  
Americium  
Plutonium  
Sr-90 Env

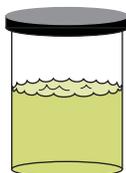
B24287



S10M000396

Hg  
pH  
H+  
IC Anions  
ICP/MS Actinides  
ICP/MS Metals  
GEA  
Alpha/Beta  
Americium  
Plutonium  
Sr-90 Env

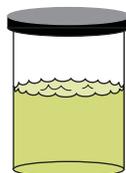
B24292



S10M000397

Hg  
pH  
IC Anions  
ICP Metals  
ICP/MS Actinides  
ICP/MS Metals  
GEA  
Alpha/Beta  
Americium  
Plutonium  
Sr-90 Env

B24293



S10M000398

Hg  
pH  
H+  
IC Anions  
ICP/MS Actinides  
ICP/MS Metals  
GEA  
Alpha/Beta  
Americium  
Plutonium  
Sr-90 Env

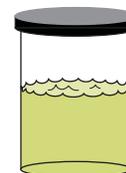
B24294



S10M000399

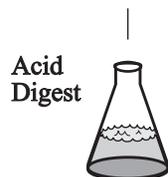
Hg  
pH  
H+  
IC Anions  
ICP/MS Actinides  
ICP/MS Metals  
GEA  
Alpha/Beta  
Americium  
Plutonium  
Sr-90 Env

B24295



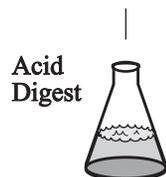
S10M000400

Hg  
pH  
IC Anions  
ICP Metals  
ICP/MS Actinides  
ICP/MS Metals  
GEA  
Alpha/Beta  
Americium  
Plutonium  
Sr-90 Env



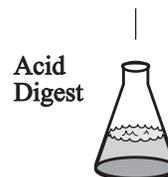
S10M000479

ICP Metals



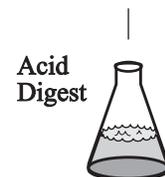
S10M000480

ICP Metals



S10M000481

ICP Metals

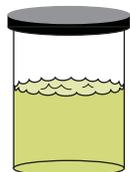


S10M000482

ICP Metals  
ICP/MS Metals

PFP A Lab Rm 144  
SAF: F10-069  
SDG 222S20100688

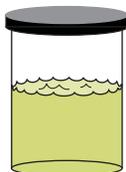
B24296



S10M000401

Hg  
pH  
H+  
ICP/MS Actinides  
ICP/MS Metals  
GEA  
Alpha/Beta  
Americium  
Plutonium  
Sr-90 Env

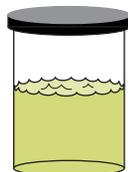
B24299



S10M000402

Hg  
pH  
H+  
IC Anions  
ICP Metals  
ICP/MS Actinides  
ICP/MS Metals  
GEA  
Alpha/Beta  
Americium  
Plutonium  
Sr-90 Env

B242B1



S10M000403

Hg  
pH  
H+  
IC Anions  
ICP Metals  
ICP/MS Actinides  
ICP/MS Metals  
GEA  
Alpha/Beta  
Americium  
Plutonium  
Sr-90 Env

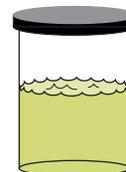
B242B2



S10M000404

Hg  
pH  
H+  
IC Anions  
ICP/MS Actinides  
ICP/MS Metals  
GEA  
Alpha/Beta  
Americium  
Plutonium  
Sr-90 Env

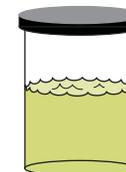
B242B4



S10M000405

Hg  
pH  
H+  
IC Anions  
ICP/MS Actinides  
ICP/MS Metals  
GEA  
Alpha/Beta  
Americium  
Plutonium  
Sr-90 Env

B242B8



S10M000406

Hg  
pH  
H+  
IC Anions  
ICP/MS Actinides  
ICP/MS Metals  
GEA  
Alpha/Beta  
Americium  
Plutonium  
Sr-90 Env

Acid  
Digest



S10M000483

ICP Metals  
ICP/MS Metals

Acid  
Digest



S10M000484

ICP Metals

Acid  
Digest



S10M000485

ICP Metals

Acid  
Digest



S10M000486

ICP Metals

Attachment 3

TENTATIVELY IDENTIFIED COMPOUNDS REPORT

**PFP A Lab Rm 144**  
**Opportunistic Analyte Results**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24285**

**Sample Portion: Parent**

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
S10M000378				Unknown-1		5.24	ug/L	39	JT
S10M000378				Unknown-2		6.54	ug/L	20	JT
S10M000378				Methyl propionate	554-12-1	10.73	ug/L	45	JNT
S10M000378				Butanoic acid, methyl	623-42-7	12.54	ug/L	19	JNT
S10M000378				Nitric acid, butyl est	928-45-0	14.67	ug/L	82	JNT
S10M000378				Unknown-3		17.03	ug/L	22	JT

**Sample Portion: SVOC Extr**

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
S10M000380		O		Oxirane, trimethyl-	5076-19-7	2.74	ug/L	2.8E+03	JNT
S10M000380		O		Unknown-1		3.27	ug/L	900	JT
S10M000380		O		Propanoic acid	79-09-4	3.61	ug/L	1.7E+04	JNT
S10M000380		O		Butanoic acid	107-92-6	4.58	ug/L	3.3E+04	JNT
S10M000380		O		Pentanoic acid	109-52-4	5.81	ug/L	6.3E+04	JNT
S10M000380		O		Unknown-2		6.20	ug/L	1.4E+03	JT
S10M000380		O		2-Fluoro-6-nitrophenol	1526-17-6	8.70	ug/L	5.4E+03	JT
S10M000380		O		Benzoic acid	65-85-0	8.80	ug/L	1.2E+04	JNT
S10M000380		O		1,3-Isobenzofurandione	85-44-9	10.39	ug/L	2.3E+03	JNT

NA = Not Analyzed, ND = Not Detectec

T - OrganicTICS

P - Potentially Identified Compound

J - Organic Estimated

N - Identified TIC

**PFP A Lab Rm 144  
 Opportunistic Analyte Results**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24298**

**Sample Portion: Parent**

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
S10M000379				Unknown Alkane-1		19.35	ug/L	1.2E+05	JT
S10M000379				Nonane, 3,7-dimethyl-	17302-32-8	19.78	ug/L	4.0E+05	JNT
S10M000379				Tetradecane	629-59-4	19.96	ug/L	2.7E+05	JNT
S10M000379				Unknown Alkane-2		20.16	ug/L	1.5E+05	JT
S10M000379				Tridecane, 4,8-dimethy	55030-62-1	20.65	ug/L	1.3E+05	JNT
S10M000379				Dodecane, 2,6,10-trime	3891-98-3	20.93	ug/L	3.3E+05	JNT
S10M000379				Pentadecane	629-62-9	21.39	ug/L	1.7E+05	JNT

**Sample Portion: SVOC Extr**

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
S10M000381				Tridecane	629-50-5	10.32	ug/kg	2.3E+05	JNTP
S10M000381				Tridecane, 2-methyl-	1560-96-9	10.93	ug/kg	1.9E+05	JNT
S10M000381				Unknown-1		10.99	ug/kg	2.5E+05	JT
S10M000381				Dodecane, 2,7,10-trime	74645-98-0	11.03	ug/kg	4.7E+05	JNT
S10M000381				Tetradecane	629-59-4	11.26	ug/kg	1.5E+06	JNTP
S10M000381				Unknown-2		11.33	ug/kg	2.7E+05	JT
S10M000381				Unknown-3		11.36	ug/kg	2.3E+05	JT
S10M000381				Unknown-4		11.46	ug/kg	2.3E+05	JT
S10M000381				Unknown-5		11.68	ug/kg	4.1E+05	JT
S10M000381				Unknown-6		11.72	ug/kg	2.3E+05	JT
S10M000381				Heptadecane, 2,6,10,14	18344-37-1	11.79	ug/kg	9.6E+05	JNT
S10M000381				Unknown-7		11.82	ug/kg	4.6E+05	JT
S10M000381				Unknown-8		11.89	ug/kg	2.8E+05	JT
S10M000381				Unknown-9		11.94	ug/kg	2.0E+05	JT
S10M000381				Pentadecane	629-62-9	12.14	ug/kg	1.5E+06	JNTP
S10M000381				Unknown-10		12.52	ug/kg	3.1E+05	JT
S10M000381				Unknown-11		12.56	ug/kg	1.6E+05	JT

NA = Not Analyzed, ND = Not Detectec

T - OrganicTICS

P - Potentially Identified Compound

J - Organic Estimated

N - Identified TIC

**PFP A Lab Rm 144**  
**Opportunistic Analyte Results**

**Sample Group: 20100688**

**Customer Group or SDG Number: 222S20100688**

**Customer Sample ID: B24298**

**Sample Portion: SVOC Extr**

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
S10M000381				Unknown Hydrocarbon-12		12.67	ug/kg	2.8E+05	JT
S10M000381				Hexadecane-	544-76-3	12.97	ug/kg	7.5E+05	JNTP
S10M000381				Heptadecane	629-78-7	13.78	ug/kg	8.8E+05	JNTP
S10M000381				Octadecane	593-45-3	14.50	ug/kg	3.8E+05	JNTP
S10M000381				Unknown-13		15.20	ug/kg	9.7E+05	JT
S10M000381				Eicosane	112-95-8	15.89	ug/kg	8.9E+04	JNTP

NA = Not Analyzed, ND = Not Detectec

T - OrganicTICS

P - Potentially Identified Compound

J - Organic Estimated

N - Identified TIC

Attachment 4

MS AND MSD REPORT

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: \_\_\_\_\_ Contract: \_\_\_\_\_  
 Lab Code: \_\_\_\_\_ Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 100927\_PFP  
 Matrix Spike - Sample No.: S10M000378

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
1,1-Dichloroethene	200.00	0.0000	172.09	86	62-151
Acetone	1000.0	51.076	698.22	65	55-139
2-Butanone	1000.0	0.0000	916.67	92	60-146
n-Butanol	2000.0	907.32	2389.5	74	73-140
Benzene	200.00	0.0000	207.95	104	86-120
Trichloroethene	200.00	0.0000	187.19	94	71-128
Methyl Isobutyl Ketone	1000.0	0.0000	1001.2	100	75-137
Toluene	200.00	1.648	197.22	98	83-118
2-Hexanone	1000.0	58.035	1063.0	100	71-141
Chlorobenzene	200.00	0.0000	185.87	93	88-113

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS	
					RPD	REC.
1,1-Dichloroethene	200.00	192.84	96	11	30	62-151
Acetone	1000.0	819.51	77	17	30	55-139
2-Butanone	1000.0	1051.4	105	13	30	60-146
n-Butanol	2000.0	2777.8	94	24	30	73-140
Benzene	200.00	215.24	108	4	30	86-120
Trichloroethene	200.00	188.94	94	0	30	71-128
Methyl Isobutyl Ketone	1000.0	1072.5	107	7	30	75-137
Toluene	200.00	192.23	95	3	30	83-118
2-Hexanone	1000.0	1179.4	112	11	30	71-141
Chlorobenzene	200.00	182.27	91	2	30	88-113

# Column to be used to flag recovery and RPD values with an asterisk

\* Values outside of QC limits

RPD: 0 out of 10 outside limits  
 Spike Recovery: 0 out of 20 outside limits

COMMENTS: \_\_\_\_\_  
 \_\_\_\_\_

WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: \_\_\_\_\_ Contract: \_\_\_\_\_  
 Lab Code: \_\_\_\_\_ Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 101028\_PFP  
 Matrix Spike - EPA Sample No.: S10M000380

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
1,2,4-Trichlorobenzene	8000.0	0.00000	3562.4	44	24- 79
2,4-Dinitrotoluene	8000.0	0.00000	5890.2	74	55-105
Acenaphthene	8000.0	0.00000	4096.6	51	34-106
4-Chloro-3-Methylphenol	16000	0.00000	9513.3	59	50- 97
2-Chlorophenol	16000	0.00000	8946.0	56	40-106
N-Nitroso-di-n-prop. (1)	8000.0	0.00000	5823.4	73	44- 99
Pyrene	8000.0	0.00000	4806.0	60*	65-111

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	REC.
1,2,4-Trichlorobenzene	8000.0	3991.9	50	13	30	24- 79
2,4-Dinitrotoluene	8000.0	6413.1	80	8	30	55-105
Acenaphthene	8000.0	4589.8	57	11	30	34-106
4-Chloro-3-Methylphenol	16000	10346	65	10	30	50- 97
2-Chlorophenol	16000	10339	65	15	30	40-106
N-Nitroso-di-n-prop. (1)	8000.0	6492.4	81	10	30	44- 99
Pyrene	8000.0	5446.5	68	12	30	65-111

(1) N-Nitroso-di-n-propylamine

# Column to be used to flag recovery and RPD values with an asterisk  
 \* Values outside of QC limits

RPD: 0 out of 7 outside limits  
 Spike Recovery: 1 out of 14 outside limits

COMMENTS: \_\_\_\_\_

WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: PFP A Room 144 Contract: \_\_\_\_\_

Lab Code: 222-S Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 20100688

Matrix Spike - EPA Sample No. S10M000383

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
Diesel	9700000	61813830	98417476	377 *	70 - 130

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS	
					RPD	REC.
Diesel	8800000	89539474	315 *	18	30	70 - 130

# Column to be used to flag recovery and RPD values with an asterisk

\* Values outside of QC limits

RPD: 0 out of 1 outside limits

Spike Recovery: 2 out of 2 outside limits

COMMENTS: RPD Value was calculated using To Retov's as results for each sample.

Attachment 5

SURROGATE RECOVERIES

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name:

Contract:

Lab Code:

Case No.:

SAS No.:

SDG No.: 100927\_PFP

	CLIENT SAMPLE NO.	SMC1 #	SMC2 (DCE) #	SMC3 (TOL) #	OTHER (BFB) #	TOT OUT
	=====	=====	=====	=====	=====	=====
01	S10M000378	103	100	99	102	0
02	S10M000378MS	102	107	101	101	0
03	S10M000378MS	109	107	96	102	0
04	S10M000379	103	100	102	104	0
05						
06						
07						
08						
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29						
30						

QC LIMITS

SMC1 = Dibromofluoromethane (73-136)  
 SMC2 (DCE) = 1,2-Dichloroethane-d4 (77-132)  
 SMC3 (TOL) = Toluene-d8 (86-119)  
 OTHER (BFB) = Bromofluorobenzene (82-128)

# Column to be used to flag recovery values

\* Values outside of contract required QC limits

D System Monitoring Compound diluted out

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name:

Contract:

Lab Code:

Case No.:

SAS No.:

SDG No.: 100927\_PFP

	CLIENT SAMPLE NO.	SMC1 #	SMC2 (DCE) #	SMC3 (TOL) #	OTHER (BFB) #	TOT OUT
	=====	=====	=====	=====	=====	=====
01	CCB	102	101	99	93	0
02	LCS	100	101	98	94	0
03						
04						
05						
06						
07						
08						
09						
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QC LIMITS

SMC1 = Dibromofluoromethane (85-123)  
 SMC2 (DCE) = 1,2-Dichloroethane-d4 (83-123)  
 SMC3 (TOL) = Toluene-d8 (82-121)  
 OTHER (BFB) = Bromofluorobenzene (82-126)

# Column to be used to flag recovery values

\* Values outside of contract required QC limits

D System Monitoring Compound diluted out

SOIL SEMIVOLATILE SURROGATE RECOVERY

Lab Name:

Contract:

Lab Code:

Case No.:

SAS No.:

SDG No.: PFP

Level: (low/med) LOW

	CHG SAMPLE NO.	S1 (FBP) #	S2 (2FP) #	S3 (NBZ) #	S4 #	S5 (TBP) #	S6 (TPH) #	S7 #	S8 #	TOT OUT
01	S10M000381	0D	0	0	0D	0D	0D			0
02	BLANK	96	94	93	95	68	106			0
03	LCS	101	96	98	97	94	117			0
* { 04	S10M000380	1*	0	0	0*	0*	1*			4
05	S10M000380MS	1*	0	0	0*	0*	1*			4
06	S10M000380MS	1*	0	0	0*	0*	1*			4
07	S10M000381	97	92	97	80	40	102			0
08										
09										
10										
11										
12										
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30										

QC LIMITS

- S1 (FBP) = 2-Fluorobiphenyl (10-147)
- S2 (2FP) = 2-Fluorophenol (0-127)
- S3 (NBZ) = Nitrobenzene-d5 (0-125)
- S4 = Phenol-d6 (37-125)
- S5 (TBP) = 2,4,6-Tribromophenol (40-176)
- S6 (TPH) = Terphenyl-d14 (71-175)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

\* - Sample S10M000380 was reprepared using liquid extraction method and was reported on a separate batch. *MJD 10/26/10*

FORM 2  
 WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: \_\_\_\_\_ Contract: \_\_\_\_\_  
 Lab Code: \_\_\_\_\_ Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 101028\_PFP

DF500\*  
 DF=1  
 DF=1  
 DF=1

	CHG SAMPLE NO.	S1 (FBP) #	S2 (2FP) #	S3 (NBZ) #	S4 #	S5 (TBP) #	S6 (TPH) #	S7 #	S8 #	TOT OUT
01	PRPBLK	48	80	92	84	66	98			0
02	LCS	54	79	91	83	71	107			0
03	S10M000380	34	38	44	44	0D	76			0
04	S10M000380	41	46	78	58	52	86			0
05	S10M000380MS	40	55	84	68	61	82			0
06	S10M000380MS	52	64	98	76	68	104			0
07										
08										
09	<i>* Sample overdiluted and reran (see line 4)</i>									
10										
11										
12										
13										
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*MD 11/4/10*

QC LIMITS

S1 (FBP) = 2-Fluorobiphenyl (27- 91)  
 S2 (2FP) = 2-Fluorophenol (38-109)  
 S3 (NBZ) = Nitrobenzene-d5 (43-108)  
 S4 = Phenol-d6 (39-115)  
 S5 (TBP) = 2,4,6-Tribromophenol (48-112)  
 S6 (TPH) = Terphenyl-d14 (58-119)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

FORM 2  
 WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name:

Contract:

Lab Code:

Case No.:

SAS No.:

SDG No.: 101101\_PFP

CHG	S1	S2	S3	S4	S5	S6	S7	S8	TOT
SAMPLE NO.	(FBP) #	(2FP) #	(NBZ) #	#	(TBP) #	(TPH) #	#	#	OUT
# 01 CCB	0*	0*	0*	0*	0*	0*			6
* 02 CCB	47	80	93	85	64	97	} Information only - see 10/28/10 results for official values. MJD 11/4/10		0
* 03 LCS	55	80	91	83	70	110		0	
DF 25 04 S10M000380	38	44	62	54	103	82		0	
DF 10 05 S10M000380	41	47	72	57	67	90		0	
06									
07									
08	# This is an instrument blank and was not spiked with surrogate MJD 11/4/10								
09									
10									
11									
12	* These extracted QC samples were initially extracted MJD 11/4/10 and analyzed on 10/28/10 and passed all QC requirements, therefore they did not need to be reanalyzed. These remain results, therefore, will be included as supporting data but will not be officially reported. MJD 11/4/10								
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									

QC LIMITS	
S1 (FBP) = 2-Fluorobiphenyl	(27- 91)
S2 (2FP) = 2-Fluorophenol	(38-109)
S3 (NBZ) = Nitrobenzene-d5	(43-108)
S4 = Phenol-d6	(39-115)
S5 (TBP) = 2,4,6-Tribromophenol	(48-112)
S6 (TPH) = Terphenyl-d14	(58-119)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: PFP A Room 144 Contract: \_\_\_\_\_  
 Lab Code: 222-S Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 20100688

	EPA SAMPLE NO.	S1 #	TOT OUT
01	PRPBLK	82	0
02	MRL	92	0
03	LCS	94	0
04	S10M000383	79	0
05	S10M000383MS	88	0
06	S10M000383MS	94	0
07	CCB2	*	1

} 10x sample dilution resulted in  
 surrogates being diluted below LOQ.

\* - Surrogate NOT spiked into this instrument blank

S1 = p-terphenyl-d14

QC LIMITS  
 (70-130)

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate diluted out

Attachment 6

CORRESPONDENCE

**Bushaw, Ruth A**

---

**From:** Cathel, Robert L  
**Sent:** Wednesday, August 18, 2010 3:43 PM  
**To:** Bushaw, Ruth A  
**Cc:** Clinton, Richard (Rich); Hansen, Daniel R; Wyse, Eric J; Duchsherer, Mark J; Schroeder, Robert W; Ross, Roxie R  
**Subject:** RE: Holding Times for PFP A Lab Room 144 Chemicals

Ruth,

PFP project personnel are aware that holding times for several of the analytes for these samples have already passed. The approach you propose in your email below (8/18 12:10 PM) is acceptable.

Thanks,  
Bob Cathel

---

**From:** Bushaw, Ruth A  
**Sent:** Wednesday, August 18, 2010 12:10 PM  
**To:** Cathel, Robert L  
**Cc:** Clinton, Richard (Rich); Hansen, Daniel R; Wyse, Eric J; Duchsherer, Mark J; Schroeder, Robert W; Ross, Roxie R  
**Subject:** Holding Times for PFP A Lab Room 144 Chemicals  
**Importance:** High

Bob,

The NDA report for the subject project states that the NDA was started on 7/21/2010. This indicates that the samples were collected at least 29 days before the expected delivery of the first 3 samples (expected on 8/19/2010). Therefore, short holding times are already missed; such as 48 hours for nitrate, nitrite, and phosphate for liquid samples; 14 days for SVOA extraction and VOA; and 28 days for Hg analysis. Since many of these samples have a very high alpha activity and will require continuous RCT support and air monitoring, I would prefer to NOT run any analyses on overtime. We might be able to get some analyses run with our normal swing shift personnel, if there is sufficient RCT coverage.

This means that I am not going to ask the lab to perform “heroics” to get any analysis done “as soon as possible” after receiving, if the holding time was already missed before we got the samples. Is this approach acceptable to you?

Please let me know if there are any assumptions that I have made that are incorrect. It is the laboratory’s opinion that the short holding times are not applicable because the samples were collected so long prior to delivery.

Thanks,  
*Ruth A. Bushaw*  
Project Manager  
ATL International, Inc.  
222-S Laboratory  
office: 509-373-4314  
cell: 509-554-4978

**Bushaw, Ruth A**

---

**From:** Cathel, Robert L  
**Sent:** Thursday, September 16, 2010 8:07 AM  
**To:** Bushaw, Ruth A  
**Cc:** Clinton, Richard (Rich)  
**Subject:** RE: PFP A Lab Room 144 Samples

Ruth,

I agree with the analytical proposals noted below.

Bob Cathel

---

**From:** Bushaw, Ruth A  
**Sent:** Wednesday, September 15, 2010 10:12 AM  
**To:** Cathel, Robert L  
**Cc:** Clinton, Richard (Rich)  
**Subject:** PFP A Lab Room 144 Samples  
**Importance:** High

Bob,

I just spoke with our two chem techs who were going to run the pH on the two solid samples. They told me that sample B242B6 (S11B) was only two large chunks of solid, about 1 – 2 g each. Besides being the large chunks, he indicated that there was still a little of the liquid left in the jar, which you described as an organic liquid. When some of sample S11 was added to water, it did form a separate layer, so we know it is organic. Since this is not an appropriate matrix for running the pH, I'm going to cancel that analysis request for this sample.

Also for sample B242B6, since there are only two chunks of material, we are going to try to acid digest one and will use the other for a water leach. That will use up the sample. If we have digestate remaining after the metals and MS actinides are run, I can start adding other radionuclides per your priority list, but I don't know if we will be able to get all of them.

They are testing HEPA filters today in the hood where we could run the pH on the other solid sample, but we have access to a hood to prepare the acid digest for metals analysis. Therefore, even though your priority list indicates pH is top priority, I would prefer to get started on the acid digestion. We will run the pH before we run any other analysis on sample B241X2 (S28). Is this acceptable to you? Also, since we don't know how much sample is available in S28 for running the required duplicate and spikes, if there is a limited amount of sample, we might not spike for all of the radionuclides by ICP/MS. We need to prepare 2 separate bottles of spike to get all of the requested metals by ICP. If we need to prepare a digested spike for the radionuclides by ICP/MS, that will require 2 additional bottles. If we are limited in sample, I would think that you would prefer that we try to get additional analyses done (like IC-anions). Therefore, we might just run post-digestion spikes for the radionuclides. Is that acceptable?

Thanks,

*Ruth A. Bushaw*

Project Manager  
ATL International, Inc.

**Bushaw, Ruth A**

---

**From:** Cathel, Robert L  
**Sent:** Monday, September 27, 2010 10:55 AM  
**To:** Bushaw, Ruth A  
**Cc:** Clinton, Richard (Rich); Wyse, Eric J; Major, Christopher A  
**Subject:** RE: PFP A Lab Room 144 SVOA Issue

Ruth,

The reasons for the failed QC results are understood and do not affect the use of the data by PFP Closure Project personnel. Therefore, PFP will accept the data as-is without reanalysis.

Bob Cathel

---

**From:** Bushaw, Ruth A  
**Sent:** Thursday, September 23, 2010 3:34 PM  
**To:** Cathel, Robert L  
**Cc:** Clinton, Richard (Rich); Wyse, Eric J  
**Subject:** PFP A Lab Room 144 SVOA Issue  
**Importance:** High

Bob,

We run the SVOC analysis for samples B24285 (S11) and B24298 (D15) from the PFP A Lab Rm 144 project as “dilute and shoot” because these were indicated by you as being organic liquids. However, after the analysis was run, the chemist is of the opinion that sample B24285 was not an organic liquid. At the time of analysis, the analyst thought the sample was soluble in the organic solvent used for analysis, but when reviewing the results, the chemist believes that the sample was not soluble. They are scheduling this sample to be extracted and rerun.

Unfortunately, B24285 was the sample chosen for the MS and MSD for the “dilute and shoot” analysis batch. With the failure of the MS and MSD recoveries, we don’t have sample QC to report for this batch, which still contains sample B24298. Sample B24298 appeared to be about 80% TBP. They ran it with a low dilution to look for TICs, and then ran it again at a very high dilution to read the TBP. It is the chemist’s preference to NOT reanalyze this sample so as to preserve the life of the column in the instrument. If he was required to rerun the sample to get passing QC for an MS/MSD, they would spike the sample at a high level and only run very dilute. This would cause them to not be able to “see” and report any TICs.

**Will it be acceptable for your use of the data if we report the results for sample B24298 in a batch with failing sample QC?** The LCS recoveries were acceptable, but because of the large dilution required to report the TBP (the only requested analyte), the surrogates were also diluted out and not reported.

The chemist’s notes indicate that since the sample matrix was different, the failure of spike and surrogate compounds for sample B24285 do not indicate problems with the preparation and analysis of sample B24298.

On a side note, the chemist was able to positively identify the following compounds in the SVOC analysis:  
n-hexadecane  
n-tridecane  
n-pentadecane

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n-octadecane  
n-eicosane  
n-heptadecane  
n-tetradecane

He indicated that the chromatogram does NOT resemble "NPH", a hydrocarbon mixture that was used in the past at the Hanford site.

Thanks,

*Ruth A. Bushaw*

Project Manager  
ATL International, Inc.  
222-S Laboratory  
office: 509-373-4314  
cell: 509-554-4978

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**Bushaw, Ruth A**

---

**From:** Cathel, Robert L  
**Sent:** Wednesday, September 29, 2010 7:35 AM  
**To:** Bushaw, Ruth A  
**Cc:** Clinton, Richard (Rich); Wyse, Eric J; Schroeder, Robert W; Brown, Kenneth M; Major, Christopher A  
**Subject:** RE: PFP A Lab Rm 144 Samples pH Results

Ruth,

The pH result of ~10.5 is expected and in-line with our process knowledge. PFP Closure Project personnel will be able to use the results as-is, without reanalysis, for waste disposition.

Thanks,  
Bob Cathel

---

**From:** Bushaw, Ruth A  
**Sent:** Tuesday, September 28, 2010 11:26 AM  
**To:** Cathel, Robert L  
**Cc:** Clinton, Richard (Rich); Wyse, Eric J; Schroeder, Robert W; Brown, Kenneth M  
**Subject:** PFP A Lab Rm 144 Samples pH Results  
**Importance:** High

Bob,

When we ran the pH analysis for sample B24286 (S12) (assumed sodium carbonate), we calibrated with pH 7 and pH 10 standards. However, the result for the sample and duplicate for this sample were pH 10.48 and pH 10.5. These results are outside of our calibration range. We don't really think that there is anything wrong with the results, but the procedure requires a reanalysis. However, before doing so, since this sample requires that we have RCT support and air sampling during analysis, I wanted to know if you will be able to use these results without reanalysis. They will be flagged with an "E" (translated to a ">" for HEIS) to indicate that the results exceeded the calibration range.

Thanks,  
*Ruth A. Bushaw*

Project Manager  
ATL International, Inc.  
222-S Laboratory  
office: 509-373-4314  
cell: 509-554-4978

**Bushaw, Ruth A**

---

**From:** Major, Christopher A  
**Sent:** Tuesday, October 05, 2010 12:37 PM  
**To:** Bushaw, Ruth A  
**Cc:** Clinton, Richard (Rich); Hansen, Daniel R  
**Subject:** RE: PFP A Lab Rm 144 GEA Detection Limits and Project Delay

Ruth – for the two isotopes listed I believe your detection limits and “less than” values will work fine for our characterization purposes.

Sorry to hear about the other difficulties. We’ll just have to wait until early November then.

Chris  
942-6489

---

**From:** Bushaw, Ruth A  
**Sent:** Tuesday, October 05, 2010 9:53 AM  
**To:** Major, Christopher A  
**Cc:** Clinton, Richard (Rich); Hansen, Daniel R  
**Subject:** PFP A Lab Rm 144 GEA Detection Limits and Project Delay  
**Importance:** High

Chris,

When we ran the GEA, we used only a 1 mL sample size for most samples to be sure to have sufficient sample for all other requested analyses, so we didn’t meet the detection limits requested in DOE-RL-2004-29. NO  $^{60}\text{Co}$  or  $^{137}\text{Cs}$  was detected in any of the samples.

The requested limits are:

$^{60}\text{Co}$  9.00E-06  $\mu\text{Ci/mL}$

$^{137}\text{Cs}$  1.25E-05  $\mu\text{Ci/mL}$

We are currently reporting the following detection limits:

$^{60}\text{Co}$  ~2.5E-05  $\mu\text{Ci/mL}$

$^{137}\text{Cs}$  ~3.0E-05  $\mu\text{Ci/mL}$

For the alpha higher activity samples, our detection limits are quite a bit higher because we had to use much less sample.

Will these “less than” results meet your needs? Or would you prefer that we check remaining volume when all other analyses are complete to see if there is sufficient sample to rerun with 3 times for sample to meet your detection limits? Our counting room is currently on restricted access, so we can’t run any radionuclides. We also have been having difficulty with the Pu analysis by AEA and most of the samples still need to be reanalyzed.

I also wanted to inform you that we are continuing to have facility issues causing delays. We still have limited RCT resources due to facility issues that need RCT support and because only a limited number of alpha sample analyses can be covered in the lab at one time. The ICP room is still under investigation for mold issues. There

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was a spill in the counting room, so it is currently on restricted access. They are working on a recovery plan to attempt to get the counting room released by Friday, but it might be Tuesday before they can start counting samples again after getting the detectors back up and running and running all of the check standards and blanks over the weekend.

The 45-day due date for this report is 10/14/2010. Based on these outages and the other backlog of analyses in addition to this work, I most likely will not be able to issue the report until early November, at the earliest. I will have a better estimate of a completion date once the counting room and ICP room are released for running analyses.

We still have not run IC for any samples. I need Pu, ICP, ICP/MS, and Hg completed for most samples. There are still a few samples needing GEA and alpha/beta, and I still need Sr-90 and Am for about half of the samples. I believe that most of the organic analyses have been run, but the data still needs to be reviewed. Since the VOA room was taken out of service yesterday, the group had been focusing the last 2 weeks on getting all of the VOA samples run for all projects currently in the lab.

Thanks,

*Ruth A. Bushaw*

Project Manager  
ATL International, Inc.  
222-S Laboratory  
office: 509-373-4314  
cell: 509-554-4978

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**Bushaw, Ruth A**

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**From:** Clinton, Richard (Rich)  
**Sent:** Wednesday, October 06, 2010 7:50 AM  
**To:** Bushaw, Ruth A; Major, Christopher A  
**Cc:** Wyse, Eric J  
**Subject:** RE: PFP A Lab Hydrogen Ion Analysis Question

Ruth,  
We are good with your approach.

Thanks – Rich C.

---

**From:** Bushaw, Ruth A  
**Sent:** Tuesday, October 05, 2010 4:41 PM  
**To:** Major, Christopher A; Clinton, Richard (Rich)  
**Cc:** Wyse, Eric J  
**Subject:** PFP A Lab Hydrogen Ion Analysis Question

Chris and Rich,

We ran the hydrogen ion analysis on the PFP A Lab Rm 144 samples on 9/21/2010. Upon review of the data, the chemist realized that there was no method detection limit (MDL) in the LIMS system for this method. Typically, the lab runs an MDL study a method and it gets approved by QA prior to running samples. This method addresses both free H<sup>+</sup> and OH<sup>-</sup>, but is almost exclusively used for hydroxide, because the samples typically analyzed by 222-S are virtually always caustic. Since the method is commonly used, it was believed to be fully validated for everything it covers. We ran a set of standards yesterday to determine an MDL, and it was approved by QA. It is the laboratory's opinion that this MDL is representative of the system at the time of the analysis. However, since it was determined after the fact, I will need to explain the situation in the narrative.

Thanks,  
*Ruth A. Bushaw*  
Project Manager  
ATL International, Inc.  
222-S Laboratory  
office: 509-373-4314  
cell: 509-554-4978

**Bushaw, Ruth A**

---

**From:** Major, Christopher A  
**Sent:** Friday, October 08, 2010 7:58 AM  
**To:** Bushaw, Ruth A  
**Cc:** Clinton, Richard (Rich)  
**Subject:** RE: PFP A Lab Room 144 IC Analysis

Ruth – I just got off the phone with Rich and we agree with canceling the IC anions and ICP/MS metals analysis. Do proceed with the Hg, though.

Chris

---

**From:** Bushaw, Ruth A  
**Sent:** Thursday, October 07, 2010 3:58 PM  
**To:** Major, Christopher A; Clinton, Richard (Rich)  
**Subject:** PFP A Lab Room 144 IC Analysis

Chris and Rich,

We attempted to run the IC anions and ICP metals analyses on sample B24296. However, the chem techs indicated that the sample acted soapy when it was pipetted, and it formed a foamy solution when diluted for analysis. They decided to not try to run in on the IC, but they did try running it on the ICP and the lines were clogging and it shifted the baseline so that one of their check standards failed. They are trying to rinse out the lines right now to try to pass the closing QC.

I discussed this behavior with one of our Organic chemists, who indicated that it could be TBP that decomposes to dibutyl phosphate (DBP) + butanol, that further decomposes to monobutyl phosphate (MBP) + butanol. The MBP decomposes to phosphoric acid + butanol. We were able to measure a pH of 1.38 and the H<sup>+</sup> was 0.01M. This could be from the phosphoric acid. The DBP and MBP can act like surfactants, which is consistent with our observation of the sample bubbling up when we try to dilute it.

Unfortunately, we don't have a method to determine if this sample contains DBP or MBP.

Regardless of what this sample really contains, I plan to cancel the request for IC anions and ICP and ICP/MS metals analysis. Since a larger dilution was analyzed for radionuclides by ICP/MS and radiochemistry isotopes, there was no issue reported for those analyses. I will talk to the chemist for Hg analysis to see if he thinks he can run that analysis. The Hg digestion is designed to breakdown organic compounds so that they don't interfere in the analysis.

Thanks,

*Ruth A. Bushaw*

Project Manager  
ATL International, Inc.  
222-S Laboratory  
office: 509-373-4314  
cell: 509-554-4978

**Bushaw, Ruth A**

---

**From:** Major, Christopher A  
**Sent:** Tuesday, October 12, 2010 4:39 PM  
**To:** Bushaw, Ruth A  
**Cc:** Clinton, Richard (Rich)  
**Subject:** RE: PFP A Lab Room 144 Request for Due Date Extension

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

Ruth – I talked this over with Rich. We understand the problems and accept the extension. Please be mindful, however, that the delays have largely brought our disposal work on these chemicals to a standstill, so please continue to feed us preliminary data as soon as it becomes available. Thanks.

Chris  
208-821-1291

---

**From:** Bushaw, Ruth A  
**Sent:** Monday, October 11, 2010 2:49 PM  
**To:** Clinton, Richard (Rich); Major, Christopher A  
**Cc:** Schroeder, Robert W; Finn, Cheryl R; Hansen, Daniel R  
**Subject:** PFP A Lab Room 144 Request for Due Date Extension  
**Importance:** High

Chris and Rich,

We are continuing to have difficulty in getting the sample analyses completed for the PFP A Lab Room 144 samples. There are several issues that continue to impede progress on this project: it has been difficult to obtain sufficient RCT resources on a daily basis to run more than just a couple of analyses at a time (some days we have had no RCT coverage for working with alpha samples), we are having difficulty getting standards to pass recovery for the plutonium by AEA method, and we are having matrix issues with a number of the low alpha liquid samples on the ICP and are planning to try to rerun from an acid digestion.

Because of all of the issues, we don't expect to get analyses completed until at least the end of October; except I don't know if we will get the plutonium method working by then, I'll have to keep you informed on that.

Therefore, I would like to request an extension on the due date of the report from 10/14/2010 extended to 11/11/2010. Will that be acceptable?

Thanks,

*Ruth A. Bushaw*

Project Manager  
ATL International, Inc.  
222-S Laboratory  
office: 509-373-4314  
cell: 509-554-4978

**Bushaw, Ruth A**

---

**From:** Major, Christopher A  
**Sent:** Monday, October 18, 2010 3:04 PM  
**To:** Bushaw, Ruth A  
**Cc:** Hansen, Daniel R; Schroeder, Robert W; Clinton, Richard (Rich)  
**Subject:** RE: PFP A Lab Room 144 Preliminary IC Anions Data

Yes. We will conservatively take the highest concentration or "worse case scenario" for characterization purposes.

Chris

---

**From:** Bushaw, Ruth A  
**Sent:** Monday, October 18, 2010 2:06 PM  
**To:** Major, Christopher A; Clinton, Richard (Rich)  
**Cc:** Hansen, Daniel R; Schroeder, Robert W  
**Subject:** PFP A Lab Room 144 Preliminary IC Anions Data  
**Importance:** High

Chris and Rich,

Based on sample matrix, I had requested the IC anions analysis on twenty of the liquid samples that you delivered. The attached Excel and .pdf files contain the preliminary results for these samples. I'm sorry that this wasn't available last week, but they had some difficulties with this analysis because of the high acid matrix, and it took longer than expected for the chemists to review the data. The solid samples have been analyzed and the results are still in the upload/data review process.

One issue was an unexplainable matrix spike failure. We figured out this morning that the chem tech might have used an incorrect standard, so we are planning to rerun that analysis tomorrow. I have included the results from the original analysis for those samples in the attached files. We believe that the sample results are correct, we just need to have a matrix spike that passes. However, the actual results that will be included in the final report might vary slightly from those in this file due to slight differences in the column conditions from day to day. I hope to have the reanalysis results uploaded and reviewed to be able to provide to you by the close of business on Wednesday.

One other issue with the data is that there was chloride, nitrate and sulfate detected in the method blanks. For the samples with low concentrations of these analytes, the results are flagged with a "C" to indicated blank contamination greater than 5% of the sample results. Our QAPP allows reporting of sample results flagged with blank contamination if the concentration detected in the blank was less than the quantitation limit. This was the case for these results. The affected sample results are also "B" flagged to indicate sample results less than the quantitation limit. **I believe that for your use of the data, you will be concerned with the higher concentrations of analytes in these samples so that the "C" flag on the low concentration analytes will not affect your use of the results. Is that correct?**

<< File: PFP A Lab Rm 144 IC Prelim Results.xlsx >> << File: PFP A Lab Rm 144 IC Prelim Results.pdf >>

Thanks,  
*Ruth A. Bushaw*  
Project Manager

**Bushaw, Ruth A**

---

**From:** Major, Christopher A  
**Sent:** Friday, November 05, 2010 1:31 PM  
**To:** Bushaw, Ruth A  
**Cc:** Clinton, Richard (Rich)  
**Subject:** RE: Additional ICP results for PFP A Lab Rm 144

Ruth, the potential false for Antimony is not a show stopper. So, it's acceptable. The other issues, particularly the Chromium detection limit for B241X2 (which factored 3X still comes in under RCRA limits), are acceptable.

Chris

---

**From:** Bushaw, Ruth A  
**Sent:** Friday, November 05, 2010 10:18 AM  
**To:** Major, Christopher A  
**Cc:** Clinton, Richard (Rich)  
**Subject:** FW: Additional ICP results for PFP A Lab Rm 144  
**Importance:** High

Chris,

I had sent these results to you on 10/2282010 with the discussion of QC issues. I didn't receive a reply from you for whether the results will be acceptable as reported. Specifically, I was concerned about the potential false negative reported for Sb due to loss during the acid digest, indicated by the 48% matrix spike recovery. The results were all reported as <MDL, but there was no requested detection limit in the DOE document that we were asked to follow, so I don't know what your action level is for this analyte.

Please let me know if these results (all results discussed below with QC issues) will be acceptable for your use without reanalysis.

Thanks,

*Ruth A. Bushaw*

Project Manager  
Advanced Technologies and Laboratories International, Inc.  
Contractor to the Office of River Protection  
U.S. Department of Energy 222-S Laboratory  
373-4314

---

**From:** Bushaw, Ruth A  
**Sent:** Friday, October 22, 2010 1:12 PM  
**To:** Major, Christopher A  
**Cc:** Clinton, Richard (Rich); Hansen, Daniel R  
**Subject:** Additional ICP results for PFP A Lab Rm 144  
**Importance:** High

Chris,

The attached files contain the ICP results for the PFP A Lab Rm 144 solid (B242B6 & B241X2), the organic liquid (B24285 & B24298) samples, and the 8 liquid samples that were acid digested. The last three liquid samples are analyzed but are in the process of upload and chemist review. Please read my comment below and let me know if these results will meet your needs, or if you want us to try a reanalysis.

<< File: PFP A Lab ICP Results 10-22-2010.xlsx >>

I also attached an Excel file for the hydrogen ion results for the last 4 samples that we haven't provided yet. There were no issues to report for these results.

<< File: PFP A Lab H+ Results for Last 4 Samples.xlsx >>

Some notes concerning these results:

1. Samples B24285 and B24298 were identified as organic liquids in the information that I received from Bob Cathel. Therefore, the sample preparation consisted of an ashing step to get rid of the organic material, then the ashed material was digested using a method that uses strong acids to ensure dissolution of analytes of interest. Historically we have not prepared a digested standard and matrix spike with this digestion method because of the concern of spattering. However, to check for analyte loss, we did prepare a digested standard and spike with this batch. Since the PFP samples had limited amount of material to perform all of the analyses, we prepared an organic liquid from another customer in the same batch and used that sample for the duplicate and spike analysis. The digested standard had a very low recovery for silver (47%). It is the laboratory's opinion that the low recovery is due to precipitation of silver chloride upon addition of the strong hydrochloric acid. All of the undigested calibration check standards and the low level standard met the recovery limits in the QAPP. There was no silver reported for the samples, but it could be that it was also precipitated. The digested matrix spike passed at 88%. This won't print in the attached data summary report because it was analyzed with a sample from another customer, but I can add a table to the report narrative to provide the duplicate RPDs and spike recoveries. The sodium recovery in the digested standard was high, 138%. It is the laboratory's opinion that this high recovery was due to leaching of sodium from the glassware during the digestion with strong acids. A "X" flag was applied to the sample results for silver and sodium to indicate the standard recovery failures. It is the laboratory's opinion that a re-preparation would cause the same standard failures. Sodium and aluminum were both detected in the preparation blank and the concentrations were greater than 5% of the sample results, so a "C" flag was applied. These may have also leached from the glassware due to the strong acid digest. The low level standard (LLS), used to check for accuracy of results at the quantitation limit, was very low for chromium (36%). The laboratory believes that this was due to a bad standard, but to be conservative, the result for sample B24285 was flagged with a "B" to indicate that the result should be considered an estimate and could be biased low. The result for B24298 was below the detection limit and is flagged with a "U". The LLS recovery for potassium was also low (51%). Sample B24298 was reported as a non-detect possibly because of the low bias. The result for sample B24285 was sufficiently above the quantitation limit that the low bias did not affect the result.
2. For the solid samples, again the LLS had low recoveries for chromium (36%) and potassium (35%). The chromium results for both samples (B241X2 and B242B6) were reported as below the MDL, but again this could be because of the low bias causing the non-detect. The highest reported detection limit is 1.97 µg/g. If low bias indicates results could be 3 times higher, the results might be as high as  $3 \times 1.97 = 11.91$  µg/g. If the level of concern is the TCLP limit of 5.0 µg/mL, you can divide the solid result by 20 to compare. So,  $11.91/20 = 0.6$  µg/mL. For the potassium, the result for B241X2 were sufficiently above the quantitation that the low bias indicated by the low LLS recovery did not affect the result. For sample B242B6, the result was < MDL, which may be a false non-detect due to the low bias. The pre-digestion matrix spike recovery for potassium failed at 62%. This could be due to the low bias.

An “N” flag was applied to indicate this spike failure. Another item of potential concern in this analysis run was that the percent difference for the serial dilution for sodium was 14%, which is outside the control limit of <10%. The serial diluted result was higher than the result reported in the attached file (serial dilution = 6.4E+04 µg/g; sample result = 5.6E+04 µg/g. This indicates that there is a low bias in the sample result possibly from the effect of higher solids concentration in the less diluted sample. The chemist selected a dilution to minimize the reported detection limits for analytes for which you provided requested detection limits. Unfortunately, using that dilution, the sodium concentration is high in the calibration range, which subsequently caused the serial dilution failure. The sample result is flagged with an “X” to indicate this failure. We also we failed to meet the recovery criteria for the pre-digested matrix spike for sodium because the sample concentration was much greater than 4 times the spike added. The spiking criterion is not applicable in this situation. The post-digestion spike recovery met the requirements.

3. For the liquids run from an acid digest (indicated by a B in the “A” column of the spreadsheet), one of the main concern is that the ending LLS for potassium is low (62%). The initial LLS was good (94%), so this indicates a stability issue by the end of the run. Most samples were reported <MDL. Sample B24294 was reported with a positive sample result, but the duplicate was <MDL. The result is flagged with a “B” to indicate that it is estimated. It is possibly biased low. Also, the digested matrix spike recovery for antimony for sample B24294 was low (48%), and “N” flag was applied to indicate the spike failure. This might be due to the acid digest not having enough hydrochloric acid. Typically a second digestion is required for reporting antimony. The addition of extra HCl keeps the antimony in solution. The sample results are all <MDL, but might be biased low from loss during the digestion. Antimony was also analyzed by ICP/MS. Those results are still in chemist review.

Thanks,

*Ruth A. Bushaw*

Project Manager

Advanced Technologies and Laboratories International, Inc.

Contractor to the Office of River Protection

U.S. Department of Energy

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office: 509-373-4314

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**Bushaw, Ruth A**

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**From:** Clinton, Richard (Rich)  
**Sent:** Tuesday, November 16, 2010 9:25 AM  
**To:** Bushaw, Ruth A; Major, Christopher A  
**Subject:** RE: Lack of Sample QC in AEA Batches

I concur with the lab's conclusion.

Thanks – Rich C.

---

**From:** Bushaw, Ruth A  
**Sent:** Tuesday, November 16, 2010 8:39 AM  
**To:** Major, Christopher A; Clinton, Richard (Rich)  
**Subject:** Lack of Sample QC in AEA Batches  
**Importance:** High

Chris and Rich,

I had previously reported to you that we were needing a reanalysis on four samples (B24280, B24281, B24288, B24289) for americium and plutonium by AEA because the results were not in agreement with the non reported plutonium and americium results by GEA and total alpha results. In the original analysis batches, a duplicate analysis was performed on sample B24283 with acceptable results an RPD, so this sample was not requested for reanalysis. Unfortunately, due to an oversight, the reanalysis batch did not contain a duplicate, as required by HASQARD and our QAPP. Since the sample results on the reanalysis are in agreement with those obtained from the GEA, it is the laboratory's opinion that the lack of a sample duplicate in the batch has no adverse affect on the use of the data.

Will this be acceptable for your use of the data?

Thanks,

*Ruth A. Bushaw*

Project Manager  
Advanced Technologies and Laboratories International, Inc.  
Contractor to the Office of River Protection  
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**Bushaw, Ruth A**

---

**From:** Clinton, Richard (Rich)  
**Sent:** Wednesday, November 17, 2010 9:51 AM  
**To:** Bushaw, Ruth A; Major, Christopher A  
**Subject:** RE: Nickel Results Biased High for PFP A Lab Samples

Ruth,

The results are acceptable. Nickel is not constituent that causes us any problems. We'll take the data as is with an explanation in the narrative.

Thanks,

Rich C.

---

**From:** Bushaw, Ruth A  
**Sent:** Tuesday, November 16, 2010 11:11 AM  
**To:** Major, Christopher A; Clinton, Richard (Rich)  
**Subject:** Nickel Results Biased High for PFP A Lab Samples  
**Importance:** High

Chris and Rich,

We ran nickel by ICP/MS for the PFP A Lab samples because we couldn't meet the requested detection limit (RDL) of 0.057 µg/mL by ICP. For two of the liquid samples that were acid digested, the preparation blank had nickel above the MDL, but below the quantitation limit, so our QAPP does not require us to reanalysis. However, for sample B24296, the nickel result was lower than what was reported in the blank and was "C" flagged. The result of 6.73E-03 µg/mL is likely a false positive, but the result was less than the RDL, so I suspect that this should be an issue for you. For sample B24294, the result for the blank was about 10% of the sample result, so this sample result was also "C" flagged. The result was 6.46E-02 µg/mL is likely biased high and is slightly above the RDL. I hope that these results are acceptable for your use because our ICP/MS room is currently out-of-service for maintenance on the air conditioning system. I could report results from the ICP, but they will be reported as less than the MDL, which is 0.1µg/mL and doesn't meet the RDL.

Thanks,

*Ruth A. Bushaw*

Project Manager  
Advanced Technologies and Laboratories International, Inc.  
Contractor to the Office of River Protection  
U.S. Department of Energy  
222-S Laboratory  
office: 509-373-4314  
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**Bushaw, Ruth A**

---

**From:** Major, Christopher A  
**Sent:** Monday, November 22, 2010 8:43 AM  
**To:** Bushaw, Ruth A  
**Cc:** Clinton, Richard (Rich)  
**Subject:** RE: Chromium and Nickel Results by ICP-MS

Ruth – I follow your logic on the Cr issue and – yes – the results are useable. The Ni results are useable too.

Chris  
942-6489

---

**From:** Bushaw, Ruth A  
**Sent:** Monday, November 22, 2010 8:01 AM  
**To:** Major, Christopher A; Clinton, Richard (Rich)  
**Subject:** Chromium and Nickel Results by ICP-MS  
**Importance:** High

Chris and Rich,

I have two more concerns; one about chromium results and the other about the nickel results for the ICP-MS analysis of the organic liquid samples B24285 and B25298.

The initial LLS recovery for chromium was greater than 130%, which fails to meet the criteria in the QAPP. This indicates a potential high bias for sample B24285. The result for sample B24298 was sufficiently high that the bias indicated by the high LLS recovery should not affect that result. The LLS at the end of the run met the criteria in the QAPP. Chromium was detected in the initial continuing calibration blank (CCB) above the MDL, but less than the quantitation limit, so no reanalysis was required. The preparation blank result for chromium was greater than the MDL, but less than the quantitation limit, so no re-preparation or reanalysis was required. The preparation blank result was greater than the chromium result for sample B24285 and was approximately 8% of the result for B24298, so a “B” flag was applied to both sample results. The high blanks might be due to the high bias indicated by the high recovery for the initial LLS. The blank was previously analyzed in another analytical batch and was less than the MDL. The results for the two samples from that initial batch were about the same as those reported from the reanalysis batch with the high blank result. However, since the CCV at the end of the initial run failed high, the results could not be reported from that run. Even with the potential high bias indicated by the high blank results, the sample result for chromium for sample B24298 (0.420 µg/mL) was less than the regulatory level of 5 µg/mL. The chromium result for sample B24285 was 10.6 µg/mL. Even if you correct for an 8% blank contribution, this result will be greater than the regulatory limit of 5 µg/mL. I would prefer to not report the chromium results from the ICP run because the LLS indicated a very low bias, with a recovery of only 34%. Also, the ICP result for chromium for sample B24298 did not meet the requested detection limit.

For nickel, it was detected in the preparation blank above the MDL, but below the quantitation limit, so no re-preparation or reanalysis is required. The blank result was less than 5% of that for sample B24285 (11.6 µg/mL), but was nearly 50% of the result for sample B24298 (0.216 µg/mL).

Since you previously indicated that nickel was not an analyte of concern for your use of the data, I assume that these nickel results are also usable. However, will the chromium results be usable?

20100687  
DECEMBER 21, 2010

Thanks,

*Ruth A. Bushaw*

Project Manager

Advanced Technologies and Laboratories International, Inc.

Contractor to the Office of River Protection

U.S. Department of Energy

222-S Laboratory

office: 509-373-4314

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**Bushaw, Ruth A**

---

**From:** Major, Christopher A  
**Sent:** Monday, November 22, 2010 10:37 AM  
**To:** Bushaw, Ruth A  
**Cc:** Clinton, Richard (Rich)  
**Subject:** RE: PFP a Lab Room 144 Lead Results

Ruth – I would use the ICP/MS results with a note explaining the likely false positive.

Chris

---

**From:** Bushaw, Ruth A  
**Sent:** Friday, November 19, 2010 3:38 PM  
**To:** Major, Christopher A; Clinton, Richard (Rich)  
**Subject:** PFP a Lab Room 144 Lead Results  
**Importance:** High

Chris and Rich,

We were unable to meet the requested detection limit for lead by ICP, so we ran it by ICP/MS. For the organic liquid samples, we had a couple of issues. The result for the preparation blank was 1.12 µg/mL, which was greater than the quantitation limit and requires a repreparation and reanalysis, per our QAPP. The sample results were 0.885 µg/mL for sample B24285 and 0.585 µg/mL for B24298. The duplicate was run on an organic liquid sample from another customer because of limited sample volume in your two samples. The RPD was 116%. This also requires a repreparation and reanalysis by our QAPP. The chemist suspects that there was a non-homogenous matrix issue.

Currently our ICP-MS lab is out-of-service due to an HVAC upgrade. It's expected to be out for about a month, so we won't be able to reprep and reanalyze very soon.

The lead results from ICP were:

Prep blank = <6.25 µg/mL

B24285 = <6.25 µg/mL

B24298 = <6.25 µg/mL

Would you prefer that I report the ICP results with the high detection limit? Or will the ICP/MS results be usable for you? I will explain that the results are possibly a false positive based on the contamination indicated by the high blank result. I will also have to discuss that the initial low level standard recovery was low (63%), but since these sample results were above the EQL, they shouldn't be affected.

Thanks,

*Ruth A. Bushaw*

Project Manager

Advanced Technologies and Laboratories International, Inc.

Contractor to the Office of River Protection

U.S. Department of Energy

222-S Laboratory

20100687  
DECEMBER 21, 2010

office: 509-373-4314

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**Bushaw, Ruth A**

---

**From:** Major, Christopher A  
**Sent:** Thursday, December 09, 2010 10:59 AM  
**To:** Bushaw, Ruth A  
**Cc:** Clinton, Richard (Rich)  
**Subject:** RE: PFP A Lab Sr-90 Results

I think we would be able to use the Sr-90 data as is. Please qualify the value in your final report, however.

Chris  
942-6489

---

**From:** Bushaw, Ruth A  
**Sent:** Thursday, December 09, 2010 10:38 AM  
**To:** Major, Christopher A; Clinton, Richard (Rich)  
**Subject:** PFP A Lab Sr-90 Results  
**Importance:** High

Chris and Rich,

I was just running the final data summary report for the PFP A Lab Rm 144 samples to verify that the correct flags are now being applied. I just noticed that for sample B242B6, the acid digest preparation blank was not analyzed for Sr-90. For this sample, we ran the radionuclides from the acid digest prepared for the ICP metals analysis. The acid digest preparation blank was run for all other radionuclides except for Sr-90. For the Sr-90, this sample was analyzed in the same batch as sample B241X2, which was prepared using the environmental digest (or what we call an acid digest using stronger acids). The only preparation blank that was analyzed with that batch was the environmental digest preparation blank.

Will you be able to use the Sr-90 result for sample B242B6 without a blank result? If I report without that blank, I'm about ready to provide the final report to a peer for review and we should have it ready to issue next week. If you need a blank result, we wouldn't be able to get the results from the lab until next Tuesday (12/14/2010) and I would need another couple of days to finish the report and get the peer review.

Thanks,

*Ruth A. Bushaw*

Project Manager  
Advanced Technologies and Laboratories International, Inc.  
Contractor to the Office of River Protection  
U.S. Department of Energy  
222-S Laboratory  
office: 509-373-4314  
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Attachment 7

RECEIPT PAPERWORK

ATL	<b>SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST</b>	LO-090-101 Rev <u>EE.0</u>
-----	---	----------------------------

Date Samples Received: 8.17.10 Group #: 20100688  
 Number of Samples: 13 Beryllium / 3 PFP ALAB Rm 144  
 Sample Custodian: [Signature]

**Sample Custodian to Complete:**

Action	OK? (Y/N)	N/A	Comments
RSA/COC provided?	✓		
RSR provided?	✓		
Verify GKI is complete	✓		on file
Check that outer custody seal is intact, if present	✓		
Record cooler temperature in centigrade, as appropriate		✓	<input type="checkbox"/> Check if no cooler and/or no ice
Samples are intact and in good condition	✓		If No, provide comments on back
Verify that COC or RSA is accurate 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			
• 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 PM immediately if any problems are noted. (A "No" answer requires Project Manager resolution.)

**PM to Complete:**

Samples acceptable for release? Yes PM Initials RMS Date 8/30/2010

If No, comment on communication and resolution:

Other Comments:



<b>CH2MHill Plateau Remediation Company</b>		<b>CHAIN OF CUSTODY / SAMPLE ANALYSIS REQUEST</b>		<b>F10-069-003</b>	<b>PAGE 2 OF 2</b>
<b>COLLECTOR</b> KB Hulse CHPRC	<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b>  45 Days / 45 Days
<b>SAMPLING LOCATION</b> S3; RM 144; Hood 1; bottle #11 Std lab	<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>	<b>FIELD LOGBOOK NO.</b> HNF -N-507-14.35	<b>ACTUAL SAMPLE DEPTH</b> N/A	<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations	<b>OFFSITE PROPERTY NO.</b> N/A		<b>BILL OF LADING/AIR BILL NO.</b> N/A		

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
  - \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
  - \*\* ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ *on 6/28/10*
  - \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).
  - \*\* ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ *on 6/28/10*
  - \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *on 6/28/10*
- (1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi-VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH D (Total petroleum hydrocarbons - kerosene range) - 6020\_METALS\_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}~~

 ORIGINAL

CH2M Hill Plateau Remediation Company		F10-069-004		PAGE 1 OF 2	
COLLECTOR <b>KB Hulse CHPRC</b>	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION S4; RM 144; Hood 2; Ion Exchange waste		PROJECT DESIGNATION PPF A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY <input type="checkbox"/>
ICE CHEST NO.	FIELD LOGBOOK NO. <b>HNF-N-507-14.35</b>	ACTUAL SAMPLE DEPTH <b>N/A</b>	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations		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 may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	PRESERVATION <del>Cool 16</del> <b>NONE</b>	TYPE OF CONTAINER aG	NO. OF CONTAINER(S) 1	VOLUME 125mL
SPECIAL HANDLING AND/OR STORAGE		SAMPLE ANALYSIS SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)		

*An 6/29/10*  
*an 6/28/10*

*bb 7/19/10*

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B24281 (54)	OTHER LIQUID	JUL 19 2010	1350	X

*bb 7/19/10*

*bb 7/19/10*

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM <b>CHPRC KB Hulse</b>	DATE/TIME <b>JUL 19 2010 5:30</b>	RECEIVED BY/STORED IN <b>Kawilson - Hulse</b>
RELINQUISHED BY/REMOVED FROM <b>Kawilson</b>	DATE/TIME <b>8/18/10 2:37</b>	RECEIVED BY/STORED IN <b>AGSARCE</b>
RELINQUISHED BY/REMOVED FROM <b>RESINCE</b>	DATE/TIME <b>8-19-10 9:20</b>	RECEIVED BY/STORED IN <b>Fidel Gutierrez</b>
RELINQUISHED BY/REMOVED FROM <b>Fidel Gutierrez</b>	DATE/TIME <b>8-19-10 10:15</b>	RECEIVED BY/STORED IN <b>Patricia Steele</b>
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

**GRP# 20100688**  
**Sam# 510M000387**

**ORIGINAL**

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

<b>CH2MHill Plateau Remediation Company</b>		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>		<b>F10-069-004</b>	<b>PAGE 2 OF 2</b>
<b>COLLECTOR</b> KB Hulse CHPRC	<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b>
<b>SAMPLING LOCATION</b> S4; RM 144; Hood 2; Ion Exchange waste	<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	<b>45 Days / 45 Days</b>
<b>ICE CHEST NO.</b>	<b>FIELD LOGBOOK NO.</b> HNF-N-507- <u>14.35</u>	<b>ACTUAL SAMPLE DEPTH</b> <u>N/A</u>	<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations	<b>OFFSITE PROPERTY NO.</b> N/A	<b>BILL OF LADING/AIR BILL NO.</b> N/A			

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
  - \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
  - \*\* ~~TPH - Kerosene shall be analyzed if SVOA-TICs indicate the presence of Contaminant of Concern (COC).~~ *on 6/28/10*
  - \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).
  - \*\* ~~222-S laboratory shall perform Differential Scanning Colorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ *on 6/28/10*
  - \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *on 6/28/10*
- (1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range) 6020\_METALS\_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}~~

 ORIGINAL

<b>COLLECTOR</b> KB Hulse CHPRC		<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> S14; RM 144; Hood 5; A00109		<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>		<b>FIELD LOGBOOK NO.</b> HNF-N-507-14-35	<b>ACTUAL SAMPLE DEPTH</b> N/A	<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations		<b>OFFSITE PROPERTY NO.</b> N/A		<b>BILL OF LADING/AIR BILL NO.</b> N/A		

<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b> <del>Cool-1C</del> None	<b>TYPE OF CONTAINER</b> aG	<b>NO. OF CONTAINER(S)</b> 1	<b>VOLUME</b> 125mL	<b>SPECIAL HANDLING AND/OR STORAGE</b>	<b>SAMPLE ANALYSIS</b> SEE ITEM (1) IN SPECIAL INSTRUCTIONS Generic Testing (No CAS)
		<b>None</b>	<b>P</b>	<b>1</b>	<b>60mL</b>		

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B24288 (514)	OTHER LIQUID	JUL 19 2010	1000	X

<b>CHAIN OF POSSESSION</b>		<b>SIGN/ PRINT NAMES</b>	<b>SPECIAL INSTRUCTIONS</b>
RELINQUISHED BY/REMOVED FROM KB Hulse CHPRC	DATE/TIME JUL 19 2010	RECEIVED BY/STORED IN K Wilson / Kwon	DATE/TIME JUL 19 2010
RELINQUISHED BY/REMOVED FROM K Wilson / Kwon	DATE/TIME 8/18/10 2:37	RECEIVED BY/STORED IN RE STRACE Ryan Strace	DATE/TIME 8-18-10 2:37
RELINQUISHED BY/REMOVED FROM RE STRACE Ryan Strace	DATE/TIME 8-19-10 9:20	RECEIVED BY/STORED IN Fidel Gutierrez	DATE/TIME 8-19-10 9:20
RELINQUISHED BY/REMOVED FROM Fidel Gutierrez	DATE/TIME 8-19-10 10:15	RECEIVED BY/STORED IN R Steed	DATE/TIME 8-19-10 10:15
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP # 20100688  
SAM # SIGM000 390

ORIGINAL

<b>LABORATORY SECTION</b>	<b>RECEIVED BY</b>	<b>TITLE</b>	<b>DATE/TIME</b>
<b>FINAL SAMPLE DISPOSITION</b>	<b>DISPOSAL METHOD</b>	<b>DISPOSED BY</b>	<b>DATE/TIME</b>

CH2M Hill Plateau Remediation Company		F10-069-011		PAGE 2 OF 2
COLLECTOR KB Hulse CHPRC	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION S14; RM 144; Hood 5; A00109	PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY <input type="checkbox"/>
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-507-14-35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A	BILL OF LADING/AIR BILL NO. N/A		

## SPECIAL INSTRUCTIONS

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
- \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
- \*\* ~~TPH - Kerosene shall be analyzed if SVQA TICs indicate the presence of Contaminant of Concern (COC).~~ *By 6/28/10*
- \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).
- \*\* ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ *By 6/28/10*
- \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *By 6/28/10*
- (1) ~~VQA - 8260B - COMPLETE (Carbon tetrachloride) Semi VQA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range) 6020\_METALS\_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}~~



**ISOCS Item Report**

Item ID:	B24280 (S3)
Date Assayed:	7/20/10
Item Mass, kg:	0.16
Isotopic Source:	HNF-15500 (DSA)

Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrtny (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrtny (g)	Upper Limit (g)	Codes
Pu-238	0.210%	1.93E+03	2.84E+02	2.50E+03	1.13E-04	1.66E-05	1.46E-04	I
Pu-239	81.361%	2.71E+03	2.93E+02	3.29E+03	4.36E-02	4.73E-03	5.31E-02	M
Pu-240	16.355%	1.99E+03	2.93E+02	2.58E+03	8.77E-03	1.29E-03	1.14E-02	I
Pu-242	0.670%	1.42E+00	2.10E-01	1.84E+00	3.59E-04	5.30E-05	4.65E-04	I
Np-237								
Am-241	2.470%	4.55E+03	6.74E+02	5.89E+03	1.32E-03	1.96E-04	1.72E-03	I
Other TRU								
U-235								
U-238								
Pu-241	1.404%	7.78E+04	1.15E+04	1.01E+05	7.53E-04	1.11E-04	9.75E-04	I
Other								
Other								
Other								

Total Pu, g**	5.364E-02
Total Uncertainty, g***	7.910E-03
Upper Limit, g Pu****	6.946E-02

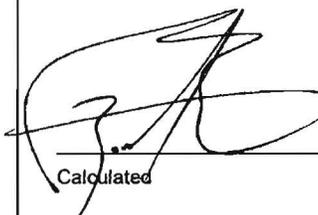
Total TRU Activity, uCi	1.12E+04
Total Uncertainty, uCi***	1.36E+03
Upper Limit, uCi****	1.39E+04

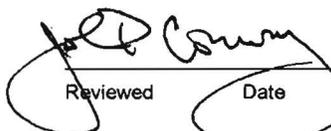
TRU Specific Activity, nCi/g	7.20E+04
Total Uncertainty, nCi/g***	8.77E+03
Upper Limit, nCi/g****	8.95E+04

Total Activity (TRU + non-TRU), uCi	8.90E+04
Total Uncertainty, uCi***	1.25E+04
Upper Limit, uCi****	1.14E+05

\* Codes: M = Activity directly measured by ISOCS.  
 I = Activity inferred from ISOCS measured Pu-239 and mass fraction using identified isotopic source.  
 C = Mass fraction calculated from measured ISOCS value and total plutonium.

\*\* Based on Pu-239 and mass fraction of Pu-239.  
 \*\*\* Uncertainties stated at 1 standard deviation.  
 \*\*\*\* The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

  
 Calculated Date 7/29/10

  
 Reviewed Date 7/29/10

**ISOCS Item Report**

Item ID:	B24281 (S4)
Date Assayed:	7/21/10
Item Mass, kg:	0.15
Isotopic Source:	HNF-15500 (DSA)

Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrtnty (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrtnty (g)	Upper Limit (g)	Codes*
Pu-238	0.210%	6.26E+01	1.17E+01	8.59E+01	3.66E-06	6.80E-07	5.02E-06	M, C
Pu-239	81.361%	6.73E+02	7.30E+01	8.19E+02	1.08E-02	1.18E-03	1.32E-02	M
Pu-240	16.355%	1.91E+02	3.19E+01	2.54E+02	8.40E-04	1.41E-04	1.12E-03	M, C
Pu-242	0.670%	3.54E-01	5.21E-02	4.58E-01	8.93E-05	1.32E-05	1.16E-04	I
Np-237		2.42E-04	1.08E-04	4.59E-04	3.45E-07	1.54E-07	6.53E-07	M
Am-241	0.303%	1.39E+02	1.58E+01	1.70E+02	4.04E-05	4.61E-06	4.96E-05	M, C
Other TRU								
U-235								
U-238								
Pu-241	1.404%	2.54E+03	3.75E+02	3.29E+03	2.45E-05	3.63E-06	3.18E-05	M, C
Other								
Other								
Other								

Total Pu, g**	1.333E-02
Total Uncertainty, g***	1.967E-03
Upper Limit, g Pu****	1.726E-02

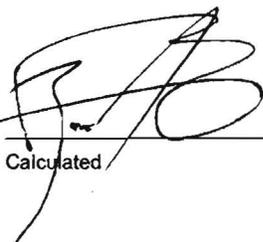
Total TRU Activity, uCi	1.06E+03
Total Uncertainty, uCi***	1.37E+02
Upper Limit, uCi****	1.34E+03

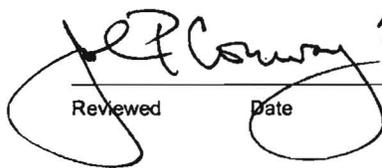
TRU Specific Activity, nCi/g	7.34E+03
Total Uncertainty, nCi/g***	9.47E+02
Upper Limit, nCi/g****	9.23E+03

Total Activity (TRU + non-TRU), uCi	3.60E+03
Total Uncertainty, uCi***	4.76E+02
Upper Limit, uCi****	4.55E+03

\* Codes: M = Activity directly measured by ISOCS.  
 I = Activity inferred from ISOCS measured Pu-239 and mass fraction using identified isotopic source.  
 C = Mass fraction calculated from measured ISOCS value and total plutonium.

\*\* Based on Pu-239 and mass fraction of Pu-239.  
 \*\*\* Uncertainties stated at 1 standard deviation.  
 \*\*\*\* The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

  
 Calculated 7/29/10  
 Date

  
 Reviewed 7/29/10  
 Date

**ISOCS Item Report**

Item ID:	B24288 (S14)
Date Assayed:	7/21/10
Item Mass, kg:	0.14
Isotopic Source:	HNF-15500 (DSA)

Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrntny (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrntny (g)	Upper Limit (g)	Codes
Pu-238	0.210%	1.84E+03	2.71E+02	2.38E+03	1.07E-04	1.58E-05	1.39E-04	I
Pu-239	81.361%	2.58E+03	2.80E+02	3.14E+03	4.16E-02	4.51E-03	5.06E-02	M
Pu-240	16.355%	1.90E+03	2.80E+02	2.46E+03	8.38E-03	1.23E-03	1.08E-02	I
Pu-242	0.670%	1.36E+00	2.00E-01	1.76E+00	3.43E-04	5.05E-05	4.44E-04	I
Np-237								
Am-241	2.470%	4.33E+03	6.43E+02	5.62E+03	1.26E-03	1.87E-04	1.64E-03	I
Other TRU								
U-235								
U-238								
Pu-241	1.404%	7.42E+04	1.09E+04	9.60E+04	7.18E-04	1.06E-04	9.29E-04	I
Other								
Other								
Other								

Total Pu, g**	5.113E-02
Total Uncertainty, g***	7.542E-03
Upper Limit, g Pu****	6.621E-02

Total TRU Activity, uCi	1.07E+04
Total Uncertainty, uCi***	1.30E+03
Upper Limit, uCi****	1.32E+04

TRU Specific Activity, nCi/g	7.50E+04
Total Uncertainty, nCi/g***	9.14E+03
Upper Limit, nCi/g****	9.32E+04

Total Activity (TRU + non-TRU), uCi	8.48E+04
Total Uncertainty, uCi***	1.19E+04
Upper Limit, uCi****	1.09E+05

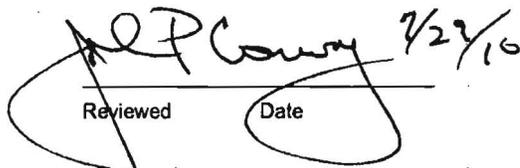
\* Codes: M = Activity directly measured by ISOCS.  
 I = Activity inferred from ISOCS measured Pu-239 and mass fraction using identified isotopic source.  
 C = Mass fraction calculated from measured ISOCS value and total plutonium.

\*\* Based on Pu-239 and mass fraction of Pu-239.

\*\*\* Uncertainties stated at 1 standard deviation.

\*\*\*\* The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

  
 Calculated \_\_\_\_\_ Date 7/24/10

  
 Reviewed \_\_\_\_\_ Date 7/27/10



ATL	<b>SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST</b>	LO-090-101 Rev <u>EC.0</u>
-----	---	----------------------------

Date Samples Received: 8.23.10 Group #: 20100688  
 Number of Samples: 15  
 Sample Custodian: et Hood

**Sample Custodian to Complete:**

Action	OK? (Y/N)	N/A	Comments
RSA/ <del>COC</del> provided?	✓		
RSR provided?	✓		
Verify GKI is complete		✓	<u>on file</u>
Check that outer custody seal is intact, if present	✓		
Record cooler temperature in centigrade, as appropriate		✓	<input checked="" type="checkbox"/> Check if no cooler and/or no ice
Samples are intact and in good condition	✓		If No, provide comments on back
Verify that COC or RSA is accurate 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	✓		
• 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 PM immediately if any problems are noted. (A "No" answer requires Project Manager resolution.)

**PM to Complete:**

Samples acceptable for release? Yes PM Initials RWB Date 8/30/2010

If No, comment on communication and resolution:

Other Comments:

<b>CH2M Hill Plateau Remediation Company</b>		<b>COLLECTOR</b> KB Hulse CHPRC		<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> S8; RM 144; Hood 3; Waste from Hood 1		<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid			<b>SAF NO.</b> F10-069		<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>		<b>FIELD LOGBOOK NO.</b> HNF-N-507-14.35	<b>ACTUAL SAMPLE DEPTH</b> N/A		<b>COA</b> 301891ES10		<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations		<b>OFFSITE PROPERTY NO.</b> N/A			<b>BILL OF LADING/AIR BILL NO.</b> N/A			

<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b> Cooling none none																		
		<b>TYPE OF CONTAINER</b> aG																		
		<b>NO. OF CONTAINER(S)</b> 1																		
		<b>VOLUME</b> 125mL																		
		<b>SPECIAL HANDLING AND/OR STORAGE</b>	<b>SAMPLE ANALYSIS</b> SEE ITEM (1) IN SPECIAL INSTRUCTIONS																	

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME																
B24283	OTHER LIQUID	JUL 19 2010	1340	X															

<b>CHAIN OF POSSESSION</b>				<b>SIGN/ PRINT NAMES</b>				<b>SPECIAL INSTRUCTIONS</b>			
RELINQUISHED BY/REMOVED FROM KB Hulse CHPRC	DATE/TIME JUL 19 2010 1530	RECEIVED BY/STORED IN Kowilson/Kow	DATE/TIME JUL 19 2010 1530	SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS							
RELINQUISHED BY/REMOVED FROM Kowilson/Kow	DATE/TIME 8/23/10 9:15	RECEIVED BY/STORED IN MARVIN HUCK	DATE/TIME 8-23-10 9:15								
RELINQUISHED BY/REMOVED FROM MARVIN HUCK	DATE/TIME 8-23-10 10:10	RECEIVED BY/STORED IN R. STEELS	DATE/TIME 8.23.10 1010								
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								

ORIGINAL

GRPE 20100688  
SAM# 510M000388

<b>LABORATORY SECTION</b>	<b>RECEIVED BY</b>	<b>TITLE</b>	<b>DATE/TIME</b>
<b>FINAL SAMPLE DISPOSITION</b>	<b>DISPOSAL METHOD</b>	<b>DISPOSED BY</b>	<b>DATE/TIME</b>

CH2MHill Plateau Remediation Company		COMPANY CONTACT WIDRIG, DL		TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND
COLLECTOR KB Hulse CHPRC	PROJECT DESIGNATION PPF A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY <input type="checkbox"/>		45 Days / 45 Days	
SAMPLING LOCATION S8; RM 144; Hood 3; Waste from Hood 1		FIELD LOGBOOK NO. HNF -N-507-14 35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE		
ICE CHEST NO.		OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A			
SHIPPED TO 222-S Lab Operations							

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
- \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
- \*\* ~~TPH~~ Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC). *6/28/10*
- \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).
- \*\* ~~222-S laboratory shall perform Differential Scanning Colorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ *6/28/10*
- \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *6/28/10*
- (1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range WTPH-B (Total petroleum hydrocarbons - kerosene range) 6020\_METALS\_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}~~



<b>CH2M Hill Plateau Remediation Company</b>		<b>COLLECTOR</b> KB Hulse CHPRC	<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> S15; RM 144; Hood 5; A0086 (Liquid Rm 155)		<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid			<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>		<b>FIELD LOGBOOK NO.</b> INF-N-507-14.35	<b>ACTUAL SAMPLE DEPTH</b> N/A		<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations		<b>OFFSITE PROPERTY NO.</b> N/A			<b>BILL OF LADING/AIR BILL NO.</b> N/A		

<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b> Cooler/C None	<del>           on 7/28/10            on 7/28/10            bb 7/19/10         </del>					
		<b>TYPE OF CONTAINER</b> aG						
		<b>NO. OF CONTAINER(S)</b> 1						
		<b>VOLUME</b> 125mL						
		<b>SPECIAL HANDLING AND/OR STORAGE</b>						
<b>SAMPLE ANALYSIS</b>		SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CA)					

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME						
B24289	(S15)	JUL 19 2010	1020	X	<del>bb 7/19/10</del>				
					<del>bb 7/19/10</del>				

<b>CHAIN OF POSSESSION</b>		<b>SIGN/ PRINT NAMES</b>		<b>SPECIAL INSTRUCTIONS</b>	
RELINQUISHED BY/REMOVED FROM KB Hulse CHPRC	DATE/TIME JUL 19 2010	RECEIVED BY/STORED IN K Wilson / Kain	DATE/TIME JUL 19 2010	SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM K Wilson / Kain	DATE/TIME 8/23/10	RECEIVED BY/STORED IN MARVON HUCK	DATE/TIME 8-23-10 9:15	GRP# 20100688 SAM# 510M000391 	
RELINQUISHED BY/REMOVED FROM MARVON HUCK	DATE/TIME 8-23-10 10:10	RECEIVED BY/STORED IN R. Steele	DATE/TIME 8-23-10 10:10		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		

<b>LABORATORY SECTION</b>	<b>RECEIVED BY</b>	<b>TITLE</b>	<b>DATE/TIME</b>
<b>FINAL SAMPLE DISPOSITION</b>	<b>DISPOSAL METHOD</b>	<b>DISPOSED BY</b>	<b>DATE/TIME</b>

<b>CH2M Hill Plateau Remediation Company</b>		<b>COMPANY CONTACT</b> WIDRIG, DL		<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>COLLECTOR</b> KB Hulse CHPRC	<b>SAMPLING LOCATION</b> S15; RM 144; Hood 5; A0086 (Liquid Rm 155)	<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>		
<b>ICE CHEST NO.</b>	<b>FIELD LOGBOOK NO.</b> HNF-N-507-14.35	<b>ACTUAL SAMPLE DEPTH</b> N/A	<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE			
<b>SHIPPED TO</b> 222-S Lab Operations	<b>OFFSITE PROPERTY NO.</b> N/A	<b>BILL OF LADING/AIR BILL NO.</b> N/A					

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
- \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
- \*\* ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ *on 6/28/10*
- \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).
- \*\* ~~222-S laboratory shall perform Differential Scanning Colorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ *on 6/28/10*
- \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *on 6/28/10*
- (1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range) - 6020 METALS\_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}~~

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ORIGINAL

<b>CH2MHill Plateau Remediation Company</b>		<b>COLLECTOR</b> KB Hulse CHPRC	<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> S29; RM 144; Hood 9; Red Std Pu 150 0901		<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid			<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>		<b>FIELD LOGBOOK NO.</b> HNF-N-507-14.35	<b>ACTUAL SAMPLE DEPTH</b> N/A		<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations		<b>OFFSITE PROPERTY NO.</b> N/A			<b>BILL OF LADING/AIR BILL NO.</b> N/A		

<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b> Cool-4C None	None	<del>bb 7/19/10</del>	
		<b>TYPE OF CONTAINER</b>	aG		P
		<b>NO. OF CONTAINER(S)</b>	1		1
		<b>VOLUME</b>	125mL		60mL
		<b>SPECIAL HANDLING AND/OR STORAGE</b>	<b>SAMPLE ANALYSIS</b>		SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B24297 (S29)	OTHER LIQUID	JUL 19 2010	1435	X
<del>bb 7/19/10</del>				

<b>CHAIN OF POSSESSION</b>		<b>SIGN/ PRINT NAMES</b>		<b>SPECIAL INSTRUCTIONS</b>	
RELINQUISHED BY/REMOVED FROM KB Hulse CHPRC	DATE/TIME JUL 19 2010 5:30	RECEIVED BY/STORED IN Kowilson/Kan	DATE/TIME JUL 19 2010 5:30	SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM Kan	DATE/TIME 8/28/10 9:15	RECEIVED BY/STORED IN MARVIN HUCK Thi Han	DATE/TIME 8-23-10 9:15	GRP# 20100688 SAM# S10M000394  	
RELINQUISHED BY/REMOVED FROM MARVIN HUCK Thi Han	DATE/TIME 8-23-10 10:30	RECEIVED BY/STORED IN elita etstele	DATE/TIME 8-23-10 10:10		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		

<b>LABORATORY SECTION</b>	RECEIVED BY	TITLE	DATE/TIME
<b>FINAL SAMPLE DISPOSITION</b>	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

<b>CH2MHill Plateau Remediation Company</b>		<b>COMPANY CONTACT</b> WIDRIG, DL		<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>COLLECTOR</b> KB Hulse CHPRC	<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid			<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>		
<b>SAMPLING LOCATION</b> S29; RM 144; Hood 9; Red Std Pu 150 0901	<b>FIELD LOGBOOK NO.</b> HNF -N-507-14.35	<b>ACTUAL SAMPLE DEPTH</b> N/A	<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE			
<b>ICE CHEST NO.</b>	<b>OFFSITE PROPERTY NO.</b> N/A	<b>BILL OF LADING/AIR BILL NO.</b> N/A					
<b>SHIPPED TO</b> 222-S Lab Operations							

**SPECIAL INSTRUCTIONS**

\*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

\*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

\*\* ~~TPH~~ Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC). *Per 6/28/10*

\*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

\*\* ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ *Per 6/28/10*

\*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *Per 6/28/10*  
 (1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi-VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range WTPH-D (Total petroleum hydrocarbons - kerosene range) 6020\_METALS\_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}~~

 ORIGINAL

<b>CH2MHill Plateau Remediation Company</b>		<b>COLLECTOR</b> KB Huise CHPRC		<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> S2; RM 144; Hood 1; Sample HIAC		<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid			<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>		
<b>ICE CHEST NO.</b>		<b>FIELD LOGBOOK NO.</b> HNF -N-507-14.35	<b>ACTUAL SAMPLE DEPTH</b> N/A		<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE		
<b>SHIPPED TO</b> 222-S Lab Operations		<b>OFFSITE PROPERTY NO.</b> N/A			<b>BILL OF LADING/AIR BILL NO.</b> N/A			

<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b>	None	<del>         Cool to None in 6/28/10          on 6/28/10       </del>
		<b>TYPE OF CONTAINER</b>	aG	
		<b>NO. OF CONTAINER(S)</b>	1	
		<b>VOLUME</b>	125mL	
		<b>SPECIAL HANDLING AND/OR STORAGE</b>		
<b>SAMPLE ANALYSIS</b>		SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)	

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B24279 (S2)	OTHER LIQUID	7-13-10	1020	X

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Huise CHPRC	1315 JUL 13 2010	Kowilson	1315 JUL 13 2010
Kowilson / Kowilson	8/18/10 2:31	RESTEGE Ryan Steg	8-18-10 2:37
RESTEGE Ryan Steg	8-23-10 9:15	MARVIN HUCK	8-23-10 9:15
MARVIN HUCK	8-23-10 10:10	RESTEGE Ryan Steg	8-23-10 10:10

**SPECIAL INSTRUCTIONS**  
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

Exp# 20100688  
S.A.M.# 510M000395

**ORIGINAL**

<b>LABORATORY SECTION</b>	<b>RECEIVED BY</b>	<b>TITLE</b>	<b>DATE/TIME</b>
<b>FINAL SAMPLE DISPOSITION</b>	<b>DISPOSAL METHOD</b>	<b>DISPOSED BY</b>	<b>DATE/TIME</b>

<b>CH2MHill Plateau Remediation Company</b>		<b>COMPANY CONTACT</b> WIDRIG, DL		<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>COLLECTOR</b> KB Hulse CHPRC	<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069		<b>AIR QUALITY</b> <input type="checkbox"/>		
<b>SAMPLING LOCATION</b> S2; RM 144; Hood 1; Sample HIAC		<b>FIELD LOGBOOK NO.</b> HNF-N-507-14-35	<b>ACTUAL SAMPLE DEPTH</b> N/A		<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>ICE CHEST NO.</b>		<b>OFFSITE PROPERTY NO.</b> N/A		<b>BILL OF LADING/AIR BILL NO.</b> N/A			
<b>SHIPPED TO</b> 222-S Lab Operations							

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
  - \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
  - \*\* ~~TPH~~ Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC). *B- 6/28/10*
  - \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).
  - \*\* ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ *B- 6/28/10*
  - \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *B- 6/28/10*
- (1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi-VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range) 6020\_METALS\_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}~~



<b>CH2MHill Plateau Remediation Company</b>		<b>COMPANY CONTACT</b> WIDRIG, DL		<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>COLLECTOR</b> KB Hulse CHPRC		<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>		
<b>SAMPLING LOCATION</b> S13; RM 144; Hood 4; HCL		<b>FIELD LOGBOOK NO.</b> HNF-N507-14.35		<b>ACTUAL SAMPLE DEPTH</b> N/A	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE		
<b>ICE CHEST NO.</b>		<b>OFFSITE PROPERTY NO.</b> N/A		<b>BILL OF LADING/AIR BILL NO.</b> N/A			
<b>SHIPPED TO</b> 222-S Lab Operations		<b>PRELIMINARY ANALYSIS</b> None					

<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b> Cooler None	None	<b>SPECIAL HANDLING AND/OR STORAGE</b>	<b>SAMPLE ANALYSIS</b> SEE ITEM (1) IN SPECIAL INSTRUCTIONS Generic Testing (No CAS)	
		<b>TYPE OF CONTAINER</b>	aG			P
		<b>NO. OF CONTAINER(S)</b>	1			1
		<b>VOLUME</b>	125mL			60mL

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B24287 (513)	OTHER LIQUID	JUL 19 2010	1355	X

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM KB Hulse CHPRC	DATE/TIME JUL 19 2010 1530	RECEIVED BY/STORED IN Kowilson/Kwan JUL 19 2010 1530
RELINQUISHED BY/REMOVED FROM Kowilson/Kwan	DATE/TIME 8/18/10 2:37	RECEIVED BY/STORED IN RESTEGGE 8-18-10 2:37
RELINQUISHED BY/REMOVED FROM RESTEGGE	DATE/TIME 8-23-10 9:15	RECEIVED BY/STORED IN MARLON HICK 8-23-10 9:15
RELINQUISHED BY/REMOVED FROM MARLON HICK	DATE/TIME 8-23-10 10:10	RECEIVED BY/STORED IN RESTEGGE 8-23-10 10:10
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN

GRP # 20100687  
SAM # 510M00396

ORIGINAL

<b>LABORATORY SECTION</b>	<b>RECEIVED BY</b>	<b>TITLE</b>	<b>DATE/TIME</b>
<b>FINAL SAMPLE DISPOSITION</b>	<b>DISPOSAL METHOD</b>	<b>DISPOSED BY</b>	<b>DATE/TIME</b>

<b>COLLECTOR</b> KB Hulse CHPRC	<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> S13; RM 144; Hood 4; HCL	<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>	<b>FIELD LOGBOOK NO.</b> HNF-N-507-14.35	<b>ACTUAL SAMPLE DEPTH</b> N/A	<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations	<b>OFFSITE PROPERTY NO.</b> N/A		<b>BILL OF LADING/AIR BILL NO.</b> N/A		

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
- \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
- \*\* ~~TPH~~ Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC). *Am 6/28/10*
- \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11). *Am 6/28/10*
- \*\* ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~
- \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *Am 6/28/10*
- (1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range WTPH D (Total petroleum hydrocarbons - kerosene range) 6020\_METALS\_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240; Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}~~



ORIGINAL

<b>CH2MHill Plateau Remediation Company</b>		<b>COLLECTOR</b> KB Hulse CHPRC	<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> S19; RM 144; Hood 9; Acid from 143		<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid			<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>		<b>FIELD LOGBOOK NO.</b> HNF-N-507-14.35	<b>ACTUAL SAMPLE DEPTH</b> N/A		<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations		<b>OFFSITE PROPERTY NO.</b> N/A			<b>BILL OF LADING/AIR BILL NO.</b> N/A		

<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b> None	<b>TYPE OF CONTAINER</b> aG	<b>NO. OF CONTAINER(S)</b> 1	<b>VOLUME</b> 125mL	<b>SAMPLE ANALYSIS</b> SEE ITEM (1) IN SPECIAL INSTRUCTIONS		

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B24292 (519)	OTHER LIQUID	7-13-10	1011	X

RELINQUISHED BY / REMOVED FROM	DATE/TIME	RECEIVED BY / STORED IN	DATE/TIME
KB Hulse / CHPRC	7/13/2010	Kowilson / Kowilson	JUL 13 2010
Kowilson / Kowilson	8/18/10 2:37	RESTARGE	8-18-10 2:37
RESTARGE / Marvyn Huck	8-23-10 9:15	MARVYN HUCK	8-23-10
MARVYN HUCK / Marvyn Huck	8-23-10 10:10	RESTARGE	8-23-10 1010

**SPECIAL INSTRUCTIONS**  
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP# 20100688  
SAM# 510M000397

ORIGINAL

<b>LABORATORY SECTION</b>	<b>RECEIVED BY</b>	<b>TITLE</b>	<b>DATE/TIME</b>
<b>FINAL SAMPLE DISPOSITION</b>	<b>DISPOSAL METHOD</b>	<b>DISPOSED BY</b>	<b>DATE/TIME</b>

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY / SAMPLE ANALYSIS REQUEST		F10-069-015	PAGE 2 OF 2
COLLECTOR KB Hulse CHPRC	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION S19; RM 144; Hood 9; Acid from 143	PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY <input type="checkbox"/>	
ICE CHEST NO.	FIELD LOGBOOK NO. HNF -N-507- <u>1435</u>	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A	BILL OF LADING/AIR BILL NO. N/A			

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
- \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
- \*\* ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ *Per 6/28/10*
- \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).
- \*\* ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ *6/28/10*
- \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *6/28/10*
- (1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH D (Total petroleum hydrocarbons - kerosene range) 6020\_METALS\_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}~~



ORIGINAL

<b>COLLECTOR</b> KB Hulse CHPRC		<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> S20; RM 144; Hood 9; HNO3, H2SO4, Hydro carbonic		<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>		<b>FIELD LOGBOOK NO.</b> HNF-N-507-14-35	<b>ACTUAL SAMPLE DEPTH</b> N/A	<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations		<b>OFFSITE PROPERTY NO.</b> N/A		<b>BILL OF LADING/AIR BILL NO.</b> N/A		

<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b> Cool-4C None																					
		<b>TYPE OF CONTAINER</b>	aG	P																			
		<b>NO. OF CONTAINER(S)</b>	1	1																			
		<b>VOLUME</b>	125mL	60mL																			
		<b>SPECIAL HANDLING AND/OR STORAGE</b>		<b>SAMPLE ANALYSIS</b>	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)																	

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B24293 (S20)	OTHER LIQUID	7-13-10	1022	X

<b>CHAIN OF POSSESSION</b>		<b>SIGN/ PRINT NAMES</b>		<b>SPECIAL INSTRUCTIONS</b>	
RECEIVED BY/REMOVED FROM CHPRC	DATE/TIME JUL 13 2010	RECEIVED BY/STORED IN Kovilson	DATE/TIME JUL 13 2010	SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM Kovilson	DATE/TIME 8/18/10 2:37	RECEIVED BY/STORED IN RESTEGE	DATE/TIME 9-18-10 2:37	GRP # 20100688	
RELINQUISHED BY/REMOVED FROM RESTEGE	DATE/TIME 8/23/10 9:15	RECEIVED BY/STORED IN MARVEN HUCK	DATE/TIME 8-23-10 9:15	SAM # 510M000398	
RELINQUISHED BY/REMOVED FROM MARVEN HUCK	DATE/TIME 8-23-10 10:10	RECEIVED BY/STORED IN RESTEGE	DATE/TIME 8-23-10 1010	ORIGINAL	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		

<b>LABORATORY SECTION</b>	<b>RECEIVED BY</b>	<b>TITLE</b>	<b>DATE/TIME</b>
<b>FINAL SAMPLE DISPOSITION</b>	<b>DISPOSAL METHOD</b>	<b>DISPOSED BY</b>	<b>DATE/TIME</b>

<b>CH2M Hill Plateau Remediation Company</b>		<b>COMPANY CONTACT</b> WIDRIG, DL		<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>COLLECTOR</b> KB Hulse CHPRC	<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069		<b>AIR QUALITY</b> <input type="checkbox"/>		
<b>SAMPLING LOCATION</b> S20; RM 144; Hood 9; HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , Hydro carbonic		<b>FIELD LOGBOOK NO.</b> HNF-N-507-1435	<b>ACTUAL SAMPLE DEPTH</b> N/A		<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>ICE CHEST NO.</b>		<b>OFFSITE PROPERTY NO.</b> N/A		<b>BILL OF LADING/AIR BILL NO.</b> N/A			
<b>SHIPPED TO</b> 222-S Lab Operations							

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
  - \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
  - \*\* ~~TPH - Kerosene shall be analyzed if SVOA-TICs indicate the presence of Contaminant of Concern (COC).~~ *on 6/28/10*
  - \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).
  - \*\* ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ *on 6/28/10*
  - \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *on 6/28/10*
- (1) ~~VQA - 8260B - COMPLETE (Carbon tetrachloride) Semi-VQA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range) 6020\_METALS\_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}~~

 ORIGINAL

CH2M Hill Plateau Remediation Company		COMPANY CONTACT WIDRIG, DL		TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND 45 Days / 45 Days
COLLECTOR KB Huise CHPRC	SAMPLING LOCATION S23; RM 144; Hood 9; Possible acid		PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY <input type="checkbox"/>	
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-507-14.35	ACTUAL SAMPLE DEPTH N/A		COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE		
SHIPPED TO 222-S Lab Operations		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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b> Coolant C None						
		<b>TYPE OF CONTAINER</b> aG	P					
		<b>NO. OF CONTAINER(S)</b> 1	1					
		<b>VOLUME</b> 125mL	60mL					
<b>SPECIAL HANDLING AND/OR STORAGE</b>		<b>SAMPLE ANALYSIS</b>	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)				

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B24294 (523)	OTHER LIQUID	7-13-10	1015	X

<b>CHAIN OF POSSESSION</b>		<b>SIGN/ PRINT NAMES</b>		<b>SPECIAL INSTRUCTIONS</b>	
RELINQUISHED BY/REMOVED FROM CHPRC KB Huise	DATE/TIME 1315 JUL 13 2010	RECEIVED BY/STORED IN Kovilson / kovilson	DATE/TIME 1315 JUL 13 2010	SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM Kovilson / kovilson	DATE/TIME 8/18/10 2:57	RECEIVED BY/STORED IN RSTEEG / Ryan Steeg	DATE/TIME 8-18-10 2:37	GRP# 20100688 SAM# 510M000399  	
RELINQUISHED BY/REMOVED FROM RSTEEG / Ryan Steeg	DATE/TIME 8-23-10 7:15	RECEIVED BY/STORED IN MAYEN HUCK / M. Huck	DATE/TIME 8-23-10 9:15		
RELINQUISHED BY/REMOVED FROM MAYEN HUCK / M. Huck	DATE/TIME 8-23-10 10:10	RECEIVED BY/STORED IN RSTEEG / RSTEEG	DATE/TIME 8-23-10 10:10		
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

<b>CH2M Hill Plateau Remediation Company</b>		<b>COMPANY CONTACT</b> WIDRIG, DL		<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>COLLECTOR</b> KB Hulse CHPRC	<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069		<b>AIR QUALITY</b> <input type="checkbox"/>		
<b>SAMPLING LOCATION</b> S23; RM 144; Hood 9; Possible acid		<b>FIELD LOGBOOK NO.</b> HNF-N-507-14-35	<b>ACTUAL SAMPLE DEPTH</b> N/A	<b>COA</b> 301891ES10		<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>ICE CHEST NO.</b>		<b>OFFSITE PROPERTY NO.</b> N/A		<b>BILL OF LADING/AIR BILL NO.</b> N/A			
<b>SHIPPED TO</b> 222-S Lab Operations							

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
  - \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
  - \*\* TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC). *Ac 6/28/10*
  - \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).
  - \*\* ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ *Ac 6/28/10*
  - \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *Ac 6/28/10*
- (1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi-VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range WTPH-D (Total petroleum hydrocarbons - kerosene range) 6020\_METALS\_ICPMS (TAL) (Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium) ICP Metals - 6010B (TAL) (Sodium, Aluminum, Potassium, Zinc) Actinides ICPMS (Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242) Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 (Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate) Gamma Spectroscopy (Cesium-137, Cobalt-60) Gross Alpha (Gross alpha) Gross Beta (Gross beta) Isotopic Plutonium (Plutonium-239/240, Plutonium-238) Strontium-89,90 -- Sr-90; Americium-241 (Americium-241)~~


**ORIGINAL**

<b>CH2MHill Plateau Remediation Company</b>		<b>COLLECTOR</b> KB Hulse CHPRC	<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> S24; RM 144; Hood 9; Possible Acid		<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid			<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>		<b>FIELD LOGBOOK NO.</b> HNF-N-507-14.35	<b>ACTUAL SAMPLE DEPTH</b> N/A		<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations		<b>OFFSITE PROPERTY NO.</b> N/A			<b>BILL OF LADING/AIR BILL NO.</b> N/A		

<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b> Cooling None																			
		<b>TYPE OF CONTAINER</b>	aG	P																	
		<b>NO. OF CONTAINER(S)</b>	1	1																	
		<b>VOLUME</b>	125mL	60mL																	
		<b>SPECIAL HANDLING AND/OR STORAGE</b>		<b>SAMPLE ANALYSIS</b>	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)															

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME																
B24295 (S24)	OTHER LIQUID	7-13-10	1045	X															

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse CHPRC	JUL 13 2010	KAW / Kowilson	JUL 13 2010
KAW / Kowilson	8/18/10 2:57	RESEREGE	8-18-10 2:37
RESEREGE	8-23-10 9:15	MARVEN HUCK	8-23-10 9:15
MARVEN HUCK	8-23-10 10:10	RESEREGE	8-23-10 10:10

**SPECIAL INSTRUCTIONS**  
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP# 20100688  
SAM# S10M000400

**ORIGINAL**

<b>LABORATORY SECTION</b>	<b>RECEIVED BY</b>	<b>TITLE</b>	<b>DATE/TIME</b>
<b>FINAL SAMPLE DISPOSITION</b>	<b>DISPOSAL METHOD</b>	<b>DISPOSED BY</b>	<b>DATE/TIME</b>

<b>COLLECTOR</b> KB Hulse CHPRC	<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> S24; RM 144; Hood 9; Possible Acid	<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>	<b>FIELD LOGBOOK NO.</b> HNF-N-507-14.35	<b>ACTUAL SAMPLE DEPTH</b> N/A	<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations	<b>OFFSITE PROPERTY NO.</b> N/A	<b>BILL OF LADING/AIR BILL NO.</b> N/A			

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
  - \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
  - \*\* ~~TPH~~ - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC). - *An 6/28/10*
  - \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).
  - \*\* ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ *An 6/28/10*
  - \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *An 6/28/10*
- (1) ~~VGA-8260B-COMplete (Carbon tetrachloride) Semi-VOA-8270B-COMplete (Tributyl phosphate) TPH-Diesel Range WTPH-D (Total petroleum hydrocarbons - kerosene range) 6020\_METALS\_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}~~



<b>CH2M Hill Plateau Remediation Company</b>		<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>COLLECTOR</b> KB Hulse CHPRC	<b>SAMPLING LOCATION</b> S27; RM 144; Hood 9; Unknown	<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>	<b>FIELD LOGBOOK NO.</b> HNF-N-507-14.35	<b>ACTUAL SAMPLE DEPTH</b> N/A		<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations		<b>OFFSITE PROPERTY NO.</b> N/A		<b>BILL OF LADING/AIR BILL NO.</b> N/A		

<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b> Cooler/C None None									
		<b>TYPE OF CONTAINER</b> aG	P								
		<b>NO. OF CONTAINER(S)</b> 1	1								
		<b>VOLUME</b> 125mL	60mL								
<b>SPECIAL HANDLING AND/OR STORAGE</b>		<b>SAMPLE ANALYSIS</b> SEE ITEM (1) IN SPECIAL INSTRUCTIONS Generic Testing (No CAS)									

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME							
B24296 (S 27)	OTHER LIQUID	7-13-10	1026	X						
<i>bb 7/13/10</i>										

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse CHPRC	7-13-10 13:15	KW Wilson	JUL 13 2010
KW Wilson / KW Wilson	8-19-10 2:37	RESTEGG Ryan Stagg	8-18-10 2:37
RESTEGG Ryan Stagg	8-23-10 9:15	MARVIN HUCK	8-23-10 9:15
MARVIN HUCK	8-23-10 10:10	R. Deval RESTEGG	8-23-10 10:10

**SPECIAL INSTRUCTIONS**  
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP # 20100688  
SAM # 510M000401

**ORIGINAL**

<b>LABORATORY SECTION</b>	<b>RECEIVED BY</b>	<b>TITLE</b>	<b>DATE/TIME</b>
<b>FINAL SAMPLE DISPOSITION</b>	<b>DISPOSAL METHOD</b>	<b>DISPOSED BY</b>	<b>DATE/TIME</b>

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F10-069-019	PAGE 2 OF 2
COLLECTOR KB Hulse CHPRC	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION S27; RM 144; Hood 9; Unknown	PROJECT DESIGNATION PPF A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY <input type="checkbox"/>	
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-507-14-35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A	BILL OF LADING/AIR BILL NO. N/A			

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
- \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
- \*\* ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ *As 6/28/10*
- \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).
- \*\* ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ *As 6/28/10*
- \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *As 6/28/10*
- (1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range) 6020\_METALS\_ICPMS (TAL) (Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium) ICP Metals - 6010B (TAL) (Sodium, Aluminum, Potassium, Zinc) Actinides ICPMS (Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242) Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 (Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate) Gamma Spectroscopy (Cesium-137, Cobalt-60) Gross Alpha (Gross alpha) Gross Beta (Gross beta) Isotopic Plutonium (Plutonium-239/240, Plutonium-238) Strontium-89,90 -- Sr-90; Americium-241 (Americium-241)~~



ORIGINAL

<b>CH2MHill Plateau Remediation Company</b>		<b>COLLECTOR</b> KB Hulse CHPRC	<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> D16; RM 144; Hood 9; HN03 Std		<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid			<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>		<b>FIELD LOGBOOK NO.</b> HNF-N-507-14.35	<b>ACTUAL SAMPLE DEPTH</b> N/A		<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations		<b>OFFSITE PROPERTY NO.</b> N/A			<b>BILL OF LADING/AIR BILL NO.</b> N/A		

<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b> Cool to 4C None																			
		<b>TYPE OF CONTAINER</b>	g	P																	
		<b>NO. OF CONTAINER(S)</b>	1	1																	
		<b>VOLUME</b>	125mL	60mL																	
		<b>SPECIAL HANDLING AND/OR STORAGE</b>		<b>SAMPLE ANALYSIS</b>	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Genetic Testing (No CAS)															

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME																
B24299 (016)	OTHER LIQUID	JUL 13 2010	1039	X															

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse CHPRC	JUL 13 2010	ICOM / Kowison	JUL 13 2010
Kowison / ICOM	8/18/10 2:37	RESTEGGS / Ryan Steggs	8-18-10 2:37
RESTEGGS / Ryan Steggs	8-23-10 9:15	MARNEN Huck / Marnen Huck	8-23-10 9:15
MARNEN Huck / Marnen Huck	8-23-10 10:10	Rt. Dept / Rt. Steggs	8.23.10 1010

**SPECIAL INSTRUCTIONS**  
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP# 20100688  
SAM# S10M000402

**ORIGINAL**

<b>LABORATORY SECTION</b>	<b>RECEIVED BY</b>	<b>TITLE</b>	<b>DATE/TIME</b>
<b>FINAL SAMPLE DISPOSITION</b>	<b>DISPOSAL METHOD</b>	<b>DISPOSED BY</b>	<b>DATE/TIME</b>

<b>CH2MHill Plateau Remediation Company</b>		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>		<b>F10-069-022</b>	<b>PAGE 2 OF 2</b>
<b>COLLECTOR</b> KB Hulse CHPRC	<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> D16; RM 144; Hood 9; HN03 Std	<b>PROJECT DESIGNATION</b> PPF A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>	<b>FIELD LOGBOOK NO.</b> HNF-N-507-14-35	<b>ACTUAL SAMPLE DEPTH</b> N/A	<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations	<b>OFFSITE PROPERTY NO.</b> N/A		<b>BILL OF LADING/AIR BILL NO.</b> N/A		

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
  - \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
  - \*\* TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC). *Pr 6/28/10*
  - \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).
  - \*\* 222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative. *Pr 6/28/10*
  - \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *Pr 6/28/10*
- (1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi-VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range) 6020 METALS ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}~~



<b>CH2MHill Plateau Remediation Company</b>		<b>COLLECTOR</b> KB Huise CHPRC	<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> S30; RM 144; Hood 1; HN03		<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid			<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>		<b>FIELD LOGBOOK NO.</b> HNF-N-507-1435	<b>ACTUAL SAMPLE DEPTH</b> N/A		<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations		<b>OFFSITE PROPERTY NO.</b> N/A			<b>BILL OF LADING/AIR BILL NO.</b> N/A		

<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b> Cooler None																			
		<b>TYPE OF CONTAINER</b> aG	P																		
		<b>NO. OF CONTAINER(S)</b> 1	1																		
		<b>VOLUME</b> 125mL	60mL																		
		<b>SPECIAL HANDLING AND/OR STORAGE</b>	<b>SAMPLE ANALYSIS</b> SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)																	

On 6/28/10

None

On 6/28/10

bb 7/13/10

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME																		
B242B1 (S30)	OTHER LIQUID	JUL 13 2010	1005	X																	

bb 7/13/10

bb 7/13/10

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	DATE/TIME	DATE/TIME
RELINQUISHED BY/REMOVED FROM KB Huise CHPRC	RECEIVED BY/STORED IN K Wilson	1315 JUL 13 2010	1315 JUL 13 2010
RELINQUISHED BY/REMOVED FROM K Wilson / K Wilson	RECEIVED BY/STORED IN R Steele / Ryan Stagg	8/18/10 2:35	8-18-10 2:37
RELINQUISHED BY/REMOVED FROM R Steele / Ryan Stagg	RECEIVED BY/STORED IN MARVIN HUCK / Thi Ann	8-23-10 9:15	8-23-10 9:15
RELINQUISHED BY/REMOVED FROM MARVIN HUCK / Thi Ann	RECEIVED BY/STORED IN R Steele	8-23-10 10:10	8-23-10 10:10
RELINQUISHED BY/REMOVED FROM	RECEIVED BY/STORED IN	DATE/TIME	DATE/TIME
RELINQUISHED BY/REMOVED FROM	RECEIVED BY/STORED IN	DATE/TIME	DATE/TIME

**SPECIAL INSTRUCTIONS**  
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP# 20100688  
SAM# S10M000403

**ORIG**

<b>LABORATORY SECTION</b>	RECEIVED BY	TITLE	DATE/TIME
<b>FINAL SAMPLE DISPOSITION</b>	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

<b>CH2MHill Plateau Remediation Company</b>		<b>COMPANY CONTACT</b> WIDRIG, DL		<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>COLLECTOR</b> KB Hulse CHPRC	<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069		<b>AIR QUALITY</b> <input type="checkbox"/>		
<b>SAMPLING LOCATION</b> S30; RM 144; Hood 1; HN03	<b>FIELD LOGBOOK NO.</b> HNF-N507-14-35	<b>ACTUAL SAMPLE DEPTH</b> N/A	<b>COA</b> 301891ES10		<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE		
<b>ICE CHEST NO.</b>	<b>OFFSITE PROPERTY NO.</b> N/A		<b>BILL OF LADING/AIR BILL NO.</b> N/A				
<b>SHIPPED TO</b> 222-S Lab Operations							

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
  - \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
  - \*\* ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ *Pr 6/28/10*
  - \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).
  - \*\* ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ *Pr 6/28/10*
  - \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *Pr 6/28/10*
- (1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi-VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range) 6020\_METALS\_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}~~



CH2MHill Plateau Remediation Company

F10-069-025

PAGE 1 OF 2

<b>COLLECTOR</b> KB Hulse CHPRC	<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> S31; RM 144; Hood 4; conc HN03	<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>	<b>FIELD LOGBOOK NO.</b> HNF-N-507-14.35	<b>ACTUAL SAMPLE DEPTH</b> N/A	<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations		<b>OFFSITE PROPERTY NO.</b> N/A	<b>BILL OF LADING/AIR BILL NO.</b> N/A		

<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b> Cool-4G None	None																		
		<b>TYPE OF CONTAINER</b>	aG	P																	
		<b>NO. OF CONTAINER(S)</b>	1	1	on 6/28/10																
		<b>VOLUME</b>	125mL	60mL																	
		<b>SPECIAL HANDLING AND/OR STORAGE</b>	<b>SAMPLE ANALYSIS</b>	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)																

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME																
B242B2 (531)	OTHER LIQUID	JUL 19 2010	1405	X															

RELINQUISHED BY / REMOVED FROM	DATE/TIME	RECEIVED BY / STORED IN	DATE/TIME
KB Hulse / CHPRC	JUL 19 2010 1530	Kowilson / Kow	JUL 19 2010 1530
Kowilson / Kowilson	8/18/10 2:37	RESTAGE / RESTAGE	8-18-10 2:37
RESTAGE / RESTAGE	8-23-10 9:15	MARVIN HUCK / MARVIN HUCK	8-23-10 9:15
MARVIN HUCK / MARVIN HUCK	8-23-10 10:10	RESTAGE / RESTAGE	8-23-10 10:10

**SPECIAL INSTRUCTIONS**  
 SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP # 20100688  
 SAM # S10M000409

ORIGINAL

<b>LABORATORY SECTION</b>	RECEIVED BY	TITLE	DATE/TIME
<b>FINAL SAMPLE DISPOSITION</b>	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

<b>CH2MHill Plateau Remediation Company</b>		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>		<b>F10-069-025</b>	<b>PAGE 2 OF 2</b>
<b>COLLECTOR</b> KB Hulse CHPRC	<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> S31; RM 144; Hood 4; conc HN03	<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>	<b>FIELD LOGBOOK NO.</b> HNF-N-507-14 35	<b>ACTUAL SAMPLE DEPTH</b> N/A	<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations	<b>OFFSITE PROPERTY NO.</b> N/A		<b>BILL OF LADING/AIR BILL NO.</b> N/A		

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
  - \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
  - \*\* TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC). *As 6/28/10*
  - \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).
  - \*\* 222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative. *As 6/28/10*
  - \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *As 6/28/10*
- (1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi-VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range) 6020\_METALS\_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}~~



<b>CH2MHill Plateau Remediation Company</b>		<b>COLLECTOR</b> KB Hulse CHPRC		<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> S33; RM 144; Hood 9; 2 vials HN03		<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid			<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>		
<b>ICE CHEST NO.</b>		<b>FIELD LOGBOOK NO.</b> HNF -N-507- <u>14.35</u>	<b>ACTUAL SAMPLE DEPTH</b> N/A		<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE		
<b>SHIPPED TO</b> 222-S Lab Operations		<b>OFFSITE PROPERTY NO.</b> N/A			<b>BILL OF LADING/AIR BILL NO.</b> N/A			

<b>MATRIX*</b> A=Air DL=Drum Liquids DS=Drum Solids L=Liquid Q=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b> Cooler None	<b>TYPE OF CONTAINER</b> aG	<b>NO. OF CONTAINER(S)</b> 1	<b>VOLUME</b> 125mL	<b>SAMPLE ANALYSIS</b> SEE ITEM (1) IN SPECIAL INSTRUCTIONS Generic Testing (No CAS)	
	<b>SPECIAL HANDLING AND/OR STORAGE</b>						

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B242B4 (S33)	OTHER LIQUID	JUL 13 2010	1032	✓

<b>CHAIN OF POSSESSION</b>	<b>SIGN/ PRINT NAMES</b>	<b>SPECIAL INSTRUCTIONS</b>
RELINQUISHED BY/REMOVED FROM KB Hulse CHPRC	1315 DATE/TIME JUL 13 2010	RECEIVED BY/STORED IN Kowilson DATE/TIME JUL 13 2010
RELINQUISHED BY/REMOVED FROM Kowilson/Kow	8/18/10 2:57 DATE/TIME	RECEIVED BY/STORED IN RESERVE TRANSFER 8-23-10 2:37 DATE/TIME
RELINQUISHED BY/REMOVED FROM RESERVE TRANSFER	8-23-10 9:15 DATE/TIME	RECEIVED BY/STORED IN MARVIN HUCK THE AM 8-23-10 9:15 DATE/TIME
RELINQUISHED BY/REMOVED FROM MARVIN HUCK THE AM	8-23-10 10:10 DATE/TIME	RECEIVED BY/STORED IN RITTED RTSTEELG 8-23-10 1010 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

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP# 20100688  
SAm# 510M000405

**ORIGINAL**

<b>LABORATORY SECTION</b>	<b>RECEIVED BY</b>	<b>TITLE</b>	<b>DATE/TIME</b>
<b>FINAL SAMPLE DISPOSITION</b>	<b>DISPOSAL METHOD</b>	<b>DISPOSED BY</b>	<b>DATE/TIME</b>

<b>CH2M Hill Plateau Remediation Company</b>		<b>COLLECTOR</b> KB Hulse CHPRC		<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> S33; RM 144; Hood 9; 2 vials HN03		<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid			<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>		
<b>ICE CHEST NO.</b>		<b>FIELD LOGBOOK NO.</b> HNF-N-507-14-35	<b>ACTUAL SAMPLE DEPTH</b> N/A		<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE		
<b>SHIPPED TO</b> 222-S Lab Operations		<b>OFFSITE PROPERTY NO.</b> N/A			<b>BILL OF LADING/AIR BILL NO.</b> N/A			

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
- \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
- \*\* ~~TPH~~ Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC). *Per 6/28/10*
- \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).
- \*\* ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ *Per 6/28/10*
- \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *Per 6/28/10*
- (1) ~~VOA-8260B-COMplete (Carbon tetrachloride) Semi-VOA-8270B-COMplete (Tributyl phosphate) TPH-Diesel Range-WTPH-D (Total petroleum hydrocarbons-kerosene range)~~ 6020\_METALS\_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}



**ORIGINAL**

<b>CH2MHill Plateau Remediation Company</b>		<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>COLLECTOR</b> KB Hulse CHPRC	<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid	<b>SAF NO.</b> F10-069		<b>AIR QUALITY</b> <input type="checkbox"/>		
<b>SAMPLING LOCATION</b> Contingency #3 <i>(533 B) on 8/13/10</i>	<b>FIELD LOGBOOK NO.</b> HW-1507-1435	<b>ACTUAL SAMPLE DEPTH</b> N/A	<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE		
<b>ICE CHEST NO.</b>	<b>OFFSITE PROPERTY NO.</b> N/A	<b>BILL OF LADING/AIR BILL NO.</b> N/A				

<b>SHIPPED TO</b> 222-S Lab Operations	<b>PRESERVATION</b> Coolant None	<b>TYPE OF CONTAINER</b> aG	<b>NO. OF CONTAINER(S)</b> 1	<b>VOLUME</b> 125ml	<b>SAMPLE ANALYSIS</b> SEE ITEM (1) IN SPECIAL INSTRUCTIONS Generic Testing (No CAS)
<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)				
<b>SPECIAL HANDLING AND/OR STORAGE</b>					

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B242B8	OTHER LIQUID	7/13/10	1032	X

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse CHPRC	1315 JUL 13 2010	KD Wilson 1315	JUL 13 2010
KD Wilson / CHPRC	8/18/10 2:37	RESTORGE 8-18-10 2:37	
RESTORGE	8-23-10 9:15	MARVEN RUCK 8-23-10 9:15	
MARVEN RUCK	8-23-10 10:10	RESTORGE 8-23-10 10:10	

**SPECIAL INSTRUCTIONS**  
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRPH 20100688  
SAM# 510M000406

**ORIGINAL**

<b>LABORATORY SECTION</b>	<b>RECEIVED BY</b>	<b>TITLE</b>	<b>DATE/TIME</b>
<b>FINAL SAMPLE DISPOSITION</b>	<b>DISPOSAL METHOD</b>	<b>DISPOSED BY</b>	<b>DATE/TIME</b>

<b>CH2MHill Plateau Remediation Company</b>		<b>COMPANY CONTACT</b> WIDRIG, DL		<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>COLLECTOR</b> KB Hulse CHPRC	<b>SAMPLING LOCATION</b> Contingency #3	<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>		
<b>ICE CHEST NO.</b>	<b>FIELD LOGBOOK NO.</b> HNF-N-507-14-35	<b>ACTUAL SAMPLE DEPTH</b> N/A	<b>COA</b> 301891ES10		<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE		
<b>SHIPPED TO</b> 222-S Lab Operations	<b>OFFSITE PROPERTY NO.</b> N/A		<b>BILL OF LADING/AIR BILL NO.</b> N/A				

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
- \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD-based on which ever methods or documents are applicable to radiochemistry analyses.
- \*\* ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ *Per 6/28/10*
- \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).
- \*\* ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ *Per 6/28/10*
- \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *Per 6/28/10*
- (1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi-VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range) 6020\_METALS\_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}~~



**ISOCS Item Report**

Item ID:	B24283 (S8)
Date Assayed:	7/26/10
Item Mass, kg:	0.12
Isotopic Source:	HNF-15500 (DSA)

Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrtny (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrtny (g)	Upper Limit (g)	Codes
Pu-238	0.210%	1.23E+00	1.81E-01	1.59E+00	7.18E-08	1.06E-08	9.30E-08	I
Pu-239	81.361%	1.73E+00	8.81E-01	3.49E+00	2.78E-05	1.42E-05	5.62E-05	M
Pu-240	16.355%	1.27E+00	1.87E-01	1.64E+00	5.59E-06	8.23E-07	7.24E-06	I
Pu-242	0.670%	9.07E-04	1.34E-04	1.17E-03	2.29E-07	3.37E-08	2.97E-07	I
Np-237								
Am-241	0.734%	8.61E-01	2.24E-01	1.31E+00	2.51E-07	6.52E-08	3.81E-07	M, C
Other TRU								
U-235		6.07E-03	6.69E-04	7.41E-03	2.81E-03	3.10E-04	3.43E-03	M
U-238								
Pu-241	1.404%	2.51E+01	4.31E+00	3.37E+01	2.43E-07	4.17E-08	3.26E-07	M, C
Other								
Other								
Other								

Total Pu, g**	3.418E-05
Total Uncertainty, g***	1.779E-05
Upper Limit, g Pu****	6.977E-05

Total TRU Activity, uCi	5.09E+00
Total Uncertainty, uCi***	1.07E+00
Upper Limit, uCi****	7.24E+00

TRU Specific Activity, nCi/g	4.42E+01
Total Uncertainty, nCi/g***	9.34E+00
Upper Limit, nCi/g****	6.29E+01

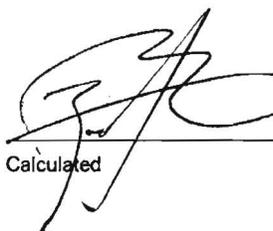
Total Activity (TRU + non-TRU), uCi	3.02E+01
Total Uncertainty, uCi***	4.79E+00
Upper Limit, uCi****	3.98E+01

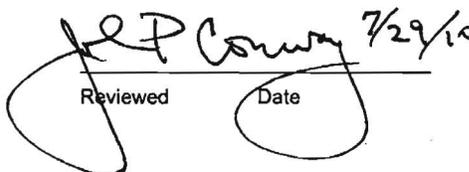
\* Codes: M = Activity directly measured by ISOCS.  
 I = Activity inferred from ISOCS measured Pu-239 and mass fraction using identified isotopic source.  
 C = Mass fraction calculated from measured ISOCS value and total plutonium.

\*\* Based on Pu-239 and mass fraction of Pu-239.

\*\*\* Uncertainties stated at 1 standard deviation.

\*\*\*\* The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

  
 Calculated 7/29/10  
 Date

  
 Reviewed 7/29/10  
 Date

**ISOCS Item Report**

Item ID:	B24289 (S15)
Date Assayed:	7/21/10
Item Mass, kg:	0.15
Isotopic Source:	HNF-15500 (DSA)

Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrtny (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrtny (g)	Upper Limit (g)	Codes
Pu-238	0.210%	2.64E+02	3.89E+01	3.42E+02	1.54E-05	2.27E-06	2.00E-05	I
Pu-239	81.361%	3.70E+02	4.03E+01	4.51E+02	5.97E-03	6.50E-04	7.27E-03	M
Pu-240	16.355%	2.72E+02	4.01E+01	3.53E+02	1.20E-03	1.77E-04	1.55E-03	I
Pu-242	0.670%	1.95E-01	2.87E-02	2.52E-01	4.92E-05	7.24E-06	6.37E-05	I
Np-237		9.22E-02	1.00E-02	1.12E-01	1.31E-04	1.42E-05	1.59E-04	M
Am-241	8.212%	2.07E+03	2.27E+02	2.52E+03	6.03E-04	6.63E-05	7.35E-04	M, C
Other TRU								
U-235		6.92E-03	7.87E-04	8.49E-03	3.20E-03	3.64E-04	3.93E-03	M
U-238								
Pu-241	1.404%	1.34E+03	2.03E+02	1.74E+03	1.29E-05	1.96E-06	1.68E-05	M, C
Other								
Other								
Other								

Total Pu, g**	7.337E-03
Total Uncertainty, g***	1.085E-03
Upper Limit, g Pu****	9.507E-03

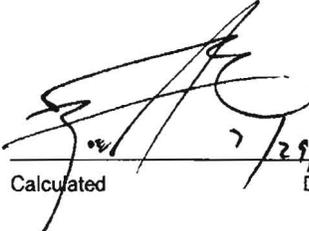
Total TRU Activity, uCi	2.98E+03
Total Uncertainty, uCi***	3.31E+02
Upper Limit, uCi****	3.64E+03

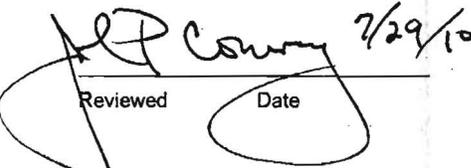
TRU Specific Activity, nCi/g	1.96E+04
Total Uncertainty, nCi/g***	2.18E+03
Upper Limit, nCi/g****	2.40E+04

Total Activity (TRU + non-TRU), uCi	4.31E+03
Total Uncertainty, uCi***	4.97E+02
Upper Limit, uCi****	5.30E+03

\* Codes: M = Activity directly measured by ISOCS.  
 I = Activity inferred from ISOCS measured Pu-239 and mass fraction using identified isotopic source.  
 C = Mass fraction calculated from measured ISOCS value and total plutonium.

\*\* Based on Pu-239 and mass fraction of Pu-239.  
 \*\*\* Uncertainties stated at 1 standard deviation.  
 \*\*\*\* The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

  
 Calculated Date 7/29/10

  
 Reviewed Date 7/29/10

**ISOCS Item Report**

Item ID:	B24297 (S29)
Date Assayed:	7/21/10
Item Mass, kg:	0.01
Isotopic Source:	HNF-15500 (DSA)

Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrtny (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrtny (g)	Upper Limit (g)	Codes
Pu-238	0.210%	9.15E+02	1.37E+02	1.19E+03	5.34E-05	7.98E-06	6.94E-05	M, C
Pu-239	81.361%	9.11E+03	9.87E+02	1.11E+04	1.47E-01	1.59E-02	1.79E-01	M
Pu-240	16.355%	4.91E+03	7.28E+02	6.37E+03	2.16E-02	3.21E-03	2.81E-02	M, C
Pu-242	0.670%	4.79E+00	7.06E-01	6.20E+00	1.21E-03	1.78E-04	1.57E-03	I
Np-237		7.30E-03	8.33E-04	8.97E-03	1.04E-05	1.18E-06	1.27E-05	M
Am-241	0.246%	1.53E+03	1.68E+02	1.86E+03	4.45E-04	4.90E-05	5.43E-04	M, C
Other TRU								
U-235								
U-238								
Pu-241	1.404%	3.60E+04	5.31E+03	4.66E+04	3.48E-04	5.13E-05	4.51E-04	M, C
Other								
Other								
Other								

Total Pu, g**	1.806E-01
Total Uncertainty, g***	2.662E-02
Upper Limit, g Pu****	2.338E-01

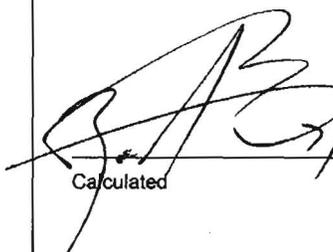
Total TRU Activity, uCi	1.65E+04
Total Uncertainty, uCi***	2.08E+03
Upper Limit, uCi****	2.06E+04

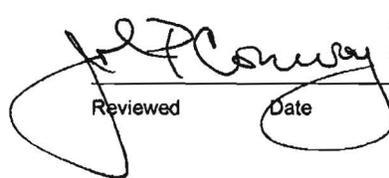
TRU Specific Activity, nCi/g	1.17E+06
Total Uncertainty, nCi/g***	1.48E+05
Upper Limit, nCi/g****	1.46E+06

Total Activity (TRU + non-TRU), uCi	5.24E+04
Total Uncertainty, uCi***	6.86E+03
Upper Limit, uCi****	6.62E+04

\* Codes: M = Activity directly measured by ISOCS.  
 I = Activity inferred from ISOCS measured Pu-239 and mass fraction using identified isotopic source.  
 C = Mass fraction calculated from measured ISOCS value and total plutonium.

\*\* Based on Pu-239 and mass fraction of Pu-239.  
 \*\*\* Uncertainties stated at 1 standard deviation.  
 \*\*\*\* The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

  
 Calculated Date 7/25/10

  
 Reviewed Date 7/29/10

<b>RADIOACTIVE SHIPMENT RECORD</b>		Page 1 of 1	4. Ship Prepaid	5. Via Site Carrier
<b>1. SHIP FROM U.S. DEPT. OF ENERGY C/O</b> Company <u>CH2MHILL PRC</u> Address <u>PPF</u> City, State, Zip <u>200 West Area</u> Contact <u>Jeff Widney</u> Phone <u>372-3090</u>		<b>2. SHIP TO</b> <input checked="" type="checkbox"/> <b>U.S. DEPT. OF ENERGY C/O</b> Company <u>ATLII</u> Address <u>222-S</u> City, State, Zip <u>200 West Area</u> Attention <u>Gerald Ritenour</u> Phone <u>372-2742</u>		<b>6. SHIPMENT AUTHORIZATION NUMBER</b> <u>KM015</u> <b>7. EMERGENCY RESPONSE</b> Telephone <u>1-509-373-3800</u> Emergency Response Guide(s) <u>163</u>

<b>HM 8. Proper Shipping Name:</b>			PRI HAZ SUB HAZ UN ID
<u>Radioactive Material, Type A package</u>			7 UN2915

9. No. Pkg.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.
1	Viking	DOT 7A TYPE A	S/N 12		Pu238, Pu239, Pu240, Am241	N/A	0.2	2.10E-3 TBq	9 Kg

<b>10. Identify for Normal Form Only</b> Physical Form <u>Liquid</u> Chemical Form <u>Mixture</u>	<b>11.</b> <input type="checkbox"/> Highway Route Controlled Quantity <input checked="" type="checkbox"/> Exclusive Use Shipment with instructions <input type="checkbox"/> Placards Applied _____ <input checked="" type="checkbox"/> Fissile Excepted, Grams <u>1.59E-01</u> <input checked="" type="checkbox"/> UN ID Marking <u>UN2915</u>	<b>12. LABELS APPLIED</b> <u>Radioactive Yellow - II</u> <b>13. ADDITIONAL LABELS / MARKINGS</b>
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<b>HM 8. Proper Shipping Name:</b>			PRI HAZ SUB HAZ UN ID

9. No. Pkg.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.

<b>10. Identify for Normal Form Only</b> Physical Form _____ Chemical Form _____	<b>11.</b> <input type="checkbox"/> Highway Route Controlled Quantity <input type="checkbox"/> Exclusive Use Shipment with instructions <input type="checkbox"/> Placards Applied _____ <input type="checkbox"/> Fissile Excepted, Grams _____ <input type="checkbox"/> UN ID Marking _____	<b>12. LABELS APPLIED</b> _____ <b>13. ADDITIONAL LABELS / MARKINGS</b>
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<b>HM 8. Proper Shipping Name:</b>			PRI HAZ SUB HAZ UN ID

9. No. Pkg.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.

<b>10. Identify for Normal Form Only</b> Physical Form _____ Chemical Form _____	<b>11.</b> <input type="checkbox"/> Highway Route Controlled Quantity <input type="checkbox"/> Exclusive Use Shipment with instructions <input type="checkbox"/> Placards Applied _____ <input type="checkbox"/> Fissile Excepted, Grams _____ <input type="checkbox"/> UN ID Marking _____	<b>12. LABELS APPLIED</b> _____ <b>13. ADDITIONAL LABELS / MARKINGS</b>
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<b>14. Shipment DE-Ci:</b>					<b>Shipment Totals</b>		C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.
1.95E-02							N/A	0.2	2.10E-3 TBq	9

<b>15. Surface Dose Rate of Package</b> <input type="checkbox"/> <0.005 or _____ mSv/hr <0.5 or <u>40.2</u> mrem/hr (N+β γ)	<b>Dose Rate @ 1 Meter from Surface of Package</b> <input type="checkbox"/> <0.005 or _____ mSv/hr <0.5 or <u>40.2</u> mrem/hr (N+β γ)	<b>Smears of Outer Container</b> <input type="checkbox"/> <4.0 Bq (220 dpm) β γ/cm <sup>2</sup> <input type="checkbox"/> <0.4 Bq (22 dpm) α/cm <sup>2</sup> <input checked="" type="checkbox"/> <Tbl. 2-2 HNF-5173 Limits	<b>TRUCK LOAD OR EXCLUSIVE USE</b> Surface <input checked="" type="checkbox"/> <2 mSv/hr (200 mrem/hr) @ 2 meters <input checked="" type="checkbox"/> <0.1 mSv/hr (10 mrem/hr) @ Cab <input checked="" type="checkbox"/> <0.02 mSv/hr (2 mrem/hr) (Using N+β γ) or sleeper
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Additional Data and Instructions (inc. Readings on Internal Packaging)	Bldg. <u>234-52</u>	Survey No. <u>2100823004</u>	Date <u>8/23/10</u>
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<b>16. TRANSPORTER</b>		<b>17. RECEIVER</b>	
Vehicle Number <u>HO-68B-7162</u>	DRIVER SIGNATURE <u>[Signature]</u>	RECEIVER SIGNATURE <u>[Signature]</u>	PRINT NAME <u>MARVIN HUCK</u>
	PRINT NAME <u>[Signature]</u>	PRINT NAME <u>[Signature]</u>	Date <u>10-10</u>
			Date <u>8-23-10</u>

18. This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

Certifier's Signature <u>Scott Weiss</u>	Print Name <u>Scott Weiss</u>	On behalf of DOE-RL	Date <u>8-23-10</u>	Organization <u>CSG</u>
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<b>19. AUTHORIZATION FOR SHIPMENT</b>			
<b>AIR TRANSPORT CERTIFICATION</b> <input type="checkbox"/> N/A	<b>CARGO AIRCRAFT</b> <input type="checkbox"/> Cargo Aircraft Only Labels Applied	<b>PASSENGER AIRCRAFT</b> <input type="checkbox"/> Ltd Qty <input type="checkbox"/> Research/Medical Diagnosis <input type="checkbox"/> <3 T.I. <input type="checkbox"/> Human Medical Research	Pkg. Dimensions (cm)

<b>20. OFFSITE AUTHORIZATION</b>			
Survey No.	Date Shipped	Routing	ETA
Approved for Shipment Offsite			Date

20100687  
**DECEMBER 21, 2010**

SHIP TO:		<b>HAZARDOUS MATERIAL SHIPMENT RECORD</b> (HMSR)		Shipment# KM020	
Company <b>ATLII</b>		Originating Facility/ Building: <b>PFP</b>		Date: 8/23/10	
Location <b>222S Labs</b>		Area: <b>200 West</b>		From <b>CHPRC</b>	
City, State, Zip <b>200 West Area</b>		OFFSITE ONLY:		SHIP: PREPAID <input checked="" type="checkbox"/> COLLECT <input type="checkbox"/>	
Attention <b>Gerald Ritenour 372-2742</b>		Cost Code: <b>300260</b>			

CONTAINERS/PACKAGING						CONTENT/DESCRIPTION
Number of Containers	Type Container	Package Spec.	Package Dimension	Quantity Pkg (Net)	Gross Wt each pkg	See 49 CFR 172.101(c) Hazardous Material Table
1	Drum	1A2	15 Gallon	1.132 Lt.	14 K	Proper Shipping Name: <b>Corrosive, liquid, acidic, inorganic, n.o.s.</b>  Hazard Class <b>8 (7)</b> UN/NA No.: <b>UN3264 (Nitric Acid)</b> Limited Quantity of Radioactive Material List Secondary Hazards: <b>Radioactive PG: II</b> List Labels Req'd/Applied: <b>Corrosive ERG: 154</b>
						Proper Shipping Name:  Hazard Class: UN/NA No.: PG: List Secondary Hazards: ERG: List Labels Req'd/Applied:
						Proper Shipping Name:  Hazard Class: UN/NA No.: PG: List Secondary Hazards: ERG: List Labels Req'd/Applied:

No. Containers <b>1</b>	Gross Wt of Shipment <b>14 Kg</b>	Identify Placards Required <b>1 None</b>	Identify Property Control or Return Order No.: (if applicable) <b>N/A</b>
		<b>2</b>	

Material in manufacturers original container Container free of deterioration or damage: Container acceptability documented Material is packaged, sealed, marked and labeled to meet DOT requirements	(Circle One)		<i>Describe Internal Packaging:</i> <b>Twelve, 125 ml. bottles bagged and placed in a 1 qt. "ice cream carton" which, are placed upright in a plastic lined 15 gallon drum with chemically compatible absorbent pads.</b>
	Yes	No	

Radiation Release	Survey No. <b>2-100823004</b>	Date <b>8/23/10</b>	RM Signature <i>Chris Ellingsworth</i>	Print Name <b>Chris Ellingsworth / C. Ellingsworth</b>
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<b>Transporter</b>		<b>Receiver</b>	
Vehicle Number <b>HO-688-7162</b>	Driver Signature <i>Paul Hall</i>	Receiver Signature <i>[Signature]</i>	Date <b>8-23-10 10:10</b>

<b>CERTIFICATION</b>		
CONTRACTORS CERTIFICATION This is to certify that the above named-materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation:	This shipment is within the limitations prescribed for Passenger Aircraft Cargo NA <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	
<i>[Signature]</i> Certification Signature	<b>Scott Weiss</b> Print Name	<b>8-23-10</b> Date

<b>Emergency Contact</b> <b>1-888-766-0771</b>	B.L. No.	N/A	Date Shipped	ETA	Routing	Special Considerations N/A
	DFSNW Traffic: N/A			DFSNW Shipping N/A		

ATL	<b>SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST</b>	LO-090-101 Rev <u>66.0</u>
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Date Samples Received: 8.25.10 Group #: 20100687 / 688  
 Number of Samples: 5  
 Sample Custodian: [Signature]

**Sample Custodian to Complete:**

Action	OK? (Y/N)	N/A	Comments
<u>RSA/COC</u> provided?	✓		
<u>RSP</u> provided?	✓		
Verify GKI is complete		✓	<u>on file</u>
Check that outer custody seal is intact, if present	✓		
Record cooler temperature in centigrade, as appropriate		✓	<input type="checkbox"/> Check if no cooler and/or no ice
Samples are intact and in good condition	✓		If No, provide comments on back
Verify that COC or RSA is accurate 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	✓		
• 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 PM immediately if any problems are noted. (A "No" answer requires Project Manager resolution.)

**PM to Complete:**

Samples acceptable for release? Yes PM Initials ARS Date 8/30/2010

If No, comment on communication and resolution:

Other Comments:



CH2M Hill Plateau Remediation Company		COMPANY CONTACT WIDRIG, DL		TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND
COLLECTOR KB Hulse CHPRC	PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY <input type="checkbox"/>		45 Days / 45 Days	
SAMPLING LOCATION S11; RM 144; Hood 3; Bag of glass waste (Hood 4)		FIELD LOGBOOK NO. HNF-N-507-14.35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE		
ICE CHEST NO.		OFFSITE PROPERTY NO. N/A	BILL OF LADING/AIR BILL NO. N/A				
SHIPPED TO 222-S Lab Operations							

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
- \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
- \*\* ~~TPH - Kerocene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ *on 6/28/10*
- \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH < 2 or pH > 11). *on 6/28/10*
- \*\* ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~
- \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *on 6/28/10*
- (1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH D (Total petroleum hydrocarbons - kerosene range) 6020\_METALS\_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}~~

Deleted VOA - 8260B Complete & Semi VOA - 8270 Complete by MISTAKE. These analyses are to be conducted.  
Bob Cathel 6/28/10



ORIGINAL

<b>CH2MHill Plateau Remediation Company</b>		<b>COLLECTOR</b> KB Hulse CHPRC	<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> Contingency #1 (S11B) on 8/19/10		<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069-029-68 8/31/2010	<b>AIR QUALITY</b> <input type="checkbox"/>		
<b>ICE CHEST NO.</b>		<b>FIELD LOGBOOK NO.</b> HNF-N-507-14.35	<b>ACTUAL SAMPLE DEPTH</b> N/A		<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations		<b>OFFSITE PROPERTY NO.</b> N/A		<b>BILL OF LADING/AIR BILL NO.</b> N/A			

<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b> Coolant None	None	bb 7/19/10	
		<b>TYPE OF CONTAINER</b>	aG		P
		<b>NO. OF CONTAINER(S)</b>	1		1
		<b>VOLUME</b>	125mL		60mL
<b>SPECIAL HANDLING AND/OR STORAGE</b> Changed matrix per telecom with R. Cathel 8/25/2010		<b>SAMPLE ANALYSIS</b> SEE ITEM (1) IN SPECIAL INSTRUCTIONS Generic Testing (No CAS)			

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B242B6 (S11B)	OTHER LIQUID SOLID	JUL 19 2010	1420	X
bb 7/19/10				

RELINQUISHED BY / REMOVED FROM	DATE/TIME	RECEIVED BY / STORED IN	DATE/TIME
KB Hulse	JUL 19 2010 1530	Kawilson / Icar	JUL 19 2010 1530
CHPRC		Wayne Rieke / Wayne R	8-24-10 10:00
Kawilson / Icar	8/24/10 10:30	Juan F Mendoza / Juan F Mendoza	8-25-10 10:03
Wayne Rieke / Wayne R	8-25-10	Juan F Mendoza / Juan F Mendoza	8-25-10 10:03
Juan F Mendoza / Juan F Mendoza	8-25-10 10:45	Rick R Steele	8-25-10 10:45

**SPECIAL INSTRUCTIONS**  
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

687  
GRP# 20100688 RAB 8/25/2010  
Sam # S10MP00378  
370

**ORIGINAL**

<b>LABORATORY SECTION</b>	<b>RECEIVED BY</b>	<b>TITLE</b>	<b>DATE/TIME</b>
<b>FINAL SAMPLE DISPOSITION</b>	<b>DISPOSAL METHOD</b>	<b>DISPOSED BY</b>	<b>DATE/TIME</b>

<b>CH2MHill Plateau Remediation Company</b>		<b>CHAIN OF CUSTODY / SAMPLE ANALYSIS REQUEST</b>		<b>F10-069-029</b>	<b>PAGE 2 OF 2</b>
<b>COLLECTOR</b> KB Hulse CHPRC	<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> Contingency #1	<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>	<b>FIELD LOGBOOK NO.</b> HNF-N-507-14.35	<b>ACTUAL SAMPLE DEPTH</b> N/A	<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations	<b>OFFSITE PROPERTY NO.</b> N/A		<b>BILL OF LADING/AIR BILL NO.</b> N/A		

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
- \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
- \*\* ~~TPH - Kerosene shall be analyzed if SVOA-TICs indicate the presence of Contaminant of Concern (COC).~~ *Per 6/28/10*
- \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).
- \*\* ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ *Per 6/28/10*
- \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *Per 6/28/10*
- (1) ~~VQA - 8260B - COMPLETE (Carbon tetrachloride) Semi-VQA - 8270B - COMPLETE (Tributyl phosphate) TPH-Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range) 6020\_METALS\_ICPMS (TAL) (Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Copper, Cadmium, Strontium, Thallium, Beryllium, Vanadium, Manganese, Nickel, Uranium, Selenium, Silver) ICP Metals - 6010B (TAL) (Sodium, Aluminum, Potassium, Zinc) Actinides ICPMS (Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242) Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 (Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate) Gamma Spectroscopy (Cesium-137, Cobalt-60) Gross Alpha (Gross alpha) Gross Beta (Gross beta) Isotopic Plutonium (Plutonium-239/240, Plutonium-238) Strontium-89,90 -- Sr-90; Americium-241 (Americium-241)~~



ORIGINAL

<b>COLLECTOR</b> KB Hulse CHPRC		<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> S12; RM 144; Hood 4; sodium carbonate		<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>		<b>FIELD LOGBOOK NO.</b> HNF-N507-14.35	<b>ACTUAL SAMPLE DEPTH</b> N/A	<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations		<b>OFFSITE PROPERTY NO.</b> N/A		<b>BILL OF LADING/AIR BILL NO.</b> N/A		

<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b> None	<b>TYPE OF CONTAINER</b> aG	<b>NO. OF CONTAINER(S)</b> 1	<b>VOLUME</b> 125mL	<b>SPECIAL HANDLING AND/OR STORAGE</b> <b>SAMPLE ANALYSIS</b> SEE ITEM (1) IN SPECIAL INSTRUCTIONS Generic Testing (No CAS)
		<del>Cooling</del> None	P	1	60mL	

*Handwritten notes: on 6/28/10, on 6/28/10, bb 7/19/10*

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B24286	(S12) OTHER LIQUID	JUL 19 2010	1400	X

*Handwritten notes: bb, bb 7/19/10*

<b>CHAIN OF POSSESSION</b>		<b>SIGN/ PRINT NAMES</b>		<b>SPECIAL INSTRUCTIONS</b>
RELINQUISHED BY/REMOVED FROM KB Hulse CHPRC	DATE/TIME JUL 19 2010 1530	RECEIVED BY/STORED IN K Wilson / K Wilson	DATE/TIME JUL 19 2010 1530	SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS   GRP # 20100588 SAM # 510M000389
RELINQUISHED BY/REMOVED FROM K Wilson / K Wilson	DATE/TIME 8/24/10 1000	RECEIVED BY/STORED IN Wayne Rike / Wayne Rike	DATE/TIME 8-24-10	
RELINQUISHED BY/REMOVED FROM Wayne Rike / Wayne Rike	DATE/TIME 8-25-10	RECEIVED BY/STORED IN Juan F Mendoza / Juan F Mendoza	DATE/TIME 8/25/10 10:03	
RELINQUISHED BY/REMOVED FROM Juan F Mendoza / Juan F Mendoza	DATE/TIME 8-25-10 1045	RECEIVED BY/STORED IN Richard R Stegler	DATE/TIME 9-25-10 1045	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	

<b>LABORATORY SECTION</b>	<b>RECEIVED BY</b>	<b>TITLE</b>	<b>DATE/TIME</b>
<b>FINAL SAMPLE DISPOSITION</b>	<b>DISPOSAL METHOD</b>	<b>DISPOSED BY</b>	<b>DATE/TIME</b>

<b>CH2MHill Plateau Remediation Company</b>		<b>COMPANY CONTACT</b> WIDRIG, DL		<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>COLLECTOR</b> KB Hulse CHPRC	<b>SAMPLING LOCATION</b> S12; RM 144; Hood 4; sodium carbonate		<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>	<b>FIELD LOGBOOK NO.</b> HNF-N-507-4.35	<b>ACTUAL SAMPLE DEPTH</b> N/A		<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE		
<b>SHIPPED TO</b> 222-S Lab Operations	<b>OFFSITE PROPERTY NO.</b> N/A		<b>BILL OF LADING/AIR BILL NO.</b> N/A				

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
- \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on whichever methods or documents are applicable to radiochemistry analyses.
- \*\* TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC). *on 6/28/10*
- \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11). *on 6/28/10*
- \*\* ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ *on 6/28/10*
- \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *on 6/28/10*
- ~~(1) VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range) 6020 METALS ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}~~



ORIGINAL

<b>CH2M Hill Plateau Remediation Company</b>		<b>COLLECTOR</b> KB Hulse CHPRC	<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> S28; RM 144; Hood 9; Chelex 100 chelating Resin		<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Solid			<b>SAF NO.</b> F10-068	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>		<b>FIELD LOGBOOK NO.</b> HNF-N-507-14.35	<b>ACTUAL SAMPLE DEPTH</b> N/A		<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations		<b>OFFSITE PROPERTY NO.</b> N/A			<b>BILL OF LADING/AIR BILL NO.</b> N/A		

<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b> Cool to NONE	<i>on 6/28/10</i>	<del>bb 7/13/10</del>
		<b>TYPE OF CONTAINER</b>	aG	
		<b>NO. OF CONTAINER(S)</b>	1	
		<b>VOLUME</b>	60mL	
	<b>SPECIAL HANDLING AND/OR STORAGE</b>	<b>SAMPLE ANALYSIS</b>	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B241X2 (S28)	OTHER SOLID	7-13-10	1057	X
<del>bb 7/13/10</del>				

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse / CHPRC	1315 JUL 13 2010	Kawilson / Kawilson	1315 JUL 13 2010
Kawilson / Kawilson	8/24/10	Wayne Rieke / Wayne Rieke	8-24-10
Wayne Rieke / Wayne Rieke	8-25-10	Juan F Mendoza / Juan F Mendoza	8-25-10
Juan F Mendoza / Juan F Mendoza	8-25-10	RT Steele / RT Steele	8-25-10 1045

**SPECIAL INSTRUCTIONS**  
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

ORIGINAL

Grp# 20100687  
Samp# S10M000371

<b>LABORATORY SECTION</b>	<b>RECEIVED BY</b>	<b>TITLE</b>	<b>DATE/TIME</b>
<b>FINAL SAMPLE DISPOSITION</b>	<b>DISPOSAL METHOD</b>	<b>DISPOSED BY</b>	<b>DATE/TIME</b>

<b>COLLECTOR</b> KB Hulse CHPRC	<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> S28; RM 144; Hood 9; Chelex 100 chelating Resin	<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Solid		<b>SAF NO.</b> F10-068	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>	<b>FIELD LOGBOOK NO.</b> HNF -N-507- <u>4.35</u>	<b>ACTUAL/SAMPLE DEPTH</b> <u>N/A</u>	<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations	<b>OFFSITE PROPERTY NO.</b> N/A	<b>BILL OF LADING/AIR BILL NO.</b> N/A			

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
  - \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance.
  - \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
  - ~~\*\* TPH - Kerosene shall be analyzed if SVOA-TICs indicate the presence of Contaminant of Concern (COC).~~ Be 6/28/10
  - \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).
  - \*\* As previously agreed, the 20X rule shall apply when TCLP is requested to meet project specific requirements. All exceptions to this will have project approval and laboratory agreement to proceed with extraction and analysis. The laboratory shall note all deviations from these and other analyses in the final report narrative to meet S&GRP SDM process protocol and data quality requirements. Be 6/28/10
- (1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi-VOA - 8270B - COMPLETE (Tributyl phosphate) TPH - Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range)~~ 6020\_METALS\_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7470 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90 {Strontium-90} Americium-241 {Americium-241}



<b>COLLECTOR</b> KB Hulse CHPRC		<b>COMPANY CONTACT</b> WIDRIG, DL		<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> D15; RM 144; Hood 9; Tributyl phosphate		<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid			<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>		<b>FIELD LOGBOOK NO.</b> HNF-N-507-14.35	<b>ACTUAL SAMPLE DEPTH</b> N/A		<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations		<b>OFFSITE PROPERTY NO.</b> N/A			<b>BILL OF LADING/AIR BILL NO.</b> N/A		

<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b> Cool-dg None						
		<b>TYPE OF CONTAINER</b> aG	None ARG 7/13/10 bb 7/13/10					
		<b>NO. OF CONTAINER(S)</b> 1	1 bb 7/13/10					
		<b>VOLUME</b> 125mL	60mL bb 7/13/10					
		<b>SPECIAL HANDLING AND/OR STORAGE</b>	<b>SAMPLE ANALYSIS</b>	SEE ITEM (1) IN SPECIAL INSTRUCTIONS Generic Testing (No CAS)				

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME						
B24298 (D15)	OTHER LIQUID	JUL 13 2010	1043	X					
bb 7/13/10									

<b>CHAIN OF POSSESSION</b>		<b>SIGN/ PRINT NAMES</b>		<b>SPECIAL INSTRUCTIONS</b>	
RELINQUISHED BY/REMOVED FROM KB Hulse CHPRC	DATE/TIME JUL 13 2010	RECEIVED BY/STORED IN Korn / Kowilson	DATE/TIME JUL 13 2010	SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM Kowilson / Korn	DATE/TIME 8/24/10 1000	RECEIVED BY/STORED IN Wayne Rehe / Wayne A...	DATE/TIME 8-21-10	GRP# 20100688	
RELINQUISHED BY/REMOVED FROM Wayne Rehe / Wayne A...	DATE/TIME 8-25-10	RECEIVED BY/STORED IN Juan F Mendez / Juan F Mendez	DATE/TIME 8/25/10	SAM# S10M000379	
RELINQUISHED BY/REMOVED FROM Juan F Mendez / Juan F Mendez	DATE/TIME 8-25-10 1045	RECEIVED BY/STORED IN R. L. Steele	DATE/TIME 8-25-10 1045		
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		

<b>LABORATORY SECTION</b>	<b>RECEIVED BY</b>	<b>TITLE</b>	<b>DATE/TIME</b>
<b>FINAL SAMPLE DISPOSITION</b>	<b>DISPOSAL METHOD</b>	<b>DISPOSED BY</b>	<b>DATE/TIME</b>

<b>CH2MHill Plateau Remediation Company</b>		<b>CHAIN OF CUSTODY / SAMPLE ANALYSIS REQUEST</b>		<b>F10-069-021</b>	<b>PAGE 2 OF 2</b>
<b>COLLECTOR</b> KB Hulse CHPRC	<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> D15; RM 144; Hood 9; Tributyl phosphate	<b>PROJECT DESIGNATION</b> PPF A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>	<b>FIELD LOGBOOK NO.</b> HNF -N-507- 14.35	<b>ACTUAL SAMPLE DEPTH</b> N/A	<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations	<b>OFFSITE PROPERTY NO.</b> N/A	<b>BILL OF LADING/AIR BILL NO.</b> N/A			

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
  - \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
  - \*\* TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).
  - \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).
  - \*\* 222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.
  - \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance.
- (1)VOA - 8260B - COMPLETE {Carbon tetrachloride} Semi-VOA - 8270B - COMPLETE {Tributyl phosphate} TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - kerosene range} 6020\_METALS\_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}


**ORIGINAL**

**ISOCS Item Report**

Item ID:	B24285 (S11)
Date Assayed:	7/22/10
Item Mass, kg:	0.14
Isotopic Source:	HNF-15500 (DSA)

Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrtny (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrtny (g)	Upper Limit (g)	Codes
Pu-238	0.210%	2.76E-01	4.07E-02	3.58E-01	1.61E-08	2.38E-09	2.09E-08	I
Pu-239	81.361%	3.87E-01	8.96E-02	5.67E-01	6.25E-06	1.44E-06	9.13E-06	M
Pu-240	16.355%	2.85E-01	4.20E-02	3.69E-01	1.26E-06	1.85E-07	1.63E-06	I
Pu-242	0.670%	2.04E-04	3.00E-05	2.64E-04	5.14E-08	7.58E-09	6.66E-08	I
Np-237								
Am-241	2.470%	6.51E-01	9.65E-02	8.44E-01	1.90E-07	2.81E-08	2.46E-07	I
Other TRU								
U-235								
U-238								
Pu-241	1.404%	1.11E+01	1.64E+00	1.44E+01	1.08E-07	1.59E-08	1.40E-07	I
Other								
Other								
Other								

Total Pu, g**	7.676E-06
Total Uncertainty, g***	1.934E-06
Upper Limit, g Pu****	1.154E-05

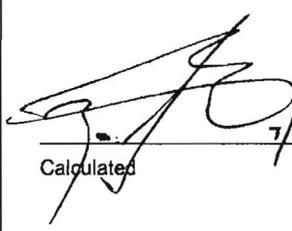
Total TRU Activity, uCi	1.60E+00
Total Uncertainty, uCi***	2.10E-01
Upper Limit, uCi****	2.02E+00

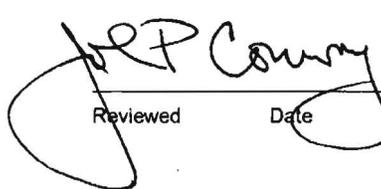
TRU Specific Activity, nCi/g	1.13E+01
Total Uncertainty, nCi/g***	1.48E+00
Upper Limit, nCi/g****	1.42E+01

Total Activity (TRU + non-TRU), uCi	1.27E+01
Total Uncertainty, uCi***	1.79E+00
Upper Limit, uCi****	1.63E+01

\* Codes: M = Activity directly measured by ISOCS.  
 I = Activity inferred from ISOCS measured Pu-239 and mass fraction using identified isotopic source.  
 C = Mass fraction calculated from measured ISOCS value and total plutonium.

\*\* Based on Pu-239 and mass fraction of Pu-239.  
 \*\*\* Uncertainties stated at 1 standard deviation.  
 \*\*\*\* The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

  
 \_\_\_\_\_  
 Calculated                      Date      7/29/10

 PFP Conway  
 \_\_\_\_\_  
 Reviewed                      Date      7/29/10

**ISOCS Item Report**

Item ID:	B24285 (S11) SOLID
Date Assayed:	7/22/10
Item Mass, kg:	0.01
Isotopic Source:	HNF-15500 (DSA)

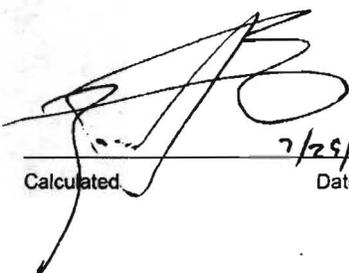
Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrtny (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrtny (g)	Upper Limit (g)	Codes
Pu-238	0.210%	9.44E-02	1.39E-02	1.22E-01	5.51E-09	8.12E-10	7.13E-09	I
Pu-239	81.361%	1.32E-01	2.48E-02	1.82E-01	2.13E-06	4.00E-07	2.93E-06	M
Pu-240	16.355%	9.74E-02	1.43E-02	1.26E-01	4.29E-07	6.32E-08	5.55E-07	I
Pu-242	0.670%	6.96E-05	1.03E-05	9.01E-05	1.76E-08	2.59E-09	2.28E-08	I
Np-237								
Am-241	2.470%	2.22E-01	3.30E-02	2.88E-01	6.48E-08	9.61E-09	8.40E-08	I
Other TRU								
U-235								
U-238								
Pu-241	1.404%	3.81E+00	5.61E-01	4.93E+00	3.68E-08	5.43E-09	4.77E-08	I
Other								
Other								
Other								

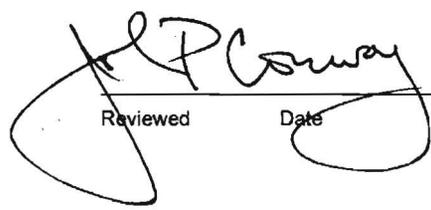
Total Pu, g**	2.623E-06	Total TRU Activity, uCi	5.47E-01
Total Uncertainty, g***	5.573E-07	Total Uncertainty, uCi****	6.96E-02
Upper Limit, g Pu****	3.738E-06	Upper Limit, uCi****	6.86E-01

TRU Specific Activity, nCi/g	3.77E+01	Total Activity (TRU + non-TRU), uCi	4.35E+00
Total Uncertainty, nCi/g***	4.80E+00	Total Uncertainty, uCi****	6.11E-01
Upper Limit, nCi/g****	4.73E+01	Upper Limit, uCi****	5.58E+00

\* Codes: M = Activity directly measured by ISOCS.  
 I = Activity inferred from ISOCS measured Pu-239 and mass fraction using identified isotopic source.  
 C = Mass fraction calculated from measured ISOCS value and total plutonium.

\*\* Based on Pu-239 and mass fraction of Pu-239.  
 \*\*\* Uncertainties stated at 1 standard deviation.  
 \*\*\*\* The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

  
 Calculated \_\_\_\_\_ Date 7/25/10

  
 Reviewed \_\_\_\_\_ Date 7/29/10

**ISOCS Item Report**

Item ID:	B24286 (S12)
Date Assayed:	7/22/10
Item Mass, kg:	0.11
Isotopic Source:	HNF-15500 (DSA)

Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrtny (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrtny (g)	Upper Limit (g)	Codes
Pu-238	0.210%	3.34E-01	4.91E-02	4.32E-01	1.95E-08	2.87E-09	2.52E-08	I
Pu-239	81.361%	4.68E-01	9.19E-02	6.52E-01	7.54E-06	1.48E-06	1.05E-05	M
Pu-240	16.355%	3.44E-01	5.07E-02	4.46E-01	1.52E-06	2.23E-07	1.96E-06	I
Pu-242	0.670%	2.46E-04	3.63E-05	3.19E-04	6.21E-08	9.15E-09	8.05E-08	I
Np-237								
Am-241	2.470%	7.86E-01	1.17E-01	1.02E+00	2.29E-07	3.40E-08	2.97E-07	I
Other TRU								
U-235								
U-238								
Pu-241	1.404%	1.35E+01	1.98E+00	1.74E+01	1.30E-07	1.92E-08	1.69E-07	I
Other								
Other								
Other								

Total Pu, g**	9.273E-06
Total Uncertainty, g***	2.044E-06
Upper Limit, g Pu****	1.336E-05

Total TRU Activity, uCi	1.93E+00
Total Uncertainty, uCi***	2.48E-01
Upper Limit, uCi****	2.43E+00

TRU Specific Activity, nCi/g	1.81E+01
Total Uncertainty, nCi/g***	2.32E+00
Upper Limit, nCi/g****	2.27E+01

Total Activity (TRU + non-TRU), uCi	1.54E+01
Total Uncertainty, uCi***	2.16E+00
Upper Limit, uCi****	1.97E+01

\* Codes: M = Activity directly measured by ISOCS.

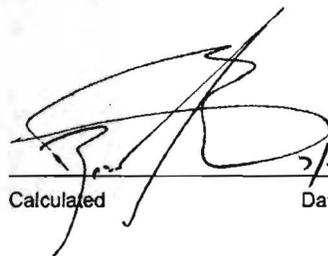
I = Activity inferred from ISOCS measured Pu-239 and mass fraction using identified isotopic source.

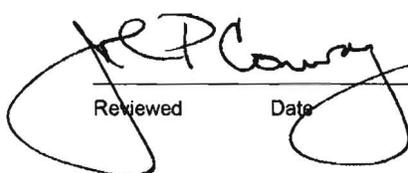
C = Mass fraction calculated from measured ISOCS value and total plutonium.

\*\* Based on Pu-239 and mass fraction of Pu-239.

\*\*\* Uncertainties stated at 1 standard deviation.

\*\*\*\* The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

  
 Calculated Date 7/29/10

 7/29/10  
 Reviewed Date

<b>RADIOACTIVE SHIPMENT RECORD</b>			Page 1 of 1		4. Ship Prepaid		5. Via Site Carrier			
1. SHIP FROM U.S. DEPT. OF ENERGY C/O Company CH2MHILL PRC Address PFP City, State, Zip 200 West Area Contact Jeff Widney Phone 372-3090			2. SHIP TO <input checked="" type="checkbox"/> U.S. DEPT. OF ENERGY C/O Company ATLII Address 222-S City, State, Zip 200 West Area Attention Gerald Ritenour Phone 372-2742			6. SHIPMENT AUTHORIZATION NUMBER KM016				
						<b>7. EMERGENCY RESPONSE</b> Telephone 1-509-373-3800 Emergency Response Guide(s) 163				
HM 8. Proper Shipping Name: X Radioactive Material, Type A package						PRI HAZ 7		SUB HAZ		UN ID UN2915
9. No. Pkg. 1	Model Package Viking	COC/Spec DOT 7A TYPE A	Serial No. S/N 12	Seal No.	Isotopes Pu238, Pu239, Pu240, Am241		C.S.I. N/A	T.I. 0.2	Bq/Package 1.20E-6 TBq	Gr. Wt. Kg. 9 Kg
10. Identify for Normal Form Only Physical Form Liquid Chemical Form Mixture		11. <input type="checkbox"/> Highway Route Controlled Quantity <input checked="" type="checkbox"/> Exclusive Use Shipment with instructions <input type="checkbox"/> Placards Applied <input checked="" type="checkbox"/> Fissile Excepted, Grams 1.62E-05 <input checked="" type="checkbox"/> UN ID Marking UN2915			12. LABELS APPLIED Radioactive Yellow - II		13. ADDITIONAL LABELS / MARKINGS			
HM 8. Proper Shipping Name:						PRI HAZ		SUB HAZ		UN ID
9. No. Pkg.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes		C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.
10. Identify for Normal Form Only Physical Form Chemical Form		11. <input type="checkbox"/> Highway Route Controlled Quantity <input type="checkbox"/> Exclusive Use Shipment with instructions <input type="checkbox"/> Placards Applied <input type="checkbox"/> Fissile Excepted, Grams <input type="checkbox"/> UN ID Marking			12. LABELS APPLIED		13. ADDITIONAL LABELS / MARKINGS			
HM 8. Proper Shipping Name:						PRI HAZ		SUB HAZ		UN ID
9. No. Pkg.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes		C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.
10. Identify for Normal Form Only Physical Form Chemical Form		11. <input type="checkbox"/> Highway Route Controlled Quantity <input type="checkbox"/> Exclusive Use Shipment with instructions <input type="checkbox"/> Placards Applied <input type="checkbox"/> Fissile Excepted, Grams <input type="checkbox"/> UN ID Marking			12. LABELS APPLIED		13. ADDITIONAL LABELS / MARKINGS			
HM 8. Proper Shipping Name:						PRI HAZ		SUB HAZ		UN ID
9. No. Pkg.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes		C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.
10. Identify for Normal Form Only Physical Form Chemical Form		11. <input type="checkbox"/> Highway Route Controlled Quantity <input type="checkbox"/> Exclusive Use Shipment with instructions <input type="checkbox"/> Placards Applied <input type="checkbox"/> Fissile Excepted, Grams <input type="checkbox"/> UN ID Marking			12. LABELS APPLIED		13. ADDITIONAL LABELS / MARKINGS			
14. Shipment DE-Ci: 6.29e-06					Shipment Totals		C.S.I. N/A	T.I. 0.2	Bq/Package 1.20E-6 TBq	Gr. Wt. Kg. 9
15. Surface Dose Rate of Package <input type="checkbox"/> <0.005 or _____ mSv/hr <0.5 or <u>0.2</u> mrem/hr (N+β γ)		Dose Rate @ 1 Meter from Surface of Package <input type="checkbox"/> <0.005 or _____ mSv/hr <0.5 or <u>0.2</u> mrem/hr (N+β γ)		Smears of Outer Container <input type="checkbox"/> <4.0 Bq (220 dpm) β γ /cm <sup>2</sup> <input type="checkbox"/> <0.4 Bq (22 dpm) α /cm <sup>2</sup> <input checked="" type="checkbox"/> <Tbl. 2-2 HNF-5173 Limits		TRUCK LOAD OR EXCLUSIVE USE Surface <input checked="" type="checkbox"/> <2 mSv/hr (200 mrem/hr) @ 2 meters <input checked="" type="checkbox"/> <0.1 mSv/hr (10 mrem/hr) @ Cab <input checked="" type="checkbox"/> <0.02 mSv/hr (2 mrem/hr) or sleeper (Using N+β γ)				
Additional Data and Instructions (inc. Readings on Internal Packaging)				Bldg. 7345Z	Survey No. E-100825004		Date 8-25-10			
16. TRANSPORTER Vehicle Number HO-688-7162 DRIVER SIGNATURE Juan F Mendez PRINT NAME Juan F Mendez			17. RECEIVER RECEIVER SIGNATURE [Signature] PRINT NAME R F Steede Date 8-25-10 1045							
18. This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. Certifier's Signature Scott Weiss Print Name Scott Weiss On behalf of DOE-RL Date 8-25-10 Organization CSG										
19. AUTHORIZATION FOR SHIPMENT AIR TRANSPORT CERTIFICATION <input type="checkbox"/> N/A CARGO AIRCRAFT <input type="checkbox"/> Cargo Aircraft Only Labels Applied PASSENGER AIRCRAFT <input type="checkbox"/> Ltd Qty <input type="checkbox"/> Research/Medical Diagnosis <input type="checkbox"/> <3 T.I. <input type="checkbox"/> Human Medical Research Pkg. Dimensions (cm)										
20. OFFSITE AUTHORIZATION Survey No. Date Shipped Routing ETA Approved for Shipment Offsite Date										



<b>CH2MHill Plateau Remediation Company</b>		<b>COLLECTOR</b> KB Hulse CHPRC	<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> S17; RM 144; Hood 9; A0077 slurp jar		<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid			<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>		<b>FIELD LOGBOOK NO.</b> HNF-N-507-14.35	<b>ACTUAL SAMPLE DEPTH</b> N/A		<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations		<b>OFFSITE PROPERTY NO.</b> N/A			<b>BILL OF LADING/AIR BILL NO.</b> N/A		

<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> *Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b> Cooling None	<b>TYPE OF CONTAINER</b> aG P	<b>NO. OF CONTAINER(S)</b> 1 1	<b>VOLUME</b> 125mL 60mL 60mL	<b>SAMPLE ANALYSIS</b> SEE ITEM (1) IN SPECIAL INSTRUCTIONS Generic Testing (No CAS)	
		ac 6/28/10 ac 6/28/10 bb 7/19/10					
		bb 7/19/10					
		bb 7/19/10					
		bb 7/19/10					

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B24290	OTHER LIQUID	JUL 19 2010	0955 X
bb 7/19/10			

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM KB Hulse CHPRC	DATE/TIME JUL 19 2010	RECEIVED BY/STORED IN Kowilson/Kom JUL 19 2010
RELINQUISHED BY/REMOVED FROM Kowilson/Kom	DATE/TIME 8/26/10 1000	RECEIVED BY/STORED IN Wayne Ricks/Wayne AR 8-26-10 1000
RELINQUISHED BY/REMOVED FROM Wayne Ricks/Wayne AR	DATE/TIME 8-30-10 0915	RECEIVED BY/STORED IN MARVIN HUCK 8-30-10 9:15
RELINQUISHED BY/REMOVED FROM MARVIN HUCK	DATE/TIME 8-30-10 9:16	RECEIVED BY/STORED IN P. Kocig 8.30.10 1316
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

ORIGINAL

Grp # 20100688  
SIOM 000392

<b>LABORATORY SECTION</b>	<b>RECEIVED BY</b>	<b>TITLE</b>	<b>DATE/TIME</b>
<b>FINAL SAMPLE DISPOSITION</b>	<b>DISPOSAL METHOD</b>	<b>DISPOSED BY</b>	<b>DATE/TIME</b>

<b>CH2MHill Plateau Remediation Company</b>		<b>COMPANY CONTACT</b> WIDRIG, DL		<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>COLLECTOR</b> KB Hulse CHPRC	<b>SAMPLING LOCATION</b> S17; RM 144; Hood 9; A0077 slurp jar			<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>
<b>ICE CHEST NO.</b>	<b>FIELD LOGBOOK NO.</b> HNF-N-507-14-35	<b>ACTUAL SAMPLE DEPTH</b> N/A	<b>COA</b> 301891ES10		<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE		
<b>SHIPPED TO</b> 222-S Lab Operations		<b>OFFSITE PROPERTY NO.</b> N/A		<b>BILL OF LADING/AIR BILL NO.</b> N/A			

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
- \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
- \*\* ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ *Per 6/28/10*
- \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).
- \*\* ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ *Per 6/28/10*
- \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *Per 6/28/10*
- (1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi-VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range)~~ 6020\_METALS\_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}


 ORIGINAL

<b>COLLECTOR</b> KB Hulse CHPRC	<b>COMPANY CONTACT</b> WIDRIG, DL	<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> S18; RM 144; Hood 9; A00110 slurp jar	<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b>	<b>FIELD LOGBOOK NO.</b> HNF-N-507-14-35	<b>ACTUAL SAMPLE DEPTH</b> N/A	<b>COA</b> 301891ES10	<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>SHIPPED TO</b> 222-S Lab Operations		<b>OFFSITE PROPERTY NO.</b> N/A	<b>BILL OF LADING/AIR BILL NO.</b> N/A		

<b>MATRIX*</b> 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	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b> Cool -16 None	None	<i>on 6/28/10</i> <i>on 6/28/10</i> <i>on 6/28/10</i>	
		<b>TYPE OF CONTAINER</b>	aG		P
		<b>NO. OF CONTAINER(S)</b>	1		1
		<b>VOLUME</b>	125mL		60mL
		<b>SPECIAL HANDLING AND/OR STORAGE</b>	<b>SAMPLE ANALYSIS</b>		SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B24291	OTHER LIQUID	JUL 19 2010	1025	X

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse / CHPRC	JUL 19 2010 2:55	K Wilson / Hume	JUL 19 2010 2:55
K Wilson / Hume	8/26/10 10:00	Wayne Riecke / Way A R	8-26-10 10:00
Wayne Riecke / Way A R	8-30-10 09:15	MARVIN HUCK / Thi Ann	8-30-10 9:15
MARVIN HUCK / Thi Ann	8-30-10 1:16	PT Steegle	8-30-10 1316

**SPECIAL INSTRUCTIONS**  
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

ORIGINAL

Grp # 2010 0 688  
S10M000393

<b>LABORATORY SECTION</b>	<b>RECEIVED BY</b>	<b>TITLE</b>	<b>DATE/TIME</b>
<b>FINAL SAMPLE DISPOSITION</b>	<b>DISPOSAL METHOD</b>	<b>DISPOSED BY</b>	<b>DATE/TIME</b>

<b>CH2MHill Plateau Remediation Company</b>		<b>COMPANY CONTACT</b> WIDRIG, DL		<b>TELEPHONE NO.</b> 376-2858	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 9N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>COLLECTOR</b> KB Hulse CHPRC	<b>PROJECT DESIGNATION</b> PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		<b>SAF NO.</b> F10-069		<b>AIR QUALITY</b> <input type="checkbox"/>		
<b>SAMPLING LOCATION</b> S18; RM 144; Hood 9; A00110 slurp jar	<b>FIELD LOGBOOK NO.</b> HNF-N-507-1435	<b>ACTUAL SAMPLE DEPTH</b> N/A		<b>COA</b> 301891ES10		<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE	
<b>ICE CHEST NO.</b>	<b>OFFSITE PROPERTY NO.</b> N/A		<b>BILL OF LADING/AIR BILL NO.</b> N/A				

**SPECIAL INSTRUCTIONS**

- \*\* The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.
  - \*\* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.
  - \*\* TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC). *Am 6/28/10*
  - \*\* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).
  - \*\* ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ *Am 6/28/10*
  - \*\* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. *Am 6/28/10*
- (1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range) 6020\_METALS\_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89/90 -- Sr-90; Americium-241 {Americium-241}~~

 ORIGINAL

**ISOCS Item Report**

Item ID:	B24290 (S17)
Date Assayed:	7/21/10
Item Mass, kg:	0.02
Isotopic Source:	HNF-15500 (DSA)

Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrtnty (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrtnty (g)	Upper Limit (g)	Codes
Pu-238	0.210%	2.20E+03	3.29E+02	2.86E+03	1.28E-04	1.92E-05	1.67E-04	M, C
Pu-239	81.361%	6.83E+03	7.39E+02	8.30E+03	1.10E-01	1.19E-02	1.34E-01	M
Pu-240	16.355%	4.96E+03	7.41E+02	6.44E+03	2.19E-02	3.27E-03	2.84E-02	M, C
Pu-242	0.670%	3.59E+00	5.29E-01	4.65E+00	9.06E-04	1.33E-04	1.17E-03	I
Np-237		9.63E-02	1.05E-02	1.17E-01	1.37E-04	1.49E-05	1.67E-04	M
Am-241	3.198%	1.48E+04	1.63E+03	1.81E+04	4.32E-03	4.75E-04	5.27E-03	M, C
Other TRU								
U-235		1.47E-02	1.70E-03	1.81E-02	6.81E-03	7.89E-04	8.39E-03	M
U-238								
Pu-241	1.404%	8.90E+04	1.31E+04	1.15E+05	8.61E-04	1.27E-04	1.11E-03	M, C
Other								
Other								
Other								

Total Pu, g**	1.352E-01
Total Uncertainty, g***	1.994E-02
Upper Limit, g Pu****	1.751E-01

Total TRU Activity, uCi	2.88E+04
Total Uncertainty, uCi***	3.28E+03
Upper Limit, uCi****	3.54E+04

TRU Specific Activity, nCi/g	1.32E+06
Total Uncertainty, nCi/g***	1.51E+05
Upper Limit, nCi/g****	1.63E+06

Total Activity (TRU + non-TRU), uCi	1.18E+05
Total Uncertainty, uCi***	1.57E+04
Upper Limit, uCi****	1.49E+05

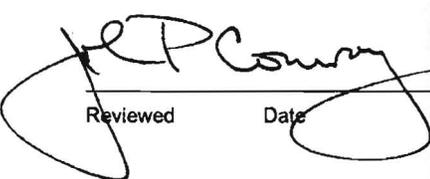
\* Codes: M = Activity directly measured by ISOCS.  
 I = Activity inferred from ISOCS measured Pu-239 and mass fraction using identified isotopic source.  
 C = Mass fraction calculated from measured ISOCS value and total plutonium.

\*\* Based on Pu-239 and mass fraction of Pu-239.

\*\*\* Uncertainties stated at 1 standard deviation.

\*\*\*\* The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

  
 Calculated Date 7/29/10

  
 Reviewed Date 7/29/10

**ISOCS Item Report**

Item ID:	B24291 (S18)
Date Assayed:	7/21/10
Item Mass, kg:	0.13
Isotopic Source:	HNF-15500 (DSA)

Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrtny (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrtny (g)	Upper Limit (g)	Codes
Pu-238	0.210%	3.37E+03	5.09E+02	4.39E+03	1.97E-04	2.97E-05	2.56E-04	M, C
Pu-239	81.361%	1.37E+04	1.49E+03	1.67E+04	2.22E-01	2.40E-02	2.70E-01	M
Pu-240	16.355%	8.40E+03	1.26E+03	1.09E+04	3.70E-02	5.55E-03	4.81E-02	M, C
Pu-242	0.670%	7.23E+00	1.06E+00	9.35E+00	1.82E-03	2.69E-04	2.36E-03	I
Np-237		2.15E-01	2.34E-02	2.62E-01	3.06E-04	3.33E-05	3.73E-04	M
Am-241	1.622%	1.52E+04	1.67E+03	1.85E+04	4.42E-03	4.85E-04	5.39E-03	M, C
Other TRU								
U-235		1.69E-02	2.15E-03	2.12E-02	7.84E-03	9.92E-04	9.83E-03	M
U-238								
Pu-241	1.404%	9.87E+04	1.46E+04	1.28E+05	9.54E-04	1.41E-04	1.24E-03	M, C
Other								
Other								
Other								

Total Pu, g**	2.723E-01
Total Uncertainty, g***	4.014E-02
Upper Limit, g Pu****	3.526E-01

Total TRU Activity, uCi	4.07E+04
Total Uncertainty, uCi***	4.76E+03
Upper Limit, uCi****	5.02E+04

TRU Specific Activity, nCi/g	3.04E+05
Total Uncertainty, nCi/g***	3.56E+04
Upper Limit, nCi/g****	3.75E+05

Total Activity (TRU + non-TRU), uCi	1.39E+05
Total Uncertainty, uCi***	1.83E+04
Upper Limit, uCi****	1.76E+05

\* Codes: M = Activity directly measured by ISOCS.

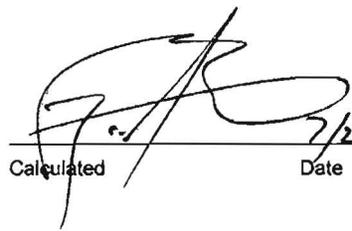
I = Activity inferred from ISOCS measured Pu-239 and mass fraction using identified isotopic source.

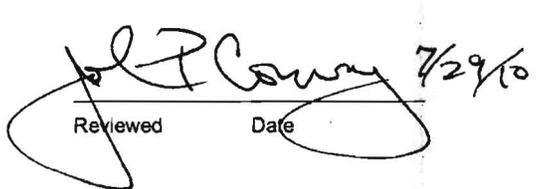
C = Mass fraction calculated from measured ISOCS value and total plutonium.

\*\* Based on Pu-239 and mass fraction of Pu-239.

\*\*\* Uncertainties stated at 1 standard deviation.

\*\*\*\* The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

  
 Calculated \_\_\_\_\_ Date 7/29/10

  
 Reviewed \_\_\_\_\_ Date 7/29/10



GENERATOR KNOWLEDGE INFORMATION

1. Chain of Custody Number F10-069-XXX CACN/COA 301891 Customer Identification Number #'s D15 & D21

2. List generator knowledge or description of process that produced sample. Or list description of sample source:  
Samples are from chemicals used at the PFP A Labs; currently in room 144.

MSDS Available?  No  Yes Hanford MSDS No. N/A

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  Unknown

U Codes: \_\_\_\_\_  Yes  No  Unknown

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 \_\_\_\_\_  Yes  No  Unknown

D004-D043 (Identify applicable waste codes and concentrations): (i.e., peroxide former, explosive, air reactive)  Yes  No  Unknown

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):

Unknown

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

Unknown

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 7/7/10

GENERATOR KNOWLEDGE INFORMATION

1. Chain of Custody Number F10-069-XXX CACN/COA 301891 Customer Identification Number See item #2

2. List generator knowledge or description of process that produced sample. Or list description of sample source:  
Samples are from chemicals used at the PFP A Labs; currently in room 144. Sample ID's include S2, S3, S4, S6, S8, S9, S11, S12, S14, S18, S27, S29 & S33.  
MSDS Available?  No  Yes Hanford MSDS No. N/A

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  Unknown  
U Codes: \_\_\_\_\_  Yes  No  Unknown  
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 \_\_\_\_\_  Yes  No  Unknown  
D004-D043 (Identify applicable waste codes and concentrations): \_\_\_\_\_ (i.e., peroxide former, explosive, air reactive)  Yes  No  Unknown

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):  
Unknown

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

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 7/7/10

### GENERATOR KNOWLEDGE INFORMATION

1. Chain of Custody Number F10-069-XXX CACN/COA 301891 Customer Identification Number See item #2

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

Samples are from chemicals used at the PFP A Labs; currently in room 144. Sample ID's include S13, S15, S17, S19, S20, S23, S24, S30, S31, S32, S34 & D16.

MSDS Available?  No  Yes Hanford MSDS No. N/A

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: _____	_____	<input type="radio"/> Yes	<input checked="" type="radio"/> No	<input type="radio"/> Unknown
U Codes: _____	_____	<input type="radio"/> Yes	<input checked="" type="radio"/> No	<input type="radio"/> Unknown
K Codes: _____	_____	<input type="radio"/> Yes	<input checked="" type="radio"/> No	<input type="radio"/> Unknown
F Codes: _____	_____	<input type="radio"/> Yes	<input checked="" type="radio"/> No	<input type="radio"/> Unknown

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

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

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):

Unknown

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

Unknown

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

(\*State mixture rule for ignitability)

WT01: <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown	WP01: <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown
WT02: <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown	WP02: <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown
W001: <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown	WP03: <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown
List constituents and concentrations:	F003:* <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> 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)

<input type="checkbox"/> PCB Liquid Waste	<input type="checkbox"/> PCB Bulk Product Waste	<input type="checkbox"/> PCB Transformer ≥500 ppm	<input type="checkbox"/> Unknown
<input type="checkbox"/> PCB Remediation Waste	<input type="checkbox"/> PCB R&D Waste	<input type="checkbox"/> PCB contaminated electrical equipment (capacitor/ballast) <500 ppm	
<input type="checkbox"/> PCB Spill Material	<input type="checkbox"/> PCB Item	<input type="checkbox"/> 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

7/7/10