ADMIN RECORD

DELIVERABLE (COMBINED 224A AND 224E)

POND SLUDGE WASTE CHARACTERIZATION REPORT AND CLARIFIER SLUDGE WASTE CHARACTERIZATION REPORT

FOR

EG&G ROCKY FLATS

PREPARED BY

HALLIBURTON NUS ENVIRONMENTAL CORPORATION

MARCH 1992

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HALLIBURTON NUS APPROVALS:

Ted Bittner

TED BITTNER, PROJECT MANAGER

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1.0 INTRODUCTION

1.1 Authorization

This report has been prepared by HALLIBURTON NUS Environmental Corporation (HALLIBURTON NUS) as part of EG&G Letter Subcontract PC-84017JB. The purpose of this report is to summarize and evaluate the characterization data collected for the sludges and waters from the following sources:

- Pond 207A
- Pond 207B North
- Pond 207B Center
- Pond 207B South
- Pond 207C
- Clarifier

This report is defined as combined deliverable number 224A and 224E. A separate report summarizing the characterization data for pondcrete and saltcrete will be prepared when sampling and analysis of those wastes has been completed.

1.2 Background

Five lined solar evaporation ponds, designated ponds 207A, 207B north, 207B center, 207B south, and 207C, are to be closed. In support of the closure project, HALLIBURTON NUS has been awarded a contract to stabilize the pond sludges and a portion of the pond water. One of the initial tasks of the project was the collection and analysis of pond water and sludge samples to support the development of stabilization recipes. Specific goals of the pond characterization program were as follows:

- Characterize the liquids and the sludges in the ponds and the clarifier.
- Determine the variability of constituents in each media within a given pond.
- Determine the variability of constituents in each media between ponds.
- Evaluate the compatibility of the ponds to support any design options that include pond consolidation.

1.3 Scope of Work

The scope of work for the pond characterization effort was defined in the combined deliverable number 211A, 211E, 221A, and 221E, the "Pond Sludge Sampling Plan, Clarifier Sludge Sampling Plan, Pond Sludge Analysis Plan, and Clarifier Sludge Analysis Plan." This deliverable was prepared by HALLIBURTON NUS and approved by EG&G Rocky Flats in July 1991. Combined deliverable 212A and 212E, the Pond Sludge Sampling Procedure and the Clarifier Sampling Procedure, provided the detailed sampling instructions for the pond and clarifier water and sludges. This deliverable was issued in August 1991, and was subsequently modified by three revisions, the last of which was issued November 25, 1991.

Section 2.0 provides additional detail concerning the sampling and analytical program.

2.0 SAMPLING AND ANALYSIS PROGRAM

2.1 Sampling Locations

The Sampling Plan specified the collection of discrete water and sludge samples from each of the four quadrants in each of the five ponds. The plan also called for the collection of a field composite made from equal aliquots from the four quadrants. The purpose of the composite samples was to provide characterization data for comparison with the individual quadrant samples, and to provide analytical data of the bulk sample on which treatability studies will be conducted. The composite sampling data will be presented in a separate document.

Quadrant samples were collected from the ponds as planned, with the following exceptions:

- Pond 207A - The water level in the pond was low, exposing the pond liner in the southwest corner of the pond. Therefore, it was only possible to collect three water samples from this pond.

- Pond 207A - Insufficient sludge was present in the pond to enable sludge sampling from the quadrants. A pump sump located in the northeast corner of the pond contained the only appreciable accumulation of sludge, and was the only sludge sample collected from this pond.

- Pond 207C - The samplers were unable to collect four quadrant-specific sludge samples from the pond because of insufficient material in the eastern quadrants. Therefore, only the southwest and northwest quadrant sludge samples were collected. In lieu of the eastern quadrant samples, an interior composite sample was collected. Sludge from four locations in the east-central portion of the pond was composited to make this sample. A fourth sludge sample was collected from the material that collected along the waterline. Samples of this material were collected from eight locations around the pond berm and composited.

Samples were collected from the clarifier as planned. Four sludge and water samples were collected from the clarifier bridge. One sample was collected near the clarifier wall, one was collected near the center of the bridge, and one sample was collected at the end of the bridge near the center of the clarifier. One duplicate sample was also collected from the clarifier.

Table 2-1 summarizes the pond water characterization samples, and Table 2-2 summarizes the pond sludge characterization samples, which were collected and analyzed. Figure 2-1 shows the approximate pond sampling locations, while Figure 2-2 shows the approximate clarifier sampling locations.

2.2 Sampling Procedures

All samples were collected by EG&G personnel. HALLIBURTON NUS provided one person during each sampling event to assist in sample bottle labelling, preparing the chain-of-custody forms, and maintaining the field log book. A copy of the

field notes can be found in Appendix C. Copies of the chain-of-custody forms are in Appendix D.

As noted previously, sampling was conducted in accordance with combined deliverable 212A and 212E, "Pond Sludge Sampling Procedure and Clarifier Sampling Procedure," and subsequent revisions. Any deviations from the procedures due to conditions encountered in the field are documented in the field log book notes (Appendix C). Changes in the number or location of samples were previously documented in Section 2.1.

2.3 Analytical Program

2.3.1 Laboratory Analyses

The laboratory analytical program for pond waters and sludges is summarized in Table 2-3. The rationale for selecting these parameters was described in detail in the combined Sampling and Analysis Plans for the pond and clarifier sludges and waters. The following issues are highlighted to facilitate interpretation of the database:

- Analysis of select VOAs, select semivolatiles, select alcohols, metals, cyanide, and TCLP parameters were conducted to achieve a data quality objective Level IV. This provides data of a quality similar to that required for CLP (i.e., legally defensible data). All other parameter are engineering parameters and only require a DQO level of III.

- The analytical program included TCLP metals analysis of both the pond waters and the pond sludges. For the pond sludges, the analysis included the acidic extraction as per the method. For the waters, the method specifies that for samples with less than 0.5 percent suspended solids, should be filtered through a 0.6-0.8 μm glass filter to remove the suspended solids, followed by analysis of the filtrate. In essence, the analysis for metals in the filtrate represents a determination of the dissolved metals concentration at the natural pH of the liquid, since no pH adjustment of the filtrate is performed. Since all the pond waters contained less than 0.5 percent suspended solids, this method was followed for all TCLP analyses of pond waters.

- The specified analysis for amenable cyanide routinely resulted in negative values. These negative results are quite common with this method and are a result of matrix interferences. Samples are divided into two aliquots for cyanide analysis. The first aliquot is analyzed for cyanide and is reported as total cyanide. The second aliquot is pretreated with calcium hypochlorite and also submitted for cyanide analysis. The cyanide result for the pretreated aliquot minus the result for total cyanide equals the reported result for amenable cyanide. The addition of calcium hypochlorite results in reactions with thiocyanates and organometalics. These reactions will tend to elevate the cyanide result for the treated aliquot, thus causing a negative value for the calculated amenable cyanide result.

- The Blaine fineness analysis of solids was not performed because the results of the analysis would not be meaningful based on the observed grain size distribution of the sludge.

2.3.2 Field Measurements

Pond water samples were analyzed in the field for the following parameters:

- Temperature
- pH
- Specific conductance

All measurements were made by EG&G Rocky Flats personnel using equipment supplied by EG&G or another contractor.

2.4 Data Validation and Evaluation

All laboratory analytical data were subjected to the process of data validation. Formal data validation is a systematic review and evaluation of data that serves as an independent QA check of the laboratory results. It is also a means of evaluating laboratory performance and determining the impact, if any, of noncompliances on the data. Through the use of data qualifiers, validation lends interpretive guidance concerning proper usage and limitations of the data.

Data validation was conducted in accordance with the EPA "Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses" and "Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses," as applied for use within EPA Region VIII. The validation performed on the characterization samples was the same as, which would be performed on Contract Laboratory Protocol (CLP) samples.

Internal memoranda documenting the validation process were prepared and are included in Appendix B. These memoranda explain the findings of the validation process, interpret the actions taken on the data, and summarize the data qualifiers assigned. The results of the validation process have been entered into the database in Appendix A.

Summary tables were prepared for both water and sludge media for the ponds and the clarifier to facilitate review and interpretation of the data. These tables are included in Section 3.0. The tables include information on the frequency of positive detections within the total sample set, the range of positive detections, the mean concentration, the standard deviation, and the relative standard deviation. The presentation and interpretation of data is relatively straightforward when a given analyte is detected in all the samples. However, the situation is complicated when analytes are detected in some samples but not in others. Even though quantitation was not possible at the stated detection limit in a given sample, it does not necessarily mean that the analyte was not present. It is possible that the analyte is present, but at a concentration less than the quantitation limit. This problem is exacerbated when the detection limits are elevated because of matrix interferences.

EPA has recognized this problem, especially where analytical data are used as the basis for quantitative risk assessments. Current guidance (USEPA, 1989) calls for assigning a value of one half the detection limit to nondetect samples for statistical analysis. This is not a perfect solution, and it can produce apparent inconsistencies in the data. For instance, it is possible for a mean concentration to be higher than the maximum quantitated value. This can result when elevated detection limits result in a nondetect value reported by the laboratory, but one half the detection limit being higher than any of the positive quantitations. For this reason, the mean, standard deviation, and the relative standard deviation must be evaluated with consideration of the frequency of detection and the detection limits of nondetect analyses. The database in Appendix A includes the quantitation limits for all nondetect analyses.

TABLE 2-1

SAMPLE COLLECTION SUMMARY - POND WATERS
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

POND	SAMPLE NUMBER	SAMPLE DESCRIPTION	DATE SAMPLED
207A	PW-207A-NE	Northeast Quadrant	8-19-91
	PW-207A-NW	Northwest Quadrant	8-19-91
	PW-207A-SE	Southeast Quadrant	8-19-91
	PW-207A-T	Trip Blank	8-19-91
207B-North	PW-207BN-NE	Northeast Quadrant	8-8-91
	PW-207BN-NW	Northwest Quadrant	8-8-91
	PW-207BN-SE	Southeast Quadrant	8-8-91
	PW-207BN-SW	Southwest Quadrant	8-8-91
	PW-207BN-T	Trip Blank	8-8-91
207B-Center	PW-207BC-NE	Northeast Quadrant	8-12-91
	PW-207BC-NW	Northwest Quadrant	8-12-91
	PW-207BC-SE	Southeast Quadrant	8-12-91
	PW-207BC-SW	Southwest Quadrant	8-12-91
	PW-207BC-T	Trip Blank	8-12-91
207B-South	PW-207BS-NE	Northeast Quadrant	8-15-91
	PW-207BS-NW	Northwest Quadrant	8-15-91
	PW-207BS-NW-D	Northwest Quadrant Duplicate	8-15-91
	PW-207BS-SE	Southeast Quadrant	8-15-91
	PW-207BS-SW	Southwest Quadrant	8-15-91
	PW-207BS-B	Rinsate Blank	8-15-91
	PW-207BS-F	Field Blank	8-15-91
	PW-207BS-T	Trip Blank	8-15-91
207C	PW-207C-NE	Northeast Quadrant	8-21-91
	PW-207C-NE-D	Northeast Quadrant Duplicate	8-21-91
	PW-207C-NW	Northwest Quadrant	8-21-91
	PW-207C-SE	Southeast Quadrant	8-21-91
	PW-207C-SW	Southwest Quadrant	8-21-91
	PW-207C-B	Rinsate Blank	8-21-91
	PW-207C-F	Field Blank	8-21-91
	PW-207C-T	Trip Blank	8-21-91
Clarifier	CW-001	Sample 1	8-22-91
	CW-001-D	Sample 1 Duplicate	8-22-91
	CW-002	Sample 2	8-22-91
	CW-003	Sample 3	8-22-91
	CW-000-B	Rinsate Blank	8-22-91
	CW-000-F	Field Blank	8-22-91
	CW-000-T	Trip Blank	8-22-91

TABLE 2-2

SAMPLE COLLECTION SUMMARY - POND SLUDGES
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

POND	SAMPLE NUMBER	SAMPLE DESCRIPTION	DATE SAMPLED
207A	PS-207A-NE	Northeast Quadrant	8-19-91
207B-North	PS-207BN-NE	Northeast Quadrant	8-8-91
	PS-207BN-NW	Northwest Quadrant	8-8-91
	PS-207BN-SE	Southeast Quadrant	8-8-91
	PS-207BN-SW	Southwest Quadrant	8-8-91
	PS-207BN-T	Trip Blank	8-8-91
207B-Center	PS-207BC-NE	Northeast Quadrant	8-12-91
	PS-207BC-NW	Northwest Quadrant	8-12-91
	PS-207BC-SE	Southeast Quadrant	8-12-91
	PS-207BC-SW	Southwest Quadrant	8-12-91
	PS-207BC-T	Trip Blank	8-12-91
207B-South	PS-207BS-NE	Northeast Quadrant	8-19-91
	PS-207BS-NW	Northwest Quadrant	8-19-91
	PS-207BS-NW-D	Northwest Quadrant Duplicate	8-19-91
	PS-207BS-SE	Southeast Quadrant	8-19-91
	PS-207BS-SW	Southwest Quadrant	8-19-91
	PS-207BS-B	Rinsate Blank	8-19-91
	PS-207BS-F	Field Blank	8-19-91
	PS-207BS-T	Trip Blank	8-19-91
207C	PS-207C-NW	Northwest Quadrant	8-22-91
	PS-207C-NW-D	Northwest Quadrant Duplicate	8-22-91
	PS-207C-SW	Southwest Quadrant	8-23-91
	PS-207C-C	Pond Sludge Composite	8-23-91
	PS-207C-CB	Pond Sludge Berm Composite	8-23-91
	PS-207C-B	Rinsate Blank	8-23-91
	PS-207C-F	Field Blank	8-23-91
	PS-207C-T	Trip Blank	8-23-91
Clarifier	CS-001	Sample 1	8-22-91
	CS-001-D	Sample 1 Duplicate	8-22-91
	CS-002	Sample 2	8-22-91
	CS-003	Sample 3	8-22-91
	CS-000-B	Rinsate Blank	8-22-91
	CS-000-F	Field Blank	8-22-91
	CS-000-T	Trip Blank	8-22-91

TABLE 2-3

SUMMARY OF ANALYTICAL PROGRAM
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

Matrix	Analysis	Target Detection Limit	Analytical Method	DQO Level (1)
Sludges	**Chemical Characterization**			
	• Selected VOAs(2)	Per Method	SW 8240	IV
	• Selected Semivolatiles(2)	Per Method	SW 8270	IV
	• Selected Alcohols(2)	Per Method	ASTM D3695-82	IV
	• Cyanide (total and ammenable)	Per Method	ASTM D2036	IV
	• Arsenic	Per Method	SW 3050/6010	IV
	• Barium	Per Method	SW 3050/6010	IV
	• Boron	Per Method	SW 3050/6010	IV
	• Cadmium	Per Method	SW 3050/6010	IV
	• Chromium (Total)	Per Method	SW 3050/6010	IV
	• Lead	Per Method	SW 3050/6010	IV
	• Magnesium	Per Method	SW 3050/6010	IV
	• Nickel	Per Method	SW 3050/6010	IV
	• Potassium	Per Method	SW 3050/6010	IV
	• Selenium	Per Method	SW 3050/6010	IV
	• Silver	Per Method	SW 3050/6010	IV
	• Sodium	Per Method	SW 3050/6010	IV
	• Mercury	Per Method	SW 7471	IV
	• Ammonia	1 mg/Kg	EPA 350.2	III
	• TCLP (As,Ba,Cd,Cr,Pb,Hg,Ni,Se,Ag,pH)	Per Method	SW 1311(3)	IV
	• pH	NA	SW 9045	III
	• ASTM Leach	---	ASTM D3987-85	III
	- Phosphorus, Total (as P)	0.01 mg/L	EPA 365.2	III
	- Sulfate	1.0 mg/L	EPA 375.4	III
	- Nitrate	0.1 mg/L	EPA 352.2	III
	- Chloride	2 mg/L	EPA 325.3	III
	- TDS	1 mg/L	EPA 160.1	III
	- % Recovery of Solids	NA	NA	III
	• Total Organic Carbon (TOC)	1 mg/Kg	Walkley-Black	III
	Geotechnical Parameters			
	• Moisture - Karl Fisher Method	N/A	ASTM E203-75	III
	• Moisture - Gravimetric Method	N/A	ASTM 209F	III
	• Bulk Density	N/A	AGRONOMY NO. 9 CHAPT. 30	III
	• Specific Gravity	N/A	ASTM D854/D1429	III
	• Atterberg Limits	N/A	ASTM D4318	III
	• Particle Size	N/A	ASTM D436-849	III
	• Swell Test	N/A	Free Swell Test (Holtz & Gibbs, 1956)	III

TABLE 2-3
SUMMARY OF ANALYTICAL PROGRAM
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO
PAGE 2 OF 3

Matrix	Analysis	Target Detection Limit	Analytical Method	DQO Level (1)
Sludge (Continued)	**Rad Parameters**			
	• Gross Alpha & Gross Beta	N/A	SW 3050/ EPA 900.0	III
Waters	**Chemical Characterization**			
	• Selected VOAs(2)	Per Method	SW 8240	IV
	• Selected Semivolatiles(2)	Per Method	SW 8270	IV
	• Selected Alcohols(2)	Per Method	ASTM D3695-82	IV
	• Arsenic	Per Method	SW 3010/6010	IV
	• Barium	Per Method	SW 3010/6010	IV
	• Boron	Per Method	SW 3010/6010	IV
	• Cadmium	Per Method	SW 3010/6010	IV
	• Calcium	Per Method	SW 3010/6010	IV
	• Chromium (Total)	Per Method	SW 3010/6010	IV
	• Lead	Per Method	SW 3010/6010	IV
	• Magnesium	Per Method	SW 3010/6010	IV
	• Nickel	Per Method	SW 3010/6010	IV
	• Selenium	Per Method	SW 3010/6010	IV
	• Silver	Per Method	SW 3010/6010	IV
	• Potassium	Per Method	SW 3010/6010	IV
	• Sodium	Per Method	SW 3010/6010	IV
	• Mercury	Per Method	SW 7470	IV
	• Cyanide (Total and amenable)	Per Method	ASTM D2036	IV
	• TCLP (As,Ba,Cd,Cr,Pb,Hg,Ni,Se,Ag,pH)	Per Method	SW 1311(3)	IV
	• Phosphorus, Total (as P)	0.01 mg/L	EPA 365.2	III
	• Sulfate	1.0 mg/L	EPA 375.4	III
	• Nitrate	0.1 mg/L	EPA 352.2	III
	• Chloride	2 mg/L	EPA 325.3	III
	• Ammonia	0.1 mg/L	EPA 350.3	III
	• Total Dissolved Solids (TDS)	1 mg/L	EPA 160.1	III
	• Total Suspended Solids (TSS)	1 mg/L	EPA 160.2	III
	• pH	---	EPA 150.1	III
	• Total Organic Carbon (TOC)	1 mg/L	EPA 415.1	III
	• Alkalinity (phenolphthalein)	1 mg/L	SM 403	III
	• Alkalinity (methyl orange)	1 mg/L	SM 403	III
	• Specific Gravity	---	ASTM D1429	III
	Rad Parameters			
	• Gross Alpha & Gross Beta	N/A	EPA 900	III

TABLE 2-3
SUMMARY OF ANALYTICAL PROGRAM
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO
PAGE 3 OF 3

(1) Deliverables for DQO Level IV parameters are as close to CLP as possible. Deliverables for DQO Level III parameters include signed and dated chain-of-custody forms, calculations, copies of analyst logbooks, and data summaries.

(2) F001, F002, F003, and F005 (spent solvents) Land Disposal Restriction (LDR) analytes.

Select VOAs	Select Semivolatiles	Select Alcohols
Tetrachloroethylene	Cyclohexanone	N-butyl Alcohol
Trichloroethylene	Pyridine	Methanol
Methylene Chloride	2-Nitropropane	Isobutanol
1,1,1-Trichloroethane	1,2-Dichlorobenzene	2-Ethoxyethanol
Carbon Tetrachloride		
Chlorobenzene		
1,1,2-Trichloro-1,2,2-Trifluoroethane		
Trichlorofluoromethane		
1,1,2-Trichloroethane		
Xylene		
Acetone		
Ethyl Acetate		
Ethylbenzene		
Ethyl Ether		
Methyl Isobutyl Ketone		
Toluene		
Methyl Ethyl Ketone		
Carbon Disulfide		
Benzene		

(3) Extraction was done as per SW 1311.

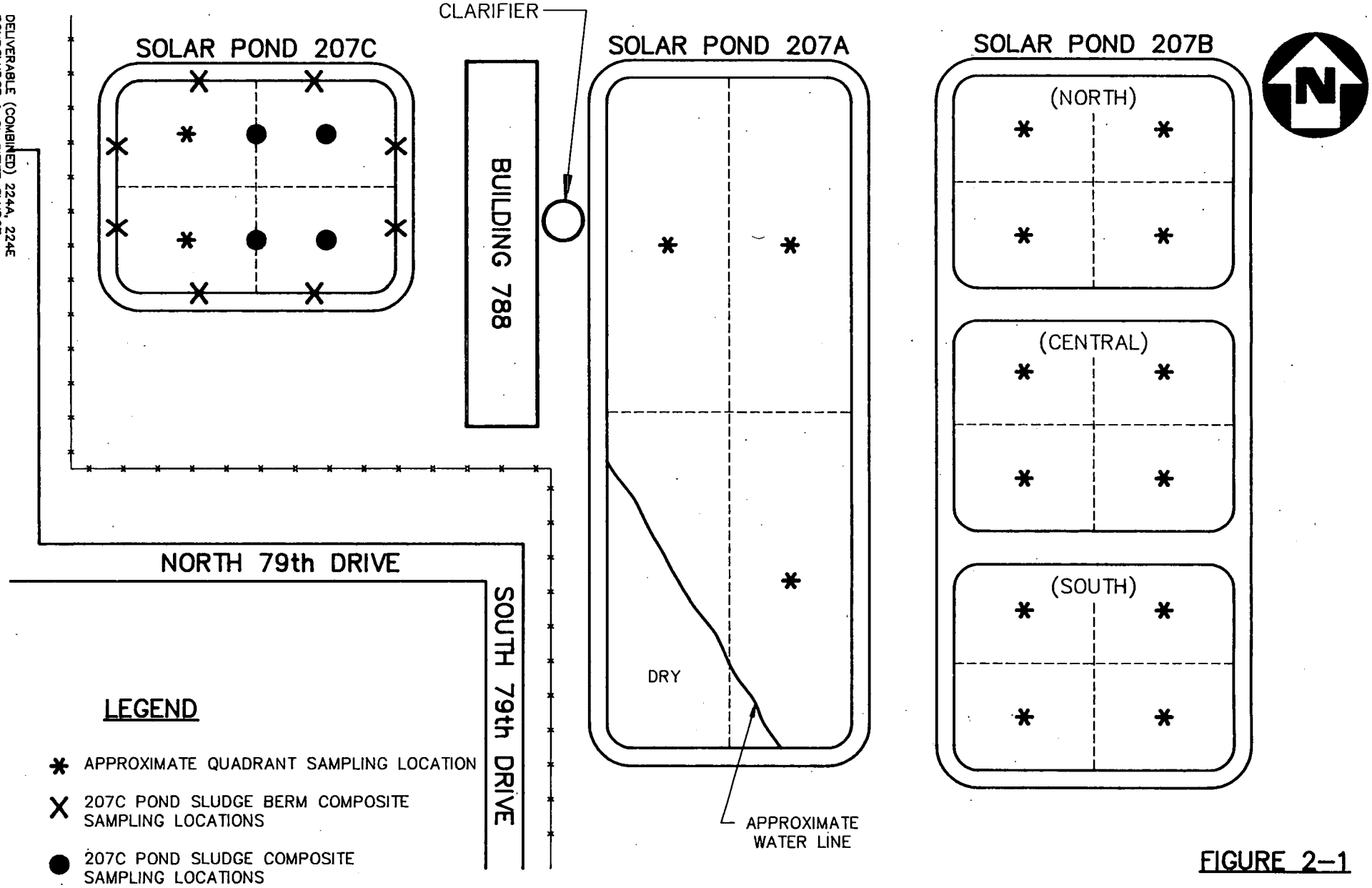

FIGURE 2-1

SOLAR POND SAMPLING LOCATIONS
ROCKY FLATS PLANT, COLORADO
NOT TO SCALE

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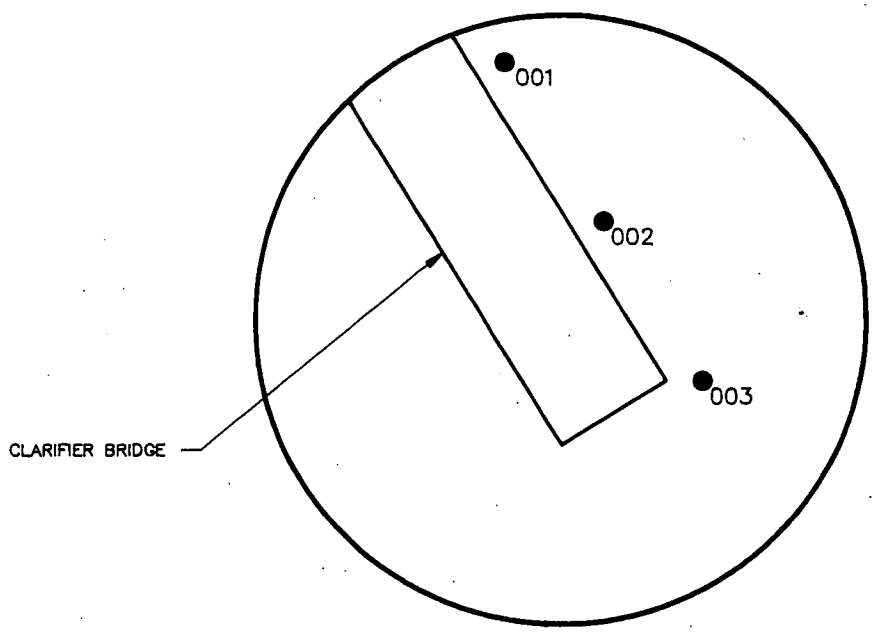

LEGEND

● APPROXIMATE CLARIFIER SAMPLING LOCATION

FIGURE 2-2

CALRIFIER SAMPLING LOCATIONS
ROCKY FLATS PLANT, COLORADO
NOT TO SCALE

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3.0 ANALYTICAL DATA EVALUATION

3.1 Field Measurements

As part of the field sampling activities for pond waters, field measurements of pH, temperature, and specific conductance were collected. These data are summarized in Table 3-1. Because of equipment problems, data for Pond 207B-North were not collected. The field data are discussed in detail for each pond in the following sections.

3.2 Pond 207A

3.2.1 Water

Only three aqueous samples were collected from Pond 207A, from the northwest, southwest, and northeast quadrants. Because of the low water level in the pond, a sample could not be collected from the southwest quadrant. In general, the three water samples show little variability, and the pond water appears to be less contaminated than the water from the other ponds and the clarifier.

The pH of the pond water is approximately 9.8, based on field measurements. The water was yellow in color with low turbidity. The specific conductance of the water is approximately 9000 μmho/cm, which is less than the specific conductance for the other ponds and the clarifier. The water temperature at the time of sampling was 25°C (77°F).

No target volatile organics, semi-volatile organics, or alcohols were detected in the samples. Table 3-2 summarizes the laboratory analytical data for Pond 207A waters.

The inorganic analyses show the predominant cations to be sodium, potassium, and magnesium. However, sodium, which was detected at the highest concentration, was detected at a concentration of less than 0.2 percent by weight, indicating a relatively low salt content when compared to Pond 207C (refer to Table 3-10). Arsenic (205 μg/l), barium (139 μg/l), boron (1430 μg/l), and chromium (44 μg/l) were detected in all three samples at the average concentrations noted. Lead, mercury, nickel, selenium, and silver were not detected in any of the samples. Cadmium was detected in only one sample, at 5 μg/l, which was the detection limit for the sample. The metals analyses showed little variability between quadrants, as indicated by the low relative standard deviations shown on Table 3-2.

TCLP leach data show positive detections for only arsenic (238 μg/l average) and silver (one positive detection at 6 μg/l). It is interesting to note that the arsenic was detected at concentrations equal to or greater than the concentrations in the raw water. Because the pond liquid contained less than 0.5 percent solids, the method (SW 1311) specifies that the liquid be filtered and the filtrate analyzed for the metals of interest. The data indicates that all the arsenic is soluble at the ambient pH. No LDR standards were exceeded, nor were the TCLP standards for classifying the waters as RCRA hazardous waste based on the characteristic of toxicity.

Total cyanide was detected in all three samples, but at concentrations less than 1 mg/l. The concentrations of ammonia and phosphorus were also negligible. Total dissolved solids averaged 7800 mg/l and nitrate, the predominant anion averaged 980 mg/l. The average TOC concentration was 69 mg/l, indicating low organic content in the aqueous phase.

3.2.2 Sludge

Very little sludge was present in Pond 207A, resulting in only one sample being obtained from a pump sump located in the northeast corner of the pond. These analytical data are summarized in Table 3-3.

Four of the target volatile organics were detected in the sample, with PCE (290 μg/kg) and 1,1,2-trichloro-1,2,2-trifluoroethane (260 μg/kg) at the highest concentrations. No target semivolatile organics or alcohols were detected.

Metals detected in the sludge sample included arsenic (40.2 mg/kg), barium (210 mg/kg), boron (84.3 mg/kg), cadmium (1300 mg/kg), chromium (658 mg/kg), lead (89 mg/kg), and nickel (102 mg/kg). Predominant cations include sodium and magnesium, both at greater than 1 percent by weight. An elevated detection limit for potassium resulted in no detection for this compound. Only arsenic, barium, and cadmium were detected in the TCLP leachate. The cadmium leachate concentration (485 μg/l) exceeded the LDR standard of 66 μg/l for electroplating wastes (F006, F007, and F009).

The sludge sample contained 12.7 percent solids. Significant organics were present, as indicated by the TOC value of 14,000 mg/kg. Low concentrations of ammonia and total cyanide were detected. The majority of geotechnical analyses following the revised methods to account for salt content have not been completed.

3.3 Pond 207B-North

3.3.1 Water

Four water samples were collected from Pond 207B-North, one from each quadrant. The samples were visually described as being clear with low turbidity. No measurements of pH, specific conductance, or temperature were made because of equipment problems. However, the laboratory pH ranged from 8.3 to 8.5, which is the lowest of all the ponds. Laboratory analytical data are summarized in Table 3-4.

No target volatile organics, semivolatile organics, or alcohols were detected.

Metals detected in all four samples include barium and boron. Arsenic was detected in three out of four samples, chromium in two, and selenium in only one. Cadmium, lead, mercury, nickel, and silver were not detected in any of the samples. Predominant cations include sodium, calcium, magnesium, and potassium, all below 400 mg/l. Only barium was detected in all four TCLP analyses. Chromium was detected in one TCLP analysis. Again, because the sample was low

in solids, the TCLP analysis constituted analysis of the water following filtration. The TCLP metals analysis therefore represents the soluble metals concentrations at the ambient pH. It should be noted that the TCLP analysis for arsenic was rejected during data validation. No LDR standards were exceeded, nor were the TCLP standards for classifying the waters as RCRA hazardous waste based on the characteristic of toxicity.

The pond water contained very low levels of total cyanide (average 0.03 mg/l) and ammonia (average 0.4 mg/l). The TDS averaged 2800 mg/l, while the organic content, as measured by TOC, averaged 36 mg/l. The average concentrations of chloride, nitrate, and sulfate were all relatively low at 98 mg/l, 320 mg/l, and 130 mg/l, respectively.

3.3.2 Sludge

Four sludge samples were collected in Pond 207B-North, one from each quadrant. The sludge was more concentrated than the sludges from the other ponds, averaging 24.9 percent solids. This is approximately twice the solids content of the sludges from the other ponds. Laboratory analytical data are summarized in Table 3-5.

No target volatile organics, semivolatile organics, or alcohols were detected in the sludge.

Barium, chromium, and lead were the only metals of concern detected in all four samples. Cadmium was detected in three samples, while mercury and nickel were detected in two samples. Boron was detected in only one of the four samples. Arsenic, selenium, and silver were not detected in any of the samples. Magnesium is the predominant cation present in the sludge. Neither potassium nor sodium were detected, although both had relatively high detection limits. Barium and cadmium were detected in the TCLP leachates from all four samples, while chromium and nickel were detected in three of the leachates. TCLP arsenic data were rejected during data validation. No LDR standards were exceeded, nor were the TCLP standards for classifying the sludges as RCRA hazardous waste based on the characteristic of toxicity.

Total cyanide was not detected in any of the sludge samples, while an average of 22 mg/kg ammonia was detected. TOC averaged 3200 mg/kg. The dried solids showed a slight tendency to swell (0-10 percent) following immersion in water. The Atterberg data indicate that the sludge can be identified as having engineering properties similar to organic and/or inorganic clays with medium to high placticity.

3.4 Pond 207B-Center

3.4.1 Water

Four water samples, one from each quadrant, were collected from Pond 207B-Center. The water was dark blue as a result of the addition of dye to enhance evaporation, with low turbidity. The pH, as measured in the field, was

approximately 9.0. The specific conductance ranged from 13,500 to 15,000 μmho/cm. The temperature of the samples reported in the field was 15.5°C (59.9°F), but this appears to be an anomalous value since the temperatures in the other ponds was approximately 10 C warmer. The field data are summarized in Table 3-1, while the laboratory analytical data are summarized in Table 3-6.

No target volatile organics, semivolatile organics, or alcohols were detected in the water samples.

Arsenic, barium, boron, chromium, and nickel were detected in all four samples. Selenium was detected in only one of the samples. Cadmium, lead, mercury, and silver were not detected in any of the samples. Sodium was the predominant cation, at an average concentration of approximately 0.3 percent. Potassium, magnesium, and calcium were detected at lesser concentrations.

Because of the low solids content of the waters, the TCLP analysis for metals was performed on the liquid following filtration without pH adjustment. As with the other pond water TCLP analyses, the TCLP metals data therefore represents the analysis of soluble metals. Arsenic was the only metal detected in all four TCLP leachates, again showing the solubility of this compound at the ambient alkaline pH of the pond water. Chromium and nickel were detected in three of the leachates, barium in two, and cadmium in one. None of the values were above regulatory standards.

Low levels of total cyanide (average 0.4 mg/l) and ammonia (average 0.3 mg/l) were detected. The TDS of the waters was 1.6 percent, with the predominant anions being nitrates and sulfates. The TOC of the waters averaged 155 mg/l, and the low TSS values (average of 9 mg/l) confirmed the observation of low turbidity made in the field.

3.4.2 Sludge

Four samples of sludge, one from each quadrant, were collected from Pond 207B-Center. The sludge averaged 8.7 percent solids, less than the concentration in Pond 207B-North (refer to Table 3-5), but comparable to the solids concentration in Pond 207B-South (refer to Table 3-9). Table 3-7 summarizes the laboratory analytical data for the sludge from Pond 207B-Center.

Tetrachloroethene (PCE) was detected in two of the four samples at 37 and 180 μg/kg. No other volatile organics were detected. No target semivolatile organics or alcohols were detected.

Barium and cadmium were detected in all four sludge samples. Chromium was detected in three of the samples, while boron and mercury were each detected in one sample. Arsenic, lead, nickel, selenium, and silver were not detected in any of the samples. It should be noted that arsenic was detected in the TCLP leachate from the samples, therefore there had to be arsenic present in the sludge at concentrations less than the detection limit (i.e., the detection limit for arsenic in sludge is higher than for arsenic in the TCLP leachate). The TCLP leachate also contained barium, cadmium, and chromium from all four samples.

Nickel was also detected in the leachate from one sample. The cadmium leached at a level exceeding the LDR standard.

Low levels (average 0.64 mg/kg) of total cyanide were detected in all four samples. Ammonia was present at an average concentration of 43 mg/kg. The average concentration of TOC was 7400 mg/kg, indicating a high organic content in the sludge.

The dry solids swelled 60-70 percent when wetted, significantly higher than the swelling noted for solids from Pond 207B-North. The Atterberg data indicate that the sludge can be identified as having engineering properties similar to organic clays and silts with medium to high placticity.

3.5 Pond 207B-South

3.5.1 Water

Five water samples were collected from Pond 207B-South, one from each quadrant plus a duplicate from the northwest quadrant. The water was blue in color due the addition of dye to enhance solar evaporation, and had low turbidity. The pH of the water was approximately 9.0, as measured in the field. The specific conductance was 17,000-18,000 μmho/cm, slightly higher than that of Pond 207B-Center (refer to Table 3-6). The water temperature at the time of sampling was 25°C (77°F). Field data are summarized in Table 3-1. Laboratory analytical data are summarized in Table 3-8.

No target volatile organics, semivolatile organics, or alcohols were detected in any of the samples.

Arsenic, barium, and boron were detected in all five samples, while chromium and nickel were detected in three out of five samples. Cadmium, lead, mercury, selenium, and silver were not detected in any of the samples. Sodium was the predominant cation (average concentration of approximately 0.24 percent), with lesser amounts of potassium, magnesium, and calcium. In the TCLP leachate, arsenic and barium were the only metals detected in all five samples. Nickel was detected in three sample leachates, while chromium was detected in two. No LDR standards were exceeded, nor were the TCLP standards for classifying the waters as RCRA hazardous waste based on the characteristic of toxicity. As with the other pond waters, the TCLP analysis for metals is essentially the analysis of soluble metals, since the method specifies the analysis of the liquid without extraction, following filtering, for samples with less than 0.5 percent solids. The data show that most, if not all, arsenic and barium are soluble at the ambient pH of the pond. The chromium and nickel in the TCLP leachate, although not detected in all samples, was detected at concentrations similar to the detections in the unfiltered samples, also indicating that these metals are highly soluble at pH 9.

Low levels of ammonia (0.6 mg/l average) and total cyanide (0.29 mg/l average) were detected in the pond water. Dissolved solids averaged 1.5 percent, while the organic content was relatively low, as measured by TOC (92 mg/l average).

The suspended solids concentration was also low (22 mg/l average), confirming the visual observation of low turbidity.

3.5.2 Sludge

Five sludge samples were also collected from Pond 207B-South, one from each quadrant and a duplicate from the northwest quadrant. Table 3-9 summarizes the laboratory analytical data for Pond 207B-South sludge. The sludge averaged 9.8 percent solids, similar to the solids concentration in Pond A (refer to Table 3-3) and Pond 207B-Center (refer to Table 3-7).

Two target volatile organics were detected in the sludge, tetrachloroethene (PCE) in all five samples, and trichloroethene (TCE) in three of five samples. No target semivolatiles or alcohols were detected.

Barium, cadmium, and chromium were detected in all five samples. Boron was detected in two samples, while arsenic, lead, and mercury were each detected in only one sample. Nickel, selenium, and silver were not detected in any samples. Arsenic, barium, cadmium, and chromium were detected in all five TCLP leachate samples. None were at concentrations exceeding LDR standards or sufficient to classify the sludge as hazardous based on the characteristic of toxicity.

Total cyanide was detected in all samples at an average concentration of 1.3 mg/l. TOC averaged 8600 mg/l, indicating a significant organic content in the sludge. Geotechnical analyses using revised methodology to account for the salt content of the waste have not yet been completed.

3.6 Pond 207C

3.6.1 Water

Five water samples were collected from Pond 207C, one from each quadrant and a duplicate sample from the northeast quadrant. The pond water was a golden color, with a few black flecks noted in what was otherwise described as a low turbidity liquid. The pH of the water was approximately 10.2, the highest of all the ponds. The specific conductance of the water was off the scale of the monitoring instrument, greater than 50,000 umho/cm. The pond water temperature at the time of sampling was 25°C (77°F). Field data are summarized in Table 3-1. Laboratory analytical data are summarized in Table 3-10.

Two target volatile organics were detected in the 207C pond water. 2-Butanone (Methyl ethyl ketone) was detected in four of the five samples. All four of the detected values were greater than the land disposal restriction standard for the compound. Methylene chloride was detected in only one of the samples. No target semivolatile organics or alcohols were detected in any of the samples.

In general, the concentrations of inorganics in Pond 207C water were higher than those in the other ponds. Arsenic, barium, boron, cadmium, chromium, and nickel were detected in all five water samples. Lead and selenium were each detected in two of the samples. Chromium, lead, and nickel were at concentrations that

exceed the LDR standards for those compounds. Sodium (average 13.8 percent) and potassium (average 5.58 percent) were both detected at percent levels in the Pond 207C water, confirming the high salt content in the water and consistent with the high TDS levels (average 46 percent) in the water. Five metals were detected in all five of the TCLP leachates; arsenic, cadmium, chromium, nickel, and silver. Again, the TCLP method for a liquid with less than 0.5 percent solids specifies analysis of the liquid following filtration, in essence making the TCLP leachate representative of the dissolved metals fraction. It should be noted that silver was detected in the TCLP leachate, but not in the total inorganic analysis. This appears to be because of a slightly higher detection limit for the total analysis, which masks the presence of silver at the levels detected in the TCLP leachate, which had a lower detection limit. It is also noted that the maximum concentrations of arsenic, chromium, and nickel in the TCLP leachate were higher than the maximum concentrations detected in the total inorganic analysis, which is opposite of what should be expected based on an understanding of the analytical methodology.

The water in Pond 207C had much higher alkalinity than the other ponds, consistent with the higher pH. As mentioned earlier, the TDS in the pond water averaged 46 percent. The organic content was also relatively high, as measured by TOC (average 1400 mg/l). Total cyanide concentrations ranged from 3.3 to 20 mg/l, with all values exceeding the LDR standard. Anion concentrations were in the percent level, including nitrate (6.2 percent average), chloride (2.3 percent average), and sulfate (1.7 percent average). The average specific gravity of the water was the highest of all the ponds at 1.332, indicative of the high dissolved salt content.

3.6.2 Sludge

The five sludge samples collected in Pond 207C included two quadrant-specific samples plus one duplicate, a composite from the eastern portion of the pond where there was insufficient sludge to collect quadrant-specific samples, and a composite of sludge from the berms above the water line. The sludges represent a mixture of the crystalline material and the fine-grained material that underlies the crystals, although not in any measured proportion. Analytical data for Pond 207C sludge are summarized in Table 3-11.

Five of the target volatile organics were detected in the sludge samples. Tetrachloroethene (PCE) and 2-Butanone (MEK) were detected in all five samples. Benzene and trichloroethene (TCE) were detected in two of the samples, while 1,1,2-trichloro-1,2,2-trifluoroethane was detected in one sample. None were at concentrations of regulatory concern. No target semivolatile compounds were detected. Pyrene, a semivolatile that was quantitated because it is used as a standard, was detected in two of the samples. No target alcohols were detected.

All metal analytes, with the exception of selenium, were detected in all five sludge samples. The concentrations of boron, cadmium, chromium, lead, mercury, nickel, and silver were significantly higher than the concentrations in the other pond sludges. Arsenic, cadmium, chromium, nickel, and silver were detected in all five TCLP leachates. Barium was detected in three, lead in two, and mercury in one TCLP leachate. The leachate concentrations of cadmium and nickel exceeded

their respective LDR standards, and cadmium leached at a concentration sufficient to classify the sludge as a RCRA waste based on the characteristic of toxicity.

The concentration of total cyanide in the sludge ranged from 13 to 170 mg/kg, considerably higher than the other pond sludges, but still below the LDR standard of 590 mg/kg. Amenable cyanide was not run on these samples, but will be run on the treatability study samples received at a later date.

The moisture analysis of the sludge indicates an average solids content of 66 percent. However, because of the unique crystalline nature of a portion of the sludge, a revised method that accounts for this possible interference will be conducted along with the other geotechnical analyses that have not yet been completed.

3.7 Clarifier

3.7.1 Water

Four aqueous samples, one of which was a duplicate, were collected from the clarifier. All samples were collected from the clarifier bridge that extended from the side of the clarifier to the center. The sample locations were spaced evenly along the length of the bridge. The water samples were yellow/green in color, with a few black solids noted. Otherwise, the samples were relatively clear with low turbidity. The pH of the ponds was approximately 10 to 10.2, which is higher than the A and B ponds, and similar to the pH of Pond 207C. The specific conductance ranged from 30,000 to 40,000 umho/cm, which is again higher than that of the A and B ponds, but less than the value for Pond 207C. The temperature at the time of sampling was 27.9°C (82.2°F), which was slightly higher than the temperature of the ponds.

No target volatile organics, semivolatile organics, or alcohols were detected in the clarifier water. Table 3-12 summarizes the laboratory analytical data for clarifier water.

The clarifier water contained considerable amounts of inorganic contaminants. Arsenic, barium, boron, cadmium, chromium, mercury, nickel, and silver were detected in all four samples. Of these, cadmium and chromium showed the widest range of concentrations. Lead was detected in two of the four samples. Sodium was the predominant cation, at an average concentration of approximately 1.2 percent. Potassium and magnesium were detected at lesser concentrations. In the TCLP leachate, only arsenic was detected in all four samples. It is noted that the concentration in the leachate is significantly higher than the concentration of the raw water, even though the TCLP analysis involved simply the analysis of the water following filtration. Nickel was detected in three of the four leachates, at concentrations approximating those detected in the raw water analysis. This indicates that the nickel is highly soluble at the natural pH of the pond. Chromium was detected in two of the leachates.

Total cyanide was detected in the water at concentrations ranging from 2.4 to 3 mg/l, exceeding the lowest LDR standard of 1.2 mg/l. All the calculated

amenable cyanide values were negative. Ammonia was detected in all four samples at concentrations ranging from 5 to 14 mg/l. The organic content of the water averaged 165 mg/l TOC. The TDS had an average concentration of 5.9 percent. Nitrate was the anion detected at the highest average concentration (7300 mg/l).

3.7.2 Sludge

Three sludge samples plus one duplicate were collected from the clarifier, at approximately the same locations as the water samples. Analytical data for the clarifier sludge samples are summarized in Table 3-13. The sludge had a relatively high solids content, averaging 39.4 percent solids. However, it should be noted that this includes an apparent high value of 66.9 percent solids for sample CS-001D. When this value is excluded, the average solids concentration drops to 30.2 percent.

Four target volatile organics were detected in the sludge; 1,1,1-trichloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane, 2-butanone, and tetrachloroethene (PCE). Of these, only PCE is of a regulatory concern. PCE was detected in one sludge sample at a concentration of 1000 μg/kg, which could potentially leach from the sample at a concentration exceeding the LDR standard of 50 μg/l in the TCLP zero headspace extract. This is based on the conservative assumption that all the PCE will leach following the 20:1 dilution called for in the method.

The clarifier sludge, in general, contained heavy metals in concentrations equal to or greater than the sludges from the ponds. All of the target inorganics were detected in all four of the samples, with the exception of arsenic, which was detected in only two of the samples, and selenium, which was not detected. The highest values in any of the sludges for the following constituents were found in samples from the clarifier; cadmium (4660 mg/kg), chromium (3190 mg/kg), lead (191 mg/kg), mercury (14 mg/kg), nickel (902 mg/kg), and silver (166 mg/kg).

Four metals, arsenic, cadmium, chromium, and nickel, were detedted in the TCLP leachate in all four samples. Cadmium and nickel exceeded their respective LDR standards, while cadmium also exceeded the TCLP standard for classifying the sludge as a hazardous waste based on the characteristic of toxicity. Silver, barium, lead, and mercury were also detected in some of the leachate samples.

Total cyanide was detected in all four samples at concentrations ranging from 21 to 190 mg/kg. These concentrations are still below the LDR standard of 590 mg/kg. Ammonia was also detected in all four samples at concentrations generally equal to or greater than the concentrations in the pond sludges. The TOC of the sludge averaged 5175 mg/kg, which is in the range of the other sludges and indicates a significant organic content.

TABLE 3-1

FIELD DATA SUMMARY - POND WATER
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

POND	QUADRANT	DATE	pH UNITS	TEMPERATURE (^{0}C)	SPECIFIC CONDUCTANCE (umho/cm)	VISUAL OBSERVATION
207A	NE	8/19/91	9.73	25	9500	Yellow, clear, low turbidity
	NW	8/19/91	9.82	25	8500	
	SE	8/19/91	9.83	25	9000	
207B-North	NE	8/8/91	--	--	--	Clear, low turbidity
	NW	8/8/91	--	--	--	
	SE	8/8/91	--	--	--	
	SW	8/8/91	--	--	--	
207B-Center	NE	8/12/91	9.04	15.5*	14,500	Blue, low turbidity
	NW	8/12/91	9.03	15.5*	13,500	
	SE	8/12/91	9.04	15.5*	15,000	
	SW	8/12/91	9.04	15.5*	15,000	
207B-South	NE	8/15/91	9.09	25.0	17,000	Blue, clear, low turbidity
	NW	8/15/91	9.07	25.0	17,000	
	SE	8/15/91	9.08	25.0	18,000	
	SW	8/15/91	9.03	25.1	17,000	
207C	NE	8/21/91	--	--	--	Golden, clear, low turbidity with a few black flecks
	NW	8/21/91	10.22	25.0	>50,000	
	SE	8/21/91	10.19	25.0	>50,000	
	SW	8/21/91	10.24	25.0	>50,000	
Clarifier	1	8/22/91	10.22	27.9	33,000	Yellow/green with a few black flecks. Fairly clear, low turbidity.
	2	8/22/91	9.98	27.9	40,000	
	3	8/22/91	10.19	27.9	30,000	

* Possible anomalous result
-- No data
> Greater than
umho/cm - micromhos per centimeter

TABLE 3-2

SUMMARY OF POND WATER CHARACTERIZATION DATA - POND 207A
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
VOLATILES(2)	ug/l	0/3	ND	ND	ND	ND
SEMIVOLATILES(2)	ug/l	0/3	ND	ND	ND	ND
ALCOHOLS(2)	mg/l	0/3	ND	ND	ND	ND
INORGANICS						
Arsenic	ug/l	3/3	188-224	205	18	8.8
Barium	ug/l	3/3	135-141	139	3.2	2.3
Boron	ug/l	3/3	1400-1460	1430	30	2.1
Cadmium	ug/l	1/3	5	3	1.4	43
Calcium	ug/l	0/3	ND	ND	ND	ND
Chromium	ug/l	3/3	38-49	44	5.6	13
Lead	ug/l	0/3	ND	ND	ND	ND
Magnesium	ug/l	3/3	120,000-124,000	123,000	2300	1.9
Mercury	ug/l	0/3	ND	ND	ND	ND
Nickel	ug/l	0/3	ND	ND	ND	ND
Potassium	ug/l	3/3	388,000-397,000	394,000	4900	1.2
Selenium	ug/l	0/3	ND	ND	ND	ND
Silver	ug/l	0/3	ND	ND	ND	ND
Sodium	ug/l	3/3	1,840,000-1,870,000	1,860,000	17,320	0.9
TCLP LEACH						
Arsenic	ug/l	3/3	233-246	238	6.8	2.8
Barium	ug/l	0/3	ND	ND	ND	ND
Cadmium	ug/l	R	R	R	R	R
Chromium	ug/l	0/3	ND	ND	ND	ND
Lead	ug/l	0/3	ND	ND	ND	ND
Mercury	ug/l	0/3	ND	ND	ND	ND
Nickel	ug/l	0/3	ND	ND	ND	ND
Selenium	ug/l	0/3	ND	ND	ND	ND
Silver	ug/l	1/3	6	4	1.7	43
pH	units	3/3	9.6-9.7	9.6	--	--

TABLE 3-2
SUMMARY OF POND WATER CHARACTERIZATION DATA - POND 207A
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO
PAGE 2 OF 2

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
MISCELLANEOUS						
Alkalinity (Methyl Orange)	mg/l	3/3	250	250	0.0	0.0
Alkalinity (Phenolphthalein)	mg/l	3/3	84-89	87	2.5	2.9
Ammonia	mg/l	3/3	0.3	0.3	0.0	0.0
Chloride	mg/l	3/3	380-430	400	25	6.2
Cyanide-Amenable	mg/l	0/3	(-0.79)-(-0.47)	-0.63	--	--
Cyanide-Total	mg/l	3/3	0.39-0.47	0.43	0.04	9.3
Gross Alpha	pCi/l	3/3	610-790	690	91.6	13
Gross Beta	pCi/l	3/3	1000	1000	0.0	0.0
Nitrate	mg/l	3/3	970-1000	980	17.3	1.8
pH	units	3/3	9.7	9.7	0.0	0.0
Phosphorus, Total (as P)	mg/l	3/3	0.06-0.07	0.06	0.006	9.1
Specific Gravity		3/3	1.010-1.012	1.011	0.001	0.1
Sulfate (as SO_4)	mg/l	3/3	460-510	480	26.4	0.6
TDS (Total Dissolved Solids)	mg/l	3/3	7600-7900	7800	153	2.0
TOC (Total Organic Carbon)	mg/l	3/3	68-70	69	1.0	1.4
TSS (Total Suspended Solids)	mg/l	3/3	14-23	19	4.6	24

ND Not Detected
R Rejected

(1) Values calculated using 1/2 detection limit for nondetects, based on guidance contained in the Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manaual (Part A). Interim Final, December 1989.

(2) Only compounds with positive detections are listed. The complete list of compounds analyzed is shown in Table 2-3. The complete database is included in Appendix A.

TABLE 3-3

SUMMARY OF POND SLUDGE CHARACTERIZATION DATA - POND 207A
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS
VOLATILES(1)			
1,1,1-Trichloroethane	ug/kg	1/1	24
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/kg	1/1	260
Tetrachloroethene (PCE)	ug/kg	1/1	290
Trichloroethene (TCE)	ug/kg	1/1	29
SEMIVOLATILES(1)	ug/kg	0/1	
ALCOHOLS(1)	mg/kg	0/1	
MISCELLANEOUS			
Ammonia	mg/kg	1/1	36
Atterberg - Liquid Limit	--	1/1	83
Atterberg - Plastic Index	--	1/1	49
Atterberg - Plastic Limit	--	1/1	34
Bulk Density (Dried Solids)	g/cc	NA	NA
Cyanide-Amenable	mg/kg	NA	NA
Cyanide-Total	mg/kg	1/1	1.6
Gross Alpha	pCi/g	1/1	570
Gross Beta	pCi/g	1/1	95
Moisture-Gravimetric	%	1/1	87.3
Moisture-Karl Fisher	%	1/1	34
pH	units	1/1	8.9
Specific Gravity	--	1/1	1.1
Swell Test	%	1/1	40
TOC (Total Organic Carbon)	mg/kg	1/1	14,000
Chloride(2)	mg/l	1/1	20
Nitrate(2)	mg/l	1/1	35
% Recovery of Solids(2)	%	1/1	11.6
Phosphorus, Total (as P)(2)	mg/l	1/1	0.1
Sulfate(2)	mg/l	1/1	20
TDS (Total Dissolved Solids)(2)	mg/l	1/1	480
INORGANICS			
Arsenic	mg/kg	1/1	40.2
Barium	mg/kg	1/1	210
Boron	mg/kg	1/1	84.3
Cadmium	mg/kg	1/1	1300
Chromium	mg/kg	1/1	658
Lead	mg/kg	1/1	89
Magnesium	mg/kg	1/1	11,400
Mercury	mg/kg	0/1	ND
Nickel	mg/kg	1/1	102
Potassium	mg/kg	0/1	ND
Selenium	mg/kg	0/1	ND
Silver	mg/kg	0/1	ND
Sodium	mg/kg	1/1	14,500
TCLP LEACH			
Arsenic	ug/l	1/1	185
Barium	ug/l	1/1	1710
Cadmium	ug/l	1/1	485
Chromium	ug/l	0/1	ND
Lead	ug/l	0/1	ND
Mercury	ug/l	0/1	ND
Nickel	ug/l	0/1	ND
Selenium	ug/l	0/1	ND
Silver	ug/l	0/1	ND
pH	units	1/1	6.1

NA Not Analyzed
pCi/g Picocuries per Gram
ND Not Detected
(1) Only compounds with positive detections are listed. The complete list of compounds analyzed is shown in Table 2-3. The complete database is included in Appendix A.
(2) Following ASTM Leach

TABLE 3-4

SUMMARY OF POND WATER CHARACTERIZATION DATA - POND 207B NORTH
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
VOLATILES(2)	ug/l	0/4	ND	ND	ND	ND
SEMIVOLATILES(2)	ug/l	0/4	ND	ND	ND	ND
ALCOHOLS(2)	mg/l	0/4	ND	ND	ND	ND
INORGANICS						
Arsenic	ug/l	3/4	60-63	51	21	41
Barium	ug/l	4/4	117-120	118	1	1
Boron	ug/l	4/4	149-171	157	10	6
Cadmium	ug/l	0/4	ND	ND	ND	ND
Calcium	ug/l	4/4	137,000-140,000	138,000	1400	1
Chromium	ug/l	2/4	10-16	9	5	58
Lead	ug/l	0/4	ND	ND	ND	ND
Magnesium	ug/l	4/4	64,800-65,900	65,200	480	0.7
Mercury	ug/l	0/4	ND	ND	ND	ND
Nickel	ug/l	0/4	ND	ND	ND	ND
Potassium	ug/l	4/4	55,700-56,400	55,900	340	0.6
Selenium	ug/l	1/4	76	42	23	55
Silver	ug/l	0/4	ND	ND	ND	ND
Sodium	ug/l	4/4	254,000-345,000	296,000	41,000	14
TCLP LEACH						
Arsenic	ug/l	R	R	R	R	R
Barium	ug/l	4/4	215-230	221	7	3
Cadmium	ug/l	0/4	ND	ND	ND	ND
Chromium	ug/l	1/4	16	8	6	71
Lead	ug/l	0/4	ND	ND	ND	ND
Mercury	ug/l	0/4	ND	ND	ND	ND
Nickel	ug/l	0/4	ND	ND	ND	ND
Selenium	ug/l	0/4	ND	ND	ND	ND
Silver	ug/l	0/4	ND	ND	ND	ND
pH	units	4/4	8.3-8.5	8.4	--	--

TABLE 3-4
SUMMARY OF POND WATER CHARACTERIZATION DATA - POND 207B NORTH
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO
PAGE 2 OF 2

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
MISCELLANEOUS						
Alkalinity (Methyl Orange)	mg/l	4/4	110	110	0.0	0.0
Alkalinity (Phenolphthalein)	mg/l	3/4	2-3	2	1	55
Ammonia	mg/l	4/4	0.3-0.5	0.4	0.1	28
Chloride	mg/l	4/4	96-100	98	1.7	2
Cyanide-Amenable	mg/l	4/4	(-0.017)-(-0.014)	-0.006	--	--
Cyanide-Total	mg/l	4/4	0.016-0.043	0.030	0.01	36
Gross Alpha	pCi/l	4/4	40-52	47	6.4	14
Gross Beta	pCi/l	4/4	75-510	290	177	61
Nitrate	mg/l	4/4	310-330	320	8	3
pH	units	4/4	8.3-8.5	8.4	--	--
Phosphorus, Total (as P)	mg/l	4/4	0.02-0.08	0.05	0.02	52
Specific Gravity	--	4/4	1.008	1.008	0.0	0.0
Sulfate (as SO_4)	mg/l	4/4	120-160	130	20	15
TDS (Total Dissolved Solids)	mg/l	4/4	2700-2800	2800	50	1.8
TOC (Total Organic Carbon)	mg/l	4/4	35-37	36	1	2.3
TSS (Total Suspended Solids)	mg/l	1/4	15	7.5	5	66

ND Not Detected
R Rejected
pCi/l Picocuries per Liter

(1) Values calculated using 1/2 detection limit for nondetects, based on guidance contained in the Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A). Interim Final, December 1989.

(2) Only compounds with positive detections are listed. The complete list of compounds analyzed is shown in Table 2-3. The complete database is included in Appendix A.

TABLE 3-5

SUMMARY OF POND SLUDGE CHARACTERIZATION DATA - POND 207B NORTH
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
VOLATILES(2)	ug/kg	0/4	ND	ND	ND	ND
SEMIVOLATILES(2)	ug/kg	0/4	ND	ND	ND	ND
ALCOHOLS(2)	mg/kg	0/4	ND	ND	ND	ND
MISCELLANEOUS						
Ammonia	mg/kg	4/4	9.8-35	22	10.4	47
Atterberg - Liquid Limit	--	4/4	71-75	73	1.7	2
Atterberg - Plastic Index	--	4/4	34-40	37	3.2	8
Atterberg - Plastic Limit	--	4/4	33-37	36	1.9	5
Bulk Density (Dried Solids)	g/cc	4/4	0.84-0.90	0.87	0.025	3
Cyanide-Amenable	mg/kg	NA	NA	NA	NA	NA
Cyanide-Total	mg/kg	0/4	ND	ND	ND	ND
Gross Alpha	pCi/g	4/4	5.2-11	8.9	2.55	29
Gross Beta	pCi/g	4/4	5.1-9.8	7.3	2.38	33
Moisture-Gravimetric	%	4/4	71.8-76.8	75.1	2.25	3
Moisture-Karl Fisher	%	4/4	23.5-27.9	25.6	1.81	7
pH	units	4/4	7.6-7.7	7.7	--	--
Specific Gravity	--	4/4	1.2	1.2	0.00	0.0
Swell Test	%	4/4	0-10	7.5	5.00	67
TOC (Total Organic Carbon)	mg/kg	4/4	3000-3400	3200	170	5
Chloride(3)	mg/l	4/4	4-24	12	8.6	71
Nitrate(3)	mg/l	4/4	1.7-9.8	6.8	3.6	53
% Recovery of Solids(3)	%	4/4	16.6-25.8	20.8	4.16	20
Phosphorus, Total (as P)(3)	mg/l	4/4	0.01-0.05	0.03	0.02	61
Sulfate(3)	mg/l	4/4	150-160	155	5.8	40
TDS (Total Dissolved Solids)(3)	mg/l	4/4	160-220	190	25.8	14
INORGANICS						
Arsenic	mg/kg	0/4	ND	ND	ND	ND
Barium	mg/kg	4/4	89.1-116	105	11.7	11
Boron	mg/kg	1/4	12.8	7.3	1.2	16
Cadmium	mg/kg	3/4	6.7-8.5	7.1	0.9	13
Chromium	mg/kg	4/4	7.9-33.3	23.2	11.9	51
Lead	mg/kg	4/4	13.8-21.3	15.8	3.6	23
Magnesium	mg/kg	4/4	3270-4160	3805	380	10
Mercury	mg/kg	2/4	0.7-0.8	0.5	0.3	72
Nickel	mg/kg	2/4	7.1-9.5	6.2	2.6	42
Potassium	mg/kg	0/4	ND	ND	ND	ND
Selenium	mg/kg	0/4	ND	ND	ND	ND
Silver	mg/kg	0/4	ND	ND	ND	ND
Sodium	mg/kg	0/4	ND	ND	ND	ND

TABLE 3-5
SUMMARY OF POND SLUDGE CHARACTERIZATION DATA - POND 207B NORTH
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO
PAGE 2 OF 2

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
TCLP LEACH						
Arsenic	ug/l	R	R	R	R	R
Barium	ug/l	4/4	1060-1210	1140	76.1	7
Cadmium	ug/l	4/4	54-104	73	21.6	29
Chromium	ug/l	3/4	10-57	22	24.2	111
Lead	ug/l	0/4	ND	ND	ND	ND
Mercury	ug/l	0/4	ND	ND	ND	ND
Nickel	ug/l	3/4	20-56	28	19.8	69
Selenium	ug/l	0/4	ND	ND	ND	ND
Silver	ug/l	0/4	ND	ND	ND	ND
pH	ug/l	4/4	5.7-5.9	5.8	0.1	2

NA Not Analyzed
ND Not Detected
pCi/g Picocuries per Gram
R Rejected

(1) Values calculated using 1/2 detection limit for nondetects, based on guidance contained in the Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A). Interim Final, December 1989.

(2) Only compounds with positive detections are listed. The complete list of compounds analyzed is shown in Table 2-3. The complete database is included in Appendix A.

(3) Following ASTM Leach

TABLE 3-6

SUMMARY OF POND WATER CHARACTERIZATION DATA - POND 207B CENTER
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
VOLATILES(2)	ug/l	0/4	ND	ND	ND	ND
SEMIVOLATILES(2)	ug/l	0/4	ND	ND	ND	ND
ALCOHOLS(2)	mg/l	0/4	ND	ND	ND	ND
INORGANICS						
Arsenic	ug/l	4/4	314-330	321	7	2.1
Barium	ug/l	4/4	68-70	69	1	1.4
Boron	ug/l	4/4	3440-3530	3480	40	1.1
Cadmium	ug/l	0/4	ND	ND	ND	ND
Calcium	ug/l	4/4	26,400-27,700	27,000	600	2.3
Chromium	ug/l	4/4	22-32	28	5	16.7
Lead	ug/l	0/4	ND	ND	ND	ND
Magnesium	ug/l	4/4	216,000-220,000	218,000	2000	0.7
Mercury	ug/l	0/4	ND	ND	ND	ND
Nickel	ug/l	4/4	28-31	29	1	4.9
Potassium	ug/l	4/4	791,000-807,000	800,000	8000	1.0
Selenium	ug/l	1/4	81	43	26	59.6
Silver	ug/l	0/4	ND	ND	ND	ND
Sodium	ug/l	4/4	2,060,000-4,060,000	3,150,000	823,000	26.1
TCLP LEACH						
Arsenic	ug/l	4/4	180-251	221	31	14.2
Barium	ug/l	2/4	214-258	162	87	53.8
Cadmium	ug/l	1/4	5	3	1	40.0
Chromium	ug/l	3/4	20-27	20	8	42.2
Lead	ug/l	0/4	ND	ND	ND	ND
Mercury	ug/l	0/4	ND	ND	ND	ND
Nickel	ug/l	3/4	21-30	24	4	17.0
Selenium	ug/l	0/4	ND	ND	ND	ND
Silver	ug/l	0/4	ND	ND	ND	ND
pH	units	4/4	9.1-9.2	9.1	--	--

TABLE 3-6
SUMMARY OF POND WATER CHARACTERIZATION DATA - POND 207B CENTER
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO
PAGE 2 OF 2

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
MISCELLANEOUS						
Alkalinity (Methyl Orange)	mg/l	4/4	1400	1400	0.0	0.0
Alkalinity (Phenolphthalein)	mg/l	4/4	230-240	235	6	2.4
Ammonia	mg/l	4/4	0.2-0.4	0.3	0.1	27.2
Chloride	mg/l	0/4	ND	ND	ND	ND
Cyanide-Amenable	mg/l	4/4	(-0.83) - (-5.3)	-1.97	--	--
Cyanide-Total	mg/l	4/4	0.34-0.57	0.40	0.12	28.9
Gross Alpha	pCi/l	4/4	1800-2300	2100	210	10.1
Gross Beta	pCi/l	4/4	2700-3000	2900	130	4.5
Nitrate	mg/l	4/4	1900-2100	2000	100	5.1
pH	units	4/4	9.1-9.2	9.1	--	--
Phosphorus, Total (as P)	mg/l	4/4	4.2	4.2	0.0	0.0
Specific Gravity	--	4/4	1.016-1.018	1.017	0.001	0.10
Sulfate (as SO_4)	mg/l	4/4	740-1000	880	109	12.4
TDS (Total Dissolved Solids)	mg/l	4/4	16,000	16,000	0.0	0.0
TOC (Total Organic Carbon)	mg/l	4/4	93-320	155	110	71.4
TSS (Total Suspended Solids)	mg/l	2/4	11-16	9	5.3	57.5

ND Not Detected
pCi/l Picocuries per Liter

(1) Values calculated using 1/2 detection limit for nondetects, based on guidance contained in the Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A). Interim Final, December 1989.

(2) Only compounds with positive detections are listed. The complete list of compounds analyzed is shown in Table 2-3. The complete database is included in Appendix A.

TABLE 3-7
SUMMARY OF POND SLUDGE CHARACTERIZATION DATA - POND 207B CENTER
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
VOLATILES(2)						
Tetrachloroethene (PCE)	ug/kg	2/4	37-180	70	73	105
SEMIVOLATILES(2)	ug/kg	0/4	ND	ND	ND	ND
ALCOHOLS(2)	mg/kg	0/4	ND	ND	ND	ND
MISCELLANEOUS						
Ammonia	mg/kg	4/4	25-58	43	14	32
Atterberg - Liquid Limit	--	4/4	77-85	83	4	5
Atterberg - Plastic Index	--	4/4	20-40	29	9	33
Atterberg - Plastic Limit	--	4/4	45-65	52	9	18
Bulk Density (Dried Solids)	g/cc	4/4	0.81-0.88	0.84	0.03	4
Cyanide-Amenable	mg/kg	NA	NA	NA	NA	NA
Cyanide-Total	mg/kg	4/4	0.34-1.3	0.64	0.45	71
Gross Alpha	pCi/g	4/4	13-19	17	3	17
Gross Beta	pCi/g	4/4	12-16	15	2	13
Moisture-Gravimetric	%	4/4	89.9-93.4	91.3	1.5	2
Moisture-Karl Fisher	%	4/4	42-53	48	5	10
pH	units	4/4	9.1-9.2	9.2	---	---
Specific Gravity	--	4/4	1.0	1.0	0.0	0.0
Swell Test	%	4/4	60-70	63	5	08
TOC (Total Organic Carbon)	mg/kg	4/4	5500-8800	7400	1500	20
Chloride(3)	mg/l	3/4	210-300	200	80	40
Nitrate(3)	mg/l	4/4	50-74	66	11	16
% Recovery of Solids(3)	%	4/4	9.3-13.7	10.5	2.2	21
Phosphorus, Total (as P)(3)	mg/l	4/4	1.4-3.9	2.1	1.1	56
Sulfate(3)	mg/l	4/4	33-90	49	28	57
TDS (Total Dissolved Solids)(3)	mg/l	4/4	670-770	740	45	6

TABLE 3-7
SUMMARY OF POND SLUDGE CHARACTERIZATION DATA - POND 207B CENTER
SOLAR POND/PONDCRETE PROJECT - ROCKY FLATS PLANT
PAGE 2 OF 2

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
INORGANICS						
Arsenic	mg/kg	0/4	ND	ND	ND	ND
Barium	mg/kg	4/4	46.5-120	82.3	30	37
Boron	mg/kg	1/4	151	84	46	55
Cadmium	mg/kg	4/4	46.5-84.4	57.9	17.9	31
Chromium	mg/kg	3/4	48.5-130	63.1	52	82
Lead	mg/kg	0/4	ND	ND	ND	ND
Magnesium	mg/kg	4/4	7,190-19,800	12,400	5,300	43
Mercury	mg/kg	1/4	5.5	1.8	2.5	141
Nickel	mg/kg	0/4	ND	ND	ND	ND
Potassium	mg/kg	3/4	10,900-15,400	10,700	4,350	41
Selenium	mg/kg	0/4	ND	ND	ND	ND
Silver	mg/kg	0/4	ND	ND	ND	ND
Sodium	mg/kg	4/4	35,200-54,200	42,000	8,400	20
TCLP LEACH						
Arsenic	ug/l	4/4	122-181	145	26	18
Barium	ug/l	4/4	2660-3690	3220	430	13
Cadmium	ug/l	4/4	114-153	136	17	12
Chromium	ug/l	4/4	11-54	34	22	65
Lead	ug/l	0/4	ND	ND	ND	ND
Mercury	ug/l	0/4	ND	ND	ND	ND
Nickel	ug/l	1/4	28	14.5	9	62
Selenium	ug/l	0/4	ND	ND	ND	ND
Silver	ug/l	0/4	ND	ND	ND	ND
pH	units	4/4	4.9-6.1	5.8	---	---

ND Not Detected
NA Not Analyzed
pCi/g Picocuries per Gram

(1) Values calculated using 1/2 detection limit for nondetects, based on guidance contained in the Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A), Interim Final, December 1989.

(2) Only compounds with positive detections are listed. The complete list of compounds analyzed is shown in Table 2-3. The complete database is included in Appendix A.

(3) Following ASTM Leach

TABLE 3-8

SUMMARY OF POND WATER CHARACTERIZATION DATA - POND 207 B SOUTH
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
VOLATILES(2)	ug/l	0/5	ND	ND	ND	ND
SEMIVOLATILES(2)	ug/l	0/5	ND	ND	ND	ND
ALCOHOLS(2)	mg/l	0/5	ND	ND	ND	ND
INORGANICS						
Arsenic	ug/l	5/5	263-276	270	6	3
Barium	ug/l	5/5	110-118	115	3	3
Boron	ug/l	5/5	2730-2800	2760	30	1
Cadmium	ug/l	0/5	ND	ND	ND	ND
Calcium	ug/l	5/5	52,000-52,700	52,400	270	0.5
Chromium	ug/l	3/5	14-21	13	8	59
Lead	ug/l	0/5	ND	ND	ND	ND
Magnesium	ug/l	5/5	187,000-190,000	188,000	1225	0.6
Mercury	ug/l	0/5	ND	ND	ND	ND
Nickel	ug/l	3/5	20-32	19	9	49
Potassium	ug/l	5/5	684,000-696,000	691,000	5100	0.7
Selenium	ug/l	0/5	ND	ND	ND	ND
Silver	ug/l	0/5	ND	ND	ND	ND
Sodium	ug/l	5/5	2,010,000-2,660,000	2,360,000	283,000	12
TCLP LEACH						
Arsenic	ug/l	5/5	167-390	228	93	41
Barium	ug/l	5/5	269-319	291	19	64
Cadmium	ug/l	0/5	ND	ND	ND	ND
Chromium	ug/l	2/5	10-87	22	36	161
Lead	ug/l	0/5	ND	ND	ND	ND
Mercury	ug/l	0/5	ND	ND	ND	ND
Nickel	ug/l	3/5	21-24	17	7	39
Selenium	ug/l	0/5	ND	ND	ND	ND
Silver	ug/l	0/5	ND	ND	ND	ND
pH	units	5/5	9.0	9.0	0.0	0.0

TABLE 3-8
SUMMARY OF POND WATER CHARACTERIZATION DATA - POND 207B SOUTH
SOLAR POND/PONDCRETE PROJECT
PAGE 2 OF 2

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
MISCELLANEOUS						
Alkalinity (Methyl Orange)	mg/l	5/5	900-910	905	5.5	0.6
Alkalinity (Phenolphthalein)	mg/l	5/5	140-160	150	7.1	5
Ammonia	mg/l	5/5	0.5-0.6	0.6	0.05	10
Chloride	mg/l	0/5	ND	ND	ND	ND
Cyanide-Amenable	mg/l	0/5	(-0.86) - (-2.6)	---	---	---
Cyanide-Total	mg/l	5/5	0.28-0.31	0.29	0.01	4
Gross Alpha	pCi/l	5/5	1500-2100	1900	250	13
Gross Beta	pCi/l	5/5	2500-2900	2700	164	6
Nitrate	mg/l	5/5	1600-1800	1700	84	5
pH	units	5/5	9.1	9.1	0.0	0.0
Phosphorus, Total (as P)	mg/l	5/5	2.6-2.8	2.8	0.09	3
Specific Gravity		4/4	1.016-1.020	1.019	0.002	0.2
Sulfate (as SO_4)	mg/l	5/5	540-600	560	26	5
TDS (Total Dissolved Solids)	mg/l	5/5	14,000-15,000	15,000	550	4
TOC (Total Organic Carbon)	mg/l	5/5	58-110	92	22	24
TSS (Total Suspended Solids)	mg/l	5/5	11-39	22	11	49

(1) Average calculated using 1/2 detection limit for nondetects, based on guidance contained in the Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation manual (Part A), Interim Final, December 1989.

(2) Only compounds with positive detections are listed. The complete list of compounds analyzed is shown in Table 2-5. The complete database is included in Appendix A.

TABLE 3-9

SUMMARY OF POND SLUDGE CHARACTERIZATION DATA - POND 207B SOUTH
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
VOLATILES(2)						
Tetrachloroethene (PCE)	ug/kg	5/5	32-460	238	153	64
Trichloroethene (TCE)	ug/kg	3/5	47-57	41	14	34
SEMIVOLATILES(2)	ug/kg	0/5	ND	ND	ND	ND
ALCOHOLS(2)	mg/kg	0/5	ND	ND	ND	ND
MISCELLANEOUS						
Ammonia	mg/kg	4/5	17-34	20	10	53
Atterberg - Liquid Limit	--	4/4	70-101	85	15	18
Atterberg - Plastic Index	--	4/4	28-41	36	6	18
Atterberg - Plastic Limit	--	4/4	41-60	49	9	18
Bulk Density (Dried Solids)	g/cc	NA	NA	NA	NA	NA
Cyanide-Amenable	mg/kg	NA	NA	NA	NA	NA
Cyanide-Total	mg/kg	5/5	0.46-4.1	1.3	1.5	115
Gross Alpha	pCi/g	5/5	31-61	38	13	33
Gross Beta	pCi/g	5/5	21-47	27	11.1	41
Moisture-Gravimetric	%	5/5	88.3-92.3	90.2	1.9	2
Moisture-Karl Fisher	%	4/4	39-50	45	5	11
pH	units	5/5	9.1	9.1	0.0	0.0
Specific Gravity	--	4/4	1.0-1.1	1.1	0.05	5
Swell Test	%	4/4	30-60	45	13	29
TOC (Total Organic Carbon)	mg/kg	5/5	6,800-11,000	8600	1,600	18
Chloride(3)	mg/l	0/5	ND	ND	ND	ND
Nitrate(3)	mg/l	5/5	77-89	84	5	6
% Recovery of Solids(3)	%	5/5	6.4-12.4	8.9	2.2	24
Phosphorus, Total (as P)(3)	mg/l	5/5	0.09-1.7	0.8	0.7	85
Sulfate(3)	mg/l	5/5	23-40	32	6	20
TDS (Total Dissolved Solids)(3)	mg/l	5/5	740-790	760	20	2

TABLE 3-9
SUMMARY OF POND SLUDGE CHARACTERIZATION DATA - POND 207B SOUTH
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO
PAGE 2 OF 2

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
INORGANICS						
Arsenic	mg/kg	1/5	59.7	27.7	18.2	65
Barium	mg/kg	5/5	62.2-134	107	33.2	31
Boron	mg/kg	2/5	336-349	166	161	96
Cadmium	mg/kg	5/5	7.4-30.4	22.7	9.3	41
Chromium	mg/kg	5/5	25.2-51.9	38.1	12.0	31
Lead	mg/kg	1/5	61	24	21	86
Magnesium	mg/kg	5/5	5140-15,200	10,500	4,100	39
Mercury	mg/kg	1/5	5	1.4	2.0	72
Nickel	mg/kg	0/5	ND	ND	ND	ND
Potassium	mg/kg	1/5	8910	5720	2,300	40
Selenium	mg/kg	0/5	ND	ND	ND	ND
Silver	mg/kg	0/5	ND	ND	ND	ND
Sodium	mg/kg	4/5	30,000-44,600	30,000	17,000	56
TCLP LEACH						
Arsenic	ug/l	5/5	194-233	211	21	10
Barium	ug/l	5/5	1660-2770	1960	460	23
Cadmium	ug/l	5/5	19-32	24	6	24
Chromium	ug/l	5/5	23-56	41	12	29
Lead	ug/l	0/5	ND	ND	ND	ND
Mercury	ug/l	0/5	ND	ND	ND	ND
Nickel	ug/l	0/5	ND	ND	ND	ND
Selenium	ug/l	0/5	ND	ND	ND	ND
Silver	ug/l	0/5	ND	ND	ND	ND
pH	units	5/5	5.4-5.9	5.7	---	---

ND Not Detected
NA Not Analyzed
pCi/g Picocuries per Gram

(1) Values calculated using 1/2 detection limit for nondetects, based on guidance contained in the Risk Assessment Guidance for Superfund, Volum I, Human Health Evaluation Manual (Part A), Interim Final, December 1989.
(2) Only compounds with positive detections are listed. The complete list of compounds analyzed is shown in Table 2-3. The complete data base is included in Appendix A.
(3) Following ASTM Leach

TABLE 3-10

SUMMARY OF POND WATER CHARACTERIZATION DATA - POND 207C
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
VOLATILES(2)						
2-Butanone	ug/l	4/5	77-110	76	43	56
Methylene Chloride	ug/l	1/5	8	5.6	1.3	24
SEMIVOLATILES(2)	ug/l	0/5	ND	ND	ND	ND
ALCOHOLS(2)	mg/l	0/5	ND	ND	ND	ND
INORGANICS						
Arsenic	ug/l	5/5	3350-4110	3690	374	10.1
Barium	ug/l	5/5	110-150	130	14	10.9
Boron	ug/l	5/5	437,000-494,000	463,000	26,000	5.6
Cadmium	ug/l	5/5	430-560	490	50	10.3
Calcium	ug/l	0/5	ND	ND	ND	ND
Chromium	ug/l	5/5	3320-3940	3520	250	7.2
Lead	ug/l	2/5	300	210	80	39.1
Magnesium	ug/l	5/5	1300-3870	2790	930	33.3
Mercury	ug/l	0/5	ND	ND	ND	ND
Nickel	ug/l	5/5	2540-2920	2680	170	6.5
Potassium	mg/l	5/5	54,500-59,200	55,800	1900	3.5
Selenium	ug/l	2/5	600-3000	1980	1400	70.7
Silver	ug/l	0/5	ND	ND	ND	ND
Sodium	mg/l	5/5	136,000-142,000	138,000	2500	1.8
TCLP LEACH						
Arsenic	ug/l	5/5	4660-5510	4960	330	6.5
Barium	ug/l	0/5	ND	ND	ND	ND
Cadmium	ug/l	5/5	350-560	430	80	18.6
Chromium	ug/l	5/5	2240-9160	3780	3000	79.8
Lead	ug/l	0/5	ND	ND	ND	ND
Mercury	ug/l	0/5	ND	ND	ND	ND
Nickel	ug/l	5/5	2330-4930	2980	1100	37.0
Selenium	ug/l	0/5	ND	ND	ND	ND
Silver	ug/l	5/5	150-430	250	110	44.3
pH	units	5/5	10.2	10.2	0.0	0.0

TABLE 3-10

SUMMARY OF POND WATER CHARACTERIZATION DATA - POND 207C
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
VOLATILES(2)						
2-Butanone	ug/l	4/5	77-110	76	43	56
Methylene Chloride	ug/l	1/5	8	5.6	1.3	24
SEMIVOLATILES(2)	ug/l	0/5	ND	ND	ND	ND
ALCOHOLS(2)	mg/l	0/5	ND	ND	ND	ND
INORGANICS						
Arsenic	ug/l	5/5	3350-4110	3690	374	10.1
Barium	ug/l	5/5	110-150	130	14	10.9
Boron	ug/l	5/5	437,000-494,000	463,000	26,000	5.6
Cadmium	ug/l	5/5	430-560	490	50	10.3
Calcium	ug/l	0/5	ND	ND	ND	ND
Chromium	ug/l	5/5	3320-3940	3520	250	7.2
Lead	ug/l	2/5	300	210	80	39.1
Magnesium	ug/l	5/5	1300-3870	2790	930	33.3
Mercury	ug/l	0/5	ND	ND	ND	ND
Nickel	ug/l	5/5	2540-2920	2680	170	6.5
Potassium	%	5/5	5.45-5.92	5.58	0.19	3.5
Selenium	ug/l	2/5	600-3000	1980	1400	70.7
Silver	ug/l	0/5	ND	ND	ND	ND
Sodium	%	5/5	13.6-14.2	13.8	0.25	1.8
TCLP LEACH						
Arsenic	ug/l	5/5	4660-5910	4960	330	6.5
Barium	ug/l	0/5	ND	ND	ND	ND
Cadmium	ug/l	5/5	350-560	430	80	18.6
Chromium	ug/l	5/5	2240-9160	3780	3000	79.8
Lead	ug/l	0/5	ND	ND	ND	ND
Mercury	ug/l	0/5	ND	ND	ND	ND
Nickel	ug/l	5/5	2330-4930	2980	1100	37.0
Selenium	ug/l	0/5	ND	ND	ND	ND
Silver	ug/l	5/5	150-430	250	110	44.3
pH	units	5/5	10.2	10.2	0.0	0.0

Replaced

TABLE 3-10
SUMMARY OF POND WATER CHARACTERIZATION DATA - POND 207C
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO
PAGE 2 OF 2

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
MISCELLANEOUS						
Alkalinity (Methyl Orange)	mg/l	5/5	58,000-63,000	60,000	1900	3.2
Alkalinity (Phenolphthalein)	mg/l	5/5	25,000-32,000	29,000	2500	8.6
Ammonia	mg/l	5/5	1.8-6.4	3.7	2	53.2
Chloride	mg/l	5/5	21,000-25,000	23,000	1600	6.9
Cyanide-Amenable	mg/l	0/5	(-120)-(-0.77)	-34	---	---
Cyanide-Total	mg/l	5/5	3.3-20	7.7	7	91.3
Gross Alpha	nCi/l	5/5	63-130	99	27	27.3
Gross Beta	nCi/l	5/5	170-230	190	23	11.9
Nitrate	mg/l	5/5	57,000-66,000	62,000	3500	5.6
pH	units	5/5	10.0-10.1	10	---	---
Phosphorus, Total (as P)	mg/l	5/5	520-610	570	32	5.7
Specific Gravity	--	5/5	1.316-1.348	1.332	0.02	0.01
Sulfate (as SO_4)	mg/l	5/5	16,000-18,000	17,000	700	4.1
TDS (Total Dissolved Solids)	mg/l	5/5	300,000-510,000	460,000	88,500	19.4
TOC (Total Organic Carbon)	mg/l	5/5	1200-1600	1400	150	11.1
TSS (Total Suspended Solids)	mg/l	5/5	220-1400	530	490	91.5

ND Not Detected
nCi/l Nanocuries per Liter

(1) Values calculated using 1/2 detection limit for nondetects, based on guidance contained in the Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A). Interim Final, December 1989.

(2) Only compounds with positive detections are listed. The complete list of compounds analyzed is shown in Table 2-3. The complete database is included in Appendix A.

TABLE 3-10
SUMMARY OF POND WATER CHARACTERIZATION DATA - POND 207C
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO
PAGE 2 OF 2

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
MISCELLANEOUS						
Alkalinity (Methyl Orange)	mg/l	5/5	58,000-63,000	60,000	1900	3.2
Alkalinity (Phenolphthalein)	mg/l	5/5	25,000-32,000	29,000	2500	8.6
Ammonia	mg/l	5/5	1.8-6.4	3.7	2	53.2
Chloride	mg/l	5/5	21,000-25,000	23,000	1600	6.9
Cyanide-Amenable	mg/l	0/5	(-120)-(-0.77)	-34	---	---
Cyanide-Total	mg/l	5/5	3.3-20	7.7	7	91.3
Gross Alpha	pCi/l	5/5	63-130	99	27	27.3
Gross Beta	pCi/l	5/5	170-230	190	23	11.9
Nitrate	mg/l	5/5	57,000-66,000	62,000	3500	5.6
pH	units	5/5	10.0-10.1	10	---	---
Phosphorus, Total (as P)	mg/l	5/5	520-610	570	32	5.7
Specific Gravity	--	5/5	1.316-1.348	1.332	0.02	0.01
Sulfate (as SO_4)	mg/l	5/5	16,000-18,000	17,000	700	4.1
TDS (Total Dissolved Solids)	mg/l	5/5	300,000-510,000	460,000	88,500	19.4
TOC (Total Organic Carbon)	mg/l	5/5	1200-1600	1400	150	11.1
TSS (Total Suspended Solids)	mg/l	5/5	220-1400	530	490	91.5

ND Not Detected
pCi/l Picocuries per Liter

(1) Values calculated using 1/2 detection limit for nondetects, based on guidance contained in the Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A). Interim Final, December 1989.

(2) Only compounds with positive detections are listed. The complete list of compounds analyzed is shown in Table 2-3. The complete database is included in Appendix A.

Replaced

TABLE 3-11

SUMMARY OF POND SLUDGE CHARACTERIZATION DATA - POND 207C
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
VOLATILES(2)						
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/kg	1/5	33	10.2	12.7	125
2-Butanone	ug/kg	5/5	16-160	110	63.3	57
Benzene	ug/kg	2/5	7-31	10.5	11.5	109
Tetrachloroethene (PCE)	ug/kg	5/5	8-73	22.2	28.4	128
Trichloroethene (TCE)	ug/kg	2/5	5-7	3.9	0.96	25
SEMI-VOLATILES(2)						
Pyrene	ug/kg	2/5	190-320	286	56.5	20
ALCOHOLS(2)	mg/kg	0/5	ND	ND	ND	ND
MISCELLANEOUS						
Ammonia	mg/kg	0/5	ND	ND	ND	ND
Atterberg - Liquid Limit	--	4/4	NP	NP	NP	NP
Atterberg - Plastic Index	--	4/4	NP	NP	NP	NP
Atterberg - Plastic Limit	--	4/4	NP	NP	NP	NP
Bulk Density (Dried Solids)	g/cc	NA	NA	NA	NA	NA
Cyanide-Amenable	mg/kg	NA	NA	NA	NA	NA
Cyanide-Total	mg/kg	5/5	13-170	72	80.5	111
Gross Alpha	pCi/g	5/5	2700-8700	5000	2,400	49
Gross Beta	pCi/g	5/5	420-1200	710	314	44
Moisture-Gravimetric	%	5/5	34.8-48.8	44.0	5.9	13
Moisture-Karl Fisher	%	NA	NA	NA	NA	NA
pH	units	5/5	10.2-10.5	10.4	--	--
Specific Gravity	--	NA	NA	NA	NA	NA
Swell Test	%	4/4	0-10	3	5	200
TOC (Total Organic Carbon)	mg/kg	5/5	6400-9000	7700	1100	14
Chloride(3)	mg/l	5/5	660-990	770	126	16
Nitrate(3)	mg/l	5/5	8900-11,000	10,000	750	7
% Recovery of Solids(3)	%	5/5	9.2-18.8	11.6	4.0	35
Phosphorus, Total (as P)(3)	mg/l	5/5	22-38	31	7.5	24
Sulfate(3)	mg/l	5/5	810-1300	970	190	20
TDS (Total Dissolved Solids)(3)	mg/l	5/5	18,000-24,000	21,000	2,600	12

TABLE 3-11
SUMMARY OF POND SLUDGE CHARACTERIZATION DATA - POND 207C
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO
PAGE 2 OF 2

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
INORGANICS						
Arsenic	mg/kg	5/5	18-37	28	7.9	28
Barium	mg/kg	5/5	13.2-61.5	31	18.3	59
Boron	mg/kg	5/5	455-781	612	128.3	21
Cadmium	mg/kg	5/5	27.3-665	164(4)	280.5	171
Chromium	mg/kg	5/5	252-960	618	256.9	42
Lead	mg/kg	5/5	7.9-38.5	19.4	11.6	60
Magnesium	mg/kg	5/5	1340-6250	3370	1836.0	54
Mercury	mg/kg	5/5	0.7-1.0	0.9	0.1	16
Nickel	mg/kg	5/5	17.4-146	52.3(5)	52.8	101
Potassium	mg/kg	5/5	64,500-87,200	78,100	8640	11
Selenium	mg/kg	0/5	ND	ND	ND	ND
Silver	mg/kg	5/5	35.1-73.6	54.1	14.0	26
Sodium	mg/kg	5/5	139,000-193,000	157,600	21,570	14
TCLP LEACH						
Arsenic	ug/l	5/5	447-538	506	37.3	7
Barium	ug/l	3/5	481-559	377	186.0	49
Cadmium	ug/l	5/5	342-5230	1490(6)	2100	142
Chromium	ug/l	5/5	1840-3940	2770	841	30
Lead	ug/l	2/5	33-52	26	16.5	63
Mercury	ug/l	1/5	0.4	0.2	0.13	84
Nickel	ug/l	5/5	563-2140	986(7)	654	66
Selenium	ug/l	0/5	ND	ND	ND	ND
Silver	ug/l	5/5	9-23	18	5.9	33
pH	units	5/5	4.8-5.3	5.1	--	--

ND Not Detected
NA Not Analyzed
pCi/g Picocuries per Gram
NP Not possible to analyze due to nature of solids

(1) Values calculated using 1/2 detection limit for nondetects, based on guidance contained in the Risk Assessment Guidance for Superfund Volume 1, Human Health Evaluation Manual (Part A). Interim Final, December 1989.
(2) Only compounds with positive detections are listed. The complete list of compounds analyzed is shown in Table 2-3. The complete database is included in Appendix A.
(3) Following ASTM Leach
(4) When the Pond Sludge Berm Composite (Sample PS207C-CB) value of 665 is excluded, the average falls to 38.8 mg/kg.
(5) When the Pond Sludge Berm Composite (Sample PS207C-CB) value of 146 is excluded, the average falls to 28.9 mg/kg.
(6) When the Pond Sludge Berm Composite (Sample PS207C-CB) value of 5230 is excluded, the average falls to 552 mg/kg.
(7) When the Pond Sludge Berm Composite (Sample PS207C-CB) value of 2140 is excluded, the average falls to 698 mg/kg.

TABLE 3-12

SUMMARY OF POND WATER CHARACTERIZATION DATA - CLARIFIER
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
VOLATILES(2)	ug/l	0/4	ND	ND	ND	ND
SEMI-VOLATILES(2)	ug/l	0/4	ND	ND	ND	ND
ALCOHOLS(2)	mg/l	0/4	ND	ND	ND	ND
INORGANICS						
Arsenic	ug/l	4/4	272-342	313	32	10
Barium	ug/l	4/4	30-91	49	29	58
Boron	ug/l	4/4	23,300-34,700	28,000	5,400	19
Cadmium	ug/l	4/4	38-570	221	250	113
Calcium	ug/l	0/4	ND	ND	ND	ND
Chromium	ug/l	4/4	138-825	355	319	90
Lead	ug/l	2/4	34-46	28	15	55
Magnesium	ug/l	4/4	2580-6730	3900	1910	50
Mercury	ug/l	4/4	2.2-4.6	3.5	1.0	28
Nickel	ug/l	4/4	258-393	320	58	18
Potassium	mg/l	4/4	4860-7000	5720	1020	18
Selenium	ug/l	0/4	ND	ND	ND	ND
Silver	ug/l	4/4	66-110	85	20	24
Sodium	mg/l	4/4	9940-14,800	11,940	2310	19
TCLP LEACH						
Arsenic	ug/l	4/4	1400-1800	1540	180	12
Barium	ug/l	0/4	ND	ND	ND	ND
Cadmium	ug/l	1/1(3)	50	50	0	0
Chromium	ug/l	2/4	110-140	58	45	51
Lead	ug/l	0/4	ND	ND	ND	ND
Mercury	ug/l	0/4	ND	ND	ND	ND
Nickel	ug/l	3/4	240-350	250	110	44
Selenium	ug/l	0/4	ND	ND	ND	ND
Silver	ug/l	0/4	ND	ND	ND	ND
pH	units	4/4	10.1	10.1	0	0

TABLE 3-12
SUMMARY OF POND WATER CHARACTERIZATION DATA - CLARIFIER
SOLAR POND/PONDCRETE PROJECT
ROCKY FLAT PLANT, COLORADO
PAGE 2 OF 2

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
MISCELLANEOUS						
Alkalinity (Methyl Orange)	mg/l	4/4	5500-8200	6800	1130	17
Alkalinity (Phenolphthalein)	mg/l	4/4	2300-3100	2800	340	12
Ammonia	mg/l	4/4	5-14	9	4	40
Chloride	mg/l	4/4	1600-3200	2090	750	36
Cyanide-Amenable	mg/l	0/4	(-14)-(-3.3)	---	---	---
Cyanide-Total	mg/l	4/4	2.4-3	2.7	0.3	9
Gross Alpha	nCi/l	4/4	16-19	17	2	9
Gross Beta	nCi/l	4/4	22-30	25	4	14
Nitrate	mg/l	4/4	5700-10,000	7300	1900	26
pH	units	4/4	9.9-10	10	---	---
Phosphorus, Total (as P)	mg/l	4/4	78-84	81	3	3
Specific Gravity	---	3/3	1.038-1.044	1.041	0.003	0.3
Sulfate (as SO_4)	mg/l	4/4	2600-3200	2800	280	10
TDS (Total Dissolved Solids)	mg/l	4/4	46,000-68,000	59,000	2200	16
TOC (Total Organic Carbon)	mg/l	4/4	140-190	165	21	13
TSS (Total Suspended Solids)	mg/l	4/4	68-180	140	51	36

ND Not Detected
NA Not Analyzed
nCi/l Nanocuries per Liter

(1) Values calculated using 1/2 detection limit for nondetects, based on guidance contained in the Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A). Interim Final, December 1989.

(2) Only compounds with positive detections are listed. The complete list of compounds analyzed is shown in Table 2-3. The complete database is included in Appendix A.

(3) Three out of four values were rejected during data validation.

TABLE 3-12
SUMMARY OF POND WATER CHARACTERIZATION DATA - CLARIFIER
SOLAR POND/PONDCRETE PROJECT
ROCKY FLAT PLANT, COLORADO
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ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
MISCELLANEOUS						
Alkalinity (Methyl Orange)	mg/l	4/4	5500-8200	6800	1130	17
Alkalinity (Phenolphthalein)	mg/l	4/4	2300-3100	2800	340	12
Ammonia	mg/l	4/4	5-14	9	4	40
Chloride	mg/l	4/4	1600-3200	2090	750	36
Cyanide-Amenable	mg/l	0/4	(-14)-(-3.3)	---	---	---
Cyanide-Total	mg/l	4/4	2.4-3	2.7	0.3	9
Gross Alpha	pCi/l	4/4	16-19	17	2	9
Gross Beta	pCi/l	4/4	22-30	25	4	14
Nitrate	mg/l	4/4	5700-10,000	7300	1900	26
pH	units	4/4	9.9-10	10	---	---
Phosphorus, Total (as P)	mg/l	4/4	78-84	81	3	3
Specific Gravity	---	3/3	1.038-1.044	1.041	0.003	0.3
Sulfate (as SO_4)	mg/l	4/4	2600-3200	2800	280	10
TDS (Total Dissolved Solids)	mg/l	4/4	46,000-68,000	59,000	2200	16
TOC (Total Organic Carbon)	mg/l	4/4	140-190	165	21	13
TSS (Total Suspended Solids)	mg/l	4/4	68-180	140	51	36

ND Not Detected
NA Not Analyzed
pCi/l Picocuries per Liter

(1) Values calculated using 1/2 detection limit for nondetects, based on guidance contained in the Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A). Interim Final, December 1989.

(2) Only compounds with positive detections are listed. The complete list of compounds analyzed is shown in Table 2-3. The complete database is included in Appendix A.

(3) Three out of four values were rejected during data validation.

Replaced

TABLE 3-13

SUMMARY OF POND SLUDGE CHARACTERIZATION DATA - CLARIFIER
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
VOLATILES(2)						
1,1,1-Trichloroethane	ug/kg	3/4	9-29	18	11	59
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/kg	4/4	45-150	92	45	49
2-Butanone	ug/kg	4/4	87-180	122	43	35
Tetrachloroethene (PCE)	ug/kg	4/4	280-1000	610	360	60
SEMIVOLATILES(2)	ug/kg	0/4	ND	ND	ND	ND
ALCOHOLS(2)	mg/kg	0/4	ND	ND	ND	ND
MISCELLANEOUS						
Ammonia	mg/kg	4/4	28-84	62	24	39
Atterberg - Liquid Limit	--	3/3	69-72	71	2	2
Atterberg - Plastic Index	--	3/3	32-34	33	1	3
Atterberg - Plastic Limit	--	3/3	37-38	38	1	2
Bulk Density (Dried Solids)	g/cc	NA	NA	NA	NA	NA
Cyanide-Amenable	mg/kg	NA	NA	NA	NA	NA
Cyanide-Total	mg/kg	4/4	21-190	87	80	93
Gross Alpha	pCi/g	4/4	3400-6600	5250	1490	28
Gross Beta	pCi/g	4/4	540-860	695	150	21
Moisture-Gravimetric	%	4/4	33.1-72.5	60.6(5)	18.4	30
Moisture-Karl Fisher	%	NA	NA	NA	NA	NA
pH	units	4/4	9.7-9.8	9.75	---	---
Specific Gravity	--	NA	NA	NA	NA	NA
Swell Test	%	3/3	10	10	0	0
TOC (Total Organic Carbon)	mg/kg	4/4	3500-6400	5175	1380	27
Chloride(3)	mg/l	4/4	160-180	168	10	6
Nitrate(3)	mg/l	4/4	410-450	430	18	4
% Recovery of Solids(3)	%	4/4	18.0-22.2	21	2	9
Phosphorus, Total (as P)(3)	mg/l	4/4	33-52	46	9	19
Sulfate(3)	mg/l	4/4	210-280	243	33	14
TDS (Total Dissolved Solids)(3)	mg/l	4/4	4600-5400	4950	340	7

TABLE 3-13
SUMMARY OF POND SLUDGE CHARACTERIZATION DATA - CLARIFIER
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO
PAGE 2 OF 2

ANALYSIS	UNITS	FREQUENCY OF DETECTION	RANGE OF POSITIVE DETECTIONS	MEAN CONCENTRATION(1)	STANDARD DEVIATION(1)	% RELATIVE STANDARD DEVIATION(1)
INORGANICS						
Arsenic	mg/kg	2/4	13.5-21.9	12	7.2	59
Barium	mg/kg	4/4	94.8-217	183	59.2	32
Boron	mg/kg	4/4	420-1380	930	450	48
Cadmium	mg/kg	4/4	2010-4660	3660	1170	32
Chromium	mg/kg	4/4	1180-3190	2480	894	36
Lead	mg/kg	4/4	83-191	161	52	32
Magnesium	mg/kg	4/4	10,400-24,200	20,500	6250	33
Mercury	mg/kg	4/4	5-14	9	5	51
Nickel	mg/kg	4/4	339-902	700	250	36
Potassium	mg/kg	4/4	28,700-67,900	56,500	18,700	33
Selenium	mg/kg	0/4	ND	ND	ND	ND
Silver	mg/kg	4/4	64.6-166	134.9	47.2	35
Sodium	mg/kg	4/4	39,200-96,300	78,900	27,040	34
TCLP LEACH						
Arsenic	ug/l	4/4	224-282	245	26	10
Barium	ug/l	1/4	530	260	180	70
Cadmium	ug/l	4/4	14,800-25,900	20,650	5390	26
Chromium	ug/l	4/4	214-485	362	119	33
Lead	ug/l	1/4	34	20	10	48
Mercury	ug/l	2/4	0.9-4.9	1.5	2.3	153
Nickel	ug/l	4/4	6990-8300	7400	620	8
Selenium	ug/l	0/4	ND	ND	ND	ND
Silver	ug/l	3/4	10-11	8.5	3.7	43
pH	units	4/4	4.6-4.9	4.75	---	---

ND Not Detected
NA Not Analyzed
pCi/g Picocuries per Gram

(1) Values calculated using 1/2 detection limit for nondetects, based on guidance contained in the Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A). Interim Final, December 1989.
(2) Only compounds with positive detections are listed. The complete list of compounds analyzed is shown in Table 2-3. The complete database is included in Appendix A.
(3) Following ASTM Leach
(4) Samples included: CS-001, CS-001D, CS-002, CS-003.
(5) When the apparent low value of 33.1% from CS-001D is omitted, the average % moisture is 69.8%.

4.0 SUMMARY AND CONCLUSIONS

4.1 Regulatory Compliance

The overall goal of the solar pond/pondcrete project is to produce a stabilized waste form that meets all regulatory requirements for ultimate land disposal. It is anticipated that the stabilized waste will be disposed at the Nevada Test Site (NTS). Since the pond sludges are a mixed waste, Federal and state regulations that apply to the disposal of hazardous waste are applicable. Additional requirements are listed in the "Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements," NVO-325.
The Land Disposal Restrictions (LDRs), 40 CFR Part 268, apply to all hazardous wastes. The LDR regulations specify treatment standards that must be met prior to land disposal of hazardous waste. Treatment standards can be expressed as a concentration limit in an extract of the waste (CCWE), a concentration limit in the waste (CCW), or as a specified technology. The hazardous waste codes associated with the wastes in the ponds are as follows: F001, F002, F003, F005, F006, F007, F009, and D006. Separate LDR standards have been promulgated for wastewaters and non-wastewaters. Wastewaters are defined by 40 CFR 268 as wastes that contain less than 1 percent TOC and 1 percent TSS by weight. Also, for F001-F005 solvent mixtures, wastewaters must contain less than 1 percent TOC or 1 percent total F001-F005 solvents, by weight. The pond and clarifier waters meet these requirements for classification as wastewaters, while the sludges are classified as non-wastewaters. The LDR treatment standards for wastewaters are listed in Table 4-1, and the LDR treatment standards for non-wastewaters are listed in Table 4-2.

The waters and sludges were subjected to the Toxicity Characterization Leaching Procedure (TCLP) and the extract analyzed for heavy metals. This data can be compared to standards to determine whether the material is a RCRA hazardous waste based on the characteristic of toxicity. The regulatory standards for metal constituents for the toxicity characteristic are as follows:

- Arsenic 5.0 mg/l
- Barium 100.0 mg/l
- Cadmium 1.0 mg/l
- Chromium 5.0 mg/l
- Lead 5.0 mg/l
- Mercury 0.2 mg/l
- Selenium 1.0 mg/l
- Silver 5.0 mg/l

The pond water data was compared to the LDR standards for wastewaters (see Table 4-1), and those constituents exceeding their respective standards are listed in Table 4-3. As shown, only waters from Pond 207C and the clarifier exceed LDR standards. The water from Pond 207C contains total cyanide, chromium, lead, and nickel above their respective standards. 2-Butanone is also present at a concentration at which it could potentially leach above its standard in the leachate. The clarifier water contains chromium, lead, and total cyanide at concentrations exceeding their respective standards.

Table 4-4 lists constituents in the pond waters that exceed regulatory standards for the characteristic of toxicity. Only Pond 207C water would be listed as a RCRA hazardous waste based on the toxicity characteristic, for arsenic and chromium.

The pond sludge data was also compared to the LDR Standards for non-wastewaters (see Table 4-2), and the constituents exceeding their respective standards are listed in Table 4-5. Sludges from all the ponds, except 207B-South, contain constituents that exceed LDR standards. Cadmium exceed its standard in sludges from Pond 207A, Pond 207B-North, Pond 207B-Center, Pond 207C, and the clarifier. Nickel exceeded its LDR standard in sludge from Pond 207C and the clarifier.

Table 4-6 lists constituents in the pond sludge extract that exceed regulatory standards for the characteristic of toxicity. Only sludges from Pond 207C and the clarifier had constituents exceeding the toxicity standard, in both cases cadmium.

Table 4-7 presents a summary of the solar pond and clarifier samples that exceed regulatory standards.

4.2 Conclusions

The following conclusions concerning the pond and clarifier sludge and water have been made based on the characterization data available to date:

- The characterization data presented in this report are sufficient to characterize the media in each pond in support of regulatory compliance and stabilization process development evaluation. Evaluation of the available data indicates that the variability of data within each pond is within acceptable range and is consistent with other environmental data.

- As shown on Table 4-7, a regulatory evaluation of both the pond waters and sludges has been performed, and the constituents exceeding regulatory standards have been identified.

- Although numerous constituents that are potential inhibitors to stabilization are present in the sludge, only the high salt content in Pond 207C appears to be of major concern in the development of a stabilization recipe. However, preliminary treatability studies have shown that successful stabilization recipes using lime, cement, and fly ash can be developed for this matrix.

- The A and B pond sludges can be consolidated, if so required, for treatment. The pond sludges contain similar constituents at concentrations that are amenable to stabilization singularly or in combination. Table 4-8 shows the range of positive detections of selected parameters for pond sludges. This table has been prepared to facilitate comparison of data between ponds.

  EG&G and HALLIBURTON NUS have completed chemical compatibility tests and demonstrated that the materials from these ponds produce no abnormal chemical reactions when mixed. Therefore, the only other issue is whether a treatment process can be developed to sufficiently treat the mixture. Successful

treatability studies have already been conducted on these four ponds separately by HALLIBURTON NUS which demonstrated that the stabilized sludge can pass LDR and toxicity characteristic standards. Therefore, it is necessary only to show either that all these ponds have similar chemical concentrations or that the resulting concentrations in the mixture will be within the ranges of the original concentrations among the ponds.

Although the physical characteristics, chemicals present, and pH values of these four ponds are similar, the ANOVA (ANalysis Of VAriance, which is the general title of methods developed for examining differences between the means of several groups) analyses on the analytical data can not conclude that the mean concentrations of each inorganic among these ponds are statistically the same. This is not a surprising result, considering the different locations/stages of these ponds in the former waste processing operation. Nevertheless, no compounds in the water from any of these ponds exceed either the LDR or toxicity characteristic standards. In the sludge, only cadmium from three ponds (i.e., 207A, 207B-north and 207B-center) exceeds the LDR standard. Clearly, this is a more important factor to be considered in the current stabilization process than the differences between specific chemical concentrations among these ponds. Given the govern criteria of this stabilization process, for all practical purposes, three out of these four ponds (207A, 207B-north, and 207B-center) can be considered similar and an effective treatment can be designed to treat their mixture. For 107B-south, which has no compound in the water or sludge that exceeds the LDR or toxicity characteristic standard, the addition of materials from the other three ponds will increase the concentration of cadmium. However, a treatment process based on the worst-case conditions (i.e., higher cadmium concentrations) will still successfully treat this mixture.

The chemical concentrations in the mixture of water or sludge from these four ponds can be estimated by weighted averages of original concentrations in each pond. Using the volumes and specific weights of the sludge in each pond, the following equation can be derived:

$$Cmix = Ca \times 0.055 + Cb\text{-}n \times 0.344 + Cb\text{-}c \times 0.286 + Cb\text{-}s \times 0.315$$

where Cmix is the concentration in the mixture; Ca, Cb-n, Cb-c, and Cb-s are the original concentrations in 207A, 207B-north, 207B-center, and 207B-south, respectively. This equation can be applied to every chemical in the sludge. A similar equation can also be derived for the water. Numerically, Cmix will always be within the range between the maximum and minimum of the original concentrations. For example, the leachable cadmium concentrations in 207A, 207B-north, 207B-center and 207B-south are 485, 73, 136, and 24 ug/l, respectively, and the calculated Cmix is 98.2 ug/l.

In summary, the following conclusions support the acceptance of mixing the water and sludge from these four ponds and treating the mixture by a single treatment process:

- 207A, 207B-north, 207B-center and 207B-south are chemically compatible.

- 207A, 207B-north and 207B-center are the same under the LDR and toxicity characteristic standards.

- 207B-south satisfies both LDR and toxicity characteristic standards for all chemicals.

- Preliminary treatability studies for stabilization of sludges from 207A, 207B-north, 207B-center and 207B-south have been successful, producing a stabilized waste form that passes LDR and toxicity characteristic standards.

- The chemical concentrations in the mixture will be in the range of the original concentrations.

- Better process control can be achieved in a single treatment process for material for a narrower concentration range, such as a homogenous mixture.

- The same rationale applied to the A and B Ponds also applies to the combination of clarifier and 207C Pond material.

TABLE 4-1

LDR TREATMENT STANDARDS - POND WATERS
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

REGULATED HAZARDOUS CONSTITUENT	LDR TREATMENT STANDARD (WASTEWATERS)(1)				
	F001-F003, F005	F006	F007	F009	D006
Acetone	0.05 mg/l(2)	NA	NA	NA	NA
n-Butyl Alcohol	5.0 mg/l(2)	NA	NA	NA	NA
Carbon Disulfide	1.05 mg/l(2)	NA	NA	NA	NA
Carbon Tetrachloride	0.05 mg/l(2)	NA	NA	NA	NA
Chlorobenzene	0.15 mg/l(2)	NA	NA	NA	NA
Cyclohexanone	0.125 mg/l(2)	NA	NA	NA	NA
1,2-Dichlorobenzene	0.65 mg/l(2)	NA	NA	NA	NA
Ethyl Acetate	0.05 mg/l(2)	NA	NA	NA	NA
Ethylbenzene	0.05 mg/l(2)	NA	NA	NA	NA
Ethyl Ether	0.05 mg/l(2)	NA	NA	NA	NA
Isobutanol	5.0 mg/l(2)	NA	NA	NA	NA
Methanol	0.25 mg/l(2)	NA	NA	NA	NA
Methylene Chloride	0.20 mg/l(2)	NA	NA	NA	NA
2-Butanone (MEK)	0.05 mg/l(2)	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	0.05 mg/l(2)	NA	NA	NA	NA
Pyridine	1.12 mg/l(2)	NA	NA	NA	NA
Tetrachloroethene (PCE)	0.079 mg/l(2)	NA	NA	NA	NA
Toluene	1.12 mg/l(2)	NA	NA	NA	NA
1,1,1-Trichloroethane	1.05 mg/l(2)	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	1.05 mg/l(2)	NA	NA	NA	NA
Trichloroethene (TCE)	0.062 mg/l(2)	NA	NA	NA	NA
Trichlorotrifluoromethane	0.05 mg/l(2)	NA	NA	NA	NA
Xylene	0.05 mg/l(2)	NA	NA	NA	NA
1,1,2-Trichloroethane	0.03 mg/l(3)	NA	NA	NA	NA
Benzene	0.07 mg/l(3)	NA	NA	NA	NA

TABLE 4-1
LDR TREATMENT STANDARDS - POND WATERS
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO
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REGULATED HAZARDOUS CONSTITUENT	LDR TREATMENT STANDARD (WASTEWATERS)(1)				
	F001-F003, F005	F006	F007	F009	D006
2-Nitropropane	(WETOX or CHOXD) followed by CARBN; or INCIN(4)	NA	NA	NA	NA
2-Ethoxyethanol	BIODG OR INCIN(4)	NA	NA	NA	NA
Cyanides (Total)	NA	1.2 mg/l(3)	1.9 mg/l(3)	1.9 mg/l(3)	NA
Cyanides (Amenable)	NA	0.86 mg/l(3)	0.1 mg/l(3)	0.1 mg/l(3)	NA
Cadmium	NA	1.6 mg/l(3)	NA	NA	1.0 mg/l(3)
Chromium (Total)	NA	0.32 mg/l(3)	0.32 mg/l(3)	0.32 mg/l(3)	NA
Lead	NA	0.04 mg/l(3)	0.04 mg/l(3)	0.04 mg/l(3)	NA
Nickel	NA	0.44 mg/l(3)	0.44 mg/l(3)	0.44 mg/l(3)	NA

(1) Wastewaters are defined by 40 CFR 268.2(f) as wastes that contain less than 1% TOC and 1% TSS by weight. Also, for F001-F005 solvent mixtures, wastewaters must contain less than 1% TOC or 1% total F001-F005 solvents, by weight.
(2) Concentration in waste extract (CCWE)
(3) Concentration in waste (CCW)
(4) Specified treatment technology

LDR - Land Disposal Restrictions, 40 CFR Part 268
NA - Not applicable
WETOX - Wet air oxidation
CHOXD - Chemical or electrolytic oxidation
CARBN - Carbon adsorption
INCIN - Incineration
BIODG - Biodegradation

TABLE 4-2

LDR TREATMENT STANDARDS - POND SLUDGES
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

REGULATED HAZARDOUS CONSTITUENT	LDR TREATMENT STANDARD (NONWASTEWATERS)(1)		
	F001-F003, F005	F006,F007,F009	D006
Acetone	0.59 mg/l(2)	NA	NA
n-Butyl Alcohol	5.0 mg/l(2)	NA	NA
Carbon Disulfide	4.81 mg/l(2)	NA	NA
Carbon Tetrachloride	0.96 mg/l(2)	NA	NA
Chlorobenzene	0.05 mg/l(2)	NA	NA
Cyclohexanone	0.75 mg/l(2)	NA	NA
1,2-Dichlorobenzene	0.125 mg/l(2)	NA	NA
Ethyl Acetate	0.75 mg/l(2)	NA	NA
Ethylbenzene	0.053 mg/l(2)	NA	NA
Ethyl Ether	0.75 mg/l(2)	NA	NA
Isobutanol	5.0 mg/l(2)	NA	NA
Methanol	0.75 mg/l(2)	NA	NA
Methylene Chloride	0.96 mg/l(2)	NA	NA
2-Butanone (MEK)	0.75 mg/l(2)	NA	NA
4-Methyl-2-pentanone (MIBK)	0.33 mg/l(2)	NA	NA
Pyridine	0.33 mg/l(2)	NA	NA
Tetrachloroethene (PCE)	0.05 mg/l(2)	NA	NA
Toluene	0.33 mg/l(2)	NA	NA
1,1,1-Trichloroethane	0.41 mg/l(2)	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	0.96 mg/l(2)	NA	NA
Trichloroethene (TCE)	0.91 mg/l(2)	NA	NA
Trichlorotrifluoromethane	0.96 mg/l(2)	NA	NA
Xylene	0.15 mg/l(2)	NA	NA
1,1,2-Trichloroethane	7.6 mg/kg(3)	NA	NA
Benzene	3.7 mg/kg(3)	NA	NA
2-Nitropropane	Incineration(4)	NA	NA
2-Ethoxyethanol	Incineration(4)	NA	NA
Cyanides (Total)	NA	590 mg/kg(3)	NA
Cyanides (Amenable)	NA	30 mg/kg(3)	NA
Cadmium	NA	0.066 mg/l(2)	1.0 mg/l(2)
Chromium (Total)	NA	5.2 mg/l(2)	NA
Lead	NA	0.51 mg/l(2)	NA
Nickel	NA	0.32 mg/l(2)	NA
Silver	NA	0.072 mg/l(2)	NA

(1) Wastewaters are defined by 40 CFR 268.2(f) as wastes that contain less than 1% TOC and 1% TSS by weight. Also, for F001-F005 solvent mixtures, wastewaters must contain less than 1% TOC or 1% total F001-F005 solvents, by weight.
(2) Concentration in waste extract (CCWE)
(3) Concentration in waste (CCW)
(4) Specified treatment technology
LDR - Land Disposal Restrictions, 40 CFR Part 268
NA - Not applicable

TABLE 4-3

SOLAR POND WATER SAMPLES EXCEEDING LDR STANDARDS
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

POND	CONSTITUENT	LDR STANDARD (ug/l)	POND WATER CONCENTRATION (ug/l)	SAMPLE NUMBER
207A	None			
207B-North	None			
207B-Center	None			
207B-South	None			
207C	2-Butanone	50[1] CCWE	110 77 110 79	PW207C-NE PW207C-NE-D PW207C-NW PW207C-SW
	Cyanide-Total	1200 CCW	3300 20,000 4000 7100 4100	PW-207C-NE PW-207C-NE-D PW-207C-NW PW-207C-SE PW-207C-SW
	Chromium	320 CCW	3580 3400 3370 3320 3940	PW207C-NE PW207C-NE-D PW207C-NW PW207C-SE PW207C-SW
	Lead	40 CCW	300 300	PW207C-NE PW207C-NE-D
	Nickel	440 CCW	2610 2920 2560 2540 2790	PW207C-NE PW207C-NE-D PW207C-NW PW207C-SE PW207-SW
Clarifier	Chromium	320 CCW	825	CW-001-D
	Lead	40 CCW	46	CW-001-D
	Cyanide-Total	1200 CCW	2400 2700 2800 3000	CW-001 CW-001-D CW-002 CW-003

LDR - Land Disposal Restrictions, 40 CFR, Part 268.

(1) The LDR standard for 2-butanone is based on the CCWE concentration. Only the CCW concentration for pond waters was determined. However, for waters with less than 0.5% solids, the TCLP method includes analysis of the water following filtration, and does not include the Zero Headspace Extraction procedure. Therefore, the CCWE concentration would be equal to the CCW concentration if all the 2-butanone was soluble. This conservative assumption is the basis for listing 2-butanone on this table.

TABLE 4-4

SOLAR POND WATER SAMPLES EXCEEDING TCLP STANDARDS FOR THE CHARACTERISTIC OF TOXICITY
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

POND	CONSTITUENT	TCLP STANDARD(1) (ug/l)	TCLP EXTRACT CONCENTRATION(2) (ug/l)	SAMPLE NUMBER
207A	None			
207B-North	None			
207B-Center	None			
207B-South	None			
207C	Arsenic	5000	5510	PW207C-NE
	Chromium	5000	9160	PW207C-NE-D
Clarifier	None			

TCLP - Toxicity Characteristic Leaching Procedure.

(1) Waste is a RCRA hazardous waste based on the characteristic of toxicity if the TCLP standard is exceeded.

(2) The TCLP method specifies that for liquids with less than 0.5% solids, the liquid should be filtered through a 0.6-0.8 um glass fiber filter to remove the solids, and then analyzed without extraction.

TABLE 4-5

SOLAR POND SLUDGE SAMPLES EXCEEDING LDR STANDARDS
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

POND	CONSTITUENT	LDR STANDARD (ug/l)	POND SLUDGE TCLP EXTRACT CONCENTRATION (ug/l)	SAMPLE NUMBER
207A	Cadmium	66 CCWE	$\bar{X}$ = 485	PS207A-NE
207B-North	Cadmium	66 CCWE	$\bar{X}$=73 67 104 67	PS207BN-NW PS207BN-SE PS207BN-SW
207B-Center	Cadmium	66 CCWE	$\bar{X}$=135.75 153 143 133 114	PS207BC-NE PS207BC-NW PS207BC-SE PS207BC-SW
207B-South	None			
207C	Cadmium	66 CCWE	$\bar{X}$=1773.5 945 5230 475 342× 444	PS207C-C PS207C-CB PS207C-NW PS207C-NW-D PS207C-SW
	Nickel	320 CCWE	$\bar{X}$=1077 840 2140 563 624× 765	PS207C-C PS207C-CB PS207C-NW PS207C-NW-D PS207C-SW
Clarifier	Cadmium	66 CCWE	$\bar{X}$=21,733.3 14,800 17,400× 25,900 24,500	CS-001 CS-001-D CS-002 CS-003
	Nickel	320 CCWE	$\bar{X}$=7536.67 7010 6990× 8300 7300	CS-001 CS-001-D CS-002 CS-003

LRD - Land Disposal Restrictions, 40 CFR, Part 268

TABLE 4-6

SOLAR POND SLUDGE SAMPLES EXCEEDING TCLP STANDARDS FOR THE CHARACTERISTIC OF TOXICITY
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

POND	CONSTITUENT	TCLP STANDARD (ug/l)	POND SLUDGE TCLP EXTRACT CONCENTRATION (ug/l)	SAMPLE NUMBER
207A	None	---	---	---
207B-North	None	---	---	---
207B-Center	None	---	---	---
207B-South	None	---	---	---
207C	Cadmium	1000	5230	PS207C-CB
Clarifier	Cadmium	1000	14,800 17,400 25,900 24,500	CS-001 CS-001-D CS-002 CS-003

TCLP - Toxicity Characteristic Leaching Procedure
--- - No reading

TABLE 4-7

SUMMARY OF SOLAR POND SAMPLES EXCEEDING REGULATORY STANDARDS
SOLAR POND/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

MEDIA	POND	LDR STANDARD EXCEEDED?	TOXCITY CHARACTERISTIC STANDARD EXCEEDED?(1)
Water	207A	No	No
	207B-North	No	No
	207B-Center	No	No
	207B-South	No	No
	207C	Yes (2-Butanone, Cyanide-Total, Chromium, Lead, Nickel)	Yes (Arsenic, Chromium)
	Clarifier	Yes (Cyanide-Total, Chromium, Lead)	No
Sludge	207A	Yes (Cadmium)	No
	207B-North	Yes (Cadmium)	No
	207B-Center	Yes (Cadmium)	No
	207B-South	No	No
	207C	Yes (Cadmium, Nickel)	Yes (Cadmium)
	Clarifier	Yes (Cadmium, Nickel)(2)	Yes (Cadmium)

(1) Waste is a RCRA hazardous waste based on the characteristic of toxicity.

(2) Tetrachloroethene (PCE) was detected in one clarifier sludge sample at a concentration (1000 ug/kg) that is greater than or equal to 20 times the CCWE standard for PCE (50 ug/l), which indicates a potential for PCE to exceed the CCWE standard following the TCLP Zero Headspace Extraction.

TABLE 4-8
RANGE OF POSITIVE DETECTIONS OF SELECTED PARAMETERS FOR POND SLUDGE
POND SLUDGE/PONDCRETE PROJECT
ROCKY FLATS PLANT, COLORADO

		Pond Sludge					
Analysis	Units	207A	207B-North	207B-Center	207B-South	Clarifier	207C
Arsenic	mg/kg	40.2	ND	ND	59.7	13.5-21.9	18-37
Barium	mg/kg	210	89.1-116	46.5-120	62.2-134	94.8-217	13.2-61.5
Boron	mg/kg	84.3	12.8	151	336-349	420-1380	455-781
Cadmium	mg/kg	1300	6.7-8.5	46.5-84.4	7.4-30.4	2010-4660	27.3-665
Chromium	mg/kg	658	7.9-33.3	48.5-170	25.2-51.9	1180-3190	252-960
Lead	mg/kg	89	13.3-21.3	ND	61	83-191	7.9-38.5
Magnesium	mg/kg	11,400	3270-4160	7190-19,800	5140-15,200	10,400-24,200	1340-6250
Mercury	mg/kg	ND	0.7-0.8	5.5	5	5-14	0.7-1.0
Nickel	mg/kg	102	7.1-9.5	ND	ND	339-902	17.4-146
Potassium	mg/kg	ND	ND	10,900-15,400	8910	28,700-67,900	64,500-87,200
Selenium	mg/kg	ND	ND	ND	ND	ND	ND
Silver	mg/kg	ND	ND	ND	ND	64.6-166	35.1-73.6
Sodium	mg/kg	14,500	ND	35,200-54,200	30,000-44,600	39,200-96,300	139,000-193,000
CN-Total	mg/kg	1.6	ND	0.34-1.3	0.46-4.1	21-190	13-170
Moisture (Grav.)	%	87.3	71.8-76.8	89.9-93.4	88.3-92.3	33.1-72.5	34.8-48.8
TOC	mg/kg	14,000	3000-3400	5500-8800	6800-11,000	3500-6400	6400-9000
Ammonia	mg/kg	36	9.8-35	25-58	17-34	28-84	ND
Liquid Limit	-	NA	71-75	77-85	NA	NA	NA
Plastic Index	-	NA	34-40	20-40	NA	NA	NA
Plastic Limit	-	NA	33-37	45-65	NA	NA	NA
Swell Test	%	NA	0-10	60-70	NA	NA	NA

NA Not Analyzed
ND Not Detected

Only positive detections are included in this table.

5.0 IMPLICATIONS OF CHARACTERIZATION DATA FOR WASTE PROCESSING

5.1 Waste Consolidation

The current plan for implementing the stabilization treatment of the pond sludges includes the consolidation of the following wastes:

- 207A and 207B-Series sludges
- Clarifier sludge/water with 207C sludge/water

The benefits of combining the wastes to be stabilized from six individual sources to two sources are as follows:

- By reducing the number of stabilization recipes, and therefore, the number of process control variables, better process control will be attained in the field.

- Considerable time and cost savings related to treatability studies and process control documentation will be realized.

As stated in Section 4.0, the wastes to be consolidated are similar in composition (as related to the proposed stabilization process) and appear to be amenable to similar stabilization recipes based on the results of preliminary treatability studies. Also, the wastes that will be consolidated have similar regulatory considerations, in particular LDR constituents of concern.

5.2 Treatment Considerations

By combining and homogenizing the contents of the clarifier and Pond 207C, the resulting mix would be classified as a non-wastewater (for the purpose of applying LDR standards) since the suspended solids concentration would be greater than 1% by weight. The estimated total cyanide concentration in the mix would be well below the non-wastewater LDR standard of 590 mg/kg (CCW) for total cyanide. If concurrence is obtained from the appropriate regulatory authorities, then no specific treatment for the destruction of total cyanide would be required prior to the stabilization treatment process.

Because of the unknown regulatory states of cyanide treatment of Clarifier/207C water, treatability testing was performed to gather technical/data and support the decision-making process.

Treatability testing for the destruction of total cyanide in Pond 207C water has not been successful. Oxidation using calcium hypochlorite, chlorine dioxide, and hydrogen peroxide has not been effective in the destruction of the cyanide, even though these are well-documented methods of treatment. The reason for the lack of success is not known, although it is probably related to the matrix (saturated brine solution), the form of total cyanide (such as metal-cyanide complexes, which are stable and more difficult to treat than free cyanide), or a combination of these two factors.

Although total cyanide in the 207C/Clarifier mix is regulated as a CCW constituent, total cyanide will be analyzed on the TCLP leachate (CCWE) of stabilized 207C/Clarifier waste during the treatability study. This data will be useful in determining the degree to which total cyanide is bound in the stabilized matrix.

REFERENCES

1. Conner, Jesse R. 1990. Chemical Fixation and Solidification of Hazardous Wastes. Van Nostrand Reinhold, New York, NY.

2. HALLIBURTON NUS. July, 1991. Deliverable (combined) 211A, 211E, 221A and 221E, Pond Sludge Sampling Plan, Clarifier Sludge Sampling Plan, Pond Sludge Analysis Plan and Clarifier Sludge Analysis Plan.

3. HALLIBURTON NUS. September 27, 1991. Rev. 2. Deliverable (combined) 212A and 212E, Pond Sludge Sampling Procedure and Clarifier Sludge Sampling Procedure.

4. EPA (U.S. Environmental Protection Agency). February 1988. Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses.

5. EPA (U.S. Environmental Protection Agency). February 1988. Laboratory Data Validation Functional Guidelines For Evaluating Organic Analyses.

6. EPA (U.S. Environmental Protection Agency). Land Disposal Restrictions. 40 Federal Registry Part 268.

7. U.S. Department of Energy Nevada Operations Office and Reynolds Electric and Engineering Co., Inc. October 1988. Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements (NVO-325).

APPENDIX A

ANALYTICAL DATABASE

GLOSSARY

Data Qualifier Definitions

For the purposes of this document the following code letters and associated definitions are provided.

U	-	The material was analyzed for but was not detected. The associated numerical value is the sample quantitation limit.
J	-	The associated numerical value is an estimated quantity.
R	-	The data are unusable (compound may or may not be present). Resampling and reanalysis is necessary for verification.
UJ	-	The material was analyzed for but was not detected. The sample quantitation limit is an estimated quantity.

SAMPLE ID NUMBER:	PW207A-NE	PW207A-NW	PW207A-SE	PW207A-T
SAMPLE TYPE:				TRIP BLANK
COMPOUND				
****** VOLATILES ******				
ETHYLBENZENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L
4-METHYL-2-PENTANONE	10U ug/L	10U ug/L	10U ug/L	10U ug/L
TOLUENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L
CHLOROBENZENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L
TETRACHLOROETHENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L
XYLENE (total)	5U ug/L	5U ug/L	5U ug/L	6 ug/L
ETHYL ACETATE	5U ug/L	5U ug/L	5U ug/L	5U ug/L
CARBON TETRACHLORIDE	5U ug/L	5U ug/L	5U ug/L	5U ug/L
ETHYL ETHER	5U ug/L	5U ug/L	5U ug/L	5U ug/L
ACETONE	18U ug/L	20U ug/L	24U ug/L	11B ug/L
BENZENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L
1,1,1-TRICHLORETHANE	5U ug/L	5U ug/L	5U ug/L	5U ug/L
METHYLENE CHLORIDE	5U ug/L	5U ug/L	5U ug/L	5U ug/L
CARBON DISULFIDE	5U ug/L	5U ug/L	5U ug/L	5U ug/L
1,1-DICHLOROETHENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L
TRICHLOROFLUOROMETHANE	5U ug/L	5U ug/L	5U ug/L	5U ug/L
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5U ug/L	5U ug/L	5U ug/L	5U ug/L
2-BUTANONE	10U ug/L	10U ug/L	10U ug/L	10U ug/L
1,1,2-TRICHLOROETHANE	5U ug/L	5U ug/L	5U ug/L	5U ug/L
TRICHLORETHENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L
****** SEMI-VOLATILES ******				
1,4-DICHLOROBENZENE	10U ug/L	10U ug/L	10U ug/L	
CYCLOHEXANONE	10U ug/L	10U ug/L	10U ug/L	
PYRIDINE	10U ug/L	10U ug/L	10U ug/L	
1,2,4-TRICHLOROBENZENE	10U ug/L	10U ug/L	10U ug/L	
2,4-DINITROTOLUENE	10U ug/L	10U ug/L	10U ug/L	
PYRENE	10U ug/L	10U ug/L	10U ug/L	
N-NITROSO-DI-N-PROPYLAMINE	10U ug/L	10U ug/L	10U ug/L	
2-NITROPROPANE	10UJ ug/L	10UJ ug/L	10UJ ug/L	
ACENAPHTHENE	10U ug/L	10U ug/L	10U ug/L	
1,2-DICHLOROBENZENE	10U ug/L	10U ug/L	10U ug/L	
****** ALCOHOLS ******				
N-BUTYL ALCOHOL	1U mg/L	1U mg/L	1U ug/L	
METHANOL	1UJ mg/L	1UJ mg/L	1UJ ug/L	
ISOBUTANOL	1U mg/L	1U mg/L	1U ug/L	
2-ETHOXYETHANOL	50U mg/L	50U mg/L	50U ug/L	

SAMPLE ID NUMBER:	PW207A-NE	PW207A-NW	PW207A-SE	PW207A-T
SAMPLE TYPE:				TRIP BLANK
****** INORGANICS ******				
SILVER	6.0UJ ug/L	6.0UJ ug/L	6.0UJ ug/L	
ARSENIC	224 ug/L	204 ug/L	188 ug/L	
BORON	1400 ug/L	1430 ug/L	1460 ug/L	
BARIUM	135 ug/L	141 ug/L	140 ug/L	
CALCIUM	23200U ug/L	24300U ug/L	24000U ug/L	
CADMIUM	5.0UJ ug/L	5.0J ug/L	5.0UJ ug/L	
CHROMIUM	49.0J ug/L	45.0J ug/L	38.0J ug/L	
MERCURY	0.2UJ ug/L	0.2UJ ug/L	0.2UJ ug/L	
POTASSIUM	388000 ug/L	396000 ug/L	397000 ug/L	
MAGNESIUM	120000 ug/L	124000 ug/L	124000 ug/L	
SODIUM	1870000J ug/L	1870000J ug/L	1840000J ug/L	
NICKEL	20.0UJ ug/L	20.0UJ ug/L	20.0UJ ug/L	
LEAD	30.0U ug/L	30.0U ug/L	30.0U ug/L	
SELENIUM	60.0U ug/L	60.0U ug/L	60.0 ug/L	
****** MISCELLANEOUS ******				
PHOSPHORUS,TOTAL (AS P)	0.07J mg/L	0.06J mg/L	0.06J mg/L	
SULFATE (AS SO4)	510 mg/L	470 mg/L	460 mg/L	
NITRATE	970J mg/L	1000J mg/L	970J mg/L	
CHLORIDE	380 mg/L	400 mg/L	430 mg/L	
TDS (Total Dissolved Solids)	7900 mg/L	7800 mg/L	7600 mg/L	
AMMONIA	0.3J mg/L	0.3J mg/L	0.3J mg/L	
TOC (Total Organic Carbon)	68J mg/L	69J mg/L	70J mg/L	
CYANIDE - TOTAL	0.39J mg/L	0.47J mg/L	0.43J mg/L	
CYANIDE - AMENABLE	-0.47J mg/L	-0.63J mg/L	-0.79J mg/L	
pH	9.7	9.7	9.7	
TSS (Total Suspened Solids)	14J mg/L	20J mg/L	23J mg/L	
ALKALINITY (Phenolphthalein)	87 mg/L	84 mg/L	89 mg/L	
ALKALINITY (Methyl Orange)	250 mg/L	250 mg/L	250 mg/L	
SPECIFIC GRAVITY	1.010	1.012	1.012	
GROSS ALPHA	790+-140 pCi/L	610+-120 pCi/L	670+-130 pCi/L	
GROSS BETA	1000+-200 pCi/L	1000+-100 pCi/L	1000+-100 pCi/L	
****** TCLP LEACH ******				
ARSENIC	246 ug/L	233 ug/L	236 ug/L	
BARIUM	259U ug/L	299U ug/L	235U ug/L	
CADMIUM	R ug/L	R	R	
CHROMIUM	43.0U ug/L	37.0U ug/L	48.0U ug/L	
LEAD	30.0UJ ug/L	30.0UJ ug/L	30.0UJ ug/L	
MERCURY	0.2U ug/L	0.2U ug/L	0.2U ug/L	
NICKEL	20.0UJ ug/L	20.0UJ ug/L	20.0UJ ug/L	
SELENIUM	60.0UJ ug/L	60.0UJ ug/L	60.0UJ ug/L	
SILVER	6.0J ug/L	6.0UJ ug/L	6.0UJ ug/L	
pH	9.6	9.6	9.7	

SAMPLE ID NUMBER:	PW207BN-NE	PW207BN-NW	PW207BN-SE	PW207BN-SW	PW207BN-T
SAMPLE TYPE:					TRIP BLANK
COMPOUND					
****** VOLATILES ******					
ETHYLBENZENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
4-METHYL-2-PENTANONE	10U ug/L	10U ug/L	10U ug/L	10UJ ug/L	10UJ ug/L
TOLUENE	4U ug/L	12U ug/L	8U ug/L	8U ug/L	5U ug/L
CHLOROBENZENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
TETRACHLOROETHENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
XYLENE (total)	5U ug/L	5U ug/L	5U ug/L	4U ug/L	4J ug/L
ETHYL ACETATE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
CARBON TETRACHLORIDE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
ETHYL ETHER	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
ACETONE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10UJ ug/L
BENZENE	5U ug/L	5U ug/L	5U ug/L	5UJ ug/L	5U ug/L
1,1,1-TRICHLORETHANE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
METHYLENE CHLORIDE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
CARBON DISULFIDE	5U ug/L	5U ug/L	5U ug/L	5UJ ug/L	5UJ ug/L
1,1-DICHLOROETHENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
TRICHLOROFLUOROMETHANE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
2-BUTANONE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L
1,1,2-TRICHLOROETHANE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
TRICHLORETHENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
****** SEMI-VOLATILES ******					
1,4-DICHLOROBENZENE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	
CYCLOHEXANONE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	
PYRIDINE	10UJ ug/L	10UJ ug/L	10UJ ug/L	10UJ ug/L	
1,2,4-TRICHLOROBENZENE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	
2,4-DINITROTOLUENE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	
PYRENE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	
N-NITROSO-DI-N-PROPYLAMINE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	
2-NITROPROPANE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	
ACENAPHTHENE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	
1,2-DICHLOROBENZENE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	
****** ALCOHOLS ******					
N-BUTYL ALCOHOL	1U mg/L	1U mg/L	1U mg/L	1U mg/L	
METHANOL	1U mg/L	1U mg/L	1U mg/L	1U mg/L	
ISOBUTANOL	1U mg/L	1U mg/L	1U mg/L	1U mg/L	
2-ETHOXYETHANOL	50U mg/L	50U mg/L	50U mg/L	50U mg/L	

SAMPLE ID NUMBER:	PW207BN-NE		PW207BN-NW		PW207BN-SE		PW207BN-SW		PW207BN-T
SAMPLE TYPE:									TRIP BLANK
****** INORGANICS ******									
SILVER	6.0U	ug/L	7.0U	ug/L	8.0U	ug/L	8.0U	ug/L	
ARSENIC	40.0U	ug/L	63.0	ug/L	60.0	ug/L	63.0	ug/L	
BORON	158J	ug/L	151J	ug/L	149J	ug/L	171J	ug/L	
BARIUM	117	ug/L	118	ug/L	118	ug/L	120	ug/L	
CALCIUM	138000	ug/L	137000	ug/L	137000	ug/L	140000	ug/L	
CADMIUM	5.0U	ug/L	5.0U	ug/L	5.0U	ug/L	5.0U	ug/L	
CHROMIUM	16.0J	ug/L	10.0UJ	ug/L	10.0J	ug/L	10.0UJ	ug/L	
MERCURY	0.2U	ug/L	0.2U	ug/L	0.2U	ug/L	0.2U	ug/L	
POTASSIUM	55700	ug/L	55800	ug/L	55700	ug/L	56400	ug/L	
MAGNESIUM	64800	ug/L	65100	ug/L	65000	ug/L	65900	ug/L	
SODIUM	254000	ug/L	271000	ug/L	312000	ug/L	345000	ug/L	
NICKEL	20.0U	ug/L	20.0U	ug/L	20.0U	ug/L	20.0U	ug/L	
LEAD	30.0U	ug/L	30.0U	ug/L	30.0U	ug/L	30.0U	ug/L	
SELENIUM	60.0U	ug/L	60.0U	ug/L	76.0	ug/L	60.0U	ug/L	
****** MISCELLANEOUS ******									
PHOSPHORUS,TOTAL (AS P)	0.06J	mg/L	0.08J	mg/L	0.02J	mg/L	0.04J	mg/L	
SULFATE (AS SO4)	160	mg/L	120	mg/L	120	mg/L	120	mg/L	
NITRATE	320	mg/L	320	mg/L	310	mg/L	330	mg/L	
CHLORIDE	96J	mg/L	98J	mg/L	100J	mg/L	99J	mg/L	
TDS (Total Dissolved Solids)	2800	mg/L	2800	mg/L	2800	mg/L	2700	mg/L	
AMMONIA	0.3	mg/L	0.3	mg/L	0.3	mg/L	0.5	mg/L	
TOC (Total Organic Carbon)	36	mg/L	37	mg/L	35	mg/L	36	mg/L	
CYANIDE - TOTAL	0.031J	mg/L	0.043J	mg/L	0.016J	mg/L	0.031J	mg/L	
CYANIDE - AMENABLE	-0.013	mg/L	0.014	mg/L	-0.008	mg/L	-0.017	mg/L	
pH	8.4		8.5		8.5		8.3		
TSS (Total Suspened Solids)	10UJ	mg/L	10UJ	mg/L	15J	mg/L	10UJ	mg/L	
ALKALINITY (Phenolphthalein)	2	mg/L	2	mg/L	3	mg/L	1U	mg/L	
ALKALINITY (Methyl Orange)	110	mg/L	110	mg/L	110	mg/L	110	mg/L	
SPECIFIC GRAVITY	1.008		1.008		1.008		1.008		
GROSS ALPHA	42+/-12J	pCi/L	40+/-11J	pCi/L	52+/-12J	pCi/L	52+/-12J	pCi/L	
GROSS BETA	75+/-11J	pCi/L	290+/-30J	pCi/L	510+/-60J	pCi/L	290+/-30J	pCi/L	
****** TCLP LEACH ******									
ARSENIC	R		R		R		R		
BARIUM	216	ug/L	215	ug/L	221	ug/L	230	ug/L	
CADMIUM	5.0U	ug/L	5.0U	ug/L	5.0U	ug/L	5.0U	ug/L	
CHROMIUM	16.0	ug/L	10.0U	ug/L	10.0U	ug/L	10.0U	ug/L	
LEAD	30.0U	ug/L	30.0U	ug/L	30.0U	ug/L	30.0U	ug/L	
MERCURY	0.2U	ug/L	0.2U	ug/L	0.2U	ug/L	0.2U	ug/L	
NICKEL	20.0U	ug/L	20.0U	ug/L	20.0U	ug/L	20.0U	ug/L	
SELENIUM	60.0UJ	ug/L	60.0UJ	ug/L	60.0UJ	ug/L	60.0UJ	ug/L	
SILVER	6.0UJ	ug/L	6.0UJ	ug/L	6.0UJ	ug/L	6.0UJ	ug/L	
pH	8.4		8.5		8.5		8.3		

SAMPLE ID NUMBER:	PW207BC-NE	PW207BC-NW	PW207BC-SE	PW207BC-SW	PW207BC-T
SAMPLE TYPE:					TRIP BLANK
COMPOUND					
****** VOLATILES ******					
ETHYLBENZENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
4-METHYL-2-PENTANONE	10UJ ug/L	10UJ ug/L	10UJ ug/g	10UJ ug/L	10UJ ug/L
TOLUENE	5U ug/L	5U ug/L	4U ug/L	5U ug/L	4J ug/L
CHLOROBENZENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
TETRACHLOROETHENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
XYLENE (total)	3U ug/L	5U ug/L	5U ug/L	5U ug/L	3J ug/L
ETHYL ACETATE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
CARBON TETRACHLORIDE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
ETHYL ETHER	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
ACETONE	10UJ ug/L	49U ug/L	9U ug/L	10UJ ug/L	10UJ ug/L
BENZENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
1,1,1-TRICHLORETHANE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
METHYLENE CHLORIDE	8U ug/L	11U ug/L	4U ug/L	4U ug/L	5U ug/L
CARBON DISULFIDE	5UJ ug/L	5UJ ug/L	5UJ ug/L	5UJ ug/L	5UJ ug/L
1,1-DICHLOROETHENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
TRICHLOROFLUOROMETHANE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
2-BUTANONE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L
1,1,2-TRICHLOROETHANE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
TRICHLORETHENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
****** SEMI-VOLATILES ******					
1,4-DICHLOROBENZENE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	
CYCLOHEXANONE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	
PYRIDINE	10UJ ug/L	10UJ ug/L	10UJ ug/L	10UJ ug/L	
1,2,4-TRICHLOROBENZENE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	
2,4-DINITROTOLUENE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	
PYRENE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	
N-NITROSO-DI-N-PROPYLAMINE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	
2-NITROPROPANE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	
ACENAPHTHENE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	
1,2-DICHLOROBENZENE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	
****** ALCOHOLS ******					
N-BUTYL ALCOHOL	1U mg/L	1U mg/L	1U mg/L	1U mg/L	
METHANOL	1U mg/L	1U mg/L	1U mg/L	1U mg/L	
ISOBUTANOL	1U mg/L	1U mg/L	1U mg/L	1U mg/L	
2-ETHOXYETHANOL	50U mg/L	50U mg/L	50U mg/L	50U mg/L	

SAMPLE ID NUMBER:	PW207BC-NE	PW207BC-NW	PW207BC-SE	PW207BC-SW	PW207BC-T
SAMPLE TYPE:					TRIP BLANK
****** INORGANICS ******					
SILVER	20.0U ug/L	11.0U ug/L	10.0U ug/L	6.0U ug/L	
ARSENIC	319 ug/L	330 ug/L	319 ug/L	314 ug/L	
BORON	3490J ug/L	3470J ug/L	3530J ug/L	3440J ug/L	
BARIUM	68.0 ug/L	69.0 ug/L	70.0 ug/L	68.0 ug/L	
CALCIUM	26400 ug/L	27300 ug/L	27700 ug/L	26500 ug/l	
CADMIUM	5.0U ug/L	5.0U ug/L	5.0U ug/L	5.0U ug/L	
CHROMIUM	31.0J ug/L	22.0J ug/L	26.0J ug/L	32.0J ug/L	
MERCURY	0.2U ug/L	0.2U ug/L	0.2U ug/L	0.2U ug/L	
POTASSIUM	807000 ug/L	794000 ug/L	806000 ug/L	791000 ug/L	
MAGNESIUM	218000 ug/L	218000 ug/L	220000 ug/L	216000 ug/L	
SODIUM	4060000 ug/L	3250000 ug/L	2060000 ug/L	3220000 ug/L	
NICKEL	28.0 ug/L	31.0 ug/L	28.0 ug/L	29.0 ug/L	
LEAD	30.0U ug/L	30.0U ug/L	30.0U ug/L	30.0U ug/L	
SELENIUM	81.0 ug/L	60.0U ug/L	60.0U ug/L	60.0U ug/L	
****** MISCELLANEOUS ******					
PHOSPHORUS,TOTAL (AS P)	4.2J mg/L	4.2J mg/L	4.2J mg/L	4.2J mg/L	
SULFATE (AS SO4)	740 mg/L	860 mg/L	1000 mg/L	920 mg/L	
NITRATE	1900 mg/L	2100 mg/L	1900 mg/L	1900 mg/L	
CHLORIDE	1000U mg/L	1000U mg/L	1000U mg/L	1000U mg/L	
TDS (Total Dissolved Solids)	16000 mg/L	16000 mg/L	16000 mg/L	16000 mg/L	
AMMONIA	0.3 mg/L	0.2 mg/L	0.4 mg/L	0.3 mg/L	
TOC (Total Organic Carbon)	110 mg/L	320 mg/L	93 mg/L	96 mg/L	
CYANIDE - TOTAL	0.34J mg/L	0.34J mg/L	0.57J mg/L	0.34J mg/L	
CYANIDE - AMENABLE	-0.90 mg/L	-0.85 mg/L	-5.3 mg/L	-0.83 mg/L	
pH	9.1	9.2	9.1	9.1	
TSS (Total Suspened Solids)	11J mg/L	10UJ mg/L	16J mg/L	10UJ mg/L	
ALKALINITY (Phenolphthalein)	230 mg/L	240 mg/L	240 mg/L	230 mg/L	
ALKALINITY (Methyl Orange)	1400 mg/L	1400 mg/L	1400 mg/L	1400 mg/L	
SPECIFIC GRAVITY	1.016	0.016	1.016	1.018	
GROSS ALPHA	2100+-300JpCi/L	2100+-300JpCi/L	1800+-200JpCi/L	2300+-300JpCi/L	
GROSS BETA	270+-300JpCi/L	270+-300JpCi/L	3000+-300JpCi/L	2900+-300JpCi/L	
****** TCLP LEACH ******					
ARSENIC	213J ug/L	180J ug/L	238J ug/L	251J ug/L	
BARIUM	214 ug/L	161U ug/L	258 ug/L	193U ug/L	
CADMIUM	5.0U ug/L	5.0U ug/L	5.0U ug/L	5.0 ug/L	
CHROMIUM	27.0 ug/L	16.0U ug/L	24.0 ug/L	20.0 ug/L	
LEAD	30.0U ug/L	30.0U ug/L	30.0U ug/L	30.0U ug/L	
MERCURY	0.2U ug/L	0.2U ug/L	0.2U ug/L	0.2U ug/L	
NICKEL	23.0 ug/L	22.0U ug/L	21.0 ug/L	30.0 ug/L	
SELENIUM	60.0UJ ug/L	60.0UJ ug/L	60.0UJ ug/L	60.0UJ ug/L	
SILVER	6.0UJ ug/L	6.0UJ ug/L	6.0U ug/L	6.0UJ ug/L	
pH	9.1	9.2	9.1	9.1	

SAMPLE ID NUMBER:	PW207BS-B	PW207BS-F	PW207BS-NE	PW207BS-NW	PW207BS-NW-D	PW207BS-SE
SAMPLE TYPE:	RINSATE BLANK	FIELD BLANK			DUPLICATE	
COMPOUND						
****** VOLATILES ******						
ETHYLBENZENE	5U ug/L	5U ug/L	5U ug/L	5UJ ug/L	5U ug/L	5U ug/L
4-METHYL-2-PENTANONE	10U ug/L	10U ug/L	10U ug/L	10UJ ug/L	10UJ ug/L	10U ug/L
TOLUENE	5U ug/L	5U ug/L	5U ug/L	5UJ ug/L	5U ug/L	5U ug/L
CHLOROBENZENE	5U ug/L	5U ug/L	5U ug/L	5UJ ug/L	5U ug/L	5U ug/L
TETRACHLOROETHENE	5U ug/L	5U ug/L	5U ug/L	5UJ ug/L	5U ug/L	5U ug/L
XYLENE (total)	5U ug/L	5U ug/L	5U ug/L	5UJ ug/L	5U ug/L	5U ug/L
ETHYL ACETATE	5U ug/L	5U ug/L	5U ug/L	5UJ ug/L	5U ug/L	5U ug/L
CARBON TETRACHLORIDE	5U ug/L	5U ug/L	5U ug/L	5UJ ug/L	5U ug/L	5U ug/L
ETHYL ETHER	5U ug/L	5U ug/L	5U ug/L	5UJ ug/L	5U ug/L	5U ug/L
ACETONE	11U ug/L	22U ug/L	10U ug/	14U ug/L	8U ug/L	6U ug/L
BENZENE	5U ug/L	5U ug/L	5U ug/L	5UJ ug/L	5U ug/L	5U ug/L
1,1,1-TRICHLORETHANE	5U ug/L	5U ug/L	5U ug/L	5UJ ug/L	5U ug/L	5U ug/L
METHYLENE CHLORIDE	5U ug/L	5U ug/L	5U ug/L	5UJ ug/L	5U ug/L	5U ug/L
CARBON DISULFIDE	5U ug/L	5U ug/L	5U ug/L	5UJ ug/L	5UJ ug/L	5U ug/L
1,1-DICHLOROETHENE	5U ug/L	5U ug/L	5U ug/L	5UJ ug/L	5U ug/L	5U ug/L
TRICHLOROFLUOROMETHANE	5UJ ug/L	5UJ ug/L	5UJ ug/L	5UJ ug/L	5U ug/L	5UJ ug/L
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5UJ ug/L	5UJ ug/L	5UJ ug/L	5UJ ug/L	5U ug/L	5UJ ug/L
2-BUTANONE	10U ug/L	10U ug/L	10U ug/L	10UJ ug/L	10U ug/L	10U ug/L
1,1,2-TRICHLOROETHANE	5U ug/L	5U ug/L	5U ug/L	5UJ ug/L	5U ug/L	5U ug/L
TRICHLORETHENE	5U ug/L	5U ug/L	5U ug/L	5UJ ug/L	5U ug/L	5U ug/L
****** SEMI-VOLATILES ******						
1,4-DICHLOROBENZENE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L
CYCLOHEXANONE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L
PYRIDINE	10UJ ug/L	10UJ ug/L	10UJ ug/L	10UJ ug/L	10UJ ug/L	10UJ ug/L
1,2,4-TRICHLOROBENZENE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L
2,4-DINITROTOLUENE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L
PYRENE	10UJ ug/L	10UJ ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L
N-NITROSO-DI-N-PROPYLAMINE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L
2-NITROPROPANE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L
ACENAPHTHENE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L
1,2-DICHLOROBENZENE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L
****** ALCOHOLS ******						
N-BUTYL ALCOHOL	1U mg/L	1U mg/L	1U mg/L	1U mg/L	1U mg/L	1U mg/L
METHANOL	1U mg/L	1U mg/L	1U mg/L	1U mg/L	1U mg/L	1U mg/L
ISOBUTANOL	1U mg/L	1U mg/L	1U mg/L	1U mg/L	1U mg/L	1U mg/L
2-ETHOXYETHANOL	50U mg/L	50U mg/L	50U mg/L	50U mg/L	50UJ mg/L	50U mg/L

SAMPLE ID NUMBER:	PW207BS-B	PW207BS-F	PW207BS-NE	PW207BS-NW	PW207BS-NW-D	PW207BS-SE
SAMPLE TYPE:	RINSATE BLANK	FIELD BLANK			DUPLICATE	
****** INORGANICS ******						
SILVER	7.0U ug/L	6.0U ug/L	9.0U ug/L	17.0U ug/L	12.0U ug/L	20.0U ug/L
ARSENIC	40.0U ug/l	40.0U ug/L	276 ug/L	274 ug/L	263 ug/L	264 ug/L
BORON	13.0U ug/L	14.0U ug/L	2770J ug/L	2730J ug/L	2770J ug/L	2800J ug/L
BARIUM	3.0U ug/L	3.0U ug/L	118 ug/L	115 ug/L	118 ug/L	110 ug/L
CALCIUM	20.0U ug/L	20.0U ug/L	52000 ug/L	52200 ug/L	52700 ug/L	52400 ug/L
CADMIUM	5.0U ug/L	5.0U ug/L	5.0U ug/L	5.0U ug/L	5.0U ug/L	5.0U ugL/
CHROMIUM	10.0UJ ug/L	10.0UJ ug/L	19.0J ug/L	10.0UJ ug/L	21.0J ug/L	10.0UJ ug/L
MERCURY	0.2U ug/L	0.2U ug/L	0.2U ug/L	0.2U ug/L	0.2U ug/L	0.2U ug/L
POTASSIUM	1000U ug/L	564U ug/L	696000 ug/L	693000 ug/L	694000 ug/L	684000 ug/L
MAGNESIUM	41.0 ug/L	20.0U ug/L	188000 ug/L	187000 ug/L	190000 ug/L	188000 ug/L
SODIUM	142J ug/L	85.0U ug/L	2620000 ug/L	2360000 ug/L	2160000 ug/L	2010000 ug/L
NICKEL	20.0U ug/L	20.0U ug/L	20.0U ug/L	20.0U ug/L	32.0 ug/L	24.0 ug/L
LEAD	30.0U ug/L	30.0U ug/L	30.0U ug/L	30.0U ug/L	30.0U ug/L	30.0U ug/L
SELENIUM	60.0U ug/L	60.0U ug/L	60.0U ug/L	60.0U ug/L	60.0U ug/L	60.0U ug/L
****** MISCELLANEOUS ******						
PHOSPHORUS,TOTAL (AS P)			2.6J mg/L	2.8J mg/L	2.8J mg/L	2.8J mg/L
SULFATE (AS SO4)			540 mg/L	560 mg/L	540 mg/L	540 mg/L
NITRATE			1700 mg/L	1700 mg/L	1800 mg/L	1600 mg/L
CHLORIDE			1000U mg/L	1000U mg/L	1000U mg/L	1000U mg/L
TDS (Total Dissolved Solids)			14000 mg/L	14000 mg/L	15000 mg/L	15000 mg/L
AMMONIA			0.6 mg/L	0.6 mg/L	0.5 mg/L	0.6 mg/L
TOC (Total Organic Carbon)			100 mg/L	58 mg/L	81 mg/L	110 mg/L
CYANIDE - TOTAL	0.005UJ mg/L	0.005UJ mg/L	0.31J mg/L	0.30J mg/L	0.29J mg/L	0.29J mg/L
CYANIDE - AMENABLE	0.005U mg/L	0.005 mg/L	-1.4 mg/L	-1.7 mg/L	-0.86 mg/L	-1.1 mg/L
pH			9.1	9.1	9.1	9.1
TSS (Total Suspened Solids)			11J mg/L	26J mg/L	39J mg/L	18J mg/L
ALKALINITY (Phenolphthalein)			150 mg/L	150 mg/L	140 mg/L	150 mg/L
ALKALINITY (Methyl Orange)			900 mg/L	910 mg/L	910 mg/L	900 mg/L
SPECIFIC GRAVITY			1.020	1.020 mg/L		1.018
GROSS ALPHA	3UJ mg/L	3U pCi/L	2000+-300JpCi/L	1500+-200JpCi/L	2100+-300JpCi/L	2100+-300JpCi/L
GROSS BETA	6UJ mg/L	6U pCi/L	2900+-300JpCi/L	2500+-300JpCi/L	2800+-300JpCi/L	2800+-300JpCi/L
****** TCLP LEACH ******						
ARSENIC	R	R	167J ug/L	203J ug/L	215J ug/L	167J ug/L
BARIUM	41.0 ug/L	22.0 ug/L	286 ug/L	284 ug/L	299 ug/L	269 ug/L
CADMIUM	5.0U ug/L	5.0U ug/L	5.0U ug/L	5.0U ug/L	5.0U ug/L	5.0U ug/L
CHROMIUM	10.0U ug/L	10.0U ug/L	10.0 ug/L	10.0U ug/L	10.0U ug/L	10.0U ug/L
LEAD	30.0U ug/L	30.0U ug/L	30.0U ug/L	30.0U ug/L	30.0U ug/L	30.0U ug/L
MERCURY	0.2U ug/L	0.2U ug/L	0.2U ug/L	0.2U ug/L	0.2U ug/L	0.2U ug/L
NICKEL	20.0U ug/L	20.0U ug/L	24.0 ug/L	20.0U ug/L	21.0 ug/L	22.0 ug/L
SELENIUM	60.0UJ ug/L	60.0UJ ug/L	60.0UJ ug/L	60.0UJ ug/L	60.0UJ ug/L	60.0UJ ug/L
SILVER	6.0UJ ug/L	6.0UJ ug/L	6.0U ug/L	6.0UJ ug/L	6.0UJ ug/L	6.0UJ ug/L
pH	4.0	6.0	9.0	9.0	9.0	9.0

SAMPLE ID NUMBER:	PW207BS-SW	PW207BS-T
SAMPLE TYPE:		TRIP BLANK
COMPOUND		
****** VOLATILES ******		
ETHYLBENZENE	5U ug/L	5U ug/L
4-METHYL-2-PENTANONE	10U ug/L	10U ug/L
TOLUENE	5U ug/L	5U ug/L
CHLOROBENZENE	5U ug/L	5U ug/L
TETRACHLOROETHENE	5U ug/L	5U ug/L
XYLENE (total)	5U ug/L	5U ug/L
ETHYL ACETATE	5U ug/L	5U ug/L
CARBON TETRACHLORIDE	5U ug/L	5U ug/L
ETHYL ETHER	5U ug/L	5U ug/L
ACETONE	10U ug/L	33U ug/L
BENZENE	5U ug/L	5U ug/L
1,1,1-TRICHLORETHANE	5U ug/L	5U ug/L
METHYLENE CHLORIDE	5U ug/L	5U ug/L
CARBON DISULFIDE	5U ug/L	5U ug/L
1,1-DICHLOROETHENE	5U ug/L	5U ug/L
TRICHLOROFLUOROMETHANE	5UJ ug/L	5UJ ug/L
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5UJ ug/L	5UJ ug/L
2-BUTANONE	10U ug/L	10U ug/L
1,1,2-TRICHLOROETHANE	5U ug/L	5U ug/L
TRICHLORETHENE	5U ug/L	5U ug/L
****** SEMI-VOLATILES ******		
1,4-DICHLOROBENZENE	10U ug/L	
CYCLOHEXANONE	10U ug/L	
PYRIDINE	10UJ ug/L	
1,2,4-TRICHLOROBENZENE	10U ug/L	
2,4-DINITROTOLUENE	10U ug/L	
PYRENE	10U ug/L	
N-NITROSO-DI-N-PROPYLAMINE	10U ug/L	
2-NITROPROPANE	10U ug/L	
ACENAPHTHENE	10U ug/L	
1,2-DICHLOROBENZENE	10U ug/L	
****** ALCOHOLS ******		
N-BUTYL ALCOHOL	1U mg/L	
METHANOL	1U mg/L	
ISOBUTANOL	1U mg/L	
2-ETHOXYETHANOL	50U mg/L	

SAMPLE ID NUMBER:	PW207BS-SW	PW207BS-T
SAMPLE TYPE:		TRIP BLANK

****** INORGANICS ******

SILVER	10.0U	ug/L
ARSENIC	274	ug/L
BORON	2740J	ug/L
BARIUM	115	ug/L
CALCIUM	52500	ug/L
CADMIUM	5.0U	ug/L
CHROMIUM	14.0J	ug/L
MERCURY	0.2U	ug/L
POTASSIUM	687000	ug/L
MAGNESIUM	187000	ug/L
SODIUM	2660000	ug/L
NICKEL	20.0	ug/L
LEAD	30.0U	ug/L
SELENIUM	60.0U	ug/L

****** MISCELLANEOUS ******

PHOSPHORUS,TOTAL (AS P)	2.8J	mg/L
SULFATE (AS SO4)	600	mg/L
NITRATE	1600	mg/L
CHLORIDE	1000U	mg/L
TDS (Total Dissolved Solids)	15000	mg/L
AMMONIA	0.5	mg/L
TOC (Total Organic Carbon)	110	mg/L
CYANIDE - TOTAL	0.28J	mg/L
CYANIDE - AMENABLE	-2.6	mg/L
pH	9.1	mg/L
TSS (Total Suspened Solids)	17J	mg/L
ALKALINITY (Phenolphthalein)	160	mg/L
ALKALINITY (Methyl Orange)	910	mg/L
SPECIFIC GRAVITY	1.016	
GROSS ALPHA	1900+-200J	pCi/L
GROSS BETA	2600+-300J	pCi/L

****** TCLP LEACH ******

ARSENIC	390J	ug/L
BARIUM	319	ug/L
CADMIUM	5.0U	ug/L
CHROMIUM	87.0	ug/L
LEAD	30.0U	ug/L
MERCURY	0.2U	ug/L
NICKEL	20.0U	ug/L
SELENIUM	60.0UJ	ug/L
SILVER	11.0U	ug/L
pH	9.0	

SAMPLE ID NUMBER:	PW207C-B	PW207C-F	PW207C-NE	PW207C-NE-D	PW207C-NW	PW207C-SE
SAMPLE TYPE:	RINSATE BLANK	FIELD BLANK		DUPLICATE		
COMPOUND						
****** VOLATILES ******						
ETHYLBENZENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
4-METHYL-2-PENTANONE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L
TOLUENE	5U ug/L	3J ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
CHLOROBENZENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
TETRACHLOROETHENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
XYLENE (total)	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
ETHYL ACETATE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
CARBON TETRACHLORIDE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
ETHYL ETHER	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
ACETONE	15U ug/L	14U ug/L	270U ug/L	150U ug/L	220U ug/L	140U ug/L
BENZENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
1,1,1-TRICHLORETHANE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
METHYLENE CHLORIDE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	8 ug/L	5U ug/L
CARBON DISULFIDE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
1,1-DICHLOROETHENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
TRICHLOROFLUOROMETHANE	5U ug/L	3J ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
2-BUTANONE	10U ug/L	10U ug/L	110J ug/L	77J ug/L	110 ug/L	10U ug/L
1,1,2-TRICHLOROETHANE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
TRICHLORETHENE	5U ug/L	5U ug/L	8U ug/L	5U ug/L	5U ug/L	5U ug/L
****** SEMI-VOLATILES ******						
1,4-DICHLOROBENZENE	10U ug/L	10U ug/L	10UJ ug/L	R	10UJ ug/L	10UJ ug/L
CYCLOHEXANONE	10U ug/L	10UJ ug/L	10UJ ug/L	R	10UJ ug/L	10UJ ug/L
PYRIDINE	10U ug/L	10U ug/L	10U ug/L	R	10UJ ug/L	10UJ ug/L
1,2,4-TRICHLOROBENZENE	10U ug/L	10U ug/L	10UJ ug/L	R	10UJ ug/L	10UJ ug/L
2,4-DINITROTOLUENE	10U ug/L	10U ug/L	10UJ ug/L	R	10UJ ug/L	10UJ ug/L
PYRENE	10U ug/L	10U ug/L	10UJ ug/L	R	10UJ ug/L	10UJ ug/L
N-NITROSO-DI-N-PROPYLAMINE	10U ug/L	10U ug/L	10UJ ug/L	R	10UJ ug/L	10UJ ug/L
2-NITROPROPANE	10UJ ug/L	10UJ ug/L	10UJ ug/L	R	10UJ ug/L	10UJ ug/L
ACENAPHTHENE	10U ug/L	10U ug/L	10UJ ug/L	R	10UJ ug/L	10UJ ug/L
1,2-DICHLOROBENZENE	10U ug/L	10U ug/L	10UJ ug/L	R	10U ug/L	10U ug/L
****** ALCOHOLS ******						
N-BUTYL ALCOHOL	1U mg/L	1U mg/L	1U ug/L	1U ug/L	1U ug/L	1U ug/L
METHANOL	1UJ mg/L	1UJ mg/L	1UJ ug/L	1U ug/L	1UJ ug/L	1UJ ug/L
ISOBUTANOL	1U mg/L	1U mg/L	1UJ ug/L	1U ug/L	1U ug/L	1U ug/L
2-ETHOXYETHANOL	50U mg/L	50U mg/L	50UJ ug/L	50U ug/L	50U ug/L	50U ug/L

SAMPLE ID NUMBER:	PW207C-B	PW207C-F	PW207C-NE	PW207C-NE-D	PW207C-NW	PW207C-SE
SAMPLE TYPE:	RINSATE BLANK	FIELD BLANK		DUPLICATE		
****** INORGANICS ******						
SILVER	6.0UJ ug/L	6.0UJ ug/L	580UJ ug/L	240UJ ug/L	530UJ ug/L	460UJ ug/L
ARSENIC	40.0U ug/L	40.0U ug/L	4110 ug/L	3370 ug/L	3550 ug/L	3350 ug/L
BORON	13.0 ug/L	14.0 ug/L	460000 ug/L	494000 ug/L	438000 ug/L	437000 ug/L
BARIUM	3.0U ug/L	3.0U ug/L	130 ug/L	110 ug/L	130 ug/L	130 ug/L
CALCIUM	20.0U ug/L	5930 ug/L	4080U ug/L	1080U ug/L	10100U ug/L	3820U ug/L
CADMIUM	5.0UJ ug/L	5.0UJ ug/L	490 ug/L	430J ug/L	450J ug/L	500J ug/L
CHROMIUM	10.0UJ ug/L	10.0UJ ug/L	3580J ug/L	3400J ug/L	3370J ug/L	3320J ug/L
MERCURY	0.2UJ ug/L	0.2UJ ug/L	2.0UJ ug/L	2.0UJ ug/L	2.0UJ ug/L	2.0UJ ug/L
POTASSIUM	1150 ug/L	1690 ug/L	55200000 ug/L	59200000 ug/L	55200000 ug/L	54700000 ug/L
MAGNESIUM	20.0U ug/L	128 ug/L	2970 ug/L	1300 ug/L	2950 ug/L	2850 ug/L
SODIUM	929J ug/L	1350J ug/L	138000000J ug/L	142000000J ug/L	137000000J ug/L	136000000J ug/L
NICKEL	20.0UJ ug/L	20.0UJ ug/L	2610J ug/L	2920J ug/L	2560J ug/L	2540J ug/L
LEAD	30.0U ug/L	30.0U ug/L	300 ug/L	300 ug/L	300U ug/L	300U ug/L
SELENIUM	60.0U ug/L	60.0U ug/L	600 ug/L	6000U ug/L	3000U ug/L	3000 ug/L
****** MISCELLANEOUS ******						
PHOSPHORUS,TOTAL (AS P)			570J mg/L	610J mg/L	520J mg/L	560J mg/L
SULFATE (AS SO4)			17000 mg/L	17000 mg/L	18000 mg/L	16000 mg/L
NITRATE			65000J mg/L	66000J mg/L	57000J mg/L	62000J mg/L
CHLORIDE			21000 mg/L	24000 mg/L	25000 mg/L	22000 mg/L
TDS (Total Dissolved Solids)			510000 mg/L	500000 mg/L	470000 mg/L	500000 mg/L
AMMONIA			5.0 mg/L	6.4J mg/L	1.9J mg/L	1.8J mg/L
TOC (Total Organic Carbon)			1300J mg/L	1600J mg/L	1300J mg/L	1200J mg/L
CYANIDE - TOTAL	0.17J mg/L	0.005UJ mg/L	3.3J mg/L	20J mg/L	4.0J mg/L	7.1J mg/L
CYANIDE - AMENABLE	-0.013J mg/L	-0.11J mg/L	-23J mg/L	-120J mg/L	-0.77J mg/L	-7.5J mg/L
pH			10.0	10.1	10.1	10.1
TSS (Total Suspened Solids)			410J mg/L	1400J mg/L	310J mg/L	330J mg/L
ALKALINITY (Phenolphthalein)			29000 mg/L	32000 mg/L	29000 mg/L	29000 mg/L
ALKALINITY (Methyl Orange)			60000 mg/L	6300 mg/L	58000 mg/L	59000 mg/L
SPECIFIC GRAVITY			1.348 mg/L	1.348	1.318 L	1.330
GROSS ALPHA	3 pCi/L	3U pCi/L	63+/-9 nCi/L	84+/-10 nCi/L	98 +/-10 nCi/L	130+/-20 nCi/L
GROSS BETA	6U pCi/L	6U pCi/L	170 +/-20 nCi/L	190+/-20 nCi/L	180 +/-20 nCi/L	200 +/-20 nCi/L
****** TCLP LEACH ******						
ARSENIC	40.0U ug/L	40.0U ug/L	5510 ug/L	4810 ug/L	4970 ug/L	4860 ug/L
BARIUM	48.0J ug/L	55.0J ug/L	360U ug/L	400U ug/L	340U ug/L	340U ug/L
CADMIUM	R	R	440J ug/L	560J ug/L	350J ug/L	430J ug/L
CHROMIUM	10.0UJ ug/L	20.0UJ ug/L	2710J ug/L	9160J ug/L	2360J ug/L	2420J ug/L
LEAD	30.0UJ ug/L	30.0UJ ug/L	300UJ ug/L	300UJ ug/L	300UJ ug/L	300UJ ug/L
MERCURY	0.2U ug/L	0.2U ug/L	2.0U ug/L	2.0U ug/L	2.0U ug/L	2.0U ug/L
NICKEL	20.0UJ ug/L	20.0UJ ug/L	2730J ug/L	4930J ug/L	2440J ug/L	2450J ug/L
SELENIUM	60.0UJ ug/L	60.0UJ ug/L	600UJ ug/L	600UJ ug/L	600UJ ug/L	600UJ ug/L
SILVER	6.0UJ ug/L	6.0UJ ug/L	250J ug/L	430J ug/L	210J ug/L	190J ug/L
pH	4.0	4.2	10.2	10.2	10.2	10.2

SAMPLE ID NUMBER:	PW207C-SW	PW207C-T
SAMPLE TYPE:		TRIP BLANK
COMPOUND		
****** VOLATILES ******		
ETHYLBENZENE	5U ug/L	5U ug/L
4-METHYL-2-PENTANONE	10U ug/L	10U ug/L
TOLUENE	5U ug/L	5U ug/L
CHLOROBENZENE	5U ug/L	5U ug/L
TETRACHLOROETHENE	5U ug/L	5U ug/L
XYLENE (total)	5U ug/L	5U ug/L
ETHYL ACETATE	5U ug/L	5U ug/L
CARBON TETRACHLORIDE	5U ug/L	5U ug/L
ETHYL ETHER	5U ug/L	5U ug/L
ACETONE	150U ug/L	10U ug/L
BENZENE	5U ug/L	5U ug/L
1,1,1-TRICHLORETHANE	5U ug/L	5U ug/L
METHYLENE CHLORIDE	5U ug/L	5U ug/L
CARBON DISULFIDE	5U ug/L	5U ug/L
1,1-DICHLOROETHENE	5U ug/L	5U ug/L
TRICHLOROFLUOROMETHANE	5U ug/L	5U ug/L
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5U ug/L	5U ug/L
2-BUTANONE	79 ug/L	10U ug/L
1,1,2-TRICHLOROETHANE	5U ug/L	5U ug/L
TRICHLORETHENE	5U ug/L	5U ug/L
****** SEMI-VOLATILES ******		
1,4-DICHLOROBENZENE	10UJ ug/L	
CYCLOHEXANONE	10UJ ug/L	
PYRIDINE	10UJ ug/L	
1,2,4-TRICHLOROBENZENE	10UJ ug/L	
2,4-DINITROTOLUENE	10UJ ug/L	
PYRENE	10UJ ug/L	
N-NITROSO-DI-N-PROPYLAMINE	10UJ ug/L	
2-NITROPROPANE	10UJ ug/L	
ACENAPHTHENE	10UJ ug/L	
1,2-DICHLOROBENZENE	10U ug/L	
****** ALCOHOLS ******		
N-BUTYL ALCOHOL	1U ug/L	
METHANOL	1UJ ug/L	
ISOBUTANOL	1U ug/L	
2-ETHOXYETHANOL	50U ug/L	

SAMPLE ID NUMBER:	PW207C-SW	PW207C-T
SAMPLE TYPE:		TRIP BLANK
****** INORGANICS ******		
SILVER	520UJ ug/L	
ARSENIC	4070 ug/L	
BORON	484000 ug/L	
BARIUM	150 ug/L	
CALCIUM	32300U ug/L	
CADMIUM	560J ug/L	
CHROMIUM	3940J ug/L	
MERCURY	2.0UJ ug/L	
POTASSIUM	54500000 ug/L	
MAGNESIUM	3870 ug/L	
SODIUM	136000000J ug/L	
NICKEL	2790J ug/L	
LEAD	300U ug/L	
SELENIUM	600U ug/L	
****** MISCELLANEOUS ******		
PHOSPHORUS,TOTAL (AS P)	570J mg/L	
SULFATE (AS SO4)	17000 mg/L	
NITRATE	62000 mg/L	
CHLORIDE	23000 mg/L	
TDS (Total Dissolved Solids)	300000 mg/L	
AMMONIA	3.6J mg/L	
TOC (Total Organic Carbon)	1400J mg/L	
CYANIDE - TOTAL	4.1J mg/L	
CYANIDE - AMENABLE	-21J mg/L	
pH	10.1	
TSS (Total Suspened Solids)	220J mg/L	
ALKALINITY (Phenolphthalein)	25000 mg/L	
ALKALINITY (Methyl Orange)	61000 mg/L	
SPECIFIC GRAVITY	1.316	
GROSS ALPHA	120+/-20 nCi/L	
GROSS BETA	230+/-30 nCi/L	
****** TCLP LEACH ******		
ARSENIC	4660 ug/L	
BARIUM	390U ug/L	
CADMIUM	380J ug/L	
CHROMIUM	2240J ug/L	
LEAD	300UJ ug/L	
MERCURY	2.0U ug/L	
NICKEL	2330J ug/L	
SELENIUM	600UJ ug/L	
SILVER	150J ug/L	
pH	10.2	

SAMPLE ID NUMBER:	CW-000-B	CW-000-F	CW-000-T	CW-001	CW-001-D	CW-002
SAMPLE TYPE:	RINSATE BLANK	FIELD BLANK	TRIP BLANK		DUPLICATE	
COMPOUND						
****** VOLATILES ******						
ETHYLBENZENE	5U ug/L	5U ug/L	5U ug/l	5U ug/L	5U ug/L	5U ug/L
4-METHYL-2-PENTANONE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L
TOLUENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
CHLOROBENZENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
TETRACHLOROETHENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
XYLENE (total)	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
ETHYL ACETATE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
CARBON TETRACHLORIDE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
ETHYL ETHER	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
ACETONE	10U ug/L	10U ug/L	11B ug/L	14U ug/L	13U ug/L	18U ug/L
BENZENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
1,1,1-TRICHLORETHANE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
METHYLENE CHLORIDE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
CARBON DISULFIDE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
1,1-DICHLOROETHENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
TRICHLOROFLUOROMETHANE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
2-BUTANONE	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L	10U ug/L
1,1,2-TRICHLOROETHANE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
TRICHLORETHENE	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L	5U ug/L
****** SEMI-VOLATILES ******						
1,4-DICHLOROBENZENE	10U ug/L	10U ug/L		10U ug/L	10U ug/L	10U ug/L
CYCLOHEXANONE	10U ug/L	10U ug/L		10U ug/L	10U ug/L	10U ug/L
PYRIDINE	10U ug/L	10U ug/L		10U ug/L	10UJ ug/L	10U ug/L
1,2,4-TRICHLOROBENZENE	10U ug/L	10U ug/L		10U ug/L	10U ug/L	10U ug/L
2,4-DINITROTOLUENE	10U ug/L	10U ug/L		10U ug/L	10U ug/L	10U ug/L
PYRENE	10U ug/L	10U ug/L		10U ug/L	10U ug/L	10U ug/L
N-NITROSO-DI-N-PROPYLAMINE	10U ug/L	10U ug/L		10U ug/L	10U ug/L	10U ug/L
2-NITROPROPANE	10UJ ug/L	10UJ ug/L		10UJ ug/L	10UJ ug/L	10UJ ug/L
ACENAPHTHENE	10U ug/L	10U ug/L		10U ug/L	10U ug/L	10U ug/L
1,2-DICHLOROBENZENE	10U ug/L	10U ug/L		10U ug/L	10U ug/L	10U ug/L
****** ALCOHOLS ******						
N-BUTYL ALCOHOL	1U ug/L	1U mg/L		1U mg/L	1U mg/L	1U mg/L
METHANOL	1U ug/L	1U mg/L		1U mg/L	1U mg/L	1U mg/L
ISOBUTANOL	1U ug/L	1U mg/L		1U mg/L	1U mg/L	1U mg/L
2-ETHOXYETHANOL	50U ug/L	1U mg/L		50U mg/L	50U mg/L	50U mg/L

SAMPLE ID NUMBER:	CW-000-B	CW-000-F	CW-000-T	CW-001	CW-001-D	CW-002
SAMPLE TYPE:	RINSATE BLANK	FIELD BLANK	TRIP BLANK		DUPLICATE	
****** INORGANICS ******						
SILVER	6.0UJ ug/L	7.0J ug/L		66.0J ug/L	110J ug/L	72.0J ug/L
ARSENIC	40.0U ug/L	40.0U ug/L		342 ug/L	272 ug/L	334 ug/L
BORON	6.0 ug/L	29.0 ug/L		23900 ug/L	23300 ug/L	30200 ug/L
BARIUM	3.0U ug/L	3.0U ug/L		44.0 ug/L	91.0 ug/L	30.0 ug/L
CALCIUM	205 ug/L	285 ug/L		17300U ug/L	25400U ug/L	14400U ug/L
CADMIUM	5.0UJ ug/L	5.0UJ ug/L		231J ug/L	570J ug/L	38.0J ug/L
CHROMIUM	10.0UJ ug/L	10.0UJ ug/L		283J ug/L	825J ug/L	138J ug/L
MERCURY	0.2UJ ug/L	0.2UJ ug/L		2.2J ug/L	3.8J ug/L	3.5J ug/L
POTASSIUM	692 ug/L	852 ug/L		4930000 ug/L	4860000 ug/L	6090000 ug/L
MAGNESIUM	20.0U ug/L	20.0 ug/L		3270 ug/L	6730J ug/L	2580 ug/L
SODIUM	1000J ug/L	1110J ug/L		10200000J ug/L	9940000J ug/L	12800000J ug/L
NICKEL	20.0UJ ug/L	20.0UJ ug/L		258J ug/L	393J ug/L	293J ug/L
LEAD	30.0U ug/L	30.0U ug/L		34.0 ug/L	46.0 ug/L	30.0U ug/L
SELENIUM	60.0U ug/L	60.0U ug/L		60.0U ug/L	60.0U ug/L	60.0U ug/L
****** MISCELLANEOUS ******						
PHOSPHORUS,TOTAL (AS P)				84 mg/L	80 mg/L	78 mg/L
SULFATE (AS SO4)				3200 mg/L	2600 mg/L	2800 mg/L
NITRATE				10000J mg/L	5700J mg/L	6900J mg/L
CHLORIDE				1600 mg/L	1700 mg/L	3200 mg/L
TDS (Total Dissolved Solids)				46000 mg/L	61000 mg/L	60000 mg/L
AMMONIA				8.5J mg/L	5.0J mg/L	9.8J mg/L
TOC (Total Organic Carbon)				190J mg/L	140J mg/L	160J mg/L
CYANIDE - TOTAL	0.005UJ mg/L	0.005UJ mg/L		2.4J mg/L	2.7J mg/L	2.8J mg/L
CYANIDE - AMENABLE	-0.017J mg/L	0.005UJ mg/L		-14J mg/L	-8.3J mg/L	-9.8J mg/L
pH				10.00	10.0	10.0
TSS (Total Suspened Solids)				180J mg/L	140J mg/L	68J mg/L
ALKALINITY (Phenolphthalein)				2300 mg/L	2700 mg/L	2900 mg/L
ALKALINITY (Methyl Orange)				5500 mg/L	6400 mg/L	6900 mg/L
SPECIFIC GRAVITY				1.038		1.040
GROSS ALPHA	57+/-7 pCi/L	3 pCi/L		16+/-2 nCi/L	19+/-2 nCi/L	18+/-2 nCi/L
GROSS BETA	73+/-8 pCi/L	6 pCi/L		23 +/-3 nCi/L	22 +/-3 nCi/L	26 +/-3 nCi/L
****** TCLP LEACH ******						
ARSENIC	200 ug/L	200 ug/L		1440 ug/L	1500 ug/L	1400 ug/L
BARIUM	75.0J ug/L	80.0J ug/L		270U ug/L	320U ug/L	280U ug/L
CADMIUM	R	R		50.0J ug/L	R	R
CHROMIUM	10.0UJ ug/L	10.0UJ ug/L		100UJ ug/L	110J ug/L	100UJ ug/L
LEAD	30.0UJ ug/L	30.0UJ ug/L		300UJ ug/L	300UJ ug/L	300UJ ug/L
MERCURY	0.2U ug/L	0.2U ug/L		0.2U ug/L	0.2U ug/L	0.2U ug/L
NICKEL	20.0UJ ug/L	20.0UJ ug/L		200UJ ug/L	310J ug/L	350J ug/L
SELENIUM	60.0UJ ug/L	60.0UJ ug/L		600UJ ug/L	600UJ ug/L	600UJ ug/L
SILVER	6.0UJ ug/L	6.0UJ ug/L		60.0UJ ug/L	60.0UJ ug/L	60.0UJ ug/L
pH	7.2	6.5		10.1	10.1	10.1

SAMPLE ID NUMBER: CW-003
SAMPLE TYPE:

COMPOUND		
****** VOLATILES ******		
ETHYLBENZENE	5U	ug/L
4-METHYL-2-PENTANONE	10U	ug/L
TOLUENE	5U	ug/L
CHLOROBENZENE	5U	ug/L
TETRACHLOROETHENE	5U	ug/L
XYLENE (total)	5U	ug/L
ETHYL ACETATE	5U	ug/L
CARBON TETRACHLORIDE	5U	ug/L
ETHYL ETHER	5U	ug/L
ACETONE	24U	ug/L
BENZENE	5U	ug/L
1,1,1-TRICHLORETHANE	5U	ug/L
METHYLENE CHLORIDE	5U	ug/L
CARBON DISULFIDE	5U	ug/L
1,1-DICHLOROETHENE	5U	ug/L
TRICHLOROFLUOROMETHANE	5U	ug/L
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5U	ug/L
2-BUTANONE	10U	ug/L
1,1,2-TRICHLOROETHANE	5U	ug/L
TRICHLORETHENE	5U	ug/L
****** SEMI-VOLATILES ******		
1,4-DICHLOROBENZENE	10U	ug/L
CYCLOHEXANONE	10U	ug/L
PYRIDINE	10U	ug/L
1,2,4-TRICHLOROBENZENE	10U	ug/L
2,4-DINITROTOLUENE	10U	ug/L
PYRENE	10U	ug/L
N-NITROSO-DI-N-PROPYLAMINE	10U	ug/L
2-NITROPROPANE	10UJ	ug/L
ACENAPHTHENE	10U	ug/L
1,2-DICHLOROBENZENE	10U	ug/L
****** ALCOHOLS ******		
N-BUTYL ALCOHOL	1U	mg/L
METHANOL	1U	mg/L
ISOBUTANOL	1U	mg/L
2-ETHOXYETHANOL	50U	mg/L

SAMPLE ID NUMBER:	CW-003	
SAMPLE TYPE:		

****** INORGANICS ******

SILVER	91.0J	ug/L
ARSENIC	302	ug/L
BORON	34700	ug/L
BARIUM	32.0	ug/L
CALCIUM	14200U	ug/L
CADMIUM	43.0J	ug/L
CHROMIUM	175J	ug/L
MERCURY	4.6J	ug/L
POTASSIUM	7000000	ug/L
MAGNESIUM	3020	ug/L
SODIUM	14800000	ug/L
NICKEL	335J	ug/L
LEAD	30.0U	ug/L
SELENIUM	60.0U	ug/L

****** MISCELLANEOUS ******

PHOSPHORUS,TOTAL (AS P)	81	mg/L
SULFATE (AS SO4)	2600	mg/L
NITRATE	6400J	mg/L
CHLORIDE	1850	mg/L
TDS (Total Dissolved Solids)	68000J	mg/L
AMMONIA	14J	mg/L
TOC (Total Organic Carbon)	170J	mg/L
CYANIDE - TOTAL	3.0J	mg/L
CYANIDE - AMENABLE	-3.3J	mg/L
pH	9.9	
TSS (Total Suspened Solids)	170J	mg/L
ALKALINITY (Phenolphthalein)	3100	mg/L
ALKALINITY (Methyl Orange)	8200	mg/L
SPECIFIC GRAVITY	1.044	
GROSS ALPHA	16+/-1	nCi/L
GROSS BETA	30 +/-3	nCi/L

****** TCLP LEACH ******

ARSENIC	1800	ug/L
BARIUM	260U	ug/L
CADMIUM	R	
CHROMIUM	140J	ug/L
LEAD	300UJ	ug/L
MERCURY	0.2U	ug/L
NICKEL	290J	ug/L
SELENIUM	600UJ	ug/L
SILVER	60.0UJ	ug/L
pH	10.1	

SAMPLE ID NUMBER: PS207A-NE
SAMPLE TYPE:

COMPOUND		
****** VOLATILES ******		
1,1,1-TRICHLORETHANE	24J	ug/kg
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	260J	ug/kg
1,1,2-TRICHLOROETHANE	38U	ug/kg
1,1-DICHLOROETHENE	38U	ug/kg
2-BUTANONE	77U	ug/kg
4-METHYL-2-PENTANONE	77U	ug/kg
ACETONE	77UJ	ug/kg
BENZENE	38U	ug/kg
CARBON DISULFIDE	38U	ug/kg
CARBON TETRACHLORIDE	38U	ug/kg
CHLOROBENZENE	38U	ug/kg
ETHYL ACETATE	38U	ug/kg
ETHYL ETHER	38U	ug/kg
ETHYLBENZENE	38U	ug/kg
METHYLENE CHLORIDE	38U	ug/kg
TETRACHLOROETHENE	290	ug/kg
TOLUENE	38U	ug/kg
TRICHLORETHENE	29J	ug/kg
TRICHLOROFLUOROMETHANE	38U	ug/kg
XYLENE (total)	38U	ug/kg
****** SEMI-VOLATILES ******		
1,2,4-TRICHLOROBENZENE	2500U	ug/kg
1,2-DICHLOROBENZENE	2500U	ug/kg
1,4-DICHLOROBENZENE	2500U	ug/kg
2,4-DINITROTOLUENE	2500U	ug/kg
2-NITROPROPANE	2500UJ	ug/k
ACENAPHTHENE	2500U	ug/kg
CYCLOHEXANONE	2500U	ug/kg
N-NITROSO-DI-N-PROPYLAMINE	2500U	ug/kg
PYRENE	2500U	ug/kg
PYRIDINE	2500UJ	ug/k
****** ALCOHOLS ******		
2-ETHOXYETHANOL	500U	mg/kg
ISOBUTANOL	10U	mg/kg
METHANOL	10U	mg/kg
N-BUTYL ALCOHOL	10U	mg/kg

SAMPLE ID NUMBER:	PS207A-NE
SAMPLE TYPE:	

****** INORGANICS ******		
ARSENIC	40.2J	mg/mg
BARIUM	210J	mg/kg
BORON	84.3J	mg/kg
CADMIUM	1300J	mg/kg
CALCIUM		
CHROMIUM	658J	mg/kg
LEAD	89.0J	mg/kg
MAGNESIUM	11400J	mg/kg
MERCURY	0.8U	mg/kg
NICKEL	102J	mg/kg
POTASSIUM	7340UJ	mg/kg
SELENIUM	47.2UJ	mg/kg
SILVER	45.7UJ	mg/kg
SODIUM	14500J	mg/kg
****** MISCELLANEOUS ******		
AMMONIA	36	mg/kg
ATTERBERG - LIQUID LIMIT	83	
ATTERBERG - PLASTIC INDEX	49	
ATTERBERG - PLASTIC LIMIT	34	
BULK DENSITY (DRIED SOLIDS)		
CYANIDE - AMENABLE		
CYANIDE - TOTAL	1.6J	mg/kg
GROSS ALPHA	570+/- 60	pCi/g
GROSS BETA	95+/-10	pCi/g
MOISTURE - GRAVIMETRIC	87.3J	%
MOISTURE - KARL FISHER	34	%
pH	8.9	
SPECIFIC GRAVITY	1.1	
SWELL TEST	40	%
TOC (Total Organic Carbon)	14000	mg/kg
****** ASTM LEACH ******		
CHLORIDE	20	mg/L
NITRATE	35	mg/L
PERCENT RECOVERY OF SOLIDS	11.6	%
PHOSPHORUS,TOTAL (AS P)	0.1J	mg/L
SULFATE	20	mg/L
TDS (Total Dissolved Solids)	480	mg/L

SAMPLE ID NUMBER: PS207A-NE
SAMPLE TYPE:

****** TCLP LEACH ******

ARSENIC	185J	ug/L
BARIUM	1710J	ug/L
CADMIUM	485J	ug/L
CHROMIUM	51.0U	ug/L
LEAD	30.0U	ug/L
MERCURY	0.2U	ug/L
NICKEL	20.0UJ	ug/L
pH	6.1	
SELENIUM	60.0UG	ug/L
SILVER	6.0U	ug/L

SAMPLE ID NUMBER:	PS207BN-NE	PS207BN-NW	PS207BN-SE	PS207BN-SW	PS207BN-T
SAMPLE TYPE:					TRIP BLANK
COMPOUND					
****** VOLATILES ******					
1,1,1-TRICHLORETHANE	21UJ ug/kg	22U ug/kg	18UJ ug/kg	21U ug/kg	5U ug/L
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	21UJ ug/kg	22U ug/kg	18UJ ug/kg	21UJ ug/kg	5UJ ug/L
1,1,2-TRICHLOROETHANE	21UJ ug/kg	22UJ ug/kg	18UJ ug/kg	21U ug/kg	5U ug/L
1,1-DICHLOROETHENE	21UJ ug/kg	22U ug/kg	18UJ ug/kg	21U ug/kg	5U ug/L
2-BUTANONE	42UJ ug/kg	43U ug/kg	36UJ ug/kg	42U ug/kg	10U ug/L
4-METHYL-2-PENTANONE	42UJ ug/kg	43U ug/kg	36UJ ug/kg	42UJ ug/kg	10U ug/L
ACETONE	42UJ ug/kg	43UJ ug/kg	36UJ ug/kg	42UJ ug/kg	7U ug/L
BENZENE	21UJ ug/kg	22U ug/kg	18UJ ug/kg	21U ug/kg	5U ug/L
CARBON DISULFIDE	21UJ ug/kg	22UJ ug/kg	18UJ ug/kg	21UJ ug/kg	5U ug/L
CARBON TETRACHLORIDE	21UJ ug/kg	22U ug/kg	18UJ ug/kg	21U ug/kg	5U ug/L
CHLOROBENZENE	21UJ ug/kg	22U ug/kg	18UJ ug/kg	21UJ ug/kg	5U ug/L
ETHYL ACETATE	21U ug/kg	22U ug/kg	18U ug/kg	21U ug/kg	5U ug/L
ETHYL ETHER	21UJ ug/kg	22UJ ug/kg	18UJ ug/kg	21UJ ug/kg	5U ug/L
ETHYLBENZENE	21UJ ug/kg	22U ug/kg	18UJ ug/kg	21UJ ug/kg	5U ug/L
METHYLENE CHLORIDE	21UJ ug/kg	22U ug/kg	18UJ ug/kg	21U ug/kg	5U ug/L
TETRACHLOROETHENE	21UJ ug/kg	22U ug/kg	18UJ ug/kg	21UJ ug/kg	5U ug/L
TOLUENE	21UJ ug/kg	22U ug/kg	18UJ ug/kg	21UJ ug/kg	5U ug/L
TRICHLORETHENE	21UJ ug/kg	22U ug/kg	18UJ ug/kg	21U ug/kg	5U ug/L
TRICHLOROFLUOROMETHANE	21UJ ug/kg	22UJ ug/kg	18UJ ug/kg	21UJ ug/kg	5U ug/L
XYLENE (total)	21UJ ug/kg	22U ug/kg	18UJ ug/kg	21UJ ug/kg	5U ug/L
****** SEMI-VOLATILES ******					
1,2,4-TRICHLOROBENZENE	1400U ug/kg	1400U ug/kg	1200U ug/kg	1400U ug/kg	
1,2-DICHLOROBENZENE	1400U ug/kg	1400U ug/kg	1200U ug/kg	1400U ug/kg	
1,4-DICHLOROBENZENE	1400U ug/kg	1400U ug/kg	1200U ug/kg	1400U ug/kg	
2,4-DINITROTOLUENE	1400U ug/kg	1400U ug/kg	1200U ug/kg	1400U ug/kg	
2-NITROPROPANE	1400U ug/kg	1400U ug/kg	1200U ug/kg	1400U ug/kg	
ACENAPHTHENE	1400U ug/kg	1400U ug/kg	1200U ug/kg	1400U ug/kg	
CYCLOHEXANONE	1400U ug/kg	1400U ug/kg	1200U ug/kg	1400U ug/kg	
N-NITROSO-DI-N-PROPYLAMINE	1400U ug/kg	1400U ug/kg	1200U ug/kg	1400U ug/kg	
PYRENE	1400U ug/kg	1400U ug/kg	1200U ug/kg	1400U ug/kg	
PYRIDINE	1400UJ ug/kg	1400UJ ug/kg	1200UJ ug/kg	1400UJ ug/kg	
****** ALCOHOLS ******					
2-ETHOXYETHANOL	500U mg/kg	500U mg/kg	500U mg/kg	500U mg/kg	
ISOBUTANOL	10U mg/kg	10U mg/kg	10U mg/kg	10U mg/kg	
METHANOL	10U mg/kg	10U mg/kg	10U mg/kg	10U mg/kg	
N-BUTYL ALCOHOL	10U mg/kg	10U mg/kg	10U mg/kg	10U mg/kg	

SAMPLE ID NUMBER:	PS207BN-NE	PS207BN-NW	PS207BN-SE	PS207BN-SW	PS207BN-T
SAMPLE TYPE:					TRIP BLANK
****** INORGANICS ******					
ARSENIC	16.7UJ mg/kg	17.2UJ mg/kg	14.2UJ mg/kg	16.5UJ mg/kg	
BARIUM	89.1J mg/kg	111J mg/kg	105J mg/kg	116J mg/kg	
BORON	18.0U mg/kg	14.2U mg/kg	13.5U mg/kg	12.8J mg/kg	
CADMIUM	6.7J mg/kg	6.9J mg/kg	8.5J mg/kg	12.8U mg/kg	
CALCIUM					
CHROMIUM	7.9J mg/kg	31.9J mg/kg	33.3J mg/kg	19.8J mg/kg	
LEAD	13.8J mg/kg	14.2J mg/kg	21.3J mg/kg	14.0J mg/kg	
MAGNESIUM	3270 mg/kg	3940 mg/kg	3850 mg/kg	4160 mg/kg	
MERCURY	0.8J mg/kg	0.7J mg/kg	0.3UJ mg/kg	0.4UJ mg/kg	
NICKEL	8.4U mg/kg	9.5J mg/kg	7.1 mg/kg	8.2U mg/kg	
POTASSIUM	1260U mg/kg	1350U mg/kg	1550U mg/kg	1350U mg/kg	
SELENIUM	25.1UJ mg/kg	25.9UJ mg/kg	21.3UJ mg/kg	24.7UJ mg/kg	
SILVER	2.5UJ mg/kg	2.6UJ mg/kg	2.1UJ mg/kg	2.5UJ mg/kg	
SODIUM	1830U mg/kg	1990U mg/kg	1640U mg/kg	1850U mg/kg	
****** MISCELLANEOUS ******					
AMMONIA	20J mg/kg	23J mg/kg	35J mg/kg	9.8J mg/kg	
ATTERBERG - LIQUID LIMIT	73	75	71	72	
ATTERBERG - PLASTIC INDEX	40	40	34	35	
ATTERBERG - PLASTIC LIMIT	33	35	37	37	
BULK DENSITY (DRIED SOLIDS)	0.84 g/cc	0.87	0.88 g/cc	0.90 g/cc	
CYANIDE - AMENABLE					
CYANIDE - TOTAL	0.25UJ mg/kg	0.25UJ mg/kg	0.25UJ mg/kg	0.25UJ mg/kg	
GROSS ALPHA	9.4+-3.7J pCi/g	5.2+-3.0J pCi/g	11+-4J pCi/g	10 +/- 4J pCi/g	
GROSS BETA	5.4+-3.4J pCi/g	5.1+-3.2J pCi/g	8.8+-3.8J pCi/g	9.8+-3.5J pCi/g	
MOISTURE - GRAVIMETRIC	76.1 %	76.8 %	71.8 %	75.7 %	
MOISTURE - KARL FISHER	23.5 %	25.3 %	25.7 %	27.9 %	
pH	7.7	7.7J	7.6	7.6	
SPECIFIC GRAVITY	1.2	1.2	1.2	1.2	
SWELL TEST	0 %	10 %	10 %	10 %	
TOC (Total Organic Carbon)	3300J mg/kg	3200J mg/kg	3400J mg/kg	3000J mg/kg	
****** ASTM LEACH ******					
CHLORIDE	13J mg/L	4J mg/L	8J mg/L	24J mg/L	
NITRATE	8.7 mg/L	1.7 mg/L	9.8 mg/L	7.0 mg/L	
PERCENT RECOVERY OF SOLIDS	18.2 %	16.6 %	25.8 %	22.4 %	
PHOSPHORUS,TOTAL (AS P)	0.05L mg/L	0.01L mg/L	0.04L mg/L	0.02L mg/L	
SULFATE	160 mg/L	160 mg/L	150 mg/L	150 mg/L	
TDS (Total Dissolved Solids)	200 mg/L	220 mg/L	180 mg/L	160 mg/L	

SAMPLE ID NUMBER:	PS207BN-NE	PS207BN-NW	PS207BN-SE	PS207BN-SW	PS207BN-T
SAMPLE TYPE:					TRIP BLANK
****** TCLP LEACH ******					
ARSENIC	R ug/L	R	R	R	
BARIUM	1090J ug/L	1210J ug/L	1060J ug/L	1200J ug/L	
CADMIUM	54.0 ug/L	67.0 ug/L	104 ug/L	67.0 ug/L	
CHROMIUM	18.0 ug/L	10.0 ug/L	57.0 ug/L	5.0U ug/L	
LEAD	30.0UJ ug/L	30.0UJ ug/L	30.0UJ ug/L	30.0UJ ug/L	
MERCURY	0.2U ug/L	0.2U ug/L	0.2U ug/L	0.2U ug/L	
NICKEL	20.0U ug/L	28.0 ug/L	20.0 ug/L	56.0 ug/L	
pH	5.7	5.9	5.7	5.9	
SELENIUM	60.0UJ ug/L	60.0UJ ug/L	60.0UJ ug/L	60.0UJ ug/L	
SILVER	6.0UJ ug/L	6.0UJ ug/L	7.0U ug/L	6.0UJ ug/L	

SAMPLE ID NUMBER:	PS207BC-NE	PS207BC-NW	PS207BC-SE	PS207BC-SW	PS207BC-T
SAMPLE TYPE:					TRIP BLANK
****** INORGANICS ******					
ARSENIC	39.6UJ mg/kg	60.6UJ mg/kg	44.4UJ mg/kg	43.5UJ mg/kg	
BARIUM	46.5J mg/kg	120J mg/kg	86.7J mg/kg	76.1J mg/kg	
BORON	151J mg/kg	138U mg/kg	131U mg/kg	97.8U mg/kg	
CADMIUM	46.5J mg/kg	53.0J mg/kg	84.4J mg/kg	47.8J mg/kg	
CALCIUM					
CHROMIUM	9.9UJ mg/kg	48.5J mg/kg	68.9J mg/kg	130J mg/kg	
LEAD	29.7UJ mg/kg	45.5UJ mg/kg	33.3UJ mg/kg	32.6UJ mg/kg	
MAGNESIUM	7190 mg/kg	19800 mg/kg	11900 mg/kg	10700 mg/kg	
MERCURY	0.9UJ mg/kg	5.5J mg/kg	1.1UJ mg/kg	1.1UJ mg/kg	
NICKEL	19.8U mg/kg	30.3U mg/kg	22.2U mg/kg	21.7U mg/kg	
POTASSIUM	9800U ug/kg	15400 mg/kg	11700 mg/kg	10900 mg/kg	
SELENIUM	59.4UJ mg/kg	90.9UJ mg/kg	66.7UJ mg/kg	65.2UJ mg/kg	
SILVER	5.9UJ mg/kg	27.3U mg/kg	6.7UJ mg/kg	10.9U mg/kg	
SODIUM	35200 mg/kg	54200 mg/kg	40200 mg/kg	38100 mg/kg	
****** MISCELLANEOUS ******					
AMMONIA	25J mg/kg	46J mg/kg	42J mg/kg	58J mg/kg	
ATTERBERG - LIQUID LIMIT	77	85	85	84	
ATTERBERG - PLASTIC INDEX	32	20	40	22	
ATTERBERG - PLASTIC LIMIT	45	65	45	52	
BULK DENSITY (DRIED SOLIDS)	0.82 g/cc	0.88 g/cc	0.86 g/cc	0.81 g/cc	
CYANIDE - AMENABLE					
CYANIDE - TOTAL	0.34J mg/kg	0.52J mg/kg	1.3J mg/kg	0.38J mg/kg	
GROSS ALPHA	19 +/- 4J pCi/g	13 +/- 3J pCi/g	19 +/- 4J pCi/g	16 +/- 4J pCi/g	
GROSS BETA	16 +/- 3J pCi/g	14 +/- 4J pCi/g	16 +/- 4J pCi/g	12 +/- 4J pCi/g	
MOISTURE - GRAVIMETRIC	89.9 %	93.4 %	91.0 %	90.8 %	
MOISTURE - KARL FISHER	42 %	53 %	47 %	51 %	
pH	9.2	9.1	9.2	9.2	
SPECIFIC GRAVITY	1.0	1.0	1.0	1.0	
SWELL TEST	60 %	60 %	70 %	60 %	
TOC (Total Organic Carbon)	8800J mg/kg	5500J mg/kg	8300J mg/kg	6800J mg/kg	
****** ASTM LEACH ******					
CHLORIDE	220J mg/L	300J mg/L	200U mg/L	210J mg/L	
NITRATE	70 mg/L	50 mg/L	74 mg/L	70 mg/L	
PERCENT RECOVERY OF SOLIDS	9.3 %	13.7 %	9.5 %	9.3 %	
PHOSPHORUS,TOTAL (AS P)	1.7 mg/L	3.9 mg/L	1.5 mg/L	1.4 mg/L	
SULFATE	37 mg/L	90 mg/L	34 mg/L	33 mg/L	
TDS (Total Dissolved Solids)	760 mg/L	670 mg/L	770 mg/L	750J mg/L	

SAMPLE ID NUMBER:	PS207BC-NE	PS207BC-NW	PS207BC-SE	PS207BC-SW	PS207BC-T
SAMPLE TYPE:					TRIP BLANK
****** TCLP LEACH ******					
ARSENIC	134J ug/L	141J ug/L	122J ug/L	181J ug/L	
BARIUM	3340J ug/L	2660J ug/L	3190J ug/L	3690J ug/L	
CADMIUM	153 ug/L	143 ug/L	133 ug/L	114 ug/L	
CHROMIUM	50.0 ug/L	11.0 ug/L	19.0 ug/L	54.0 ug/L	
LEAD	30.0U ug/L	30.0UJ ug/L	30.0UJ ug/L	30.0UJ ug/L	
MERCURY	0.2U ug/L	0.2U ug/L	0.2U ug/L	0.2U ug/L	
NICKEL	28 ug/L	20.0U ug/L	20.0U ug/L	20.0U ug/L	
pH	5.5	4.9	6.1	5.8	
SELENIUM	60.0UJ ug/L	60.0UJ ug/L	60.0UJ ug/L	60.0UJ ug/L	
SILVER	6.0UJ ug/L	6.0UJ ug/L	6.0UJ ug/L	6.0UJ ug/L	

SAMPLE ID NUMBER:	PS207BS-B	PS207BS-F	PS207BS-NE	PS207BS-NW	PS207BS-NW-D	PS207BS-SE
SAMPLE TYPE:	RINSATE BLANK	FIELD BLANK			DUPLICATE	
COMPOUND						
****** VOLATILES ******						
1,1,1-TRICHLORETHANE	5U ug/L	5U ug/L	42U ug/kg	62U ug/kg	62U ug/kg	45U ug/kg
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5UJ ug/L	5UJ ug/L	42U ug/kg	62UJ ug/kg	62UJ ug/kg	45U ug/kg
1,1,2-TRICHLOROETHANE	5U ug/L	5U ug/L	42U ug/kg	62U ug/kg	62U ug/kg	45U ug/kg
1,1-DICHLOROETHENE	5U ug/L	5U ug/L	42U ug/kg	62U ug/kg	62U ug/kg	45U ug/kg
2-BUTANONE	10U ug/L	10U ug/L	83U ug/kg	120U ug/kg	120U ug/kg	91U ug/kg
4-METHYL-2-PENTANONE	10U ug/L	10U ug/L	83U ug/kg	120U ug/kg	20U ug/kg	91U ug/kg
ACETONE	17U ug/L	10U ug/L	83UJ ug/kg	120U ug/kg	120U ug/kg	91UJ ug/kg
BENZENE	5U ug/L	5U ug/L	42U ug/kg	62U ug/kg	62U ug/kg	45U ug/kg
CARBON DISULFIDE	5U ug/L	5U ug/L	42U ug/kg	62U ug/kg	62U ug/kg	45U ug/kg
CARBON TETRACHLORIDE	5U ug/L	5U ug/L	42U ug/kg	62U ug/kg	62U ug/kg	45U ug/kg
CHLOROBENZENE	5U ug/L	5U ug/L	42U ug/kg	62U ug/kg	62U ug/kg	45U ug/kg
ETHYL ACETATE	5U ug/L	5U ug/L	42U ug/kg	62U ug/kg	62U ug/kg	45U ug/kg
ETHYL ETHER	5U ug/L	5U ug/L	42U ug/kg	62U ug/kg	62U ug/kg	45U ug/kg
ETHYLBENZENE	5U ug/L	5U ug/L	42U ug/kg	62U ug/kg	62U ug/kg	45U ug/kg
METHYLENE CHLORIDE	5U ug/L	5U ug/L	28U ug/kg	62U ug/kg	62U ug/kg	28U ug/kg
TETRACHLOROETHENE	5U ug/L	5U ug/L	460 ug/kg	210 ug/kg	260 ug/kg	230 ug/kg
TOLUENE	5U ug/L	5U ug/L	42U ug/kg	62U ug/kg	62U ug/kg	45U ug/kg
TRICHLORETHENE	5U ug/L	5U ug/L	57 ug/kg	47J ug/kg	62U ug/kg	48 ug/kg
TRICHLOROFLUOROMETHANE	5UJ ug/L	5UJ ug/L	42U ug/kg	62UJ ug/kg	62UJ ug/kg	45U ug/kg
XYLENE (total)	5U ug/L	5U ug/L	42U ug/kg	62U ug/kg	62U ug/kg	45U ug/kg
****** SEMI-VOLATILES ******						
1,2,4-TRICHLOROBENZENE	10U ug/L	10UJ ug/L	2700U ug/kg	4100U ug/kg	4100U ug/kg	3000U ug/kg
1,2-DICHLOROBENZENE	10U ug/L	10UJ ug/L	2700U ug/kg	4100U ug/kg	4100U ug/kg	3000U ug/kg
1,4-DICHLOROBENZENE	10U ug/L	10UJ ug/L	2700U ug/kg	4100U ug/kg	4100U ug/kg	3000U ug/kg
2,4-DINITROTOLUENE	10U ug/L	10UJ ug/L	2700U ug/kg	4100U ug/kg	4100U ug/kg	3000U ug/kg
2-NITROPROPANE	10U ug/L	10UJ ug/L	2700U ug/kg	4100U ug/kg	4100U ug/kg	3000U ug/kg
ACENAPHTHENE	10U ug/L	10UJ ug/L	2700U ug/kg	4100U ug/kg	4100U ug/kg	3000U ug/kg
CYCLOHEXANONE	10U ug/L	10UJ ug/L	2700U ug/kg	4100U ug/kg	4100U ug/kg	3000U ug/kg
N-NITROSO-DI-N-PROPYLAMINE	10U ug/L	10UJ ug/L	2700U ug/kg	4100U ug/kg	4100U ug/kg	3000U ug/kg
PYRENE	10UJ ug/L	10UJ ug/L	2700U ug/kg	4100U ug/kg	4100U ug/kg	3000U ug/kg
PYRIDINE	10UJ ug/L	10UJ ug/L	2700UJ ug/kg	4100UJ ug/kg	4100UJ ug/kg	3000UJ ug/kg
****** ALCOHOLS ******						
2-ETHOXYETHANOL	50U mg/L	50U mg/L	500U mg/kg	500U mg/kg	500UJ mg/kg	500U mg/kg
ISOBUTANOL	1U mg/L	1U mg/L	10U mg/kg	10U mg/kg	10U mg/kg	10U mg/kg
METHANOL	1U mg/L	1U mg/L	10U mg/kg	10U mg/kg	10U mg/kg	10U mg/kg
N-BUTYL ALCOHOL	1U mg/L	1U mg/L	10U mg/kg	10U mg/kg	10U mg/kg	10U mg/kg

SAMPLE ID NUMBER:	PS207BS-B	PS207BS-F	PS207BS-NE	PS207BS-NW	PS207BS-NW-D	PS207BS-SE
SAMPLE TYPE:	RINSATE BLANK	FIELD BLANK			DUPLICATE	
****** INORGANICS ******						
ARSENIC	40U ug/L	40.0U ug/L	34.2UJ mg/kg	50.6UJ mg/kg	59.7J mg/kg	37.0UJ mg/kg
BARIUM	3.0U ug/L	3.0U ug/L	80.3J mg/kg	124 mg/kg	134J mg/kg	133J mg/kg
BORON	13.0U ug/L	11.0U ug/L	336J mg/kg	106U mg/kg	112U mg/kg	77.8U mg/kg
CADMIUM	5.0U ug/L	5.0U ug/L	26.5J mg/kg	30.4J mg/kg	28.6J mg/kg	7.4J mg/kg
CALCIUM	20.0U ug/L	20.0U ug/L				
CHROMIUM	10.0UJ ug/L	10.0U ug/L	41.9J mg/kg	51.9J mg/kg	45.5J mg/kg	25.9J mg/kg
LEAD	30.0U ug/L	30.0U ug/L	25.6UJ mg/kg	38.0UJ mg/kg	61.0J mg/kg	27.8UJ mg/kg
MAGNESIUM	20.0U ug/L	20.0U ug/L	10200 mg/kg	13800 mg/kg	15200 mg/kg	5140 mg/kg
MERCURY	0.2U ug/L	0.2U ug/L	0.9UJ mg/kg	1.0UJ mg/kg	5.0J mg/kg	1.0UJ mg/kg
NICKEL	20.0U ug/L	20.0U ug/L	17.1U mg/kg	25.3U mg/kg	26.0U mg/kg	18.5U mg/kg
POTASSIUM	673U ug/L	479U ug/L	8910 mg/kg	12100U mg/kg	12900U mg/kg	5580U mg/kg
SELENIUM	300U ug/L	60.0U ug/L	51.3UJ mg/kg	75.9UJ mg/kg	77.9UJ mg/kg	55.6UJ mg/kg
SILVER	6.0U ug/L	6.0U ug/L	5.1UJ mg/kg	26.6U mg/kg	40.3U mg/kg	5.6UJ mg/kg
SODIUM	581U ug/L	431U ug/L	30000 mg/kg	42100 mg/kg	44600 mg/kg	4080U mg/kg
****** MISCELLANEOUS ******						
AMMONIA			10U mg/kg	17J mg/kg	22J mg/kg	34J mg/kg
ATTERBERG - LIQUID LIMIT			74	93		70
ATTERBERG - PLASTIC INDEX			33	41		28
ATTERBERG - PLASTIC LIMIT			41	52		42
BULK DENSITY (DRIED SOLIDS)						
CYANIDE - AMENABLE						
CYANIDE - TOTAL	0.005UJ mg/L	0.005UJ mg/L	0.72J mg/kg	4.1J mg/kg	0.89J mg/kg	0.55J mg/kg
GROSS ALPHA	3UJ pCi/L	3UJ pCi/L	61 +/- 8J pCi/g	32 +/- 6J pCI/G	31 +/- 6J pCi/g	37 +/- 6J pCi/g
GROSS BETA	6UJ pCi/L	6UJ pCi/L	47 +/- 6J pCi/g	24 +/- 4J pCI/G	22 +/- 5J pCi/g	22 +/- 4J pCi/g
MOISTURE - GRAVIMETRIC			88.3 %	92.1 %	92.3 %	89.2 %
MOISTURE - KARL FISHER			43 %	50 %		39 %
pH			9.1	9.1	9.1	9.1
SPECIFIC GRAVITY			1.1	1.0		1.1
SWELL TEST			30 %	50 %		60 %
TOC (Total Organic Carbon)			9200J mg/kg	11000J mg/kg	6800J mg/kg	8400J mg/kg
****** ASTM LEACH ******						
CHLORIDE			200U mg/L	200U mg/L	200U mg/L	200U mg/L
NITRATE			89 mg/L	77 mg/L	89 mg/L	86 mg/L
PERCENT RECOVERY OF SOLIDS			8.6 %	6.4 %	9.0 %	8.2 %
PHOSPHORUS,TOTAL (AS P)			1.7 mg/L	0.09 mg/L	0.61 mg/L	1.4 mg/L
SULFATE			30 mg/L	40 mg/L	36 mg/L	31 mg/L
TDS (Total Dissolved Solids)			760 mg/L	790 mg/L	760 mg/L	770 mg/L

SAMPLE ID NUMBER:	PS207BS-B	PS207BS-F	PS207BS-NE	PS207BS-NW	PS207BS-NW-D	PS207BS-SE
SAMPLE TYPE:	RINSATE BLANK	FIELD BLANK			DUPLICATE	
****** TCLP LEACH ******						
ARSENIC	R	R	198J ug/L	233J ug/L	233J ug/L	194J ug/L
BARIUM	33.0J ug/L	30.0J ug/L	1870J ug/L	1710J ug/L	2770J ug/L	1810J ug/L
CADMIUM	5.0U ug/L	5.0U ug/L	29.0 ug/L	20.0 ug/L	19.0 ug/L	32.0 ug/L
CHROMIUM	10.0U ug/L	10.0U ug/L	56.0 ug/L	39.0 ug/L	43.0 ug/L	43.0 ug/L
LEAD	30.0UJ ug/L	30.0UJ ug/L	30.0UJ ug/L	30.0UJ ug/L	30.0UJ ug/L	30.0UJ ug/L
MERCURY	0.2U ug/L	0.2U ug/L	0.2U ug/L	0.2U ug/L	0.2U ug/L	0.2U ug/L
NICKEL	20.0U ug/L	20.0U ug/L	20.0U ug/L	20.0U ug/L	20.0U ug/L	20.0U ug/L
pH	5.8	4.3	5.9	5.6	5.4	5.7
SELENIUM	60.0UJ ug/L	60.0UJ ug/L	60.0UJ ug/L	60.0UJ ug/L	60.0UJ ug/L	60.0UJ ug/L
SILVER	6.0UJ ug/L	6.0UJ ug/L	6.0UJ ug/L	6.0UJ ug/L	6.0UJ ug/L	6.0UJ ug/L

SAMPLE ID NUMBER:	PS207BS-SW	PS207BS-T
SAMPLE TYPE:		TRIP BLANK
COMPOUND		
****** VOLATILES ******		
1,1,1-TRICHLORETHANE	45U ug/kg	5U ug/L
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	45UJ ug/kg	5UJ ug/L
1,1,2-TRICHLOROETHANE	45U ug/kg	5U ug/L
1,1-DICHLOROETHENE	45U ug/kg	5U ug/L
2-BUTANONE	91U ug/kg	10U ug/L
4-METHYL-2-PENTANONE	91U ug/kg	10U ug/L
ACETONE	91U ug/kg	15U ug/L
BENZENE	45U ug/kg	5U ug/L
CARBON DISULFIDE	45U ug/kg	5U ug/L
CARBON TETRACHLORIDE	45U ug/kg	5U ug/L
CHLOROBENZENE	45U ug/kg	5U ug/L
ETHYL ACETATE	45U ug/kg	5U ug/L
ETHYL ETHER	45U ug/kg	5U ug/L
ETHYLBENZENE	45U ug/kg	5U ug/L
METHYLENE CHLORIDE	45U ug/kg	5U ug/L
TETRACHLOROETHENE	32J ug/kg	5U ug/L
TOLUENE	45U ug/kg	5U ug/L
TRICHLORETHENE	45U ug/kg	5U ug/L
TRICHLOROFLUOROMETHANE	45UJ ug/kg	5U ug/L
XYLENE (total)	45U ug/kg	9 ug/L
****** SEMI-VOLATILES ******		
1,2,4-TRICHLOROBENZENE	3000U ug/kg	
1,2-DICHLOROBENZENE	3000U ug/kg	
1,4-DICHLOROBENZENE	3000U ug/kg	
2,4-DINITROTOLUENE	3000U ug/kg	
2-NITROPROPANE	3000U ug/kg	
ACENAPHTHENE	3000U ug/kg	
CYCLOHEXANONE	3000U ug/kg	
N-NITROSO-DI-N-PROPYLAMINE	3000U ug/kg	
PYRENE	3000U ug/kg	
PYRIDINE	3000UJ ug/kg	
****** ALCOHOLS ******		
2-ETHOXYETHANOL	500U mg/kg	
ISOBUTANOL	10U mg/kg	
METHANOL	10U mg/kg	
N-BUTYL ALCOHOL	10U mg/kg	

SAMPLE ID NUMBER:	PS207BS-SW	PS207BS-T
SAMPLE TYPE:		TRIP BLANK
****** INORGANICS ******		
ARSENIC	36.0UJ mg/kg	
BARIUM	62.2J mg/kg	
BORON	349J mg/kg	
CADMIUM	20.7J mg/kg	
CALCIUM		
CHROMIUM	25.2J mg/kg	
LEAD	27.0UJ mg/kg	
MAGNESIUM	8170 mg/kg	
MERCURY	0.9UJ mg/kg	
NICKEL	18.0U mg/kg	
POTASSIUM	8800U mg/kg	
SELENIUM	54.1UJ mg/kg	
SILVER	5.4UJ mg/kg	
SODIUM	31200 mg/kg	
****** MISCELLANEOUS ******		
AMMONIA	21J mg/kg	
ATTERBERG - LIQUID LIMIT	101	
ATTERBERG - PLASTIC INDEX	41	
ATTERBERG - PLASTIC LIMIT	60	
BULK DENSITY (DRIED SOLIDS)		
CYANIDE - AMENABLE		
CYANIDE - TOTAL	0.46J mg/kg	
GROSS ALPHA	31 +/- 6J pCi/g	
GROSS BETA	21 +/- 4J pCi/g	
MOISTURE - GRAVIMETRIC	88.9 %	
MOISTURE - KARL FISHER	49 %	
pH	9.1	
SPECIFIC GRAVITY	1.1	
SWELL TEST	40 %	
TOC (Total Organic Carbon)	7800J mg/kg	
****** ASTM LEACH ******		
CHLORIDE	200U mg/L	
NITRATE	80 mg/L	
PERCENT RECOVERY OF SOLIDS	12.4 %	
PHOSPHORUS,TOTAL (AS P)	0.3 mg/L	
SULFATE	23 mg/L	
TDS (Total Dissolved Solids)	740 mg/L	

SAMPLE ID NUMBER:	PS207BS-SW	PS207BS-T
SAMPLE TYPE:		TRIP BLANK

****** TCLP LEACH ******

ARSENIC	195J	ug/L
BARIUM	1660J	ug/L
CADMIUM	21.0	ug/L
CHROMIUM	23.0	ug/L
LEAD	30.0UJ	ug/L
MERCURY	0.2U	ug/L
NICKEL	20.0U	ug/L
pH	5.7	
SELENIUM	60.0UJ	ug/L
SILVER	6.0UJ	ug/L

SAMPLE ID NUMBER:	PS207C-B	PS207C-C	PS207C-CB	PS207C-F	PS207C-NW	PS207C-NW-D
SAMPLE TYPE:	RINSATE BLANK	POND SLUDGE COMPOSITE	POND SLUDGE BERM COMPOSITE	FIELD BLANK		DUPLICATE
COMPOUND						
****** VOLATILES ******						
1,1,1-TRICHLORETHANE	5U ug/L	8UJ ug/kg	9U ug/kg	5U ug/L	10U ug/kg	10U ug/kg
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5U ug/L	8UJ ug/kg	33J ug/kg	5U ug/L	10U ug/kg	10U ug/kg
1,1,2-TRICHLOROETHANE	5U ug/L	8UJ ug/kg	9U ug/kg	5U ug/L	10U ug/kg	10U ug/kg
1,1-DICHLOROETHENE	5U ug/L	8UJ ug/kg	9U ug/kg	5U ug/L	10U ug/kg	10U ug/kg
2-BUTANONE	10U ug/L	16J ug/kg	74J ug/kg	10U ug/L	160J ug/kg	160J ug/kg
4-METHYL-2-PENTANONE	10U ug/L	15UJ ug/kg	19U ug/kg	10U ug/L	19U ug/kg	20U ug/kg
ACETONE	10U ug/L	15UJ ug/kg	19UJ ug/kg	32U ug/L	19UJ ug/kg	20UJ ug/kg
BENZENE	5U ug/L	7J ug/kg	9U ug/kg	5U ug/L	10U ug/kg	10U ug/kg
CARBON DISULFIDE	5U ug/L	8UJ ug/kg	9U ug/kg	5U ug/L	10U ug/kg	10U ug/kg
CARBON TETRACHLORIDE	5U ug/L	8U ug/kg	9U ug/kg	5U ug/L	10U ug/kg	10U ug/kg
CHLOROBENZENE	5U ug/L	8UJ ug/kg	9U ug/kg	5U ug/L	10U ug/kg	10U ug/kg
ETHYL ACETATE	5U ug/L	8UJ ug/kg	9UJ ug/kg	5U ug/L	10UJ ug/kg	10UJ ug/kg
ETHYL ETHER	5U ug/L	8UJ ug/kg	9U ug/kg	5U ug/L	10U ug/kg	10U ug/kg
ETHYLBENZENE	5U ug/L	8UJ ug/kg	9U ug/kg	5U ug/l	10U ug/kg	10U ug/kg
METHYLENE CHLORIDE	5U ug/L	16U ug/kg	9U ug/kg	5U ug/L	10UJ ug/kg	10UJ ug/kg
TETRACHLOROETHENE	5U ug/L	11J ug/kg	73 ug/kg	5U ug/L	9J ug/kg	8J ug/kg
TOLUENE	5U ug/L	12U ug/kg	9U ug/kg	5U ug/L	10U ug/kg	10U ug/kg
TRICHLORETHENE	5U ug/L	8UJ ug/kg	9U ug/kg	5U ug/L	10U ug/kg	7J ug/kg
TRICHLOROFLUOROMETHANE	5U ug/L	8UJ ug/kg	9U ug/kg	5U ug/L	10UJ ug/kg	10U ug/kg
XYLENE (total)	5U ug/L	13U ug/kg	15U ug/kg	5U ug/L	18U ug/kg	18U ug/kg
****** SEMI-VOLATILES ******						
1,2,4-TRICHLOROBENZENE	10U ug/L	510U ug/kg	610U ug/kg	10U ug/L	630U ug/kg	650U ug/kg
1,2-DICHLOROBENZENE	10U ug/L	510U ug/kg	610U ug/kg	10U ug/L	630U ug/kg	650U ug/kg
1,4-DICHLOROBENZENE	10U ug/L	510U ug/kg	610U ug/kg	10U ug/L	630U ug/kg	650U ug/kg
2,4-DINITROTOLUENE	10U ug/L	510U ug/kg	610U ug/kg	10U ug/L	630U ug/kg	650U ug/kg
2-NITROPROPANE	10UJ ug/L	510UJ ug/kg	610UJ ug/kg	10UJ ug/L	630UJ ug/kg	650U ug/kg
ACENAPHTHENE	10U ug/L	510U ug/kg	610U ug/kg	10U ug/L	630U ug/kg	650U ug/kg
CYCLOHEXANONE	10U ug/L	510U ug/kg	610U ug/kg	10U ug/L	630U ug/kg	650U ug/kg
N-NITROSO-DI-N-PROPYLAMINE	10U ug/L	510U ug/kg	610U ug/kg	10U ug/L	630U ug/kg	650U ug/kg
PYRENE	10UJ ug/L	190J ug/kg	320J ug/kg	10UJ ug/L	630U ug/kg	650U ug/kg
PYRIDINE	10U ug/L	510UJ ug/kg	610UJ ug/kg	10UJ ug/L	630UJ ug/kg	650U ug/kg
****** ALCOHOLS ******						
2-ETHOXYETHANOL	50U mg/L	500UJ mg/kg	500UJ mg/kg	50U mg/L	500UJ mg/kg	500UJ mg/kg
ISOBUTANOL	1U mg/L	10U mg/kg	10U mg/kg	1U mg/L	10U mg/kg	10U mg/kg
METHANOL	1U mg/L	10U mg/kg	10U mg/kg	1U mg/L	10U mg/kg	10U mg/kg
N-BUTYL ALCOHOL	1U mg/L	10U mg/kg	10U mg/kg	1U mg/L	10U mg/kg	10U mg/kg

SAMPLE ID NUMBER:	PS207C-B		PS207C-C		PS207C-CB		PS207C-F		PS207C-NW		PS207C-NW-D	
SAMPLE TYPE:	RINSATE BLANK		POND SLUDGE COMPOSITE		POND SLUDGE BERM COMPOSITE		FIELD BLANK				DUPLICATE	
****** INORGANICS ******												
ARSENIC	40.0	ug/L	23.9J	mg/kg	35.0J	mg/kg	40.0U	ug/L	37.0J	mg/kg	18.0J	mg/kg
BARIUM	3.0U	ug/L	23.0J	mg/kg	61.5J	mg/kg	3.0U	ug/L	13.2J	mg/kg	32.2J	mg/kg
BORON	87.0	ug/L	455J	mg/kg	693J	mg/kg	33.0	ug/L	594J	mg/kg	781J	mg/kg
CADMIUM	5.0UJ	ug/L	67.3J	mg/kg	665J	mg/kg	5.0UJ	ug/L	28.9J	mg/kg	31.8J	mg/kg
CALCIUM	286	ug/L					264	ug/L				
CHROMIUM	10.0UJ	ug/L	572J	mg/kg	960J	mg/kg	10.0UJ	ug/L	252J	mg/kg	718J	mg/kg
LEAD	30.0U	ug/L	12.9J	mg/kg	38.5J	mg/kg	30.0U	ug/L	7.9J	mg/kg	19.1J	mg/kg
MAGNESIUM	20.0	ug/L	2410J	mg/kg	6250J	mg/kg	20.0U	ug/L	1340J	mg/kg	3690J	mg/kg
MERCURY	0.2UJ	ug/L	1.0	mg/kg	1.0	mg/kg	0.2UJ	ug/L	0.8	mg/kg	0.8	mg/kg
NICKEL	20.0UJ	ug/L	33.6J	mg/kg	146J	mg/kg	20.0UJ	ug/L	17.4J	mg/kg	30.5J	mg/kg
POTASSIUM	889	ug/L	87200J	mg/kg	64500J	mg/kg	1200	ug/L	82000J	mg/kg	81200J	mg/kg
SELENIUM	60.0U	ug/L	46.0UJ	mg/kg	112UJ	mg/kg	60.0U	ug/L	58.1UJ	mg/kg	117UJ	mg/kg
SILVER	7.0J	ug/L	58.6J	mg/kg	73.6J	mg/kg	6.0UJ	ug/L	35.1J	mg/kg	54.1J	mg/kg
SODIUM	885J	ug/L	144000J	mg/kg	150000J	mg/kg	754	ug/L	19300J	mg/kg	162000J	mg/kg
****** MISCELLANEOUS ******												
AMMONIA			10U	mg/kg	10U	mg/kg			10U	mg/kg	10U	mg/kg
ATTERBERG - LIQUID LIMIT												
ATTERBERG - PLASTIC INDEX												
ATTERBERG - PLASTIC LIMIT												
BULK DENSITY (DRIED SOLIDS)												
CYANIDE - AMENABLE												
CYANIDE - TOTAL	0.005UJ	mg/L	13J	mg/kg	14J	mg/kg	0.005UJ	mg/L	170J	mg/kg	150J	mg/kg
GROSS ALPHA	3U	pCi/L	4500+-500	pCi/g	5900+-600	pCi/g	3U	pCi/L	2700+-300	pCi/g	3100+-400	pCi/g
GROSS BETA	6U	pCi/L	660+-70	pCi/g	810+- 90	pCi/g	6U	pCi/L	470+-50	pCi/g	420+-50	pCi/g
MOISTURE - GRAVIMETRIC			34.8J	%	46.5J	%			48.4J	%	48.8J	%
MOISTURE - KARL FISHER												
pH			10.5		10.2				10.4		10.4	
SPECIFIC GRAVITY												
SWELL TEST			0	%	10	%			0	%		
TOC (Total Organic Carbon)			9000J	mg/kg	8800J	mg/kg			6400J	mg/kg	7300J	mg/kg
****** ASTM LEACH ******												
CHLORIDE			740	mg/L	730	mg/L			660	mg/L	990	mg/L
NITRATE			11000	mg/L	8900	mg/L			10000	mg/L	10000	mg/L
PERCENT RECOVERY OF SOLIDS			9.8	%	18.8	%			9.8	%	9.2	%
PHOSPHORUS,TOTAL (AS P)			38	mg/L	22	mg/L			34	mg/L	24	mg/L
SULFATE			1300	mg/L	880	mg/L			940	mg/L	810	mg/L
TDS (Total Dissolved Solids)			24000	mg/L	18000	mg/L			24000	mg/L	21000	mg/L

SAMPLE ID NUMBER:	PS207C-B	PS207C-C	PS207C-CB	PS207C-F	PS207C-NW	PS207C-NW-D
SAMPLE TYPE:	RINSATE BLANK	POND SLUDGE COMPOSITE	POND SLUDGE BERM COMPOSITE	FIELD BLANK		DUPLICATE
****** TCLP LEACH ******						
ARSENIC	R	447J ug/L	538J ug/L	R	497J ug/L	509J ug/L
BARIUM	66.0J ug/L	350U ug/L	559J ug/L	81.0J ug/L	354U ug/L	481J ug/L
CADMIUM	R	945J ug/L	5230J ug/L	R	475J ug/L	342J ug/L
CHROMIUM	13.0J ug/L	1840J ug/L	2080J ug/L	10.0UJ ug/L	2900J ug/L	3090J ug/L
LEAD	30.0U ug/L	33.0 ug/L	52.0 ug/L	30.0U ug/L	30.0U ug/L	30.0U ug/L
MERCURY	0.2U ug/L	0.2U ug/L	0.4 ug/L	0.2U ug/L	0.2U ug/L	0.2U ug/L
NICKEL	20.0UJ ug/L	840J ug/L	2140J ug/L	20.0UJ ug/L	563J ug/L	624J ug/L
pH	6.1	5.1	5.3	4.1	5.1	4.9
SELENIUM	60.0UJ ug/L	300UJ ug/L	300UJ ug/L	60.0UJ ug/L	300UJ ug/L	300UJ ug/L
SILVER	6.0U ug/L	9.0 ug/L	22.0 ug/L	6.0U ug/L	15.0 ug/L	21.0 ug/L

SAMPLE ID NUMBER:	PS207BC-NE	PS207BC-NW	PS207BC-SE	PS207BC-SW	PS207BC-T
SAMPLE TYPE:					TRIP BLANK
COMPOUND					
****** VOLATILES ******					
1,1,1-TRICHLORETHANE	50U ug/kg	71U ug/kg	56U ug/kg	56U ug/kg	5U ug/L
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	50UJ ug/kg	71UJ ug/kg	56UJ ug/kg	56UJ ug/kg	5U ug/L
1,1,2-TRICHLOROETHANE	50U ug/kg	71U ug/kg	56U ug/kg	56U ug/kg	5U ug/L
1,1-DICHLOROETHENE	50U ug/kg	71U ug/kg	56U ug/kg	56U ug/kg	5U ug/L
2-BUTANONE	100U ug/kg	140U ug/kg	110U ug/kg	110U ug/kg	10U ug/L
4-METHYL-2-PENTANONE	100U ug/kg	140U ug/kg	110U ug/kg	110U ug/kg	10UJ ug/L
ACETONE	100U ug/kg	140U ug/kg	110U ug/kg	110U ug/kg	10UJ ug/L
BENZENE	50U ug/kg	71U ug/kg	56U ug/kg	56U ug/kg	5U ug/L
CARBON DISULFIDE	50U ug/kg	71U ug/kg	56U ug/kg	56U ug/kg	5UJ ug/L
CARBON TETRACHLORIDE	50U ug/kg	71U ug/kg	56U ug/kg	56U ug/kg	5U ug/L
CHLOROBENZENE	50U ug/kg	71U ug/kg	56U ug/kg	56U ug/kg	5U ug/L
ETHYL ACETATE	50U ug/kg	71U ug/kg	56U ug/kg	56U ug/kg	5U ug/L
ETHYL ETHER	50U ug/kg	71U ug/kg	56U ug/kg	56U ug/kg	5U ug/L
ETHYLBENZENE	50U ug/kg	71U ug/kg	56U ug/kg	56U ug/kg	3J ug/L
METHYLENE CHLORIDE	30U ug/kg	71U ug/kg	56U ug/kg	40U ug/kg	5U ug/L
TETRACHLOROETHENE	180 ug/kg	71U ug/kg	56U ug/kg	37J ug/kg	5U ug/L
TOLUENE	50U ug/kg	71U ug/kg	56U ug/kg	56U ug/kg	5U ug/L
TRICHLORETHENE	50U ug/kg	71U ug/kg	56U ug/kg	56U ug/kg	5U ug/L
TRICHLOROFLUOROMETHANE	50UJ ug/kg	71UJ ug/kg	56UJ ug/kg	56UJ ug/kg	5U ug/L
XYLENE (total)	50U ug/kg	71U ug/kg	56U ug/kg	56U ug/kg	5U ug/L
****** SEMI-VOLATILES ******					
1,2,4-TRICHLOROBENZENE	3300U ug/kg	4700U ug/kg	3700UJ ug/kg	3700U ug/kg	
1,2-DICHLOROBENZENE	3300U ug/kg	4700U ug/kg	3700U ug/kg	3700U ug/kg	
1,4-DICHLOROBENZENE	3300U ug/kg	4700U ug/kg	3700U ug/kg	3700U ug/kg	
2,4-DINITROTOLUENE	3300UJ ug/kg	4700U ug/kg	3700UJ ug/kg	3700UJ ug/kg	
2-NITROPROPANE	3300U ug/kg	4700U ug/kg	3700U ug/kg	3700U ug/kg	
ACENAPHTHENE	3300UJ ug/kg	4700U ug/kg	3700UJ ug/kg	3700UJ ug/kg	
CYCLOHEXANONE	3300U ug/kg	4700U ug/kg	3700U ug/kg	3700U ug/kg	
N-NITROSO-DI-N-PROPYLAMINE	3300U ug/kg	4700U ug/kg	3700U ug/kg	3700U ug/kg	
PYRENE	3300U ug/kg	4700U ug/kg	3700U ug/kg	3700U ug/kg	
PYRIDINE	3300UJ ug/kg	4700UJ ug/kg	3700UJ ug/kg	3700UJ ug/kg	
****** ALCOHOLS ******					
2-ETHOXYETHANOL	500U mg/kg	500U mg/kg	500U mg/kg	500U mg/kg	
ISOBUTANOL	10U mg/kg	10U mg/kg	10U mg/kg	10U mg/kg	
METHANOL	10U mg/kg	10U mg/kg	10U mg/kg	10U mg/kg	
N-BUTYL ALCOHOL	10U mg/kg	10U mg/kg	10U mg/kg	10U mg/kg	

SAMPLE ID NUMBER:	PS207C-SW	PS207C-T
SAMPLE TYPE:		TRIP BLANK

COMPOUND				
****** VOLATILES ******				
1,1,1-TRICHLORETHANE	8U	ug/kg	5U	ug/L
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	8U	ug/kg	5U	ug/L
1,1,2-TRICHLOROETHANE	8U	ug/kg	5U	ug/L
1,1-DICHLOROETHENE	8U	ug/kg	5U	ug/L
2-BUTANONE	140J	ug/k	10U	ug/L
4-METHYL-2-PENTANONE	17U	ug/kg	10U	ug/L
ACETONE	17UJ	ug/kg	10U	ug/L
BENZENE	31	ug/kg	5U	ug/L
CARBON DISULFIDE	8U	ug/kg	5U	ug/L
CARBON TETRACHLORIDE	8U	ug/kg	5U	ug/L
CHLOROBENZENE	8U	ug/kg	5U	ug/L
ETHYL ACETATE	8UJ	ug/kg	5U	ug/L
ETHYL ETHER	8U	ug/kg	5U	ug/L
ETHYLBENZENE	8U	ug/kg	5U	ug/L
METHYLENE CHLORIDE	8U	ug/kg	5U	ug/L
TETRACHLOROETHENE	10	ug/kg	5U	ug/L
TOLUENE	23U	ug/kg	5U	ug/L
TRICHLORETHENE	5J	ug/kg	5U	UG/L
TRICHLOROFLUOROMETHANE	8UJ	ug/kg	5U	ug/L
XYLENE (total)	35U	ug/kg	5U	ug/L
****** SEMI-VOLATILES ******				
1,2,4-TRICHLOROBENZENE	560U	ug/kg		
1,2-DICHLOROBENZENE	560U	ug/kg		
1,4-DICHLOROBENZENE	560U	ug/kg		
2,4-DINITROTOLUENE	560U	ug/kg		
2-NITROPROPANE	560U	ug/kg		
ACENAPHTHENE	560U	ug/kg		
CYCLOHEXANONE	560U	ug/kg		
N-NITROSO-DI-N-PROPYLAMINE	560U	ug/kg		
PYRENE	560U	ug/kg		
PYRIDINE	560U	ug/kg		
****** ALCOHOLS ******				
2-ETHOXYETHANOL	500UJ	mg/kg		
ISOBUTANOL	10U	mg/kg		
METHANOL	10U	mg/kg		
N-BUTYL ALCOHOL	10U	mg/kg		

SAMPLE ID NUMBER:	PS207C-SW	PS207C-T
SAMPLE TYPE:		TRIP BLANK
****** INORGANICS ******		
ARSENIC	26.2J mg/kg	
BARIUM	25.2J mg/kg	
BORON	536J mg/kg	
CADMIUM	27.3J mg/kg	
CALCIUM		
CHROMIUM	586J mg/kg	
LEAD	18.4J mg/kg	
MAGNESIUM	3160J mg/kg	
MERCURY	0.7J mg/kg	
NICKEL	34.2J mg/kg	
POTASSIUM	75700J mg/kg	
SELENIUM	51.1UJ mg/kg	
SILVER	49.2J mg/kg	
SODIUM	139000J mg/kg	
****** MISCELLANEOUS ******		
AMMONIA	10U mg/kg	
ATTERBERG - LIQUID LIMIT		
ATTERBERG - PLASTIC INDEX		
ATTERBERG - PLASTIC LIMIT		
BULK DENSITY (DRIED SOLIDS)		
CYANIDE - AMENABLE		
CYANIDE - TOTAL	14J mg/kg	
GROSS ALPHA	8700+-900 pCi/g	
GROSS BETA	1200+-200 pCi/g	
MOISTURE - GRAVIMETRIC	41.3J %	
MOISTURE - KARL FISHER		
pH	10.5	
SPECIFIC GRAVITY		
SWELL TEST	0 %	
TOC (Total Organic Carbon)	7200J mg/kg	
****** ASTM LEACH ******		
CHLORIDE	750 mg/L	
NITRATE	10000 mg/L	
PERCENT RECOVERY OF SOLIDS	10.4 %	
PHOSPHORUS,TOTAL (AS P)	37 mg/L	
SULFATE	900 mg/L	
TDS (Total Dissolved Solids)	20000 mg/L	

SAMPLE ID NUMBER:	PS207C-SW	PS207C-T
SAMPLE TYPE:		TRIP BLANK

****** TCLP LEACH ******

ARSENIC	537J	ug/L
BARIUM	494J	ug/L
CADMIUM	444J	ug/L
CHROMIUM	3940J	ug/L
LEAD	30.0U	ug/L
MERCURY	0.2U	ug/L
NICKEL	765J	ug/L
pH	4.8	
SELENIUM	300UJ	ug/L
SILVER	23.0	ug/L

SAMPLE ID NUMBER:	CS-000B	CS-000F	CS-000T	CS-001	CS-001D	CS-002
SAMPLE TYPE:	RINSATE BLANK	FIELD BLANK	TRIP BLANK		DUPLICATE	
COMPOUND						
****** VOLATILES ******						
1,1,1-TRICHLORETHANE	5U ug/L	5U ug/L	5U ug/L	26J ug/k	9J ug/kg	18U ug/kg
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5U ug/L	5U ug/L	5U ug/L	100J ug/k	73J ug/kg	45J ug/kg
1,1,2-TRICHLOROETHANE	5U ug/L	5U ug/L	5U ug/L	16U ug/kg	7U ug/kg	18U ug/kg
1,1-DICHLOROETHENE	5U ug/L	5U ug/L	5U ug/L	16U ug/kg	7U ug/kg	18U ug/kg
2-BUTANONE	10U ug/L	10U ug/L	10U ug/L	180J ug/k	92J ug/kg	87J ug/kg
4-METHYL-2-PENTANONE	10U ug/L	10U ug/L	10U ug/L	32U ug/kg	15U ug/kg	36U ug/kg
ACETONE	10U ug/L	10U ug/L	10U ug/L	32UJ ug/kg	15UJ ug/kg	36UJ ug/kg
BENZENE	5U ug/L	5U ug/L	5U ug/L	16U ug/kg	7U ug/kg	18U ug/kg
CARBON DISULFIDE	5U ug/L	5U ug/L	5U ug/L	16U ug/kg	7U ug/kg	18U ug/kg
CARBON TETRACHLORIDE	5U ug/L	5U ug/L	5U ug/L	16U ug/kg	7U ug/kg	18U ug/kg
CHLOROBENZENE	5U ug/L	5U ug/L	5U ug/L	16U ug/kg	7U ug/kg	18U ug/kg
ETHYL ACETATE	5U ug/L	5U ug/L	5U ug/L	16U ug/kg	7U ug/kg	18UJ ug/kg
ETHYL ETHER	5U ug/L	5U ug/L	5U ug/L	16U ug/kg	7U ug/kg	18U ug/kg
ETHYLBENZENE	5U ug/L	5U ug/L	5U ug/L	16U ug/kg	7U ug/kg	18U ug/kg
METHYLENE CHLORIDE	5U ug/L	5U ug/L	5U ug/L	16U ug/kg	7U ug/kg	18UJ ug/kg
TETRACHLOROETHENE	5U ug/L	5U ug/L	5U ug/L	1000J ug/kg	280J ug/kg	320 ug/kg
TOLUENE	5U ug/L	5U ug/L	5U ug/L	16U ug/kg	7J ug/kg	18U ug/kg
TRICHLORETHENE	5U ug/L	5U ug/L	5U ug/L	16U ug/kg	7U ug/kg	18U ug/kg
TRICHLOROFLUOROMETHANE	5U ug/L	5U ug/L	5U ug/L	16U ug/kg	7U ug/kg	18U ug/kg
XYLENE (total)	5U ug/L	5U ug/L	5U ug/L	55U ug/kg	14U ug/kg	18U ug/kg
****** SEMI-VOLATILES ******						
1,2,4-TRICHLOROBENZENE	10U ug/L	10U ug/L		1100U ug/kg	490U ug/kg	1200U ug/kg
1,2-DICHLOROBENZENE	10U ug/L	10U ug/L		1100U ug/kg	490U ug/kg	1200U ug/kg
1,4-DICHLOROBENZENE	10U ug/L	10U ug/L		1100U ug/kg	490U ug/kg	1200U ug/kg
2,4-DINITROTOLUENE	10U ug/L	10U ug/L		1100U ug/kg	490U ug/kg	1200U ug/kg
2-NITROPROPANE	10UJ ug/L	10UJ ug/L		1100UJ ug/kg	490UJ ug/kg	1200UJ ug/kg
ACENAPHTHENE	10U ug/L	10U ug/L		1100U ug/kg	490U ug/kg	1200U ug/kg
CYCLOHEXANONE	10U ug/L	10U ug/L		1100U ug/kg	490U ug/kg	1200U ug/kg
N-NITROSO-DI-N-PROPYLAMINE	10U ug/L	10U ug/L		1100U ug/kg	490U ug/kg	1200U ug/kg
PYRENE	10UJ ug/L	10UJ ug/L		1100U ug/kg	490UJ ug/kg	1200U ug/kg
PYRIDINE	10UJ ug/L	10UJ ug/L		1100UJ ug/kg	490UJ ug/kg	1200U ug/kg
****** ALCOHOLS ******						
2-ETHOXYETHANOL	50U mg/L	50U mg/L		500U mg/kg	500UJ mg/kg	500U mg/kg
ISOBUTANOL	1U mg/L	1U mg/L		10U mg/kg	10U mg/kg	10U mg/kg
METHANOL	1U mg/L	1U mg/L		10U mg/kg	10U mg/kg	10U mg/kg
N-BUTYL ALCOHOL	1U mg/L	1U mg/L		10U mg/kg	10U mg/kg	10U mg/kg

SAMPLE ID NUMBER:	CS-000B		CS-000F		CS-000T	CS-001		CS-001D		CS-002	
SAMPLE TYPE:	RINSATE BLANK		FIELD BLANK		TRIP BLANK			DUPLICATE			
****** INORGANICS ******											
ARSENIC	40.0U	ug/L	40.0U	ug/L		21.9J	ug/L	13.5J	ug/L	14.5UJ	ug/L
BARIUM	3.0U	ug/L	3.0U	ug/L		217J	ug/L	94.8J	ug/L	215J	ug/L
BORON	41.0	ug/L	99.0	ug/L		687J	ug/L	420J	ug/L	1230J	ug/L
CADMIUM	5.0UJ	ug/L	5.0UJ	ug/L		4660J	ug/L	2010J	ug/L	3690J	ug/L
CALCIUM	280	ug/L	242	ug/L							
CHROMIUM	10.0UJ	ug/L	10.0UJ	ug/L		2640J	ug/L	1180J	ug/L	3190J	ug/L
LEAD	30.0U	ug/L	30.0U	ug/L		182J	ug/L	83.0J	ug/L	191J	ug/L
MAGNESIUM	20.0U	ug/L	20.0U	ug/L		24200J	ug/L	10400J	ug/L	23300J	ug/L
MERCURY	0.2UJ	ug/L	0.2UJ	ug/L		5.0	ug/L	5.3J	ug/L	12	ug/L
NICKEL	20.0UJ	ug/L	20.0UJ	ug/L		738J	ug/L	339J	ug/L	902J	ug/L
POTASSIUM	1200	ug/L	1730	ug/L		62300J	ug/L	28700J	ug/L	67900J	ug/L
SELENIUM	60.0U	ug/L	60.0U	ug/L		194UJ	ug/L	89.7UJ	ug/L	218UJ	ug/L
SILVER	6.0UJ	ug/L	6.0UJ	ug/L		156J	ug/L	64.6J	ug/L	153J	ug/L
SODIUM	1410J	ug/L	1210J	ug/L		84000J	ug/L	39200J	ug/L	95900J	ug/L
****** MISCELLANEOUS ******											
AMMONIA						84	mg/kg	64	mg/kg	28	mg/kg
ATTERBERG - LIQUID LIMIT						69				72	
ATTERBERG - PLASTIC INDEX						32				34	
ATTERBERG - PLASTIC LIMIT						37				38	
BULK DENSITY (DRIED SOLIDS)											
CYANIDE - AMENABLE											
CYANIDE - TOTAL	0.005UJ	mg/L	0.005UJ	mg/L		25J	mg/kg	21J	mg/kg	190J	mg/kg
GROSS ALPHA	3U	pCi/L	3U	pCi/L		6600+-700	pCi/g	6300+-700	pCi/g	3400+-400	pCi/g
GROSS BETA	6U	pCi/L	6U	pCi/L		780+-80	pCi/g	860+-90	pCi/g	540+- 60	pCi/g
MOISTURE - GRAVIMETRIC						69.0J	%	33.1J	%	72.5J	%
MOISTURE - KARL FISHER											
pH			4.9			9.7		9.7		9.8	
SPECIFIC GRAVITY											
SWELL TEST						10	%			10	%
TOC (Total Organic Carbon)						3500J	mg/kg	6200J	mg/kg	4600J	mg/kg
****** ASTM LEACH ******											
CHLORIDE						160	mg/L	160	mg/L	180	mg/L
NITRATE						410	mg/L	450	mg/L	440	mg/L
PERCENT RECOVERY OF SOLIDS						22.2	%	21.0	%	18.0	%
PHOSPHORUS,TOTAL (AS P)						51	mg/L	52	mg/L	33	mg/L
SULFATE						210	mg/L	220	mg/L	260	mg/L
TDS (Total Dissolved Solids)						4600	mg/L	4800	mg/L	5000	mg/L

SAMPLE ID NUMBER:	CS-000B	CS-000F	CS-000T	CS-001	CS-001D	CS-002
SAMPLE TYPE:	RINSATE BLANK	FIELD BLANK	TRIP BLANK		DUPLICATE	
****** TCLP LEACH ******						
ARSENIC	R	R		224J ug/L	282J ug/L	243J ug/L
BARIUM	59.0J ug/L	64.0J ug/L		530J ug/L	369U ug/L	360U ug/L
CADMIUM	R	R		14800J ug/L	17400 ug/L	25900J ug/L
CHROMIUM	50.0 ug/L	10.0UJ ug/L		214J ug/L	326J ug/L	485J ug/L
LEAD	30.0U ug/L	30.0U ug/L		30.0U ug/L	30.0U ug/L	30.0U ug/L
MERCURY	0.2U ug/L	0.2U ug/L		0.2U ug/L	0.2U ug/L	0.9 mg/L
NICKEL	20.0UJ ug/L	20.0UJ ug/L		7010J ug/L	6990J ug/L	8300J mg/L
pH	6.0	5.9			4.8	4.6
SELENIUM	87.0J ug/L	60.0UJ ug/L		60.0UJ ug/L	60.0UJ ug/L	60.0UJ ug/L
SILVER	30.0U ug/L	6.0U ug/L		6.0U ug/L	11.0 ug/L	10.0 ug/L

SAMPLE ID NUMBER: CS-003
SAMPLE TYPE:

COMPOUND		
****** VOLATILES ******		
1,1,1-TRICHLORETHANE	29	ug/kg
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	150J	ug/kg
1,1,2-TRICHLOROETHANE	16U	ug/kg
1,1-DICHLOROETHENE	16U	ug/kg
2-BUTANONE	130J	ug/kg
4-METHYL-2-PENTANONE	31U	ug/kg
ACETONE	31UJ	ug/kg
BENZENE	16U	ug/kg
CARBON DISULFIDE	16U	ug/kg
CARBON TETRACHLORIDE	16U	ug/kg
CHLOROBENZENE	16U	ug/kg
ETHYL ACETATE	16UJ	ug/kg
ETHYL ETHER	16U	ug/kg
ETHYLBENZENE	16U	ug/kg
METHYLENE CHLORIDE	16UJ	ug/kg
TETRACHLOROETHENE	830J	ug/kg
TOLUENE	16U	ug/kg
TRICHLORETHENE	16U	ug/kg
TRICHLOROFLUOROMETHANE	16UJ	ug/kg
XYLENE (total)	49U	ug/kg
****** SEMI-VOLATILES ******		
1,2,4-TRICHLOROBENZENE	1000U	ug/kg
1,2-DICHLOROBENZENE	1000U	ug/kg
1,4-DICHLOROBENZENE	1000U	ug/kg
2,4-DINITROTOLUENE	1000U	ug/kg
2-NITROPROPANE	1000UJ	ug/kg
ACENAPHTHENE	1000U	ug/kg
CYCLOHEXANONE	1000U	ug/kg
N-NITROSO-DI-N-PROPYLAMINE	1000U	ug/kg
PYRENE	1000U	ug/kg
PYRIDINE	1000UJ	ug/kg
****** ALCOHOLS ******		
2-ETHOXYETHANOL	500U	mg/kg
ISOBUTANOL	10U	mg/kg
METHANOL	10U	mg/kg
N-BUTYL ALCOHOL	10U	mg/kg

SAMPLE ID NUMBER: CS-003
SAMPLE TYPE:

****** INORGANICS ******		
ARSENIC	12.5UJ	mg/kg
BARIUM	207J	mg/kg
BORON	1380J	mg/kg
CADMIUM	4280J	mg/kg
CALCIUM		
CHROMIUM	2900J	mg/kg
LEAD	187J	mg/kg
MAGNESIUM	24100J	mg/kg
MERCURY	14	mg/kg
NICKEL	822J	mg/kg
POTASSIUM	67100J	mg/kg
SELENIUM	187UJ	mg/kg
SILVER	166J	mg/kg
SODIUM	96300J	mg/kg
****** MISCELLANEOUS ******		
AMMONIA	71	mg/kg
ATTERBERG - LIQUID LIMIT	71	
ATTERBERG - PLASTIC INDEX	33	
ATTERBERG - PLASTIC LIMIT	38	
BULK DENSITY (DRIED SOLIDS)		
CYANIDE - AMENABLE		
CYANIDE - TOTAL	110J	mg/kg
GROSS ALPHA	4700+-500	pCi/g
GROSS BETA	600+-60	pCi/g
MOISTURE - GRAVIMETRIC	67.9J	%
MOISTURE - KARL FISHER		
pH	9.8	
SPECIFIC GRAVITY		
SWELL TEST	10	%
TOC (Total Organic Carbon)	6400J	mg/kg
****** ASTM LEACH ******		
CHLORIDE	170	mg/L
NITRATE	420	mg/L
PERCENT RECOVERY OF SOLIDS	21.4	%
PHOSPHORUS,TOTAL (AS P)	47	mg/L
SULFATE	280	mg/L
TDS (Total Dissolved Solids)	5400	mg/L

SAMPLE ID NUMBER: CS-003
SAMPLE TYPE:

****** TCLP LEACH ******

ARSENIC	231J	ug/L
BARIUM	291U	ug/L
CADMIUM	24500J	ug/L
CHROMIUM	425J	ug/L
LEAD	34.0	ug/L
MERCURY	4.9	ug/L
NICKEL	7300J	ug/L
pH	4.7	
SELENIUM	60.0UJ	ug/L
SILVER	10.0	ug/L

APPENDIX B

DATA VALIDATION COVER LETTERS

HALLIBURTON NUS
Environmental Corporation

INTERNAL CORRESPONDENCE

C-49-10-1-331

TO: RICH NINESTEEL

DATE: OCTOBER 28, 1991

FROM: KENT WEAVER KEW

COPIES: D. A. SCHEIB

SUBJECT: ORGANIC DATA VALIDATION - VOA/BNAs
ROCKY FLATS
CASE NO. RFP1, SDG PKG1

SAMPLES:

Volatiles:

13/soil/PS207BC-NE, PS207BC-NW, PS207BC-SE, PS207BC-SW
PS207BN-NE, PS207BN-NW, PS207BN-SE, PS207BN-SW,
PS207BS-NE, PS207BS-NW, PS207BS-NWD, PS207BS-SE,
PS207BS-SW

23/aqueous/PS207BC-T, PS207BN-T, PS207BS-B, PS207BS-F,
PS207BS-T, PW207BC-NE, PW207BC-NW, PW207BC-SE,
PW207BC-SW, PW207BC-T, PW207BN-NE, PW207BN-NW,
PW207BN-SE, PW207BN-SW, PW207BN-T, PW207BS-B,
PW207BS-F, PW207BS-NE, PW207BS-NW, PW207BS-NWD,
PW207BS-SE, PW207BS-SW, PW207BS-T

Semivolatiles:

13/soil/PS207BC-NE, PS207BC-NW, PS207BC-SE, PS207BC-SW,
PS207BN-NE, PS207BN-NW, PS207BN-SE, PS207BN-SW,
PS207BS-NE, PS207BS-NW, PS207BS-NWD, PS207BS-SE,
PS207BS-SW

17/aqueous/PS207BS-B, PS207BS-F, PW207BC-NE, PW207BC-NW,
PW207BC-SE, PW207BC-SW, PW207BN-NE, PW207BN-NW,
PW207BN-SE, PW207BN-SW, PW207BS-F, PW207BS-NE,
PW207BS-NW, PW207BS-NWD, PW207BS-SE, PW207BS-SW,
PW207BS-B

A validation was performed on the organic analytical data from the volatile and semivolatile fractions of Case No. RFP 1, SDG PKG 1, low level soil and aqueous samples collected by HALLIBURTON NUS Environmental Corporation at the Rocky Flats site. The data were reviewed with reference to the EPA "Functional Guidelines for Evaluating Organic Analyses" as applied for use within Region VIII and were evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
	•	Blanks
	•	Surrogate Spike Recoveries
*	•	Matrix Spike/Matrix Spike Duplicate Results
*	•	Field Duplicate Performance
	•	Internal Standard Precision
*	•	Compound Identification
*	•	Compound Quantification

* - All quality control criteria were met for this parameter.

The attached Table I summarizes the validation recommendations which were based on the following information:

CALIBRATIONS

The following tables summarize calibration non-compliances and corresponding actions. The key associated with these tables is presented on page six of this memorandum.

Volatiles

Compound	IC 08/21/91
trichlorofluoromethane	XX
1,1,2-trichloro-1,2,2-trifluoroethane (a.k.a. freon-113)	XX
acetone	X
trichloroethene	X

Associated Samples: PS207BC-(NE,NW,SE,SW), PS207BN-T, PS207BS-(B,F,NW,NWD,SW,T), PW207BS-(B,F,NE,NW,SE,SW,T)

Nondetects for trichlorofluoromethane and freon-113 in these samples are qualified as estimated, "UJ". Positive results for trichloroethene in sample PS207BS-NW and acetone in four samples are qualified as estimated, "J". No other qualifications were made as either no positive results were reported for the other compounds in affected samples or affected positive results are qualified due to blank contamination.

Compound	CC 08/19/91
acetone	X
4-methyl-2-pentanone	X

Associated Samples: PW207BN-(NW,NE,SE)

No qualifications were made because no positive results were reported for these compounds in affected samples.

Compound	CC 08/20/91
acetone	XX
carbon disulfide	XX
trichlorofluoromethane	XX
freon-113	XX
ethyl ether	XX
1,1,1-trichloroethane	X
carbon tetrachloride	X
trichloroethene	X
1,1,2-trichloroethane	X

Associated Samples: PS207BN-(NW,NE,SW,SE)

Nondetects for acetone, carbon disulfide, trichlorofluoromethane, freon-113, and ethyl ether in these samples are qualified as estimated, "UJ". No other qualifications were made as no positive results were reported for the other compounds in affected samples.

Compound	CC 08/20/91
acetone	XX
carbon disulfide	XX
4-methyl-2-pentanone	XX
1,1,1-trichloroethane	X
carbon tetrachloride	X
benzene	X
trichlorofluoromethane	X
ethyl ether	X
ethyl acetate	X

Associated Samples: PS207BC-T, PW207BC-(T,NW,NE,SW,SE), PW207BN-(T,SW), PW207BS-NWD.

Nondetects for acetone, carbon disulfide, and 4-methyl-2-pentanone (not qualified for blank contamination) are qualified as estimated, "UJ", in affected samples. No other qualifications were made as no positive results were reported for the other compounds in affected samples.

Compound	CC 08/21/91
trichloroethene	X
4-methyl-2-pentanone	X
ethyl acetate	X

Associated Samples: PS207BS-SW

No actions were required as no positive results were reported for these compounds in the affected samples.

Compound	CC 08/21/91
freon-113	X

Associated Samples: PS207BC-(NW,NE,SW,SE), PS207BS-(NW,NWD)

No actions were required as no positive results were reported for this compound in the affected samples.

Compound	CC 08/22/91
acetone	X
4-methyl-2-pentanone	X
ethyl acetate	X

Associated Samples: PS207BN-T, PW207BS-(NW,NE,SE,SW,B)

The positive result for acetone in sample PS207BN-T is qualified as estimated, "J". No other qualifications were made because no positive results were reported for these compounds in affected samples which were not qualified due to blank contamination.

Compound	CC 08/26/91
acetone	XX
carbon disulfide	X
trichlorofluoromethane	X
ethyl acetate	X

Associated Samples: PS207BS-(NE,SE)

Nondetects for acetone are qualified as estimated, "UJ", in these samples. No other qualifications were made as no positive results were reported for the other compounds in the affected samples.

Compound	CC 08/27/91
1,1,1-trichloroethane	X

Associated Samples: PS207BS-(T,B,F), PW207BS-(T,F)

No actions were required as no positive results were reported for this compound in the affected samples.

Semivolatiles

Compound	CC 08/30/91
pyridine	XX
2-fluorobiphenyl	X
1,2,4-trichlorobenzene	X

Associated Samples: PW207BN-(NW,NE,SW,SE), PW207BC-(NW,NE,SW,SE)

Nondetects for pyridine in these samples are qualified as estimated,"UJ". No other qualifications were made as no positive results were reported for the other compound in affected samples.

Compound	CC 08/30/91
pyridine	XX
1,2,4-trichlorobenzene	X

Associated samples: PS207BN-(NW,NE,SW,SE), PS207BC-(NW,NE,SW,SE)

Nondetects for pyridine in these samples are qualified as estimated,"UJ". No other qualifications were made as no positive results were reported for the other compound in affected samples.

Compound	CC 09/01/91
pyridine	XX
2-fluorobiphenyl	X
1,2,4,-trichlorobenzene	X

Associated Samples: PW207BS-(NW,NWD,NE,SW,SE,B,F), PS207BS-B

Nondetects for pyridine are qualified as estimated,"UJ", in these samples. No other qualifications were made as no positive results were reported for the other compounds in affected samples.

Compound	CC 09/06/91
pyridine	XX

Associated Samples: PS207BS-F

The nondetect for pyridine in the associated sample is qualified as estimated, "UJ".

Compound	CC 09/10/91
pyridine	XX
pyrene	X

Associated Samples: PS207BS-(NW,NWD,NE,SW,SE)

Nondetects for pyridine are qualified as estimated,"UJ", in these samples. No other qualifications were made as no positive results were reported for pyrene in affected samples.

Compound	CC 09/12/91
pyridine	XX
1,2,4-trichlorobenzene	X
2,4-dinitrotoluene	X

Associated Samples: PS207BS-FRE

The nondetect for pyridine in the associated sample is qualified as estimated, "UJ". No other qualifications were made as no positive results were reported for the other compounds in affected samples.

Calibration Key:

X - Percent RSD > 30; percent D > 25; Estimate (J) positive results.
XX - Percent RSD > 50; percent D > 50; Estimate (J) positive results and estimate (UJ) nondetects.

BLANKS

Volatiles

Laboratory method rinsate, field, and trip blanks contained the following contaminants in the maximum amounts indicated below:

Waters:

Compound	Maximum Concentration
methylene chloride	6 ug/kg
acetone	15 ug/l
2-butanone	5 ug/kg
freon-113	25 ug/kg
ethylbenzene	3 ug/l
total xylenes	9 ug/l
4-methyl-2-pentanone	5 ug/kg

Associated Samples: All waters

Soils:

Compound	Maximum Concentration
acetone	33 ug/l
toluene	4 ug/l
total xylenes	4 ug/l

Associated Samples: All soils

Action levels of ten times the maximum amount of common contaminants and five times the maximum amount of the other contaminants were used to evaluate the data.

Blank Actions:

- Value < CRQL; report CRQL followed by a U.
- Value > CRQL and < action level; report value followed by a U.
- Value > CRQL and > action level; report value unqualified.

No actions were taken for 2-butanone, freon, ethylbenzene, and 4-methyl-2-pentanone in affected samples as no positive results were reported for these compounds.

SURROGATE SPIKE RECOVERIES

The percent recoveries of the following surrogates do not meet the Contract Required Recovery (CRR) range:

Sample	Compound	Percent Recovery	QC Limits
PW207BS-NW	1,2-Dichloroethane-d4	118	76-114
PS207BS-F	2-Fluorobiphenyl	38	43-116
	Terphenyl	32	33-141

Surrogate Recovery Actions:

- Percent Recovery < 10%; Estimate (J) positive results and Reject (R) all nondetects.
- Percent Recovery 10% - CRR; Estimate, (J) positive results and (UJ) all nondetects.
- Percent Recovery > CRR; Estimate (J) positive results and (UJ) all nondetects.

Associated nondetects for samples PW207BS-NW and PS207BS-F are qualified as estimated, "UJ". Associated positive results are qualified due to blank contamination, therefore, no further actions were required.

Internal Standards

The internal standard areas for the following samples were outside the quality control (QC) limits:

Volatiles

Sample	Internal Standard	Area	QC Limits
PS207BN-NE	BCM	58100	58500-234000
	DFB	254000	258000-1032000
	CBZ	83500	122000-488000
PS207BN-SE	BCM	51900	58500-234000
	DFB	255000	258000-1032000
	CBZ	88700	122000-488000
PS207BN-SW	CBZ	91600	122000-488000

BCM - Bromochloromethane
DFB - 1,4-difluorobenzene
CBZ - Chlorobenzene

Semivolatiles

Sample	Internal Standard	Area	QC Limits
PS207BC-NE	ANT	20200	21750-87000
PS207BC-SE	NPT	38900	39800-159200
	ANT	17100	21750-87000
	PHN	23000	26000-104000
PS207BC-SW	ANT	19200	21750-87000
	PHN	22900	26000-104000
PS207BN-NW	PHN	25100	26000-104000
PS207BS-NWD	PRY	64100	16000-64000
PS207BS-B	CRY	7180	9750-39000
PW207BS-B	CRY	7670	9750-39000
PW207BS-F	CRY	8080	9750-39000
PW207BS-SW	CRY	9430	9750-39000

ANT - Acenaphthene
NPT - Naphthalene-d8
PHN - Phenanthrene-d10
CRY - Chrysene-d12
PRY - Perylene-d12

Internal Standards Actions:

- Internal standard area outside QC limits; (J) positive results and (UJ) all associated nondetects.
- Reject (R) data if internal standards are extremely poor.

Associated nondetects in samples PS207BN-NE, PS207BN-SE, PS207BN-SW, PS207BC-NE, PS207BC-SE, PS207BS-B, PW207BS-B, PW207BS-F, and PW207BS-SW are qualified as estimated, "UJ".

No other problems were encountered in this case.

ROCKY FLATS SITE
CASE NO. RFP1, SDG PKG1

TABLE I - RECOMMENDATION SUMMARY

Sample	Volatile	Semivolatiles
PS207BC-NE	A^{1}, $J^{7,8}$	$J^{13,14}$
PS207BC-NW	$J^{7,8}$	J^{13}
PS207BC-SE	$J^{7,8}$	$J^{13,14}$
PS207BC-SW	A^{1}, $J^{1,7,8}$	J^{13}
PS207BC-T	$J^{1,2,3,9}$	
PS207BN-NE	$J^{2,3,4,5,6,12}$	J^{13}
PS207BN-NW	$J^{2,3,4,5,6}$	J^{13}
PS207BN-SE	$J^{2,3,4,5,6,12}$	J^{13}
PS207BN-SW	$J^{2,3,4,5,6,12}$	J^{13}
PS207BN-T	A^{2}, $J^{7,8}$	
PS207BS-B	A^{2}, $J^{7,8}$	$J^{13,14}$
PS207BS-F	A^{2}, $J^{7,8}$	$J^{11,13}$
PS207BS-NE	A^{1}, J^{2}	J^{13}
PS207BS-NW	$J^{7,8,10}$	J^{13}
PS207BS-NWD	$J^{7,8}$	J^{13}
PS207BS-SE	A^{1}, J^{2}	J^{13}
PS207BS-SW	$J^{1,7,8}$	J^{13}
PS207BS-T	A^{2}, $J^{7,8}$	
PW207BC-NE	A^{3}, $J^{2,3,9}$	J^{13}
PW207BC-NW	A^{2}, $J^{3,9}$	J^{13}
PW207BC-SE	$A^{2,4}$, $J^{3,9}$	J^{13}
PW207BC-SW	$J^{2,3,9}$	J^{13}
PW207BC-T	$J^{1,2,3,9}$	
PW207BN-NE	A^{4}	J^{13}
PW207BN-NW	A^{4}	J^{13}
PW207BN-SE	A^{4}	J^{13}
PW207BN-SW	$A^{3,4}$, $J^{2,3,9}$	J^{13}
PW207BN-T	$J^{1,2,3,9}$	
PW207BS-B	A^{2}, $J^{7,8}$	$J^{13,14}$
PW207BS-F	A^{2}, $J^{7,8}$	$J^{13,14}$
PW207BS-NE	A^{2}, $J^{7,8}$	J^{13}
PW207BS-NW	A^{2}, $J^{7,8,11}$	J^{13}
PW207BS-NWD	A^{2}, $J^{3,9}$	J^{13}
PW207BS-SE	A^{2}, $J^{7,8}$	J^{13}
PW207BS-SW	$J^{7,8}$	$J^{13,14}$
PW207BS-T	A^{2}, $J^{7,8}$	

A^1- Change positive result for methylene chloride to a revised detection limit because of blank contamination.

A^2- Change positive result for acetone to a revised detection limit because of blank contamination.

A^3- Change positive result for total xylenes to a revised detection limit because of blank contamination.

A^4- Change positive result for toluene to a revised detection limit because of blank contamination.

J^1- Estimate "J" positive results which are less than the CRQL.

J^2- Estimate "UJ" nondetect for acetone due to %D > 50.

J^3- Estimate "UJ" nondetect for carbon disulfide due to %D > 50.

J^4- Estimate "UJ" nondetect for trichlorofluoromethane due to %D > 50.

J^5- Estimate "UJ" nondetect for freon-113 due to %D > 50.

J^6- Estimate "UJ" nondetect for ethyl ether due to %D > 50.

J^7- Estimate "UJ" nondetect for trichlorofluoromethane due to %RSD > 50.

J^8- Estimate "UJ" nondetect for freon-113 due to %RSD > 50.

J^9- Estimate "UJ" nondetect for 4-methyl-2-pentanone due to %D > 50.

J^{10}- Estimate "J" positive result for trichloroethene due to %D > 25.

J^{11}- Estimate "UJ" all nondetects due to poor surrogate recovery.

J^{12}- Estimate "UJ" associated nondetects due to poor internal standards.

J^{13}- Estimate "UJ" nondetect for pyridine due to %D > 50.

J^{14}- Estimate "UJ" associated nondetects due to poor internal standards.

HALLIBURTON NUS
Environmental Corporation

INTERNAL CORRESPONDENCE

C-49-11-1-216

TO: RICH NINESTEEL

DATE: NOVEMBER 19, 1991

FROM: DWAYNE S. MOCK

CC: D. A. SCHEIB

SUBJECT: INORGANIC DATA VALIDATION
ROCKY FLATS
CASE NO. RFP1, SDG PKG1

Selected TAL Metals:

17/waters/PS-207BS-B, PS-207BS-F, PW-207BC-NE
PW-207BC-NW, PW-207BC-SE, PW-207BC-SW
PW-207BN-NE, PW-207BN-NW, PW-207BN-SE
PW-207BN-SW, PW-207BS-B, PW-207BS-F
PW-207BS-NE, PW-207BS-NW, PW-207BS-SE
PW-207BS-SW, PW-207BS-NW-D

13/soil/PS-207BC-NE, PS-207BC-NW, PS-207BC-SE
PS-207BC-SW, PS-207BN-NE, PS-207BN-NW
PS-207BN-SE, PS-207BN-SW, PS-207BS-NE
PS-207BS-NW, PS-207BS-SE, PS-207BS-SW
PS-207BS-NW-D

A validation was performed on the inorganic analytical data from Case No. RFP1, SDG PKG1, water and sludge samples collected by HALLIBURTON NUS Environmental Corporation at the Rocky Flats site. The data were reviewed with reference to the EPA "Functional Guidelines for Evaluating Inorganic Analyses" as applied for use within Region VIII, and were evaluated based on the following parameters:

* o Data Completeness
* o Holding Times
* o Calibration Verification
o Laboratory and Field Blank Analyses
* o ICP Interference Check Sample Results
o Matrix Spike Recoveries
o Laboratory Control Sample Results
o Laboratory Duplicates
o Field Duplicate Precision
* o Detection Limits
* o Sample Quantitation

* - All quality control criteria were met for this parameter.

An ICP serial dilution analysis was required by the analysis method. This analysis was not performed by the laboratory. Consequently, the sample data were not evaluated for this parameter.

The attached Table 1 summarizes the validation recommendations which were based on the following information:

Blanks

Samples PS-207BS-B, PS-207BS-F, PW-207BS-B and PW-207BS-F are rinsate and field blanks and according to validation protocol are only qualified on the basis of laboratory method blank contamination.

Laboratory method, field and rinsate blank analyses yielded the following contaminants in the maximum concentrations indicated:

Analyte	Maximum Concentration (ug/l)	Action Level (ug/l)
boron	14.0	70.0
magnesium	41.0	205
potassium	1000	5000
silver	9.0	45.0
sodium	581	2900

Sample Affected: All

Blank Actions:

Value > IDL and < Action Level = Report value U.
Value > IDL and > Action Level = Report value unqualified.

Individual sample size, dilution factors and moisture content were considered prior to the application of all actions levels. No actions were taken for magnesium because all sample concentrations for this analyte are above the action level.

ICP Interference Check Sample Results

ICP interferences were noted for chromium during the Interference Check Sample (ICS) analysis. Suppression due to high calcium sample concentrations may exist for samples PS-207BN-SE and PS-207BN-SW. Estimated interferences were calculated for these samples. Positive results for chromium in these samples are qualified as estimated, (J), since estimated interferences were < 50% of the reported sample results.

Matrix Spike Recoveries

Matrix Spike (MS) Percent Recoveries (%Rs) for boron in both matrices were extremely low (< 30%). Positive results for this

analyte in all samples (not qualified due to blank contamination) are qualified as estimated, (J); no nondetects were reported.

MS %Rs for arsenic, cadmium, selenium and silver in the sludge matrix were below the 75% quality control limit (yet > 30%). Positive results (not qualified on the basis of blank contamination) and nondetects for these analytes in sludge samples are qualified as estimated, (J) and (UJ), respectively; no positive results were reported for selenium and no nondetects were reported for cadmium.

MS %Rs for barium, chromium, lead and nickel exceeded the 125% upper quality control limit for the sludge matrix. Positive results for these analytes in affected samples are qualified as estimated, (J).

Laboratory Control Sample Results

Solid Laboratory Control Sample (LCS) concentrations for barium and selenium fell below the respective lower quality control limit. Positive barium results and nondetects for selenium in sludge samples are qualified as estimated, (J) and (UJ), respectively; no positive results were reported for selenium and no nondetects were reported for barium.

Laboratory Duplicates

The Relative Percent Difference (RPD) for chromium exceeded the 20% quality control criterion for the water matrix. Chromium sample data in waters (not qualified based on blank contamination) are qualified as estimated, (J) and (UJ).

The RPD for mercury exceeded the 35% quality control criterion for the sludge matrix. Sample data for mercury in sludges are qualified as estimated, (J) and (UJ).

Field Duplicate Precision

RPDs for lead, arsenic and mercury exceeded the 30% quality control criterion for the water field duplicate pair. Positive results and nondetects for these analytes in waters are qualified as estimated, (J) and (UJ), respectively.

The RPD for chromium in the sludge field duplicate pair was high (> 50%). Positive results (not qualified because of blank contamination) and nondetects for chromium in sludges are qualified as estimated, (J) and (UJ), respectively.

Overall Assessment of the Data

The data are acceptable for use as qualified. Several analytes were detected as contaminants in the field, rinsate and/or laboratory method blanks. Matrix spike recoveries for several analytes were noncompliant resulting in the estimation of associated sample data. Chromium results in two samples were estimated because of ICP interferences due to high calcium sample concentrations. Some sample data for chromium, mercury, arsenic and lead were estimated due to laboratory and/or field duplicate imprecision. Sludge sample results for barium and selenuim were also estimated due to low solid LCS concentrations. No other problems were encountered.

ROCKY FLATS
CASE NO. RFP1, SDG PKG1

TABLE 1 - RECOMMENDATION SUMMARY

Arsenic	$J^{2,7}$	Mercury	$J^{5,7}$
Barium	$J^{3,4}$	Nickel	J^{3}
Boron	A^{1}, J^{1}	Potassium	A^{1}
Cadmium	J^{2}	Selenium	$J^{2,4}$
Chromium	$J^{3,6,8,9}$	Silver	A^{1}, J^{2}
Lead	$J^{3,7}$	Sodium	A^{1}
Magnesium			

If the field is left blank, the qualifier is A - Accept all data.

A^{1} - Accept data, but raise sample detection limit (where appropriate) to a revised detection limit due to blank contamination.

J^{1} - Estimate (J) positive results in all samples due to extremely low MS recovery for both matrices.

J^{2} - Estimate (J) positive results and (UJ) nondetects in soil samples due to MS %R < 75% but > 30%.

J^{3} - Estimate (J) positive results in soils due to high MS recovery.

J^{4} - Estimate (J) positive barium results and (UJ) selenium nondetects in soil samples due to low concentrations for the solid LCS.

J^{5} - Estimate (J) positive results and (UJ) nondetects in soils because of poor laboratory duplicate precision.

J^{6} - Estimate (J) positive results and (UJ) nondetects in waters because of laboratory duplicate RPD > 20%.

J^{7} - Estimate (J) positive results and (UJ) nondetects in soils due to field duplicate imprecision.

J^{8} - Estimate (J) positive results and (UJ) nondetects in waters due to poor field duplicate precision.

J^{9} - Estimate (J) positive results in two samples due to ICP interferences caused by high calcium sample concentrations.

HALLIBURTON NUS
Environmental Corporation

INTERNAL CORRESPONDENCE

C-49-10-1-334

TO: RICH NINESTEEL

DATE: OCTOBER 29, 1991

FROM: KAREN M. SMECKER KMS

CC: D. A. SCHEIB

SUBJECT: INORGANIC DATA VALIDATION
ROCKY FLATS
CASE NO. RFP1A, SDG PKG1A

SAMPLES: 15/waters/PW-207BC-NE, PW-207BC-NW
PW-207BC-SE, PW-207BC-SW
PW-207BN-NE, PW-207BN-NW
PW-207BN-SE, PW-207BN-SW
PW-207BS-NE, PW-207BS-NW
PW-207BS-NW-D, PW-207BS-SE
PW-207BS-SW, PW-207BS-B
PW-207BS-F

15/sludges/PS-207BC-NE, PS-207BC-NW
PS-207BC-SE, PS-207BC-SW
PS-207BN-NE, PS-207BN-NW
PS-207BN-SE, PS-207BN-SW
PS-207BS-NE, PS-207BS-NW
PS-207BS-NW-D, PS-207BS-SE
PS-207BS-SW, PS-207BS-B
PS-207BS-F

A validation was performed on the inorganic analytical data from Case No. RFP1A, SDG PKG1A, pond water and pond sludge samples, collected by HALLIBURTON NUS Environmental Corporation at the Rocky Flats site. The water samples and the TCLP extracts from the sludge samples were analyzed for arsenic, barium, cadmium, chromium, lead, mercury, nickel, selenium and silver. The data were reviewed with reference to the EPA "Functional Guidelines for Evaluating Inorganic Analyses" as applied for use within Region VIII, and were evaluated based on the following parameters:

- o Data Completeness
- * o Holding Times
- * o Calibration Verification
- o Laboratory and Field Blank Analyses
- o ICP Interference Check Sample Results
- o Matrix Spike Recoveries
- o Laboratory Control Sample Results
- o Field Duplicate Precision
- * o Detection Limits
- * o Sample Quantitation

* - All quality control criteria were met for this parameter.

Laboratory duplicate and ICP serial dilution analyses are required by the analysis method. These analyses were not performed by the laboratory, therefore, sample data were not evaluated for these parameters.

The attached Table 1 summarizes the validation recommendations which were based on the following information:

Data Completeness

The chromium result for sample PS-207BS-NW-D was inadvertently omitted from the Form I report for this sample. After a review of the raw data, the sample result was transcribed onto the Form I by the validator.

Blanks

Samples PW-207BS-B, PW-207BS-F, PS-207BS-B and PS-207BS-F are rinsate and field blanks and according to validation protocol are only qualified on the basis of laboratory method blank contamination.

Laboratory method, field and rinsate blank analyses yielded the following contaminants in the maximum concentrations indicated:

Analyte	Maximum Concentration (ug/l)	Action Level (ug/l)
silver	7.0	35.0
barium	41.0	205

Sample Affected: All

Blank Actions:

Value > IDL and < Action Level = Report value U.
Value > IDL and > Action Level = Report value unqualified.

Dilution factors were considered prior to the application of these actions levels.

ICP Interference Check Sample Results

ICP interferences were noted for cadmium during the Interference Check Sample (ICS) analysis. Suppression due to high calcium sample concentrations may exist; seven samples were affected. Estimated intferences were calculated for these samples. Positive cadmium results in samples PS-207BN-SW and PS-207BN-NE are

considered unreliable and qualified as rejected, (R), because the estimated interference was > 50% of the reported sample result. Positive cadmium results in samples PS-207BN-NW, PS-207BN-SE, PS-207BC-NE, PS-207BC-SW and PS-207BC-SE are qualified as estimated, (J), since the estimated intference was < 50% of the reported sample result.

Matrix Spike Recoveries

Matrix Spike (MS) recoveries for barium in the water matrix and arsenic in both matrices were extremely low (< 30%). Positive results for these analytes in affected samples are qualified as estimated, (J). Nondetects for arsenic in all samples are considered unreliable and qualified as rejected, (R); no nondetects were reported for barium in water samples.

MS Percent Recoveries (%Rs) for lead in the water matrix and selenium and silver in both matrices were below the 75% quality control limit (yet > 30%). Nondetects for these analytes in affected samples are qualified as estimated, (UJ); no positive results were reported for selenium and positive silver results are qualified due to blank contamination.

Laboratory Control Sample Results

The Laboratory Control Sample (LCS) %R for selenium was low (< 80%). Only nondetects were reported for this analyte, and these results are qualified as estimated, (UJ).

Field Duplicate Precision

The Relative Percent Difference (RPD) for barium exceeded the 30% quality control criterion for the sludge field duplicate pair. No nondetects were reported for barium in sludges; positive results for this analyte in these samples are qualified as estimated, (J).

Overall Assessment of the Data

The data are acceptable for use as qualified. Silver and barium were identified as contaminants in the field, rinsate and/or laboratory method blanks. Matrix spike recoveries for several analytes were low resulting in the estimation or rejection of associated sample data. Several sample results for cadmium were estimated or rejected due to interferences stemming from high sample concentrations for calcium. All selenium results were estimated because of low LCS recovery. Field duplicate imprecision was noted for barium in the sludges. No other problems were encountered.

ROCKY FLATS
CASE NO. RFP1A, SDG PKG1A

TABLE 1 - RECOMMENDATION SUMMARY

Arsenic	R^1, J^1	Mercury	R^1, J^1
Barium	A^1, J^1, J^4	Nickel	
Cadmium	R^2, J^5	Selenium	J^2, J^3
Chromium		Silver	A^1, J^2
Lead	J^2		

If the field is left blank, the qualifier is A - Accept all data.

A^1 - Accept data, but raise sample detection limit (where appropriate) to a revised detection limit due to blank contamination.

J^1 - Estimate (J) positive results in affected samples due to extremely low MS recovery.

J^2 - Estimate (UJ) nondetects in affected samples due to MS %R < 75 but > 30.

J^3 - Estimate (UJ) nondetects in all samples due to low LCS recovery.

J^4 - Estimate (J) positive results in sludges due to poor field duplicate precision.

J^5 - Estimate (J) positive results in samples PS-207BN-NW, PS-207BN-SE, PS-207BC-NE, PS-207BC-SW and PS-207BC-SE due to ICP interferences caused by high calcium sample concentrations.

R^1 - Reject (R) nondetects in all samples due to MS %R < 30.

R^2 - Reject (R) positive results in samples PS-207BN-SW and PS-207BN-NE due to ICP interferences caused by high calcium sample concentrations.

HALLIBURTON NUS
Environmental Corporation

INTERNAL CORRESPONDENCE

C-49-11-1-257

TO: RICH NINESTEEL

DATE: NOVEMBER 21, 1991

FROM: DWAYNE S. MOCK

COPIES: D. A. SCHEIB

SUBJECT: ORGANIC DATA VALIDATION - VOA/BNAs
ROCKY FLATS
CASE NO. RFP2, SDG PKG2

SAMPLES:

Volatiles:

10/soil/CS-002, CS-003, CS-001, CS-001D, PS-207A-NE, PS-207C-C
PS-207C-CB, PS-207C-NW, PS-207C-NW-D, PS-207C-SW

25/aqueous/CW-001, CW-001-D, CW-002, CW-003, PW-207A-NE, PW-207A-NW
PW-207A-SE, PW-207C-NE, PW-207C-NE-D, PW-207C-NW
PW-207C-SE, PW-207C-SW, PW-207C-T, CW-000-B, CW-000-F
CW-000-T, PS-207C-B, PS-207C-F, PS-207C-T, PW-207A-T
PW-207C-B, PW-207C-F, CS-000-B, CS-000-F, CS-OOO-T

Semivolatiles:

10/soil/CS-001, CS-001-D, CS-002, CS-003, PS-207A-NE, PS-207C-C
PS-207C-NW, PS-207C-NW-D, PS-207C-SW, PS-207C-CB

20/aqueous/CW-001, CW-001-D, CW-002, CW-003, PW-207A-NE, PW-207A-NW
PW-207A-SE, PW-207C-NE, PW-207C-NE-D, PW-207C-NW
PW-207C-SE, PW-207C-SW, CW-000-F, CW-000-B, CS-000-F
CS-000-B, PS-207C-F, PS-207C-B, PW-207C-B, PW-207C-F

A validation was performed on the organic analytical data from the volatile and semivolatile fractions of Case No. RFP 2, SDG PKG 2, low level soil and aqueous samples collected by HALLIBURTON NUS Environmental Corporation at the Rocky Flats site. The data were reviewed with reference to the EPA "Functional Guidelines for Evaluating Organic Analyses" as applied for use within Region VIII and were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • GC/MS Tuning
  • Calibrations
  • Blanks
  • Surrogate Spike Recoveries
  • Matrix Spike/Matrix Spike Duplicate Results
  • Field Duplicate Precision

(continued)

- Internal Standards Performance
- * Compound Identification
- * Compound Quantification

* - All quality control criteria were met for this parameter.

The attached Table I summarizes the validation recommendations which were based on the following information:

CALIBRATIONS

The following tables summarize calibration non-compliances and corresponding actions. The key associated with these tables is presented on page six of this memorandum.

Volatiles

Compound	IC 08/22/91
acetone	X
methylene chloride	X

Associated Samples: PS-207A-NE, PS-207C-(NW, NW-D, SW, C, CB) CS-(001, 001-D, 002, 003)

No actions were taken in these samples as no positive results were reported for acetone and positive results for methylene chloride are qualified due to blank contamination.

Compound	CC 08/27/91
4-methyl-2-pentanone	X
acetone	XX
carbon disulfide	X
methylene chloride	X
2-butanone	X
trichlorofluoromethane	X
1,1,2-trichloro-1,2,2-trifluoromethane	X
ethyl ether	X
ethyl acetate	X

Associated Samples: CS-(001, 001-D), PS-207A-NE

Nondetects for acetone in these samples are qualified as estimated, (UJ). Positive results for 2-butanone and 1,1,2-trichloro-1,2,2-trifluoromethane in these samples are qualified as estimated, (J). No other qualifications were made as either no positive results were reported for the other compounds in affected samples or

affected positive results are qualified due to blank contamination.

Compound	CC 08/27/91
1,1-dichloroethene	X
acetone	XX
methylene chloride	XX
2-butanone	X
trichlorofluoromethane	XX
1,1,2-trichloro-1,2,2-trifluoromethane	X
ethyl ether	X
ethyl acetate	XX

Associated Samples: CS-(002, 003), PS-207C-(NW, NW-D, SW, C, CB)

Nondetects for acetone, methylene chloride, trichlorofluoromethane and ethyl acetate are qualified as estimated, (UJ). No further action was taken for positive methylene chloride results in affected samples since they are qualified based on blank contamination. Positive results for 2-butanone and 1,1,2-trichloro-trifluoromethane in these samples are qualified as estimated, (J). No other qualifications were made because no positive results were reported for ethyl ether and 1,1-dichloroethene.

Compound	CC 08/27/91
1,1,1-trichloroethane	X

Associated Samples: PW-207A-(NE, NW)

No qualifications were made because no positive results were reported for this compound in affected samples.

Compound	CC 08/30/91
4-methyl-2-pentanone	X

Associated Samples: PW-207C-(B, F, T), PS-207C-(F, B), CS-000-T
CW-000-(B, F, T)

Only nondetect were reported for this compound in associated samples, therefore, no qualifications were necessary.

Compound	CC 09/03/91
1,1,2-trichloro-1,2,2-trifluoromethane	X

Associated Sample: CS-000-F

No qualification was made because no positive result was reported for this compound in this sample.

Semivolatiles

Compound	IC 08/23/91
pyridine	X

Associated Samples: PW-207A-NW, CW-(001, 001-D), PS-207A-NE
PW-207C-(NE, NW, SE, SW, B, F, NE-D)

Actions were not required because no positive results were reported for this compound in any associated sample.

Compound	CC 09/06/91
pyridine	XX

Associated Samples: PW-207C-(NE, NW, SE, SW, B, F, NE-D)
PW-207A-NW

Nondetects for pyridine in all of these samples, except PW-207C-NE-D, are qualified as estimated, (UJ). No further action was necessary for the pyridine nondetect in sample PW-207C-NE-D since it was rejected due to extremely low surrogate recovery.

Compound	CC 09/07/91
2-nitropropane	XX
cyclohexane	X

Associated Samples: PW-207C-(NE, NE-D, NW, SE, SW, B, F)
PW-207A-NW

Nondetects for 2-nitropropane in all of these samples, except PW-207C-NE-D, are qualified as estimated, (UJ). No further action was required for the 2-nitropropane nondetect in sample PW-207C-NE-D as it is qualified as rejected due to extremely low surrogate recovery. No other qualifications were made as no positive results

were reported for the other compound in affected samples.

Compound	CC 09/10/91
pyridine	XX
pyrene	X
2-nitropropane	XX

Associated samples: CW-(001, 001-D), PS-207A-NE

Nondetects for pyridine and 2-nitropropane in these samples are qualified as estimated, (UJ). No other qualifications were made as no positive results were reported for the other compounds in affected samples.

Compound	IC 09/11/91
pyridine	XX

Associated Samples: PW-207A-(NERE, SERE), PS-207C-(F,B,SW,C,CB)
CW-(002,003,000-F, 000-B)
CS-(001, 001-D, 000-F, 000-B)

Nondetects for this compound in these samples are qualified as estimated, (UJ).

Compound	CC 09/12/91
pyridine	XX
2-nitropropane	XX

Associated Samples: PW-207A-(NERE, SERE), CW-(002,003)

Nondetects for pyridine and 2-nitropropane are qualified as estimated, (UJ), in these samples.

Compound	CC 09/15/91
pyridine	XX
n-nitroso-di-n-propylamine	X
pyrene	X
2-nitropropane	XX
cyclohexanone	X

Associated Samples: CS-(000-B, 000-F, 001 001-D), PS-207C-(F, B)
CW-(000-B, 000-F)

Nondetects for pyridine and 2-nitropropane in the associated samples are qualified as estimated, (UJ).

Compound	CC 09/16/91
pyridine	XX
2,4-dinitrotoluene	X
pyrene	X
2-nitropropane	XX
cyclohexanone	X

Associated Samples: CS-(002, 003), PS-207C-(NW, NW-D)

Nondetects for pyridine and 2-nitropropane are qualified as estimated, (UJ), in these samples. No other qualifications were made as no positive results were reported for any other compounds in affected samples.

Compound	CC 09/17/91
pyridine	XX
pyrene	X
2-nitropropane	XX
cyclohexanone	X

Associated Samples: PS-207C-(SW, C, CB)

Nondetects for pyridine in associated samples are qualified as estimated, (UJ). Positive results for pyrene in these samples are qualified as estimated, (J). No other qualifications were made as no positive results were reported for the other compounds in affected samples.

Calibration Key:

X - Percent RSD > 30; percent D > 25; Estimate (J) positive results.

XX - Percent RSD > 50; percent D > 50; Estimate (J) positive results and estimate (UJ) nondetects.

BLANKS

Volatiles

Field, rinsate and trip blanks are only qualified on the basis of laboratory method blank contamination.

Laboratory method, rinsate, field, and trip blanks contained the following contaminants in the maximum amounts indicated below:

Compound	Maximum Concentration
acetone	32 ug/l
toluene	3 ug/l
trichlorofluoromethane	3 ug/l
total xylenes	6 ug/l
methylene chloride *	4 ug/kg
4-methyl-2-pentanone *	5 ug/kg

Associated Samples: All

* Methylene chloride and 4-methyl-2-pentanone were detected in a soil laboratory method blank. Qualifications for these compounds are limited to soil samples.

Action levels of ten times the maximum amount of common contaminants and five times the maximum amount of the other contaminants were used to evaluate the data.

Blank Actions:

- o Value < CRQL; report CRQL followed by a U.
- o Value > CRQL and < action level; report value followed by a U.
- o Value > CRQL and > action level; report value unqualified.

Individual sample size, dilution factors and moisture correction were considered prior to the application of all action levels.

SURROGATE SPIKE RECOVERIES

Volatiles

The percent recoveries of the following surrogates do not meet the Contract Required Recovery (CRR) range:

Sample	Compound	Percent Recovery	QC Limits
PS-207C-C	toluene-d8	136	81-117
	bromofluorobenzene	65	74-121

Surrogate Recovery Actions:

- Percent Recovery < 10%; Estimate (J) positive results and reject (R) all nondetects.

(continued)

- Percent Recovery 10% - CRR; Estimate, (J) positive results and (UJ) all nondetects.
- Percent Recovery > CRR; Estimate (J) positive results and (UJ) all nondetects.

Positive results (not qualified due to blank contamination) and nondetects for this sample are qualified as estimated, (J) and (UJ), respectively.

Semivolatiles

The percent recoveries of the following surrogates do not meet the Contract Required Recovery (CRR) range:

Sample	Compound	Percent Recovery	QC Limits
PW-207C-NE	nitrobenzene-d5	29	35-114
	2-fluorobiphenyl	23	43-116
	terphenyl-d14	16	33-141
PW-207C-NE-D	nitrobenzene-d5	17	35-114
	2-fluorobiphenyl	12	43-116
	terphenyl-d14	9	33-141
PW-207C-NW	nitrobenzene-d5	29	35-114
	2-fluorobiphenyl	21	43-116
	terphenyl-d14	16	33-141
PW-207C-SE	nitrobenzene-d5	23	35-114
	2-fluorobiphenyl	15	43-116
	terphenyl-d14	11	33-141
PW-207C-SW	nitrobenzene-d5	29	35-114
	2-fluorobiphenyl	17	43-116
	terphenyl-d14	10	33-141

Surrogate Recovery Actions:

- Percent Recovery < 10%; Estimate (J) positive results and reject (R) all nondetects.
- Percent Recovery 10% - CRR; Estimate, (J) positive results and (UJ) all nondetects.
- Percent Recovery > CRR; Estimate (J) positive results and (UJ) all nondetects.

Nondetects in sample PW-207C-NE-D are considered unreliable and qualified as rejected, (R), due to extremely low surrogate recovery. Nondetects in the other affected samples are qualified as estimated, (UJ).

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

Relative Percent Differencs (RPDs) between percent recoveries of 1,4-dichlorobenzene, 1,2,4-trichlorobenzene, acenaphthaene and 2,4-dinitrotoluene exceeded quality control criteria. No positive results were reported in the spiked sample, therefore no qualifications were made.

In addition, the following compounds did not meet the Contract Required Recovery (CRR) range:

Sample	Compound	Percent Recovery	QC Limits
PW-207C-NE-DMS	1,4-dichlorobenzene	11	36-97
	n-nitroso-di-n-propylamine	22	41-116
	1,2,4-trichlorobenzene	12	39-98
	acenaphthene	19	46-118
	2,4-dinitrotoluene	19	24-96
	pyrene	24	26-127
PW-207C-NE-DMSD	1,4-dichlorobenzene	16	36-97
	n-nitroso-di-n-propylamine	30	41-116
	1,2,4-trichlorobenzene	18	39-98
	acenaphthene	26	46-118
	pyrene	23	26-127

Matrix Spike/Matrix Spike Duplicate Actions:

- Percent Recovery > CCR; Estimate (J) positive results and accept nondetects.
- Percent Recovery 10% - CRR; Estimate, (J) positive results and accept nondetects.
- Percent Recovery < 10%; Estimate (J) positive results and reject (R) nondetects.

No qualifications were needed since no positive results were reported for these compounds in the unspiked sample.

FIELD DUPLICATE PRECISION

The Relative Percent Difference (RPD) for 2-butanone was high (> 30%) for the aqueous field duplicate pair consisting of samples PW-207C-NE and PW-207C-NE-D. Positive results for this compound in these samples are qualified as estimated, (J).

RPDs for 2-butanone, 1,1,1-trichloroethane and tetrachloroethene in the soil field duplicate pair (samples CS-001 and CS-001-D)

exceeded the 50% quality control limit. Positive results for these compounds in this sample pair are qualified as estimated, (J).

INTERNAL STANDARDS PERFORMANCE

The internal standard areas for the following samples were outside the quality control (QC) limits:

Volatiles

Sample	Internal Standard	Area	QC Limits
PS-207C-C	CBZ	131000	157000-628000

CBZ- Chlorobenzene

Semivolatiles

Sample	Internal Standard	Area	QC Limits
PS-207C-C	PRY	45900	8000-32000
PS-207C-CB	PRY	46800	8000-32000
PS-207C-SW	PRY	39000	8000-32000
PW-207C-F	DCB	9180	11750-47000
	NPT	27100	39050-156200
	ANT	14000	19350-77400
	PHN	17600	23900-95600
	CRY	15800	17600-70400
PW-207C-NE-D	DCB	9970	11750-47000
	NPT	32000	39050-156200
	ANT	16500	19350-77400
	PHN	19500	23900-95600
CW-003	ANT	16300	16700-66800
CS-000-B	CRY	37500	7350-29400
	PRY	30100	4640-18560
CS-000-F	CRY	38800	7350-29400
	PRY	31200	4640-18560
CS-001	CRY	42400	7350-29400
	PRY	44100	4640-18560
CS-001-D	CRY	46000	7350-29400
	PRY	43300	4640-18560
CW-000-B	CRY	40800	7350-29400
	PRY	34200	4640-18560
CW-000-F	CRY	40500	7350-29400
	PRY	32900	4640-18560

(continued)

Sample	Internal Standard	Area	QC Limits
PS-207C-B	CRY	39300	7350-29400
	PRY	33000	4640-185602
PS-207C-F	CRY	38300	7350-29400
	PRY	31800	4640-18560
PW-207C-B	NPT	38300	39050-156200

DCB - 1,4-Dichlorobenzene
ANT - Acenaphthene
NPT - Naphthalene-d8
PHN - Phenanthrene-d10
CRY - Chrysene-d12
PRY - Perylene-d12

Internal Standards Actions:

- Internal standard area outside QC limits; (J) positive results and (UJ) all associated nondetects.
- Reject (R) data if internal standards are extremely poor.

Associated positive results (not qualified due to blank contamination) and associated nondetects in affected samples are qualified as estimated, (J) and (UJ), respectively. Internal standard areas for phenanthrene-d10 and perylene-d12 were not used for quantitating any compounds analyzed in this sample set, therefore, no actions were necessary for these non-compliant internal standard areas.

OVERALL DATA ASSESSMENT

The data are acceptable for use as qualified. Several volatile organic compounds were found as contaminants in the laboratory method and field quality control blanks. Many internal standard areas were below the lower quality control limits, thus, associated sample results were estimated. All data for one sample was rejected due to an extremely low surrogate recovery. Some calibration responses and surrogate recoveries were non-compliant resulting in the estimation of various sample results. Positive results for several compounds are estimated since they are below the CRQL. In addition, sample data for several compounds were estimated because of poor field duplicate precision.

No other problems were encountered in this case.

ROCKY FLATS SITE
CASE NO. RFP1, SDG PKG1

TABLE I - RECOMMENDATION SUMMARY

Sample	Volatile	Semivolatiles
CW-001	A^{2}	$J^{3,4}$
CW-001-D	A^{2}	$J^{3,4}$
CW-002	A^{2}	$J^{3,4}$
CW-003	$A^{2,}$	$J^{3,4,15}$
CS-001	$A^{1,3,5}$, $J^{2,5,6,10,11}$	$J^{3,4,15}$
CS-001-D	$A^{1,3,5}$, $J^{2,5,6,10,11}$	$J^{3,4,15}$
CS-002	A^{3}, $J^{2,10,11,12,13}$	$J^{3,4}$
CS-003	$A^{1,3}$, $J^{2,10,11,12,13}$	$J^{3,4}$
CW-000-F		$J^{3,4,15}$
CW-000-B		$J^{3,4,15}$
CS-000-F	A^{2}	$J^{3,4,15}$
CW-000-T	A^{2}	
CS-000-T	A^{2}	
CS-000-B	A^{2}	$J^{3,4,15}$
PW-207A-NE	A^{2}	J^{3}
PW-207A-NW	A^{2}	$J^{3,4}$
PW-207A-SE	A^{2}	$J^{3,4}$
PW-207C-NE	A^{2}, J^{6}	$J^{3,4,14}$
PW-207C-NE-D	A^{2}, J^{6}	R^{1}
PW-207C-NW	A^{2}	$J^{3,4,14}$
PW-207C-SE	A^{2}	$J^{3,4,14}$
PW-207C-SW	A^{2}	$J^{3,4,14}$
PS-207C-F	A^{2}	$J^{3,4,15}$
PS-207C-B	A^{2}	$J^{3,4,15}$
PW-207C-B	A^{2}	$J^{3,4}$
PW-207C-T		
PW-207C-F	A^{2}	$J^{3,4,15}$
PW-207A-T	A^{2}	
PS-207C-T		
PS-207A-NE	A^{3}, $J^{1,2,11}$	$J^{3,4}$
PS-207C-C	$A^{1,3,4}$, $J^{1,2,8,9,10,13}$	$J^{3,4,7}$
PS-207C-CB	$A^{1,3,4}$, $J^{2,10,11,13}$	$J^{3,4,7}$
PS-207C-NW	$A^{1,3,4,7}$, $J^{1,2,10,12,13}$	$J^{3,4}$
PS-207C-NW-D	$A^{1,3,4,7}$, $J^{1,2,10,12,13}$	$J^{3,4}$
PS-207C-SW	$A^{1,3,4}$, $J^{1,2,10,13}$	$J^{3,4}$

A[1]- Change positive result for toluene to a revised detection limit because of blank contamination.

A[2]- Change positive result for acetone to a revised detection limit because of blank contamination.

A[3]- Change positive result for total xylenes to a revised detection limit because of blank contamination.

A[4]- Change positive result for methylene chloride to a revised detection limit because of blank contamination.

A[5]- Change positive result for 4-methyl-2-pentanone to a revised detection limit because of blank contamination.

J[1]- Estimate (J) positive results which are less than the CRQL.

J[2]- Estimate (UJ) nondetect for acetone due to %D > 50.

J[3]- Estimate (UJ) nondetect for pyridine due to %RSD and/or %D > 50.

J[4]- Estimate (UJ) nondetect for 2-nitropropane due to %D > 50.

J[5]- Estimate (J) positive results for 1,1,1-trichloroethane and tetrachloroethene due to field duplicate imprecision.

J[6]- Estimate (J) positive result for 2-butanone due to poor field duplicate precision.

J[7]- Estimate (J) postive result for pyrene due to %D > 25.

J[8]- Estimate (J) all positive results and (UJ) all nondetects due to poor surrogate recovery.

J[9]- Estimate (J) positive result for tetrachloroethene and (UJ) nondetects for chlorobenzene and ethylbenzene due to low internal standard area.

J[10]- Estimate (J) positive result for 2-butanone due to %D > 25%.

J[11]- Estimate (J) positive result for 1,1,2-trichloro-1,2,2-trifluoromethane due to %D > 25%.

J[12]- Estimate (UJ) nondetect for methylene chloride due to %D > 50%.

J^{13}- Estimate (UJ) nondetects for trichloromethane and ethyl acetate due to %D > 50%.

J^{14}- Estimate (UJ) all nondetects due to low surrogate spike recovery.

J^{15}- Estimate (UJ) associated nondetects due to low internal standard area.

R^{1}- Reject (R) all nondetects due to extremely low surrogate recovery.

HALLIBURTON NUS
Environmental Corporation

INTERNAL CORRESPONDENCE

C-49-11-1-116

TO: RICH NINESTEEL

DATE: NOVEMBER 8, 1991

FROM: RICKY C. DEPAUL RCD

CC: D. A. SCHEIB

SUBJECT: INORGANIC DATA VALIDATION
ROCKY FLATS
CASE NO. RFP2, SDG PKG2

SAMPLES: 12/waters/CW-001-D, CW-001, CW-002, CW-003
PW-207A-NE, PW-207A-NW, PW-207A-SE
PW-207C-NE, PW-207C-NW, PW-207C-SE
PW-207C-NE-D, PW-207C-SW

10/sludges/CS-001-D, CS-001, CS-002, CS-003
PS-207A-NE, PS-207C-CB, PS-207C-C
PS-207C-NW-D, PS-207C-NW, PS-207C-SW

A validation was performed on the inorganic analytical data from Case No. RFP2, SDG PKG2, pond water and pond sludge samples collected by HALLIBURTON NUS Environmental Corporation at the Rocky Flats site. These samples were analyzed for arsenic, barium, cadmium, chromium, lead, magnesium, mercury, nickel, potassium, selenium, silver, sodium and boron. The aqueous samples were also analyzed for calcium. The data were reviewed with reference to the EPA "Functional Guidelines for Evaluating Inorganic Analyses" as applied for use within Region VIII, and were evaluated based on the following parameters:

* o Data Completeness
* o Holding Times
o Calibration Verification
o Laboratory and Field Blank Analyses
* o ICP Interference Check Sample Results
o Matrix Spike Recoveries
o Laboratory Duplicates
o Laboratory Control Sample Results
o Field Duplicate Precision
* o Detection Limits
* o Sample Quantitation

* - All quality control criteria were met for this parameter.

An ICP serial dilution analysis is required by the analysis method. This analysis was not performed by the laboratory, therefore, sample data were not evaluated for this paramater.

<u>The attached Table 1 summarizes the validation recommendations which were based on the following information</u>:

Blanks

Samples PW-207C-F, CS-000-F, CW-000-F, and PS-207C-F are field blanks. Samples PW-207C-B, PS-207C-B, CW-000-B and CS-000-B are rinsate blanks. According to validation protocol, such blanks are only qualified on the basis of laboratory method blank contamination.

Laboratory method, field and rinsate blank analyses yielded the following contaminants in the maximum concentration indicated:

Analyte	Maximum Concentration (ug/l)	Action Level (ug/l)
silver	7.0	35
magnesium	128	640
calcium	5930	29,650
potassium	1730	8650
sodium	357	1785

Samples Affected: All

Blank Actions:

Value > IDL and < Action Level = Report value U.
Value > IDL and > Action Level = Report value unqualified.

Dilution factors, individual sample size and moisture correction factors were considered prior to the application of these action levels. No actions were taken for potassium and sodium because either all positive results for these analytes were reported for field quality control blanks or sample concentrations were greater than the action levels.

Matrix Spike Recoveries

The soil matrix spike recovery for boron was < 30%. All sludge results for boron were positive, and these were qualified as estimated, (J). These results are biased very low. The aqueous matrix spike recovery for boron was also low, however, no actions are required since the initial sample result for this analyte exceeds 4X the amount spiked.

Matrix spike recoveries for mercury were high for the soil matrix and both high and low for the aqueous matrix. No action is required for soil matrix results since the unspiked initial sample result for mercury for the soil matrix is greater than 4X the

amount spiked. Positive results and nondetects for mercury in the

water samples are qualified as estimated, (J) and (UJ), respectively.

The soil matrix spike recovery for arsenic was low (< 75%). Positive results and nondetects for arsenic in sludges are qualified as estimated, (J) and (UJ), respectively.

Matrix Spike (MS) percent recoveries for cadmium, chromium, silver, potassium, and sodium were outside quality control limits for both matrices; however, no actions are required since all initial analysis sample results for these analytes are greater than 4X the amount spiked. Positive results and nondetects in aqueous samples are qualified as estimated (J) and (UJ), respectively for barium, calcium, lead, magnesium, selenium because all MS %Rs for these analytes were less than the 75% quality control limit.

Laboratory Duplicate Precision

Results for arsenic for the soil matrix laboratory duplicate analysis failed to meet the quality control criteria. Positive results and nondetects for arsenic are qualified as estimated, (J) and (UJ), respectively in all sludge samples.

Results for mercury, cadmium and silver failed to meet the quality control criteria for the aqueous laboratory duplicate analysis. Positive results and nondetects for these analytes in waters are qualified as estimated, (J) and (UJ), respectively.

Laboratory Control Sample Results

The aqueous Laboratory Control Sample (LCS) recovery for cadmium was less than the 80% lower quality control limit. Positive results and nondetects for cadmium in waters are qualified as estimated, (J) and (UJ), respectively.

Field Duplicate Precision

Results for silver, sodium, cadmium, chromium, mercury and nickel failed to meet the aqueous field duplicate quality control criteria. Positive results and nondetects for these analytes in waters are qualified as estimated, (J) and (UJ).

Results for barium, cadmium, chromium, lead, magnesium, nickel, potassium, selenium, silver, arsenic and sodium failed to meet the soil field duplicate quality control criteria. Sample data for these analytes in sludges are qualified as estimated (J) and (UJ).

Overall Data Assessment

Positive sample results for silver, magnesium and calcium are qualified due to laboratory method blank contamination.

Positive results for boron in the soil matrix are qualified as estimated due to extremely low matrix spike recovery. Both high and low matrix spike recoveries were reported for mercury in the aqueous matrix; hence positive and nondetected results are estimated. Positive and nondetected sample results for arsenic are estimated due to low soil matrix spike recovery. Positive and nondetected results for barium, calcium, lead, magnesium, and selenium, in aqueous samples are estimated due to low matrix spike recoveries.

Both positive and nondetected sample results for cadmium in waters are qualifed as estimated due to low Laboratory Control Sample (LCS) recovery.

Results for numerous analytes failed to meet both aqueous and soil field duplicate quality control criteria. Positive and nondetected sample results are qualified as estimated.

Positive and nondetected soil sample results for arsenic are estimated for the laboratory duplicate analysis due to failed quality control criteria. Aqueous matrix laboratory duplicate analysis failed quality control limits for mercury, cadmium and silver. Positive and nondetected sample results are qualified as estimated.

ROCKY FLATS
CASE # RFP2, SDG PKG2

TABLE 1 - RECOMMENDATION SUMMARY

Arsenic	$J^{1,3,4}$	Magnesium	A^{1}, $J^{1,3}$
Barium	$J^{1,3}$	Mercury	$J^{1,3,4}$
Boron	J^{1}	Nickel	J^{3}
Cadmium	$J^{1,2,3,4}$	Potassium	J^{3}
Calcium	A^{1}, J^{1}	Selenium	$J^{1,3}$
Chromium	J^{3}	Silver	A^{1}, $J^{1,3,4}$
Lead	$J^{1,3}$	Sodium	J^{3}

If the field is left blank, the qualifier is A - Accept all data.

A^{1} - Accept data, but change positive result for silver to a revised detection limit because of blank contamination.

J^{1} - Estimate (J) positive results and (UJ) nondetected results due to MS (%R) outside quality control limits.

J^{2} - Estimate (J) positive results and (UJ) nondetects because of LCS recovery < the 80% lower quality control limit.

J^{3} - Estimate (J) positive results and (UJ) nondetects due to field duplicate imprecision.

J^{4} - Estimate (J) positive results and (UJ) nondetects due to laboratory duplicate imprecision.

HALLIBURTON NUS
Environmental Corporation

INTERNAL CORRESPONDENCE

C-49-11-1-149

TO: RICH NINESTEEL

DATE: NOVEMBER 13, 1991

FROM: KAREN M. SMECKER KMS

CC: D. A. SCHEIB

SUBJECT: INORGANIC DATA VALIDATION
ROCKY FLATS
CASE NO. RFP2A, SDG PKG2A

SAMPLES: 15/waters/PW-207C-NE, PW-207C-NE-D, PW-207C-NW
PW-207C-SE, PW-207C-SW, PW-207A-NE
PW-207A-NW, PW-207A-SE, CW-001
CW-001-D, CW-002, CW-003, PW-207C-B
PW-207C-F, CW-000-B, CW-000-F

14/sludges/PS-207C-C, PS-207C-CB, PS-207C-NW
PS-207C-NW-D, PS-207C-SW, PS-207A-NE
CS-001, CS-001-D, CS-002, CS-003
PS-207C-B, PS-207C-F, CS-000-B
CS-000-F

A validation was performed on the inorganic analytical data from Case No. RFP2A, SDG PKG2A, pond water and pond sludge samples, collected by HALLIBURTON NUS Environmental Corporation at the Rocky Flats site. The TCLP extracts from the these samples were analyzed for arsenic, barium, cadmium, chromium, lead, mercury, nickel, selenium and silver. The data were reviewed with reference to the EPA "Functional Guidelines for Evaluating Inorganic Analyses" as applied for use within Region VIII, and were evaluated based on the following parameters:

* o Data Completeness
* o Holding Times
* o Calibration Verification
o Laboratory and Field Blank Analyses
* o ICP Interference Check Sample Results
o Matrix Spike Recoveries
o Laboratory Control Sample Results
o Field Duplicate Precision
* o Detection Limits
* o Sample Quantitation

* - All quality control criteria were met for this parameter.

Laboratory duplicate and ICP serial dilution analyses are required by the analysis method. These analyses were not performed by the laboratory, therefore, sample data were not evaluated for these parameters.

The attached Table 1 summarizes the validation recommendations which were based on the following information:

Blanks

Samples PW-207C-B, PW-207C-F, CW-000-B, PS-207C-B, PS-207C-F, CS-000-B, CW-000-F and CS-000-F are rinsate and field blanks and according to validation protocol are only qualified on the basis of laboratory method blank contamination.

Laboratory method, field and rinsate blank analyses yielded the following contaminants in the maximum concentrations indicated:

Analyte	Maximum Concentration (ug/l)	Action Level (ug/l)
barium	81.0	405
cadmium	5.0	25.0
chromium	13.0	65.0
selenium	87.0	435

Sample Affected: All

Blank Actions:

Value > IDL and < Action Level = Report value U.
Value > IDL and > Action Level = Report value unqualified.

Dilution factors were considered prior to the application of these actions levels. Actions were not taken for selenium and cadmium because all sample concentrations for cadmium are above the action level and no positive results were reported for selenium.

Matrix Spike Recoveries

Matrix Spike (MS) recoveries for cadmium in both matrices, barium in the water matrix and arsenic in the sludge matrix were extremely low (< 30%). Positive results for these analytes in affected samples (not qualified due to blank contamination) are qualified as estimated, (J). Nondetects for these analytes in all samples are considered unreliable and are qualified as rejected, (R); no nondetects were reported for barium.

MS Percent Recoveries (%Rs) for lead in the water matrix, nickel in the sludge matrix and selenium and chromium in both matrices were below the 75% quality control limit (yet > 30%). Sample data (not qualified on the basis of blank contamination) for these analytes in affected samples are qualified as estimated, (J) and (UJ).

The MS %R for silver exceeded the 125% upper quality control limit in the water matrix. Positive silver results in pond water samples are qualified as estimated, (J).

Laboratory Control Sample Results

The Laboratory Control Sample (LCS) %R for selenium was low (< 80%). Only nondetects were reported for this analyte, and these results are qualified as estimated, (UJ).

Field Duplicate Precision

Relative Percent Differences (RPDs) for chromium, nickel and silver exceeded the 30% quality control criterion for the water field duplicate pairs. Sample data for these analytes in pond waters (not qualified based on blank contamination) are qualified as estimated, (J) and (UJ).

RPDs for barium, chromium and cadmium exceeded the 30% quality control criterion for the sludge field duplicate pairs. Positive results for these analytes in sludges (not qualified because of blank contamination) are qualified as estimated, (J). Nondetects for these analytes in sludge samples (not qualified due to extremely low matrix spike recovery) are qualified as estimated, (UJ).

Overall Assessment of the Data

The data are acceptable for use as qualified. Barium, silver, chromium and selenium were detected as contaminants in the field, rinsate and/or laboratory method blanks. Matrix spike recoveries for several analytes were noncompliant resulting in the estimation or rejection of associated sample data. All selenium results were estimated due to low LCS recovery. Field duplicate imprecision was noted for several analytes in both matrices. No other problems were encountered.

ROCKY FLATS
CASE NO. RFP2A, SDG PKG2A

TABLE 1 - RECOMMENDATION SUMMARY

Arsenic	R^1, J^1	Mercury	
Barium	A^1, J^1, J^5	Nickel	J^2, J^5
Cadmium	R^1, J^1, J^5	Selenium	J^2, J^4
Chromium	A^1, J^2, J^5	Silver	J^3, J^5
Lead	J^2		

If the field is left blank, the qualifier is A - Accept all data.

A^1 - Accept data, but raise sample detection limit (where appropriate) to a revised detection limit due to blank contamination.

J^1 - Estimate (J) positive results in affected samples due to extremely low MS recovery.

J^2 - Estimate (J) positive results and (UJ) nondetects in affected samples due to MS %R < 75 but > 30.

J^3 - Estimate (J) positive results in pond waters due to high MS recovery.

J^4 - Estimate (UJ) nondetects in all samples due to low LCS recovery.

J^5 - Estimate (J) positive results and (UJ) nondetects in affected samples due to field duplicate imprecision.

R^1 - Reject (R) nondetects in affected samples due to MS %R < 30.

APPENDIX C

FIELD LOG BOOK

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1123

ROCKY FLATS - SOLAR PONDS PROJECT

MONDAY, AUG 5 1991

HALLIBURTON NUS (H/NUS) - E. RODMAN

AM: SUNNY CLEAR

PM: CLOUDING OVER, T-STORMS.

0730 - MET JOHN SCHMIDT (H/NUS - PROJ. MANAG.) AT RAMADA INN - SUITE 101. GOT DIRECTIONS TO SITE.

0815 - ARRIVE AT WEST GATE.

0830 - MET ERNIE LOMBARDI AT TRAILER T130C. ALSO MET DON FERRIER (EG+G PROJ. MANAG.) BRIEFLY. LOMBARDI WALKED ME THROUGH GETTING AN EG+G DOSIMETER; THEN THRU SECURITY INTO PROTECTED AREA.

0900 - BUILDING (AREA) INDOCTRINATION FOR BLDG + PAD 750 WITH STEVE DEWITT.

- DISCUSSED SCHEDULE A LITTLE w/ LOMBARDI, DEWITT, + JOHN GUADAGNOLI

0945 - TOURED 750 PAD W/ DEWITT. PONDCRETE + SALTCRETE BILLITS IN 5 TENTS (# 2-6) AND IN AN OUTSIDE STAGING AREA.

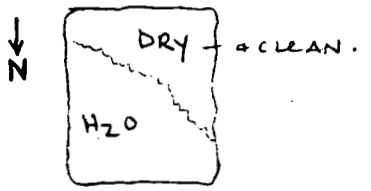
BLDG 750 APPEARS TO BE A CENTRAL MTG BLDG, WILL LEAVE DOSIMETER BADGE THERE DAILY.

1030 - H+S MOVE IN BLDG 750.

11-12:00 LUNCH.

12:00 - BLDG INDOCTRINATION FOR BLDG 788 - SOLAR PONDS AREA - BY RICHARD GARCIA (FOREMAN)

- TOURED AREA. POND 207A IS DRYING OUT; MAY BE DIFFICULT TO LAUNCH/FLOAT A BOAT.



- POND 207B - CENTER IS ALSO QUITE LOW.

1400 - BACK AT T130C. JOHN GUADAGNOLI HAS SENT COPIES OF MY 40 HR TRAINING CERTIFICATE, AND MEDICAL MONITORING LETTERS TO BRIAN FIELDING (EG+G H+S). I MAY NOT HAVE TO GO THRU TOO MUCH OF THEIR H+S TRAINING, IF MY PAPERS/CERTIFICATIONS ARE SUFFICIENT.

Elizabeth Rodman

8/5/91

2 8-5-91

~~0231~~
1430 - WILL TRY TO HAVE A MTG W/ ME, EG+G, + WESTON TOMORROW AT 10 AM. WILL TALK SOP'S, + SCHEDULE.

1435 - LEFT SITE FOR RAMADA INN

1500 - AT SUITE 101 - LOOKED AT FINAL SOPS BRIEFLY.

1530 - WORKED ON LOG BOOK, , END OF DAY

E J Rodman 8/5/91

ROCKY FLATS - SOLAR PONDS PROJECT

TUESDAY, AUG 6, 1991

2KB8
1123

E. RODMAN (H/NUS)

AM: CLOUDY
PM: "

0730 - IN SUITE 101 - REVIEWING SOPS PRIOR TO MEETING AT 10:00AM.
0945 - ARRIVE ON SITE - PROCEEDED TO T130C

1025 - MEETING WITH E. LOMBARDI, J. GUADAGNOLI } EG+G
M. SELMAN, S. WILLIAMS } WESTON

DISCUSSED SOPS & SCHEDULE. NEED TO FINALIZE PLANS FOR TREATABILITY SAMPLING THAT WILL ADDRESS LOW POND WATER LEVELS. ALSO NEED TO SMOOTH OUT QUESTION OF RESPONSIBILITY FOR CUSTODY OF SAMPLES - EG+G OR H/NUS.

1130 - CALLED PITTSBURGH H/NUS OFFICE. TALKED TO RICH NINESTEEL, DON BRENNEMAN, AND MARK SPECRANZA. THEY WILL STUDY WATER LEVEL PROBLEM. I WILL DISCUSS CUSTODY QUESTION W/ J. SCHMIDT. RICH SUGGESTED THAT JOHN SHOULD TALK TO TED BITTNER ABOUT THIS.

1215 - TALKED W/ E. LOMBARDI ABOUT FIELD NOTE TAKING AND CUSTODY OF SAMPLES.

1230 - LEFT SITE.

1300 - LUNCH

1330 - AT SUITE 101. DISCUSSED MTG RESULTS WITH JOHN SCHMIDT AND L. MCDOUGAL. J. SCHMIDT FEELS WE CAN RESOLVE THE CUSTODY QUESTION IN THE FIELD.

1430 - TO MY ROOM TO REVIEW/STUDY TREATABILITY SOPS, WILL MEET TOMORROW A 7:30 W/ STEVE WILLIAMS TO CONDUCT AN INVENTORY OF BLDG 788.

1530 - END OF DAY

8/6/91

8/6/91

4 8-7-91

E Rodem 8/7/91

ROCKY FLATS - SOLAR PONDS

2K68
1123

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WEDNESDAY AUG. 7, 1991

E. RODMAN (H/NUS)

AM: CLEAR WARM
PM: CLEAR HOT

0730 - MEETING W/ STEVE WILLIAMS - WESTON AT PORTAL - PROCEED TO 788
0830 - CONDUCTING BOTTLE INVENTORY IN BLDG 788. ALSO INVENTORIED MSC. STOCK.
1000 - SET OUT EQ. + SUPPLIES FOR TOMORROW AM.
1100 - PHONE CALLS TO EG+G PEOPLE · OBTAINING LOCKERS.
1200 - LUNCH
1230 - PHONE CALLS - PAUL FRANK (H/NUS LABS) LEFT MESSAGE. WILL TRY AGAIN
J. GUADAGNOLI - SET MEET TIME FOR TOMORROW AT 7:00AM.
B. FIELDING - GAVE HIM PITTSBURGH #S TO CALL TO DISCUSS MY H&S REQUIREMENTS
1330 - PICKED UP PHOTO DOSIMETER BADGE AT BLDG 123.
E. LOMBARDI IS TRYING TO GET A PHOTO ACCESS BADGE FOR ME, THRU D. FERRIER.
1400 - LEFT SITE FOR H/NUS SUITE 101
1530 - STILL IN SUITE 101. SORTING THRU FAXES FROM PITTSBURGH CONCERNING RESPIRATOR TRAINING AND FIT TESTING.
- STUDIED LIST OF SUBJECTS FOR VIDEOTAPING. SOME OF BROWN + ROOTS COMMENTS ARE UNCLEAR.
- ORGANIZING PAPERWORK FOR TOMORROW.
1600 - PREPARED SAMPLE LABELS
1630 - END DAY

8/7/91

6 8/8/91

POND 207B N WATERS

SAMPLE #	DATE	TIME	PH	TEMP °C	SC	SAMPLE DESCRIPTION COLOR & TURBIDITY
PW-207BN-T	08-08-91	NA	-	-	-	TRIP BLANK
PW-207BN-NW	08-08-91	0858	NA			CLEAR & LOW
PW-207BN-NE	08-08-91	0904				CLEAR & LOW
PW-207BN-SE	08-08-91	0907				CLEAR & LOW
PW-207BN-SW	08-08-91	0909				CLEAR & LOW
~~PW-207BN-C~~	~~08-08-91~~	~~0932~~			SPR	~~CLEAR & LOW~~ – RETURNED / TO POND. COMPOSITES TO BE COLLECTED DURING TREATABILITY STUDY.

(*) DECONNED USING DRINKINGWATER IN THE WASH, COMMERCIAL DISTILLED IN THE RINSE

(*) WESTON WAS UNABLE TO PROVIDE A PH METER FOR TODAY'S ACTIVITIES., BUT WILL HAVE ONE AVAILABLE BY MONDAY'S SAMPLING

SPR 8/8-91

ROCKY FLATS - SOLAR PONDS 2K68 1123

THURSDAY AUG 8 1991

E. RODMAN (HANKS). STEVE WILLIAMS (WESTON)
KARAN HOLLOWAY " , K. MILLER (WESTON)
H. TRICKLE (EG+G FOREMAN)
N. PROCHAZKA (EG+G OBSERVER)

AM: SUNNY/CLEAR
PM: PTLY SUNNY ~83°F

0645 - ARRIVE ONSITE. ORGANIZING BOX OF PAPERWORK TO TAKE INTO ZONE.
0720 - IN BLDG 750 FOR PRE-EVOLUTION MEETING
0810 - MOBING EQ. AT POND 207B NORTH
0815 - WAITING FOR WESTON PERSONNEL TO ARRIVE WITH EQUIPMENT
0835 - WESTON ARRIVED W/ GEAR. EG+G SETTING UP TO DECON EQUIPMENT. - DECONING EQ
0915 - COMPLETED WATER SAMPLES - I ASSISTED WITH BOTTLE LABLES
- ORGANIZING FOR SLUDGE SAMPLING
0945 - THERE IS NOT ENOUGH WATER IN THE BUCKETS TO COMPLETE THE SAMPLING IN ONE BUCKET FULL. (SAMPLE + COMPOSITE)
SAMPLERS WILL FOR POND 207BN:
1) ONLY COLLECT SLUDGE FROM 2 QUADS (IN PROGRESS ALREADY)
2) WILL COLLECT MORE WATER IN THE S.S. BUCKETS. IN UNSLUDGE SAMPLED QUADS FIRST TO ALLOW OTHER QUADS TO SETTLE.
3) WILL COMPLETE SLUDGE SAMPLING.

(A) WILL PURCHASE MORE BUCKETS (4) FOR FUTURE PONDS.
1015 - MORE H_2O COLLECTED
- FINISHING SLUDGE SAMPLES

1055 - SLUDGE SAMPLES COMPLETED - STILL NEED TO COLLECT A SLUDGE COMPOSITE SAMPLE - I NEED TO CALL IN TO FIND THIS OUT! WILL DO SO AFTER LUNCH.
1105 - MOBING SAMPLES TO 788 FOR PACKAGING
1120 - BREAK FOR LUNCH. I AM CALLING THE LAB AND THE OFFICE:
LAB - PAUL FRANK WILL SEND ADDITIONAL BOTTLES, LABLES, + CUSTODY SEALS
OFFICE - COMPOSITE SAMPLES WILL BE COLLECTED DURING THE TREATABILITY STUDY. WONT NEED MORE BUCKETS (A). Composite water sample WILL BE RETURNED TO POND

8 8/8/91

POND 207BN SLUDGE

SAMPLE #	DATE + TIME		PH	NA ~~TEMP~~ ~~SC~~ ER °C	SC	SAMPLE DESCRIPTION COLOR + TURBIDITY
PS-207BN-T	8/8/91	NA				TRIP BLANK
PS-207BN-NW	8/8/91	0920				ALL BROWN (MED) - VERY SATURATED + RUNNEY, granular w/ small shrimps swimming in them.
PS-207BN-SW	8/8/91	934				
PS-207BN-NE	8/8/91	1016				
PS-207BN SE	8/8/91	1028				

FIELD DENSITY MEASUREMENTS - from coluvasa sample

402 JAR EMPTY	127 g	
207BN-SE	282 g	JAR + SAMPLE
207BN-SW	277 g	JAR + SAMPLE
207BN-NW	280 g	JAR + SAMPLE
207BN-NE	282 g	JAR + SAMPLE

SLUDGE DEPTH MEASUREMENTS

QUAD	DEPTH
NW	16 inches
NE	6 inches
SW	12 inches
SE	12 inches

R.F. SOLAR PONDS

8/8/91

2K68
1123

1200 - I AM ACTUALLY HAVING LUNCH.
1240 - RETURNING TO BLDG 788.
- INSTRUCTED EG+G PERSONNEL HOW TO APPLY CUSTODY SEALS TO BOTTLES. GOT ALL THE BOTTLES SEALED, IN BAGS, AND IN THE REFRIDGERATOR.
- ORGANIZED SAMPLE BOTTLES + SOME GEAR FOR MONDAY'S SAMPLING
- DISCUSSED BRIEFLY W/ EG+G PEOPLE HOW TO MAKE SAMPLING RUN SMOOTHLY —
  1) WILL DO ALL LABELING + PRE PACKING (BAGS) AT POND.
  2) WILL HAVE PEOPLE ASSIGNED TO SPECIFIC TASKS (IE DECON, LABELING)

1415 - DONE AT 788 FOR DAY.
1430 - LEFT FACILITY
1500 - AT SUITE 101 - DISCUSSED DAY'S ACTIVITES W/ JOHN SCHMIDT.
1600 - PRESIGNING CUSTODY SEALS, FILLING OUT LABLES TO USE TO TRAIN EG+G.
1730 - END OF DAY

SUMMARY

1) PREVOLUTION MTG - SIGNED WORK PERMIT
2) COLLECTED 4 WATER + 4 SLUDGE SAMPLES FROM 4 QUADS OF 207B - NORTH
3) PREPACKAGED ALL SAMPLES + TRIP BLANKS FOR SHIPPING
4) ORGANIZED NEXT ROUND OF SAMPLE BOTTLES
5) PREPARED LABLES + SEALS FOR NEXT ROUND OF SAMPLING

OBSERVATIONS

1) NEED TO GET EG+G MORE INVOLVED IN DOCUMENTATION (SAMPLE LABLES!) DURING SAMPLING TO PROVIDE ME MORE TIME TO OVERSEE FIELD ACTIVITIES.
2) NEED TO SLOW DOWN JUST A LITTLE SO WE DON'T GET ANY ONE STEP OF THE PROCESS BACKED UP.
3) M. PROCHAZKA WANTS TO KNOW ABOUT THE DOCUMENTATION FOR THE DISTILLED WATER.

8/8/91

Elizabeth [illegible]

8-8-91

1C 08-09-91

SAMPLES SHIPPED 8-9-91

PW-207BN-NW
- NE
- SW
- SE
- T

PS-207BN-NW
- NE
- SW
- SE
- T

4 waters, 4 sludges, 2 tripblanks

WF - 8-9-91

ROCKY FLATS - SOLAR PONDS 2K68 11

FRI, AUG 9, 1991 1123

E. RODMAN (H/NUS) K. HOLLIWAY (WESTON)
S. WILLIAMS (")

R GARCIA (FORMAN EG+G)

AM: SUNNY & CLEAR
PM: CLOUDING, NO RAIN

0700 - ARRIVE ONSITE
0710 - ARRIVE AT BLDG 750 FOR PREEVOL. MTG
0730 - MOVING TO 788 TO PACKAGE & SHIP SAMPLES.
0800 - EG+G SHOWED UP AT 788 FOR PRE EVALUT.
0820 - BEGIN PACKAGING AS PER SOPS. FOR ENVIRONMENTAL SAMPLES.
0955 - COMPLETED PACKAGES - 10 COOLERS
- GETTING C.O.C'S XEROXED. - 1 copy to 788 FORMAN
1000 - WAITING FOR SHIPPING FORMS TO COME THRU.
- WEIGHING COOLERS & ORGANIZING SHIPPING MEMO, MATERIAL TRANSFER TAG, & COURIER RECEIPT.
- EG+G PERSONNEL BREAK
1040 - IN 788 BREAK ROOM - CHECKING OVER EG+G NOTE BOOK
1045 - COURIER PICKED UP SAMPLES & TRANSFERRED THEM TO SHIPPING.
1055 - TO 750 PAD W/ GARCIA TO MAKE SOME PHONE CALLS
1105 - CALLED PITTSBURGH
LAB - ORDERED MORE COOLERS, SHOULD GET MORE BOTTLES AND COOLERS TODAY.
OFFICE - NINESTEEL - JUST UPDATED HIM ON SAMPLING + SHIPPING
ORIENT - " " " " " " ".
1230 - LUNCH
1210 - RETURNING TO 788 BLDG. WILL TRAIN SAMPLERS TO FILL OUT SAMPLE LABELS.
1330 - LEFT FACILITY RETURING TO SUITE 101
1910 - TRIED TO CALL J. TEMPLETON AT BROWN+ ROOT TO DISCUSS VIDEOTAPING.
- CALLED L. COLLINS (EG+G) TO DISCUSS TRIWALL MAP UPDATING. HE WANTED TO KNOW WHAT WE WANT TO DO.
1500 - FILLED OUT A FEW MORE LABLES + CUSTODY SEALS.
1530 - END DAY

E. Rodman

8-9-91

12 08-12-91

POND 207 B CENTER

WATERS

SAMPLE #	DATE + TIME	PH	°TEMP °C	SC	DESCRIPTION COLOR + TURBIDITY
PW-207BC-NW	8-12-91 0859	9.03	15.5	13,500	Blue, not cloudy, low turbidity
PW-207 BC-SW	8-12-91 0850	9.04	15.5	15,000	
PW-207BC-SE	8-12-91 0907	9.04	15.5	15,000	
PW-207BC-NE	8-12-91 0904	9.04	15.5	14,500	
PW-207BC-T	FROM LAB	—	—	—	TRIP BLANK

SLUDGE

SAMPLE #	DATE + TIME	COLIWASA MEASUREMENT	DESCRIPTION
PS-207BC-NW	8-12-91 0947	4 inches	Blue green muddy - full of algae
PS-207BC-SW	8-12-91 0924	2 inches	low % granular material
PS-207BC-SE	8-12-91 1001	2 inches	very SATURATED.
PS-207BC-NE	8-12-91 1025	3 inches	
PS-207BC-T	FROM LAB	—	TRIP BLANK

FIELD DENSITY MEASUREMENTS

GP 8/12/91

WT MEASUREMENTS not necessary because the sample in the jar is not a single coliwasa full.

	WT in grams		
EMPTY JAR			
207BC-NW		sample + jar	sample
207BC-SW		sample + jar	sample
207BC-SE		sample + jar	sample
207BC-NE		sample + jar	sample

(*) STILL USING COMMERCIALLY PRODUCED DISTILLED WATER IN THE DECON

ROCKY FLATS SOLAR PONDS 2K68 **13**

MON. AUG 12, 1991 1123

E. RODMAN (H/NUS) K. HOLLIWAY + S. WILLIAMS (WESTON)
R. GARCIA (EG+G) (FUDMAN)

AM: FOG EARLY w/ 7mph wind
PM: FOG ALL DAY

0645 - ARRIVE ONSITE
0710 - IN 750 WAITING TO HAVE PREEVOLUTION MEETING.
0740 - STILL WAITING FOR EG+G PEOPLE TO ARRIVE.
0820 - SETTING UP EQUIP. AT POND 207 B CENTER
0850 - BEGIN SAMPLING WATER IN SW QUAD
0859 - " " " " NW QUAD
0904 - " " " " NE QUAD
0915 - TRANSFERRING WATER SAMPLES TO SHORE
0924 - SAMPLING SLUDGE IN SW QUAD
0947 - " " " NW QUAD
~~0950~~ 1001 - SAMPLING SE QUAD SLUDGES
- decon, labeling and prepackaging going along well.
- field measurements of pH, Temp and SC done by Weston. I will do them next time.
1025 - BEGIN SAMPLING SLUDGE IN NE QUAD
1045 - PULLING BOAT OFF POND. FINISHING DECON AND LABELING OF SAMPLES.
1055 - DECONNING EQUIPMENT + MOVING SAMPLES TO BLDG 788.
1130 - HEADING TO 750 PAD
1140 - LUNCH
1240 - WAITING FOR J. GUADAGNOLI TO RETURN w/ J. SCHMIDT.
- STILL TRYING TO RESOLVE THE QUESTIONS ABOUT DISTILLED WATER. WE DON'T HAVE THE DOCUMENTATION FOR THE 5gal. JUGS OF DISTILLED WATER THAT WESTON PROCURED. EG+G QA/QC IS CONCERNED THAT WE MUST HAVE REAGENT GRADE WATER.

(*) POND 207B CENTER WAS DIFFICULT TO SAMPLE FOR SLUDGES, SINCE THE SLUDGE WAS ONLY 2-4 inches DEEP. THESE SAMPLES MAY HAVE A HIGHER PROPORTION OF WATER IN THEM.

1310 - RETURNED TO 788 - FILLED OUT CHAIN OF CUSTODY FORMS FOR 207BC.
- J. GUADAGNOLI ARRIVED WITH J. TEMPLETON (BROWN + ROOT) TO LOOK AT THE SLUDGE SAMPLES.

[signature] 8/12/91

1515 - Left Rocky Flats for Suite 101.
- HAD TALKED WITH J. TEMPLETON FOR ~ 1 HR. ABOUT VIDEO TAPING SAMPLING ACTIVITIES

1630 - TALKED w/ H/NUS + TEMPLETON IN SUITE 101 ABOUT SAMPLING SCHEDULE, PROGRESS TO DATE, AND SAMPLING PROCEDURE.

1640 - FILLING OUT SAMPLE LABELS + C of CUSTODY SEALS.

1800 - ORGANIZING PAPERWORK FOR TOMORROW. LABELS ETC.

1830 - END OF DAY

8/12/91

ROCKY FLATS - SOLAR PONDS 2K68 **15**

TUES. AUG 13, 1991 1123

E. RODMAN (H/NUS)

CLEAR ALL DAY

K. HOLLIWAY, ST. WILLIAMS (WESTON) J. TEMPLETON (BROWN + ROOT)

R. GARCIA (FOREMAN EG+G)

0645 - ARRIVE ON SITE

0715 - PREVOLUTION MTG @ 750 PAD. STILL TRYING TO RESOLVE THE DISTILLED WATER ISSUE.

(*) WATER QUALITY ISSUE

- EG+G QA (M. PROCHAZKA) IDENTIFIED THAT WE ARE SUPPOSED TO BE USING LAB GRADE (?)/REAGENT WATER. FOR DECON + BLANKS. (GRADE 2 WATER)
- WESTON HAS BEEN PROCURING BOTTLED DISTILLED WATER, BUT IT IS NOT LAB GRADE (G.4)
- WASP DOESN'T SPECIFY ANYTHING BUT DISTILLED/DIONIZED WATER.
- WESTON & EG+G ARE INVESTIGATING WHERE APPROVED WATER CAN BE HAD.
- WESTON WILL PROCURE GRADE 2 WATER.

0745 - PRE EVOL. IN 788. CALLED R. NINESTEEL TO DISCUSS WATER SITUATION

0810 - SETTING UP PACKAGING GEAR + EQUIPMENT

0930 - FINISHED PACKAGING SAMPLES - WEIGHING THEM PRIOR TO SHIPMENT
- SIGNING OFF ON TRANSPORTATION FORMS

1000 - PREPARED BOTTLE SETS FOR POND 207 BS, LOADED GEAR INTO WESTON VAN

1030 - RETURNED TO 750 PAD AND REDRESSED,

1055 - AT 750, WAITING TO TALK TO J. TEMPLETON. WESTON IS ARRANGING FOR GRADE 2 WATER.

SHIPPED 207BC NE, NW, SE, SW + T (WATERS)
207 BC NE, NW, SE, SW + T (SLUDGES)

1110 - LOOKING AT SLUDGE SAMPLING EQUIPMENT W/ J. GUADAGNOLI AND J. TEMPLETON.

TEMPLETON WOULD LIKE TO OBSERVE THE COLIWASA SAMPLING BEFORE HE DECIDES IF WE NEED TO SEND THE COLIWASA SAMPLES TO THE LAB FOR ANALYSIS. IF THE COLIWASA SAMPLE ARE GOOD, REPRESENTATIVE CROSS SECTIONAL SAMPLES OF THE SLUDGE LAYER, HE WOULD LIKE TO SEND THEM FOR A BATTERY OF GEOTECHNICAL PARAMETERS. IF THE COLIWASA SAMPLES ARE NOT SUITABLE, WE WILL SEND ONLY THE DREDGE ACQUIRED SAMPLES.

TEMPLETON WILL ASSO BE ON HAND TO DIRECT THE VIDEO TAPING ACTIVITIES.

1130 - LEFT SITE - RETURNED TO SUITE 101.

E. Rodman 8/13/91

16 08-13-91

1200 - DISCUSSING SAMPLING SCHEDULE AND PROGRESS WITH J. SCHMIDT.

1315 - FILLING OUT SAMPLE LABLES FOR POND 207BS.

(*) WASP DOES NOT HAVE A QA DESIGNATOR FOR FIELD BLANKS!

I.E.
- D = DUPLICATE
- B = RINSATE
- T = TRIP BLANK.

I HAVE SELECTED:

F = FIELD BLANK

1400 - PHONE CALLS BACK + FORTH WITH EG+G CONCERNING SAMPLING, DECON+ BLANK WATER, + SCHEDULE.

1500 - WILL NOT SAMPLE TOMORROW. GRADE 2 WATER NOT AVAILABLE UNTIL THURSDAY. PROBABLY WILL RESUME SAMPLING ON MONDAY. (EG+G DECISION)

1530 - END OF DAY

8/13/91

ROCKY FLATS - SOLAR PONDS 2K68 **17**

WED AUG 14 1991 1123

E. RODMAN (H/NUS)
R. GARCIA (750 FORMAN EG+G)
D. KING (EG+G ESCORT)

AM: SUNNY & CLEAR
PM: " "

0705 - ARRIVE ONSITE - TRY TO GET PHOTO BADGE, NO PAPERWORK IN PLACE
0805 - PASSED PACS 1 INTO ZONE TO 750 PAD

(A) NO SAMPLING TODAY: WESTON CANNOT GET GRADE 2 WATER UNTIL MIDDAY THURSDAY. SO WE CAN'T SAMPLE AGAIN UNTIL MONDAY. THE EG+G WATER SUPPLY MAY NOT BE GRADE 2 WATER. UNTIL WE GET DOCUMENTED ANALYSIS OF THE LAB'S WATER, WE CANNOT USE IT.

WILL ~~ASK~~ TRY TO COORDINATE A SCHEDULE W/ EG+G, BROWN+ROTT + WESTON TODAY

0815 - WILL MAP TRIWALLS AT 750 PAD TODAY
0820 - ESCORTED BY D. KING . STARTED COUNTING TRIWALLS IN TENTS + ON THE PADS. N OF TENTS AT 750 PAD IS AN AREA OF METAL CONTAINERS + WOODEN 1/2 CRATES. CRATES CONTAIN ASPHALT + DIRT. METAL CONTAINERS CONTAIN 1-3 PONDCRETE TRIWALLS. THE MARKINGS ARE HIDDEN ON SOME OF THE METAL CONTAINERS, SO WE DON'T KNOW HOW MANY TRIWALLS ARE IN SOME OF THE BOXES. ALMOST ALL THE METAL CRATES CONTAIN 3 TRIWALLS. SOME CONTAIN 2.
1110 - COMPLETED THE INVENTORY FOR N OF TENT AREA, TENT 2, TENT 3, and TENT 4. TENT 2 MAPS WERE NOT AS ACCURATE AS TENTS 3+4. THERE WERE ALSO SOME MORE WOODEN 1/2 CRATES TO THE W. OF TENT 3.
11-15 - BREAK FOR LUNCH.
~~1200~~ ER
1200 - RETURNING TO MAPPING OF 750 PAD.
1230 - COMPLETED MAPPING 750 PAD. - TENT 6 + 5 LAYDOWN AREA.
1295 - LEFT ZONE. CAN'T GO TO 904 PAD, BECAUSE THERE IS NO ONE THERE TO CONDUCT A BLDG INDOCTRINATION. I WILL DO IT TOMORROW. HEADING TO T130C

E. Rodman 8-14-91

08-14-91

TO TALK TO E. LOMBARDI ABOUT A PHOTO BADGE

- NEED TO GET THE MOST RECENT TRIWALL COUNTS FROM 750 + 904 PADS. I WILL COMPARE THESE TO WHAT I MAP.
- ALSO STILL WAITING TO RESOLVE THE POND SAMPLING SCHEDULE

1345 - BACK AT SUITE 101.

- ERNIE LOMBARDI HAD NOT STARTED THE PAPERWORK FOR A PHOTO BADGE. SINCE WE ARE WORKING UNDER AN AUTHORIZATION, NOT A CONTRACT, I DONT THINK I CAN GET A PHOTO BADGE (RED), SO I'LL CONTINUE TO WORK ON A VISITOR'S BADGE.
- MAKING PHONE CALLS.

ERNIE LOMBARDI - NOT IN - WANTED TO CHECK ON JUSTIFICATION EXTENSION.

JEFF ORIENT - NOT IN - JUST WANTED TO CHECK IN

PAUL FRANK - " " - NEED TO DISCUSS SAMPLE SHIPPING SCHEDULE

RICH NINESTEEL - DISCUSSED SCHEDULE + PROGRESS.

1450 - DISCUSSED SAMPLING w/ J. TEMPLETON.

- E. LOMBARDI CALLED: WE WILL SAMPLE 207B "SOUTH TOMORROW, USING THE GRADE 4 DISTILLED H_2O. EG+G HAS DECIDED THAT THE RISK IS ACCEPTABLE. WE WILL USE GRADE 2 WATER ONCE IT ARRIVES.
- J. GUADAGNOLI CALLED TO CONFIRM THAT WE WILL SAMPLE TOMORROW. HE WILL HAVE VIDEO TAPING AVAILABLE FOR J. TEMPLETON.

1530 - END OF DAY.

SUMMARY

1) MAPPED 750 PAD TRIWALLS

2) RESOLVED WATER ISSUE. WILL USE GRADE 4 UNTIL GRADE 2 IS AVAILABLE.

[illegible] 8/14/91

ROCKY FLATS - SOLAR PONDS
THURS AUG 15 1991

2K68
1123

E. RODMAN (H/NUS) S. WILLIAMS (WESTON)
R. GARCIA (EG+G FOREMAN) J. TEMPLETON (BROWN + ROOT)
B.

AM: PTLY. CLOUDY / WARM. - RAIN @ 9:00
PM: CLOUDY W/ T-STORMS

0645 - ARRIVE ON SITE - DRESSOUT
0715 - IN 750 BREAKROOM FOR PREEVOLUTION MTG

(*) RICHARD RODENBOUGH - INDUST. HYGENE X 6626 PG 3058
RE. SEE FOR RESPIRATORY FIT CARD.
- OTHERS SHOULD SEND THEIR DOCUMENTATION TO HIM TO OBTAIN A RESP. FIT. CARD

(*) KEITH ANDERSON X 5151 - RADIATION ENGINEERING
- TALK TO HIM FOR INFORMATION CONCERNING RAD SCREENING OF SAMPLE BOTTLES + CONTAINERS.

0730 - MTG IN 750 PAD. - DISCUSSED H+S → CAN PROBABLY DOWNGRADE THE RESPIRATORY REQUIREMENTS

0805 - MOBING GEAR TO 207 B SOUTH.
0845 - WIND IS GREATER THAN 15 MPH. WILL CEASE ACTIVITIES UNTIL WIND DIES DOWN - NO SAMPLING YET
0905 - SHUTTING DOWN SAMPLING ACTIVITIES (STILL SHUT DOWN BY WIND) DUE TO RAIN AS WELL AS WIND.
- WILL TAKE A 1/2 HR BREAK IN HOPES THAT WIND + RAIN WILL DIE DOWN,
0950 - REMOBING AT 207BS
1005 - CALIBRATED SC METER to 1,000 μmohs/cm (YSI MODEL 33 S-C-T METER # D8016398)

1015 - LAUNCHING THE BOAT.
- CALIBRATED PH METER TO 7.0 + 10.0 STANDARDS (ORION SA 250 ph Meter # 7864)

Elizabeth Rodman

08-15-91

20 08-15-91

POND 207BS.

WATERS

SAMPLE #	DATE	TIME	PH	SC	TEMP	DESCRIPTION
PW-207BS-NW	8/15/91	1037	9.07	17000	25.0	BLUE, CLEAR - LOW TURBIDY
PW-207BS-NE	8/15/91	1054	9.09	17,000	25.0	
PW-207BS-SE	8/15	1120	18,000	9.08	25.0	
PW-207BS-SW	8/15	1108	9.03	17000	25.1	
PW-207BS-T	08/15/91	FROM LAB	—	—	—	TRIP BLANK.
PW-207BS-NE-D	8/15/91	1037	9.07	17000	25.0	
PW-207BS-FB	8/15	1109	—	—	—	RINSATE BLANK (THRU FUNNEL)
PW-207BS-F	8/15	1130	—	—	—	FIELD BLANK.

8-15-91

COLIWASA SAMPLE LENGTHES

~~NW QUAD~~ ER	TOTAL	LIQUID	SLUDGE
NW QUAD -	63'		7"
NE QUAD	X		1"
SW QUAD	X	NOT TAKEN	3"
SE QUAD	X		1"

ROCKY FLATS - SOLAR PONDS

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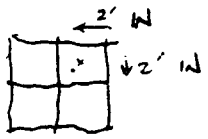
1030 - PREPARED TRIPBLANK
- HAVING DIFFICULTY W/ THE COLIWASA. - WILL PULL BOAT TO THE EDGE TO SHOW THEM HOW TO DO IT.

1037 - COLLECTING PW-207BS-NW + PW-207BS-NW-D

1054 - COLLECTING PW-207BS-NE. THE COLIWASA DOESN'T SEEM TO BE WORKING WELL. I CAN'T TELL IF ITS THE INSTRUMENT OR THE OPERATORS

1100 - OFF LOADING NW, DUP (NW), + NE QUAD WATER & COLIWASA SAMPLES.

(*) - ALL WATER SAMPLES IN 207BS ARE TAKEN 2' IN TOWARDS CENTER OF POND FOR PURPOSES OF GETTING BETTER SLUDGE MEASUREMENTS. J. TEMPLETON HAS REQUESTED THIS + I DON'T THINK IT WILL SIGNIFICANTLY EFFECT THE WATER SAMPLES. WATER SAMPLES WILL BE COLLECTED ON THE SIDE OF THE BOAT NEAREST THE ORIGINAL LOCATION, HOWEVER. THE 2' MOVE WILL ACCOMODATE THE SLOPE OF THE BERMS.



1109 - PREPARING THE FIELD BLANK PW-207BS-F
- LABELING IT. (FIELD BLANK)
- DECONING BOTTLES OF WATER SAMPLES (NW + NE SAMPLES)

1108 - TOOK SW QUAD SAMPLES
- ASSEMBLY LINE FOR PACKAGING MOVING RIGHT ALONG. COLIWASA STILL GIVING QUESTIONABLE INFO. IT MAY BE DUE TO THE SEEMINGLY THIN SLUDGE LAYER

1125 - TAKING SE QUAD SAMPLES

1130 - TAKING RINSATE BLANK

1215 - SW QUAD - ONLY FILLED 1 1/2 gallons in the plastic jugs. COULDN'T RETURN TO THE POND FOR MORE, DUE TO HEAT STRESS. THERE IS BARELY ENOUGH SAMPLE IN 1 BUCKETFULL, + WE DIDN'T GET A REALLY FULL BUCKET FROM SW QUAD
- TOOK PH, TEMP, + SC MEASUREMENTS - 25°C → THEY SAT IN THE BUCKETS FOR A LITTLE WHILE. (10 MIN?)

1230 - WATER SAMPLES TAKEN, BLANKS TAKEN, TRANSPORTED TO 788 + STORED IN FRIDGE + COOLER

1255 - BREAK FOR LUNCH. RAIN BEGINS - INTERMITTENT @ 1230

Elizabeth J. Baker

08-15-91

03-15-91

1335 - LOOKING OVER INVENTORY + HASHING OUT A WORKABLE SCHEDULE w/ J. GUADAGNOLI

1350 - S. WILLIAMS, J. TEMPLETON, + I TRIED TO USE THE COLIWASA UNDER IDEAL CONDITIONS — WE TRIED TO TAKE A WATER SAMPLE IN BLDG 788 - WE COULD NOT GET A WATER SAMPLE. J. TEMPELTON FEELS THAT THE COLIWASA IS NOT A SUITABLE INSTRUMENT, AS IT IS NOW

1425 - INVENTORIED STOCKS OF DISPOSABLES. LOOKS ALLRIGHT ON EVERYTHING.

1430 - RETURNED TO TSD PAD + SHOWERED OUT

1530 - AT SUITE 101 - SORTED THRU ALL PAPERWORK.

1630 - END OF DAY.

OBSERVATIONS

1) NEED TO COORDINATE w/ BROWN + ROOT (+ WESTON) ABOUT THE COLIWASA SAMPLES.

2) NEED TO INVOLVE PGH IN THE SCHEDULING.

SUMMARY

1) SAMPLED PW0-207BS - NE, NW, SE, SW, T, B, F, + NW-D.

2) UNABLE TO SAMPLE SLUDGE DUE TO DELAYS CAUSED BY WIND + RAIN

(*) 3) MODIFIED COLIWASA TO OBTAIN A BETTER SAMPLE. THE CENTER ROD WILL FUNCTION AS A PLUG IN THE BOTTOM. WE WILL MEASURE THE PLUG STICKING OUT THE BOTTOM AND ADD THAT TO THE TOTAL SLUDGE DEPTH. J. TEMPLETON (BROWN + ROOT) REDESIGNED THE COLIWASA IN THIS MANNER.

4) TENTETIVELY PLANNED SCHEDULE FOR TOMORROW. WILL TRY TO SAMPLE SLUDGE, BUT WILL GIVE PRIORITY TO SHIPPING WATERS.

8-15-91

ROCKY FLATS - SOLAR PONDS

2K68
1123

FRI. AUG 16, 1991

E. RODMAN (H/NUS) S. WILLIAMS (WESTON)
R. GARCIA (EG+G PORTMAN)

AM: SUNNY CLEAR
PM: CLOUDED OVER

0645 - ARRIVE ON SITE
0715 - IN 750 BLDG FOR PREV. MTG.
0820 - IN 788 - BEGINNING TO PACKAGE 20 TBS WATERS
0850 - COMPLETED PACKAGING - WEIGHING SAMPLES/COOLERS NOW, FILLING OUT PAPERWORK.
0905 - PW - 20 TBS - NW, NW-D, NE, SW, SE, T, B, F SHIPPED!
~~0910 - PRE LOADING~~ EQ. FOR MONDAY - ER
0915 - EG+G BREAK
0930 - ORGANIZED BOTTLES AND LOADED GEAR INTO THE WESTON VAN FOR MONDAY.
- CONTACTED RICH GARCIA ABOUT GETTING THE GRADE 2 WATER FROM THE WAREHOUSE TO BLDG 788.
1100 - AT 750 BREAK ROOM.
- MET w/ D. FERRIER, J. GUADAGNOLI, + S. WILLIAMS. D. FERRIER IS CONCERNED ABOUT THE USE OF DISTILLED WATER DURING SAMPLING AND THE DETAIL OF WESTON, EG+G, + H/NUS FIELD NOTES. M. PROCHAZKA FILED A DEFICIENCY REPORT THAT NEEDS TO BE ADDRESSED. I WILL SET H/NUS - PITTSBURGH ON THIS PROBLEM. WHAT IS REQUIRED FOR WATER? I WILL ALSO REVIEW FIELD NOTES FOR DEFICIENCY, AND CORRECT AS NECESSARY.

RESULT OF WATER INVESTIGATION

1) SHOULD FOLLOW SW-846 VERSION 1986. 1991 VERSIONS ARE NOT PROMULGATED + DO NOT APPLY.
2) M. PROCHAZKA WAS USING THE 1991 VERSIONS OF SW-846, AND HE WAS LOOKING AT STANDARDS FOR LAB BLANKS NOT FIELD BLANKS
3) SW-846, 1986 SAYS WE MAY USE DISTILLED OR DEIONIZED OR GRADE II WATER
4) REPORTED THESE FINDINGS TO EG+G

ANALYSIS - WE DON'T HAVE A PROBLEM CONCERNING WATER; THE DISTILLED WATER USED TO DATE IS ACCEPTABLE UNDER SW-846, 1986.

Elizabeth Rodman

8-16-91

 08-16-91

SUMMARY

1) PACKAGED 20 TBS WATER SAMPLES + DUP + FIELD BLANK, + RINSATE BLANK.

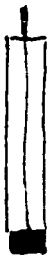
2) MEETING W/ DON FERRIER, J. GUADAGNOLI, + S. WILLIAMS.

3) INVESTIGATED AND RESOLVED THE QUESTION OF WATER FOR DECON AND BLANKS.

(*) COLIWASA MODIFICATION OF METHOD + EQUIPMENT.

1) METHOD: NO LONGER TAKING COLIWASA SAMPLES AS PER SOP. J. TEMPLETON REQUIRES SAMPLES FROM EACH QUAD, TAKEN FROM THE COLIWASA, COMPOSITED AND SPLIT TO 4 TO TEST FOR FLOCULATION CAPABILITIES. SAMPLES WILL BE REDEPOSITED INTO PONDS AFTER FIELD FLOCULATION TESTING. NO FIELD MEASUREMENT OF WEIGHT NECESSARY NOW.

2) EQUIPMENT: J. TEMPLETON MODIFIED THE COLIWASA:



— WILL BE USED AS A STRAW / WITH A PLUG IN THE BOTTOM. WILL ADD THE LENGTH OF THE PLUG TO THE TOTAL LENGTH OF SLUDGE AND SLUDGE PLUS LIQUID.

8-16-91

ROCKY FLATS - SOLAR PONDS

2K68
1123

MON. AUG 19, 1991

E. RODMAN (H/NUS) K. HOLLIWAY (WESTON), STEVE WILLIAMS (WESTON)
R. GARCIA (FOREMAN) J. SCHMIDT } (H/NUS)
J. TEMPLETON (WESTON) R. HILL

AM: CLOUDY
PM: MORE CLOUDS (TOTAL) STORMY TO THE SOUTH

0645 - ARRIVE ONSITE
0715 - IN 750 BREAK ROOM FOR PRE-EVALUATION MTG.
0800 - AT 207BS WAITING FOR EG+G PERSONNEL TO ARRIVE. J. GUADAGNOLI IS CONTACTING LOMBARDI TO RESOLVE FINALLY WHICH WATER TYPE WE WANT TO USE (DISTILLED OR GRADE II) TODAY.
0815 - SETTING UP ON BOOM OF 207BS TO SAMPLE THE SLUDGE.
0830 - EG+G HAS LOST THE DRAIN PLUG FOR THE BOAT. WORK CANNOT BEGIN UNTIL IT IS FOUND.
0845 - DRAIN IS PLUGGED - BOAT IN WATER. - READY TO LOAD BOAT.
0900 - THE MODIFIED COLIWASA IS NOT WORKING THE PLUG WON'T SEAT.
0905 - EG+G HAS DECIDED TO GO AHEAD AND USE THE DISTILLED WATER WE HAVE BEEN USING! THIS WILL MAINTAIN CONSISTANCY IN METHOD.
0903 - TAKING SLUDGE SAMPLE (+ DUPLICATE) FROM NW QUAD.
0916 - " " " FROM NE QUAD.
0940 - NE + NW QUAD BOTTLES UNLOADED - DECON BEGINNING. SE + SW QUAD SAMPLING UNDERWAY
0941 - BEGIN TAKING SW SLUDGE SAMPLES
0956 - " " SE " "
1010 - PULLING BOAT ON SHORE. DECONNING SE + SW SLUDGE SAMPLES.
1015 - POURING FIELD BLANK
1030 - POURED RINSATE BLANK AT 0930, SAMPLING OF SLUDGE COMPLETED
1045 - DEMOBING FROM 207BS. MOVING EQUIPMENT TO 207A
1050 - BREAKING FOR LUNCH.
- THE COLIWASA DID NOT WORK. THE PLUG WOULD NOT SEAT, THUS IT JUST PULLED THROUGH THE COLIWASA. J. TEMPLETON SUGGESTED WE JUST USE DREDGE SAMPLE FOR THE FLOCULATION SAMPLES.
- SLUDGE SAMPLING WENT VERY WELL.
- BIG STORM HEADING TOWARDS US. AWAITING A DECISION ABOUT SAMPLING 207A.
1230 - REMOBING AT N. END OF 207A, CALIBRATED pH + SC METER (See pg 19 for MODEL #'S)
1254 - TAKING WATER SAMPLE FROM NE QUAD
1302 - " " " " NW QUAD

E. Rodman

8-19-91

 8-19-91

POND 207BS & 207A

207BS SLUDGES

SAMPLE #	DATE & TIME	DESCRIPTION
PS-207BS-NW	8/19/91 0903	BLUE/GREEN, ALGAE RICH w/ SILT + SAND
PS-207BS-NW-D	8/19/91 0903	SOME LARGE (<2cm) WHITE FLECKS
PS-207BS-NE	08/19/91 0916	HIGHLY SATURATED (4% H_2O)
PS-207BS-SW	08/19/91 ~~0911~~ 0941 ETR	
PS-207BS-SE	08/19/91 0956	
PS-207BS-T	08/19/91 FROM LAB	TRIP BLANK
PS-207BS-B	08/19/91 0930	RINSATE (in S.S. BOWL)
PS-207BS-F	08/19/91 1015	FIELD BLANK

POND 207A

WATERS	DATE/TIME	pH	SC	°T	DESCRIPTION COLOR + TURBIDITY
PW-207A-NE	08/19/91 1254	9.73	9500	25	YELLOW CLEAR / LOW
PW-207A-NW	1302	9.82	8,500	25	" " "
PW-207A-SE	1307	9.83	9,000	25	YELLOW CLEAR / LOW
PW-207A-T	FROM LAB	—	—	—	TRIP BLANK

SLUDGE	DATE	TIME	DESCRIPTION
PS-207A-NE	08/19/91	1345	BROWN SILTY SAND w/ BLACK FLECKS VERY SATURATED

8-19-91

ROCKY FLATS - SOLAR PONDS

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08-19-91

- TOOK VOAS OFF CENTER (of QUAD) FOR NE + NW QUADS. BULK OF THESE H_2O SAMPLES WERE TAKEN ON CENTER, THOUGH.

807 - SAMPLING WATER FROM SE QUAD

1325 - LABELING + DECONNING WATER SAMPLES, SHIFTING SLUDGE GEAR TO BOAT

- CHECKED WINDSPEED (9 mph sustained)
- COLIWAGA IS NOT ABLE TO OBTAIN SAMPLE. WE HAVE NO WAY TO MEASURE SLUDGE DEPTH.

1340 - ATTEMPTING TO GET SLUDGE FROM NE QUAD 207A SAMPLING IN THE EXTREME CORNER. THERE IS ALMOST NO SLUDGE (1"?) ANYWHERE ELSE. SAMPLING IN A DEEP (4') HOLE BUILT FOR A SUMP PUMP. SLUDGE IS MIXED IN W/ TRASH (CARDBOARD). LOTS OF FINES IN THIS SLUDGE THAT ARE WASHING OUT. NOTHING WE CAN DO ABOUT THAT THOUGH. WE TRIED TO OBTAIN SAMPLE AT 2 POINTS BETWEEN THE CENTER OF THE QUAD + THE SUMP HOLE

1345 - TAKING SLUDGE SAMPLE FROM NE QUAD

1410 - NO SLUDGE IN SE OR NW QUADS. THEREFORE WE TOOK NO SAMPLES FROM THESE TWO QUADS

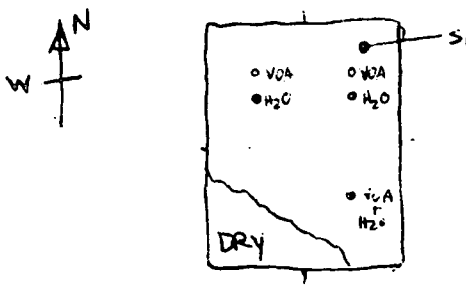
1415 - DECONNING SAMPLE BOTTLES, PACKAGING, CLEANING UP DECON AREA, DECONNING BOAT

1420 - UNLOADING SAMPLES INTO THE REFRIGERATOR + AFFIXED CUSTODY SEALS.

1445 - LEFT SITE, RETURNED TO SUITE 101.

WATER - EG+G HAS DECIDED TO MAINTAIN CONSISTENCY BY CONTINUING TO USE THE DISTILLED WATER RATHER THAN THE GRADE 2 WATER.

POND 207 A - SAMPLING LOCATION SKETCH



(*) VOAS WERE COLLECTED FROM ~4' OFF CENTER. THIS WAS REALIZED AND THE BOAT WAS MOVED, THE BUCKETS WERE DUMPED AND NEW SAMPLE WAS COLLECTED FROM THE CENTER OF THE QUAD. THE OFF CENTER VOAS WERE RETAINED TO REDUCE CROSS CONTAMINATION OF THE BOTTLES, HOWEVER.

8-19-91

8-19-91

1715 - WORKING OVER FIELD NOTES. DISCUSSED PROJECT & PROGRESS WITH J. SCHMIDT. J. TEMPLETON IS WORKING ON A CLARIFIER SAMPLING METHOD. HE WILL ALSO CONDUCT FLOCULATION TESTS ON THE A + B SERIES POND SLUDGES.

1800 - PREPARED CUSTODY SEALS FOR TOMORROW.

- END OF DAY

EF 8-19-91

SUMMARY

1) COLLECTED SLUDGE SAMPLES (4 QUADS) FROM 207BS.

2) COLLECTED 3 WATERS (NOT SW QUAD) AND 1 SLUDGE SAMPLE (NE QUAD) FROM 207A.

3) ALSO COLLECTED A SLUDGE FIELD BLANK AND RINSATE AT 207BS.

4) SAMPLES ARE READY TO BE PACKAGED AND SHIPPED TOMORROW.

5) CANNOT MEASURE SLUDGE DEPTHS IN PONDS WITH THE COLIWASA.

EF 8-19-91

ROCKY FLATS - SOLAR PONDS

TUES. AUG 20 1991

2K68
1123

E. RODMAN (HNUS) S. WILLIAMS (WESTON)
J. GUADAGNOLI (EG+G)
B. MORALES (EG+G NOTETAKER)

AM: PTLY CLOUDY, COOL
PM: " HOT

0700 - ARRIVE ONSITE, MTG IN 750 BREAK ROOM
0800 - IN 788 BLDG AWAITING ENOUGH EG+G PERSONNEL TO PACKAGE SAMPLES FOR SHIPPING.
0815 - S. WILLIAMS + J. GUADAGNOLI ARRIVE w/ VAN (WESTON) AT 788. BEGIN TO MOBILIZE PACKING AREA
0825 - SEVERAL MORE EG+G PERSONNEL ARRIVE
0830 - BEGIN PACKAGING SAMPLES
0950 - FINISHED PACKAGING SAMPLES. TAKING AN EG+G BREAK PRIOR TO WEIGHING AND HANDING OFF TO TRANSPORT DEPARTMENT

SHIPPED 2-20-91

PW -207A-NE, NW, SE, + T
PS - 207A-NE
PS - 207BS-NE, NW, NW-D, SW, SE, T, F, + B.
} 13 COOLERS!

1030 - WEIGHED SAMPLES AND FILLED OUT TRANSFER TAG, COURIER RECEIPT, AND SHIPPING MEMO.
1040 - TO 750 PAD TO MAKE XEROXES OF THE CHAIN OF CUSTODY FORM AND ABOVE LISTED PAPERWORK
1100 - LUNCH
1200 - TRANSPORTATION PICKED UP COOLERS.
- GETTING GEAR READY FOR TOMORROW.
1245 - LOADED AND LOCKED THE WESTON VAN
- WORKING ON EG+G SAMPLE TRACKING FORMS.
1320 - FILLED OUT EG+G ACCOUNTABILITY (SAMPLE) LOG SHEETS.
1410 - LEFT SITE, RETURNED TO SUITE 101.
- DISCUSSED ACTIVITIES w/ HNUS PERSONNEL.
EVENING - PREPARED SAMPLE LABLES.

Elizabeth [illegible]

08-20-91

30 08-20-91

8-20-91

ROCKY FLATS – SOLAR PONDS

~~H23~~ ER 2K68
1123

WED. AUG 21, 1991

E. RODMAN (H/NRS) S. WILLIAMS (WESTON) J. TEMPLETON (BECON+RECON)
(EG+G) R. GARCIA, J. GUADAGNOLI
C. TURNER

AM: CLEAR + SUNNY - HOT.
PM. " " " 88°F

0630 – ARRIVE ON SITE, DRESSED OUT
0700 – IN 750 PAD FOR PREEVOLUTION MTG
0820 – CREW IS DRESSING OUT FOR SAMPLING 207C (WATERS)
– AFTER CONFERRING W/ WESTON, WE AGREE THAT DUE TO A LIMITED # OF COOLERS AND LIMITED TIME, WE SHOULD ONLY SAMPLE POND 207C WATER. CLARIFIER WATER COULD BE SAMPLED ON FRIDAY. J. GUADAGNOLI FEELS WE NEED TO TRY TO DO BOTH TODAY. WE WILL PLAY IT BY EAR + SEE HOW IT GOES.
0845 – POURED FIELD BLANK SAMPLE
0855 – POSITIONING PONTOON BOAT IN NE QUAD.
0856 – BEGAN SAMPLING PW-207C-NE AND NE-D.
0919 – SAMPLED SE QUAD. CALIBRATED pH/SC METERS (SEE PG 19 FOR MODEL #S)
0923 – " SW QUAD
0935 – " NW QUAD
0942 – PULLING SAMPLES OFF THE BOAT.
0950 – NOT ENOUGH SAMPLE WAS COLLECTED FROM NE QUAD TO FULFILL SAMPLE REQUIREMENT. WILL HAVE TO GO BACK TO COLLECT MORE.
1020 – DECON TEAM GOT SOME OF THE SAMPLE BOTTLES MIXED UP DURING THE DECON PROCESS, THEY WERE MOVING BOTTLES THRU TOO FAST. I BELIEVE WE GOT THEM STRAIGHTENED OUT THOUGH. SEVERAL OF THE VOA VIALS HAVE AIR BUBBLES IN THEM – ALMOST ALL OF THEM; SAMPLERS INFORMED AGAIN OF SAMPLING METHOD.
1025 – CREW GETTING READY TO GO COLLECT ADDITIONAL DUPLICATE SAMPLE VOLUME
– LABELING CREW ~~SEP~~ MISLABELED VOAS AND SELECTED ALCOHOLS, SO I PROVIDED NEW LABELS AND THE BOTTLES WERE PROPERLY RELABELED.
1045 – COMPLETING SAMPLE & LABELING OF WATER SAMPLES AS PER SOPS (SEE pg 32)
1130 – COMPLETED PACKAGING OF SAMPLES (4 COOLERS)
PW-207C-NE, NE-D, SE, SW, NW, B, T, + F
– WAITING FOR TRAFFIC DEPT TO COMPLETE INTERNAL ROUTING PAPERWORK AND PICKUP THE SAMPLES.

Elizabeth Rodman

08-21-91

08-21-91

POND 207C

WATER SAMPLES

SAMPLE #	DATE	TIME	PH	TEMP	SC	DESCRIPTION
PW-207C-NE	8/21/91	0856	(*)	(*)	(*)	GOLDEN BROWN - CLEAR + LOW
PW-207C-NE-D	"	0856				JUST LIKE APPLE CIDER " w/ a few black flecks
PW-207C-F	"	0845	—	—	—	FIELD BLANK
PW-207C-SE	"	0919	10.19	25.0	>50,000	"
PW-207C-SW	"	0923	10.24	25.0	>50,000	"
PW-207C-NW	"	0935	10.22	25.0	>50,000	"
PW-207C-B	8/21/91	1155	—	—	—	RINSATE } DISTILLED WATER
PW-207C-T	8/21/91	FROM LAB	—	—	—	TRIP BLANK }

(*) UNABLE TO OBTAIN PH/SC OR TEMP ON 207C-NE, NE-D DUE TO CONFUSION DURING DECON AND SAMPLE LABELING. THE SAMPLE FOR PH/SC ETC. WAS DUMPED BEFORE THE MEASUREMENTS COULD BE TAKEN. DUE TO CONSISTENCY OF REMAINING 3 QUADS, I DON'T SEE THIS AS A PROBLEM, HOWEVER

OBSERVED ~~PROBLEMS~~ (DEVIATIONS + PROBLEMS)

1) NE QUAD - VOA SAMPLES NOT COLLECTED FIRST. THIS WAS RECTIFIED ONSITE, FOR FUTURE QUADS, WITH VERBAL DIRECTIONS.

2) PEOPLE HURRING SAMPLES THRU DECON AND LABELING. BOTTLES GOT MIXED UP IN DECON & HAD TO BE RESORTED OUT. BOTTLES GOT MISLABLED WHEN LABELERS DIDN'T CAREFULLY READ WHICH LABELS WENT ON WHICH BOTTLES. ADDITIONAL LABLES HAD TO BE MADE, + BOTTLES RELABLED

3) VOA SAMPLES WERE COLLECTED WITH AIR BUBBLES. WATER SAMPLERS FOR THE CLARIFIER WILL BE GIVEN MORE DIRECT, CAREFULL INSTRUCTIONS.

4) DUE TO LACK OF INITIAL SAMPLE AND HURRING DURING COLLECTION, NO SAMPLE WAS AVAILABLE FOR PH/SC OR TEMP. MEASUREMENT IN NE QUAD. (MINOR PROBLEM)

ROCKY FLATS SOLAR PONDS
Elizabeth Roth

08-21-91

2K68
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(*) - CALIBRATED PH, TEMP & SC AS PER MANUALS.
- PH TO 7.0 + 10.0
- SC TO 1000

1230 - TRANSPORT COLLECTED SAMPLES FOR SHIPPING

1235 - SHOWED SLUDGE SAMPLES TO J. TEMPLETON SO HE COULD RUN FLOCULATION TESTS THIS AFTERNOON, THEN RETURN SAMPLES TO APPROPRIATE PONDS.

1300 - REVIEWED C. OF CUSTODY'S W/ EG+G PERSONEL (B. MORALES), ASSISTED HIM IN COMPLETING EG+G FORM → SAMPLE LOG ACCOUNTABILITY. IT IS USED TO CHECK MATERIAL OUT OF AND BACK INTO THE FACILITY.

1400 - LEFT SITE. RETURNED TO SUITE 101
- PREPARED SAMPLE LABELS + ASSOC. PAPERWORK FOR TOMORROW.

Elizabeth Roth

08-21-91

34 08-22-91

POND 207C SLUDGE

SAMPLE #	DATE + TIME	DESCRIPTION
~~PS-207C-NE~~	~~[illegible]~~	NOT COLLECTED - COULD NOT OBTAIN SAMPLE.
~~PS-207C-NE-D~~	~~[illegible]~~	
~~PS-207C-SE~~		
PS-207C-SW	8/23/91 ~~[illegible]~~ 0914	green/brown w/ crystalline material, large cructs. (ALGAE?)
PS-207C-NW	8/22/91 2015	Brown w/ some crystalline material greenish-brown
PS-207C-NW-D	8/22/91 2015	" " " " "
PS-207C-T	8/22/91 From Lab	TRIP BLANK
PS-207C-B	8/23/91 0940	RINSATE BLANK (SS. BUCKET) } TYPE II H_2O
PS-207C-F	8/23/91 0900	Field blank
PS-207C-C	8/23/91 ~~[illegible]~~ 0914 0921	POND INTERIOR COMPOSITE - green/brown w/ large x/line chunks.
PS-207C-CB	8/23/91 ~~[illegible]~~ 0901	POND BERM COMPOSITE - BROWN SILTS

CLARIFIER

WATER

SAMPLE #	DATE + TIME	PH	SC	OT	DESCRIPTION
CW-001-	8/22/91 1605	10.22	33,000	27.9	Yellow/Green w/ a few black flecks.
CW-001-D	8/22/91 1605	"	"	"	fairly clear, low turbidity
CW-002	8/22/91 1700	9.98	40,000	27.9	↓
CW-003	8/22/91 1725	10.19	30,000	27.9	
CW-000-T	8/22/91 From Lab	—	—	—	TRIP BLANK
CW-000-B	" 2220	—	—	—	RINSATE (BAILER) } TYPE II H_2O
CW-000-F	" 2225	—	—	—	FIELD BLANK

SLUDGE

~~CW~~	DATE + TIME	DESCRIPTION
CS-001-	8/22/91 1815	Mostly all Fines, Brown, highly saturated
CS-001-D	" 1815	↓ (*) RADIOACTIVE!
CS-002	" 1925	
CS-003	" 1955	
CS-000-B	" 2250 ~~2240~~	~~Field blank~~ RINSATE (S.S. BOWL) } TYPE 2 H_2O
CS-000-F	" 22~~40~~ ~~2250~~	FIELD BLANK
CS-00T	" From LAB	TRIP BLANK

ROCKY FLATS - SOLAR PONDS 2K68

THURS. AUG 22 1991 1123

E RODMAN, RON HILL (H/NUS) S WILLIAMS K HOLLIWAY (WESTON)
J. SCHMIDT (H/NUS) J. TEMPLETON (B+R)
R. GARCIA + J. GUADAGNOLI (EG+G)

AM: HOT, SUNNY PM: CLOUDY (T. STORMS) VERY HOT (~90°)

0645 - ARRIVE ON SITE

0830 - MOBING EQUIPMENT FROM 788 - TO VAN

0845 - BEGIN SETTING UP DECON AREA ON BERM OF 207C

0920 - ATTEMPTING TO GET SAMPLE FROM NE QUAD. DIFFICULTY ENCOUNTERED - IT ISN'T CLEAR WHETHER THE SALTY DEPOSITS ARE SO HARD THAT WE CAN'T BREAK THROUGH, OR IF THERE SIMPLY ~~NOT~~ ER ISN'T ANY SLUDGE PRESENT NEAR THE CENTER OF THE QUADS.

- MOVED THE BOAT EAST (TOWARDS CENTER) AND N (TOWARDS BERM) ~ 8'.
- STILL NOT GETTING ANY SIGNIFICANT SAMPLE.

0950 - HAVE OBTAINED ~ 1 CUP OF CRYSTALLINE MATERIAL FROM NE QUAD.

- TRYING ~~TO MOVE~~ SE QUAD (CENTER) TO SEE IF THERE IS ANY MATERIAL THERE.

1000 - SHUT DOWN OPERATION: NEED TO IMPROVE RPT + DECON CONTROLS. EG+G PERSONNEL REQUIRED, AND ARE NOW WORKING ON IT. HEAT STRESS HAZARD, AS WELL.

- NEED TO CONSULT WITH PITTSBURGH TO RESOLVE OUR PROBLEMS WITH SAMPLING.

1115 - TALKED TO M. SPERANZA IN PITTSBURGH.

HE AGREES THAT WE SHOULD:

1) TRY SW & NW QUADS - SAMPLE IF POSSIBLE
2) COLLECT 1 COMPOSITE SAMPLE FROM 4 QUADS (center pond area)
3) " " " " " the berm sludges.

- I ADVISED EG+G (J. GUADAGNOLI) OF THIS SCENARIO.
- J. TEMPLETON ALSO AGREES WITH THIS SCENARIO. HE IS TRYING TO ARRANGE A DEVICE THAT WILL ALLOW THE SAMPLERS TO SEE THE BOTTOM. WESTON ALSO AGREES.
- SAMPLING STRATAGY: IN POND 207C
  - USE HOE + RAKE TO BREAK UP A LARGE AREA (10' CIRCLE) THEN USE THE DREDGE +/OR S.S. SCOOP TO TAKE THE SAMPLE.

(+) MATERIAL AT WATERLINE (BERM) IS DIFFERENT FROM SLUDGE IN INTERIOR OF POND → SEPERATE SAMPLE!!

(*) POND C SAMPLERS REPORT: NE QUAD - CRUST LAYER WITH <2" OF MATERIAL BENEATH IT. SE QUAD. - CRUST W/ UP TO 6" OF SLUDGE MATERIAL BENEATH IT. THIS UNDERNEATH SLUDGE IS MOSTLY FINES - MOST OF THE MATERIAL BILLOWED OUT OF THE DREDGE AS IT WAS PULLED THRU THE WATER. BELOW CRUST IS SILTY WATER; THEN ACTUAL SLUDGE.

Elizabeth [illegible]

8-22-91

 08-22-91

1220 - READY TO RESTART, BUT IT IS NOW TOO HOT TO WORK. INDUSTRIAL HYGIENE SAYS 15 MIN ON / 45 MIN OFF FOR PEOPLE IN RESPIRATORS. IT IS TOO HOT TO WEAR SARANEX AT ALL, SO WE CANNOT SAMPLE

1300 - STILL WAITING FOR TEMP TO DROP (BELOW 21.1°C). IT IS 24°C ON THE BERM.

- KAREN IS DIRECTING EG+G IN DRUM LABELING

1415 - DRUMS ARE LABELED + READY TO GO.

- CLARIFIER AREA IS SET UP + BOTTLES ARE MOBILIZED SO WE CAN START AS SOON AS H&S SAYS WE CAN BEGIN.

1445 - BEGINS TO RAIN w/ THUNDER + LIGHTENING

1500 - WAITING FOR THE RAIN TO STOP AND THE TEMP TO CONTINUE TO DROP.

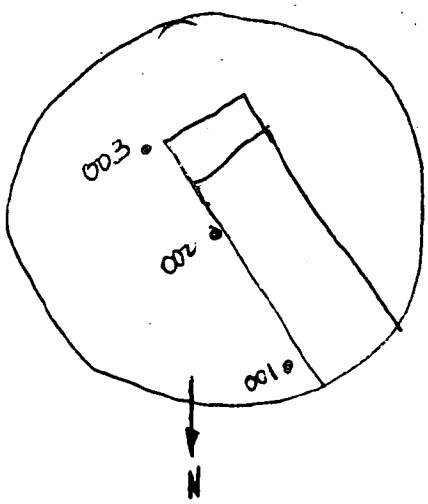
1530 - WILL BEGIN CLARIFIER SAMPLING, THEN COMPLETE POND 207C SLUDGES.

1555 - MOVING GEAR UP ONTO CLARIFIER BRIDGE

1605 - BEGIN TAKING CW-001 and CW-001-D

1625 - STILL TAKING CW-001 + CW 001-D. THE VOAS TOOK A LONG TIME.

- THE WATER LAYER IS LESS THAN 1 BAILER LENGTH DEEP, SO SOME SEDIMENT HAS BEEN INCORPORATED INTO THE SAMPLE



Clarifier Sketch. water + Sludge

1650 - CHANGING TEAMS FOR SAMPLING THE CLARIFIER WATER.

1700 - TAKING CW-002

1725 - TAKING CW-003

ROCKY FLATS - SOLAR PONDS

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1745 - COMPLETED WATER SAMPLING IN CLARIFIER
- BOTTLES ARE BEING PRE-PACKAGED FOR SHIPPING

1815 - COLLECTING THE FIRST ~~H2O ST~~ SLUDGE SAMPLE FROM THE CLARIFIER
CS-001 + 001-D

1850 - EG+G WANTS TO GET POND 207C SAMPLING GOING AT THE SAME TIME IN AN EFFORT TO GET ALL THE SAMPLING COMPLETED TONIGHT.
- INDUSTRIAL HYGINE DECIDED THAT LIFE PRESERVERS WON'T BE REQUIRED IN THE BOAT BECAUSE A PERSON COULD JUST STAND UP. NOT USING A LIFE PRESERVER WILL BE A CHANGE TO THE H+S PLAN (MODIFICATION)

1925 - MOBING TO G O OUT ON THE BOAT. WAITING FOR AN RPT, AT 207C

1928 - MOVING CREW ONTO BOAT. ON 207C, KAREN HOLLIWAY OVERSEERING CLARIFIER SAMPLING.

1943 - STILL COLLECTING NW SAMPLE (INTO S.S. BUCKETS) USING THE S.S. CONICAL DREDGE/SCOOP.
PS-207C-NW + PS-207CNW-D

1955 - STEVE WILLIAMS IS DUMPING OUT THE ~~SAMPLE FROM~~ 207C SLUDGE FROM THIS MORNING. SAMPLE CANNOT BE USED (FROM EASTERN QUAD) AS IT HAS VOLATALIZED.

2015 - GETTING NW + NW-D SAMPLES INTO JARS + GROSS DECON CARRIED OUT IN THE DARK ON THE BERM. H+S JUST NOW SETTING UP A LIGHT. JOHN GUADAGNOLI WANTS TO SET UP A DECON ZONE IN BLDG 788 SO WE CAN DECON INSIDE THE BLDG, THEN PACKAGE SAMPLES.

2035 - DRUMS AND SAMPLE CONTAINERS READY TO LOAD UP. A DECON ZONE HAS BEEN SET UP ON THE LOADING DOCK.

2100 - ONE 32 OZ JAR OF CS-001-D BROKE DURING DECONTAMINATION. DECONTAMINATION LINE IS BEING REWORKED + CLEANED UP.

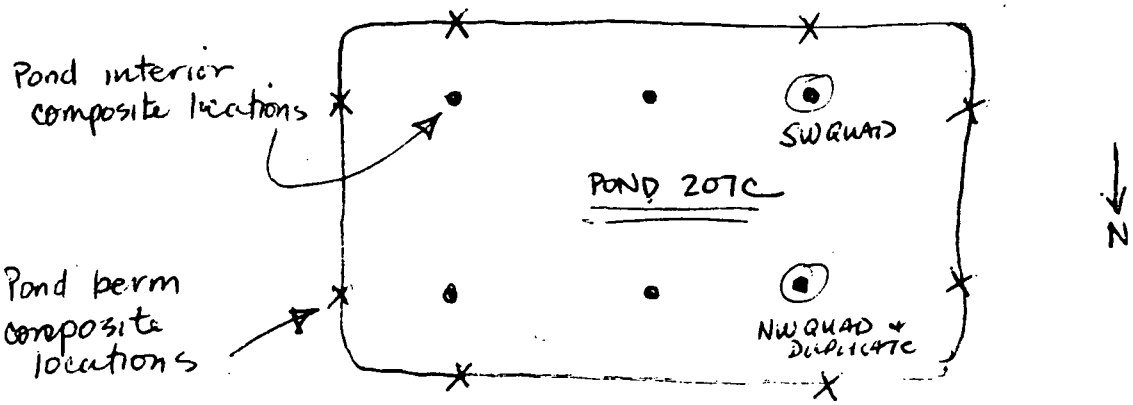
(*) SAMPLING AT POND 207C IS INCOMPLETE AS PER WHAT WAS AGREED UPON BETWEEN H/NUS, BROWN + ROOT, WESTON, + EG+G. IT IS NOT CLEAR YET AS TO WHETER OR NOT J. GUADAGNOLI PLANS TO SEND ANYONE ELSE OUT ONTO PONDS (207C) IN THE AM FOR ADDITIONAL SAMPLE.
- WE COLLECTED A NW QUAD SAMPLE + A NW QUAD DUPLICATE. WE HAVE NOT GOTTEN TO THE SW QUAD, A POND COMPOSITE, OR A BERM COMPOSITE YET.

2300 - CS-002 (MOISTURE) AND PS-207C-NW (MOISTURE) GOT THE LABELS SWITCHED. I WAS ABLE TO CORRECT THE CLARIFIER, BUT NOT THE POND SLUDGE LABEL. IT WAS NOTED WITH THE → pg 40

38 ~~8-22-91~~ EP

DEVIATIONS FROM SOPS AND WASP - 207C SLUDGES.

SAMPLING IN POND 207C: UNABLE TO COLLECT 4 QUADRANT SPECIFIC SAMPLES. NOT ENOUGH MATERIAL IN EASTERN QUADS. ALSO NOTED MATERIAL AT THE WATERLINE (WINDBLOWN MATERIAL) THAT IS DIFFERENT FROM OTHER POND DEPOSITS. COLLECTED QUAD-SPECIFIC SAMPLES FROM NW + SW QUADS; A DUPLICATE FROM THE NW QUAD, AND A COMOSITE OF THE EDGE MATERIAL AS WELL AS A COMPOSITE OF THE OVERALL POND INTERIOR MATERIAL:



- COLLECTED SLUDGE SAMPLES IN S.S. BUCKETS ON THE BOAT, AND FILLED SAMPLE JARS ON SHORE. THIS PROVED TO BE A MORE EFFICIENT USE OF THE CREW'S TIME. DUE TO HEAT STRESS CONSTRAINTS (15 MIN AT A TIME IN A RESPIRATOR) WE WERE ABLE TO COLLECT THE SAMPLES USING ONE SAMPLING CREW, IF WE FILLED BUCKETS, NOT JARS ON THE BOAT.

- DID NOT COLLECT 5 gallons OF SLUDGE FOR GEOTECHNICAL PARAMETER ANALYSIS. THERE WASN'T ENOUGH MATERIAL AVAILABLE IN A REASONABLE AMOUNT OF SAMPLING TIME.

- DID COLLECT ADDITIONAL (1 GAL. EXTRA) OF THE BERM COMPOSITE FOR GEOTECHNICAL PARAMETERS — AT J. TEMPLETON'S REQUEST.

— 8-28-91 —
Elizabeth Rodin

8-28-91 EP

ROCKY FLATS SOLAR PONDS

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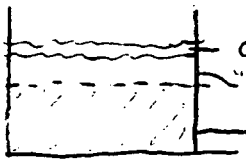
LSA SHIPMENT

EG+G DRUM #	CONTENTS	
D-77688	CLAIRIFIER SLUDGE	8 bottles (Rinsate + Field Blanks for Clarifier) 6 CANS 5 CANS
D-77684	CLAIR. SLUDGE + WATER BLANKS	~ 5 cans/layer X 3 layers
D-77687	POND SLUDGE 207C	~5 cans/layer X 3 layers
D-77690	207C SLUDGE + BLANKS	4 BOTTLES (Rinsate + Field blank for 207C Sludge) ~5 cans/layer x 2 layers.

+ 3 COOLERS OF ENVIRONMENTAL SAMPLES
- CLAIRIFIER WATER SAMPLES

POND 207C DESCRIPTION

LAYERED:



CRYSTALLINE MATERIAL (1-3" THICK)
"MUDDY" WATER - FULL OF SUSPENDED SOLIDS (0-3"?)
SLUDGE - VARIABLE THICKNESS; UP TO 5-6".

SLUDGE APPEARS THICKER IN WESTERN 1/2 OF 207C. SALT LAYER IS ALSO THICKER IN THE WESTERN 1/2. SALT LAYER IS LUMPY AND UNEVEN. SLUDGE IS GREENISH BROWN WITH A LARGE PROPORTION OF FINES.

(sludge description 8-28 only)

8-28-91

08-22-91

40 08-22-91

corrected sample. I will also call the lab and notify them.

2330- MET MIDNIGHT SHIFT COMING ON.
KAREN HOLLIWAY + STEVE WILLIAMS + I GOT ALL THE
~~CLAIRIFIER + SAMPLES~~ + SLUDGE SAMPLES INTO
DRUMS. CLAIRIFIER WATER IS IN THE REFRIDGERATOR.
- POURED CLAIRIFIER (SLUDGE + WATER) BLANKS (TYPE II H_2O.)

2400 - SHOWERED + READY TO LEAVE. HIT WITH A 45 MINUTE
LOCKDOWN.

2420 - LEFT SITE. (LOCKDOWN ONLY 20 MIN.)

8-22-91

ROCKY FLATS - SOLAR PONDS 2K68 **41**

FRI AUG 23 1991 1123

E. RODMAN (H/NUS)
K. HOLLIWAY (WESTON)
S. WILLIAMS (WESTON)
J. GUADAGNOLI (EG+G)
V. AMENT (SHIPPING EG+G)

AM: CLEAR + HOT
PM: CLOUDY + HOT

0630 - ARRIVE ONSITE, CONGREGATED AT 750 PAD
0750 - PREEV. MTG AT 788 BLDG

(A) REFER TO TABLES ON PGS 34 and 39 FOR SAMPLING + SHIPPING INFO FOR TODAYS SHIPMENT.

0807 - MOBING AT BERM OF POND 207 C TO COLLECT SW, COMPOSITE, + BERM COMPOSITES.
0845 - BOAT CREW HAS COLLECTED SW QUAD SAMPLE. PS-207C-SW
- BERM CREW IS COLLECTING A BERM COMPOSITE PS-207C-CB
0850 - BOAT CREW COLLECTING COMPOSITE SAMPLE PS-207C-C
- BERM CREW ALMOST DONE COLLECTING THE BERM COMPOSITE. COLLECTION METHOD → INTO S.S. BUCKETS, INTO JARS ON SHORE (USED S.S. CONICAL SCOOP)
0900 - POURED FIELD BLANK w/ REAGENT (TYPE II) H_2O. OUT OF DISTILLED.
0901 - TRANSFERRED BERM COMPOSITE SAMPLE TO BOTTLES, PRE PACKAGED
0914 - " SW QUAD " " " , "
0921 - " POND COMPOSITE SAMPLES TO BOTTLES, "
- KAREN HOLLIWAY IS PACKAGING CLAIRIFICE WATER SAMPLES INTO COOLERS AND WORKING ON DRUMS
- BOTTLE DECON + LABELING ON GOING
0940 - POURED RINSATE BLANK FOR 207C SLUDGE. (S.S. BUCKET) (TYPE II H_2O)
1000 - IN 788 PACKAGING SLUDGE SAMPLES INTO DRUMS AND COMPLETING PAPERWORK FOR LSA + ENVIRONMENTAL SHIPMENT. I COMPLETED THE CHAIN OF CUSTODYS, + INCLUDED THEM IN THE DRUMS/COOLERS
1200 - PACKAGING COMPLETE AS PER SOPS AND EG+G REQUIREMENTS. SAMPLES ARE IN 4 DRUMS AND 3 COOLERS WHICH WILL BE SHIPPED BY TRUCK (TOGETHER.)

↓

08-23-91

DESCRIPTION OF DECONTAMINATION PROCEDURE

1-2 people; SARANEX + RESPIRATORS

TABLE 1 - plastic covered. TRANSFER SAMPLES TO CONTAINERS, SPRAY DOWN BOTTLES IN A LARGE TUB TO REMOVE GROSS CONTAMINATION. USE BOTTLED DRINKING WATER

2 people MINIMUM, TYVEK, NO RESPIRATOR, gloves (NITRILE) + boot covers

ON GROUND - ON PLASTIC - 2 WASH, 3 RINSE. DISTILLED OR TYPE II H_2O IN RINSES. SPECIAL ATTENTION TO UNDER EDGES OF BOTTLE CAPS.

2 RPTS

TABLE 2 - PLASTIC COVERED. - DRY SAMPLES + GET RPTS TO SMEAR BOTTLES.

2 people, tyvek NO Respirators. Surgicons gloves

TABLE 3 - PLASTIC COVERED. CLEARED (COLD) SAMPLE BOTTLES LABLED, TAPED, CUSTODY SEALS, + ZIPLOCK BAGS.

WF 8-23-91

TYPE II H_2O USED FOR FINAL DECON AT 207C (RINSE ONLY) ON 8-23-91, AND FOR FIELD AND RINSATE BLANKS AT CLARIFIER (SLUDGE AND WATER) AND POND 207C (SLUDGE ONLY). USED TYPE II H_2O WHEN WE EXHAUSTED THE SUPPLY OF DISTILLED WATER

ROCKY FLATS - SOLAR PONDS

8-23-91

2K68
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SAMPLES SHIPPED: 08-23-91

PS-207C - NW
NW-D DUPLICATE
SW
C COMPOSITE
CB BERM COMPOSITE
F FIELD BLANK
T TRIP BLANK
B RINSATE BLANK (S.S. BUCKET)

} L.S.A.

CW-001 (at WALL)
001-D DUPLICATE
002 CENTER
003 ~ 3/4 across tank
000-B RINSATE (BAILER)
000-F FIELD BLANK
000-T TRIP BLANK

} ENVIRONMENTAL SAMPLES

CS-001
001-D DUPLICATE - 1 32oz jar broken
002
003
000-B RINSATE - (S.S. BOWL)
000-F FIELD BLANK
000-T TRIP BLANK

} L.S.A.

~~1330~~ 1440 - LEFT FACILITY AFTER SAMPLES WERE SHIPPED OFFSITE (~1415)
RETURNED TO SUITE 101. REPORTED ACTIVITES TO J. SCHMIDT.

8-23-91

EK 08-28-91

ROCKY FLATS - SOLAR PONDS

2K68
1123

MON. AUG 26 1991

E ROOMAN (H/NUS)
G. OSTDIEK (904 FOREMAN EG+G)

AM. SUNNY + CLEAR
PM. " "

0630 - ARRIVE ONSITE
0700 - BLDG INDOCTRINATION AND REVOLUTION MTG AT 904 PAD.
0730 - BEGIN CHECKING MAPS OF TENTS (TRIWALLS) AT 904 PAD
0830 - COMPLETED TENTS 8 + 9. PHONE CALL FROM J GUADAGNOLI → E LOMBARDI IS GOING TO COME DOWN TO SEE MY NOTES FROM POND C AND CLARIFIER SAMPLING.
- BROKE TO WORK ON FIELD NOTES. THERE ARE SEVERAL SUMMARY SECTIONS CONCERNING VARIATION FROM WASP + DECON THAT I HAVE NOT COMPLETED. PLANNED TO COMPLETE THEM IN PITTSBURGH WHEN I HAVE A PLACE TO SIT DOWN AND WORK.
0845 - RETURNING TO 904 PAD TO CONTINUE MAPPING.
0855 - COMPLETED ≅ 1/2 OF TENT 10. TIME FOR EG+G BREAK.
1012 - MET W/ E. LOMBARDI - WENT OVER FIELD NOTES.
- RETURNING TO PAD 904 TO FINISH TRIWALL MAPS.
1030 - COMPLETED TRIWALL MAPPING
1050 - LEFT FACILITY - RETURNED TO SUITE 101
- DISCUSSED ACTIVITIES
- RETURNED TO PITTSBURGH PA.

8-26-91

08-26-91

MONDAY 9/23/91 ROCKY FLATS Solar Ponds

0900 MET WITH JOHN SCHMIDT (HALLIBURTON NUS DENVER)
He gave me directions to ROCKY FLATS

1000 MET WITH ERNIE LOMBARDI (EG+G)
He led me through indoctrination. Due to complications I was unable to get through the portal to go to PAD 788. Ernie made the necessar arrangements and I should be able to gain access tomorrow.

1400 DROVE BACK TO HALLIBURTON NUS
MADE CALLS TO PITTSBURGH

1500 LEFT NUS

Rocky Flats Solar Ponds 2K68 1123 **47**

Tuesday 9/24/91

4000
DP
7298 0112

0730 ~~0800~~ Met with Ernie Lombardi (EG+G) to go to Portal 1 Entrance to Protected Area

0800 Walked to solar ponds and to building 788

Met with Rich Garcia and Steve Williams (Weston)

Going to sample at Pond 207 Bn. (Geotech Parameters) will begin sampling at NW corner. They have to sample sludge first because drums for H^2O sampling have not arrived

0845 Began sampling PS-207 Bn-NW (Total vol. 4-1 gallon containers)

Decon tubs are set up as two wash tubs + three rinse tubs.

Sample are being collected using a clam shell sampler. Sample is deposited into stainless steel bowl + transferred to 1 gallon containers

0914 Completed sampling of 207 Bn-NW

Boat was brought to shore and samples were taken from samplers and moved through decon. 2 washes and 3 rinses towel dried and labeled. Sample were also scanned for radiation

0930 Began sampling @ 207 Bn-SW (Geotech)
Sample # PS-207 Bn-SW

1000 Completed sampling of 207 Bn-SW

Boat came to shore and samplers handed bottles to decon personnel. Samples went through decon procedure and were labeled.

Mark L. Mengel 9/24/91

9/24/91

1010 Began sampling 207 Bn-SE (Geotech.) 4-1gal comp

1030 Completed sampling of 207 Bn-SE.
Did not come to shore because they had the bottles to sample the remaining quadrant.

1035 Began sampling 207-Bn-NE

1055 Completed sampling of 207-Bn-NE

Brought boat to shore with samples from NE + SE quadrants. Decon personnel decanned sample bottles and then sampling equipment.

Sample numbers and times for 207 Bn sludge for geotechnical analysis.

PS-207Bn-NW @ 0845
PS-207 Bn-SW @ 0930
PS-207 Bn-SE @ 1015
PS-207 Bn-NE @ 1040

1130 The crew is breaking for lunch.

Called Ernie Lombardi to discuss some of the sample bottle requirements regarding shipping through Fed Ex.

Will have to call Mark Speranza

1230 Discussed with Mark Speranza how the water samples will be collected for the flocculation + clarification samples.

- H_2O will be collected in 4 15 gallon plastic containers for each quadrant.
- Sludge for flocculation will be collected in 1 15 gal plastic
- 1 gallon containers will be shipped in coolers instead of drums.

Met back with crew and discussed these points with Rich Garcia. Crew is preparing to go back out onto pond 207 Bn to collect sludge for clarification.

1250 Samplers on water

Will collect 2 1/2 gallons from each quadrant to produce a 10 gallon composite

1310 Move from NW quadrant to SW quadrant

1325 Move from SW quadrant to SE quadrant

Mark A Mungel 9/24/91

Rocky Flats Solar Ponds
9-24-91

2K68
112.3

1335 moved from SE quadrant to NE quadrant. This will complete composite sample for flocculation/clarification.

sample # PS-207BN-C @ 1345

1345 Rich Garcia checked wind speed. wind gust @ maximum 10 MPH

Finished collecting sludge

1348 A second work crew is sampling H_2O for flocculation/clarification
A field change was made to use 4-15 gal containers to collect the water for analysis. This is being done to accomodate FED EX.
Beginning in NW corner. Sample is being collected from the side of the berm. Safety harnesses are being utilized for the samplers

1350 sample # PW-207BN-NW collected

Next sample will be collected from NE quadrant. Same sample procedure. Water to be collected from berm

1355 sample # PW-207BN-NE collected

1400 sample # PW-207BN-SE collected

1405 sample # PW-207BN-SW collected

This completes the sampling from Pond 207BN

All of the 15 gal containers were deconned and smeared.
All equipment was deconned + smeared crew is preparing to leave for day

1500 Left site

Mark L. Mengel

9-24-91

Rocky Flats Solar Ponds 2K68

50 9-25-91 Wednesday

0700 Arrived at Rocky Flats. Escorted through portal

Met @ Bldg. 750 for morning briefing. Then work groups went to Bldg 788.

0755 It was discussed the technique to be used for collecting the sludge from Pond 207BC due to the low amount of sludge contained in the pond. Instead of the clamshell sampler, the Teflon scoop is going to be utilized to collect the sludge. This will enable the samplers to collect sufficient sample in a timely manner. Water sample will again be collected from the shore along the berm.

Work is being delayed currently due to the lack of a work permit for conducting activities at the pond. This issue is being resolved.

0800 Crew began mobing for sampling activities at Pond 207BC. They are going to collect H_2O and sludge simultaneously. Several members of the crew are going to collect H_2O from the sides of the pond in each corner of the quadrants. Full body harnesses will be used. At the same time 2 other crew members are going to collect sludge from the boat.

Decon area has been set up and consists of ground plastic and 2 wash tubs and three rinse

Water sample are going to be collected and labeled as follows:

PW-207BC-NW @ 0835
PW-207BC-NE @ 0840
PW-207BC-SE @ 0845
PW-207BC-SW @ 0850

0845 Crew members begin sampling sludge in NW quadrant. Samples will be collected for clarification/flocculation and geotechnical.

0900 Sample for geotech (sample # PS-207BC-NW) collected moving to SW quadrant.

0915 Collected sample from SW quadrant PS-207BC-SW

0920 Crew came to shore and handed bottles over to decon people obtained bottles for NE and SE quadrant. Went back out into water to collect samples.

Decon personnel deconning large 15 gal container used for H_2O sampling and sludge sample bottles from NW + SW quad.

0930 Collected NE quadrant sample PS-207BC-NE

Moved to SE quadrant

Mark A. Mengel 9-25-9

0940 SE QUADRANT SAMPLE COLLECTED

BOAT RETURNING to shore with samples collected from NW + NE QUADRANT SAMPLES

Decon People will take samples from samplers and Decon. SAMPLERS will now go back out onto pond and collect composite sludge sample for clarification / FLOCULATION.

1005 Finishe NE QUADRANT + MOVED TO SE QUADRANT

1015 Finished SE QUADRANT + MOVED TO SW QUADRANT

1030 COMPLETED SAMPLING OF COMPOSITE sludge SAMPLE

SAMPLE NO. PS-207BC-C

All SAMPLE CONTAINERS + SAMPLING EQUIPMENT IS being deconned using two washes + three RINSES. BOAT IS deconned removing gross CONTAMINATION, then RINSED with clean DI WATER.
~~BJA~~

1055 CREW IS going TO Remob AT POND 207BS And then BREAK for lunch

1230 Began moving NECESSARY EQUIP. TO POND 207BS.
We ARE ONLY doing H2O SAMPLING due to wind gusts exceeding 15 MPH
1 gal FROM EACH QUADRANT will be collected And placed in 15 gal CONTAINERS. SAMPLE NUMBERS will be AS follows:

PW-207BS-NW @ 1245
PW-207BS-NE @ 1250
PW-207BS-SE @ 1255
PW-207BS-SW @ 1310

Mark A Mangel 9-25-91

ROCKY FLATS SOLAR PONDS

52 9-25-91

1315 15 GALLON CONTAINERS WERE DECONNED & SMEARED
THE RPT'S RESULTS INDICATED THAT THE DRUMS WERE HOT, SO A HALF HOUR WAS ELAPSED AND SMEARED AGAIN.

1345 SMEARS THIS TIME INDICATED DRUMS TO BE OKAY.

CREW MOVED SAMPLES TO LOADING DOCK AREA WHERE SAMPLES LABELS AND CHAIN OF CUSTODY LABELS WERE APPLIED.

1430 LEFT RESTRICTED AREA AND STOPPED TO SEE ERNIE LOMBARDI AT BUILDING T130 C. WE DISCUSSED THE ISSUE OF SHIPPING THE SAMPLES. E 5+6 WOULD LIKE TO HOLD ALL OF THE SAMPLES UNTIL MONDAY AND SEND THEM ALL BY TRUCK.

I WILL HAVE TO DISCUSS THIS WITH MARK SPERANZA. TOMORROW.

1530 STOPPED @ NOS (DENVER) AND TALKED WITH JOHN SCHMIDT. UPDATED HIM ON THE PROGRESS.

9-25-91

Mark L. Mengel

VOID

Rocky Flats Solar Ponds
9-26-91

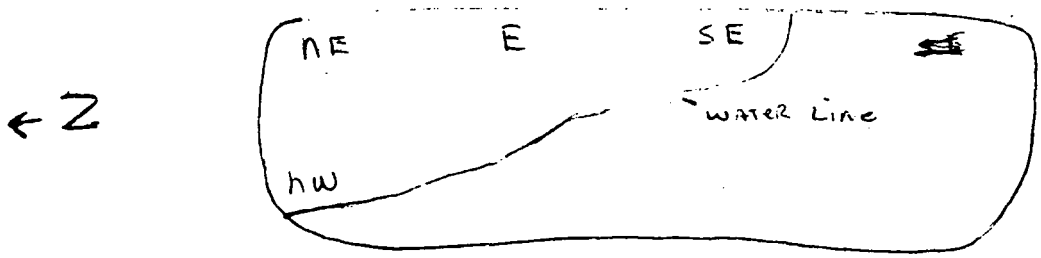
2K68
1123

0700 Arrive @ Rocky Flats. Enter through Portal 1.
Went to Bldg 750 for morning briefing. Strategy for the day includes completing the sludge sampling at Pond 207BS and then sampling water + sludge from ~~A~~ 207A Pond.

0730 Went to Bldg 788 for mobing activities for the day. Went out to Pond 207BS and prepared decon area. Decon area consists of 2 washes + 3 rinses

0830 ~~0845~~ Samplers in the boat are on the pond and will start sampling in the NW quadrant.

A 2nd activity is ongoing. Other work crew member are going to sample H2O from Pond 207A. Sample locations will be designated as follows:



Sample will once again be collected from the berm. Sampling is beginning at the SE quadrant.

Sample numbers are as follows:

PW - 207A - SE @ ~~0845~~ 0840
PW - 207A - E @ 0845
PW - 207A - NE @ 0848
PW - 207A NW @ 0855

0850 Finished NW quadrant moved to SW quadrant - (sludge sampling)

Mark L. Mungel 9/26/91

ROCKY FLATS SOLAR Ponds

54 9-26-91

0915 FINISHED SW QUADRANT AND RETURNED TO SHORE - DECON PERSONNEL TAKE SAMPLES THROUGH DECON. SAMPLERS TAKE 2 MORE SETS OF BOTTLES AND ARE going BACK OUT TO COLLECT SAMPLES FROM THE NE + SE QUADRANT.

SAMPLES ARE DRIED AND SMEARED. AFTER THE RESULTS FROM THE SMEARS RETURN THE BOTTLES WILL BE LABELED AND C.O.C. LABEL WILL BE APPLIED.

1000 COMPLETED NE QUADRANT AND MOVED TO SE QUADRANT

1005 JOHN QUADEGNOLE AND ERNIE LOMBARDI SHOW UP ONSITE TO DISCUSS THE SHIPPING MATTER. THE FOLLOWING ITEM WERE ADDRESSED:
THE ORIGINAL PLAN WAS TO SAMPLE THE 40 GAL. OF WATER AND PUT IT IN A 05 GAL DRUM. THIS WAS changed TO ACCOMODATE FED EX. IT NOW APPEARS THAT EG+G WANTS TO SHIP ALL SAMPLE VIA GROUND TRANS. THEY HAVE TOLD ME TO CONTACT JOHN SCHMIDT (NUS) AND INFORM HIM OF THIS. THE SAMPLE WILL BE PACKAGED ON MONDAY AND GO OUT TUESDAY THE 10/1/91. SAMPLES WILL BE IN PITTSBURGH ON THURSDAY.

1030 COMPLETED SE QUADRANT. THIS COMPLETES THE GEOTECH SAMPLING BOAT IS COMING IN AND SAMPLES WILL BE DECONNED. SAMPLERS ARE SCANNED TO BE SURE NOTHING IS HOT. SAMPLES ARE SMEARED LABELED AND CHAIN OF CUSTODY APPLIED.

1050 CREW IS going TO BREAK AND RETURN BY 1200

1200 CREW IS BACK AT POND 207BS AND IS GOING TO MOB FOR COMPOSITE SLUDGE SAMPLING. SAMPLE PS-207BS-[redacted]C

1220 SAMPLERS beginning in NW QUADRANT

1225 ACCEPTABLE VOLUME IS OBTAINED FROM QUADRANT NW, MOVING TO SW QUADRANT.

1230 COMPLETED SAMPLING OF SW QUADRANT. MOVING TO SE QUADRANT.

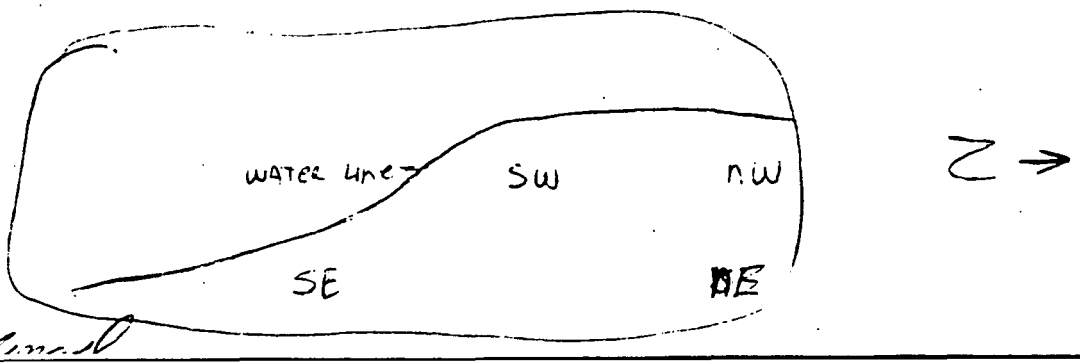
1240 COMPLETED SAMPLING OF SE QUADRANT MOVING TO NE QUADRANT

1250 SAMPLING COMPLETED. SAMPLERS COLLECTED 2½ gal of sludge from each QUADRANT TO = 10 GAL COMPOSITE.

The SAMPLE CONTAINER IS MOVED THROUGH the DECON. The boat is DECONNED USING A WASH + RINSE TO REMOVE ANY GROSS CONTAMINATION

WE ARE going TO MOVE TON POND 207 A TO SAMPLE SLUDGE.

1305 SAMPLERS ARE ON POND 207A. SAMPLING Beginning in SE QUADRANT



Mark L. Minard

Rocky Flats Solar Ponds 2K68 **55**

9/26/91 1123

1315 completed SE QUADRANT. Brought Geotech samples to shore and pickup the 15 gal container to collect the 2.5 gal sludge sample for the composite for flocculation/clarification.

1330 COMPLETED SAMPLING of SE QUADRANT. moving TO SW QUADRANT. WILL collect Geotech samples (4-1gal PE's) And 2nd 2.5 gal for composite

1345 COMPLETED SAMPLING OF SW QUADRANT. Brought samples to shore, picked up bottles for NW QUADRANT AND continued SAMPLING Decon personnel took bottle through decon. smearing + counting.

1400 COMPLETED SAMPLING of NW QUADRANT. Moving NE QUADRANT. They could not obtain Any Any SAMPLE FROM NE QUADRANT because the sludge was to silty and would not stay in the clam shell. moved back to NW QUADRANT.

1425 COMPLETED sludge sampling Decon personnel take samples and decon. All sampling equipment is deconned. All equipment and samples are smeared and counted.

1500 ALL WORK AREA'S ARE cleaned up and crew left 788 to go to 750

1515 OFFSITE

VOID

Mark L. Mengel 9-26-91

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Rocky Flats Solar Ponds
9-27-91

0700 ARRIVED AT EG&G. GET ESCORT AND GO TO 750

0730 ATTENDED MEETING AT 750 THEN DEPARTED FOR 788.

0800 CREW DRESSING OUT TO BEGIN SAMPLING @ POND 207C

0828 DISCUSSED SAMPLING STRATEGY WITH THE SAMPLING CREW. AT EACH QUADRANT A 1GALLON COMPOSITE WILL BE COLLECTED ~~FROM AND A~~ OF THE CRYSTAL SLUDGE AND THE UNDERLYING SLUDGE. IN ADDITION 4-1GALLON SAMPLES WILL BE COLLECTED FOR GEOTECH ANALYSIS. H2O SAMPLES WILL BE OBTAINED FROM EACH QUADRANT 1 GALLON EACH. ALL SAMPLING WILL BE CONDUCTED FROM THE BOAT.

0840 SAMPLERS ON WATER. WILL BEGIN IN NE QUADRANT AND WILL SAMPLE WATER FIRST.

0845 SAMPLE NO PW-207C-NE @ 0845 ~~NO~~
NEXT WILL BE CRYSTAL SLUDGE COMPOSITE

0850 CRYSTAL SLUDGE COMPOSITE COLLECTED (PS-207C-C) PARTIAL

0855 ~~NO~~ UNDERLYING SLUDGE COMPOSITE COLLECTED (PS-207C C2) PARTIAL
WILL NO COLLECT 4-1gal SAMPLES FOR GEOTECH.

0900 SAMPLE COLLED @ 0900.
SAMPLERS BROUGHT SAMPLE TO SHORE. DECON ACCEPTED SAMPLES AND MOVE THE BOTTLES THROUGH THE DECON AREA DECON IS MADE UP OF 2 WASHES + 3 RINSES, SAMPLE WILL BE DRIED SCANNED FOR RADIATION, SMEARED AND COUNTED BEFORE SAMPLE LABELS ARE APPLIED.

0910 BACK ON THE H2O IN THE SE QUADRANT

0912 WATER SAMPLE COLLECTED (PW-207C-SE)

0914 CRYSTAL SLUDGE COLLECTED (PS-207C-~~SE~~C) PARTIAL

0917 UNDERLYING SLUDE COLLECTED (PS-207C-C2) PARTIAL

0920 4-1GALLONS OF SLUDGE COLLECTED (PS-207C-SE)

BROUGHT SAMPLES TO SHORE AND WENT BACK OUT TO SW QUADRANT.

0930 COLLECTED H2O (PW-207C-SW)

0931 COLLECTED CRYSTAL SLUDGE (PS-207C-C) PARTIAL

0933 COLLECTED UNDERLYING SLUDGE (PS-207C-C2) PARTIAL

0935 COLLECTED 4-1GALLON BOTTLES FOR GEOTECH (PS-207C-SW)

MOVED TO SE QUADRANT

0937 COLLECTED H2O (PW-207C-~~SW~~)

0938 COLLECTED CRYSTAL SLUDGE (PS-207C-C) COMPLETED

0939 COLLECTED UNDERLYING SLUDGE (PS-207C-C2) COMPLETED

0945 FINISHED 4-1gal SAMPLES (PS-207C-NW)

BOAT COMING IN WITH ALL SAMPLES SAMPLERS PASS SAMPLES TO DECON PERSONNEL. THREADS OF BOTTLES ARE CLEANED TO ASSURE TIGHT FIT.

M. [illegible]

Rocky Flats Solar Ponds

9/27/91

2K68
1123

0945 Samples are deconned and skanned, smeared and counted before labels are applied

Samplers discard all PPE and are skanned as they discard clothing.

This completes all of the sampling activities. Sampler will be moved to loading dock

1030 Completed all decon and demob. went back to 788 pad

Several of the 1 gal sample from previous days sampling are leaking due to the expansion within the containers. We are going to have to open some of the containers and remove some of the material to allow for expansion. The material ~~wi~~ that is removed will be taken back to the ponds where it came from.

1800 Crew went to lunch

1200 Crew is remobing to take the excess out of the leaking sample containers.

Crew removed excess out of the bottles from 3 of the ponds. the remainder of the bottles will be done on Monday. Steve Williams of Weston will over see that activity and also the packaging & shipping.

I have left sufficient C.O.C. stickers for the traffic Dept.

1430 Crew finishes for day

Frank T. Mugl

9-27-91

APPENDIX D

CHAIN OF CUSTODY FORMS

NUS CORPORATION — **CHAIN OF CUSTODY RECORD**

PROJECT NO.: 2K68

SITE NAME: ROCKY FLATS - SOLAR PONDS

SAMPLERS (SIGNATURE): [signature]

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	VOA	SEMI VOA	ALCOHOLS	CYANIDE, METALS, NITRATE, AMMONIA, TOC, TCLP METALS, TDS, TSS, INORGANICS, RADS			REMARKS
207BN	08/08/91	0858		X	PW-207BN-NW	6	2	1	1		2		PONDWATER
207BN	"	0904		X	PW-207BN-NE	6	2	1	1		2		"
207BN	"	0907		X	PW-207BN-SE	6	2	1	1		2		"
207BN	"	0909		X	PW-207BN-SW	6	2	1	1		2		"
													"
207BN	08/08/91	FROM LAB		X	PW-207BN-T	2	2						TRIP BLANK

RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):
[signature]	08-09-91 0930				
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED FOR LABORATORY BY (SIGNATURE):	DATE/TIME:	REMARKS: SHIP TO HALLIBURTON NUS LABS - PITTSBURGH	

NUS 440 34 0484

1/2

NUS CORPORATION — **CHAIN OF CUSTODY RECORD**

PROJECT NO.: 2K68

SITE NAME: ROCKFLATS - SOLAR PONDS

SAMPLERS (SIGNATURE): Floyd H MacDonald

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	VOAs	ALCOHOLS	32 oz (*)	MOISTURE	BULK DENSITY, SPEC GRAV, BLAINE, ATTERBERG LIMITS	PARTICLE SIZE	REMARKS
207BN	08/08/91	0920		X	PS-207BN-NW	9	1	1	4	1	1	1	POND SLUDGE
207BN	"	0934		X	PS-207BN-SW	9	1	1	4	1	1	1	"
207BN	"	1016		X	PS-207BN-NE	9	1	1	4	1	1	1	"
207BN	"	1028		X	PS-207BN-SE	9	1	1	4	1	1	1	"
207BN	08/08/91	FROM LAB		X	PS-207BN-T	2	2						TRIP BLANK

(*) ANALYSIS: SEMIVOA, METALS, PH, TCLP METALS, ASTM LEACH, TOC, AMMONIA, RADS

RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):
Floyd H MacDonald	08-09-91 0930				
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED FOR LABORATORY BY (SIGNATURE):	DATE/TIME:	REMARKS: SHIP TO NUS LABS PITTSBURGH	

NUS 440 34 0484

2/2

NUS CORPORATION

CHAIN OF CUSTODY RECORD

PROJECT NO.: 2K68

SITE NAME: ROCKY FLATS - SOLAR PONDS

SAMPLERS (SIGNATURE): [illegible]

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	VOA	ALCOHOLS	32 oz glass (A)	MOISTURE	BULK DENSITY, SPEC. GRAVITY, ATTERBERG, SWELL	PARTICLE SIZE	REMARKS
207BC	08/12/91			X	PS-207BC-NW	9	1	1	4	1	1	1	POND SLUDGE
207BC	"			X	PS-207BC-NE	9	1	1	4	1	1	1	"
207BC	"			X	PS-207BC-SW	9	1	1	4	1	1	1	"
207BC	"			X	PS-207BC-SE	9	1	1	4	1	1	1	"
207BC	08/12/91	FROM LAB		X	PS-207BC-T	2	2						TRIP BLANK

(A) ANALYSIS: SEMIVOA, METALS, pH, TCLP METALS, ASTM LEACH, TOC, AMMONIA, RADS

RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):
[illegible]	8-13-91 0995				
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED FOR LABORATORY BY (SIGNATURE):	DATE/TIME:	REMARKS: SHIP TO HALLIBURTON NUS - PGH FOR ANALYSIS	

NUS 440 34 0484

NUS CORPORATION — **CHAIN OF CUSTODY RECORD**

PROJECT NO.: 2K68

SITE NAME: ROCKY FLATS - SOLAR PONDS

SAMPLERS (SIGNATURE): [signature]

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	VOA	SEMIVOA	ALCOHOLS	CYANIDE, METALS, NITRATE, AMMONIA,	TOC, TCLP METALS, TDS, TSS	INORGANICS, RADS	REMARKS
207BC	08/12/91	0859		X	PW-207BC-NW	6	2	1	1		2		PONDWATER
207BC	"	0904		x	PW-207BC-NE	6	2	1	1		2		"
207BC	"	0850		x	PW-207BC-SW	6	2	1	1		2		"
207BC	"	0907		x	PW-207BC-SE	6	2	1	1		2		"
207BC	08/12/91	FROM LAB		x	~~B~~ ER PW-207BC-T	2	2						TRIP BLANK

RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):
[signature]	08 13 91 0945				
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED FOR LABORATORY BY (SIGNATURE):	DATE/TIME:	REMARKS: SHIPPED TO HALLIBURTON NUS - PGH FOR ANALYSIS	

NUS 440 34 0484

2/2

NUS CORPORATION — **CHAIN OF CUSTODY RECORD**

PROJECT NO.: 2K68

SITE NAME: ROCKY FLATS - SOLAR PONDS

SAMPLERS (SIGNATURE): M DAgostino

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	VOA	SEMIVOA	SEL. ALCOHOLS	(CYANIDE, METALS, NITRATE, AMMONIA, TOC, TCLP METALS, TDS, TSS, INORGANICS, RADS)			REMARKS
207BS	08/15/91	1037		X	PW-207BS-NW	6	2	1	1		2		POND WATER
207BS	08/15/91	1037		X	PW-207BS-NW-D	7	2	2	1		2		POND WATER MS/MSD
207BS	"	1054		X	PW-207BS-NE	6	2	1	1		2		POND WATER
207BS	"	1120		X	PW-207BS-SE	6	2	1	1		2		POND WATER
207BS	"	1108		X	PW-207BS-SW	6	2	1	1		2		POND WATER * ONLY 1 1/2 GALS FOR THE METALS ETC... ANALYSIS
207BS	08/15/91	From LAB		X	PW-207BS-T	2	2	~~1~~	1	ER	~~1~~		TRIP BLANK (VOAS ONLY)
207BS	"	1109		X	PW-207BS-B	5	2	1	1		1		RINSATE } CYANIDE, METALS, VOA TCLP METALS, SEMIVOA AND, SEL. ALCOHOLS, RAD PARAMETERS ONLY
207BS	"	1130		X	PW-207BS-F	5	2	1	1		1		FIELD BLANK }

RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):
Elizabeth [illegible]	08/16/91 0845				
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED FOR LABORATORY BY (SIGNATURE):	DATE/TIME:	REMARKS: SHIP TO NUSLABS - FGH	

NUS 440 34 0484

NUS CORPORATION — **CHAIN OF CUSTODY RECORD**

PROJECT NO.: 2K68

SITE NAME: ROCKYFLATS - SOLAR PONDS

SAMPLERS (SIGNATURE): Bart B. Mara Cs

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	VOA	ALCOHOLS	32 oz glass (*)	MOISTURE	BULK DENSITY SPEC. GRANITY BLAINE FIT. ATTERBERG, SWELL	PARTICLE SIZE	REMARKS
207BS	08/19/91	0903		X	PS-207BS-NW	9	1	1	4	1	1	1	SLUDGE
207BS	"	0903		X	PS-207BS-NW-D	9	1	1	4	1	1	1	DUPLICATE - MS/MSD
207BS	"	0916		X	PS-207BS-NE	9	1	1	4	1	1	1	SLUDGE
207BS	"	0941		X	PS-207BS-SW	9	1	1	4	1	1	1	SLUDGE
207BS	"	0956		X	PS-207BS-SE	9	1	1	4	1	1	1	SLUDGE
207BS	08/19/91	FROM LAB		X	PS-207BS-T	2	2						TRIP BLANK VOAS ONLY, AQUEOUS
207BS	"	0930		X	PS-207BS-B	5	2	1	2				RINSATE } AQUEOUS: VOA, ALCOHOLS, SEMI VOA, CYANIDE, METALS, TCLP METALS, RAD PARAMETERS ONLY.
207BS	"	1015		X	PS-207BS-F	5	2	1	2				FIELD BLANK }
207A	08/19/91	1345		X	PS-207A-NE	9	1	1	4	1	1	1	

(*) ANALYSES: SEMI VOA, CYANIDE, METALS, pH, TCLP METALS, ASTM LEACH, TOC, AMMONIA, RAD PARAMETERS

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[signature]	08-20-91 0935				
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED FOR LABORATORY BY (SIGNATURE):	DATE/TIME:	REMARKS: SHIP TO HALLIBURTON NUS-PITTSBURGH FOR ANALYSIS	

NUS 440 34 0484

1/2

NUS CORPORATION — **CHAIN OF CUSTODY RECORD**

PROJECT NO.: 2K68

SITE NAME: ROCKY FLATS - SOLAR PONDS

SAMPLERS (SIGNATURE): [signature]

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	VOA	SEL. ALCOHOLS	SEMIVOA	CYANIDE METALS, NITRATE, AMMONIA, TOC, TCLP METALS, TDS, TSS	INORGANICS, RADS	REMARKS
207A	08/19/91	1254		X	PW-207A-NE	6	2	1	1		2		POND WATER
207A	"	1302		X	PW-207A-NW	6	2	1	1		2		"
207A	"	1307		X	PW-207A-SE	6	2	1	1		2		"
207A	08/19/91	FROM LAB		X	PW-207A-T	2	2						TRIP BLANK - VOAS ONLY

RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):
[signature]	08-20-91 0930				
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED FOR LABORATORY BY (SIGNATURE):	DATE/TIME:	REMARKS: SHIP TO HALLIBURTON NUS LABS - PITTSBURGH FOR ANALYSIS	

NUS 440 34 0484

2/2

NUS CORPORATION — **CHAIN OF CUSTODY RECORD**

PROJECT NO.: 2K68

SITE NAME: ROCKY FLATS - SOLAR PONDS

SAMPLERS (SIGNATURE): [signature]

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	VOA	SEMI VOA	SEL. ALCOHOLS	CYANIDE, METALS, AMMONIA, NITRATE, TOX, TCLP METALS, TDS, TSS, INORGANICS, RADS			REMARKS
207C	8/21/91	0856		X	PW-207C-NE	6	2	1	1		2		POND WATER
207C		0935		X	PW-207C-NW	6	2	1	1		2		
207C		0919		X	PW-207C-SE	6	2	1	1		2		
207C		0923		X	PW-207C-SW	6	2	1	1		2		
207C		0856		X	PW-207C-~~D~~ ER NE-D	7	2	2	1		2		DUPLICATE MS/MSD
207C		FROM LAB		X	PW-207C-T	2	2						TRIP BLANK -VOAS ONLY
207C		1155		X	PW-207C-B	5	2	1	1		1		RINSATE } VOA, SEMI VOA, SEL. ALCOHOL, CYANIDE, METALS, TCLP METALS, RADS ONLY
207C		0045		X	PW-207C-F	5	2	1	1		1		FIELD BLANK }
~~000~~				X	~~CW-000-B~~	5	2	1	1		1		~~RINSATE~~ ~~VOA, SEMI VOA, SEL. ALCOHOLS, CYANIDE, METALS, TCLP METALS, RADS~~
~~001~~				X	~~CW-001~~	6	2	1	1		2		
~~002~~				X	~~CW-002~~	6	2	1	1		2		
~~003~~				X	~~CW-003~~	6	2	1	1		2		
~~00~~					~~CW-00-D~~	7	2	2	1		2		~~DUPLICATE~~ ~~MS/MSD~~
~~000~~				X	~~CW-000-F~~	5	2	1	1		1		~~FIELD BLANK~~ ~~VOA, SEMI VOA, SEL. ALCOHOLS, CYANIDE, METALS, TCLP METALS, RADS~~

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[signature]	08/21/91 1130				
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RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED FOR LABORATORY BY (SIGNATURE):	DATE/TIME:	REMARKS: SHIP TO U/NUS LABS-PITTSBURGH FOR ANALYSIS	

NUS 440 34 0484

IN DRUMS # D-77684 & D-77688

NUS CORPORATION — **CHAIN OF CUSTODY RECORD**

PROJECT NO.: 2K68

SITE NAME: ROCKY FLATS - SOLAR PONDS

SAMPLERS (SIGNATURE): [signature]

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	VOA	SEL ALCOHOL	32 OZ. (A)	BULK DENSITY, SPEC. GRAV., BLAND & F. TEST, ATTERBERG, SWELL	MOISTURE	PARTICLE SIZE	REMARKS
001	08/22/91	1815		X	CS-001	9	1	1	4	1	1	1	CLARIFIER SLUDGE
001	"	1815		X	CS-001-D	5	1	1	3				SLUDGE DUPLICATE - ONE 32 OZ. JAR BROKE; USE CS-001 FOR ENOUGH FOR MS/MSD
002	"	1925		X	CS-002	9	1	1	4	1	1	1	CLARIFIER SLUDGE
003	"	1955		X	CS-003	9	1	1	4	1	1	1	CLARIFIER SLUDGE
000	"	FROM LAB		X	CS-000-T	2	2						AQUEOUS VOAS TRIP BLANK
000	"	2250		X	CS-000-B	5	2	1	2				RINSATE } VOA, SEL. ALCOHOLS, SEMI VOAS, CYANIDE, METALS, TCLP METALS, AND RADS ONLY AQUEOUS
000	"	2240		X	CS-000-F	5	2	1	2				FIELDBLANK }
													(A) 32 OZ JARS. ANALYSIS SEMI VOA, CYANIDE, METALS, PH, TCLP METALS, ASTM LEACH, TOC, AMMONIA, + RADS

RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):
[signature]	08-22-91 2310				
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RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED FOR LABORATORY BY (SIGNATURE):	DATE/TIME:	REMARKS: SHIP TO H/NUS LABS FOR ANALYSIS	

NUS 440 34 0484

ENVIRONMENTAL SAMPLES — IN COOLERS

NUS CORPORATION — **CHAIN OF CUSTODY RECORD**

PROJECT NO.: 2K68

SITE NAME: ROCKY FLATS - SOLAR PONDS

SAMPLERS (SIGNATURE): [signature]

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	VOA	SEL. ALCOHOL	SEMIVOA	CYANIDE, SULFATES, AMMONIA, NITRATE	TOX, TCLP METALS, TDS, TSS, INORGANICS	RAD	REMARKS
001	8/22/91	1605		X	CW-001	6	2	1	1		2		CLARIFIER WATER
001-D	8/22/91	1605		X	CW-001-D	7	2	1	2		2		DUPLICATE MS/MSD
002	8/22/91	1700		X	CW-002	6	2	1	1		2		CLAIR. H_2O
003	8/22/91	1725		X	CW-003	6	2	1	1		2		CLAIR. H_2O
000	8/22/91	From Lab		X	CW-000-T	2	2						TRIP BLANK
													* RINSATE + FIELD BLANK
													ARE IN DRUMS w/ CLARIFIER
													SAMPLES

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[signature]	08-23-91 0952				
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RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED FOR LABORATORY BY (SIGNATURE):	DATE/TIME:	REMARKS: TO W/NUS LABS PGH, FOR ANALYSIS	

NUS 440 34 0484

IN DRUMS # D-77687 + D-77690

NUS CORPORATION — **CHAIN OF CUSTODY RECORD**

PROJECT NO.: 2K68

SITE NAME: ROCKY FLATS SOLAR PONDS

SAMPLERS (SIGNATURE): [signature]

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	VOA	SEL. ALCOHOL	32 OZ. (*)	BULK DENSITY, SPEC. GRAV. BLANK, ATTERBERG SWELL TEST	MOISTURE	PARTICLE SIZE	REMARKS
207C	08/22/91	2015		X	PS-207C-~~NE~~ ER NW	9	1	1	4	1	1	1	POND SLUDGE
207C	08/22/91	2015		X	PS-207C-~~NE~~ NW ER-D	6	1	1	4				POND SLUDGE
207C	08/22/91	FROM LAB		X	PS-207C-T	2	2						TRIP BLANK - AQUEOUS VOA
207C	8/23/91	0914		X	PS-207C-SW	9	1	1	4	1	1	1	POND SLUDGE
207C	8/23/91	0921	X	~~X~~ ER	PS-207C-C	9	1	1	4	1	1	1	POND SLUDGE COMPOSITE
207C	8/23/91	0901	X		PS-207C-CB	11	1	1	4	1	2	2	ER ~~BON~~ POND SLUDGE - BERM COMPOSITE
207C	8/23/91	0900		X	PS-207C-F	5	2	1	2				SLUDGE (POND) FIELD BLANK
207C	8/23/91	0940		X	PS-207C-B	5	2	1	2				SLUDGE (POND) RINSATE BLANK
~~207~~													
000	8/22/91	2220		X	CW-000-B	5	2	1	2				CLAIRIFIER H_2O RINSATE
000	8/22/91	2225		X	CW-000-F	5	2	1	2				CLAIRIFER H_2O FIELD BLANK

AQUEOUS: VOA, SEL. ALCOHOL, SEMI VOA, CYANIDE, METALS, TCLP METALS, AND RADS ONLY

(*) THE CLAIRIFIER RINSATE + FIELD BLANK GO WITH CLARIFIER WATER SAMPLES SHIPPEN W/ THESE DRUMS, BUT SHIPPED IN COOLERS

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[signature]	08-23-91 0959				
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RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED FOR LABORATORY BY (SIGNATURE):	DATE/TIME:	REMARKS: Ship to H/NUS LABS PGH / FOR ANALYSIS	

NUS 440 34 0484