Treatability Study of Tank E-3-1 Waste: Mixed Waste Stream SR-W049

by
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Westinghouse Savannah River Company
Savannah River Site
Aiken, South Carolina 29808

DOE Contract No. **DE-AC09-96SR18500**

DISCLAIMER

WESTINGHOUSE SAVANNAH RIVER COMPANY
SAVANNAH RIVER TECHNOLOGY CENTER

KEY WORDS:
Mixed Waste
Waste Treatment

August 21,1997

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TREATABILITY STUDY OF TANK E-3-1 WASTE: MIXED WASTE STREAM SR-W049

SUMMARY

Treatability studies were conducted for tank E-3-1 waste which was previously characterized in WSRC-RP-97-0078. The waste was determined to be mixed waste because it displayed the characteristic of metal toxicity for Hg and Cr and was also contaminated with low levels of radionuclides.

Two types of treatments for qualifying this waste suitable for land disposal were evaluated: ion exchange and stabilization with hydraulic materials (portland cement, slag and magnesium phosphate cement). These treatments were selected for testing because:

1) Both treatments can be carried out as in-drum processes.
2) Cement stabilization is the RCRA/LDR best developed available technology (BDAT) for Hg (less than 280 mg/L) and for Cr.
3) Ion exchange via Mag-Sep is a promising alternative technology for in drum treatment of liquid wastes displaying metal toxicity.

Cement stabilization of the E-3-1 material (supernate and settled solids) resulted in waste forms which passed the TCLP test for both Hg and Cr. However, the ion exchange resins tested were ineffective in removing the Hg from this waste stream. Consequently, cement stabilization is recommended for a treatment of the five drums of the actual waste.

EXPERIMENTAL PROCEDURES

Ion Exchange Experiments

Supernate (aqueous liquid) collected from Tank E-3-1 Drum 3-116-3 was used in the ion exchange experiments. This sample, 3-116-3-A (aqueous), was selected because it contained the highest concentration of mercury (10.7 mg/L) and was the only sample to exceed the TCLP limit for Cr of 5 mg/L. Since all of the material in the five drums of Tank E-3-1 waste were taken from the same tank at the same time, only the sample with the highest concentration of mercury was used in the treatability testing. Results are expected to be applicable to all of the waste in all of the other drums as well as to that in Drum 3-116-3.

Since the speciation of the mercury in the E-3-1 waste was unknown, both anionic and cationic resins were selected to remove Hg from the aqueous portion. Resin GT-73 was selected for cationic Hg removal because it was demonstrated to be successful in previous laboratory testing and is being used in SRS processes, DPST 85-446. The Abmerlite IRA-400 resin was selected for anionic Hg removal based on recent laboratory experiments by J. Hage, SRTC, and the manufactures recommendation. Both resins are manufactured by Rhom and Haas.

The actual experiments were conducted to approximate an in-drum process. Resin GT-73 (0.1 g) was added to 100 mL of aqueous supernate from Drum 3-116-3. The amount of resin ws calculated to be more than enough to extract all of the Hg assuming that it was all in the cationic form. This material was stirred for 45 minutes and then filtered through a 0.45 um filter. The filtrate was analyzed for total Hg. Resin IRA-400 (0.1g) was also added to 100 mL of the same supernate. The mixture was again stirred for 45 minutes, then filtered to remove the resin. The filtrate was analyzed for Hg.

Cement Stabilization Experiments

Two different chemical systems were selected for testing: 1) Magnesium phosphate cement developed by Argonne National Laboratory; and 2) Portland cement, i. e., calcium silicate based cement, with and without reducing agent modifiers. The proportions of the ingredients in the various mixes are listed in Table 2. Fly ash was used in the magnesium phosphate system to aid in the mixing action. Slag, CaS, and Na_2SO_3 were added to the portland cement system to provide a chemically reducing environment in case the Cr was present as Cr^{+6}. These reducing agents are used for the same purpose in tow SRS waste forms, Saltstone and the High Level Waste Tank Reducing Grout designed for waste encapsulation and tank filling.

The magnesium phosphate samples were prepared by adding all of the ingredients to the 3-116-3-A supernate and stirring by hand for 30 minutes. This relatively long stirring time is required to achieve the stabilization reactions with the hydrated phosphate phases. These samples set with in 4 hours. The portland cement samples were prepared in a

similar manner except that they were stirred for 10 minutes. These samples set with in 24 hours. All stabilized samples cast in containers, sealed, and inspected for free water 2 and 24 hours after curing. The containers were kept sealed until the samples were prepared for the TCLP extraction

The cement waste forms were cured for 14 days in sealed containers and then prepared for the TCLP test. The TCLP test requires that solid material be crushed to pass a 3/8 inch sieve prior to being extracted in acid leachate. The leachates were analyzed for the characteristic metals by an off site testing laboratory, GEL, Charleston SC. The Data sheets form GEL are attached..

RESULTS AND DISCUSSION

Ion Exchange Experiments

Results are presented in Table 1. The total mercury present in sample 3-116-3-A was measured as 10.7 mg/L in the characterization studies and as 7.7 mg/L in the treatability studies. This difference is probably due to a filtration step which was carried out prior to the analysis of the sample used in this treatability study. The results show that neither resin removed mercury from the aqueous liquid fraction of the waste stream. The analysis indicated that there was more Hg (0.5 mg/L) in the treated sample than in the starting liquid. (This difference is considered within experimental error.) Results indicated that there was essentially no change in the Hg concentration of the starting material as the result of treatment with either resin.

In addition to using the ion exchange tests as part of the treatability study, these tests were also used to determine the speciation of the mercury in the waste. It appears that the mercury in the Tank E-3-1 supernate is present in a nonionic form, i. e., elemental, complexed as a neutral species or amalgamated, since neither ionic resin was successful in removing it.

Stabilization Experiments

All of the stabilized waste forms passed the TCLP test for Hg and Cr. Results are presented in Table 2. None of the stabilized samples had bleed water (free, drainable water) 24 hours after mixing.

CONCLUSIONS

The Tank E-3-1 waste stream consists of five partially full 55 gallon drums. This waste stream SR-W049 is classified as mixed because it displays the characteristic of metal (Hg and Cr) toxicity. Four of the drums contain settled solids and supernate. One drum contains only supernate. At least one of the drums contains a small amount or debris.

In drum processing is appropriate for stabilizing this waste provided that the settled solids can be slurried with the supernate and provided that the containers meet the

corrosion/integrity requirements for disposal. Two types of in-drum processing were evaluated, stabilization and ion exchange.

Stabilization is effective in treating the Tank E-3-1 waste stream. Portland cement and magnesium phosphate cement were tested and both systems produced waste forms which passed the TCLP test. The TCLP and Universal Treatment Standard (UTS) limits for Hg and Cr are reported in Table 2 for comparison. Both sets of limits are reported because this waste stream may be treated after the UTS goes into effect.

Experiments performed in this study were conducted on a laboratory bench scale. Scale up to a 55 gallon experiment or process is expected to be straight forward. At the time of sampling, the settled solids were not compacted to the point of being difficult to sample. Consequently it is expected that mixing with an in drum recirculating or a paddle mixer will be sufficient to achieve a slurry. The stabilizing reagents (cement and additives) can be added to the top of the drums and blended into the waste slurry.

The only issue identified is one of corrosion of the disposal containers if in drum mixing is used. It should be noted that cement waste forms contain a small amount of water in the pores of the solidified material. The pore water is not drainable, but it is available for evaporation and subsequent condensation on the inner drum surfaces. Consequently, the disposal drums should be lined with plastic liners to minimize the potential for corrosion of the steel containers. Localized drum corrosion (pitting) and container failures have been encountered for cement waste forms at SRS (Naval Fuel cement based waste forms) and at other DOE sites (Oak ridge, K-25 cemented pond sludge).

The mercury in the aqueous portion of the E-3-1 waste stream appears to be nonionic because it could not be removed by anionic or cationic ion exchange resins which are very effective in binding mercury. Therefore, in drum ion exchange is not recommended for treatment of this waste stream. Since ion exchange is the mercury removal process in the SRS Effluent treatment Facility, ETF, this facility is appropriate for the E-3-1 supernate provided that effective blending with other low mercury waste streams can be assured. Since the quantity of supernate in the E-3-1 stream is less than 250 gallons, blending for ETF is an option.

RECOMMENDATIONS

Stabalize the Tank E-3-1 waste stream (SR-W049) with a portland cement or magnesium phosphate cement to meet the TCLP metals concentration limits. (The proportions of the stabilization ingredients will be approximately those listed in Table 2 for the bench scale studies.) This will allow the resulting waste forms to be disposed of as non hazardous, low-level radioactive waste.

For long term container integrity, 90 mil plastic liners with lids or other types of compatible liners should be used for disposal of the cement waste forms. (The magnesium phosphate system is reported to result in a waste form with no evaporable

pore water, Dileep Singh, Argonne National Laboratory. Consequently, the magnesium phosphate waste form may have a long term advantage with respect to container corrosion.)

The five drums of tank E-3-1 waste can be treated through one of the following options:

- In drum ashcrete processing at the CIF;
- In drum processing in N- Area.
- Treatability studies or processing at Argonne National Laboratory in their existing in drum mixer for magnesium phosphate waste forms. (The technical contact at Argonne is Dileep Singh.)
- Treatability studies or processing at INEL.
- Vendor stabilization. Potential vendors include Chem Nuclear or SEG
- ETF processing.

REFERENCES

C. A. Langton, Characterization of Tank E-3-1-: Mixed Waste Stream SR-W049 (U), WSRC-RP-97-0078, 2-21-97.

J. P. Bibler, EP-Toxicity Test of Saturated GT-73 Resin and Resin in Grout, DPST-85- 446, 4-24-85.

J. Hage, WSRC-NB-96-703.

Table 1. Results of Ion Exchange Treatment of E-3-1 liquid.

E-3-1 Waste Sample Description	Resin	Before Treatment [Hg] mg/L	After Treatment [Hg] mg/L	Effect of Treatment [Hg] mg/L change
Drum 3-116-1-A (liquid)	none	7.7	---	
	GT-73 (cationic)	7.7	8.2	+0.5
	IRA-400 (anionic)	7.7	7.8	+0.1

Table 2. Results of Stabilization Treatment of E-3-1 Liquid.

Sample No.	Stabilization Treatment Waste Form Ingredients	TCLP [Hg] (mg/L)	TCLP [Cr] (mg/L)
3	E-3-1 liquid MgO KH_2PO_4 Class F Fly Ash	0.00095	0.0130
4	E-3-1 liquid MgO KH_2PO_4 Slag	0.00011	0.0086
I	E-3-1 Liquid Type I Portland Cement	0.00007	0.0573
II	E-3-1 Liquid Type I Portland Cement	0.000130	0.152
IV	E-3-1 Liquid Type I Port. Cem. CaS reagent grade	0.00212	0.429
V	E-3-1 Liquid Type I Port. Cem. $Na_2S_2O_3$	0.00204	0.291
VII	E-3-1 Liquid Type I Port. Cem. Slag $Na_2S_2O_3$	0.00076	0.0515
TCLP limit	-	**0.2**	**5.0**
UTS limit	-	**0.025**	**0.86**

ATTACHMENT 1

Analytical Results from General Engineering Laboratories

GENERAL ENGINEERING LABORATORIES

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CASE NARRATIVE REPORT
for
Westinghouse Savannah River Site
Subcontract No. AB93796N
EGG150

August 26, 1997

Laboratory Identification:

General Engineering Laboratories, Inc.

Summary:

Sample receipt

Eight solid samples for Westinghouse Savannah River Site arrived at General Engineering Laboratories, Inc., (GEL) Charleston, South Carolina on August 13, 1997, for analysis. All samples listed on the chain arrived without any visible signs of tampering. A 3 day turnaround for results was requested on the chain of custody. The results were faxed on August 18, 1997. Because the arsenic and selenium were not analyzed by graphite furnace as requested, the samples were relogged and analyzed on August 21,1997. The data included in this data package reflects the graphite furnance results.

The temperature of the samples was 2°C. The sample was stored properly according to SW-846 procedures and GEL Standard Operating Procedures (SOP).

The following samples were received by the laboratory:

Description	Sample Number
MIX I	9708249-01
MIX II	9708249-02
MIX III	9708249-03
MIX IV	9708249-04
MIX V	9708249-05
MIX VI	9708249-06
SAMPLE 3	9708249-07
SAMPLE 4	9708249-08

Case Narrative

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are written by analytical fraction in the enclosed narratives.

Data Package:

The enclosed data package contains the following sections: Case Narrative, Level II Certificate of Analysis, QC Sample Summaries, Chain of Custody, Sample Tracking Report, Nonconformance Reports if applicable & Electronic Data Hardcopy Report.

PO Box 30712 · Charleston, SC 29417 · 2040 Savage Road · 29407

(803) 556-8171 · Fax (803) 766-1178

Case Narrative - Westinghouse Savannah River Site
August 26, 1997
EGG150
page 2 of 4

The Level II Certificate of Analysis contains the following headings:

Sample ID:	Sample Identification
Lab ID:	This is the laboratory identification number
Matrix:	Sample matrix
Date Collected:	Date of sample collection
Date Received:	Date of sample receipt by the laboratory
Priority:	Internal status of sample turnaround
Collector:	Party responsible for sample collection.

The detail on the Certificate includes the following:

Parameter:	Analyte or characteristic tested for in the sample
Qualifier:	Qualifier used for data interpretation
Result:	Final result of each parameter.
DL:	Method Detection Limit
RL:	Reporting Limit
Units:	Units of final result
DF:	Dilution factor
Analyst:	Initials of analyst who performed the test
Date:	Date of analysis
Time:	Time of analysis
Batch:	Analytical batch in which the sample was analyzed
Method:	Analytical method used for the analysis of the sample. Identified on the report numerically with a corresponding table.
Surrogate Recovery:	Provided for organics analysis only. Surrogate compound identified.
Test:	Analytical test associated with surrogate compound.
Percent%:	Surrogate percent recovery
Acceptable Limits:	Limits established for surrogate recoveries based upon the method requirements.

The QC Summary Report contains the following headings:

Sample Parameter:	Analyte or characteristic tested for in the QC sample
Type:	Type of QC sample (i.e., blank, dup, LCS, LCS dup, MS, MSD)
Batch:	Analytical batch in which the QC sample was analyzed
NOM:	Nominal concentration of the spiking compound
Sample:	Amount of compound found in the sample associated with the QC sample.
QC:	Amount of compound found in the QC sample.
Units:	Units of final result
RPD%:	Relative percent difference between LCS/LCS dup, MS/MSD, and Sample/Sample duplicate
REC%:	Recovery for the control samples
Range:	Acceptance limits for control samples
Analyst:	Initials of analyst who performed the test
Date:	Date of analysis
Time:	Time of analysis

Case Narrative - Westinghouse Savannah River Site
August 26, 1997
EGG150
page 3 of 4

Types of QC samples that may be found on the QC Summary Report are:

Blank:	Results of the blank analysis for the sample batch
Dup:	Duplicate analysis of sample
LCS:	Lab control sample
LCS dup:	Lab control sample duplicate
MS:	Matrix spike
MSD:	Matrix spike duplicate

The following are definitions of reporting limits used at General Engineering Laboratories:

DL — Detection Limit: The minimum level of an analyte that can be determined (identified not quantified) with 99% confidence. The values are normally achieved by preparing and analyzing seven aliquots of laboratory water spiked 1 to 5 times the estimated MDL, taking the standard deviation and multiplying it against the one-tailed t-statistic at 99%. This computed value is then verified for reasonableness by repeating the study using the concentration found in the initial study, calculating an F-ratio, and computing the final limit. Sample specific preparation and dilution factors are applied to these limits when they are reported.

The detection limit is the minimum concentration of a substance that can be identified, measured, and reported with 99% confidence that the analyte concentration is above zero. It answers the question "Is It Present".

QL — Quantitation Limit: The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. The QL is generally 5 to 10 times the MDL. However, it may be nominally chosen within these guidelines to simplify data reporting. For many analytes the QL analyte concentration is selected as the lowest non-zero standard in the calibration curve. Sample QL's are highly matrix-dependent. Sample specific preparation and dilution factors are applied to these limits when they are reported

The QL is always $\geq$ DL

RL — Reporting Limit: Same as the QL except where driven by contract or client specifications. If the sample specific preparation and dilution factors cause the QL to be elevated above the RL, then the QL is used as the RL.

The quantitation limit is the lowest level at which a chemical may be accurately and reproducibly quantitated. It answers the question "HOW MUCH IS PRESENT".

Interpretation of RESULT column on the Certificate of Analysis:

If the final concentration in the sample was found to be above the RL, then the value reported is reported without a flag;

If the final concentration in the sample was found to be below the RL but above the DL, then the value reported is flagged with a "J";

If the final concentration in the sample was found to be below the DL, the value reported is flagged with a "U".

Quality Control Flags

General Engineering Laboratories maintains acceptance criteria for QC samples through use of statistical process control (SPC). The SPC limits are used to qualify data usability. The flagging criteria identified in WSRC AN95 Format does not necessarily coincide with the laboratory SPC criteria. There may be instances where the Electronic Data Deliverable (EDD) has flagged data based on the AN95 criteria and the lab has not identified the data to be outside of established control limits.

Those instances where the QC has not met laboratory SPC established criteria will be noted in the section case narratives that are included in this package.

This data package, to the best of my knowledge, is in compliance with technical and administrative requirements.

Katherine Woodward
Project Manager

wsrc00194.EGG150

Case Narrative
for
Westinghouse Savannah River Co.
EGG150
9708249

Analytical Batch Number: 106762

Analytical Method: EPA 7060,EPA 7740

Laboratory Number	Sample Description
9708249-01	MIX I
9708249-02	MIX II
9708249-03	MIX III
9708249-04	MIX IV
9708249-05	MIX V
9708249-06	MIX VI
9708249-07	SAMPLE 3
9708249-08	SAMPLE 4

Sample Preparation:

All samples were prepared in accordance with accepted procedures.

Instrument Calibration:

The instrument was properly calibrated.

Holding Time

All samples were run within the required holding time.

Blanks:

No target analytes were detected in the method blank above the required acceptance limit.

Spike Analyses:

The matrix spikes were run on the following Sample Number.

9708249-07

Acceptance limits are not applicable for TCLP spikes.

Laboratory Control Samples:

All analyte recoveries in the laboratory control sample were within the required acceptance limits.

Dilutions:

The following samples were diluted 1:20 due to matrix.

Laboratory Number
9708249-01
9708249-02
9708249-04
9708249-05
9708249-06
9708249-07
9708249-08

Case Narrative
for
Westinghouse Savannah River Co.
EGG150
9708249

Analytical Batch Number: 106513

Analytical Method: EPA 7470,EPA 7471

Laboratory Number	Sample Description
9708249-01	MIX I
9708249-02	MIX II
9708249-03	MIX III
9708249-04	MIX IV
9708249-05	MIX V
9708249-06	MIX VI
9708249-07	SAMPLE 3
9708249-08	SAMPLE 4

Sample Preparation:

All samples were prepared in accordance with accepted procedures.

Instrument Calibration:

The instrument was properly calibrated.

Holding Time:

All samples were analyzed within the required holding time.

Blanks:

No target analytes were detected in the method blank above the required acceptance limit.

Spike Analyses:

The matrix spikes were run on the following Sample Number.

9708249-01

Acceptance limits are not applicable for TCLP spikes.

Laboratory Control Samples:

All analyte recoveries in the laboratory control sample were within the required acceptance limits.

All analytes in the laboratory control sample duplicate were within the required acceptance limits for relative percent difference.

Sample Duplicates:

All sample duplicate results were within the required acceptance limits.

Dilutions:

None of the samples were diluted.

Non Conformance Reports:

The following Nonconformance Reports were written for this batch.

NCR# GEL-AS-MA-988.

Case Narrative
for
Westinghouse Savannah River Co.
EGG150
9708249

Analytical Batch Number: 106517

Analytical Method: EPA 6010A,SW846 6010A

Laboratory Number	Sample Description
9708249-01	MIX I
9708249-02	MIX II
9708249-03	MIX III
9708249-04	MIX IV
9708249-05	MIX V
9708249-06	MIX VI
9708249-07	SAMPLE 3
9708249-08	SAMPLE 4

Sample Preparation:

All samples were prepared in accordance with accepted procedures.

Instrument Calibration:

The instrument was properly calibrated.

Holding Time:

All samples were analyzed within the required holding time.

Blanks:

No target analytes were detected in the method blank above the required acceptance limit.

Spike Analyses:

The matrix spikes were run on the following Sample Number.

9708249-08

Acceptance limits are not applicable for TCLP spikes.

Laboratory Control Samples:

All analyte recoveries in the laboratory control sample were within the required acceptance limits.

All analytes in the laboratory control sample duplicate were within the required acceptance limits for relative percent difference.

Sample Duplicates:

All sample duplicate results were within the required acceptance limits.

Dilutions:

None of the samples were diluted.

Non Conformance Reports:

There were no Nonconformance Reports associated with this batch.

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Westinghouse Savannah River Co.
Building 773-58A, Room 1
P.O. Box 616
Aiken, South Carolina 29802
Contact: Ms. Janet Crawford
Project Description: Hazardous Waste Contract

cc: WSRC00497 Report Date: August 26, 1997 Page 1 of 2

Sample ID : MIX I
Lab ID : 9708249-01
Matrix : Solid
Date Collected : 08/13/97
Date Received : 08/13/97
Priority : Urgent
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Metals Analysis											
Arsenic	U	-0.0138	0.0222	0.500	MGL	20.	RMJ	08/21/97	1521	106762	1
Selenium	U	0.0304	0.0424	0.100	MGL	20.	RMJ	08/21/97	1521	106762	2
Mercury	U	0.00	0.00104	0.0200	MGL	1.0	RMJ	08/15/97	1417	106513	3
Silver	J	0.00484	0.000620	0.500	MGL	1.0	MBL	08/15/97	1231	106517	4
Barium	J	1.04	0.000332	10.0	MGL	1.0					
Cadmium	J	0.000367	0.000208	0.100	MGL	1.0	MBL	08/15/97	1231	106517	5
Chromium	J	0.0573	0.000729	0.500	MGL	1.0	MBL	08/15/97	1231	106517	4
Lead	U	0.000654	0.000678	0.500	MGL	1.0					

The following prep procedures were performed:

Mercury	CRB	08/14/97	1800	106513 3
TCLP Prep (Metals, Prep Only)	JL	08/13/97	1915	106426 6

M = Method	Method-Description
M 1	EPA 7060
M 2	EPA 7740
M 3	EPA 7470
M 4	SW846 6010A
M 5	EPA 6010A
M 6	EPA 1311M

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SC	10120	10582
TN	02934	02934

Client:	Westinghouse Savannah River Co.
	Building 773-58A, Room 1
	P.O. Box 616
	Aiken, South Carolina 29802
Contact:	Ms. Janet Crawford
Project Description:	Hazardous Waste Contract

cc: WSRC00497 Report Date: August 26, 1997

Sample ID : MIX I

M = Method **Method-Description**

Notes:
The qualifiers in this report are defined as follows:
ND indicates that the analyte was not detected at a concentration greater than the detection limit.
J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).
U indicates that the analyte was not detected at a concentration greater than the detection limit.
* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Kate Woodward at (803) 769-7376.

Reviewed By

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Westinghouse Savannah River Co.
Building 773-58A, Room 1
P.O. Box 616
Aiken, South Carolina 29802
Contact: Ms. Janet Crawford
Project Description: Hazardous Waste Contract

cc: WSRC00497 Report Date: August 26, 1997

Sample ID	: MIX II
Lab ID	: 9708249-02
Matrix	: Solid
Date Collected	: 08/13/97
Date Received	: 08/13/97
Priority	: Urgent
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Metals Analysis											
Arsenic	U	-0.00320	0.0222	0.500	MGL	20.	RMJ	08/21/97	1526	106762	1
Selenium	U	0.0374	0.0424	0.100	MGL	20.	RMJ	08/21/97	1526	106762	2
Mercury	U	0.000130	0.00104	0.0200	MGL	1.0	RMJ	08/15/97	1419	106513	3
Silver	J	0.00124	0.000620	0.500	MGL	1.0	MBL	08/15/97	1306	106517	4
Barium	J	0.626	0.000332	10.0	MGL	1.0					
Cadmium	U	0.000146	0.000208	0.100	MGL	1.0	MBL	08/15/97	1306	106517	5
Chromium	J	0.152	0.000729	0.500	MGL	1.0	MBL	08/15/97	1306	106517	4
Lead	J	0.00130	0.000678	0.500	MGL	1.0					

The following prep procedures were performed:

Mercury	CRB	08/14/97	1800	106513 3
TCLP Prep (Metals, Prep Only)	JL	08/13/97	1915	106426 6

M = Method	Method-Description
M 1	EPA 7060
M 2	EPA 7740
M 3	EPA 7470
M 4	SW846 6010A
M 5	EPA 6010A
M 6	EPA 1311M

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Notes:
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This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Kate Woodward at (803) 769-7376.

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P.O. Box 616
Aiken, South Carolina 29802
Contact: Ms. Janet Crawford
Project Description: Hazardous Waste Contract

cc: WSRC00497 Report Date: August 26, 1997

Sample ID	: MIX III
Lab ID	: 9708249-03
Matrix	: Solid
Date Collected	: 08/13/97
Date Received	: 08/13/97
Priority	: Urgent
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Metals Analysis											
Arsenic	U	-0.00120	0.0222	0.500	MGL	1.0	RMJ	08/21/97	1532	106762	1
Selenium	U	0.0284	0.0424	0.100	MGL	1.0	RMJ	08/21/97	1532	106762	2
Mercury	U	0.000450	0.00104	0.0200	MGL	1.0	RMJ	08/15/97	1422	106513	3
Silver	J	0.00100	0.000620	0.500	MGL	1.0	MBL	08/15/97	1311	106517	4
Barium	J	0.589	0.000332	10.0	MGL	1.0					
Cadmium	J	0.000216	0.000208	0.100	MGL	1.0	MBL	08/15/97	1311	106517	5
Chromium	J	0.149	0.000729	0.500	MGL	1.0	MBL	08/15/97	1311	106517	4
Lead	J	0.00102	0.000678	0.500	MGL	1.0					

The following prep procedures were performed:

Mercury	CRB	08/14/97	1800	106513 3
TCLP Prep (Metals, Prep Only)	JL	08/13/97	1915	106426 6

M = Method	Method-Description
M 1	EPA 7060
M 2	EPA 7740
M 3	EPA 7470
M 4	SW846 6010A
M 5	EPA 6010A
M 6	EPA 1311M

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FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Westinghouse Savannah River Co.
Building 773-58A, Room 1
P.O. Box 616
Aiken, South Carolina 29802
Contact: Ms. Janet Crawford
Project Description: Hazardous Waste Contract

cc: WSRC00497 Report Date: August 26, 1997 Page 2 of 2

Sample ID : MIX III

M = Method	Method-Description

Notes:
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ND indicates that the analyte was not detected at a concentration greater than the detection limit.
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TN	02934	02934

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Building 773-58A, Room 1
P.O. Box 616
Aiken, South Carolina 29802
Contact: Ms. Janet Crawford
Project Description: Hazardous Waste Contract

cc: WSRC00497 Report Date: August 26, 1997

Sample ID : MIX IV
Lab ID : 9708249-04
Matrix : Solid
Date Collected : 08/13/97
Date Received : 08/13/97
Priority : Urgent
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Metals Analysis											
Arsenic	U	-0.0140	0.0222	0.500	MGL	20.	RMJ	08/21/97	1537	106762	1
Selenium	U	0.0254	0.0424	0.100	MGL	20.	RMJ	08/21/97	1537	106762	2
Mercury	J	0.00212	0.00104	0.0200	MGL	1.0	RMJ	08/15/97	1424	106513	3
Silver	J	0.00109	0.000620	0.500	MGL	1.0	MBL	08/15/97	1316	106517	4
Barium	J	0.522	0.000332	10.0	MGL	1.0					
Cadmium	U	0.000158	0.000208	0.100	MGL	1.0	MBL	08/15/97	1316	106517	5
Chromium	J	0.429	0.000729	0.500	MGL	1.0	MBL	08/15/97	1316	106517	4
Lead	J	0.00116	0.000678	0.500	MGL	1.0					

The following prep procedures were performed:

Mercury	CRB	08/14/97	1800	106513 3
TCLP Prep (Metals, Prep Only)	JL	08/13/97	1915	106426 6

M = Method	Method-Description
M 1	EPA 7060
M 2	EPA 7740
M 3	EPA 7470
M 4	SW846 6010A
M 5	EPA 6010A
M 6	EPA 1311M

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SC	10120	10582
TN	02934	02934

Client:	Westinghouse Savannah River Co.
	Building 773-58A, Room 1
	P.O. Box 616
	Aiken, South Carolina 29802
Contact:	Ms. Janet Crawford
Project Description:	Hazardous Waste Contract

cc: WSRC00497 Report Date: August 26, 1997

Sample ID : MIX IV

M = Method	Method-Description

Notes:
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SC	10120	10582
TN	02934	02934

Client: Westinghouse Savannah River Co.
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Aiken, South Carolina 29802
Contact: Ms. Janet Crawford
Project Description: Hazardous Waste Contract

cc: WSRC00497 Report Date: August 26, 1997

Sample ID : MIX V
Lab ID : 9708249-05
Matrix : Solid
Date Collected : 08/13/97
Date Received : 08/13/97
Priority : Urgent
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Metals Analysis											
Arsenic	U	-0.0404	0.0222	0.500	MGL	20.	RMJ	08/21/97	1542	106762	1
Selenium	U	0.0218	0.0424	0.100	MGL	20.	RMJ	08/21/97	1542	106762	2
Mercury	J	0.00204	0.00104	0.0200	MGL	1.0	RMJ	08/15/97	1426	106513	3
Silver	J	0.00131	0.000620	0.500	MGL	1.0	MBL	08/15/97	1321	106517	4
Barium	J	0.476	0.000332	10.0	MGL	1.0					
Cadmium	U	0.000184	0.000208	0.100	MGL	1.0	MBL	08/15/97	1321	106517	5
Chromium	J	0.291	0.000729	0.500	MGL	1.0	MBL	08/15/97	1321	106517	4
Lead	U	0.000552	0.000678	0.500	MGL	1.0					

The following prep procedures were performed:

Mercury	CRB	08/14/97	1800	106513 3
TCLP Prep (Metals, Prep Only)	JL	08/13/97	1915	106426 6

M = Method	Method-Description
M 1	EPA 7060
M 2	EPA 7740
M 3	EPA 7470
M 4	SW846 6010A
M 5	EPA 6010A
M 6	EPA 1311M

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FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Westinghouse Savannah River Co.
Building 773-58A, Room 1
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Aiken, South Carolina 29802
Contact: Ms. Janet Crawford
Project Description: Hazardous Waste Contract

cc: WSRC00497 Report Date: August 26, 1997

Sample ID : MIX V

M = Method	Method-Description

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Client: Westinghouse Savannah River Co.
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Aiken, South Carolina 29802
Contact: Ms. Janet Crawford
Project Description: Hazardous Waste Contract

cc: WSRC00497 Report Date: August 26, 1997

Sample ID : MIX VI
Lab ID : 9708249-06
Matrix : Solid
Date Collected : 08/13/97
Date Received : 08/13/97
Priority : Urgent
Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Metals Analysis											
Arsenic	U	-0.0108	0.0222	0.500	MGL	20.	RMJ	08/21/97	1547	106762	1
Selenium	U	-0.0200	0.0424	0.100	MGL	20.	RMJ	08/21/97	1547	106762	2
Mercury	U	0.000760	0.00104	0.0200	MGL	1.0	RMJ	08/15/97	1429	106513	3
Silver	J	0.00124	0.000620	0.500	MGL	1.0	MBL	08/15/97	1327	106517	4
Barium	J	0.504	0.000332	10.0	MGL	1.0					
Cadmium	U	0.000159	0.000208	0.100	MGL	1.0	MBL	08/15/97	1327	106517	5
Chromium	J	0.0515	0.000729	0.500	MGL	1.0	MBL	08/15/97	1327	106517	4
Lead	J	0.00118	0.000678	0.500	MGL	1.0					

The following prep procedures were performed:

Mercury	CRB	08/14/97	1800	106513 3
TCLP Prep (Metals, Prep Only)	JL	08/13/97	1915	106426 6

M = Method	Method-Description
M 1	EPA 7060
M 2	EPA 7740
M 3	EPA 7470
M 4	SW846 6010A
M 5	EPA 6010A
M 6	EPA 1311M

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NC	233	
SC	10120	10582
TN	02934	02934

Client: Westinghouse Savannah River Co.
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Project Description: Hazardous Waste Contract

cc: WSRC00497 Report Date: August 26, 1997 Page 2 of 2

Sample ID : MIX VI

M = Method	Method-Description

Notes:
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TN	02934	02934

Client: Westinghouse Savannah River Co.
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P.O. Box 616
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Contact: Ms. Janet Crawford
Project Description: Hazardous Waste Contract

cc: WSRC00497 Report Date: August 26, 1997 Page 1 of 2

Sample ID	: SAMPLE 3
Lab ID	: 9708249-07
Matrix	: Solid
Date Collected	: 08/13/97
Date Received	: 08/13/97
Priority	: Urgent
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Metals Analysis											
Arsenic		0.896	0.0222	0.500	MGL	20.	RMJ	08/21/97	1552	106762	1
Selenium	J	0.0568	0.0424	0.100	MGL	20.	RMJ	08/21/97	1552	106762	2
Mercury	U	0.000950	0.00104	0.0200	MGL	1.0	RMJ	08/15/97	1431	106513	3
Silver	J	0.000976	0.000620	0.500	MGL	1.0	MBL	08/15/97	1332	106517	4
Barium	J	0.270	0.000332	10.0	MGL	1.0					
Cadmium	J	0.000274	0.000208	0.100	MGL	1.0	MBL	08/15/97	1332	106517	5
Chromium	J	0.0130	0.000729	0.500	MGL	1.0	MBL	08/15/97	1332	106517	4
Lead	J	0.00121	0.000678	0.500	MGL	1.0					

The following prep procedures were performed:

Mercury	CRB	08/14/97	1800	106513 3
TCLP Prep (Metals, Prep Only)	JL	08/13/97	1915	106426 6

M = Method	Method-Description
M 1	EPA 7060
M 2	EPA 7740
M 3	EPA 7470
M 4	SW846 6010A
M 5	EPA 6010A
M 6	EPA 1311M

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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Westinghouse Savannah River Co.
Building 773-58A, Room 1
P.O. Box 616
Aiken, South Carolina 29802
Contact: Ms. Janet Crawford
Project Description: Hazardous Waste Contract

cc: WSRC00497 Report Date: August 26, 1997

Sample ID : SAMPLE 3

M = Method	Method-Description

Notes:
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Laboratory Certifications

STATE	GEL	EPI
FL	E87156/87294	E87472/87458
NC	233	
SC	10120	10582
TN	02934	02934

Client: Westinghouse Savannah River Co.
Building 773-58A, Room 1
P.O. Box 616
Aiken, South Carolina 29802
Contact: Ms. Janet Crawford
Project Description: Hazardous Waste Contract

cc: WSRC00497 Report Date: August 26, 1997

Sample ID	: SAMPLE 4
Lab ID	: 9708249-08
Matrix	: Solid
Date Collected	: 08/13/97
Date Received	: 08/13/97
Priority	: Urgent
Collector	: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	M
Metals Analysis											
Arsenic	J	0.0270	0.0222	0.500	MGL	20.	RMJ	08/21/97	1557	106762	1
Selenium	U	0.0330	0.0424	0.100	MGL	20.	RMJ	08/21/97	1557	106762	2
Mercury	U	0.000110	0.00104	0.0200	MGL	1.0	RMJ	08/15/97	1434	106513	3
Silver	J	0.00103	0.000620	0.500	MGL	1.0	MBL	08/15/97	1337	106517	4
Barium	J	0.182	0.000332	10.0	MGL	1.0					
Cadmium	J	0.00117	0.000208	0.100	MGL	1.0	MBL	08/15/97	1337	106517	5
Chromium	J	0.00859	0.000729	0.500	MGL	1.0	MBL	08/15/97	1337	106517	4
Lead	J	0.000927	0.000678	0.500	MGL	1.0					

The following prep procedures were performed:

Mercury	CRB	08/14/97	1800	106513 3
TCLP Prep (Metals, Prep Only)	JL	08/13/97	1915	106426 6

M = Method	Method-Description
M 1	EPA 7060
M 2	EPA 7740
M 3	EPA 7470
M 4	SW846 6010A
M 5	EPA 6010A
M 6	EPA 1311M

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NC	233	
SC	10120	10582
TN	02934	02934

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Contact: Ms. Janet Crawford
Project Description: Hazardous Waste Contract

cc: WSRC00497 Report Date: August 26, 1997 Page 2 of 2

Sample ID : SAMPLE 4

M = Method	Method-Description

Notes:
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Reviewed By

QC Summary Report

Project Description: Hazardous Waste Contract

cc: WSRC00497 Lab. Sample ID: 9708249% Report Date: August 26, 1997 Page 1 of 2

Sample/Parameter	Type	Batch	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Analyst	Date	Time
Metals Analysis													
QC450042	BLANK	106762											
Arsenic						-0.000590	MGL				RMJ	08/21/97	1516
Selenium						0.000940	MGL						
QC450043	BLANK	106762											
Arsenic						-0.00251	MGL				RMJ	08/21/97	1612
Selenium						0.00272	MGL						
QC450046	LCS	106762											
Arsenic			0.04			0.0357	MGL		89.2	(80.0 - 120.)	RMJ	08/21/97	1510
Selenium			0.04			0.0376	MGL		94.1	(80.0 - 120.)			
QC450044	9708249-07MS	106762											
Arsenic			0.8	0.896		1.48	MGL		73.0		RMJ	08/21/97	1617
Selenium			0.8	0.0568		0.694	MGL		79.7				
QC450045	9708249-07MSD	106762											
Arsenic			0.8	0.896		1.47	MGL	1.87	71.6		RMJ	08/21/97	1624
Selenium			0.8	0.0568		0.710	MGL	2.39	81.6				
QC449092	BLANK	106513											
Mercury						-0.000100	MGL				RMJ	08/15/97	1441
QC449093	BLANK	106513											
Mercury						-9.00E-05	MGL				RMJ	08/15/97	1443
QC449105	9708249-01DUP	106513											
Mercury				0.00		-5.00E-05	MGL	0.00			RMJ	08/15/97	1522
QC449106	LCS	106513											
Mercury			0.02			0.0204	MGL		102	(77.7 - 123.)	RMJ	08/15/97	1524
QC449107	LCS DUP	106513											
Mercury			0.02			0.0212	MGL	3.85	106	(0.00 - 23.3)	RMJ	08/15/97	1527
QC449103	9708249-01MS	106513											
Mercury			0.02	0.00		0.0263	MGL		132		RMJ	08/15/97	1517
QC449104	9708249-01MSD	106513											
Mercury			0.02	0.00		0.0246	MGL	6.68	123		RMJ	08/15/97	1519
QC449116	BLANK	106517											
Barium						0.0426	MGL				MBL	08/15/97	1215
Cadmium						0.000157	MGL						
Chromium						0.00110	MGL						
Lead						0.000933	MGL						
Silver						0.000266	MGL						
QC449117	BLANK	106517											
Barium						0.000424	MGL				MBL	08/15/97	1221
Cadmium						0.000125	MGL						
Chromium						0.00102	MGL						

QC Summary Report

Project Description: Hazardous Waste Contract

cc: WSRC00497 Lab. Sample ID: 9708249% Report Date: August 26, 1997 Page 2 of 2

Sample/Parameter	Type	Batch	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Analyst	Date	Time
Lead						-0.000274	MGL				MBL	08/15/97	1221
Silver						0.000376	MGL						
QC449119	9708249-08DUP	106517											
Barium				0.182		0.182	MGL	0.117			MBL	08/15/97	1342
Cadmium				0.00117		0.000394	MGL	99.3					
Chromium				0.00859		0.00818	MGL	4.91					
Lead				0.000927		0.000944	MGL	200					
Silver				0.00103		0.000291	MGL	200					
QC449118	LCS	106517											
Barium			10			9.95	MGL		99.5	(71.1 - 107.)	MBL	08/15/97	1226
Cadmium			1			1.12	MGL		112	(73.6 - 120.)			
Chromium			5			5.19	MGL		104	(76.3 - 116.)			
Lead			5			5.32	MGL		106	(75.7 - 116.)			
Silver			0.5			0.505	MGL		101	(66.7 - 113.)			
QC449121	9708249-08MS	106517											
Barium			10	0.182		10.1	MGL		99.2		MBL	08/15/97	1352
Cadmium			1	0.00117		1.15	MGL		115				
Chromium			5	0.00859		5.14	MGL		103				
Lead			5	0.000927		5.35	MGL		107				
Silver			0.5	0.00103		0.519	MGL		104				
QC449120	9708249-08SERIAL	106517											
Barium				0.182		0.180	MGL	0.999			MBL	08/15/97	1347
Cadmium				0.00117		-0.000695	MGL	200					
Chromium				0.00859		0.00843	MGL	1.92					
Lead				0.000927		0.00333	MGL	200					
Silver				0.00103		0.00397	MGL	118					

Notes:
The qualifiers in this report are defined as follows:
J indicates presence of analyte < RL (Report Limit)
U indicates presence of analyte < DL (Detect Limit)

n/a indicates that spike recovery limits do not apply when
sample concentration exceeds spike conc by a factor of 4 or more

EGG150

Sample	Lab Number
SAMPLE 3	9708249-07
SAMPLE 4	9708249-08
MIX I	9708249-01
MIX II	9708249-02
MIX III	9708249-03
MIX IV	9708249-04
MIX V	9708249-05
MIX VI	9708249-06

LB		08149718OO	08149718OO	0815971441EPA7470	106513	GEQC449092	3	HGTOT	2.00UJ	Q	L	2.00UGL	0.00	0	115	106513	RMJ	0.00			0		0
LB		08149718OO	08149718OO	0815971443EPA7470	106513	GEQC449093	3	HGTOT	2.00UJ	Q	L	2.00UGL	0.00	0	115	106513	RMJ	0.00	T		0		0
LB		08149718OO	08149718OO	0815971524EPA7470	106513	GEQC449106	2D	HGTOT	2.00J	Q	L	20.4UGL	20.0	102.0	115	106513	RMJ	0.00			0		0
LB		08149718OO	08149718OO	0815971527EPA7470	106513	GEQC449107	2E	HGTOT	2.00J	Q	L	21.2UGL	20.0	106.0	115	106513	RMJ	0.00			0		0
LB		08159710OO	0815971000EPA3005	0815971215SW8466010A	106517	GEQC449116	3	CDTOT	5.00UJ	Q	L	5.00UGL	0.00	0	114	106517	MBL	0.00			0		0
LB		08159710OO	0815971000EPA3005	0815971221SW8466010A	106517	GEQC449117	3	CDTOT	5.00UJ	Q	L	5.00UGL	0.00	0	114	106517	MBL	0.00			0		0
LB		08159710OO	0815971000EPA3005	0815971226SW8466010A	106517	GEQC449118	2D	CDTOT	5.00J	Q	L	1120UGL	1000	112.0	114	106517	MBL	0.00	T	T	0		0
LB		08159710OO	0815971000SW8363010A	0815971215SW8466010A	106517	GEQC449116	3	CRTOT	5.00J	EQVL		1.10UGL	0.00	0	114	106517	MBL	0.00			0		0
LB		08159710OO	0815971000SW8363010A	0815971221SW8466010A	106517	GEQC449117	3	CRTOT	5.00J	EQVL		1.02UGL	0.00	0	114	106517	MBL	0.00			0		0
LB		08159710OO	0815971000SW8363010A	0815971226SW8466010A	106517	GEQC449118	2D	CRTOT	5.00J	QV	L	5190UGL	5000	104.0	114	106517	MBL	0.00	T	T	0		0
LB		08159710OO	0815971000SW8463010A	0815971215SW8466010A	106517	GEQC449116	3	AGTOT	5.00UJ	Q	L	5.00UGL	0.00	0	114	106517	MBL	0.00			0		0
LB		08159710OO	0815971000SW8463010A	0815971215SW8466010A	106517	GEQC449116	3	BATOT	5.00J	QV	L	42.6UGL	0.00	0	114	106517	MBL	0.00			0		0
LB		08159710OO	0815971000SW8463010A	0815971215SW8466010A	106517	GEQC449116	3	PBTOT	5.00J	EQVL		0.933UGL	0.00	0	114	106517	MBL	0.00			0		0
LB		08159710OO	0815971000SW8463010A	0815971221SW8466010A	106517	GEQC449117	3	AGTOT	5.00UJ	Q	L	5.00UGL	0.00	0	114	106517	MBL	0.00	T		0		0
LB		08159710OO	0815971000SW8463010A	0815971221SW8466010A	106517	GEQC449117	3	BATOT	5.00J	EQVL		0.424UGL	0.00	0	114	106517	MBL	0.00			0		0
LB		08159710OO	0815971000SW8463010A	0815971221SW8466010A	106517	GEQC449117	3	PBTOT	5.00UJ	Q	L	5.00UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
LB		08159710OO	0815971000SW8463010A	0815971226SW8466010A	106517	GEQC449118	2D	AGTOT	5.00J	Q	L	505.UGL	500.	101.0	114	106517	MBL	0.00			0		0
LB		08159710OO	0815971000SW8463010A	0815971226SW8466010A	106517	GEQC449118	2D	BATOT	5.00J	QV	L	9950UGL	10000	99.50	114	106517	MBL	0.00			0		0
LB		08159710OO	0815971000SW8463010A	0815971226SW8466010A	106517	GEQC449118	2D	PBTOT	5.00J	QV	L	5320UGL	5000	106.0	114	106517	MBL	0.00	T	T	0		0
LB		08199715OO	0819971500EPA3020	0821971510EPA7060	106762	GEQC450046	2D	ASTOT	5.00J	Q	L	35.7UGL	40.0	89.20	113	106762	RMJ	0.00			0		0
LB		08199715OO	0819971500EPA3020	0821971510EPA7740	106762	GEQC450046	2D	SETOT	5.00J	QV	L	37.6UGL	40.0	94.10	113	106762	RMJ	0.00			0		0
LB		08199715OO	0819971500EPA3020	0821971516EPA7060	106762	GEQC450042	3	ASTOT	5.00UJ	Q	L	5.00UGL	0.00	0	113	106762	RMJ	0.00			0		0
LB		08199715OO	0819971500EPA3020	0821971516EPA7740	106762	GEQC450042	3	SETOT	5.00UJ	Q	L	5.00UGL	0.00	0	113	106762	RMJ	0.00			0		0
LB		08199715OO	0819971500EPA3020	0821971612EPA7060	106762	GEQC450043	3	ASTOT	5.00UJ	Q	L	5.00UGL	0.00	0	113	106762	RMJ	0.00	T	T	0		0
LB		08199715OO	0819971500EPA3020	0821971612EPA7740	106762	GEQC450043	3	SETOT	5.00J	EQVL		2.72UGL	0.00	0	113	106762	RMJ	0.00	T	T	0		0
MIX I	081397	08139708149718OO		0815971417EPA7470	106513	GE9708249-01		HGTOT	2.00UJ	Q	L	2.00UGL	0.00	0	115	106513	RMJ	0.00			0		0
MIX I	081397	08139708149718OO		0815971517EPA7470	106513	GEQC449103	2A	HGTOT	2.00J	Q	L	26.3UGL	20.0	132.0	115	106513	RMJ	0.00			0		0
MIX I	081397	08139708149718OO		0815971519EPA7470	106513	GEQC449104	2B	HGTOT	2.00J	Q	L	24.6UGL	20.0	123.0	115	106513	RMJ	0.00			0		0
MIX I	081397	08139708149718OO		0815971522EPA7470	106513	GEQC449105	1	HGTOT	2.00UJ	Q	L	2.00UGL	0.00	0	115	106513	RMJ	0.00			0		0
MIX I	081397	08139708159710OOEPA3005		0815971231SW8466010A	106517	GE9708249-01		CDTOT	5.00J	EQ	L	0.367UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX I	081397	08139708159710OOSW8363010A		0815971231SW8466010A	106517	GE9708249-01		CRTOT	5.00J	QV	L	57.3UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX I	081397	08139708159710OOSW8463010A		0815971231SW8466010A	106517	GE9708249-01		AGTOT	5.00J	EQ	L	4.84UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX I	081397	08139708159710OOSW8463010A		0815971231SW8466010A	106517	GE9708249-01		BATOT	5.00J	QV	L	1040UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX I	081397	08139708159710OOSW8463010A		0815971231SW8466010A	106517	GE9708249-01		PBTOT	5.00UJ	Q	L	5.00UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX I	081397	08139708199715OOEPA3020		0821971521EPA7060	106762	GE9708249-01		ASTOT	100.UJ	Q	L	100.UGL	0.00	1	2013	106762	RMJ	0.00	T	T	0		0
MIX I	081397	08139708199715OOEPA3020		0821971521EPA7740	106762	GE9708249-01		SETOT	100.UJ	QV	L	100.UGL	0.00	1	2013	106762	RMJ	0.00	T	T	0		0
MIX II	081397	08139708149718OO		0815971419EPA7470	106513	GE9708249-02		HGTOT	2.00U			2.00UGL	0.00	0	115	106513	RMJ	0.00	T	T	0		0
MIX II	081397	08139708159710OOEPA3005		0815971306SW8466010A	106517	GE9708249-02		CDTOT	5.00U			5.00UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX II	081397	08139708159710OOSW8363010A		0815971306SW8466010A	106517	GE9708249-02		CRTOT	5.00	V		152.UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX II	081397	08139708159710OOSW8463010A		0815971306SW8466010A	106517	GE9708249-02		AGTOT	5.00J	E		1.24UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX II	081397	08139708159710OOSW8463010A		0815971306SW8466010A	106517	GE9708249-02		BATOT	5.00	V		626.UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX II	081397	08139708159710OOSW8463010A		0815971306SW8466010A	106517	GE9708249-02		PBTOT	5.00JU	EV		1.30UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX II	081397	08139708199715OOEPA3020		0821971526EPA7060	106762	GE9708249-02		ASTOT	100.U			100.UGL	0.00	1	2013	106762	RMJ	0.00	T	T	0		0
MIX II	081397	08139708199715OOEPA3020		0821971526EPA7740	106762	GE9708249-02		SETOT	100.U	V		100.UGL	0.00	1	2013	106762	RMJ	0.00	T	T	0		0
MIX III	081397	08139708149718OO		0815971422EPA7470	106513	GE9708249-03		HGTOT	2.00U			2.00UGL	0.00	0	115	106513	RMJ	0.00	T	T	0		0
MIX III	081397	08139708159710OOEPA3005		0815971311SW8466010A	106517	GE9708249-03		CDTOT	5.00J	E		0.216UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX III	081397	08139708159710OOSW8363010A		0815971311SW8466010A	106517	GE9708249-03		CRTOT	5.00	V		149.UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX III	081397	08139708159710OOSW8463010A		0815971311SW8466010A	106517	GE9708249-03		AGTOT	5.00J	E		1.00UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX III	081397	08139708159710OOSW8463010A		0815971311SW8466010A	106517	GE9708249-03		BATOT	5.00	V		589.UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX III	081397	08139708159710OOSW8463010A		0815971311SW8466010A	106517	GE9708249-03		PBTOT	5.00JU	EV		1.02UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX III	081397	08139708199715OOEPA3020		0821971532EPA7060	106762	GE9708249-03		ASTOT	100.U			100.UGL	0.00	0	113	106762	RMJ	0.00	T	T	0		0
MIX III	081397	08139708199715OOEPA3020		0821971532EPA7740	106762	GE9708249-03		SETOT	100.U			100.UGL	0.00	0	113	106762	RMJ	0.00	T	T	0		0
MIX IV	081397	08139708149718OO		0815971424EPA7470	106513	GE9708249-04		HGTOT	2.00			2.12UGL	0.00	0	115	106513	RMJ	0.00	T	T	0		0
MIX IV	081397	08139708159710OOEPA3005		0815971316SW8466010A	106517	GE9708249-04		CDTOT	5.00U			5.00UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX IV	081397	08139708159710OOSW8363010A		0815971316SW8466010A	106517	GE9708249-04		CRTOT	5.00	V		429.UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX IV	081397	08139708159710OOSW8463010A		0815971316SW8466010A	106517	GE9708249-04		AGTOT	5.00J	E		1.09UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX IV	081397	08139708159710OOSW8463010A		0815971316SW8466010A	106517	GE9708249-04		BATOT	5.00	V		522.UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX IV	081397	08139708159710OOSW8463010A		0815971316SW8466010A	106517	GE9708249-04		PBTOT	5.00JU	EV		1.16UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX IV	081397	08139708199715OOEPA3020		0821971537EPA7060	106762	GE9708249-04		ASTOT	100.U			100.UGL	0.00	1	2013	106762	RMJ	0.00	T	T	0		0
MIX IV	081397	08139708199715OOEPA3020		0821971537EPA7740	106762	GE9708249-04		SETOT	100.U	V		100.UGL	0.00	1	2013	106762	RMJ	0.00	T	T	0		0
MIX V	081397	08139708149718OO		0815971426EPA7470	106513	GE9708249-05		HGTOT	2.00			2.04UGL	0.00	0	115	106513	RMJ	0.00	T	T	0		0
MIX V	081397	08139708159710OOEPA3005		0815971321SW8466010A	106517	GE9708249-05		CDTOT	5.00U			5.00UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX V	081397	08139708159710OOSW8363010A		0815971321SW8466010A	106517	GE9708249-05		CRTOT	5.00	V		291.UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX V	081397	08139708159710OOSW8463010A		0815971321SW8466010A	106517	GE9708249-05		AGTOT	5.00J	E		1.31UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX V	081397	08139708159710OOSW8463010A		0815971321SW8466010A	106517	GE9708249-05		BATOT	5.00	V		476.UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX V	081397	08139708159710OOSW8463010A		0815971321SW8466010A	106517	GE9708249-05		PBTOT	5.00U			5.00UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX V	081397	08139708199715OOEPA3020		0821971542EPA7060	106762	GE9708249-05		ASTOT	100.U			100.UGL	0.00	1	2013	106762	RMJ	0.00	T	T	0		0
MIX V	081397	08139708199715OOEPA3020		0821971542EPA7740	106762	GE9708249-05		SETOT	100.U	V		100.UGL	0.00	1	2013	106762	RMJ	0.00	T	T	0		0
MIX VI	081397	08139708149718OO		0815971429EPA7470	106513	GE9708249-06		HGTOT	2.00U			2.00UGL	0.00	0	115	106513	RMJ	0.00	T	T	0		0
MIX VI	081397	08139708159710OOEPA3005		0815971327SW8466010A	106517	GE9708249-06		CDTOT	5.00U			5.00UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX VI	081397	08139708159710OOSW8363010A		0815971327SW8466010A	106517	GE9708249-06		CRTOT	5.00	V		51.5UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX VI	081397	08139708159710OOSW8463010A		0815971327SW8466010A	106517	GE9708249-06		AGTOT	5.00J	E		1.24UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX VI	081397	08139708159710OOSW8463010A		0815971327SW8466010A	106517	GE9708249-06		BATOT	5.00	V		504.UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX VI	081397	08139708159710OOSW8463010A		0815971327SW8466010A	106517	GE9708249-06		PBTOT	5.00JU	EV		1.18UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
MIX VI	081397	08139708199715OOEPA3020		0821971547EPA7060	106762	GE9708249-06		ASTOT	100.U			100.UGL	0.00	1	2013	106762	RMJ	0.00	T	T	0		0
MIX VI	081397	08139708199715OOEPA3020		0821971547EPA7740	106762	GE9708249-06		SETOT	100.U	V		100.UGL	0.00	1	2013	106762	RMJ	0.00	T	T	0		0
SAMPLE 3	081397	08139708149718OO		0815971431EPA7470	106513	GE9708249-07		HGTOT	2.00U			2.00UGL	0.00	0	115	106513	RMJ	0.00	T	T	0		0
SAMPLE 3	081397	08139708159710OOEPA3005		0815971332SW8466010A	106517	GE9708249-07		CDTOT	5.00J	E		0.274UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
SAMPLE 3	081397	08139708159710OOSW8363010A		0815971332SW8466010A	106517	GE9708249-07		CRTOT	5.00	V		13.0UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
SAMPLE 3	081397	08139708159710OOSW8463010A		0815971332SW8466010A	106517	GE9708249-07		AGTOT	5.00J	E		0.976UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
SAMPLE 3	081397	08139708159710OOSW8463010A		0815971332SW8466010A	106517	GE9708249-07		BATOT	5.00	V		270.UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
SAMPLE 3	081397	08139708159710OOSW8463010A		0815971332SW8466010A	106517	GE9708249-07		PBTOT	5.00JU	EV		1.21UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
SAMPLE 3	081397	08139708199715OOEPA3020		0821971552EPA7060	106762	GE9708249-07		ASTOT	100.			896.UGL	0.00	1	2013	106762	RMJ	0.00	T	T	0		0
SAMPLE 3	081397	08139708199715OOEPA3020		0821971552EPA7740	106762	GE9708249-07		SETOT	100.J	EV		56.8UGL	0.00	1	2013	106762	RMJ	0.00	T	T	0		0
SAMPLE 3	081397	08139708199715OOEPA3020		0821971617EPA7060	106762	GEQC450044	2A	ASTOT	100.			1480UGL	800.	73.01	2013	106762	RMJ	0.00			0		0
SAMPLE 3	081397	08139708199715OOEPA3020		0821971617EPA7740	106762	GEQC450044	2A	SETOT	100.	V		694.UGL	800.	79.71	2013	106762	RMJ	0.00			0		0
SAMPLE 3	081397	08139708199715OOEPA3020		0821971624EPA7060	106762	GEQC450045	2B	ASTOT	100.			1470UGL	800.	71.61	2013	106762	RMJ	0.00			0		0
SAMPLE 3	081397	08139708199715OOEPA3020		0821971624EPA7740	106762	GEQC450045	2B	SETOT	100.	V		710.UGL	800.	81.61	2013	106762	RMJ	0.00			0		0
SAMPLE 4	081397	08139708149718OO		0815971434EPA7470	106513	GE9708249-08		HGTOT	2.00U			2.00UGL	0.00	0	115	106513	RMJ	0.00	T		0		0
SAMPLE 4	081397	08139708159710OOEPA3005		0815971337SW8466010A	106517	GE9708249-08		CDTOT	5.00J	E		1.17UGL	0.00	0	114	106517	MBL	0.00	T	T	0		0
SAMPLE 4	081397	08139708159710OOSW8363010A		0815971342SW8466010A	106517	GEQC449119	1	CDTOT	5.00J	E		0.394UGL	0.00	0	114	106517	MBL	0.00			0		0
SAMPLE 4	081397	08139708159710OOEPA3005		0815971347SW8466010A	106517	GEQC449120	1	CDTOT	25.0U			25.0UGL	0.00	1	514	106517	MBL	0.00			0		0
SAMPLE 4	081397	08139708159710OOEPA3005		0815971352SW8466010A	106517	GEQC449121	2A	CDTOT	5.00			1150UGL	1000	115.0	114	106517	MBL	0.00			0		0
SAMPLE 4	081397	08139708159710OOSW8363010A		0815971337SW8466010A	106517	GE9708249-08		CRTOT	5.00	V		8.59UGL	0.00	0	114	106517	MBL	0.00	T		0		0
SAMPLE 4	081397	08139708159710OOSW8363010A		0815971342SW8466010A	106517	GEQC449119	1	CRTOT	5.00	V		8.18UGL	0.00	0	114	106517	MBL	0.00			0		0

SAMPLE 4	081397	08139708159710005W8363010A	08159713475W8466010A	106517	GEQC449120	1	CRTOT	25.0J	EV	8.43UGL	0.00	1	514	106517	MBL	0.00			0
SAMPLE 4	081397	08139708159710005W8363010A	08159713525W8466010A	106517	GEQC449121	2A	CRTOT	5.00	V	5140UGL	5000	102.0	114	106517	MBL	0.00			0
SAMPLE 4	081397	08139708159710005W8463010A	08159713375W8466010A	106517	GE9708249-08		AGTOT	5.00J	E	1.03UGL	0.00	0	114	106517	MBL	0.00			0
SAMPLE 4	081397	08139708159710005W8463010A	08159713375W8466010A	106517	GE9708249-08		BATOT	5.00U	V	182.UGL	0.00	0	114	106517	MBL	0.00	T	T	0
SAMPLE 4	081397	08139708159710005W8463010A	08159713375W8466010A	106517	GE9708249-08		PBTOT	5.00JU	EV	0.927UGL	0.00	0	114	106517	MBL	0.00	T		0
SAMPLE 4	081397	08139708159710005W8463010A	08159713425W8466010A	106517	GEQC449119	1	AGTOT	5.00U		5.00UGL	0.00	0	114	106517	MBL	0.00			0
SAMPLE 4	081397	08139708159710005W8463010A	08159713425W8466010A	106517	GEQC449119	1	BATOT	5.00U	V	182.UGL	0.00	0	114	106517	MBL	0.00			0
SAMPLE 4	081397	08139708159710005W8463010A	08159713425W8466010A	106517	GEQC449119	1	PBTOT	5.00JU	EV	0.944UGL	0.00	0	114	106517	MBL	0.00			0
SAMPLE 4	081397	08139708159710005W8463010A	08159713475W8466010A	106517	GEQC449120	1	AGTOT	25.0J	E	3.97UGL	0.00	1	514	106517	MBL	0.00			0
SAMPLE 4	081397	08139708159710005W8463010A	08159713475W8466010A	106517	GEQC449120	1	BATOT	25.0U	V	180.UGL	0.00	1	514	106517	MBL	0.00			0
SAMPLE 4	081397	08139708159710005W8463010A	08159713475W8466010A	106517	GEQC449120	1	PBTOT	25.0U	V	25.0UGL	0.00	1	514	106517	MBL	0.00			0
SAMPLE 4	081397	08139708159710005W8463010A	08159713525W8466010A	106517	GEQC449121	2A	AGTOT	5.00		519.UGL	500.	104.0	114	106517	MBL	0.00			0
SAMPLE 4	081397	08139708159710005W8463010A	08159713525W8466010A	106517	GEQC449121	2A	BATOT	5.00	V	10100UGL	10000	99.20	114	106517	MBL	0.00			0
SAMPLE 4	081397	08139708159710005W8463010A	08159713525W8466010A	106517	GEQC449121	2A	PBTOT	5.00	V	5350UGL	5000	107.0	114	106517	MBL	0.00			0
SAMPLE 4	081397	08139708159710005W8463010A	08159713525W8466010A	106517	GEQC449121		ASTOT	100.J	E	27.0UGL	0.00	1	2013	106762	RMJ	0.00	T		0
SAMPLE 4	081397	08139708199715005EPA3020	08219715575EPA7060	106762	GE9708249-08		SETOT	100.U	V	100.UGL	0.00	1	2013	106762	RMJ	0.00	T		0
SAMPLE 4	081397	08139708199715005EPA3020	08219715575EPA7740	106762	GE9708249-08														

KAW
cooler #130
Jdd #11650

CHAIN-OF-CUSTODY

9708249

Page 1 of 2

Job Number	Customer Name:	Chris Langton	Ship to:	Company:	General Engineering Laboratories, Inc.
EGG150	Customer Department:	SRTC		Address:	2040 Savage Road
Contract Number	Customer Address:	773-A		City/State:	Charleston, South Carolina 29407
AB93796N	Customer Phone:	5-5806		Attention of:	Kate Woodward, Project Manager

Westinghouse Savannah River Company
Aiken, SC 29808

Environmental Monitoring Section
Environmental Geochemistry Group

Matrix Key: S=Soil, SO=Solid, SL=Sludge, O=Organic, A=Aqueous

Sample Analysis Requested

	Sample ID: 01 Mix I	Sample ID: 02 Mix II	Sample ID: 03 Mix III	Sample ID: 04 Mix IV	Sample ID: 05 Mix V	Sample ID: 06 Mix VI
	Collect Date	Collect Date	Collect Date	Collect Date	Collect Date	Collect Date
	Collect Time	Collect Time	Collect Time	Collect Time	Collect Time	Collect Time
	No. Containers: 1	No. Containers: 1	No. Containers: 1	No. Containers: 1	No. Containers: 1	No. Containers: 1
	Matrix: SO	Matrix: SO	Matrix: SO	Matrix: SO	Matrix: SO	Matrix: SO
TCLP, Metals (Prep & Analysis) (20)	X	X	X	X	X	X
Jeng Viet						

Emergency 3-Day Turnaround (362)

Comments: Request 3-day TAT (With TCLP As-AA, Se-AA, ICPES for all the other metals

STR Authorization: Janet D. Crawford

1 Relinquished by:	Date/Time	Received by:	2 Relinquished by:	Date/Time	Received by:
(Print) J F Bolen	Date 8/13/97	(Print) Tim Kinard	(Print) Tim Kinard	Date 8-13-97	(Print) DIONNE FRANCIS
(Sign) J F Bolen	Time 0915	(Sign) Tim Kinard	(Sign) Tim Kinard	Time	(Sign) Dionne Francis
3 Relinquished by:	Date/Time	Received by:	4 Relinquished by:	Date/Time	Received by:
(Print)	Date	(Print)	(Print)	Date	(Print)
(Sign)	Time	(Sign)	(Sign)	Time	(Sign)

39

CHAIN-OF-CUSTODY

Job Number	Customer Name:	Chris Langton	Ship to:	Company:	General Engineering Laboratories, Inc.
EGG150	Customer Department:	SRTC		Address:	2040 Savage Road
Contract Number	Customer Address:	773-A		City/State:	Charleston, South Carolina 29407
AB93796N	Customer Phone:	5-5806	07 08	Attention of:	Kate Woodward, Project Manager

Westinghouse Savannah River Company
Aiken, SC 29808

Environmental Monitoring Section
Environmental Geochemistry Group

Matrix Key: S=Soil, SO=Solid, SL=Sludge, O=Organic, A=Aqueous

Sample Analysis Requested	Sample ID: Sample 3	Sample ID: Sample 4	Sample ID:	Sample ID:	Sample ID:	Sample ID:
	Collect Date	Collect Date	Collect Date	Collect Date	Collect Date	Collect Date
	Collect Time	Collect Time	Collect Time	Collect Time	Collect Time	Collect Time
	No. Containers 1	No. Containers 1	No. Containers	No. Containers	No. Containers	No. Containers
	Matrix SO	Matrix SO	Matrix	Matrix	Matrix	Matrix
TCLP, Metals (Prep & Analysis) (20)	X	X				
Jar Vial						
Emergency 3-Day Turnaround (362)						

Comments: Request 3-day TAT (With TCLP As-AA, Se-AA, ICPES for all the other metals

STR Authorization: [signature]

1 Relinquished by:	Date/Time	Received by:	2 Relinquished by:	Date/Time	Received by:
(Print) JF Bolen	Date 8/12/97	(Print) Tim King	(Print) Tim King	Date 8/12/97	(Print) Dionne Kennedy
(Sign) [signature]	Time 0915	(Sign) [signature]	(Sign) [signature]	Time	(Sign) [signature]
3 Relinquished by:	Date/Time	Received by:	**4** Relinquished by:	Date/Time	Received by:
(Print)	Date	(Print)	(Print)	Date	(Print)
(Sign)	Time	(Sign)	(Sign)	Time	(Sign)

04

Sample Receipt Review

WSRC

Received by [signature] Date 8/13/97

GEL COOLER #130

SAMPLE RECEIPT CRITERIA	YES	NO	COMMENTS/QUALIFIERS
1. Were shipping containers received intact and sealed? Call Project Manager if No	✓		
2. Was the shipment screened following the radiochemistry survey procedure (EPI SOP S-007)?	✓		
Were the survey results negative? Call Project Manager if No.	✓		
Are any samples identified by the client as radioactive? If yes, did WSRC provide RAD activity? (List the samples identified as RAD). If not call PM & put on hold.		✓	
3. Were chain of custody documents included?	✓		
4. Were chain of custody documents completed properly? (Ink, signed, match containers)	✓		
5. Did all samples containers arrive intact? (sealed. unbroken)? Call Project Manager if No.	✓		
6. Were all samples containers properly labeled?	✓		
7. Were proper sample containers received?	✓		
8. Preserved samples checked for proper pH?		/	
9. Were samples preserved properly? If no, list samples & tests	/		
10. Shipping container temperature checked?	✓		
11. Was shipping container temperature within specifications (4°±2°C)? Call Project Manager if No & put samples on hold.	✓		Temp 2C
12. Were samples received within holding time? Call Project Manager if No & put on hold if more than 48 hrs remaining.	✓		
13. Were VOA vials free of headspace? Call Project Manager if No & put on hold.	/		

Review [signature] Date 8/13/97

List samples in cooler:

Internal Chain Of Custody
Audit Trail by Container

9708249%

Printed: 08/22/97 12:32

9708249-01.01 - Other

13-AUG-97 15:47:31	Dionne Francis	--> Rad Cooler
13-AUG-97 16:24:58	Dionne Francis	--> Sample Delivery
13-AUG-97 16:26:17	Jianguo Li	--> TCLP Prep
13-AUG-97 19:21:33	Jianguo Li	--> Consumed by Analysis

186251 - 1000 ml/P

13-AUG-97 16:26:50	Jianguo Li	--> TCLP Prep
14-AUG-97 17:57:51	Christy Blumhardt	--> Inorganic Prep
15-AUG-97 08:36:32	Christy Blumhardt	--> Inorganic Prep
15-AUG-97 08:50:38	Christy Blumhardt	--> Mercury lab
15-AUG-97 10:26:00	Christy Blumhardt	--> Inorganic Prep
15-AUG-97 10:46:57	Melinda Lewis	--> ICP lab
15-AUG-97 13:58:23	Rose Jenkins	--> Mercury lab
19-AUG-97 15:08:25	Frankie Davis	--> Inorganic Prep

186389 - 50 ml/P

15-AUG-97 08:36:57	Christy Blumhardt	--> Inorganic Prep

186909 - 50 ml/P

19-AUG-97 15:10:04	Frankie Davis	--> Inorganic Prep
21-AUG-97 12:32:41	Rose Jenkins	--> GFAA lab

9708249-02.01 - Other

13-AUG-97 15:47:31	Dionne Francis	--> Rad Cooler
13-AUG-97 16:24:57	Dionne Francis	--> Sample Delivery
13-AUG-97 16:26:17	Jianguo Li	--> TCLP Prep
13-AUG-97 19:21:32	Jianguo Li	--> Consumed by Analysis

186250 - 1000 ml/P

13-AUG-97 16:26:48	Jianguo Li	--> TCLP Prep
14-AUG-97 17:57:51	Christy Blumhardt	--> Inorganic Prep
15-AUG-97 08:36:32	Christy Blumhardt	--> Inorganic Prep
15-AUG-97 08:50:38	Christy Blumhardt	--> Mercury lab
15-AUG-97 10:19:31	Christy Blumhardt	--> Inorganic Prep
15-AUG-97 10:46:58	Melinda Lewis	--> ICP lab
15-AUG-97 13:58:23	Rose Jenkins	--> Mercury lab
19-AUG-97 15:08:25	Frankie Davis	--> Inorganic Prep

186390 - 50 ml/P

15-AUG-97 08:37:05	Christy Blumhardt	--> Inorganic Prep

186907 - 50 ml/P

19-AUG-97 15:09:37	Frankie Davis	--> Inorganic Prep
21-AUG-97 12:32:42	Rose Jenkins	--> GFAA lab

9708249-03.01 - Other

13-AUG-97 15:47:31	Dionne Francis	--> Rad Cooler
13-AUG-97 16:24:58	Dionne Francis	--> Sample Delivery
13-AUG-97 16:26:17	Jianguo Li	--> TCLP Prep
13-AUG-97 19:21:33	Jianguo Li	--> Consumed by Analysis

Internal Chain Of Custody
Audit Trail by Container

97082498 Printed: 08/22/97 12:32

186249 - 1000 ml/P
13-AUG-97 16:26:46 Jianguo Li --> TCLP Prep
14-AUG-97 17:57:51 Christy Blumhardt --> Inorganic Prep
15-AUG-97 08:36:32 Christy Blumhardt --> Inorganic Prep
15-AUG-97 08:50:38 Christy Blumhardt --> Mercury lab
15-AUG-97 10:19:31 Christy Blumhardt --> Inorganic Prep
15-AUG-97 10:46:58 Melinda Lewis --> ICP lab
15-AUG-97 13:58:23 Rose Jenkins --> Mercury lab
19-AUG-97 15:08:25 Frankie Davis --> Inorganic Prep

186391 - 50 ml/P
15-AUG-97 08:37:25 Christy Blumhardt --> Inorganic Prep

186906 - 50 ml/P
19-AUG-97 15:09:29 Frankie Davis --> Inorganic Prep
21-AUG-97 12:32:42 Rose Jenkins --> GFAA lab

9708249-04.01 - Other
13-AUG-97 16:25:11 Dionne Francis --> Main Cooler
13-AUG-97 16:25:32 Dionne Francis --> Sample Delivery
13-AUG-97 16:26:17 Jianguo Li --> TCLP Prep
13-AUG-97 19:21:33 Jianguo Li --> Consumed by Analysis

186248 - 1000 ml/P
13-AUG-97 16:26:46 Jianguo Li --> TCLP Prep
14-AUG-97 17:57:50 Christy Blumhardt --> Inorganic Prep
15-AUG-97 08:36:32 Christy Blumhardt --> Inorganic Prep
15-AUG-97 08:50:38 Christy Blumhardt --> Mercury lab
15-AUG-97 10:19:30 Christy Blumhardt --> Inorganic Prep
15-AUG-97 10:19:30 Christy Blumhardt --> Inorganic Prep
15-AUG-97 10:46:59 Melinda Lewis --> ICP lab
15-AUG-97 13:58:23 Rose Jenkins --> Mercury lab
19-AUG-97 15:08:25 Frankie Davis --> Inorganic Prep

186392 - 50 ml/P
15-AUG-97 08:37:33 Christy Blumhardt --> Inorganic Prep

186905 - 50 ml/P
19-AUG-97 15:09:18 Frankie Davis --> Inorganic Prep
21-AUG-97 12:32:43 Rose Jenkins --> GFAA lab

9708249-05.01 - Other
13-AUG-97 15:47:31 Dionne Francis --> Rad Cooler
13-AUG-97 16:24:58 Dionne Francis --> Sample Delivery
13-AUG-97 16:26:17 Jianguo Li --> TCLP Prep
13-AUG-97 19:21:33 Jianguo Li --> Consumed by Analysis

186247 - 1000 ml/P
13-AUG-97 16:26:45 Jianguo Li --> TCLP Prep
14-AUG-97 17:57:51 Christy Blumhardt --> Inorganic Prep
15-AUG-97 08:36:32 Christy Blumhardt --> Inorganic Prep
15-AUG-97 08:50:38 Christy Blumhardt --> Mercury lab
15-AUG-97 10:19:31 Christy Blumhardt --> Inorganic Prep
15-AUG-97 10:46:59 Melinda Lewis --> ICP lab
15-AUG-97 13:58:23 Rose Jenkins --> Mercury lab
19-AUG-97 15:08:25 Frankie Davis --> Inorganic Prep

Internal Chain Of Custody
Audit Trail by Container

9708249%
Printed: 08/22/97 12:32

186393 - 50 ml/P
15-AUG-97 08:37:46 Christy Blumhardt --> Inorganic Prep

186910 - 50 ml/P
19-AUG-97 15:11:00 Frankie Davis --> Inorganic Prep
21-AUG-97 12:32:43 Rose Jenkins --> GFAA lab

9708249-06.01 - Other
13-AUG-97 15:47:31 Dionne Francis --> Rad Cooler
13-AUG-97 16:24:58 Dionne Francis --> Sample Delivery
13-AUG-97 16:26:17 Jianguo Li --> TCLP Prep
13-AUG-97 19:21:33 Jianguo Li --> Consumed by Analysis

186246 - 1000 ml/P
13-AUG-97 16:26:44 Jianguo Li --> TCLP Prep
14-AUG-97 17:57:50 Christy Blumhardt --> Inorganic Prep
15-AUG-97 08:36:32 Christy Blumhardt --> Inorganic Prep
15-AUG-97 08:50:38 Christy Blumhardt --> Mercury lab
15-AUG-97 10:19:28 Christy Blumhardt --> Inorganic Prep
15-AUG-97 10:47:00 Melinda Lewis --> ICP lab
15-AUG-97 13:58:23 Rose Jenkins --> Mercury lab
19-AUG-97 15:08:24 Frankie Davis --> Inorganic Prep

186394 - 50 ml/P
15-AUG-97 08:37:54 Christy Blumhardt --> Inorganic Prep

186904 - 50 ml/P
19-AUG-97 15:08:58 Frankie Davis --> Inorganic Prep
21-AUG-97 12:32:43 Rose Jenkins --> GFAA lab

9708249-07.01 - Other
13-AUG-97 15:47:31 Dionne Francis --> Rad Cooler
13-AUG-97 16:24:58 Dionne Francis --> Sample Delivery
13-AUG-97 16:26:17 Jianguo Li --> TCLP Prep
13-AUG-97 19:21:33 Jianguo Li --> Consumed by Analysis

186245 - 1000 ml/P
13-AUG-97 16:26:43 Jianguo Li --> TCLP Prep
14-AUG-97 17:57:51 Christy Blumhardt --> Inorganic Prep
15-AUG-97 08:36:32 Christy Blumhardt --> Inorganic Prep
15-AUG-97 08:50:38 Christy Blumhardt --> Mercury lab
15-AUG-97 10:19:30 Christy Blumhardt --> Inorganic Prep
15-AUG-97 10:47:00 Melinda Lewis --> ICP lab
15-AUG-97 13:58:23 Rose Jenkins --> Mercury lab
19-AUG-97 15:08:25 Frankie Davis --> Inorganic Prep

186395 - 50 ml/P
15-AUG-97 08:38:03 Christy Blumhardt --> Inorganic Prep

186911 - 50 ml/P
19-AUG-97 15:11:14 Frankie Davis --> Inorganic Prep
21-AUG-97 12:32:44 Rose Jenkins --> GFAA lab

Internal Chain Of Custody
Audit Trail by Container

9708249% Printed: 08/22/97 12:32

9708249-08.01 - Other
13-AUG-97 15:47:31 Dionne Francis --> Rad Cooler
13-AUG-97 16:24:58 Dionne Francis --> Sample Delivery
13-AUG-97 16:26:17 Jianguo Li --> TCLP Prep
13-AUG-97 19:21:33 Jianguo Li --> Consumed by Analysis

186244 - 1000 ml/P
13-AUG-97 16:26:42 Jianguo Li --> TCLP Prep
14-AUG-97 17:57:50 Christy Blumhardt --> Inorganic Prep
15-AUG-97 08:36:32 Christy Blumhardt --> Inorganic Prep
15-AUG-97 08:50:38 Christy Blumhardt --> Mercury lab
15-AUG-97 10:19:30 Christy Blumhardt --> Inorganic Prep
15-AUG-97 10:46:59 Melinda Lewis --> ICP lab
15-AUG-97 13:58:23 Rose Jenkins --> Mercury lab
19-AUG-97 15:08:25 Frankie Davis --> Inorganic Prep

186396 - 50 ml/P
15-AUG-97 08:38:14 Christy Blumhardt --> Inorganic Prep

186908 - 50 ml/P
19-AUG-97 15:09:46 Frankie Davis --> Inorganic Prep
21-AUG-97 12:32:44 Rose Jenkins --> GFAA lab