0077889

SAF-RC-032
100-F Remaining Sites Burial Grounds - Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Kathy Wendt (2) H4-21

COMMENTS:

SDG K1207 SAF-RC-032

Waste Site: 600-111

RECEIVED
JUN 11 2008
EDMC

Date: 21 May 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol – Waste Site 600-111
Subject: Inorganics - Data Package No. K1207-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1207 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J16MM7	4/21/08	Soil	C	See note 1
J16MM8	4/21/08	Soil	C	See note 1
J16MM9	4/21/08	Soil	C	See note 1
J16MN0	4/21/08	Soil	C	See note 1
J16MN1	4/21/08	Soil	C	See note 1
J16MN2	4/21/08	Soil	C	See note 1
J16MN3	4/21/08	Soil	C	See note 1
J16MN4	4/21/08	Soil	C	See note 1
J16MN5	4/21/08	Soil	C	See note 1
J16MN6	4/21/08	Soil	C	See note 1
J16MN7	4/21/08	Soil	C	See note 1
J16MN8	4/21/08	Soil	C	See note 1

1 - ICP metals (6010B) and mercury (7471A).

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 28 days for mercury and 6 months for ICP metals.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "UJ". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

Due to method blank contamination, the calcium and sodium result in sample J16MM7 were qualified as estimates and flagged "J".

Due to method blank contamination, the sodium result in samples J16MN2 and J16MN3 were qualified as estimates and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One field blank (J16MM7) was submitted for analysis. Aluminum, barium, iron, potassium, magnesium, manganese, nickel, silicon, vanadium and zinc were detected in the equipment blank. Under the WCH statement of work, no qualification is required.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

Due to a matrix spike recoveries outside QC limits, all antimony (47%) results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (6.2%), all silicon results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J16MN5/J16MN6) were submitted for analysis. Field Duplicates are compared using the same criteria as for laboratory duplicates. The RPD for silicon (30.3%) was outside QC limits. Under the WCH statement of work, no qualification is required. All other field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

- **Completeness**

Data package No. K1207 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, the calcium and sodium result in sample J16MM7 were qualified as estimates and flagged "J".
- Due to method blank contamination, the sodium result in samples J16MN2 and J16MN3 were qualified as estimates and flagged "UJ".
- Due to a matrix spike recoveries outside QC limits, all antimony (47%) results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits (6.2%), all silicon results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

METALS DATA QUALIFICATION SUMMARY*

SDG: K1207	REVIEWER: ELR	Project: 600-111	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Calcium Sodium	UJ	J16MM7	Method blank contamination
Sodium	UJ	J16MN2, J16MN3	Method blank contamination
Antimony	J	All	MS recovery
Silicon	J	All	LCS recovery

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/05/08

CLIENT: TNU-HANFORD RC-032

LVL LOT #: 0804L979

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J16MM7	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Aluminum, Total	50.2	MG/KG	3.4	1.0
		Arsenic, Total	0.43 u	MG/KG	0.43	1.0
		Boron, Total	0.43 u	MG/KG	0.43	1.0
		Barium, Total	1.0	MG/KG	0.09	1.0
		Beryllium, Total	0.04 u	MG/KG	0.04	1.0
		Calcium, Total	18.7 UJ	MG/KG	3.4	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Cobalt, Total	0.17 u	MG/KG	0.17	1.0
		Chromium, Total	0.17 u	MG/KG	0.17	1.0
		Copper, Total	0.20 u	MG/KG	0.20	1.0
		Iron, Total	1480	MG/KG	3.9	1.0
		Mercury, Total	0.009u	MG/KG	0.009	1.0
		Potassium, Total	53.2	MG/KG	42.5	1.0
		Magnesium, Total	8.0	MG/KG	2.2	1.0
		Manganese, Total	11.5	MG/KG	0.03	1.0
		Molybdenum, Total	0.26 u	MG/KG	0.26	1.0
		Sodium, Total	16.0 UJ	MG/KG	1.7	1.0
		Nickel, Total	0.20	MG/KG	0.17	1.0
		Lead, Total	0.26 u	MG/KG	0.26	1.0
		Antimony, Total	0.26 uJ	MG/KG	0.26	1.0
		Selenium, Total	0.52 u	MG/KG	0.52	1.0
		Silicon, Total	41.8 J	MG/KG	3.4	1.0
		Vanadium, Total	0.12	MG/KG	0.12	1.0
		Zinc, Total	1.0	MG/KG	0.52	1.0

5/19/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/05/08

CLIENT: TNU-HANFORD RC-032

LVL LOT #: 0804L979

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J16MM8	Silver, Total	0.25	u	MG/KG	0.25	3.0
		Aluminum, Total	11500		MG/KG	10.1	3.0
		Arsenic, Total	4.2		MG/KG	1.3	3.0
		Boron, Total	1.3	u	MG/KG	1.3	3.0
		Barium, Total	151		MG/KG	0.25	3.0
		Beryllium, Total	0.73		MG/KG	0.13	3.0
		Calcium, Total	4060		MG/KG	10.1	3.0
		Cadmium, Total	0.13	u	MG/KG	0.13	3.0
		Cobalt, Total	8.6		MG/KG	0.50	3.0
		Chromium, Total	12.0		MG/KG	0.50	3.0
		Copper, Total	15.6		MG/KG	0.58	3.0
		Iron, Total	27200		MG/KG	11.4	3.0
		Mercury, Total	0.01	u	MG/KG	0.01	1.0
		Potassium, Total	1620		MG/KG	124	3.0
		Magnesium, Total	5000		MG/KG	6.3	3.0
		Manganese, Total	420		MG/KG	0.10	3.0
		Molybdenum, Total	0.76	u	MG/KG	0.76	3.0
		Sodium, Total	176		MG/KG	5.0	3.0
		Nickel, Total	13.1		MG/KG	0.50	3.0
		Lead, Total	8.9		MG/KG	0.76	3.0
		Antimony, Total	1.0	J	MG/KG	0.76	3.0
		Selenium, Total	1.5	u	MG/KG	1.5	3.0
		Silicon, Total	498	J	MG/KG	10.1	3.0
		Vanadium, Total	56.6		MG/KG	0.35	3.0
		Zinc, Total	52.4		MG/KG	1.5	3.0

5/19/09

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/05/08

CLIENT: TNU-HANFORD RC-032

LVL LOT #: 0804L979

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J16MM9	Silver, Total	0.25 u	MG/KG	0.25	3.0
		Aluminum, Total	10600	MG/KG	10.1	3.0
		Arsenic, Total	1.7	MG/KG	1.3	3.0
		Boron, Total	1.3 u	MG/KG	1.3	3.0
		Barium, Total	168	MG/KG	0.25	3.0
		Beryllium, Total	1.1	MG/KG	0.13	3.0
		Calcium, Total	5540	MG/KG	10.1	3.0
		Cadmium, Total	0.13 u	MG/KG	0.13	3.0
		Cobalt, Total	11.2	MG/KG	0.51	3.0
		Chromium, Total	10.0	MG/KG	0.51	3.0
		Copper, Total	26.5	MG/KG	0.58	3.0
		Iron, Total	35100	MG/KG	11.4	3.0
		Mercury, Total	0.009u	MG/KG	0.009	1.0
		Potassium, Total	1080	MG/KG	124	3.0
		Magnesium, Total	5670	MG/KG	6.3	3.0
		Manganese, Total	438	MG/KG	0.10	3.0
		Molybdenum, Total	1.3	MG/KG	0.76	3.0
		Sodium, Total	183	MG/KG	5.1	3.0
		Nickel, Total	14.9	MG/KG	0.51	3.0
		Lead, Total	5.2	MG/KG	0.76	3.0
		Antimony, Total	0.76 u J	MG/KG	0.76	3.0
		Selenium, Total	1.5 u	MG/KG	1.5	3.0
		Silicon, Total	470 J	MG/KG	10.1	3.0
		Vanadium, Total	77.1	MG/KG	0.35	3.0
		Zinc, Total	65.8	MG/KG	1.5	3.0

5/19/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/05/08

CLIENT: TNU-HANFORD RC-032 LVL LOT #: 0804L979

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J16MN0	Silver, Total	0.23 u	MG/KG	0.23	3.0
		Aluminum, Total	10600	MG/KG	9.3	3.0
		Arsenic, Total	4.1	MG/KG	1.2	3.0
		Boron, Total	1.2 u	MG/KG	1.2	3.0
		Barium, Total	170	MG/KG	0.23	3.0
		Beryllium, Total	0.92	MG/KG	0.12	3.0
		Calcium, Total	4810	MG/KG	9.3	3.0
		Cadmium, Total	0.12 u	MG/KG	0.12	3.0
		Cobalt, Total	11.4	MG/KG	0.46	3.0
		Chromium, Total	12.0	MG/KG	0.46	3.0
		Copper, Total	23.3	MG/KG	0.53	3.0
		Iron, Total	33200	MG/KG	10.4	3.0
		Mercury, Total	0.009u	MG/KG	0.009	1.0
		Potassium, Total	1270	MG/KG	114	3.0
		Magnesium, Total	5670	MG/KG	5.8	3.0
		Manganese, Total	527	MG/KG	0.09	3.0
		Molybdenum, Total	0.86	MG/KG	0.70	3.0
		Sodium, Total	180	MG/KG	4.6	3.0
		Nickel, Total	14.7	MG/KG	0.46	3.0
		Lead, Total	7.2	MG/KG	0.70	3.0
		Antimony, Total	0.70 u J	MG/KG	0.70	3.0
		Selenium, Total	1.4 u J	MG/KG	1.4	3.0
		Silicon, Total	453	MG/KG	9.3	3.0
		Vanadium, Total	76.1	MG/KG	0.33	3.0
		Zinc, Total	61.6	MG/KG	1.4	3.0

5/19/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/05/08

CLIENT: TNU-HANFORD RC-032 LVL LOT #: 0804L979

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	J16MN1	Silver, Total	0.25 u	MG/KG	0.25	3.0
		Aluminum, Total	9280	MG/KG	10	3.0
		Arsenic, Total	3.3	MG/KG	1.2	3.0
		Boron, Total	1.2 u	MG/KG	1.2	3.0
		Barium, Total	137	MG/KG	0.25	3.0
		Beryllium, Total	1.1	MG/KG	0.12	3.0
		Calcium, Total	5620	MG/KG	10	3.0
		Cadmium, Total	0.12 u	MG/KG	0.12	3.0
		Cobalt, Total	11.6	MG/KG	0.50	3.0
		Chromium, Total	9.4	MG/KG	0.50	3.0
		Copper, Total	24.0	MG/KG	0.57	3.0
		Iron, Total	40800	MG/KG	11.2	3.0
		Mercury, Total	0.008u	MG/KG	0.008	1.0
		Potassium, Total	957	MG/KG	123	3.0
		Magnesium, Total	5350	MG/KG	6.2	3.0
		Manganese, Total	703	MG/KG	0.1	3.0
		Molybdenum, Total	1.1	MG/KG	0.75	3.0
		Sodium, Total	187	MG/KG	5.0	3.0
		Nickel, Total	15.0	MG/KG	0.50	3.0
		Lead, Total	6.0	MG/KG	0.75	3.0
		Antimony, Total	0.75 u J	MG/KG	0.75	3.0
		Selenium, Total	1.5 u	MG/KG	1.5	3.0
		Silicon, Total	399 J	MG/KG	10	3.0
		Vanadium, Total	86.5	MG/KG	0.35	3.0
		Zinc, Total	64.1	MG/KG	1.5	3.0

5/19/08

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INORGANICS DATA SUMMARY REPORT 05/05/08

CLIENT: TNU-HANFORD RC-032 LVL LOT #: 0804L979

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-006	J16MN2	Silver, Total	0.20 u	MG/KG	0.20	3.0
		Aluminum, Total	9560	MG/KG	7.9	3.0
		Arsenic, Total	3.6	MG/KG	0.98	3.0
		Boron, Total	0.98 u	MG/KG	0.98	3.0
		Barium, Total	156	MG/KG	0.20	3.0
		Beryllium, Total	0.84	MG/KG	0.1	3.0
		Calcium, Total	4750	MG/KG	7.9	3.0
		Cadmium, Total	0.1 u	MG/KG	0.1	3.0
		Cobalt, Total	9.7	MG/KG	0.39	3.0
		Chromium, Total	10.3	MG/KG	0.39	3.0
		Copper, Total	20.0	MG/KG	0.45	3.0
		Iron, Total	28200	MG/KG	8.9	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1250	MG/KG	96.9	3.0
		Magnesium, Total	5000	MG/KG	4.9	3.0
		Manganese, Total	424	MG/KG	0.08	3.0
		Molybdenum, Total	1.0	MG/KG	0.59	3.0
		Sodium, Total	130 UJ	MG/KG	3.9	3.0
		Nickel, Total	12.9	MG/KG	0.39	3.0
		Lead, Total	8.3	MG/KG	0.59	3.0
		Antimony, Total	0.59 u J	MG/KG	0.59	3.0
		Selenium, Total	1.2 u	MG/KG	1.2	3.0
		Silicon, Total	432 J	MG/KG	7.9	3.0
		Vanadium, Total	63.6	MG/KG	0.28	3.0
		Zinc, Total	60.7	MG/KG	1.2	3.0

5/19/08

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LVL LOT #: 0804L979

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SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-007	J16MN3	Silver, Total	0.25 u	MG/KG	0.25	3.0
		Aluminum, Total	6860	MG/KG	10.2	3.0
		Arsenic, Total	2.8	MG/KG	1.3	3.0
		Boron, Total	1.3 u	MG/KG	1.3	3.0
		Barium, Total	91.4	MG/KG	0.25	3.0
		Beryllium, Total	0.88	MG/KG	0.13	3.0
		Calcium, Total	4970	MG/KG	10.2	3.0
		Cadmium, Total	0.13 u	MG/KG	0.13	3.0
		Cobalt, Total	9.8	MG/KG	0.51	3.0
		Chromium, Total	8.2	MG/KG	0.51	3.0
		Copper, Total	15.9	MG/KG	0.58	3.0
		Iron, Total	30900	MG/KG	11.4	3.0
		Mercury, Total	0.009u	MG/KG	0.009	1.0
		Potassium, Total	663	MG/KG	125	3.0
		Magnesium, Total	4560	MG/KG	6.4	3.0
		Manganese, Total	391	MG/KG	0.10	3.0
		Molybdenum, Total	0.94	MG/KG	0.76	3.0
		Sodium, Total	133 UJ	MG/KG	5.1	3.0
		Nickel, Total	9.4	MG/KG	0.51	3.0
		Lead, Total	2.9	MG/KG	0.76	3.0
		Antimony, Total	0.76 uJ	MG/KG	0.76	3.0
		Selenium, Total	1.5 u	MG/KG	1.5	3.0
		Silicon, Total	316 J	MG/KG	10.2	3.0
		Vanadium, Total	76.1	MG/KG	0.36	3.0
		Zinc, Total	54.0	MG/KG	1.5	3.0

5/19/08

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INORGANICS DATA SUMMARY REPORT 05/05/08

CLIENT: TNU-HANFORD RC-032 LVL LOT #: 0804L979

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-008	J16MN4	Silver, Total	0.28 u	MG/KG	0.28	3.0
		Aluminum, Total	10300	MG/KG	11.1	3.0
		Arsenic, Total	6.6	MG/KG	1.4	3.0
		Boron, Total	1.4 u	MG/KG	1.4	3.0
		Barium, Total	128	MG/KG	0.28	3.0
		Beryllium, Total	0.80	MG/KG	0.14	3.0
		Calcium, Total	4370	MG/KG	11.1	3.0
		Cadmium, Total	0.14 u	MG/KG	0.14	3.0
		Cobalt, Total	9.1	MG/KG	0.55	3.0
		Chromium, Total	12.7	MG/KG	0.55	3.0
		Copper, Total	18.7	MG/KG	0.64	3.0
		Iron, Total	30300	MG/KG	12.5	3.0
		Mercury, Total	0.009u	MG/KG	0.009	1.0
		Potassium, Total	1680	MG/KG	137	3.0
		Magnesium, Total	5500	MG/KG	6.9	3.0
		Manganese, Total	428	MG/KG	0.11	3.0
		Molybdenum, Total	0.83 u	MG/KG	0.83	3.0
		Sodium, Total	175	MG/KG	5.5	3.0
		Nickel, Total	14.8	MG/KG	0.55	3.0
		Lead, Total	11.1	MG/KG	0.83	3.0
		Antimony, Total	0.99	MG/KG	0.83	3.0
		Selenium, Total	1.7 u	MG/KG	1.7	3.0
		Silicon, Total	494	MG/KG	11.1	3.0
		Vanadium, Total	65.7	MG/KG	0.39	3.0
		Zinc, Total	56.3	MG/KG	1.7	3.0

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/05/08

CLIENT: TNU-HANFORD RC-032 LVL LOT #: 0804L979

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-009	J16MN5	Silver, Total	0.23 u	MG/KG	0.23	3.0
		Aluminum, Total	10700	MG/KG	9.1	3.0
		Arsenic, Total	7.0	MG/KG	1.1	3.0
		Boron, Total	1.2	MG/KG	1.1	3.0
		Barium, Total	129	MG/KG	0.23	3.0
		Beryllium, Total	0.93	MG/KG	0.11	3.0
		Calcium, Total	5450	MG/KG	9.1	3.0
		Cadmium, Total	0.11 u	MG/KG	0.11	3.0
		Cobalt, Total	10.3	MG/KG	0.46	3.0
		Chromium, Total	12.7	MG/KG	0.46	3.0
		Copper, Total	23.2	MG/KG	0.52	3.0
		Iron, Total	31500	MG/KG	10.3	3.0
		Mercury, Total	0.03	MG/KG	0.008	1.0
		Potassium, Total	1760	MG/KG	112	3.0
		Magnesium, Total	5550	MG/KG	5.7	3.0
		Manganese, Total	441	MG/KG	0.09	3.0
		Molybdenum, Total	0.96	MG/KG	0.68	3.0
		Sodium, Total	200	MG/KG	4.6	3.0
		Nickel, Total	16.0	MG/KG	0.46	3.0
		Lead, Total	21.4	MG/KG	0.68	3.0
		Antimony, Total	0.79 J	MG/KG	0.68	3.0
		Selenium, Total	1.4 u	MG/KG	1.4	3.0
		Silicon, Total	378 J	MG/KG	9.1	3.0
		Vanadium, Total	69.6	MG/KG	0.32	3.0
		Zinc, Total	66.7	MG/KG	1.4	3.0

5/12/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/05/08

CLIENT: TNU-HANFORD RC-032 LVL LOT #: 0804L979

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-010	J16MN6	Silver, Total	0.29 u	MG/KG	0.29	3.0
		Aluminum, Total	8410	MG/KG	11.5	3.0
		Arsenic, Total	5.0	MG/KG	1.4	3.0
		Boron, Total	1.4 u	MG/KG	1.4	3.0
		Barium, Total	107	MG/KG	0.29	3.0
		Beryllium, Total	0.82	MG/KG	0.14	3.0
		Calcium, Total	5170	MG/KG	11.5	3.0
		Cadmium, Total	0.14 u	MG/KG	0.14	3.0
		Cobalt, Total	9.1	MG/KG	0.58	3.0
		Chromium, Total	8.7	MG/KG	0.58	3.0
		Copper, Total	20.8	MG/KG	0.66	3.0
		Iron, Total	28400	MG/KG	13.0	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1270	MG/KG	142	3.0
		Magnesium, Total	4680	MG/KG	7.2	3.0
		Manganese, Total	367	MG/KG	0.12	3.0
		Molybdenum, Total	0.87 u	MG/KG	0.87	3.0
		Sodium, Total	176	MG/KG	5.8	3.0
		Nickel, Total	11.8	MG/KG	0.58	3.0
		Lead, Total	15.5	MG/KG	0.87	3.0
		Antimony, Total	1.2 J	MG/KG	0.87	3.0
		Selenium, Total	1.7 u	MG/KG	1.7	3.0
		Silicon, Total	513 J	MG/KG	11.5	3.0
		Vanadium, Total	62.4	MG/KG	0.40	3.0
		Zinc, Total	57.7	MG/KG	1.7	3.0

5/19/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/05/08

CLIENT: TNU-HANFORD RC-032 LVL LOT #: 0804L979

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-011	J16MN7	Silver, Total	0.25 u	MG/KG	0.25	3.0
		Aluminum, Total	8730	MG/KG	10.0	3.0
		Arsenic, Total	6.1	MG/KG	1.3	3.0
		Boron, Total	1.3 u	MG/KG	1.3	3.0
		Barium, Total	126	MG/KG	0.25	3.0
		Beryllium, Total	0.75	MG/KG	0.13	3.0
		Calcium, Total	5520	MG/KG	10.0	3.0
		Cadmium, Total	0.13 u	MG/KG	0.13	3.0
		Cobalt, Total	9.7	MG/KG	0.50	3.0
		Chromium, Total	11.3	MG/KG	0.50	3.0
		Copper, Total	20.3	MG/KG	0.58	3.0
		Iron, Total	28600	MG/KG	11.3	3.0
		Mercury, Total	0.02	MG/KG	0.01	1.0
		Potassium, Total	1390	MG/KG	124	3.0
		Magnesium, Total	4920	MG/KG	6.3	3.0
		Manganese, Total	391	MG/KG	0.10	3.0
		Molybdenum, Total	1.1	MG/KG	0.75	3.0
		Sodium, Total	179	MG/KG	5.0	3.0
		Nickel, Total	14.7	MG/KG	0.50	3.0
		Lead, Total	11.0	MG/KG	0.75	3.0
		Antimony, Total	0.75 u J	MG/KG	0.75	3.0
		Selenium, Total	1.5 u	MG/KG	1.5	3.0
		Silicon, Total	404 J	MG/KG	10.0	3.0
		Vanadium, Total	66.6	MG/KG	0.35	3.0
		Zinc, Total	55.1	MG/KG	1.5	3.0

5/19/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/05/08

CLIENT: TNU-HANFORD RC-032 LVL LOT #: 0804L979

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-012	J16MN8	Silver, Total	0.28 u	MG/KG	0.28	3.0
		Aluminum, Total	7840	MG/KG	11.1	3.0
		Arsenic, Total	2.8	MG/KG	1.4	3.0
		Boron, Total	1.4 u	MG/KG	1.4	3.0
		Barium, Total	94.8	MG/KG	0.28	3.0
		Beryllium, Total	0.88	MG/KG	0.14	3.0
		Calcium, Total	4940	MG/KG	11.1	3.0
		Cadmium, Total	0.14 u	MG/KG	0.14	3.0
		Cobalt, Total	9.3	MG/KG	0.56	3.0
		Chromium, Total	7.4	MG/KG	0.56	3.0
		Copper, Total	17.6	MG/KG	0.64	3.0
		Iron, Total	29100	MG/KG	12.5	3.0
		Mercury, Total	0.009u	MG/KG	0.009	1.0
		Potassium, Total	1060	MG/KG	137	3.0
		Magnesium, Total	4510	MG/KG	6.9	3.0
		Manganese, Total	374	MG/KG	0.11	3.0
		Molybdenum, Total	0.83 u	MG/KG	0.83	3.0
		Sodium, Total	188	MG/KG	5.6	3.0
		Nickel, Total	11.7	MG/KG	0.56	3.0
		Lead, Total	4.1	MG/KG	0.83	3.0
		Antimony, Total	0.83 u J	MG/KG	0.83	3.0
		Selenium, Total	1.7 u	MG/KG	1.7	3.0
		Silicon, Total	441 J	MG/KG	11.1	3.0
		Vanadium, Total	70.0	MG/KG	0.39	3.0
		Zinc, Total	54.5	MG/KG	1.7	3.0

5/19/08

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-032
LVL#: 0804L979
SDG/SAF#: K1207/RC-032

W.O.#: 11343-606-001-9999-00
Date Received: 04-23-08

METALS CASE NARRATIVE

The following is a summary of the QC results accompanying the sample results. Lionville Laboratory (LvLI) certifies that all test results meet the requirements of NELAC except as noted below.

All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise.

1. This narrative covers the analyses of 12 soil samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.

   All samples with the exception of sample J16MM7 were reported with a 3-fold dilution for all ICP metals due to sample matrix.

   All samples were rerun on a different instrument for Copper and Iron due to sample matrix.

   All samples were rerun for Potassium and Sodium due to ICVs and CCVs were outside the control limits in file TA0430C. All samples were rerun for Aluminum due to CCBs were outside control limits in file TA0430C.

   All samples rerun for Aluminum, Copper, Iron, Potassium, and Sodium were rerun and reported from file PS0501C

3. All analyses were performed within the required holding times.

4. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

5. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the LOQ).

6. The preparation/method blank for 1 analyte was outside method criteria. {less than the Limit of Quantitation (3-10X the LOD), samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 41 pages.

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

a). The MB result for Sodium was greater than the Limit of Quantitation (LOQ) {3-10x the (LOD) Limit of Detection} and all samples read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample results were reported herein "uncorrected" for the levels found in the MB.

7. All ICP Interference Check Standards were within control limits.

8. All laboratory control samples (LCS) were within the 80-120% control with the exception of Silicon at 6.2%. Refer to the Inorganics Laboratory Control Standards Report. Associated sample results may be biased low.

9. The matrix spike (MS) recoveries for 5 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

10. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration level for the following analytes:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J16MM8	Aluminum	66,000	107.8
	Manganese	3000	105.2
	Iron	126,000	102.1
	Antimony	300	101.3
	Silicon	6,300	97.2

11. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

12. For the purposes of this report, the data has been reported to the Limit of Detection (LOD). Values between the LOD and the Limit of Quantitation (LOQ) are acquired in a region of less-certain quantification.

13. LvLI is NELAP accredited by the state of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

14. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Judy Stone

Iris Daniels
Laboratory Manager
Lionville Laboratory Incorporated

5/7/08
Date

000026

alm/m04-979

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-032-198 | Page 1 of 2

Collector: T. Welch-Koelling	Company Contact: JR DEBUIGNE	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 DAY		
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 600-111 Verification		SAF No.: RC-032
Ice Chest No.: IE RC-02-007	Field Logbook No.: EFL-1174-4	COA: R601112000	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A080239		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

NA Cool 4°C

Preservation	None	Cool 4C	Cool 4C								
Type of Container	P	aG	aG								
No. of Container(s)	2	1	1								
Volume	125mL	60mL	120mL								
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)								

Sample No.	Matrix *	Sample Date	Sample Time										
J16MM7	SOIL	4-21-08	1020	X									EB
J16MM8	SOIL		1025	X	X	X							1
J16MM9	SOIL		1030	X	X	X							2
J16MN0	SOIL		1035	X	X	X							3
J16MN1	SOIL		1040	X	X	X							4

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Tom Welch-Koelling	4/21/08 1300	JR DeBuigne	1300 4-21-08
Relinquished By/Removed From	JR DeBuigne	1530 4-21-08	MLK MStankovich	1530 4/21/08
Relinquished By/Removed From	MLK MStankovich	0900 4/22/08	Received By/Stored In	Fed Ex
Relinquished By/Removed From	FedEx	4-23-08 0730	Received By/Stored In	4-23-08 0930
Relinquished By/Removed From			Received By/Stored In	
Relinquished By/Removed From			Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)

Matrix *
S=Soil
SE=Sediment
SD=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
V=Vegetation
X=Other

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

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-198	Page 2 of 3

Collector: T. Welch-Koelling	Company Contact: JR DEBUIGNE	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 DAY		
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 600-111 Verification	SAF No.: RC-032	
Ice Chest No.: ERC-02-007	Field Logbook No.: EFL-1174-4	COA: R601112000	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A080239	Bill of Lading/Air Bill No.: See OSPC	

630000000

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

NA Cool 4°C

820000

Preservation	None	Cool 4C	Cool 4C									
Type of Container	P	aG	aG									
No. of Container(s)	2	1	1									
Volume	125mL	60mL	120mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)									

Sample No.	Matrix *	Sample Date	Sample Time											
J16MN2	SOIL	4-21-08	1045	X	X	X								5
J16MN3	SOIL		1050	X	X	X								6
J16MN4	SOIL		1055	X	X	X								7
J16MN5	SOIL		1100	X	X	X								8
J16MN6	SOIL		1100	X	X	X								8 DUP

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[signature]	4-21-08 1300	JR DeBuigne [signature]	1300 4-21-08
JR DeBuigne [signature]	1530 4-21-08	[signature] MS Stankovich	1530 4/21/08
[signature] MS Stankovich	1500 4/22/08	Fed Ex	
Fed Ex	4-23-08 0930	[signature]	4-23-08 0930

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)

Matrix *

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

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

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-198	Page 3 of 3

Collector T. Welch-Koelling	Company Contact JR DEBUIGNE	Telephone No. 528-6409	Project Coordinator KESSNER, JH
Project Designation 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location 600-111 Verification		SAF No. RC-032
Ice Chest No. ERC-02-007	Field Logbook No. EFL-1174-4	COA R601112000	Method of Shipment FED EX
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A080239		Bill of Lading/Air Bill No. See OSPC

Price Code	Data Turnaround
8B	7 DAY

000000040

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

NA Cool 4°C

620000029

SAMPLE ANALYSIS													
			Preservation	None	Cool 4C	Cool 4C							
			Type of Container	P	aG	aG							
			No. of Container(s)	2	1	1							
			Volume	125mL	60mL	120mL							
				See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)							
Sample No.	Matrix *	Sample Date	Sample Time										
J16MNZ	SOIL	4-21-08	1105	X	X	X							9
J16MN8	SOIL	4-21-08	1110	X	X	X							10

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time 4-21-08 1300	Received By/Stored In	Date/Time 1300 4-21-08
Relinquished By/Removed From	Date/Time 1530 4-21-08	Received By/Stored In	Date/Time 4/21/08 1530
Relinquished By/Removed From	Date/Time 1500 4/22/08	Received By/Stored In	Date/Time Fed Ex
Relinquished By/Removed From	Date/Time 4-23-08 0930	Received By/Stored In	Date/Time 4-23-08 0930
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)

Matrix *

S=Soil
SD=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

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

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 600-111			DATA PACKAGE: K1207		
VALIDATOR: ELR		LAB: LLJ		DATE: 5/18/08	
			SDG: K1207		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J16MM7	J16MM8	J16MM9	J16MN0	J16MN1	
J16MN2	J16MN3	J16MN4	J16MN5	J16MN6	
J16MN7	J16MN8				
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes No N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

ICP interference checks acceptable? ..... Yes No N/A

ICV and CCV checks performed on all instruments? ..... Yes No N/A

ICV and CCV checks acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A

ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: M7 - calcium + sodium - UJ
Sodium - N2 + N3 - UJ
FB - 12 analytes

4. ACCURACY (Levels C, D, and E)

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

Standards traceable? (Levels D, E) ..... Yes No N/A

Standards expired? (Levels D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: MS - antimony 46% - J all no MS
LCS - Silica - 6.2% - J all

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A

Duplicate results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: RD Silica 30.3%

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed? ..... Yes No N/A

ICP serial dilution %D values acceptable? ..... Yes No N/A

ICP post digestion spike required? ..... Yes No N/A

ICP post digestion spike values acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Transcription/calculation errors? ..... Yes No N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

7. FURNACE AA QUALITY CONTROL (Levels D and E)

Duplicate injections performed as required? ..... Yes No N/A

Duplicate injection %RSD values acceptable? ..... Yes No N/A

Analytical spikes performed as required? ..... Yes No N/A

Analytical spike recoveries acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

MSA performed as required? ..... Yes No N/A

MSA results acceptable? ..... Yes No N/A

Transcription/calculation errors? ..... Yes No N/A

Comments: _____

8. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/05/08

CLIENT: TNU-HANFORD RC-032 LVL LOT #: 0804L979

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	08L0173-MB1	Silver, Total	0.10 u	MG/KG	0.10	1.0
		Aluminum, Total	4.0 u	MG/KG	4.0	1.0
		Arsenic, Total	0.50 u	MG/KG	0.50	1.0
		Boron, Total	0.50 u	MG/KG	0.50	1.0
		Barium, Total	0.10 u	MG/KG	0.10	1.0
		Beryllium, Total	0.05 u	MG/KG	0.05	1.0
		Calcium, Total	5.3	MG/KG	4.0	1.0
		Cadmium, Total	0.05	MG/KG	0.05	1.0
		Cobalt, Total	0.20 u	MG/KG	0.20	1.0
		Chromium, Total	0.20 u	MG/KG	0.20	1.0
		Copper, Total	0.47	MG/KG	0.23	1.0
		Iron, Total	4.5 u	MG/KG	4.5	1.0
		Potassium, Total	49.3 u	MG/KG	49.3	1.0
		Magnesium, Total	2.5 u	MG/KG	2.5	1.0
		Manganese, Total	0.10	MG/KG	0.04	1.0
		Molybdenum, Total	0.30 u	MG/KG	0.30	1.0
		Sodium, Total	26.7	MG/KG	2.0	1.0
		Nickel, Total	0.20 u	MG/KG	0.20	1.0
		Lead, Total	0.30 u	MG/KG	0.30	1.0
		Antimony, Total	0.30 u	MG/KG	0.30	1.0
		Selenium, Total	0.60 u	MG/KG	0.60	1.0
		Silicon, Total	4.0 u	MG/KG	4.0	1.0
		Vanadium, Total	0.14 u	MG/KG	0.14	1.0
		Zinc, Total	0.60 u	MG/KG	0.60	1.0
BLANK1	08C0075-MB1	Mercury, Total	0.01 u	MG/KG	0.01	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 05/05/08

CLIENT: TNU-HANFORD RC-032

LVL LOT #: 0804L979

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	J16MM8	Silver, Total	4.0	0.25u	4.2	95.2	3.0
		Aluminum, Total	14100	11500	167	1579 *	3.0
		Arsenic, Total	163	4.2	167	95.3	3.0
		Boron, Total	77.9	1.3 u	83.4	93.4	3.0
		Barium, Total	328	151	167	106.1	3.0
		Beryllium, Total	4.8	0.73	4.2	96.8	3.0
		Calcium, Total	6570	4060	2080	120.2	3.0
		Cadmium, Total	4.0	0.13u	4.2	95.2	3.0
		Cobalt, Total	49.3	8.6	41.7	97.6	3.0
		Chromium, Total	29.6	12.0	16.7	105.4	3.0
		Copper, Total	37.6	15.6	20.9	105.3	3.0
		Iron, Total	29600	27200	83.4	2911 *	3.0
		Mercury, Total	0.17	0.01u	0.16	103.1	1.0
		Potassium, Total	3850	1620	2080	106.6	3.0
		Magnesium, Total	7520	5000	2080	120.9	3.0
		Manganese, Total	497	420	41.7	184.7*	3.0
		Molybdenum, Total	76.1	0.76u	83.4	91.2	3.0
		Sodium, Total	2260	176	2080	100.1	3.0
		Nickel, Total	54.9	13.1	41.7	100.2	3.0
		Lead, Total	50.8	8.9	41.7	100.5	3.0
		Antimony, Total	20.5	1.0	41.7	46.8	3.0
		Selenium, Total	137	1.5 u	167	82.1	3.0
		Silicon, Total	634	498	83.4	162.1*	3.0
		Vanadium, Total	100	56.6	41.7	104.3	3.0
		Zinc, Total	97.6	52.4	41.7	108.4	3.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 05/05/08

CLIENT: TNU-HANFORD RC-032 LVL LOT #: 0804L979

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-002REP	J16MM8	Silver, Total	0.25u	0.26u	NC	3.0
		Aluminum, Total	11500	11900	4.2	3.0
		Arsenic, Total	4.2	5.1	19.4	3.0
		Boron, Total	1.3 u	1.3 u	NC	3.0
		Barium, Total	151	162	7.1	3.0
		Beryllium, Total	0.73	0.76	2.9	3.0
		Calcium, Total	4060	4020	1.1	3.0
		Cadmium, Total	0.13u	0.13u	NC	3.0
		Cobalt, Total	8.6	9.0	4.5	3.0
		Chromium, Total	12.0	12.2	1.7	3.0
		Copper, Total	15.6	16.6	6.2	3.0
		Iron, Total	27200	26700	2.0	3.0
		Mercury, Total	0.01u	0.01u	NC	1.0
		Potassium, Total	1620	1800	10.1	3.0
		Magnesium, Total	5000	5130	2.4	3.0
		Manganese, Total	420	416	0.98	3.0
		Molybdenum, Total	0.76u	0.79u	NC	3.0
		Sodium, Total	176	154	13.3	3.0
		Nickel, Total	13.1	13.8	5.2	3.0
		Lead, Total	8.9	9.3	4.4	3.0
		Antimony, Total	1.0	0.79u	NC	3.0
		Selenium, Total	1.5 u	1.6 u	NC	3.0
		Silicon, Total	498	498	0.18	3.0
		Vanadium, Total	56.6	52.4	7.7	3.0
		Zinc, Total	52.4	52.6	0.38	3.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 05/05/08

CLIENT: TNU-HANFORD RC-032 LVL LOT #: 0804L979

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	08L0173-LC1	Silver, LCS	48.3	50.0	MG/KG	96.6
		Aluminum, LCS	469	500	MG/KG	93.9
		Arsenic, LCS	957	1000	MG/KG	95.7
		Boron, LCS	469	500	MG/KG	93.8
		Barium, LCS	481	500	MG/KG	96.2
		Beryllium, LCS	24.7	25.0	MG/KG	98.8
		Calcium, LCS	2480	2500	MG/KG	99.1
		Cadmium, LCS	24.4	25.0	MG/KG	97.6
		Cobalt, LCS	240	250	MG/KG	96.0
		Chromium, LCS	48.7	50.0	MG/KG	97.4
		Copper, LCS	114	125	MG/KG	91.4
		Iron, LCS	477	500	MG/KG	95.3
		Potassium, LCS	2290	2500	MG/KG	91.7
		Magnesium, LCS	2380	2500	MG/KG	95.3
		Manganese, LCS	73.3	75.0	MG/KG	97.7
		Molybdenum, LCS	466	500	MG/KG	93.1
		Sodium, LCS	2340	2500	MG/KG	93.5
		Nickel, LCS	196	200	MG/KG	98.0
		Lead, LCS	247	250	MG/KG	98.6
		Antimony, LCS	285	300	MG/KG	95.1
		Selenium, LCS	923	1000	MG/KG	92.3
		Silicon, LCS	30.9	500	MG/KG	6.2
		Vanadium, LCS	233	250	MG/KG	93.4
		Zinc, LCS	97.7	100	MG/KG	97.7
LCS1	08C0075-LC1	Mercury, LCS	4.9	4.7	MG/KG	103.4

Date: 21 May 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 600-111
Subject: Semivolatile - Data Package No. K1207-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1207 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J16MM8	4/21/08	Soil	C	See note 1
J16MM9	4/21/08	Soil	C	See note 1
J16MN0	4/21/08	Soil	C	See note 1
J16MN1	4/21/08	Soil	C	See note 1
J16MN2	4/21/08	Soil	C	See note 1
J16MN3	4/21/08	Soil	C	See note 1
J16MN4	4/21/08	Soil	C	See note 1
J16MN5	4/21/08	Soil	C	See note 1
J16MN6	4/21/08	Soil	C	See note 1
J16MN7	4/21/08	Soil	C	See note 1
J16MN8	4/21/08	Soil	C	See note 1

1 – Semivolatiles by 8270C.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were met.

- **Method Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

All method blank results were acceptable (although 5 of 6 surrogate recoveries were low).

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to matrix spike and/or matrix spike duplicate results outside QC limits, all bis(2-chloroethyl)ether (49%), 2,2'-oxybis(1-chloropropane) (49%), hexachloroethane (48%) and 2,4-dinitrophenol (12%) results were qualified as estimates and flagged "J".

Due to LCS recoveries outside QC limits, all 2,4-dinitrophenol (5%) and 4,6-dinitro-2-methylphenol (16%) and pentachlorophenol (42%) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

Due to a surrogate recovery outside QC limits, all 2,4-dichlorophenol, 2,4,6-trichlorophenol, 2,4,5-trichlorophenol, pentachlorophenol, bis(2-chloroethyl)ether, bis(2-chloroethoxy)methane, 4-chlorophenyl phenyl ether, 4-bromophenyl phenyl ether results in samples J16MM9, J16MN3, J16MN7 and J16MN8 were qualified

as estimates and flagged "J".

Due to surrogate recoveries outside QC limits, all 2-nitrophenol, 2,4-dinitrophenol, nitrobenzene, n-nitroso-di-n-propylamine, 4-chloroaniline, 2-nitroaniline, 3-nitroaniline, 4-nitroaniline, 2,6-dinitrotoluene, n-nitrosodiphenylamine, phenol, 2-methylphenol, 3/4-methylphenol, 2,4-dimethylphenol, 2-nitrophenol, 2,4-dinitrophenol, dimethyl phthalate, diethyl phthalate, di-n-butyl phthalate, butylbenzylphthalate, bis(2-ethylhexyl) phthalate and di-n-octylphthalate results in sample J16MN1 were qualified as estimates and flagged "J".

All other surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to RPDs outside QC limits, all 2,4-dinitrophenol (107%) and 4-nitrophenol (55%) results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicate Samples

One set of field duplicates (J16MN5/J16MN6) were submitted for analysis. Field Duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria.

Eighty-eight semivolatile analytes exceeded the RQL. Under the WCH statement of work, no qualification is required. All other undetected analytes met the RQL.

- **Completeness**

Data package No. K1207 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to matrix spike and/or matrix spike duplicate results outside QC limits, all bis(2-chloroethyl)ether (49%), 2,2'-oxybis(1-chloropropane) (49%), hexachloroethane (48%) and 2,4-dinitrophenol (12%) results were qualified as estimates and flagged "J".

- Due to LCS recoveries outside QC limits, all 2,4-dinitrophenol (5%) and 4,6-dinitro-2-methylphenol (16%) and pentachlorophenol (42%) results were qualified as estimates and flagged "J".

- Due to a surrogate recovery outside QC limits, all 2,4-dichlorophenol, 2,4,6-trichlorophenol, 2,4,5-trichlorophenol, pentachlorophenol, bis(2-chloroethyl)ether, bis(2-chloroethoxy)methane, 4-chlorophenylphenylether, 4-bromophenylphenylether results in samples J16MM9, J16MN3, J16MN7 and J16MN8 were qualified as estimates and flagged "J".

- Due to surrogate recoveries outside QC limits, all 2-nitrophenol, 2,4-dinitrophenol, nitrobenzene, n-nitroso-di-n-propylamine, 4-chloroaniline, 2-nitroaniline, 3-nitroaniline, 4-nitroaniline, 2,6-dinitrotoluene, n-nitrosodiphenylamine, phenol, 2-methylphenol, 3/4-methylphenol, 2,4-dimethylphenol, 2-nitrophenol, 2,4-dinitrophenol, dimethyl phthalate, diethyl phthalate, di-n-butyl phthalate, butylbenzylphthalate, bis(2-ethylhexyl) phthalate and di-n-octylphthalate results in sample J16MN1 were qualified as estimates and flagged "J".

- Due to RPDs outside QC limits, all 2,4-dinitrophenol (107%) and 4-nitrophenol (55%) results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

Eighty-eight semivolatile analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

SEMIVOLATILE DATA QUALIFICATION SUMMARY*

SDG: K1207	REVIEWER: ELR	Project: 600-111	QC Issue
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
bis(2-chloroethyl)ether 2,2'-oxybis(1-chloropropane) Hexachloroethane 2,4-dinitrophenol	J	All	MS and/or MSD recovery
2,4-dinitrophenol 4,6-dinitro-2-methylphenol	J	All	LCS recovery
2,4-dichlorophenol 2,4,6-trichlorophenol 2,4,5-trichlorophenol Pentachlorophenol Bis(2-chloroethyl)ether Bis(2-chloroethoxy)methane 4-chlorophenylphenylether 4-bromophenylphenylether	J	J16MM9, J16MN3 J16MN7, J16MN8	Surrogate recovery
2-nitrophenol 2,4-dinitrophenol Nitrobenzene n-nitroso-di-n-propylamine 4-chloroaniline 2-nitroaniline 3-nitroaniline 4-nitroaniline 2,6-dinitrotoluene n-nitrosodiphenylamine Phenol 2-methylphenol 3/4-methylphenol 2,4-dimethylphenol 2-nitrophenol 2,4-dinitrophenol Dimethylphthalate Diethylphthalate Di-n-butylphthalate Butylbenzylphthalate Bis(2-ethylhexyl) phthalate Di-n-octylphthalate	J	J16MN1	Surrogate recovery

SEMIVOLATILE DATA QUALIFICATION SUMMARY*

SDG: K1207	REVIEWER: ELR	Project: 600-111	QC Issue
2,4-dinitrophenol 4-nitrophenol	J	All	RPD

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

RFW Batch Number: 0804L979 Client: TNUHANFORD RC-032 K1207 Work Order: 11343606001 Report Date: 05/07/08 13:34 Page: 1a

	Cust ID:	J16MM8	J16MM8	J16MM8	J16MM9	J16MN0	J16MN1
Sample Information	RFW#:	002	002 MS	002 MSD	003	004	005
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	44 %	53 %	54 %	51 %	53 %	20 * %
	2-Fluorobiphenyl	47 %	68 %	76 %	61 %	64 %	35 %
	Terphenyl-d14	69 %	79 %	95 %	83 %	108 %	70 %
	Phenol-d5	49 %	62 %	65 %	50 %	56 %	17 * %
	2-Fluorophenol	49 %	62 %	63 %	50 %	52 %	44 %
	2,4,6-Tribromophenol	34 %	35 %	29 %	17 * %	54 %	25 %
		fl	fl	fl	fl	fl	fl
Phenol		350 U	59 %	65 %	350 U	340 U	340 U J
bis(2-Chloroethyl)ether		350 U J	49 * %	51 %	350 U J	340 U J	340 U J
2-Chlorophenol		350 U	59 %	63 %	350 U	340 U	340 U
1,3-Dichlorobenzene		350 U	50 %	53 %	350 U	340 U	340 U
1,4-Dichlorobenzene		350 U	51 %	53 %	350 U	340 U	340 U
1,2-Dichlorobenzene		350 U	57 %	54 %	350 U	340 U	340 U
2-Methylphenol		350 U	61 %	66 %	350 U	340 U	340 U J
2,2'-oxybis(1-Chloropropane)		350 U J	50 %	49 * %	350 U J	340 U J	340 U J
3/4 Methylphenol		350 U	65 %	68 %	350 U	340 U	340 U J
N-Nitroso-di-n-propylamine		350 U	58 %	61 %	350 U	340 U	340 U J
Hexachloroethane		350 U J	48 * %	50 %	350 U J	340 U J	340 U J
Nitrobenzene		350 U	52 %	53 %	350 U	340 U	340 U J
Isophorone		350 U	60 %	63 %	350 U	340 U	20 J
2-Nitrophenol		350 U	65 %	66 %	350 U	340 U	340 U J
2,4-Dimethylphenol		350 U	65 %	65 %	350 U	340 U	340 U
bis(2-Chloroethoxy)methane		350 U	57 %	63 %	350 U J	340 U	340 U
2,4-Dichlorophenol		350 U	68 %	74 %	350 U J	340 U	340 U
1,2,4-Trichlorobenzene		350 U	60 %	64 %	350 U	340 U	340 U
Naphthalene		350 U	57 %	60 %	350 U	340 U	340 U
4-Chloroaniline		350 U	54 %	59 %	350 U	340 U	340 U J
Hexachlorobutadiene		350 U	60 %	69 %	350 U	340 U	340 U
4-Chloro-3-methylphenol		350 U	65 %	78 %	350 U	340 U	340 U
2-Methylnaphthalene		350 U	65 %	68 %	350 U	340 U	340 U
Hexachlorocyclopentadiene		350 U	52 %	58 %	350 U	340 U	340 U
2,4,6-Trichlorophenol		350 U	45 %	40 %	350 U J	340 U	340 U
2,4,5-Trichlorophenol		880 U	70 %	56 %	880 U J	860 U	860 U

*= Outside of EPA CLP QC limits.

K 5/19/08

000013

000000000

Cust ID:	J16MM8		J16MM8		J16MM8		J16MM9		J16MN0		J16MN1	
RFW#:	002		002 MS		002 MSD		003		004		005	
2-Chloronaphthalene	350	U	67	%	73	%	350	U	340	U	340	U
2-Nitroaniline	880	U	67	%	72	%	880	U	860	U	860	U J
Dimethylphthalate	350	U	80	%	83	%	350	U	340	U	340	U J
Acenaphthylene	350	U	69	%	75	%	350	U	340	U	340	U
2,6-Dinitrotoluene	350	U	76	%	85	%	350	U	340	U	340	U J
3-Nitroaniline	880	U	65	%	61	%	880	U	860	U	860	U J
Acenaphthene	350	U	68	%	74	%	350	U	340	U	340	U
2,4-Dinitrophenol	880	U J	40	%	12 *	%	880	U J	860	U J	860	U J
4-Nitrophenol	880	U J	66	%	116	%	880	U J	860	U J	860	U J
Dibenzofuran	350	U	77	%	83	%	350	U	340	U	340	U
2,4-Dinitrotoluene	350	U	83	%	93	%	350	U	340	U	340	U
Diethylphthalate	350	U	85	%	83	%	350	U	340	U	340	U J
4-Chlorophenyl-phenylether	350	U	79	%	83	%	350	U J	340	U	340	U
Fluorene	350	U	78	%	84	%	350	U	340	U	340	U
4-Nitroaniline	880	U	68	%	62	%	880	U	860	U	860	U J
4,6-Dinitro-2-methylphenol	880	U J	56	%	42	%	880	U J	860	U J	860	U J
N-Nitrosodiphenylamine (1)	350	U	52	%	65	%	350	U	340	U	340	U J
4-Bromophenyl-phenylether	350	U	64	%	79	%	350	U J	340	U	340	U
Hexachlorobenzene	350	U	84	%	98	%	350	U	340	U	340	U
Pentachlorophenol	880	U	50	%	42	%	880	U J	860	U	860	U
Phenanthrene	350	U	72	%	90	%	350	U	340	U	340	U
Anthracene	350	U	76	%	83	%	350	U	340	U	340	U
Carbazole	350	U	75	%	77	%	350	U	340	U	340	U
Di-n-butylphthalate	350	U	75	%	79	%	350	U	340	U	340	U J
Fluoranthene	350	U	88	%	96	%	350	U	340	U	340	U
Pyrene	350	U	75	%	87	%	350	U	340	U	340	U
Butylbenzylphthalate	350	U	70	%	77	%	350	U	340	U	340	U J
3,3'-Dichlorobenzidine	350	U	61	%	65	%	350	U	340	U	340	U
Benzo(a)anthracene	350	U	76	%	84	%	350	U	340	U	340	U
Chrysene	350	U	80	%	89	%	350	U	340	U	340	U
bis(2-Ethylhexyl)phthalate	21	J	67	%	72	%	19	J	32	J	340	U J
Di-n-octyl phthalate	350	U	75	%	80	%	350	U	340	U	340	U J
Benzo(b)fluoranthene	350	U	82	%	87	%	350	U	340	U	340	U
Benzo(k)fluoranthene	350	U	85	%	87	%	350	U	340	U	340	U
Benzo(a)pyrene	350	U	79	%	84	%	350	U	340	U	340	U
Indeno(1,2,3-cd)pyrene	350	U	73	%	77	%	350	U	340	U	340	U
Dibenz(a,h)anthracene	350	U	79	%	79	%	350	U	340	U	340	U
Benzo(g,h,i)perylene	350	U	73	%	77	%	350	U	340	U	340	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

5/19/08

Lionville Laboratory, Inc.
Semivolatiles by GC/MS, HSL List

Report Date: 05/07/08 13:34

RFW Batch Number: 0804L979 Client: TNUHANFORD RC-032 K1207 Work Order: 11343606001 Page: 2a

	Cust ID:	J16MN2	J16MN3	J16MN4	J16MN5	J16MN6	J16MN7
Sample Information	RFW#:	006	007	008	009	010	011
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	63 %	61 %	44 %	46 %	43 %	58 %
	2-Fluorobiphenyl	73 %	64 %	55 %	53 %	57 %	69 %
	Terphenyl-d14	97 %	85 %	84 %	71 %	87 %	100 %
	Phenol-d5	75 %	64 %	53 %	54 %	51 %	62 %
	2-Fluorophenol	72 %	64 %	49 %	52 %	51 %	63 %
	2,4,6-Tribromophenol	36 %	7 * %	20 %	41 %	59 %	10 * %
		fl	fl	fl	fl	fl	fl
Phenol		340 U	350 U	360 U	350 U	350 U	340 U
bis(2-Chloroethyl)ether		340 U J	350 U J	360 U J	350 U J	350 U J	340 U J
2-Chlorophenol		340 U	350 U	360 U	350 U	350 U	340 U
1,3-Dichlorobenzene		340 U	350 U	360 U	350 U	350 U	340 U
1,4-Dichlorobenzene		340 U	350 U	360 U	350 U	350 U	340 U
1,2-Dichlorobenzene		340 U	350 U	360 U	350 U	350 U	340 U
2-Methylphenol		340 U	350 U	360 U	350 U	350 U	340 U
2,2'-oxybis(1-Chloropropane)		340 U J	350 U J	360 U J	350 U J	350 U J	340 U J
3/4 Methylphenol		340 U	350 U	360 U	350 U	350 U	340 U
N-Nitroso-di-n-propylamine		340 U	350 U	360 U	350 U	350 U	340 U
Hexachloroethane		340 U J	350 U J	360 U J	350 U J	350 U J	340 U J
Nitrobenzene		340 U	350 U	360 U	350 U	350 U	340 U
Isophorone		340 U	350 U	360 U	350 U	350 U	340 U
2-Nitrophenol		340 U	350 U	360 U	350 U	350 U	340 U
2,4-Dimethylphenol		340 U	350 U	360 U	350 U	350 U	340 U
bis(2-Chloroethoxy)methane		340 U	350 U J	360 U	350 U	350 U	340 U J
2,4-Dichlorophenol		340 U	350 U J	360 U	350 U	350 U	340 U J
1,2,4-Trichlorobenzene		340 U	350 U	360 U	350 U	350 U	340 U
Naphthalene		340 U	350 U	360 U	350 U	350 U	340 U
4-Chloroaniline		340 U	350 U	360 U	350 U	350 U	340 U
Hexachlorobutadiene		340 U	350 U	360 U	350 U	350 U	340 U
4-Chloro-3-methylphenol		340 U	350 U	360 U	350 U	350 U	340 U
2-Methylnaphthalene		340 U	350 U	360 U	350 U	350 U	340 U
Hexachlorocyclopentadiene		340 U	350 U	360 U	350 U	350 U	340 U
2,4,6-Trichlorophenol		340 U	350 U J	360 U	350 U	350 U	340 U J
2,4,5-Trichlorophenol		850 U	870 U J	900 U	870 U	870 U	850 U J

*= Outside of EPA CLP QC limits.

JC 5/15/08

000000010

000015

Cust ID:	J16MN2		J16MN3		J16MN4		J16MN5		J16MN6		J16MN7	
RFW#:	006		007		008		009		010		011	
2-Chloronaphthalene	340	U	350	U	360	U	350	U	350	U	340	U
2-Nitroaniline	850	U	870	U	900	U	870	U	870	U	850	U
Dimethylphthalate	340	U	350	U	360	U	350	U	350	U	340	U
Acenaphthylene	340	U	350	U	360	U	350	U	350	U	340	U
2,6-Dinitrotoluene	340	U	350	U	360	U	350	U	350	U	340	U
3-Nitroaniline	850	U	870	U	900	U	870	U	870	U	850	U
Acenaphthene	340	U	350	U	360	U	350	U	350	U	340	U
2,4-Dinitrophenol	850	U J	870	U J	900	U J	870	U J	870	U J	850	U J
4-Nitrophenol	850	U J	870	U J	900	U J	870	U J	870	U J	850	U J
Dibenzofuran	340	U	350	U	360	U	350	U	350	U	340	U
2,4-Dinitrotoluene	340	U	350	U	360	U	350	U	350	U	340	U
Diethylphthalate	340	U	350	U	360	U	350	U	350	U	340	U
4-Chlorophenyl-phenylether	340	U	350	U J	360	U	350	U	350	U	340	U J
Fluorene	340	U	350	U	360	U	350	U	350	U	340	U
4-Nitroaniline	850	U	870	U	900	U	870	U	870	U	850	U
4,6-Dinitro-2-methylphenol	850	U J	870	U J	900	U J	870	U J	870	U J	850	U J
N-Nitrosodiphenylamine (1)	340	U	350	U	360	U	350	U	350	U	340	U
4-Bromophenyl-phenylether	340	U	350	U J	360	U	350	U	350	U	340	U J
Hexachlorobenzene	340	U	350	U	360	U	350	U	350	U	340	U
Pentachlorophenol	850	U	870	U J	900	U	870	U	870	U	850	U J
Phenanthrene	340	U	350	U	360	U	350	U	350	U	340	U
Anthracene	340	U	350	U	360	U	350	U	350	U	340	U
Carbazole	340	U	350	U	360	U	350	U	350	U	340	U
Di-n-butylphthalate	340	U	350	U	360	U	350	U	350	U	340	U
Fluoranthene	340	U	350	U	360	U	350	U	350	U	340	U
Pyrene	340	U	350	U	360	U	350	U	18	J	340	U
Butylbenzylphthalate	340	U	350	U	360	U	350	U	350	U	340	U
3,3'-Dichlorobenzidine	340	U	350	U	360	U	350	U	350	U	340	U
Benzo(a)anthracene	340	U	350	U	360	U	350	U	350	U	340	U
Chrysene	340	U	350	U	360	U	350	U	350	U	340	U
bis(2-Ethylhexyl)phthalate	25	J	18	J	20	J	26	J	17	J	340	U
Di-n-octyl phthalate	340	U	350	U	360	U	350	U	350	U	340	U
Benzo(b)fluoranthene	340	U	350	U	360	U	350	U	350	U	340	U
Benzo(k)fluoranthene	340	U	350	U	360	U	350	U	350	U	340	U
Benzo(a)pyrene	340	U	350	U	360	U	350	U	350	U	340	U
Indeno(1,2,3-cd)pyrene	340	U	350	U	360	U	350	U	350	U	340	U
Dibenz(a,h)anthracene	340	U	350	U	360	U	350	U	350	U	340	U
Benzo(g,h,i)perylene	340	U	350	U	360	U	350	U	350	U	340	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

5/19/08

000016

000000011

000000012

	Cust ID:	J16MN8	SBLKUH	SBLKUH BS
Sample Information	RFW#:	012	08LE0200-MB1	08LE0200-MB1
	Matrix:	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	57 %	20 * %	64 %
	2-Fluorobiphenyl	66 %	24 * %	70 %
	Terphenyl-d14	90 %	63 %	76 %
	Phenol-d5	62 %	21 * %	72 %
	2-Fluorophenol	62 %	23 * %	69 %
	2,4,6-Tribromophenol	10 * %	5 * %	48 %
Phenol		350 U	330 U	73 %
bis(2-Chloroethyl)ether		350 U J	330 U	64 %
2-Chlorophenol		350 U	330 U	68 %
1,3-Dichlorobenzene		350 U	330 U	63 %
1,4-Dichlorobenzene		350 U	330 U	61 %
1,2-Dichlorobenzene		350 U	330 U	66 %
2-Methylphenol		350 U	330 U	70 %
2,2'-oxybis(1-Chloropropane)		350 U J	330 U	69 %
3/4 Methylphenol		350 U	330 U	72 %
N-Nitroso-di-n-propylamine		350 U	330 U	73 %
Hexachloroethane		350 U J	330 U	62 %
Nitrobenzene		350 U	330 U	61 %
Isophorone		350 U	330 U	68 %
2-Nitrophenol		350 U	330 U	65 %
2,4-Dimethylphenol		350 U	330 U	63 %
bis(2-Chloroethoxy)methane		350 U J	330 U	64 %
2,4-Dichlorophenol		350 U J	330 U	62 %
1,2,4-Trichlorobenzene		350 U	330 U	62 %
Naphthalene		350 U	330 U	65 %
4-Chloroaniline		350 U	330 U	51 %
Hexachlorobutadiene		350 U	330 U	67 %
4-Chloro-3-methylphenol		350 U	330 U	64 %
2-Methylnaphthalene		350 U	330 U	63 %
Hexachlorocyclopentadiene		350 U	330 U	65 %
2,4,6-Trichlorophenol		350 U J	330 U	57 %
2,4,5-Trichlorophenol		870 U J	830 U	67 %

*= Outside of EPA CLP QC limits.

5/19/08

000017

Cust ID:	J16MN8		SBLKUH		SBLKUH BS	
RFW#:	012		08LE0200-MB1		08LE0200-MB1	
2-Chloronaphthalene	350	U	330	U	68	%
2-Nitroaniline	870	U	830	U	72	%
Dimethylphthalate	350	U	330	U	69	%
Acenaphthylene	350	U	330	U	69	%
2,6-Dinitrotoluene	350	U	330	U	66	%
3-Nitroaniline	870	U	830	U	64	%
Acenaphthene	350	U	330	U	66	%
2,4-Dinitrophenol	870	U J	830	U	5 *	%
4-Nitrophenol	870	U J	830	U	56	%
Dibenzofuran	350	U	330	U	72	%
2,4-Dinitrotoluene	350	U	330	U	74	%
Diethylphthalate	350	U	330	U	71	%
4-Chlorophenyl-phenylether	350	U J	330	U	65	%
Fluorene	350	U	330	U	71	%
4-Nitroaniline	870	U	830	U	64	%
4,6-Dinitro-2-methylphenol	870	U J	830	U	16 *	%
N-Nitrosodiphenylamine (1)	350	U	330	U	59	%
4-Bromophenyl-phenylether	350	U J	330	U	66	%
Hexachlorobenzene	350	U	330	U	79	%
Pentachlorophenol	870	U J	830	U	42	%
Phenanthrene	350	U	330	U	71	%
Anthracene	350	U	330	U	75	%
Carbazole	350	U	330	U	66	%
Di-n-butylphthalate	350	U	330	U	66	%
Fluoranthene	350	U	330	U	75	%
Pyrene	350	U	330	U	76	%
Butylbenzylphthalate	350	U	330	U	76	%
3,3'-Dichlorobenzidine	350	U	330	U	62	%
Benzo(a)anthracene	350	U	330	U	73	%
Chrysene	350	U	330	U	75	%
bis(2-Ethylhexyl)phthalate	62	J	330	U	73	%
Di-n-octyl phthalate	350	U	330	U	66	%
Benzo(b)fluoranthene	350	U	330	U	72	%
Benzo(k)fluoranthene	350	U	330	U	68	%
Benzo(a)pyrene	350	U	330	U	70	%
Indeno(1,2,3-cd)pyrene	350	U	330	U	72	%
Dibenz(a,h)anthracene	350	U	330	U	70	%
Benzo(g,h,i)perylene	350	U	330	U	72	%

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

V 5/19/08

000018

000000013

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-032
LVL #: 0804L979
SDG/SAF # K1207 / RC-032

W.O. #: 11343-606-001-9999-00
Date Received: 04-23-2008

SEMIVOLATILE

Eleven (11) soil samples were collected on 04-21-2008.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 04-25-2008 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 04-28,29,30-2008.

All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise. The following is a summary of QC results accompanying the sample results. Lionville Laboratory Inc (LvLI) certifies that all test results meet the requirements of NELAC except as noted below:

1. Samples were extracted and analyzed within required holding time.

2. Non-target compounds were detected in the samples.

3. Eleven (11) of ninety (90) surrogate recoveries were outside acceptance criteria. However, surrogate recovery acceptance criteria were met for samples J16MM9, J16MN1, J16MN7, J16MN8 (i.e., no more than one outlier per fraction {acid and base neutral} and no recoveries less than 10%). The surrogate recover criteria were not met for samples 08LE0200-MB1 and J16MN3. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

4. Four (4) of one hundred and twenty-eight (128) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

5. Two (2) of sixty-four (64) blank spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

6. The method blank was below the reporting limit for all target compounds.

r:\group\data\2008\bna\tnu\0804-979ks2.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 31 pages.

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

7. All initial calibrations associated with this data set were within acceptance criteria.

8. All continuing calibrations standards analyzed prior to sample extracts were within acceptance criteria.

9. Internal standard area criteria were not met for sample J16MN5. The out of criteria sample was re-analyzed on 04-30-2008 with similar results and not reported. The GC/MS instrument was inspected for possible malfunction and was judged to be functioning properly and all surrogate recoveries were within QC limits; consequently, the sample was not reanalyzed.

10. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").

11. LvLI is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

12. I certify, that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data, contained in this hard-copy data package, has been authorized, by the Laboratory Manager or a designee, as verified by the following signature.

Judy Stone

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

5/8/08
Date

LVLI
LIONVILLE LABORATORY INC.

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 08MS094

Initiator: Shawn Sylvia
Date: 4-30-08
Client: TMY RC032

Batch: OFLE 979
Samples: 1MS, 1MSD, 1B5
Method: SW846/MCAWW/CLP/

Parameter: 8270
Matrix: SOLID
Prep Batch: OFLE0200

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy

__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. Problem (Include all relevant specific results; attach data if necessary)

① low spike recoveries in the MS, MSD, + B5
② low recovery of 2,4,6-tribromophenol in sample 007 (J16UN3) (<10%) also Blk
③ low surrogate recoveries in the method blank (5 out of range)

2. Known or Probable Causes(s) ① acetophenone, naphthalene are subject to erratic chromatographic behavior especially if the GC system contaminated with high boiling material. Others spectra ② loss due to a chemical reaction rather than a problem with the extraction process. Conversion compound has been reported as a TIC. ③ Possible loss during concentration of the extract on Kemp

PGL 5/6/08

3. Discussion and Proposed Action

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

Other Description:

2+3 narrate no hits in sample (above reporting limits) - no impact on data

5/6/08

4. Project Manager Instructions...signature/date: _____

✓ Concur with Proposed Action
✓ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: _____ 5/8/08

Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
①	X Project Mgr: Stone/Johnson		__ GC/LC: Kiger
__	__ Data Management: Stilwell	②	X MS: Rychlak/Daley
__	__ Sample Prep: Beegle/Kiger	__	__ Log-in: Perry
		__	__ Admin: _____
		__	__ Other: _____

QA-105-A-0805

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-032-198 | Page 1 of 2

Collector: T. Welch-Koelling	Company Contact: JR DEBUIGNE	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 DAY		
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 600-111 Verification		SAF No.: RC-032
Ice Chest No.: IE KC-02-007	Field Logbook No.: EFL-1174-4	COA: R601112000	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A080239		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

NA Cool 4°C

Preservation	None	Cool 4C	Cool 4C								
Type of Container	P	aG	aG								
No. of Container(s)	2	1	1								
Volume	125mL	60mL	120mL								
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)								

Sample No.	Matrix *	Sample Date	Sample Time										
116MM7	SOIL	4-21-08	1020	X									EB
116MM8	SOIL		1025	X	X	X							1
116MM9	SOIL		1030	X	X	X							2
116MN0	SOIL		1035	X	X	X							3
116MN1	SOIL		1040	X	X	X							4

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
JH Hatfield / JH Hatfield	4/21/08 1300	JR DeBuigne JR DeBuigne	1300 4-21-08
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
JR DeBuigne JR DeBuigne	1530 4-21-08	MLK MStankovich	1530 4/21/08
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
WCK MStankovich	0900 4/22/08		Fed Ex
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Fed Ex	4-23-08 0930	[illegible]	4-23-08 0930
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)

Matrix *

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

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

WCH-EE-011

000000028

000023

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-198	Page 2 of 3

Collector: T. Welch-Koelling	Company Contact: JR DEBUIGNE	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 600-111 Verification		SAF No.: RC-032
Ice Chest No.: ERC-02-007	Field Logbook No.: EFL-1174-4	COA: R601112000	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A080239		Bill of Lading/Air Bill No.: See OSPC

Price Code: 8B

Data Turnaround: 7 DAY

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

NA Cool 4°C

Preservation	None	Cool 4C	Cool 4C									
Type of Container	P	aG	aG									
No. of Container(s)	2	1	1									
Volume	125mL	60mL	120mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)									

Sample No.	Matrix *	Sample Date	Sample Time										
6MN2	SOIL	4-21-08	1045	X	X	X							5
6MN3	SOIL		1050	X	X	X							6
6MN4	SOIL		1055	X	X	X							7
6MN5	SOIL		1100	X	X	X							8
6MN6	SOIL		1100	X	X	X							8 DUP

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From: Robert Koelling	Date/Time: 4-21-08 1300	Received By/Stored In: JR DeBuigne	Date/Time: 1300 4-21-08
Relinquished By/Removed From: JR DeBuigne	Date/Time: 1530 4-21-08	Received By/Stored In: MS Stankovich	Date/Time: 1530 4/21/08
Relinquished By/Removed From: MS Stankovich	Date/Time: 1500 4/22/08	Received By/Stored In: Fed EX	Date/Time:
Relinquished By/Removed From: [illegible]	Date/Time: 4-23-08 0930	Received By/Stored In: [illegible]	Date/Time: 4-23-08 0930
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)

Matrix *

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

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

H-EE-011

000000024

000000029

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-198	Page 3 of 3

Collector: T. Welch-Koelling	Company Contact: JR DEBUIGNE	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 600-111 Verification		SAF No.: RC-032
Ice Chest No.: EKC-02-007	Field Logbook No.: EFL-1174-4	COA: R601112000	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A080239		Bill of Lading/Air Bill No.: See OSPC

Price Code: 8B

Data Turnaround: 7 DAY

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

NA Cool 4°C

Preservation	None	Cool 4C	Cool 4C									
Type of Container	P	aG	aG									
No. of Container(s)	2	1	1									
Volume	125mL	60mL	120mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)									

Sample No.	Matrix *	Sample Date	Sample Time											
16MN7	SOIL	4-21-08	1105	X	X	X								9
16MN8	SOIL	4-21-08	1110	X	X	X								10

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: [illegible] Kelly	4-21-08 1300	Received By/Stored In: JR DeBuigne JR DeBuigne	1300 4-21-08
Relinquished By/Removed From: JR DeBuigne JR DeBuigne	1530 4-21-08	Received By/Stored In: MSHankovich	4/21/08 1530
Relinquished By/Removed From: MSHankovich	1500 4/22/08	Received By/Stored In: Fed Ex	
Relinquished By/Removed From: Fed Ex	4-23-08 0930	Received By/Stored In: [illegible]	4-23-08 0930
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)

Matrix *

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

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

CH-EE-011

000025

000000030

Lionville Laboratory Incorporated

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: TNU HANFORD

Project/SAF/SOW/Release #: RC-032

Date: 4/23/08

LvLI Batch #: 08041979

Sample Custodian: [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier Fed Ex		Airbill # 799311902306
2. Custody Seals on coolers or shipping containers intact, signed & dated?	☑ Yes	☐ No	☐ No Seals
3. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	*Comments:*
4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible?	☑ Yes	☐ No	
5. Samples received cooled or ambient?	Temp 39	°C	Cooler # ERC-02-007
How was the temperature taken?	☑ IR	☐ Temp. Blank	☐ Other (Specify):
Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C)	☑ Yes	☐ No	
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ No Seals
7. COC (Client & LvLI) signed & dated?	☑ Yes	☐ No	
8. Sample containers are intact?	☑ Yes	☐ No	
9. All samples on COC received?	☑ Yes	☐ No	
All samples received on COC?	☑ Yes	☐ No	
10. All sample label information matches COC?	☑ Yes	☐ No	
11. Samples properly preserved? (If #5 is no, then this is no.)	☑ Yes	☐ No	
12. Samples received within hold times?	☑ Yes	☐ No	
Short holds taken to wet lab?	☐ Yes	☐ No	☑ N/A
13. VOA, TOC, TOX free of headspace?	☐ Yes	☐ No	☑ N/A
14. QC stickers placed on bottles designated by client?	☐ Yes	☐ No	☑ N/A
15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.)	☑ Yes	☐ No	
16. Project Manager contacted concerning any discrepancies?	☐ Yes	☐ No	☑ N/A

Person Contacted _____ Date _____

LVLI LIONVILLE LABORATORY INC.

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 600-111			DATA PACKAGE: K1207		
VALIDATOR: ELR		LAB: LLI		DATE: 5/18/08	
			SDG: K1207		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J16MM8	J16MM9	J16MN0	J16MN1	J16MN2	
J16MN3	J16MN4	J16MN5	J15MN6	J16MN7	
J16MN8					
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

GC/MS tuning/performance check acceptable? ..... Yes No (N/A)

Initial calibrations acceptable? ..... Yes No (N/A)

Continuing calibrations acceptable? ..... Yes No (N/A)

Standards traceable? ..... Yes No (N/A)

Standards expired? ..... Yes No (N/A)

Calculation check acceptable? ..... Yes No (N/A)

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A

Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: (Surr low S/L in MB) no FB

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A

Surrogate/system monitoring compound recoveries acceptable? ..... Yes No N/A

Surrogates traceable? (Levels D, E) ..... Yes No N/A

Surrogates expired? (Levels D, E) ..... Yes No N/A

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

Standards traceable? (Levels D, E) ..... Yes No N/A

Standards expired? (Levels D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: Surr 2,4,6-tribromophenol - N9, N3, N7, N8 - J all assoc
Surr Nitrobenzene-d5 phenol - N1 J all assoc

MS - 4 out - J all
LCS - 3 out - J all no PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD RPD values acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: RPD 2,4-dinitrophenol 4-nitrophenol - J all

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ..... Yes No N/A

Iinternal standard areas acceptable? ..... Yes No N/A

Internal standard retention times acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Transcription/calculation errors? ..... Yes No N/A

Comments:

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No N/A

Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A

Results reported for all requested analyses? ..... Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Laboratory properly identified and coded all TIC? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: 88 over

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed? ..... Yes No N/A

GPC check performed? ..... Yes No N/A

GPC check recoveries acceptable? ..... Yes No N/A

GPC calibration performed? ..... Yes No N/A

GPC calibration check performed? ..... Yes No N/A

GPC calibration check retention times acceptable? ..... Yes No N/A

Check/calibration materials traceable? ..... Yes No N/A

Check/calibration materials Expired? ..... Yes No N/A

Analytical batch QC given similar cleanup? ..... Yes No N/A

Transcription/Calculation Errors? ..... Yes No N/A

Comments:

Date: 21 May 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 600-111
Subject: PCB - Data Package No. K1207-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1207 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J16MM8	4/21/08	Soil	C	See note 1
J16MM9	4/21/08	Soil	C	See note 1
J16MN0	4/21/08	Soil	C	See note 1
J16MN1	4/21/08	Soil	C	See note 1
J16MN2	4/21/08	Soil	C	See note 1
J16MN3	4/21/08	Soil	C	See note 1
J16MN4	4/21/08	Soil	C	See note 1
J16MN5	4/21/08	Soil	C	See note 1
J16MN6	4/21/08	Soil	C	See note 1
J16MN7	4/21/08	Soil	C	See note 1
J16MN8	4/21/08	Soil	C	See note 1

1 – PCBs by 8082.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

Sample data were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blank**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than required quantitation limit (RQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than RQL, the result is qualified as undetected and elevated to the RQL.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. If spike recoveries are

outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to the lack of a matrix spike duplicate analysis, all PCB results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to the lack of a matrix spike duplicate analysis, all PCB results were qualified as estimates and flagged "J".

Field Duplicate Samples

One set of field duplicates (J16MN5/J16MN6) were submitted for analysis. Field Duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

- **Completeness**

Data Package No. K1207 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiency was noted:

- Due to the lack of a matrix spike duplicate analysis, all PCB results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

PCB DATA QUALIFICATION SUMMARY*

SDG: K1207	REVIEWER: ELR	Project: 600-111	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All	J	All	No MSD analysis

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

PCBs by GC

Report Date: 04/28/08 13:19

RFW Batch Number: 0804L979 Client: TNU-HANFORD RC-032 Work Order: 11343606001 Page: 1

	Cust ID:	J16MM8	J16MM8	J16MM8	J16MM9	J16MN0	J16MN1
Sample Information	RFW#:	002	002 MS	002 MSD	003	004	005
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	98 %	98 %	91 %	96 %	98 %	72 %
	Decachlorobiphenyl	68 %	72 %	65 %	76 %	79 %	75 %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		14 U J	93 %	NS %	14 U J	14 U J	14 U J
Aroclor-1221		14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1232		14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1242		14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1248		14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1254		14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1260		14 U	87 %	NS %	14 U	14 U	14 U

	Cust ID:	J16MN2	J16MN3	J16MN4	J16MN5	J16MN6	J16MN7
Sample Information	RFW#:	006	007	008	009	010	011
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	92 %	96 %	88 %	96 %	56 %	103 %
	Decachlorobiphenyl	77 %	84 %	84 %	90 %	60 %	91 %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		14 U J	14 U J	14 U J	14 U J	14 U J	14 U J
Aroclor-1221		14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1232		14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1242		14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1248		14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1254		14 U	14 U	14 U	14 U	14 U	14 U
Aroclor-1260		14 U	14 U	14 U	14 U	14 U	14 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

5/19/08

000000006

0000011

PCBs by GC

Report Date: 04/28/08 13:19

RFW Batch Number: 0804L979 Client: TNU-HANFORD RC-032 Work Order: 11343606001 Page: 2

	Cust ID:	J16MN8	PBLKPN	PBLKPN BS
Sample Information	RFW#:	012	08LE0198-MB1	08LE0198-MB1
	Matrix:	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		96 %	94 %	99 %
Decachlorobiphenyl		90 %	66 %	72 %
Aroclor-1016		14 U J	13 U	91 %
Aroclor-1221		14 U	13 U	13 U
Aroclor-1232		14 U	13 U	13 U
Aroclor-1242		14 U	13 U	13 U
Aroclor-1248		14 U	13 U	13 U
Aroclor-1254		14 U	13 U	13 U
Aroclor-1260		14 U	13 U	86 %

JL 5/19/08

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

000000007

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-032
LVL #: 0804L979
SDG/SAF # K1207 / RC-032

W.O. #: 11343-606-001-9999-00
Date Received: 04-23-2008

PCB

Eleven (11) solid samples were collected on 04-21-2008.

The samples and their associated QC samples were extracted on 04-24-2008 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedure on 04-25,26-2008. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise. The following is a summary of the QC results accompanying the sample results. Lionville Laboratory Inc (LvLI) certifies that all test results meet the requirements of NELAC except as noted below:

1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time
3. The samples and their associated QC samples received Copper-Sulfur and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3660A and 3665A respectively.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. The initial calibrations associated with this data set were within acceptance criteria.
9. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

k:\group\data\pest\tnu\0804-979\ksol2.pcb.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 16 pages.

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

LvLI
LIONVILLE LABORATORY INC.

10. LvLI is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

11. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Judy Stone

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

5/6/08
Date

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory Sample Discrepancy Report (SDR) SDR #: 08LE037

Initiator: Svetlana Zak
Date: 04/28/2008
Client: TOTH

Batch: 08041979
Samples: 002-T
Method: SW846/MCAWW/CLP/

Parameter: PCB
Matrix: soil
Prep Batch: 08LE0198

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code ✓ Other _____

b. General Discrepancy

__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold*
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. Problem (Include all relevant specific results; attach data if necessary)

Sample 002F MSD not spiked w/ 1016 & 1260

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description:

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

report + narrate

4. Project Manager Instructions...signature/date: 4/28/08

__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
✓ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: 5-3-08 Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA for diposition.

Route
__ Lab Manager: Daniels
(i) Project Mgr (circle): Johnson / Stone
__ Sample Prep (circle): Ford
__ Log-in: King

Route
__ Metals: Welsh / _____
__ Inorganic: Perrone / _____
__ GC/LC: Carey / _____
__ MS VOA: Rubino / _____
__ MS BNA: Carden / _____
__ Other: _____

QA-139-A-0208

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-032-198

Collector: T. Welch-Koelling	Company Contact: JR DEBUIGNE	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 DAY		
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 600-111 Verification		SAF No.: RC-032
Ice Chest No.: IE RC-02-007	Field Logbook No.: EFL-1174-4	COA: R601112000	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A080239		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

NA Cool 4°C

Preservation	None	Cool 4C	Cool 4C								
Type of Container	P	aG	aG								
No. of Container(s)	2	1	1								
Volume	125mL	60mL	120mL								
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)								

Sample No.	Matrix *	Sample Date	Sample Time										
116MM7	SOIL	4-21-08	1020	X									EB
116MM8	SOIL		1025	X	X	X							1
116MM9	SOIL		1030	X	X	X							2
116MN0	SOIL		1035	X	X	X							3
116MN1	SOIL		1040	X	X	X							4

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From: JR DeBuigne / T. Welch-Koelling, Date/Time: 4/21/08 1300	Received By/Stored In: JR DeBuigne / JR DeBuigne, Date/Time: 1300 4-21-08	
Relinquished By/Removed From: JR DeBuigne / JR DeBuigne, Date/Time: 1530 4-21-08	Received By/Stored In: MS Stankovich / MS Stankovich, Date/Time: 1530 4/21/08	
Relinquished By/Removed From: MS Stankovich, Date/Time: 0900 4/22/08	Received By/Stored In: Fed Ex, Date/Time:	
Relinquished By/Removed From: Fed Ex, Date/Time: 4-23-08 0930	Received By/Stored In: [signature], Date/Time: 4-23-08 0930	
Relinquished By/Removed From: Date/Time	Received By/Stored In: Date/Time	
Relinquished By/Removed From: Date/Time	Received By/Stored In: Date/Time	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)

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

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

VCH-EE-011

000000013

000017

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-198	Page 2 of 3

ollector T. Welch-Koelling	Company Contact JR DEBUIGNE	Telephone No. 528-6409	Project Coordinator KESSNER, JH
Price Code 8B	Data Turnaround 7 DAY		
roject Designation 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location 600-111 Verification		SAF No. RC-032
ce Chest No. ERC-02-007	Field Logbook No. EFL-1174-4	COA R601112000	Method of Shipment FED EX
hipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A080239		Bill of Lading/Air Bill No. See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

NA Cool 4°C

Preservation	None	Cool 4C	Cool 4C									
Type of Container	P	aG	aG									
No. of Container(s)	2	1	1									
Volume	125mL	60mL	120mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)									

000018

Sample No.	Matrix *	Sample Date	Sample Time										
16MN2	SOIL	4-21-08	1045	X	X	X							5
16MN3	SOIL		1050	X	X	X							6
16MN4	SOIL		1055	X	X	X							7
16MN5	SOIL		1100	X	X	X							8
16MN6	SOIL		1100	X	X	X							8 DUP

CHAIN OF POSSESSION	Sign/Print Names		
elinquished By/Removed From	Date/Time 4-21-08 1300	Received By/Stored In JR DeBuigne	Date/Time 1300 4-21-08
elinquished By/Removed From JR DeBuigne	Date/Time 1530 4-21-08	Received By/Stored In MS Stankovich	Date/Time 1530 4/21/08
elinquished By/Removed From MS Stankovich	Date/Time 1500 4/22/08	Received By/Stored In Fed EX	Date/Time
elinquished By/Removed From	Date/Time 4-23-08 0930	Received By/Stored In	Date/Time 4-23-08 0930
elinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
elinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)

Matrix *

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

ABORATORY SECTION	Received By	Title	Date/Time
INAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

CH-EE-011

000000014

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-032-198

Collector: T. Welch-Koelling	Company Contact: JR DEBUIGNE	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 DAY		
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 600-111 Verification		SAF No.: RC-032
Ice Chest No.: ERC-02-007	Field Logbook No.: EFL-1174-4	COA: R601112000	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / CLONVILLE	Offsite Property No.: A080239		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

VA

Special Handling and/or Storage

VA Cool 4°C

Preservation	None	Cool 4C	Cool 4C									
Type of Container	P	aG	aG									
No. of Container(s)	2	1	1									
Volume	125mL	60mL	120mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)									

Sample No.	Matrix *	Sample Date	Sample Time										
16MN7	SOIL	4-21-08	1105	X	X	X							9
16MN8	SOIL	4-21-08	1110	X	X	X							10

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time 4-21-08 1300	Received By/Stored In JR DeBuigne	Date/Time 1300 4-21-08
Relinquished By/Removed From JR DeBuigne	Date/Time 1530 4-21-08	Received By/Stored In MSHankovich	Date/Time 4/21/08 1530
Relinquished By/Removed From MSHankovich	Date/Time 1500 4/22/08	Received By/Stored In Fed Ex	Date/Time
Relinquished By/Removed From Fed Ex	Date/Time 4-23-08 0930	Received By/Stored In	Date/Time 4-23-08 0930
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV)

Matrix *

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

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

CH-EE-011

000000015

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F 600-111			DATA PACKAGE: K1207		
VALIDATOR: ELR		LAB: LLI		DATE: 5/16/08	
			SDG: K1207		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J16MM8	J16MM9	J16MN0	J16MN1	J16MN2	
J16MN3	J16MN4	J16MN5	J16MN6	J16MN7	
J16MN8					
				Soil	

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes No N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations acceptable? ..... Yes No N/A

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

DDT and endrin breakdowns acceptable? ..... Yes No N/A

Comments: _____

PCB DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A

Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

4. ACCURACY (Levels C, D, and E)

Surrogates analyzed? ..... Yes No N/A

Surrogate recoveries acceptable? ..... Yes No N/A

Surrogates traceable? (Levels D, E) ..... Yes No N/A

Surrogates expired? (Levels D, E) ..... Yes No N/A

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

Standards traceable? (Levels D, E) ..... Yes No N/A

Standards expired? (Levels D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: MSD - not analyzed - J all

no PA

PCB DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A

Duplicate results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: MSD not analyzed. J all

NS/NB- FD

6. SYSTEM PERFORMANCE (Levels D and E)

Chromatographic performance acceptable? ..... Yes No N/A

Positive results resolved acceptably? ..... Yes No N/A

Comments:

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments:

PCB DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No N/A

Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A

Results reported for all requested analyses? ..... Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other absorbent) cleanup performed? ..... Yes No N/A

Lot check performed? ..... Yes No N/A

Check recoveries acceptable? ..... Yes No N/A

GPC cleanup performed? ..... Yes No N/A

GPC check performed? ..... Yes No N/A

GPC check recoveries acceptable? ..... Yes No N/A

GPC calibration performed? ..... Yes No N/A

GPC calibration check performed? ..... Yes No N/A

GPC calibration check retention times acceptable? ..... Yes No N/A

Check/calibration materials traceable? ..... Yes No N/A

Check/calibration materials Expired? ..... Yes No N/A

Analytical batch QC given similar cleanup? ..... Yes No N/A

Transcription/Calculation Errors? ..... Yes No N/A

Comments: _____