9613446.1838
Los Alamos Technical Associates, Inc.

0044365

8633 Gage Blvd. / Kennewick, WA 99336 / Telephone (509) 783-4369 / FAX (509) 783-9661

START

COPY

May 30, 1995
LATA95-106

Ms. Joan Kessner
CH2M Hill
345 Hills
Richland, WA 99352

Subject: VB403.46, SDG LK3999-LAS

Dear Ms. Kessner:

Attached is the data validation report for analytical results for 100-NR-2 Round 7 (SDG LK3999-LAS). The package was received by Los Alamos Technical Associates on May 8, 1995.

If you have any questions, please let me know.

Sincerely,

Janet M. Jones
Deputy Project Manager

Attachment

cc: Jeanette Duncan, CH2M Hill
VB403.46
JMJ/lb

ln

DATA VALIDATION REPORT
for
100-NR-2 Round 7
Metals Analysis
SDG LK3999-LAS
LATA VB403.46

Bechtel Hanford Inc.
Richland, Washington

May 30, 1995

40346MTL.NAR; Printed: 30-May-95, 1:14 pm

Table of Contents

100-NR-2 Round 7
Data Validation Narrative

INTRODUCTION

All samples in Sample Delivery Group (SDG) LK3999-LAS (VB403.46) were validated at level C as defined in the Data Validation Procedures for Chemical Analysis (WHC-SD-EN-SPP-002).

The analyses were performed by Lockheed Analytical Services.

ANALYSES REQUESTED

LATA ID #: VB403.46 SDG: LK3999-LAS

Sample Information							Analyses Requested	
SAMPLE NO.	DATE COLLECTED	MATRIX	SAF	SAMPLING LOCATION	FIELD QC INFO	TEMP °C	1	2
B0DX98	3-Mar-95	WATER	B95-030	199-N-21	split of B0DX48	4		X
B0DX99	3-Mar-95	WATER	B95-030	199-N-21	split of B0DX49	4	X	

Method References:

	Analysis	Method
1.	ICP Metals (TAL) filtered	6010
2.	ICP Metals (TAL) unfiltered	6010

DATA QUALITY OBJECTIVES

Precision: Goals for precision were met.

Accuracy: Goals for accuracy were met.

Sample Result Verification: Not applicable since the data package contained no raw data.

Detection Limits: Detection limit goals were met for all sample results as specified in the *Quality Assurance Project Plan for Groundwater Monitoring Activities*, WHC-SD-EN-QAPP-001, Rev. 2.

Completeness: The data package was 100% complete for all requested analyses.

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

No minor deficiencies were identified during data validation which required qualification of data as estimated.

REFERENCES

EPA July 1992, *Test Methods for Evaluating Solid Waste (SW-846)*, Third Edition; U.S. Environmental Protection Agency, Washington, D.C.

WHC 1993, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, Richland, Washington.

WHC 1993, *Quality Assurance Project Plan for Groundwater Monitoring Activities*, WHC-SD-EN-QAPP-001, Rev. 2., Westinghouse Hanford Company, Richland, Washington.

GLOSSARY OF VALIDATION APPLIED QUALIFIERS (CHEMISTRY)

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 QC deficiency identified during data validation, the associated quantitation limit is an estimate.

J- Indicates the compound or analyte was analyzed for and detected. 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 QC deficiency the data are unusable.

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

GLOSSARY OF LABORATORY APPLIED QUALIFIERS

Qualifiers which may be applied by the laboratory in compliance with applicable requirements are as follows.

Commonly used laboratory metals (inorganic) qualifiers:

U- Indicates the analyte was analyzed for but not detected in the sample.

B- Indicates the analyte concentration is less than the CRDL but greater than the IDL.

E- Indicates the value reported is estimated due to the presence of interference.

M- Indicates duplicate injection precision criteria were not met during graphite furnace (GFAA) analysis.

N- Indicates spiked sample recovery was not within the control limits.

S- Indicates the reported value was determined by the Method of Standard Additions (MSA).

W- Indicates post-digestion spike for GFAA analysis is outside control limits and the sample absorbance is less than 50% of the spike absorbance.

*- Indicates duplicate analysis was not within control limits.

+- Indicates the correlation coefficient (r) for the MSA was less than 0.995.

Qualification Summary Table

9613446.1846

Qualification Summary Table

Inorganics (Metals)

ANALYTE	TYPE	QUALIFIER	SAMPLES AFFECTED	DQO	REASON
No qualifiers added by the validator.					

Inorganics (Metals) Field QC

ANALYTE	TYPE	QUALIFIER	FIELD QC SAMPLES	DQO	ASSESSMENT
Copper Iron	FIELD SPLIT	NONE	B0DX98 B0DX48	PRECISION	Field split precision is unacceptable.
Zinc	FIELD SPLIT	NONE	B0DX99 B0DX49	PRECISION	Field split precision is unacceptable.

Comments:

Data qualification is not required based on field split precision, however, the results of field QC evaluation are summarized here to alert the data user to uncertainties in the data set during decision making processes.

Data Summary Table

METALS
DATA SUMMARY TABLE

LATA ID#: VB403.46		HEIS #:	B0DX98		B0DX99	
		Date:	3-Mar-95		3-Mar-95	
		Matrix:	WATER		FILTERED WATER	
Constituent	CAS #	Units	Results	Q	Results	Q
Aluminum	7429-90-5	mg/L	0.07	U	0.07	U
Antimony	7440-36-0	mg/L	0.05	U	0.05	U
Arsenic	7440-38-2	mg/L	0.05	U	0.05	U
Barium	7440-39-3	mg/L	0.03	U	0.03	U
Beryllium	7440-41-7	mg/L	0.001	U	0.001	U
Cadmium	7440-43-9	mg/L	0.004	U	0.004	U
Calcium	7440-70-2	mg/L	88		84	
Chromium	7440-47-3	mg/L	0.003	U	0.003	U
Cobalt	7440-48-4	mg/L	0.008	U	0.008	U
Copper	7440-50-8	mg/L	0.004	U	0.004	U
Iron	7439-89-6	mg/L	0.13		0.010	U
Lead	7439-92-1	mg/L	0.09	U	0.09	U
Magnesium	7439-95-4	mg/L	17		16	
Manganese	7439-96-5	mg/L	0.0061	B	0.002	U
Nickel	7440-02-0	mg/L	0.012	U	0.012	U
Potassium	7440-09-7	mg/L	7.5		6.8	
Selenium	7782-49-2	mg/L	0.09	U	0.09	U
Silver	7440-22-4	mg/L	0.008	U	0.008	U
Sodium	7440-23-5	mg/L	150		140	
Thallium	7440-28-0	mg/L	0.049	U	0.049	U
Vanadium	7440-62-2	mg/L	0.012	U	0.012	U
Zinc	7440-66-6	mg/L	0.014	B	0.011	U

Sample Results (Form I's)

9613446.1850

TOTAL METALS RESULTS

Client Sample ID: BODX98	Date Collected: 03-03-95	Matrix: water
LAL Batch ID(s): 307 bhT	Date Received: 03-07-95	SAF 95-030

Constituents	Method	Concentration (mg/L)	IDL (mg/L)	RDL (mg/L)	Data Qualifier(s)	Date Analyzed	LAL ID
Aluminum	6010	<0.07	0.07	0.20	U	03-24-95	L3999-2
Antimony	6010	<0.05	0.05	0.060	U	03-24-95	L3999-2
Arsenic	6010	<0.05	0.05	0.20	U	03-24-95	L3999-2
Barium	6010	<0.03	0.03	0.20	U	03-24-95	L3999-2
Beryllium	6010	<0.001	0.001	0.005	U	03-24-95	L3999-2
Cadmium	6010	<0.004	0.004	0.005	U	03-24-95	L3999-2
Calcium	6010	88	0.05	5.0		03-24-95	L3999-2
Chromium	6010	<0.003	0.003	0.010	U	03-24-95	L3999-2
Cobalt	6010	<0.008	0.008	0.050	U	03-24-95	L3999-2
Copper	6010	<0.004	0.004	0.025	U	03-24-95	L3999-2
Iron	6010	0.13	0.010	0.10		03-24-95	L3999-2
Lead	6010	<0.09	0.09	0.10	U	03-24-95	L3999-2
Magnesium	6010	17	0.06	5.0		03-24-95	L3999-2
Manganese	6010	0.0061	0.002	0.015	B	03-24-95	L3999-2
Nickel	6010	<0.012	0.012	0.040	U	03-24-95	L3999-2
Potassium	6010	7.5	0.68	5.0		03-24-95	L3999-2
Selenium	6010	<0.09	0.09	0.30	U	03-24-95	L3999-2
Silver	6010	<0.008	0.008	0.010	U	03-24-95	L3999-2
Sodium	6010	150	0.03	5.0		03-24-95	L3999-2
Thallium	6010	<0.049	0.049	0.50	U	03-24-95	L3999-2
Vanadium	6010	<0.012	0.012	0.050	U	03-24-95	L3999-2
Zinc	6010	0.014	0.011	0.020	B	03-24-95	L3999-2

Comments:

AJ 5-19-95

9613446.1851

DISSOLVED METALS RESULTS

Client Sample ID: BODX99	Date Collected: 03-03-95	Matrix: filtered water
LAL Batch ID(s): 307 bhD	Date Received: 03-07-95	SAF 95-030

Constituents	Method	Concentration (mg/L)	IDL (mg/L)	RDL (mg/L)	Data Qualifier(s)	Date Analyzed	LAL ID
Aluminum	6010	<0.07	0.07	0.20	U	03-24-95	L3999-21
Antimony	6010	<0.05	0.05	0.060	U	03-24-95	L3999-21
Arsenic	6010	<0.05	0.05	0.20	U	03-24-95	L3999-21
Barium	6010	<0.03	0.03	0.20	U	03-24-95	L3999-21
Beryllium	6010	<0.001	0.001	0.005	U	03-24-95	L3999-21
Cadmium	6010	<0.004	0.004	0.005	U	03-24-95	L3999-21
Calcium	6010	84	0.05	5.0		03-24-95	L3999-21
Chromium	6010	<0.003	0.003	0.010	U	03-24-95	L3999-21
Cobalt	6010	<0.008	0.008	0.050	U	03-24-95	L3999-21
Copper	6010	<0.004	0.004	0.025	U	03-24-95	L3999-21
Iron	6010	<0.010	0.010	0.10	U	03-24-95	L3999-21
Lead	6010	<0.09	0.09	0.10	U	03-24-95	L3999-21
Magnesium	6010	16	0.06	5.0		03-24-95	L3999-21
Manganese	6010	<0.002	0.002	0.015	U	03-24-95	L3999-21
Nickel	6010	<0.012	0.012	0.040	U	03-24-95	L3999-21
Potassium	6010	6.8	0.68	5.0		03-24-95	L3999-21
Selenium	6010	<0.09	0.09	0.30	U	03-24-95	L3999-21
Silver	6010	<0.008	0.008	0.010	U	03-24-95	L3999-21
Sodium	6010	140	0.03	5.0		03-24-95	L3999-21
Thallium	6010	<0.049	0.049	0.50	U	03-24-95	L3999-21
Vanadium	6010	<0.012	0.012	0.050	U	03-24-95	L3999-21
Zinc	6010	<0.011	0.011	0.020	U	03-24-95	L3999-21

Comments:

AJ 5-19-95

000012 C60

Checklist

9613446.1053

LATA INORGANIC (METALS) DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

VALIDATION PROCEDURE: ☐ WHC-CM-5-3, Rev. 0 ☒ WHC-SD-EN-SPP-002, Rev. 2

PROJECT:	100-NR-2 ROUND 7		SDG:	LK3999-LAS	
VALIDATOR:	A Freier AF 5-25-95		LATA NO:	VB403.46	DATE: 19-May-95
REVIEWER:	M Webb MW 5-24-95		LAB:	LAS	CASE: N/A
SAF NO:	B95-030		QAPP NO:	WHC-SD-EN-QAPP-001, R2	SAP NO: N/A

ANALYSES REQUESTED

☒ ICP Metals 6010

SAMPLE NO.	MATRIX
B0DX98	WATER
B0DX99	FILTERED WATER

COMMENTS:

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

	YES	NO	N/A
Is technical verification documentation present?	☒	☐	☐
Is a case narrative present?	☒	☐	☐

2. HOLDING TIMES

	YES	NO	N/A
Are sample holding times acceptable?	☒	☐	☐

See HOLDING TIME SUMMARY form

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

	YES	NO	N/A
Were initial calibrations performed on all instruments?	☐	☐	☒
Are initial calibrations acceptable?	☐	☐	☒
Are ICP interference checks acceptable?	☐	☐	☒
Were ICV and CCV checks performed on all instruments?	☐	☐	☒
Are ICV and CCV checks acceptable?	☐	☐	☒
Validation calculation checks were performed and are acceptable.	☐	☐	☒

If NO(s) are checked, see CALIBRATION DATA SUMMARY form

4. BLANKS	YES	NO	N/A
Were ICB and CCB checks performed for all applicable analyses?	☐	☐	☒
Are ICB and CCB results acceptable?	☐	☐	☒
Were preparation blanks analyzed?	☒	☐	☐
Are preparation blank results acceptable?	☒	☐	☐

If NO(s) are checked, see BLANK AND SAMPLE DATA SUMMARY form

5. ACCURACY	YES	NO	N/A
Were spike samples analyzed at the proper frequency?	☒	☐	☐
Are all spike sample recoveries acceptable?	☒	☐	☐
Are all elements spiked at an appropriate level?	☒	☐	☐
Was a post digestion spike analyzed?	☐	☐	☒
Are all post digestion spike recoveries acceptable?	☐	☐	☒
Were laboratory control samples (LCS) analyzed at the proper frequency?	☐	☐	☒
Are all LCS recoveries acceptable?	☐	☐	☒
Validation calculation checks were performed and are acceptable.	☐	☐	☒

If NO(s) are checked, see ACCURACY DATA SUMMARY form

6. PRECISION	YES	NO	N/A
Were laboratory duplicates analyzed at the proper frequency?	☒	☐	☐
Are all duplicate RPD values acceptable?	☒	☐	☐
Were MS/MSDs analyzed?	☐	☐	☒
Are all MS/MSD RPD values acceptable?	☐	☐	☒
Were ICP serial dilution samples analyzed at the proper frequency?	☐	☐	☒
Are all ICP serial dilution %D values acceptable?	☐	☐	☒
Validation calculation checks were performed and are acceptable.	☐	☐	☒

If NO(s) are checked, see PRECISION DATA SUMMARY form

7. FIELD QC SAMPLES

	YES	NO	N/A
Were field QC samples (field/trip blanks, duplicates, splits, performance audit) identified?	X		
Are field/trip blank results acceptable? (see Blank Data Summary form)			X
Are field duplicate RPD values acceptable? (see Field QC calculations)			X
Are field split RPD values acceptable? (see Field Split Evaluation)		X	
Are performance audit sample results acceptable?			X

Comments: B0DX98 is a split of sample B0DX48.

B0DX99 is a split of sample B0DX49.

8. FURNACE AA QUALITY CONTROL

	YES	NO	N/A
Were duplicate injections performed if required?			X
Are all duplicate injection %RSD values acceptable?			X
Were analytical spikes performed if required?			X
Are all analytical spike recoveries acceptable?			X
Was MSA performed if required?			X
Are all MSA results acceptable?			X
Validation calculation checks were performed and are acceptable.			X

Comments:

9. REPORTED RESULTS AND DETECTION LIMITS

	YES	NO	N/A
Are results reported for all requested analyses?	X		
Are all results supported in the raw data?			X
Are results calculated properly?			X
Do results meet the CRDLs?	X		
Validation calculation checks were performed and are acceptable.			X

Comments:

VALIDATION SUMMARY

For deficiencies (major and minor) and comments, please refer to the Qualification Summary Table.

9613446.1856

HOLDING TIME SUMMARY

SDG:	LK3999-LAS		VALIDATOR: A Freier					DATE:	19-May-95	
PROJECT:	100-NR-2 ROUND 7		REVIEWER: M Webb					LATA NO.:	VB403.46	
HEIS-SN	MATRIX CODE	ANALYSIS	DATE COLLECTED	PREP DATE	ANALYSIS DATE	PREP HT (days)	*Required HT (days)*	ANALYSIS HT (days)	*Required HT (days)*	VAL Q
B0DX98	WATER	ICP METALS	3-Mar-95	NA	24-Mar-95	NA	*NA*	21	*180*	NONE
B0DX99	FILTERED WATER	ICP METALS	3-Mar-95	NA	24-Mar-95	NA	*NA*	21	*180*	NONE

000017

FIELD QC METALS
FIELD SPLIT EVALUATION

LATA ID#: VB403.46		HEIS #:	B0DX98		B0DX48		RPD	DIF	CRDL
		Date:	3-Mar-95		3-Mar-95				
		Matrix:	WATER		WATER				
			ORIGINAL		SPLIT				
Constituent	CAS #	Units	Results	Q	Results	Q			
Aluminum	7429-90-5	µg/L	70.0	U	44.7	U			
Antimony	7440-36-0	µg/L	50.0	U	32.8	U			
Arsenic	7440-38-2	µg/L	50.0	U					
Barium	7440-39-3	µg/L	30.0	U	36.4	B		36.4	200
Beryllium	7440-41-7	µg/L	1.0	U	0.95	U			
Cadmium	7440-43-9	µg/L	4.0	U	3.8	U			
Calcium	7440-70-2	µg/L	88000		86600	J	1.6%		5000
Chromium	7440-47-3	µg/L	3.0	U	2.9	U			
Cobalt	7440-48-4	µg/L	8.0	U	4.1	U			
Copper	7440-50-8	µg/L	4.0	U	30.2			**30.2**	25
Iron	7439-89-6	µg/L	130		256	U		**130**	100
Lead	7439-92-1	µg/L	90.0	U					
Magnesium	7439-95-4	µg/L	17000		17800	J		800	5000
Manganese	7439-96-5	µg/L	6.1	B	12.5	U		6.1	15
Nickel	7440-02-0	µg/L	12.0	U	15.2	U			
Potassium	7440-09-7	µg/L	7500		7250	J		250	5000
Selenium	7782-49-2	µg/L	90.0	U					
Silver	7440-22-4	µg/L	8.0	U	3.8	U			
Sodium	7440-23-5	µg/L	150000		147000	J	2.0%		5000
Thallium	7440-28-0	µg/L	49.0	U					
Vanadium	7440-62-2	µg/L	12.0	U	24.2	U			
Zinc	7440-66-6	µg/L	14.0	B	33.8			19.8	20

EVALUATION:

1. Field splits are not evaluated for precision if both results are non-detect.
2. If both sample results are >5*CRDL the RPD is used for evaluation.
3. If either sample result is <5*CRDL the DIF is used for evaluation.
4. Copper and iron precision are outside acceptance criteria.
5. All other positive results have exhibited acceptable precision.

Shaded areas indicate changes by the validator.

FIELD QC METALS
FIELD SPLIT EVALUATION

LATA ID#: VB403.46		HEIS #:	B0DX99		B0DX49		RPD	DIF	CRDL
		Date:	3-Mar-95		3-Mar-95				
		Matrix:	WATER		WATER				
			ORIGINAL		SPLIT				
Constituent	CAS #	Units	Results	Q	Results	Q			
Aluminum	7429-90-5	µg/L	70.0	U	28.5	U			
Antimony	7440-36-0	µg/L	50.0	U	32.8	U			
Arsenic	7440-38-2	µg/L	50.0	U					
Barium	7440-39-3	µg/L	30.0	U	32.7	B		32.7	200
Beryllium	7440-41-7	µg/L	1.0	U	0.55	U			
Cadmium	7440-43-9	µg/L	4.0	U	3.8	U			
Calcium	7440-70-2	µg/L	84000		84600	J	0.7%		5000
Chromium	7440-47-3	µg/L	3.0	U	3.5	B		3.5	10
Cobalt	7440-48-4	µg/L	8.0	U	4.1	U			
Copper	7440-50-8	µg/L	4.0	U	19.5	B		19.5	25
Iron	7439-89-6	µg/L	10.0	U	304	U			
Lead	7439-92-1	µg/L	90.0	U					
Magnesium	7439-95-4	µg/L	16000		17500	J		1500	5000
Manganese	7439-96-5	µg/L	2.0	U	7.0	U			
Nickel	7440-02-0	µg/L	12.0	U	15.2	U			
Potassium	7440-09-7	µg/L	6800		7810	J		1010	5000
Selenium	7782-49-2	µg/L	90.0	U	3.8	U			
Silver	7440-22-4	µg/L	8.0	U					
Sodium	7440-23-5	µg/L	140000		144000	J	2.8%		5000
Thallium	7440-28-0	µg/L	49.0	U					
Vanadium	7440-62-2	µg/L	12.0	U	21.8	U			
Zinc	7440-66-6	µg/L	11.0	U	37.7			37.7	20

EVALUATION:

1. Field splits are not evaluated for precision if both results are non-detect.
2. If both sample results are >5*CRDL the RPD is used for evaluation.
3. If either sample result is <5*CRDL the DIF is used for evaluation.
4. Zinc precision is outside acceptance criteria.
5. All other positive results have exhibited acceptable precision.

Shaded areas indicate changes by the validator.

Laboratory Case Narrative

CASE NARRATIVE
INORGANIC METALS ANALYSES

The routine calibration and quality control analyses performed for this batch include as applicable: instrument tune (ICP/MS only), initial and continuing calibration verification, initial and continuing calibration blanks, method blank(s), laboratory control sample(s), ICP interference check samples (ICP only), serial dilutions, analytical (post-digestion) spike samples, matrix spike (predigestion) sample(s), duplicate sample(s).

Preparation and Analysis Requirements

All samples were received on March 7, 1995. The samples were logged in as L3999 and were prepared and analyzed in batches 307 bhT and 307 bhD.

Holding Times

All samples were analyzed within the method-specific holding times.

Method Blanks-

The method blanks were free of contamination.

Internal Quality Control-

All Internal Quality Control were within acceptance limits.

Shellee McGrath
Prepared By

March 31, 1995
Date

Chain-of-Custody Information

Bechtel Hanford Incorporated

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST L3999

Page 1 of 1

Data Turnaround: [ ] Priority [X] Normal

Collector: K. Lee / A Rizzo	Company Contact: J. V. Borghese	Telephone No.: (509) 372-9584
Project Designation: 100-NR-2 Groundwater Sampling - Round 7	Sampling Location: 100 N	SAF No.: B95-030
Ice Chest No.: GWS-024	Field Logbook No.: EFL-1058	Method of Shipment: Federal Express
Shipped To: Lockheed	Offsite Property No.: W95-0-0204-19	Bill of Lading/Air Bill No.: 2904621246

Possible Sample Hazards/Remarks

Special Handling and/or Storage: Maintain samples between 2C and 6C.

Sample No.	Matrix*	Date Sampled	Time Sampled	SAMPLE ANALYSIS	Preservative	Type of Container	No. of Container(s)	Volume
				ICP Metals-TAL Unfiltered	HNO3	G	1	500mL
				Anions (IC) F, Cl, SO4, PO4, NO2 NO3. Unfiltered	Cool 4C	P/G	1	500mL
				Oil and Grease	H2SO4	G	4	1L
				TPH	HCl	Gs*	1	1L
				Conductivity	Cool 4C	P/G	1	250mL
				Turbidity	Cool 4C	P/G	1	250mL
				pH	Cool 4C	P	1	125mL
				Tritium	Cool 4C	G	1	500mL
				Activity Scan	Cool 4C	P	1	20mL
				Gross Alpha, Gross Beta, Sr-90, Gamma Spec	HNO3	G	8	1L
				ICP Metals-TAL Filtered	HNO3	G	1	500mL
				Anions (IC) F, Cl, SO4, PO4, NO2 NO3. Filtered	Cool 4C	P/G	1	500mL
B0DX98	W	3 3 95	1059	X	X	X	X	X
B0DX99	W	3-3-95	1059					

B0DX98	X	X	X	X	X	X	X	X	X	X									
B0DX99																	X	X	

CHAIN OF POSSESSION

Relinquished By / Date/Time	Received By / Date/Time
AG Rizzo 3-3-95 1225	David St. John EFC 03 03-95 1225
David St. John EFC 3-3-95 1315	K. Trapp/K. Trapp EFC 3/3/95 1317
K. Trapp/K. Trapp 3/6/95 1000	

SPECIAL INSTRUCTIONS

Sample analysis for PO4, NO2, and NO3 by EPA 300.0; turbidity by EPA 180.1; and pH by SW-846 9040 are being requested for information only. The ERC Contractor acknowledges that the hold times will not be met.

The Activity Scan is for all samples listed on this chain of custody.

Gs* = Glass with septum top. No head space.

Tritium preserved in Second Plastic instead of GLASS 3-3-95 (JE)

Matrix*

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

LABORATORY SECTION: Received By: Carla Davis; Title: Sample Custodian; Date/Time: 3-07-95/9:45 am

FINAL SAMPLE DISPOSITION: Disposal Method; Disposed By; Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

0082323

END OF PACKAGE

DATA VALIDATION REPORT
for
100-NR-2 Round 7
General Chemistry Analysis
SDG LK3999-LAS
LATA VB403.46

Bechtel Hanford Inc.
Richland, Washington

May 30, 1995

Table of Contents

100-NR-2 Round 7
Data Validation Narrative

INTRODUCTION

All samples in Sample Delivery Group (SDG) LK3999-LAS (VB403.46) were validated at level C as defined in the Data Validation Procedures for Chemical Analysis (WHC-SD-EN-SPP-002).

The analyses were performed by Lockheed Analytical Services.

ANALYSES REQUESTED

LATA ID #: VB403.46 SDG: LK3999-LAS

Sample Information							Analyses Requested						
SAMPLE NO.	DATE COLLECTED	MATRIX	SAF	SAMPLING LOCATION	FIELD QC INFO	TEMP °C	1	2	3	4	5	6	7
B0DX98	3-Mar-95	WATER	B95-030	199-N-21	split of B0DX48	4		X	X	X	X	X	X
B0DX99	3-Mar-95	WATER	B95-030	199-N-21	split of B0DX49	4	X						

Method References:

	Analysis	Method
1.	Anions (F, Cl, SO_4, PO_4, NO_2, NO_3) filtered	300.0
2.	Anions (F, Cl, SO_4, PO_4, NO_2, NO_3) unfiltered	300.0
3.	Oil & Grease	413.1
4.	Total Petroleum Hydrocarbons (TPH)	418.1
5.	Conductivity	120.1
6.	Turbidity	180.1
7.	pH	9040

DATA QUALITY OBJECTIVES

Precision: Goals for precision were met.

Accuracy: Goals for accuracy were met.

Sample Result Verification: Not applicable since the data package contained no raw data.

Detection Limits: Detection limit goals were met for all sample results as specified in the *Quality Assurance Project Plan for Groundwater Monitoring Activities*, WHC-SD-EN-QAPP-001, Rev. 2.

Completeness: The data package was 82% complete for all requested analyses.

MAJOR DEFICIENCIES

Major deficiencies were identified as discussed in the "**Qualification Summary Table**".

MINOR DEFICIENCIES

Minor deficiencies were identified as discussed in the "**Qualification Summary Table**".

REFERENCES

EPA July 1992, *Test Methods for Evaluating Solid Waste (SW-846)*, Third Edition; U.S. Environmental Protection Agency, Washington, D.C.

WHC 1993, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, Richland, Washington.

WHC 1993, *Quality Assurance Project Plan for Groundwater Monitoring Activities*, WHC-SD-EN-QAPP-001, Rev. 2., Westinghouse Hanford Company, Richland, Washington.

GLOSSARY OF VALIDATION APPLIED QUALIFIERS (CHEMISTRY)

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 QC deficiency identified during data validation, the associated quantitation limit is an estimate.

J- Indicates the compound or analyte was analyzed for and detected. 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 QC deficiency the data are unusable.

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

GLOSSARY OF LABORATORY APPLIED QUALIFIERS

Qualifiers which may be applied by the laboratory in compliance with applicable requirements are as follows.

Commonly used laboratory general chemistry qualifiers:

U- Indicates the analyte was analyzed for but not detected in the sample.

D- The sample required dilution for quantitation.

H- Samples were received past holding time but were analyzed "as is" per client request.

Qualification Summary Table

Qualification Summary Table

General Chemistry

ANALYTE	TYPE	QUALIFIER	SAMPLES AFFECTED	DQO	REASON
Nitrite-N	MAJOR	UR	B0DX98 B0DX99	HOLD TIME	Holding time is exceeded by greater than 2 times.
Ortho-Phosphate	MAJOR	UR	B0DX98 B0DX99	HOLD TIME	Holding time is exceeded by greater than 2 times.
Nitrate-N	MINOR	J	B0DX98 B0DX99	HOLD TIME	Holding time is exceeded by greater than 2 times.
TPH	MINOR	UJ	B0DX98	HOLD TIME	Holding time is exceeded by less than 2 times.
Turbidity	MINOR	J	B0DX98	HOLD TIME	Holding time is exceeded by greater than 2 times.
pH	MINOR	J	B0DX98	HOLD TIME	Holding time is exceeded.

General Chemistry Field QC

ANALYTE	TYPE	QUALIFIER	FIELD QC SAMPLES	DQO	ASSESSMENT
ALL	FIELD SPLIT	NONE	B0DX98 B0DX48	PRECISION	Field split precision is acceptable.
ALL	FIELD SPLIT	NONE	B0DX99 B0DX49	PRECISION	Field split precision is acceptable.

Comments:

1. For TRPH analysis a LCS/LCS duplicate pair was analyzed in place of the MS/MSD due to insufficient sample received for analyses. No qualifiers were assigned due to this condition.
2. Data qualification is not required based on field split precision, however field split results are noted here to alert the data user to uncertainties in the data set during decision making processes.

Data Summary Table

GENERAL CHEMISTRY
DATA SUMMARY TABLE

LATA ID#: VB403.46		HEIS #:	B0DX98		B0DX99	
		Date:	3-Mar-95		3-Mar-95	
		Matrix:	WATER		FILTERED WATER	
Constituent	CAS #	Units	Results	Q	Results	Q
Specific Conductance	191	uS/cm	1200		NR	
Turbidity	TURBIDITY	NTU	1.3	J	NR	
Chloride by IC	16887-00-6 (A)	mg/L	22		22	
Fluoride by IC	16984-48-8 (A)	mg/L	0.32		0.32	
Nitrate-N	14797-55-8	mg/L	5.4	J	5.3	J
Nitrite-N	14797-65-0	mg/L	0.01	UR	0.02	UR
Ortho Phosphate	14265-44-2	mg/L	0.1	UR	0.1	UR
Sulfate by IC	14808-79-8	mg/L	390		400	
pH	207	pH units	7.9	J	NR	
Total Oil & Grease	OIL/GREASE	mg/L	5.00	U	NR	
TRPH		mg/L	1.00	UJ	NR	

NR = NOT REQUESTED

Sample Results (Form I's)

LOCKHEED ANALYTICAL SERVICES

COMMON IONS AND ADDITIONAL ANALYTES

Sample Results

Client Sample ID: B0DX98	Date Collected: 03-MAR-95
Matrix: Water	Date Received: 07-MAR-95

Constituent	Units	Method	Result	Reporting Det|Limit	Data Qualifier(s)	Date Analyzed	LAS Batch|ID	LAS Sample|ID	
Specific Conductance	uS/cm	120.1	1200	1		20-MAR-95	20417	L3999-9	
Turbidity	NTU	180.1	1.3	N/A	H	20-MAR-95	20418	L3999-10	J
Chloride	mg/L	300.0	22.	0.02		15-MAR-95	20415	L3999-3	
Fluoride	mg/L	300.0	0.32	0.1		14-MAR-95	20413	L3999-3	
Nitrate-N	mg/L	300.0	5.4	0.02	H	15-MAR-95	20411	L3999-3	J
Nitrite-N	mg/L	300.0	< 0.01	0.01	H	15-MAR-95	20412	L3999-3	U
Ortho Phosphate	mg/L	300.0	< 0.1	0.1	H	14-MAR-95	20414	L3999-3	U
Sulfate	mg/L	300.0	390	1	D(1:10)	15-MAR-95	20416	L3999-3	
pH	pH Units	9040	7.9	0.1	H	20-MAR-95	20419	L3999-11	J

AS 5-19-95

026

COMMON IONS AND ADDITIONAL ANALYTES

Sample Results

Client Sample ID: BODX99	Date Collected: 03-MAR-95
Matrix: Filt H20	Date Received: 07-MAR-95

Constituent	Units	Method	Result	Reporting Det|Limit	Data Qualifier(s)	Date Analyzed	LAS Batch|ID	LAS Sample|ID
Chloride	mg/L	300.0	22.	0.02		15-MAR-95	20415	L3999-22
Fluoride	mg/L	300.0	0.32	0.1		14-MAR-95	20413	L3999-22
Nitrate-N	mg/L	300.0	5.3	0.02	H	15-MAR-95	20411	L3999-22
Nitrite-N	mg/L	300.0	< 0.02	0.02	H	15-MAR-95	20412	L3999-22
Ortho Phosphate	mg/L	300.0	< 0.1	0.1	H	14-MAR-95	20414	L3999-22
Sulfate	mg/L	300.0	400	1	D(1:10)	15-MAR-95	20416	L3999-22

6-5-95

5-19-95

0027

LOCKHEED ANALYTICAL SERVICES

OIL AND GREASE - GRAVIMETRIC METHOD
413.1 OIL AND GREASE

Client Sample ID:	B0DX98	LAL Sample ID:	L3999-4
Date Collected:	03-MAR-95	Date Received:	07-MAR-95
Date Analyzed:	28-MAR-95	Date Extracted:	28-MAR-95
Matrix:	Water	Analytical Batch ID:	032895-413.1
QC Group:	413.1 OIL AND GREASE_20890	Dilution Factor:	1

CONSTITUENT	RESULT mg/L	PRACTICAL QUANTITATION LIMIT mg/L	DATA QUALIFIER(S)
Total Oil and Grease	<5.00	5.00	

AJ 5-19-95

071

LOCKHEED ANALYTICAL SERVICES

TOTAL PETROLEUM HYDROCARBONS BY FTIR
418.1 TPH

Client Sample ID:	BODX98	LAL Sample ID:	L3999-8
Date Collected:	03-MAR-95	Date Received:	07-MAR-95
Date Analyzed:	24-MAR-95	Date Extracted:	21-MAR-95
Matrix:	Water	Analytical Batch ID:	032495-418.1
QC Group:	418.1 TPH_20712	Dilution Factor:	1

CONSTITUENT	RESULT mg/L	PRACTICAL QUANTITATION LIMIT mg/L	DATA QUALIFIER(S)
TRPH	<1.00	1.00	UJ

AJ 5-19-95

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Checklist

9613446 1980

LATA GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

VALIDATION PROCEDURE: ☐ WHC-CM-5-3, Rev. 0 ☒ WHC-SD-EN-SPP-002, Rev. 2

PROJECT:	100-NR-2 ROUND 7		SDG:	LK3999-LAS	
VALIDATOR:	A. Freier AF 10-6-95	LATA NO:	VB403.46	DATE:	19-May-95
REVIEWER:	M. Webb MW 10-6-95	LAB:	LAS	CASE:	N/A
SAF NO:	B95-030	QAPP NO:	WHC-SD-EN-QAPP-001, R2	SAP NO:	N/A

ANALYSES REQUESTED

☒	Oil & Grease 413.1	☒	TRPH 418.1	☒	Conductivity 120.1	☒	Turbidity 180.1	☒	pH 9040	☒	Anions 300.0

SAMPLE NO.	MATRIX
B0DX98	WATER
B0DX99	FILTERED WATER

COMMENTS:

TRPH and TPH are interchangeable terms.

	YES	NO	N/A
1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE			
Is technical verification documentation present?	☒	☐	☐
Is a case narrative present?	☒	☐	☐
2. HOLDING TIMES			
Are sample holding times acceptable?	☐	☒	☐

See HOLDING TIME SUMMARY form

	YES	NO	N/A
3. INSTRUMENT PERFORMANCE AND CALIBRATIONS			
Were initial calibrations performed on all instruments?	☐	☐	☒
Are initial calibrations acceptable?	☐	☐	☒
Were calibration checks performed on all instruments?	☐	☐	☒
Are calibration checks acceptable?	☐	☐	☒
Validation calculation checks were performed and are acceptable.	☐	☐	☒

If NO(s) are checked, see CALIBRATION DATA SUMMARY form

LATA GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

4. BLANKS

	YES	NO	N/A
Were laboratory blanks performed for all applicable analyses?	X		
Are laboratory blank results acceptable?	X		
Were preparation blanks analyzed?	X		
Are preparation blank results acceptable?	X		

If NO(s) are checked, see BLANK AND SAMPLE DATA SUMMARY form

5. ACCURACY

	YES	NO	N/A
Were spike samples analyzed at the proper frequency?	X		
Are all spike sample recoveries acceptable?	X		
Were laboratory control samples (LCS) analyzed at the proper frequency?			X
Are all LCS recoveries acceptable?			X
Validation calculation checks were performed and are acceptable.			X

If NO(s) are checked, see ACCURACY DATA SUMMARY form

6. PRECISION

	YES	NO	N/A
Were laboratory duplicates analyzed at the proper frequency?	X		
Are all duplicate RPD values acceptable?	X		
Were MS/MSDs analyzed?			X
Are all MS/MSD RPD values acceptable?			X
Validation calculation checks were performed and are acceptable.			X

If NO(s) are checked, see PRECISION DATA SUMMARY form

7. FIELD QC SAMPLES

	YES	NO	N/A
Were field QC samples (field/trip blanks, duplicates, splits, performance audit) identified?	X		
Are field/trip blank results acceptable? (see Blank Data Summary form)			X
Are field duplicate RPD values acceptable? (see Field QC calculations)			X
Are field split RPD values acceptable? (see Field Split Evaluation)	X		
Are performance audit sample results acceptable?			X

Comments: B0DX98 is a field split sample of B0DX48.

B0DX99 is a field split sample of B0DX49.

8. ANALYTE QUANTITATION	YES	NO	N/A
Was analyte quantitation performed properly?	☐	☐	☒
Are results calculated properly?	☐	☐	☒
Validation calculation checks were performed and are acceptable.	☐	☐	☒

Comments:

9. REPORTED RESULTS AND DETECTION LIMITS	YES	NO	N/A
Are results reported for all requested analyses?	☒	☐	☐
Are all results supported in the raw data?	☐	☐	☒
Do results meet the CRDLs?	☐	☐	☒
Validation calculation checks were performed and are acceptable.	☐	☐	☒

Comments:

VALIDATION SUMMARY

For deficiencies (major and minor) and comments, please refer to the Qualification Summary Table.

9613446.1883

HOLDING TIME SUMMARY

SDG:	LK3999-LAS		VALIDATOR: A. Freier					DATE:	19-May-95	
PROJECT:	100-NR-2 ROUND 7		REVIEWER: M. Webb					LATA NO.:	VB403.46	
HEIS-SN	MATRIX CODE	ANALYSIS	DATE COLLECTED	PREP DATE	ANALYSIS DATE	PREP HT (days)	***Required HT (days)***	ANALYSIS HT (days)	***Required HT (days)***	VAL Q
B0DX98	WATER	Chloride	3-Mar-95	N/A	15-Mar-95	N/A	***N/A***	12	***28***	NONE
B0DX98	WATER	Fluoride	3-Mar-95	N/A	14-Mar-95	N/A	***N/A***	11	***28***	NONE
B0DX98	WATER	Nitrate-N	3-Mar-95	N/A	15-Mar-95	N/A	***N/A***	12	***2***	J
B0DX98	WATER	Nitrite-N	3-Mar-95	N/A	15-Mar-95	N/A	***N/A***	12	***2***	UR
B0DX98	WATER	Ortho Phosphate	3-Mar-95	N/A	14-Mar-95	N/A	***N/A***	11	***2***	UR
B0DX98	WATER	Sulfate	3-Mar-95	N/A	15-Mar-95	N/A	***N/A***	12	***28***	NONE
B0DX98	WATER	Oil & Grease	3-Mar-95	28-Mar-95	28-Mar-95	25	***N/A***	25	***28***	NONE
B0DX98	WATER	TPH	3-Mar-95	21-Mar-95	24-Mar-95	18	***N/A***	21	***14***	UJ
B0DX98	WATER	Conductivity	3-Mar-95	N/A	20-Mar-95	N/A	***N/A***	17	***28***	NONE
B0DX98	WATER	Turbidity	3-Mar-95	N/A	20-Mar-95	N/A	***N/A***	17	***2***	J
B0DX98	WATER	pH	3-Mar-95	N/A	20-Mar-95	N/A	***N/A***	17	***ASAP***	J
B0DX99	FILTERED WATER	Chloride	3-Mar-95	N/A	15-Mar-95	N/A	***N/A***	12	***28***	NONE
B0DX99	FILTERED WATER	Fluoride	3-Mar-95	N/A	14-Mar-95	N/A	***N/A***	11	***28***	NONE
B0DX99	FILTERED WATER	Nitrate-N	3-Mar-95	N/A	15-Mar-95	N/A	***N/A***	12	***2***	J
B0DX99	FILTERED WATER	Nitrite	3-Mar-95	N/A	15-Mar-95	N/A	***N/A***	12	***2***	UR
B0DX99	FILTERED WATER	Ortho Phosphate	3-Mar-95	N/A	14-Mar-95	N/A	***N/A***	11	***2***	UR
B0DX99	FILTERED WATER	Sulfate	3-Mar-95	N/A	15-Mar-95	N/A	***N/A***	12	***28***	NONE

FIELD QC GENERAL CHEMISTRY
FIELD SPLIT EVALUATION

LATA ID#: VB403.46		HEIS #:	B0DX98		B0DX48		RPD	DIF	DL
		Date:	3-Mar-95		3-Mar-95				
		Matrix:	WATER		WATER				
			ORIGINAL		SPLIT				
Constituent	CAS #	Units	Results	Q	Results	Q			
Chloride by IC	16887-00-6 (A)	mg/L	22.0		21.9		0.5%		0.02
Fluoride by IC	16984-48-8 (A)	mg/L	0.32		0.38			0.06	0.1
Nitrate-N	14797-55-8	mg/L	5.40	J	5.00	J	7.7%		0.02
Nitrite-N	14797-65-0	mg/L	0.010	UR	0.020	UR			
Oil & Grease	OIL/GREASE	mg/L	5.00	U	2.32			2.32	5
Ortho Phosphate	14265-44-2	mg/L	0.10	UR	1.00	UR			
pH	207	pH units	7.90	J	7.95		0.6%		0.1
Specific Conductance	191	uS/cm	1200		1217		1.4%		1
Sulfate by IC	14808-79-8	mg/L	390		448		13.8%		1
TRPH		mg/L	1.00	UJ	0.48	U			
Turbidity	TURBIDITY	NTU	1.30	J	1.37	J	5.2%	0.1	N/A

EVALUATION:

1. Field splits are not evaluated for precision if both results are non-detect.
2. If both sample results are >5*DL the RPD is used for evaluation.
3. If either sample result is <5*DL the DIF is used for evaluation.
4. All positive results have exhibited acceptable precision.

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FIELD QC GENERAL CHEMISTRY
FIELD SPLIT EVALUATION

LATA ID#: VB403.46		HEIS #:	B0DX99		B0DX49		RPD	DIF	DL
		Date:	3-Mar-95		3-Mar-95				
		Matrix:	WATER		WATER				
			ORIGINAL		SPLIT				
Constituent	CAS #	Units	Results	Q	Results	Q			
Chloride by IC	16887-00-6 (A)	mg/L	22.0		22.4		1.8%		0.02
Fluoride by IC	16984-48-8 (A)	mg/L	0.32		0.36			0.04	0.1
Nitrate-N	14797-55-8	mg/L	5.30	J	5.23	J	1.3%		0.02
Nitrite-N	14797-65-0	mg/L	0.020	UR	0.020	UR			
Ortho Phosphate	14265-44-2	mg/L	0.10	UR	1.00	UR			
Sulfate by IC	14808-79-8	mg/L	400		460		14.0%		1

EVALUATION:

1. Field splits are not evaluated for precision if both results are non-detect.
2. If both sample results are >5*DL the RPD is used for evaluation.
3. If either sample result is <5*DL the DIF is used for evaluation.
4. All positive results have exhibited acceptable precision.

000021

Shaded areas indicate changes by the validator.

Laboratory Case Narrative

CASE NARRATIVE
INORGANIC NON METALS ANALYSES

The routine calibration and quality control analyses performed for this batch include as applicable: instrument tune (ICP/MS only), initial and continuing calibration verification, initial and continuing calibration blanks, method blank(s), laboratory control sample(s), ICP interference check samples (ICP only), serial dilutions, analytical (post-digestion) spike samples, matrix spike (predigestion) sample(s), duplicate sample(s).

Preparation and Analysis Requirements

- One water and one filtered water sample were received for LK3999 and prepared as batch 307WH and analyzed for selected analytes as requested on the chain of custody.

Quality control analysis was performed on the following sample:

Client ID	LAL #		Method
BODX98	L3999-9	DUP	120.1 Conductivity
	L3999-10	DUP, MS	180.1 Turbidity
	L3999-11	DUP	9040 pH
BODX99	L3999-22	MS, DUP	300.0 Chloride, Fluoride, Nitrate-N, Nitrite-N, Orthophosphate, Sulfate

Holding Time Requirements

- All samples were analyzed within the specified holding time, except Method 180.1 Turbidity, Method 300.0 Nitrate-N, Nitrite-N and Orthophosphate which were received from the client out of holding time; and Method 9040 pH which was inadvertently analyzed outside of holding time. Analyses proceeded at the direction of the client and the applicable samples are flagged with an "H".

Method Blanks

- The concentration levels of all the requested analytes in the method blank were below the reporting detection limits.

Internal Quality Control

- All Internal Quality Control were within acceptance limits.

Kay McCann
Prepared By

March 29, 1995
Date

5-30-95

005

CASE NARRATIVE
ORGANIC ANALYSES

Analytical Method 413.1 Oil and Grease

Analytical Batch 032895-413.1

The samples were extracted and analyzed within holding time on March 28, 1995. Total Oil and Grease was not detected in the method blank (MB). The recoveries of Total Oil and Grease in the matrix spike (MS), matrix spike duplicate (MSD) and laboratory control sample (LCS) were within QC limits. The relative percent difference (RPD) between the MS and MSD recoveries was within QC limits.

Analytical Method 418.1 Total Recoverable Petroleum Hydrocarbons (TRPH)

Analytical Batch 032495-418.1

The samples were extracted within holding time on March 21, 1995 and analyzed within holding time on March 24, 1995. All initial and continuing calibrations were within QC criteria. TRPH was not detected in the method blank (MB). Due to insufficient sample volume, a laboratoty control sample (LCS) and a laboratory control sample duplicate (LCSDUP) were extracted and analyzed in place of a matrix spike (MS) and a matrix spike duplicate (MSD). The TRPH recoveries in the LCS and LCSDUP were within QC limits. The relative percent difference (RPD) between the LCS and LCSDUP recoveries was within QC limits.

Lydia M. Coleman
Prepared By

April 10, 1995
Date

5-30-95

005

Chain-of-Custody Information

Bechtel Hanford Incorporated

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST L3999

Page 1 of 1

Data Turnaround: [ ] Priority [X] Normal

Collector: K. Lee / A Rizzo	Company Contact: J. V. Borghese	Telephone No.: (509) 372-9584
Project Designation: 100-NR-2 Groundwater Sampling - Round 7	Sampling Location: 100 N	SAF No.: B95-030
Ice Chest No.: GWS-024	Field Logbook No.: EFL-1058	Method of Shipment: Federal Express
Shipped To: Lockheed	Offsite Property No.: W95-0-0204-19	Bill of Lading/Air Bill No.: 2904621246

Possible Sample Hazards/Remarks:

Special Handling and/or Storage: Maintain samples between 2C and 6C.

Preservative	HNO3	Cool 4C	H2SO4	HCl	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	HNO3			HNO3	Cool 4C
Type of Container	G	P/G	G	Gs*	P/G	P/G	P	~~G~~ P 3-3-95	P	G			G	P/G
No. of Container(s)	1	1	4	1	1	1	1	1	1	8			1	1
Volume	500mL	500mL	1L	1L	250mL	250mL	125mL	500mL	20mL	1L			500mL	500mL
SAMPLE ANALYSIS	ICP Metals-TAL Unfiltered	Anions (IC) F, Cl, SO4, PO4, NO2, NO3. Unfiltered	Oil and Grease	TPH	Conductivity	Turbidity	pH	Tritium	Activity Scan	Gross Alpha, Gross Beta, Sr-90, Gamma Spec			ICP Metals-TAL Filtered	Anions (IC) F, Cl, SO4, PO4, NO2, NO3. Filtered

Sample No.	Matrix*	Date Sampled	Time Sampled														
B0DX98	W	3-3-95	1059	X	X	X	X	X	X	X	X	X	X				
B0DX99	W	3-3-95	1059													X	X

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
AG Rizzo	3-3-95 1225	David St. John EAC	03-03-95 1225
David St. John EAC	3-3-95 1315	K. Trapp / K. Trapp	3/3/95 1315
K. Trapp / K. Trapp	3/6/95 1000		

SPECIAL INSTRUCTIONS

Sample analysis for PO4, NO2, and NO3 by EPA 300.0; turbidity by EPA 180.1; and pH by SW-846 9040 are being requested for information only. The ERC Contractor acknowledges that the hold times will not be met.

The Activity Scan is for all samples listed on this chain of custody.

Gs* = Glass with septum top. No head space.

Tritium provided in 500ml plastic instead of GlASS 3-3-95

Matrix*

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

LABORATORY SECTION	Received By: Paul C Daniels	Title: Sample Custodian	Date/Time: 3-07-95/9:45 am
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

9413146.1980

00000028

END OF PACKAGE

DATA VALIDATION REPORT
for
100-NR-2 Round 7
Radiochemistry Analysis
SDG LK3999-LAS
LATA VB403.46

Bechtel Hanford Inc.
Richland, Washington

May 30, 1995

Table of Contents

100-NR-2 Round 7
Data Validation Narrative

INTRODUCTION

All samples in Sample Delivery Group (SDG) LK3999-LAS (VB403.46) were validated at level "C" as defined in the Data Validation Procedures for Radiochemical Analyses (WHC-SD-EN-SPP-001).

The analyses were performed by Lockheed Analytical Services.

ANALYSES REQUESTED

LATA ID #: VB403.46 SDG: LK3999-LAS

Sample Information							Analyses Requested						
SAMPLE NO.	DATE COLLECTED	MATRIX	SAF	SAMPLING LOCATION	FIELD QC INFO	TEMP °C	1	2	3	4	5	6	7
B0DX98	3-Mar-95	WATER	B95-030	199-N-21	split of B0DX48	4	X	X	X	X	X	X	X

Method References:

	Analysis	Method
1.	Gross Alpha	LAL-91-SOP-0060
2.	Gross Beta	LAL-91-SOP-0060
3.	Strontium-90	LAL-91-SOP-0196
4.	Gamma Spectroscopy	LAL-91-SOP-0063
5.	Tritium	LAL-91-SOP-0066
6.	Activity Scan	Laboratory Specific
7.	Rad Screen (222-S)	Laboratory Specific

DATA QUALITY OBJECTIVES

Precision: Goals for precision were met with the exception of those items discussed in the "**Qualification Summary Table**".

Accuracy: Goals for accuracy were met with the exception of those items discussed in the "**Qualification Summary Table**".

Sample Result Verification: Not applicable since the data package contained no raw data.

DATA QUALITY OBJECTIVES (continued)

Detection Limits: Detection limit goals were met for all sample results as specified in the *Quality Assurance Project Plan for Groundwater Monitoring Activities*, WHC-SD-EN-QAPP-001, Rev. 2, with the exception of those items discussed in the **"Qualification Summary Table"**.

Completeness: The data package was 100% complete for all requested analyses.

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

Minor deficiencies were identified as discussed in the **"Qualification Summary Table"**.

REFERENCES

EPA July 1992, *Test Methods for Evaluating Solid Waste (SW-846)*, Third Edition; U.S. Environmental Protection Agency, Washington, D.C.

WHC 1993, *Data Validation Procedures for Radiochemical Analyses*, WHC-SD-EN-SPP-001, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

WHC 1993, *Quality Assurance Project Plan for Groundwater Monitoring Activities*, WHC-SD-EN-QAPP-001, Rev. 2., Westinghouse Hanford Company, Richland, Washington.

GLOSSARY OF VALIDATION APPLIED QUALIFIERS (RADIOCHEMISTRY)

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

U- Indicates the constituent was analyzed for, but was not detected at a concentration above the Minimum Detectable Activity (MDA). The concentration reported is the sample result corrected for sample aliquot size, dilution factors, and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ- Indicates the constituent was analyzed and was not detected at a concentration above the Minimum Detectable Activity (MDA). Due to a quality control deficiency identified during data validation, the result reported may not accurately reflect the sample concentration. The associated data should be considered usable for decision making purposes.

J- Indicates a constituent was analyzed for and detected. The associated value is estimated due to a quality control deficiency identified during validation. The data should be considered usable for decision making purposes.

R- Indicates the constituent was analyzed for and detected; however, due to an identified quality control deficiency the data should be considered unusable for decision making purposes.

UR- Indicates the constituent was analyzed for and not detected; however, due to an identified quality control deficiency the data should be considered unusable for decision making purposes.

GLOSSARY OF LABORATORY APPLIED QUALIFIERS

Qualifiers which may be applied by the laboratory in compliance with applicable requirements are as follows.
Commonly used laboratory radiochemistry qualifiers:

U- Indicates the analyte was analyzed for but not detected in the sample.

J- Indicates the value reported is estimated due to the presence of interference.

C- Indicates the analyte was also detected in the blank at a concentration greater than the reporting detection limit (RDL).

Qualification Summary Table

Qualification Summary Table

Radiochemistry

ANALYTE	TYPE	QUALIFIER	SAMPLES AFFECTED	DQO	REASON
Gross Alpha	MINOR	UJ	B0DX98	ACCURACY	Matrix spike recoveries are outside acceptance criteria.
Gross Beta	MINOR	J	B0DX98	PRECISION	Duplicate precision is outside acceptance criteria.

Radiochemistry Field QC

ANALYTE	TYPE	QUALIFIER	FIELD QC SAMPLES	DQO	ASSESSMENT
ALL	FIELD SPLIT	NONE	B0DX98 B0DX48	PRECISION	Field split precision is acceptable.

Comments:

1. The MDA was not met for gross alpha or Eu152 from the gamma scan.
2. The QAPP requested Ru106 and Sb25 from the gamma scan, but was not listed in the SAF or the contract.
3. Data qualification is not required based on field split precision, however field split results are noted here to alert the data user to uncertainties in the data set during decision making processes.

Data Summary Table

9613446.1801

RADIOCHEMISTRY
DATA SUMMARY TABLE

LATA ID#: VB403.46		HEIS #:	B0DX98	
		Date:	3-Mar-95	
		Matrix:	WATER	
Constituent	CAS #	Units	Results	Q
Tritium	10028-17-8	pCi/L	990	
Actinium-228	15262-20-1	pCi/L	8	U
Cobalt-58	13981-38-9	pCi/L	-7.2	U
Cobalt-60	10198-40-0	pCi/L	-4.1	U
Cesium-137	10045-97-3	pCi/L	-3.8	U
Europium-152	14683-23-9	pCi/L	-6	U
Europium-154	15585-10-1	pCi/L	-11	U
Europium-155	14391-16-3	pCi/L	2	U
Iron-59	14596-12-4	pCi/L	-9.6	U
Lead-212	PB-212	pCi/L	3	U
Lead-214	PB-214	pCi/L	6	U
Radium-226	13982-63-3	pCi/L	-40	U
Uranium-235	13966-29-5	pCi/L	-32	U
Gross Alpha	ALPHA	pCi/L	4.2	UJ
Gross Beta	BETA	pCi/L	10.3	J
Total Strontium	10098-97-2	pCi/L	0.75	U

The "U" qualifiers added to form I's and DST are lab concentration qualifiers and have not been added as a result of validation.

Sample Results (Form I's)

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0DX98 LAL Sample ID: L3999-13

Date Collected: 03-MAR-95 Date Received: 07-MAR-95

Matrix: Water Login Number: L3999

SDG: LK3999

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units	
Ac-228(Ra-228)	30-MAR-95	GAMMA SPEC LAL-0063_20330	8.	25.	36.		pCi/L	U
Co-58	30-MAR-95	GAMMA SPEC LAL-0063_20330	-7.2	5.4	11.		pCi/L	U
Co-60	30-MAR-95	GAMMA SPEC LAL-0063_20330	-4.1	3.1	13.		pCi/L	U
Cs-137	30-MAR-95	GAMMA SPEC LAL-0063_20330	-3.8	5.6	10.		pCi/L	U
Eu-152	30-MAR-95	GAMMA SPEC LAL-0063_20330	-6.	12.	57.		pCi/L	U
Eu-154	30-MAR-95	GAMMA SPEC LAL-0063_20330	-11.	10.	43.		pCi/L	U
Eu-155	30-MAR-95	GAMMA SPEC LAL-0063_20330	2.	14.	18.		pCi/L	U
Fe-59	30-MAR-95	GAMMA SPEC LAL-0063_20330	-9.6	7.7	29.		pCi/L	U
Pb-212	30-MAR-95	GAMMA SPEC LAL-0063_20330	3.	12.	16.		pCi/L	U
Pb-214(Ra-226)	30-MAR-95	GAMMA SPEC LAL-0063_20330	6.	12.	18.		pCi/L	U
Ra-226(GAMMA)	30-MAR-95	GAMMA SPEC LAL-0063_20330	-40	120	190		pCi/L	U
U-235(GAMMA)	30-MAR-95	GAMMA SPEC LAL-0063_20330	-32.	22.	39.		pCi/L	U
Gross Alpha	31-MAR-95	GR ALP/BETA LAL-0060_20589	4.2	3.9	5.7	C	pCi/L	UJ
Gross Beta	31-MAR-95	GR ALP/BETA LAL-0060_20589	10.3	4.2	6.2	C	pCi/L	UJ
Total radio-strontium	06-APR-95	SR-90 LAL-0196_20603	0.75	0.94	1.6		pCi/L	U

5-25-95

5-19-95

 095

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0DX98 LAL Sample ID: L3999-12

Date Collected: 03-MAR-95 Date Received: 07-MAR-95

Matrix: Water Login Number: L3999

SDG: LK3999

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
H-3	05-APR-95	TRITIUM(H3) LAL-0066_20661	990	300	280		pCi/L

BM 5/30-95

084

Checklist

LATA RADIOCHEMISTRY

9613446.1986

DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
VALIDATION PROCEDURE:	☐ WHC-CM-5-3, Rev. 0		☒ WHC-SD-EN-SPP-001, Rev. 1		

PROJECT:	100-NR-2 ROUND 7		SDG:	LK3999-LAS	
VALIDATOR:	A. Freier 5.15.96	LATA NO:	VB403.46	DATE:	19-May-95
REVIEWER:	M. Webb 5.14.96	LAB:	LAS	CASE:	N/A
SAF NO:	B95-030	QAPP NO:	WHC-SD-EN-QAPP-001, R2	SAP NO:	N/A

ANALYSES REQUESTED

☒ Gross Alpha LAL-91-SOP-0060	☒ Gross Beta LAL-91-SOP-0060	☒ Strontium-90 LAL-91-SOP-0196	☒ Gamma Spec LAL-91-SOP-0063	☒ Tritium LAL-91-SOP-0066	

SAMPLE NO.	MATRIX
B0DX98	WATER

COMMENTS:

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE	YES	NO	N/A
Is technical verification documentation present?	☒	☐	☐
Is a case narrative present?	☒	☐	☐
2. HOLDING TIMES	**YES**	**NO**	**N/A**
Are sample holding times acceptable?	☒	☐	☐
Are samples preserved correctly?	☒	☐	☐

See HOLDING TIME SUMMARY form

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS	YES	NO	N/A
Were instruments/detectors calibrated within one year of sample analysis?	☐	☐	☒
Are initial calibrations acceptable?	☐	☐	☒
Are standards NIST traceable?	☐	☐	☒
Are standards acceptable?	☐	☐	☒

Comments:

4. CONTINUING CALIBRATION	YES	NO	N/A
Background checked at proper frequency?	☐	☐	☒
Background check acceptable?	☐	☐	☒
Efficiency checked at proper frequency?	☐	☐	☒
Efficiency check acceptable?	☐	☐	☒
Calibration check standards NIST traceable?	☐	☐	☒
Calibration check standards acceptable?	☐	☐	☒

If NO(s) are checked, see CALIBRATION DATA SUMMARY form

5. BLANKS	YES	NO	N/A
Were method blanks analyzed?	☒	☐	☐
Are the method blanks free of analytes?	☒	☐	☐
Were method blank results acceptable?	☒	☐	☐
Validation calculation/transcription checks were performed and are acceptable.	☐	☐	☒

If NO(s) are checked, see BLANK DATA SUMMARY form

6. ACCURACY	YES	NO	N/A
Were spike samples analyzed at the proper frequency?	☒	☐	☐
Are all spike sample recoveries acceptable?	☐	☒	☐
Were laboratory control standards (LCS) analyzed at the proper frequency?	☒	☐	☐
Are all LCS recoveries acceptable?	☒	☐	☐
Was a tracer/chemical carrier added?	☒	☐	☐
Was the tracer/chemical carrier recovery acceptable?	☒	☐	☐
Are standard sources traceable?	☒	☐	☐
Are standards acceptable?	☒	☐	☐
Validation calculation checks were performed and are acceptable.	☐	☐	☒

If NO(s) are checked, see ACCURACY DATA SUMMARY form

7. PRECISION	YES	NO	N/A
Were laboratory duplicates analyzed at the proper frequency?	☒	☐	☐
Are all duplicate RPD values acceptable?	☐	☒	☐
Validation calculation checks were performed and are acceptable.	☐	☐	☒

If NO(s) are checked, see PRECISION DATA SUMMARY form

8. FIELD QC SAMPLES

	YES	NO	N/A
Were field QC samples (field/trip blanks, duplicates, splits, performance audit) identified?	X		
Are field/trip blank results acceptable? (see Blank Data Summary form)			X
Are field duplicate RPD values acceptable? (see Field QC calculations)			X
Are field split RPD values acceptable? (see Field Split Evaluation)	X		
Are performance audit sample results acceptable?			X

Comments: B0DX98 is a field split sample of B0DX48.

9. REPORTED RESULTS AND DETECTION LIMITS

	YES	NO	N/A
Are results reported for all requested analyses?		X	
Are all results supported in the raw data?			X
Are results calculated properly?			X
Do MDAs meet the RDLs?		X	
Validation calculation checks were performed and are acceptable.			X

Comments: MDAs do not meet the RDLs for the Gross Alpha and Eu-152 analyses.

The QAPP requested Ru106 and Sb25 from the gamma scan, but were not listed in the SAF or contract.

VALIDATION SUMMARY

For deficiencies (major and minor) and comments, please refer to the Qualification Summary Table.

HOLDING TIME SUMMARY

SDG: LK3999-LAS			VALIDATOR: A. Freier					DATE: 19-May-95		
PROJECT: 100-NR-2 ROUND 7			REVIEWER: M. Webb					LATA NO.: VB403.46		
HEIS-SN	MATRIX CODE	ANALYSIS	DATE COLLECTED	PREP DATE	ANALYSIS DATE	PREP HT (days)	***Required HT (days)***	ANALYSIS HT (days)	***Required HT (days)***	VAL Q
B0DX98	WATER	Gross Alpha	3-Mar-95	N/A	31-Mar-95	N/A	***N/A***	28	***180***	NONE
B0DX98	WATER	Gross Beta	3-Mar-95	N/A	31-Mar-95	N/A	***N/A***	28	***180***	NONE
B0DX98	WATER	Tritium	3-Mar-95	N/A	05-Apr-95	N/A	***N/A***	33	***180***	NONE
B0DX98	WATER	Strontium-90	3-Mar-95	N/A	06-Apr-95	N/A	***N/A***	34	***180***	NONE
B0DX98	WATER	Gamma Spec	3-Mar-95	N/A	30-Mar-95	N/A	***N/A***	27	***180***	NONE

LATA RADIOCHEMISTRY DATA VALIDATION CHECKLIST

ACCURACY DATA SUMMARY

SDG: LK3999-LAS			VALIDATOR: A. Freier				DATE: 19-May-95	
PROJECT: 100-NR-2 ROUND 7			REVIEWER: M. Webb				LATA NO.: VB403.46	
				PERCENT RECOVERY (%R)				
HEIS-SN	ANALYTE	RESULTS	Lab Q	Matrix Spike	Tracer/ Carrier Yield	Laboratory Control Standard	SAMPLES AFFECTED	VAL Q
B0DX98	Gross Alpha	4.18		69.0%			B0DX98	UJ

LOCKHEED ANALYTICAL SERVICES

RADIOCHEMISTRY ANALYTES

QC Data Summary For Matrix Spike Analysis

SDG: LK3999

Analyte	Batch ID	Client ID	LAL ID	Date Analyzed	Sample Result	Error 2 Sigma	MS Result	Error 2 Sigma	Spike Value	%R	Q
Gross Alpha	20589	B0DX98	L3999-13	03/31/95	4.18	3.88	66.3	12.1	89.5	69	*
Gross Beta	20589	B0DX98	L3999-13	03/31/95	10.3	4.18	107	9.58	93.1	104	
H-3	20661	B0DX98	L3999-12	04/05/95	993	301	3830	499	3130	91	

AJ
5-19-95

LATA RADIOCHEMISTRY
DATA VALIDATION CHECKLIST

PRECISION DATA SUMMARY

SDG:	LK3999-LAS				VALIDATOR:	A. Freier				DATE:	19-May-95
PROJECT:	100-NR-2 ROUND 7				REVIEWER:	M. Webb				LATA NO.:	VB403.46
HEIS-SN	ANALYTE	RESULTS	LAB Q	UNITS	RDL	2 RDL	5 RDL	DUPE RPD	DUPE CRDL	SAMPLES AFFECTED	VAL Q
B0DX98	Gross Alpha	4.18	U	pCi/L	3	6	15	54.2%	<RDL	NONE	
B0DX98	Gross Beta	10.3		pCi/L	4	8	20	48%	>RDL	B0DX98	J
B0DX98	Tritium	993		pCi/L	400	800	2000	36.3%	<RDL	NONE	
B0DX98	Strontium-90	0.751	U	pCi/L	2	4	10	37.7%	<RDL	NONE	

LOCKHEED ANALYTICAL SERVICES

RADIOCHEMISTRY ANALYTES

QC Data Summary For Duplicate Sample Analysis

SDG: LK3999

Analyte	Batch ID	Client ID	LAL ID	Date Analyzed	Sample Result	Error 2 Sigma	Duplicate Result	Error 2 Sigma	RER	RPD	Q
Cs-137	20330	B0DX98	L3999-13	03/30/95	-3.82	5.56	-3.51	5.32	0.03	8.46	
Gross Alpha	20589	B0DX98	L3999-13	03/31/95	4.18	3.88	7.29	4.84	0.356	54.2	
Gross Beta	20589	B0DX98	L3999-13	03/31/95	10.3	4.18	16.8	4.6	0.748	48	
Total radio	20603	B0DX98	L3999-13	04/06/95	0.751	0.944	1.1	0.981	0.18	37.7	
H-3	20661	B0DX98	L3999-12	04/05/95	993	301	688	274	0.53	36.3	

AJ 6-14-95

AJ 5-19-95

100

FIELD QC RADIOCHEMISTRY
9613446 1941
FIELD SPLIT EVALUATION

LATA ID#: VB403.46		HEIS #:	B0DX98		B0DX48		RPD	DIF	RDL
		Date:	3-Mar-95		3-Mar-95				
		Matrix:	WATER		WATER				
			ORIGINAL		SPLIT				
Constituent	CAS #	Units	Results	Q	Results	Q			
Actinium-228		pCi/L	8	U					
Cesium-137	10045-97-3	pCi/L	-3.8	U	4.0	U			
Cobalt-58	13981-38-9	pCi/L	-7.2	U	5.0	U			
Cobalt-60	10198-40-0	pCi/L	-4.1	U	-6.6	U			
Europium-152	14683-23-9	pCi/L	-6	U	2	U			
Europium-154	15585-10-1	pCi/L	-11	U	6	U			
Europium-155	14391-16-3	pCi/L	2	U	-2	U			
Gross Alpha	ALPHA	pCi/L	4.2	UJ	2.9			2.9	3
Gross Beta	BETA	pCi/L	10.3	J	9.9			0.4	4
Iron-59	14596-12-4	pCi/L	-9.6	U	19.8	U			
Lead-212	PB-212	pCi/L	3	U					
Lead-214	PB-214	pCi/L	6	U					
Radium-226	13982-63-3	pCi/L	-40	U					
Total Strontium	10098-97-2	pCi/L	0.75	U	0.98			0.98	2
Tritium	10028-17-8	pCi/L	990	J	981			9	400
Uranium-235	13966-29-5	pCi/L	-32	U					

EVALUATION:

1. Field splits are not evaluated for precision if both results are non-detect.
2. If both sample results are >5*RDL the RPD is used for evaluation.
3. If either sample result is <5*RDL the DIF is used for evaluation.
4. All positive results have exhibited acceptable precision.

000022

Shaded areas indicate changes by the validator.

Laboratory Case Narrative

CASE NARRATIVE
RADIOCHEMICAL ANALYSES

The routine calibration and quality control analyses performed for this batch include as applicable: instrument calibration, initial and continuing calibration verification, quench monitoring standards, instrument background analysis, method blanks, yield tracer, laboratory control samples, matrix spike samples, duplicate samples.

Holding Time Requirements

All holding times were met.

Chemical Recoveries and MDAs can be found on the preparation sheets and calculation sheets, respectively, on the attached raw data for each method.

Analytical Method

Gamma Spectrum Analysis

The gamma spectrum analysis was performed using LAL-91-SOP-0063. No problems were encountered during analysis. All QC criteria were met.

Gross Alpha Beta

The gross alpha beta analysis was performed using LAL-91-SOP-0060. The alpha matrix spike analysis was slightly below limits; however, since the LCS is within limits, the data is considered acceptable. All other QC criteria were met.

Strontium

The strontium analysis was performed using LAL-91-SOP-0196. No problems were encountered during analysis. All QC criteria were met.

Tritium

The tritium analysis was performed using LAL-91-SOP-0066. No problems were encountered during analysis. All QC criteria were met.

Yvonne M. Jacoby
Prepared By

April 10, 1995
Date

5-3-95

Chain-of-Custody Information

Bechtel Hanford Incorporated

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST L3999

Page 1 of 1

Data Turnaround: [ ] Priority [X] Normal

Collector: K. Lee / A Rizzo	Company Contact: J. V. Borghese	Telephone No.: (509) 372-9584
Project Designation: 100-NR-2 Groundwater Sampling - Round 7	Sampling Location: 100 N	SAF No.: B95-030
Ice Chest No.: GWS-024	Field Logbook No.: EFL-1058	Method of Shipment: Federal Express
Shipped To: Lockheed	Offsite Property No.: W95-0-0204-19	Bill of Lading/Air Bill No.: 2904621246
Possible Sample Hazards/Remarks		
Special Handling and/or Storage: Maintain samples between 2C and 6C.		

Preservative	HNO3	Cool 4C	H2SO4	HCl	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	HNO3			HNO3	Cool 4C
Type of Container	G	P/G	G	Gs*	P/G	P/G	P	G	P	G			G	P/G
No. of Container(s)	1	1	4	1	1	1	1	1	1	8			1	1
Volume	500mL	500mL	1L	1L	250mL	250mL	125mL	500mL	20mL	1L			500mL	500mL
SAMPLE ANALYSIS	ICP Metals-TAL Unfiltered	Anions (IC) F, Cl, SO4, PO4, NO2 NO3. Unfiltered	Oil and Grease	TPH	Conductivity	Turbidity	pH	Tritium	Activity Scan	Gross Alpha, Gross Beta, Sr-90, Gamma Spec			ICP Metals-TAL Filtered	Anions (IC) F, Cl, SO4, PO4, NO2 NO3. Filtered

Sample No.	Matrix*	Date Sampled	Time Sampled														
B0DX98	W	3 3 95	1059	X	X	X	X	X	X	X	X	X	X				
B0DX99	W	3.3.95	1059													X	X

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
AG Rizzo	3-3-95 1225	David J. Johnson EFC	03 3-95 1225
David J. Johnson EFC	3.3.95 1315	K. Trapp/K. Trapp EFC	3/3/95 1315
K. Trapp/K. Trapp	3/6/95 1000		

SPECIAL INSTRUCTIONS

Sample analysis for PO4, NO2, and NO3 by EPA 300.0; turbidity by EPA 180.1; and pH by SW-846 9040 are being requested for information only. The ERC Contractor acknowledges that the hold times will not be met.

The Activity Scan is for all samples listed on this chain of custody.

Gs* = Glass with septum top. No head space.

TRitium provided in Second Plastic instead of GLASS 3 3 95 (JF)

Matrix*

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

LABORATORY SECTION — Received By: Carla Davis — Title: Sample Custodian — Date/Time: 3-07-95/9:45 am

FINAL SAMPLE DISPOSITION — Disposal Method — Disposed By — Date/Time

Distribution: White - Sample Coordinator

END OF PACKAGE