

START

9613426-0888

LK 3777

SAMPLE AND DATA MANAGEMENT

0043823

ROD-895-024

Record of Disposition No.

RECORD OF DISPOSITION

DATE: 01/31/95

LABORATORY: Lockheed

PROJECT TITLE/NO.: 100-HR-3 Groundwater/B94-127;
100-D Ponds/B94-098

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

B0DR05 (SAF-B94-127)

B0DMX2, B0DMX3, B0DMX4 (SAF-B94-098)

DESCRIPTION OF EVENT:

SAFs and COCs request nitrate/nitrite by method 353.1. The lab would prefer to use method 353.2.

DISPOSITION OF SAMPLES:

Proceed with nitrate/nitrite analyses by 353.2. Note in case narratives.



APPROVAL SIGNATURES:

R. C. Smith/ *[Signature]*
OSM Project Coordinator (Print/Sign Name)

1/31/95
Date

R. E. Peterson/ *[Signature]*
Technical Representative (Print/Sign Name)

3/22/95
Date

N/A
Quality Assurance (Print/Sign Name)

Date

9613426.0889

LK3777



Environmental Systems & Technologies Co.

Lockheed Analytical Services
975 Kelly Johnson Drive
Las Vegas, Nevada 89119-3705

Phone: (702) 361-0220
Phone: (800) 582-7605
Fax: (702) 361-8146

March 20, 1995

Ms. Joan Kessner
Bechtel Hanford, Inc.
345 Hills
P.O. Box 969
Richland, WA 99352



RE:	Log-in No.:	L3777
	Quotation No.:	Q400000-B
	SAF:	B94-127
	Document File No.:	0208596
	WHC Document File No.:	160
	SDG No.:	LK3777

The attached data report contains the analytical results of samples that were submitted to Lockheed Analytical Services on 8 February 1995.

The temperature of the cooler upon receipt was 4°C. Sample containers received agree with the chain-of-custody documentation. Sample containers were received intact. Samples were received in time to meet the analytical holding time requirements.

The case narratives included in the following attachments provide a detailed description of all events that occurred during sample preparation, analysis, and data review specific to the samples and analytical methods requested.

A list of data qualifiers, chain-of-custody forms, sample receiving checklist, and log-in report are also enclosed representing the samples received within this group.

If you have any questions concerning the analysis or the data please call Kathleen Hall at (509) 943-4423.

Lockheed Analytical Services

Log-in No.: L3777
Quotation No.: Q400000-B
SAF: B94-127
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Release of this data report has been authorized by the Laboratory Director or the Director's designee as evidenced by the following signature.

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

Sincerely,

Kathleen M. Hall
Client Services Representative

cc: Client Services
Document Control

Lockheed Analytical Services

Log-in No.: L3777
 Quotation No.: Q400000-B
 SAF: B94-127
 Document File No.: 0208596
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 SDG No.: LK3777
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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 sample was received for LK3777 and prepared as batch 208WH 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
BODR05	L3777-3	DUP, MS	300.0 CHLORIDE, NITRATE, NITRITE, ORTHOPHOSPHATE, AND SULFATE
	L3777-4	DUP, MS	353.2 NITRATE/NITRITE
	L3777-5	DUP, MS	9030 SULFIDE
	L3777-6	DUP, MS	350.1 AMMONIA

Holding Time Requirements

- All samples were analyzed within the specified holding time, except Method 300.0 Nitrate-N, Nitrite-N and Orthophosphate which were received from the client out 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

March 1, 1995

Prepared By

Date

CASE NARRATIVE INORGANIC TOTAL 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 sample was for total metals analysis. The sample was prepared as LAS Batch 208WHT and analyzed for selected analytes as requested on the chain of custody. Sample BODR05 (L3777-2) was used for matrix spike and duplicate, post-digestion spike and serial dilution analyses. All data flags due to the performance of the above-mentioned QC sample are also associated with every sample digested with this batch.

Holding Time Requirements

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

Method Blanks

- The level of analytes in the method blanks were less than the reporting detection limits.

Internal Quality Control

All internal quality control were within acceptance limits.

Sample Results

- The following qualifiers are reported on the basis of the techniques employed to perform the analyses:
P" ICP-AES

Nalini Prabhakar

03/02/95

Prepared By

Date

**CASE NARRATIVE
INORGANIC DISSOLVED 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 filtered water sample for dissolved metals analysis. As the measured turbidity of the sample was less than 1 NTU, it was batched as 208WHD for selected dissolved analytes as requested on the chain of custody. For this sample batch sample BODR06 (L3777-14) was used for matrix spike and matrix spike duplicate, post-digestion spike and serial dilution analyses. All data flags due to the performance of the above-mentioned QC sample are also associated with every sample analyzed with this batch.

Holding Time Requirements

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

Method Blanks

- The level of analytes in the method blanks were less than the reporting detection limits.

Internal Quality Control

All internal quality control were within acceptance limits.

Sample Results

The following qualifiers are reported on the basis of the techniques employed to perform the analyses:

"P" ICP-AES

Nalini Prabhakar

03/02/95

Prepared By

Date

**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.

Analytical Method

Strontium-90

The Strontium-90 analysis was performed using Standard Operating Procedure LAL-91-SOP-0065. All QC criteria were met and no reanalysis was performed.

Gross Alpha Beta

The Gross alpha/beta analysis was performed using Standard Operating Procedure LAL-91-SOP-0061. All QC criteria were met and no reanalysis was performed.

Tritium

The Tritium analysis was performed using Standard Operating Procedure LAL-91-SOP-0066. All QC criteria were met and no reanalysis was performed.

Keith B. Arndt
Prepared By

March 20, 1994
Date

Lockheed Analytical Services
DATA QUALIFIERS FOR INORGANIC ANALYSES

[Revised 08/28/92]

For Use on the Analytical Data Reporting Forms	
B	<i>For CLP Analyses Only</i> -- Reported value is less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).
C	<i>For Routine, Non-CLP Analyses Only</i> -- Any constituent that was also detected in the associated blank whose concentration was greater than the reporting detection limit (RDL).
D	Presence of high levels of interfering constituents required dilution of sample which increased the RDL by the dilution factor.
E	Estimated value due to presence of interference.
H	Sample analysis performed outside of method-or client-specified maximum holding time requirement.
M	<i>For CLP Analyses Only</i> -- Duplicate injection precision criterion was not met.
N	Matrix spike recovery exceeded acceptance limits.
S	Reported value was determined from the method of standard addition.
U	<i>For CLP Reporting Only</i> -- Constituent was analyzed for but not detected (sample quantitation must be corrected for dilution and percent moisture).
W	<i>For AAS Only</i> -- Post-digestion spike for Furnace AAS did not meet acceptance criteria and sample absorbance is less than 50% of spike absorbance.
X, Y, or Z	Analyst-defined qualifier.
*	Relative percent difference (RPD) for duplicate analysis exceeded acceptance limits.
+	Correlation coefficient (r) for the MSA is less than 0.995.
For Use on the QC Data Reporting Forms	
a¹	The spike recovery and/or RPD for matrix spike and matrix spike duplicates cannot be evaluated due to insufficient spiking level compared to the elevated sample analyte concentration.
b¹	The RPD cannot be computed because the sample and/or duplicate concentration was below the RDL.

¹ Used as footnote designations on the QC summary form.

Lockheed Analytical Services
DATA QUALIFIERS FOR RADIOCHEMICAL ANALYSES

[Revised 08/28/92]

For Use on the Analytical Data Reporting Forms	
B	Any constituent that was also detected in the associated blank whose concentration was greater than the reporting detection limit (RDL) and/or minimum detectable activity (MDA).
C	Presence of high TDS in sample required reduction of sample size which increased the MDA.
D	Constituent detected in the diluted sample.
E	Constituent concentration exceeded the calibration or attenuation curve range.
F	<i>For Alpha Spectrometry Only</i> -- FWHM exceeded acceptance limits.
H	Sample analysis performed outside of method-specified maximum holding time requirement.
Y	Chemical yield exceeded acceptance limits.
For Use on the QC Data Reporting Forms	
*	QC data (i.e., percent recovery data for laboratory control standard and matrix spike; and RPD for replicate analyses) exceeded acceptance limits.
a¹	The spike recovery and/or RPD for matrix spike and duplicates cannot be evaluated due to insufficient spiking level compared to the elevated sample analyte concentration.
b¹	The RPD cannot be computed because the sample and/or duplicate concentration was below the MDA.

¹ Used as foot note designations on the QC summary form.

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Feb 08 1995, 01:32 pm

Login Number: L3777
Account: 596 Bechtel-Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	Due PR Date
L3777-1 TEMP 4 Location: RFG01-43 Water 1 S SCREENING	BODR05 "SAF # B94-127"	06-FEB-95	08-FEB-95	15-MAR-95
		Hold:05-AUG-95		
L3777-2 TEMP 4 Location: RFG01-3C Water 1 S 6010 ICP METALS	BODR05 "SAF # B94-127"	06-FEB-95	08-FEB-95	15-MAR-95
		Hold:05-AUG-95		
L3777-3 TEMP 4 Location: RFG01-3C Water 1 S 300.0 CHLORIDE Water 1 S 300.0 NITRATE Water 1 S 300.0 NITRITE Water 1 S 300.0 PHOSPHATE Water 1 S 300.0 SULFATE	BODR05 "SAF # B94-127"	06-FEB-95	08-FEB-95	15-MAR-95
		Hold:06-MAR-95		
		Hold:08-FEB-95		
		Hold:08-FEB-95		
		Hold:08-FEB-95		
		Hold:06-MAR-95		
L3777-4 TEMP 4 Location: RFG01-3C Water 1 S 353.2 NITRATE	BODR05 "SAF # B94-127"	06-FEB-95	08-FEB-95	15-MAR-95
		Hold:06-MAR-95		
L3777-5 TEMP 4 Location: RFG01-3C Water 1 S 9030 SULFIDE	BODR05 "SAF # B94-127"	06-FEB-95	08-FEB-95	15-MAR-95
		Hold:13-FEB-95		
L3777-6 TEMP 4 Location: RFG01-3C Water 1 S 350.1 NH3/N	BODR05 "SAF # B94-127"	06-FEB-95	08-FEB-95	15-MAR-95
		Hold:06-MAR-95		
L3777-7 TEMP 4 Location: 157 Water 1 S GR ALP/BETA LAL-0060 Water 1 S SR-90 LAL-0196	BODR05 "SAF # B94-127"	06-FEB-95	08-FEB-95	15-MAR-95
		Hold:05-AUG-95		
		Hold:05-AUG-95		
L3777-8 TEMP 4 Location: 157	BODR05 "SAF # B94-127"	06-FEB-95	08-FEB-95	15-MAR-95

9613426.0898

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Feb 08 1995, 01:32 pm

Login Number: L3777
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	Due PR Date
L3777-9 TEMP 4 "SAF # B94-127" Location: 157	BODR05	06-FEB-95	08-FEB-95	15-MAR-95
L3777-10 TEMP 4 "SAF # B94-127" Location: 157	BODR05	06-FEB-95	08-FEB-95	15-MAR-95
L3777-11 TEMP 4 "SAF # B94-127" Location: 157	BODR05	06-FEB-95	08-FEB-95	15-MAR-95
L3777-12 TEMP 4 "SAF # B94-127" Location: 157	BODR05	06-FEB-95	08-FEB-95	15-MAR-95
L3777-13 TEMP 4 "SAF # B94-127" Location: 157 Water 1 S TRITIUM(H3) LAL-0066 Hold:05-AUG-95	BODR05	06-FEB-95	08-FEB-95	15-MAR-95
L3777-14 TEMP 4 "SAF # B94-127" Location: RFG01-3C Filt H2O 15 S 6010 ICP METALS Hold:05-AUG-95	BODR06	06-FEB-95	08-FEB-95	15-MAR-95
L3777-15 Location: Water 1 S EDD - DISK DEL. Water 1 S INORG TYPE 4A RPT Water 1 S RAD RPT TYPE 4F	REPORT TYPE	08-FEB-95	08-FEB-95	15-MAR-95

Page 2

Signature: Paul J. DavisDate: 2-8-95

01E

0208590

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

43777

Data Turnaround

Priority
 Normal

Collector <i>K. Lee A. Rizzo</i>	Company Contact <i>R. Peterson</i>	Telephone No. <i>(509) 372-9638</i>
Project Designation <i>100-HR-3 Groundwater Sampling, Round 8, Phase 2</i>	Sampling Location <i>100 D</i>	SAF No. <i>894-127</i>
Ice Chest No. <i>#168</i>	Field Logbook No. <i>EFL-1018</i>	Method of Shipment <i>Federal Express</i>
Shipped To <i>Lockheed</i>	Offsite Property No. <i>W95-0-0204-10</i>	Bill of Lading/Air Bill No. <i>29004619656</i>

Possible Sample Hazards/Remarks	Preservative	HNO3	Cool 4C	H2SO4	*1	H2SO4	HNO3	Cool 4C	Cool 4C	HNO3				
	Type of Container	G	G	P	P	P/G	G	G	P	G				
	No. of Container(s)	1	1	1	1	1	6	1	1	1				
Special Handling and/or Storage <i>Maintain between 2 C and 6 C.</i>	Volume	1L	500mL	250mL	1L	500mL	1L	40mL	20mL	1L				
SAMPLE ANALYSIS	ICP Metals													
	Unfiltered													
	ICP Metals													
	Filtered													

Sample No.	Matrix*	Date Sampled	Time Sampled												
BODR05	W	2-6-95	1008	X	X	X	X	X	X	X	X				
BODR06	W	2-6-95	1008									X			

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix*	
Relinquished By <i>K. Lee</i>	Date/Time <i>2/6/95 1245</i>	Received By <i>ERC</i>	Date/Time <i>2-6-95</i>	*1. ZnAc+NaOH Data Deliverable - Standalone Sample analysis results for phosphate, nitrate, and nitrite by EPA 300.0 is for information only. The ERC Contractor acknowledges that the 48 hour hold time will not be met.				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	
Relinquished By <i>ERC</i>	Date/Time <i>0900</i>	Received By <i>Bill L. Whitton</i>	Date/Time <i>2-7-95</i>						
Relinquished By	Date/Time	Received By	Date/Time						
Relinquished By	Date/Time	Received By	Date/Time						
LABORATORY SECTION	Received By <i>MM</i>	Title <i>Sample Custodian</i>	Date/Time <i>2-8-95 1000</i>						
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time						

9613426.0899

AMPLE STATUS REPORT FOR N 4523. RAD SCREEN 69996-49 TIME: 2/ 7/95 7:59
 DISPATCHED: 1/20/95 13:17 SAMPLE HAS NOT BEEN SLURPED PAGE 1
 RECEIVED: 2/ 7/95 4:30

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	*****	*****	***	***	*****
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	XR5444

END OF REPORT

*BODROS
 BODROG
 BW
 2/7/95*

L3777

9613426.0901

Figure 1

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 2-8-95/0900 Client Name Westinghouse
 Project/Client # SAF# B94-127 Batch or Case # N/A
 Cooler ID (if noted on outside of cooler) N/A

1. Condition of shipping container? good
2. Custody Seals on cooler intact? Yes No
3. Custody Seals dated and signed? Yes No
4. Chain of Custody record is taped on inside of cooler lid? Yes No
5. Vermiculite/packing material is: Wet Dry
6. Each sample is in a plastic bag? Yes No
7. Number of sample containers in cooler: 14
8. Samples have:

<input type="checkbox"/> tape	<input type="checkbox"/> hazard labels
<input checked="" type="checkbox"/> custody seals	<input type="checkbox"/> appropriate sample labels
9. Samples are:

<input checked="" type="checkbox"/> in good condition	<input type="checkbox"/> leaking
<input type="checkbox"/> broken	<input type="checkbox"/> have air bubbles
<input type="checkbox"/> other	
10. Coolant Present? Yes No Sample Temperature 4°C
11. The following paperwork should be accounted for (N/A if not applicable):

Chain of Custody #(s)	<u>N/A</u>
Request for Analysis #(s)	<u>N/A</u>
Airbill # <u>290 4618 656</u>	Carrier <u>FedEx</u>
12. Have any anomalies been identified above? Yes No N/A
13. Memos have been initiated for all anomalies identified above? Yes N/A

Printed Name/Signature Paul Davis Date/Time 2-8-95/9:50am

Sample Login

Login Review Checklist

Lot Number L3777

The login review should be conducted by that person logging in the samples as well as a peer. Please use this checklist to ensure that such reviews occur in a uniform basis. Please sign and date below to verify that a login review has occurred. This checklist should be affixed to each login package prior to distribution.

For an effective login review, at a minimum, five reports from the login process are required. These are the chain of custody (or equivalent), the login chain of custody report, the sample summary report, the sample receiving checklist, and the login quotation. Before beginning a review, ensure that these five components are available. For jobs with single component samples, the sample summary report may be omitted.

Sample Summary Report

Yes No

N/A

- | | | | | |
|----|---|----------|---|---|
| 1. | Are all sample IDs correct? | <u>X</u> | — | — |
| 2. | Are all samples present? | <u>X</u> | — | — |
| 3. | Are all matrices correct?
<small>(e.g., TCLP analyses should be on a TCLP leachate, field blanks should be water)</small> | <u>X</u> | — | — |
| 4. | Are all analyses on the chain of custody/login quotation included? | <u>X</u> | — | — |
| 5. | Are analyses logged in for the correct container?
<small>(e.g., analyses requiring preservation logged in for a preserved container and vice versa)</small> | <u>X</u> | — | — |
| 6. | Are samples logged in according to laboratory batching procedures?
<small>(e.g., TCLP regular leaching and associated metals/semivolatile organics should be logged in on the same bottle)</small> | <u>X</u> | — | — |

Login Chain of Custody Report

- | | | | | |
|----|--|----------|---|-----------|
| 1. | Are the Collect, Receive, and Due dates correct for every sample? | <u>X</u> | — | — |
| 2. | Have appropriate sample comments been included?
<small>(e.g., MS/MSD designation, comments from the client concerning method modifications)</small> | — | — | <u>NA</u> |

Sample Receiving Checklist

- | | | | | |
|----|---|---|---|-----------|
| 1. | Are any discrepancies between the chain of custody and the login noted?
<small>(e.g., client IDs different on chains of custody and bottle labels, samples not sent, samples lost from breakage)</small> | — | — | <u>NA</u> |
|----|---|---|---|-----------|

Park Davis

2-8-95

M. Wells

2-8-95

Primary review signature

Date

Secondary review signature

Date

Lockheed Analytical Services
Sample Receiving Checklist

Client Name: Bechtel - Hanford

Job No. 43777

Cooler ID: 111A

COOLER CONDITION UPON RECEIPT

Temperature of cooler upon receipt: 48

temperature of temp. blank upon receipt:

	Yes	No	* Comments/Discrepancies
custody seals intact	X		
chain of custody present	X		
blue ice (or equiv.) present/frozen	X		
rad survey completed	X		

SAMPLE CONDITION UPON RECEIPT

	Yes	No	* Comments/Discrepancies
all bottles labeled	X		
samples intact	X		
proper container used for sample type	X		
sample volume sufficient for analysis	X		
proper pres. indicated on the COC	X		
VOA's contain headspace			
are samples bi-phasic (if so, indicate sample ID'S):			<u>NA</u> <u>111A</u>

MISCELLANEOUS ITEMS

	Yes	No	* Comments/Discrepancies
samples with short holding times	X		<u>nitrites/nitrites</u>
samples to subcontract		X	

ADDITIONAL COMMENTS/DISCREPANCIES

Completed by / date: Paul D. Jones 2-8-95

Sent to the client (date/initials): ** Client's signature upon receipt:

Notes: * = contact the appropriate CSR of any discrepancies immediately upon receipt.

** = please review this information and return via facsimile to the appropriate CSR (702) 361-8146

9613426.0903

028550

021

9613426.0904

Lockheed Analytical Laboratory
 SAMPLE SUMMARY REPORT (su02)
 Bechtel Hanford, Inc. * Richland, WA

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method
BODR05 -	L3777-1		Water	SCREENING -
	L3777-2		Water	6010 ICP METALS -
	L3777-3		Water	300.0 CHLORIDE -
	L3777-3		Water	300.0 NITRATE -
	L3777-3		Water	300.0 NITRITE -
	L3777-3		Water	300.0 PHOSPHATE -
	L3777-3		Water	300.0 SULFATE -
	L3777-4		Water	353.2 NITRATE -
	L3777-5		Water	9030 SULFIDE -
	L3777-6		Water	350.1 NH3/N -
	L3777-7		Water	GR ALP/BETA LAL-0
	L3777-7		Water	SR-90 LAL-0196 -
	L3777-13		Water	TRITIUM(H3) LAL-0
BODR06 -	L3777-14		Filt H2O	6010 ICP METALS -
REPORT TYPE -	L3777-15		Water	EDD - DISK DEL -
	L3777-15		Water	INORG TYPE 4A RPT
	L3777-15		Water	RAD RPT TYPE 4F -

022

0208596

9613426.0905

LOCKHEED ANALYTICAL SERVICES

COMMON IONS AND ADDITIONAL ANALYTES

Sample Results

Client Sample ID: B0DR05	Date Collected: 06-FEB-95
Matrix: Water	Date Received: 08-FEB-95

Constituent	Units	Method	Result	Reporting Det Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Chloride	mg/L	300.0	12.	0.02		09-FEB-95	18909	L3777-3
Nitrate-N	mg/L	300.0	2.7	0.02	H	09-FEB-95	18910	L3777-3
Nitrite-N	mg/L	300.0	< 0.01	0.01	H	09-FEB-95	18911	L3777-3
Ortho Phosphate	mg/L	300.0	< 0.1	0.1	H	09-FEB-95	18912	L3777-3
Sulfate	mg/L	300.0	52.	0.1		09-FEB-95	18913	L3777-3
Ammonia Nitrogen	mg/L	350.1	< 0.05	0.05		16-FEB-95	18919	L3777-6
Nitrate-Nitrite-Nitrogen	mg/L	353.2	2.4	0.05		11-FEB-95	18918	L3777-4
Sulfide	mg/L	9030	< 3	3		08-FEB-95	18916	L3777-5

023A

9613426.0906

208-wh

SAF NO: B94-127

WORK GROUP REPORT (wk02)

300.0 PHOSPHATE

Feb 08 1995, 03:36 pm

Work Group: 300.0 PHOSPHATE_18912 for Department: 11 Wet Chemistry

collected: 2/6

Created: 08-FEB-95 Due: 15-MAR-95 Operator:

Sample	Account Name	ClientID	Product	Matrix	Stat UA	Workdate	PR Location
--------	--------------	----------	---------	--------	---------	----------	-------------

L3777-3	Bechtel Hanford, Inc.	B0DR05	S 300.0 PHOSPHATE	Water	WIP U	08-FEB-95	RFG01-3C
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Comments:

L3777-3 TEMP 4 "SAF # B94-127"

PER K. HALL - MAY BE ANALYZED 2/9

RC 2-8-95

ANALYSIS DVE 02/27/95

9613426.0907

208-wh

SAF No B94-127
WORK GROUP REPORT (wk02)

300.0 NITRITE

Feb 08 1995, 03:35 pm

collected: 2/6

Work Group: 300.0 NITRITE_18911 for Department: 11 Wet Chemistry

Created: 08-FEB-95 Due: 15-MAR-95 Operator:

Sample	Account Name	ClientID	C Product	Matrix	Stat UA	Workdate	PR Location
--------	--------------	----------	-----------	--------	---------	----------	-------------

L3777-3 Bechtel Hanford, Inc. B0DR05

Page 1
S 300.0 NITRITE Water WIP U 08-FEB-95 RFG01-3C

Comments:

L3777-3 TEMP 4 "SAF # B94-127"

PER K. HALL - MAY BE ANALYZED 2/9

KC
2-8-95

ANALYSIS DNE 02/27/95

9613426.0908

208-wh

300.0 NITRATE

SAF No B94-127
WORK GROUP REPORT (wk02)

Feb 08 1995, 03:35 pm

collected: 2/6

Work Group: 300.0 NITRATE_18910 for Department: 11 Wet Chemistry

Created: 08-FEB-95 Due: 15-MAR-95 Operator:

Sample	Account Name	ClientID	C Product	Matrix	Stat UA	Workdate	PR Location
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L3777-3	Bechtel Hanford, Inc.	B0DR05	S 300.0 NITRATE	Water	WIP U	08-FEB-95	RFG01-3C
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Comments:

L3777-3 TEMP 4 "SAF # B94-127"

PER K. HALL - MAY BE ANALYZED 2/9

RC 2-8-95

ANALYSIS DUE 02/27/95

9613426.0909

208-wh

300.0 CHLORIDE

SAF N° 894-127
WORK GROUP REPORT (wk02)

Feb 08 1995, 03:34 pm

collected: 2/6

Work Group: 300.0 CHLORIDE_18909 for Department: 11 Wet Chemistry

Created: 08-FEB-95 Due: 15-MAR-95 Operator:

Sample	Account Name	ClientID	C Product	Matrix	Stat UA	Workdate	PR Location
--------	--------------	----------	-----------	--------	---------	----------	-------------

L3777-3	Bechtel Hanford, Inc.	B0DR05	S 300.0 CHLORIDE	Water	WIP U	06-MAR-95	RFG01-3C
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Comments:

L3777-3 TEMP 4 "SAF # 894-127"

ANALYSIS DUE 02/21/95

9613426.0910

208-wh

SAF N° B94-127
WORK GROUP REPORT (wk02)

300.0 SULFATE

Feb 08 1995, 03:36 pm

collected: 2/6

Work Group: 300.0 SULFATE_18913 for Department: 11 Wet Chemistry

Created: 08-FEB-95 Due: 15-MAR-95 Operator:

Sample	Account Name	ClientID	C Product	Matrix	Stat	UA	Workdate	PR	Location
--------	--------------	----------	-----------	--------	------	----	----------	----	----------

L3777-3	Bechtel Hanford, Inc.	B0DR05	S 300.0 SULFATE	Water	WIP	U	06-MAR-95		RFG01-3C
---------	-----------------------	--------	-----------------	-------	-----	---	-----------	--	----------

Comments:

L3777-3 TEMP 4 "SAF # B94-127"

ANALYSIS DUE : 02/27/95

9613426.0911

208-wh

SAF NO B94-127
WORK GROUP REPORT (wk02)

350.1 Ammonia

Feb 08 1995, 04:00 pm

collector: 2/6

Work Group: 350.1 NH3/N_18919 for Department: 11 Wet Chemistry

Created: 08-FEB-95 Due: 15-MAR-95 Operator:

Sample	Account Name	ClientID	C Product	Matrix	Stat UA	Workdate	PR Location
--------	--------------	----------	-----------	--------	---------	----------	-------------

L3777-6	Bechtel Hanford, Inc.	B0DR05	S 350.1 NH3/N	Water	WIP U	01-MAR-95	RFG01-3C
---------	-----------------------	--------	---------------	-------	-------	-----------	----------

Comments:

L3777-6 TEMP 4 "SAF # B94-127"

ANALYSIS DUE 02/17/95

9613426.0912

208-wh

SAF NO 894-127
WORK GROUP REPORT (WK02)

353.2 NO₃/NO₂

Feb 08 1995, 04:00 pm

collected: 2/6

Work Group: 353.2 NITRATE_18918 for Department: 11 Wet Chemistry

Created: 08-FEB-95 Due: 15-MAR-95 Operator:

Sample	Account Name	ClientID	C Product	Matrix	Stat	UA	Workdate	PR	Location
--------	--------------	----------	-----------	--------	------	----	----------	----	----------

L3777-4	Bechtel Hanford, Inc.	B00R05	S 353.2 NITRATE	Water	WIP	U	01-MAR-95		RFG01-3C
---------	-----------------------	--------	-----------------	-------	-----	---	-----------	--	----------

Comments:

L3777-4 TEMP 4 "SAF # 894-127"

ANALYSIS DOE 02/27/95

9613426.0913

208-wh

SAF NO B94-127
WORK GROUP REPORT (wk02)

9030 SULFIDE

Feb 08 1995, 03:53 pm

Work Group: 9030 SULFIDE_18916 for Department: 9 Metal Prep.

HT EXP 2/13

Created: 08-FEB-95 Due: 15-MAR-95 Operator:

Sample	Account Name	ClientID	C Product	Matrix	Stat UA	Workdate	PR Location
--------	--------------	----------	-----------	--------	---------	----------	-------------

L3777-5	Bechtel Hanford, Inc.	BODROS	S 9030 SULFIDE	Water	WIP U	13-FEB-95	RFG01-3C
---------	-----------------------	--------	----------------	-------	-------	-----------	----------

Comments:

L3777-5 TEMP 4 "SAF # B94-127"

9613426.0914

CLP

1
INORGANIC ANALYSES DATA SHEET

CLIENT ID NO.

BODR05

Lab Name: LOCKHEED_ANALYTICAL_SVC Contract: HANFORD

Lab Code: LOCK Case No.: B94-12 SAS No.: SDG No.: LK3777

Matrix (soil/water): WATER Lab Sample ID: L3777-2

Level (low/med): LOW Date Received: 02/08/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	26.0	U		P
7440-36-0	Antimony	45.0	U		P
7440-39-3	Barium	77.0	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	3.0	U		P
7440-70-2	Calcium	44200			P
7440-47-3	Chromium	43.8			P
7440-48-4	Cobalt	7.0	U		P
7440-50-8	Copper	3.6	B		P
7439-89-6	Iron	68.1	B		P
7439-95-4	Magnesium	10000			P
7439-96-5	Manganese	3.1	B		P
7440-02-0	Nickel	12.0	U		P
7440-09-7	Potassium	4760	B		P
7440-22-4	Silver	4.0	U		P
7440-23-5	Sodium	13100			P
7440-62-2	Vanadium	13.0	B		P
7440-66-6	Zinc	11.8	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

INORGANIC ANALYSES DATA SHEET

CLIENT ID NO.

BODR06

Lab Name: LOCKHEED_ANALYTICAL_SVC__ Contract: HANFORD__

Lab Code: LOCK__ Case No.: B94-12 SAS No.: _____ SDG No.: LK3777

Matrix (soil/water): WATER Lab Sample ID: L3777-14__

Level (low/med): LOW__ Date Received: 02/08/95

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L__

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	26.0	U		P
7440-36-0	Antimony	45.0	U		P
7440-39-3	Barium	72.5	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	3.0	U		P
7440-70-2	Calcium	42400			P
7440-47-3	Chromium	40.1			P
7440-48-4	Cobalt	7.0	U		P
7440-50-8	Copper	3.0	U		P
7439-89-6	Iron	6.0	U		P
7439-95-4	Magnesium	9620			P
7439-96-5	Manganese	1.0	U		P
7440-02-0	Nickel	12.0	U		P
7440-09-7	Potassium	4700	B		P
7440-22-4	Silver	4.0	U		P
7440-23-5	Sodium	12300			P
7440-62-2	Vanadium	10.8	B		P
7440-66-6	Zinc	2.0	U		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

9613426.0916

208-wh T

ICP-WATER

WORK GROUP REPORT (wk02)

Feb 13 1995, 10:59 am

Work Group: 6010 ICP METALS_19101 for Department: 9 Metal Prep.

Created: 13-FEB-95 Due: 15-MAR-95 Operator:

Sample	Account Name	ClientID	C Product	Matrix	Stat	UA	Workdate	PR	Location
--------	--------------	----------	-----------	--------	------	----	----------	----	----------

19101DUP	DUP	L3777-2	S 6010 ICP METALS	Water	WIP	U	13-FEB-95		
19101LCS	LCS	LCSW208WHT	S 6010 ICP METALS	Water	WIP	U	13-FEB-95		
19101MB	MB	PBW208WHT	S 6010 ICP METALS	Water	WIP	U	13-FEB-95		
19101MS	MS	L3777-2	S 6010 ICP METALS	Water	WIP	U	13-FEB-95		
L3777-2	Bechtel Hanford, Inc.	B0DR05	S 6010 ICP METALS	Water	WIP	U	15-MAR-95		RFG01-3C

Comments:

L3777-2 TEMP 4 "SAF # B94-127"

9613426.0917

208-wh D

ICP - DISSOLVED

WORK GROUP REPORT (wk02)

Feb 13 1995, 11:00 am

Work Group: 6010 ICP METALS_19102 for Department: 9 Metal Prep.

Created: 13-FEB-95 Due: 15-MAR-95 Operator:

Sample	Account Name	Client ID	C Product	Matrix	Stat	UA	Workdate	PR	Location
--------	--------------	-----------	-----------	--------	------	----	----------	----	----------

Page 1

19102DUP	DUP	L3777-14	S 6010 ICP METALS	Filt H20	DONE	U	13-FEB-95		
19102LCS	LCS	LCSW208WHD	S 6010 ICP METALS	Filt H20	DONE	U	13-FEB-95		
19102MB	MB	PBW208WHD	S 6010 ICP METALS	Filt H20	DONE	U	13-FEB-95		
19102MS	MS	L3777-14	S 6010 ICP METALS	Filt H20	DONE	U	13-FEB-95		
L3777-14	Bechtel Hanford, Inc.	BODR06	S 6010 ICP METALS	Filt H20	DONE	U	01-MAR-95		RFG01-3C

Comments:

L3777-14 TEMP 4 "SAF # B94-127"

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0DR05

LAL Sample ID: L3777-7

Date Collected: 06-FEB-95

Date Received: 08-FEB-95

Matrix: Water

Login Number: L3777

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
Gross Alpha	27-FEB-95	GR ALP/BETA LAL-0060_18959	2.0	1.7	2.5	C	pCi/L
Gross Beta	27-FEB-95	GR ALP/BETA LAL-0060_18959	4.9	1.6	2.2	C	pCi/L
Total radio-strontium	10-MAR-95	SR-90 LAL-0196_19538	0.39	0.53	0.90		pCi/L

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0DR05

LAL Sample ID: L3777-13

Date Collected: 06-FEB-95

Date Received: 08-FEB-95

Matrix: Water

Login Number: L3777

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
H-3	10-MAR-95	TRITIUM(H3) LAL-0066_19975	5650	570	260		pCi/L

upside
Done

9613426.0920

WORK GROUP REPORT (wk02)

Feb 09 1995, 01:55 pm

Work Group: GR ALP/BETA LAL-0060_18959 for Department: 12 Radiation Prep.

Created: 09-FEB-95 Due: 23-FEB-95 Operator: g armendariz

Sample	Account Name	Client ID	C Product	Matrix	Stat	UA	Workdate	PR	Location
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Sample	Account Name	Client ID	C Product	Matrix	Stat	UA	Workdate	PR	Location
18959DUP1	DUP	L3769-40	S GR ALP/BETA LAL-0060	Water	WIP	U	09-FEB-95		
18959LCS1	LCS	Lab Ctrl Sample	S GR ALP/BETA LAL-0060	Water	WIP	U	09-FEB-95		
18959MB81	MB	Method Blank	S GR ALP/BETA LAL-0060	Water	WIP	U	09-FEB-95		
18959MS1	MS	L3769-83	S GR ALP/BETA LAL-0060	Water	WIP	U	09-FEB-95		
L3742-6	Westinghouse Hanford	B0DR63	S GR ALP/BETA LAL-0060	Water	WIP	U	03-MAR-95		156CART-4
L3769-40	Westinghouse Hanford	B0DSS8	S GR ALP/BETA LAL-0060	Water	WIP	U	09-MAR-95		156CART-1
L3769-83	Westinghouse Hanford	B0DSS7	S GR ALP/BETA LAL-0060	Water	WIP	U	09-MAR-95		156CART-1
L3777-7	Bechtel Hanford, Inc.	B0DR05	S GR ALP/BETA LAL-0060	Water	WIP	U	10-MAR-95		156CART-2

Page 1

Comments:

18959DUP1	L3769-40
18959LCS1	LCS
18959MB81	MB
18959MS1	L3769-83
L3742-6	temp 3
L3769-40	TEMP 2,3,4 "SAF # 95-021"
L3769-83	TEMP 2,3,4 "SAF # 95-021"
L3777-7	TEMP 4 "SAF # B94-127"

Uploaded
Done

9613426.0921

WORK GROUP REPORT (wk02)

Mar 10 1995, 04:31 pm

Work Group: SR-90 LAL-0196_19538 for Department: 12 Radiation Prep.

Created: 22-FEB-95 Due: 07-MAR-95 Operator: a wong

Sample Account Name Client C Product Matrix Stat UA Workdate PR Location

Sample	Account Name	Client	C Product	Matrix	Stat	UA	Workdate	PR	Location
19538DUP1	DUP	L3769-40	S SR-90 LAL-0196	Water	WIP	U	22-FEB-95		
19538DUP2	DUP	L3769-83	S SR-90 LAL-0196	Water	WIP	U	22-FEB-95		
19538LCS1	LCS	Lab Ctrl Sample	S SR-90 LAL-0196	Water	WIP	U	22-FEB-95		
19538MB1	MB	Method Blank	S SR-90 LAL-0196	Water	WIP	U	22-FEB-95		
L3769-40	Westinghouse Hanford	B00SS6	S SR-90 LAL-0196	Water	WIP	U	09-MAR-95		149
L3769-83	Westinghouse Hanford	B00SS7	S SR-90 LAL-0196	Water	WIP	U	09-MAR-95		149
L3777-7	Bechtel Hanford, Inc.	B00R05	S SR-90 LAL-0196	Water	WIP	U	10-MAR-95		150

Page 1

Comments:

19538DUP1 L3769-40
19538DUP2 L3769-83
19538LCS1 LCS
19538MB1 MB
L3769-40 TEMP 2,3,4 "SAF # 95-021"
L3769-83 TEMP 2,3,4 "SAF # 95-021"
L3777-7 TEMP 4 "SAF # 894-127"

4/14/95

Data Validation Check List

for Project 100-HR-3

HEIS Samp Number	Client Sample Number	Master DP File Number	DP Sequence Number	Laboratory	Y N VOA	Y N SEMI VOA	Y N PEST/PCB	Y N WETCHEM	Y N METALS	COMMENTS	Y N RADCHEM	Date OSM Rcvd DP
BODR05	Split of BODR25 699-96-49	LK3777		LOCKHEED	N	N	N	Y 3/22/95	Y 3/22/95	02/08/95 - SAF- B94-127	Y 3/22/95	3/22/95
BODR06	699-96-49	LK3777		LOCKHEED	N	N	N	N	Y 3/22/95	02/08/95 - SAF- B94-127	N	3/22/95

Data Entry Complete: DP DEA 4-10-94

DATATRAC 90

4/14/95

Validation Rcvd 4-10-94

613426-1922

9613426.0923

Golder Associates Inc.

4104-148th Avenue, NE
Redmond, WA 98052
Telephone (206) 883-0777
Fax (206) 882-5498

RECORD COPY



April 12, 1995

CH2M Hill
P.O. Box 1510
Richland, Washington 99352



Our ref: 943-1610.088.0400
94-1610/O/318

ATTENTION: Ms. Jeanette Duncan

**RE: TRANSMITTAL OF DATA VALIDATION PACKAGE COMMENT RESPONSES
CONTRACT NO. MSH-SWV-315905**

Dear Ms. Duncan:

Enclosed are comment responses for the following data validation package. The following is a summary of the data package and pages that have been revised:

<u>SAF#</u>	<u>Project</u>	<u>Data Package</u>	<u>Pages</u>
B94-127	100-HR-3 N-Springs <i>PKR 4-14-95</i>	LK3777-LAS	Radiochemistry, Pages: 1,2,6,8,9, 17,19

Please call if you have any questions.

Sincerely,

GOLDER ASSOCIATES INC.

Christina I. Jensen
Task Manager

Enclosures

p:\enviro\wbc\dv\cmstran.ltr

9613426.0924

DON'T SAY IT - - WRITE IT!

Date: 4/20/95
From: P. K. Reich H4-14, (509) 372-2785
Subject: Correction of Validation Date Received Stamp

The Date Stamped on this Validation Report is the date the final correction documents were received in the completion of the Validation Review Process.

The original front page(s) are maintained as a documented record of the date the Validation Report was originally received from the Validators.

Thank You,

Pat Reich
Data Management



TO: 100-HR-3 Round 8 Groundwater Project QA Record April 4, 1995

FR: Anne Jensen, Golder Associates Inc. *aj*

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE
LK3777-LAS (943-1610.088 LK377RAD.HR3)

INTRODUCTION

This memo presents the results of data validation on data package LK3777-LAS prepared by Lockheed Analytical Services. Sample information is provided in the following table.

SAMPLE ID	COMMENTS	ANALYSIS	MEDIA
B0DR05	FIELD SPLIT	RADIOCHEMISTRY SEE ATTACHMENT 4	WATER

* - Indicates sample results which were 100% recalculated.

Data validation was conducted to level D in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met, with the exception of deficiencies identified below.

Accuracy. Goals for accuracy were met.

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were met for all sample results.

9613426-0926

RECORD COPY

MEMORANDUM



TO: 100-HR-3 Round 8 Groundwater Project QA Record April 12, 1995

FR: Anne Jensen, Golder Associates Inc. *aj*

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE LK3777-LAS (943-1610.088 LK377RAD.HR3)

INTRODUCTION

This memo presents the results of data validation on data package LK3777-LAS prepared by Lockheed Analytical Services. Sample information is provided in the following table.

SAMPLE ID	COMMENTS	ANALYSIS	MEDIA
B0DR05	FIELD SPLIT	RADIOCHEMISTRY SEE ATTACHMENT 4	WATER
* - Indicates sample results which were 100% recalculated.			

Data validation was conducted to level D in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were met for all sample results.

revised aj
4/12/95
ml

Completeness. The data package was complete for all requested analyses. A total of one sample was validated in this data package with a total of four determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets the 90% objective of the work plan.

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.

FIELD QC

- Sample B0DR05 was identified as a field split of sample B0DQZ5. A comparison of these results will be made in the final summary report.

DATA REPORTING

- Reported sample results which are less than the minimum detectable activity (MDA) have been qualified as undetected (U) on the laboratory results form (see Attachment 3).

REFERENCES

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

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994; Westinghouse Hanford Company, Richland, Washington.

revised af
4/12/95
mz

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

ATTACHMENT 1

GLOSSARY OF RADIOCHEMISTRY DATA REPORTING QUALIFIERS.

- 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 for and was not detected at a concentration above the 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 the constituent was analyzed for and detected. The concentration reported is qualified as estimated due to a quality control deficiency identified during data validation. The associated data should be considered usable for decision making purposes.
- UR - Indicates the constituent was analyzed for and not detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.
- R - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

9613426.0930

ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

9613426.0931

WHC-SD-EN-SPP-002, REV.2

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: LK3777-LAS	REVIEWER: A. JENSEN	DATE: 4-4-95	PAGE <u>1</u> OF <u>1</u>
COMMENTS: RADIOCHEMISTRY			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
NO QUALIFICATIONS REQUIRED			

revised aj
4/12/95

006

9613426.0932

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: LK3777-LAS

	Samp#	B0DR05	
	Date	2-6-95	
	Location	699-96-49	
	Depth	---	
	Type	WATER	
	Comments	SPLIT	
Parameter	Units	Result	Q
GROSS ALPHA	pCi/L	2.000	U
GROSS BETA	pCi/L	4.900	
STRONTIUM	pCi/L	0.390	U
TRITIUM	pCi/L	5650.000	

The decimal places shown do not reflect the precision reported by the laboratory

9613426-10933

008

verified aj
4/12/95

verified aj
4/12/95

9613426.0934

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECTEL-HANFORD)

Client Sample ID: B0DR05

LAL Sample ID: L3777-7

Date Collected: 06-FEB-95

Date Received: 08-FEB-95

Matrix: Water

Login Number: L3777

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
Gross Alpha	27-FEB-95	GR ALP/BETA LAL-0060_18959	2.0	1.7	2.5	C	pCi/L
Gross Beta	27-FEB-95	GR ALP/BETA LAL-0060_18959	4.9	1.6	2.2	C	pCi/L
Total radio-strontium	10-MAR-95	SR-90 LAL-0196_19538	0.39	0.53	0.90		pCi/L

Q
U *U* *4/12/95*

revised aj
4/12/95

verified aj
4/4/95

9613426.0935

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0DR05

LAL Sample ID: L3777-13

Date Collected: 06-FEB-95

Date Received: 08-FEB-95

Matrix: Water

Login Number: L3777

Constituent	Analyzed	Batch	Activity	Error	MDA	Data/Qual	Units
H-3	10-MAR-95	TRITIUM(H3) LAL-0066_19975	5650	570	260		pCi/L

verified as 4/4/95
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241

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ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

**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.

Analytical Method**Strontium-90**

The Strontium-90 analysis was performed using Standard Operating Procedure LAL-91-SOP-0065. All QC criteria were met and no reanalysis was performed.

Gross Alpha Beta

The Gross alpha/beta analysis was performed using Standard Operating Procedure LAL-91-SOP-0061. All QC criteria were met and no reanalysis was performed.

Tritium

The Tritium analysis was performed using Standard Operating Procedure LAL-91-SOP-0066. All QC criteria were met and no reanalysis was performed.

Keith B. Arndt
Prepared By

March 20, 1994
Date

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

L3777

Page 1 of 1

Data Turnaround

Priority
 Normal

Collector K. Lee A Rizzo	Company Contact R. Peterson	Telephone No. (509) 372-9638
Project Designation 100-HR-3 Groundwater Sampling, Round 8, Phase 2	Sampling Location 100 D	SAF No. B94-127
Ice Chest No. #168	Field Logbook No. EFL-1018	Method of Shipment Federal Express
Shipped To Lockheed	Offsite Property No. W95-0-0204-10	Bill of Lading/Air Bill No. 29004614656

Possible Sample Hazards/Remarks	Preservative	HNO3	Cool 4C	H2SO4	*1	H2SO4	HNO3	Cool 4C	Cool 4C	HNO3				
	Type of Container	G	G	P	P	P/G	G	G	P	G				
No. of Container(s)	1	1	1	1	1	1	6	1	1	1				

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

SAMPLE ANALYSIS	Volume	ICP Metals	Anions-Cl, SO4, PO4, NO2, NO3	NO2, NO3	Sulfide	Ammonia	Total Alpha, Total Beta, Sr-90	Tritium	Activity Scan	ICP Metals Filtered
	1L	500mL	250mL	1L	500mL	1L	40mL	20mL	1L	

013

Sample No.	Matrix*	Date Sampled	Time Sampled											
BODR05	W	2.6.95	1008	X	X	X	X	X	X	X				
BODR06	W	2.6.95	1008								X			

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix*	
Relinquished By <i>K. Lee</i>	Date/Time 2/6/95 1245	Received By <i>ERC</i>	Date/Time 2-6-95	*1. ZnAc+NaOH Data Deliverable - Standalone Sample analysis results for phosphate, nitrate, and nitrite by EPA 300.0 is for information only. The ERC Contractor acknowledges that the 48 hour hold time will not be met.				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	
Relinquished By <i>ERC</i>	Date/Time 0900	Received By <i>Burkett</i>	Date/Time 2-6-95						
Relinquished By <i>Burkett</i>	Date/Time 2-7-95	Received By	Date/Time						
Relinquished By	Date/Time	Received By	Date/Time						

LABORATORY SECTION	Received By <i>MM</i>	Title <i>Sample Custodian</i>	Date/Time 2-8-95 / 0900
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

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ATTACHMENT 5
DATA VALIDATION SUPPORTING DOCUMENTATION

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-AR-3			DATA PACKAGE: LK3777-LAS		
VALIDATOR: A. Jensen		LAB: Lockheed		DATE: 4/4/95	
CASE:			SDG:		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> Gross Alpha/Beta	<input checked="" type="checkbox"/> Strontium-90	<input type="checkbox"/> Technetium-99	<input type="checkbox"/> Alpha Spectroscopy	<input type="checkbox"/> Gamma Spectroscopy	
<input type="checkbox"/> Total Uranium	<input type="checkbox"/> Radium-22	<input checked="" type="checkbox"/> Tritium	<input type="checkbox"/>		
SAMPLES/MATRIX					
BODRCS / WATER					

1. Completeness N/A

Technical verification forms present? **Yes** No N/A

Comments: _____

2. Initial Calibration N/A

Instruments/detectors calibrated within one year of sample analysis? **Yes** No N/A

Initial calibration acceptable? **Yes** No N/A

Standards NIST traceable? **Yes** No N/A

Standards Expired? Yes **No** N/A

Comments: _____

- 3. Continuing Calibration N/A
- Calibration checked within one week of sample analysis? . . . Yes No N/A
- Calibration check acceptable? Yes No N/A
- Calibration check standards NIST traceable? Yes No N/A
- Calibration check standards expired? Yes No N/A

Comments: _____

- 4. Blanks N/A
- Method blank analyzed? Yes No N/A
- Method blank results acceptable? Yes No N/A
- Analytes detected in method blank? Yes No N/A
- Field blank(s) analyzed? Yes No N/A
- Field blank results acceptable? Yes No N/A
- Analytes detected in field blank(s)? Yes No N/A
- Transcription/Calculation Errors? Yes No N/A

af
4/6/95

Comments: _____

- 5. Matrix Spikes N/A
- Matrix spike analyzed? Yes No N/A
- Spike recoveries acceptable? Yes No N/A
- Spike source traceable? Yes No N/A
- Spike source expired? Yes No N/A
- Transcription/Calculation Errors? Yes No N/A

Comments: _____

6. Laboratory Control Samples N/A

LCS analyzed? Yes No N/A

LCS recoveries acceptable? Yes No N/A

LCS traceable? Yes No N/A

Transcription/Calculation Errors? Yes No N/A

Comments: _____

7. Chemical Recovery N/A

Chemical carrier added? Yes No N/A

Chemical recovery acceptable? Yes No N/A

Chemical carrier traceable? Yes No N/A

Chemical carrier expired? Yes No N/A

Transcription/Calculation errors? Yes No N/A

Comments: _____

8. Duplicates N/A

Duplicates Analyzed? Yes No N/A

RPD Values Acceptable? Yes No N/A

Transcription/Calculation Errors? Yes No N/A

Comments: _____

*revised of
4/12/95*

9. Field QC Samples N/A

Field duplicate sample(s) analyzed? Yes No N/A

Field duplicate RPD values acceptable? Yes No N/A

Field split sample(s) analyzed? *see note 2* Yes No N/A

Field split RPD values acceptable? Yes No N/A

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

Performance audit sample results acceptable? Yes No N/A

Comments: 2 Sample B0DR05 is the field split of sample B0DR25. A comparison of these results will be made in the final summary report.

10. Holding Times

Are sample holding times acceptable? Yes No N/A

Comments:	Analysis	Sample Date	Prep Date	Analysis Date	Prep Hold Time	Analysis Hold Time	Qualifier
B0DR05	Gross α/B	2/6/95	N/A	2/23/95	N/A	≤ 180 days	NONE
	Strontium-90	↓	N/A	3/8/95	N/A	↓	↓
	Tritium	↓	3/9/95	3/10/95	≤ 7 days	↓	↓

11. Results and Detection Limits (Levels D & E) N/A

Results reported for all required sample analyses? Yes No N/A

Results supported in raw data? Yes No N/A

Results Acceptable? Yes No N/A

Transcription/Calculation errors? Yes No N/A

MDA's meet required detection limits? Yes No N/A

Transcription/calculation errors? Yes No N/A

Comments: _____

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019 4/12/95

LK3777.WK1

Gross Alpha	
HEIS No.:	BODR05
Detector	A1
Lab ID:	L3777-7
Aliquot:	2.50E-01
Net counts:	13
Bkg counts:	3.8
Spl count time:	100
Bkg count time:	100
EFFIC:	0.083
Calc.:	2.0
Rptd:	2.0
MDA calc:	2.6
MDA rptd:	2.5

Gross Beta	
HEIS No.:	BODR05
Detector	A1
Lab ID:	L3777-7
Aliquot:	2.50E-01
Net counts:	209
Bkg counts:	99
Spl count time:	100
Bkg count time:	100
a into b X TALK:	0.278
EFFIC:	0.394
Calc.:	4.9
Rptd:	4.9
MDA calc:	2.2
MDA rptd:	2.2

LK3777.WK1

04-Apr-95, Page 1

LK3777.WK1

Strontium 90	
HEIS No.:	B0DR05
DETECTOR:	A4
Sample:	L3777-7
DECAY:	1
Sample amt (L):	5.00E-01
GROSS CNTS:	217
Count time:	200
GROSS BKG:	188
EFFIC.:	0.454
INGROWTH:	1.056
Yield:	0.697
Calc:	0.39
Rptd:	0.39
MDA, Calc:	0.90
MDA, rptd:	0.90

Tritium	
HEIS No.	B0DR05
Lab ID	L3777-7
Aliquot, L	0.01
Gross counts, Blank	22.2
sml, CPM	25.30
bkgd CPM	0.87
Count time	20
Efficiency, sml	0.195
Efficiency, blank	0.196
Result, calc.	5643
Result, rptd.	5650
MDA, calc.	252
MDA, rptd.	260

LK3777.WK1

04-Apr-95, Page 1

021

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RECORD COPY

MEMORANDUM



TO: 100 HR 3 Phase II Round 8 Groundwater Project QA Record APR 11, 1995

FR: Heidi Gregerson, Golder Associates Inc. *HG*

RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE
LK3777-LAS (943-1610.088 LK3777GEN.HR3)

INTRODUCTION

This memo presents the results of data validation on data package LK3777-LAS prepared by Lockheed Analytical Services. Sample information is provided in the following table.

SAMPLE ID	COMMENTS	ANALYSIS	MEDIA
B0DR05*	SPLIT	GENERAL CHEMISTRY SEE ATTACHMENT 4	WATER
* - Indicates sample results which were 100% recalculated.			

Data validation was conducted to level D in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were met for all sample results.

Completeness. The data package was complete for all requested analyses. A total of one sample was validated in this data package with a total of eight determinations reported, all of which were deemed valid. This results in a completeness of 100%, which meets the 90% objective of the work plan.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

The following minor deficiencies were identified during data validation which required qualification of data.

Holding Times

- The holding times for nitrate, nitrite, and phosphate were exceeded. Attachments 2 and 5 provide a summary of samples affected, data qualifications applied and supporting documentation.

Reported Results

- Results that were reported by the laboratory as less than the detection limit on the sample result form were qualified as undetected (U).

FIELD QC

- Sample B0DR05 was identified as a field split. The RPD values will be evaluated in the final summary report.

REFERENCES

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

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994; Westinghouse Hanford Company, Richland, Washington.

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ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

Glossary of Inorganic Data Reporting Qualifiers.

- B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.
- U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution 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 for and not detected. Due to a minor quality control deficiency identified during data validation the concentration may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.
- BJ - Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.
- J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.
- UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.
- R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

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ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

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WHC-SD-EN-SPP-002, REV.2

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: LK3777-LAS	REVIEWER: H. Gregerson	DATE: 4-6-95	PAGE <u>1</u> OF <u>1</u>
COMMENTS: GENERAL CHEMISTRY			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
NITRATE	J	B0DR05	HOLDING TIME EXCEEDED
NITRITE	UJ	B0DR05	HOLDING TIME EXCEEDED
PHOSPHATE	UJ	B0DR05	HOLDING TIME EXCEEDED

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ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: LK3777-LAS

Parameter	Samp#		BODR05	
	Date	Location	Date	Location
	Depth	Type	Comments	
	Units	Result	Q	
CHLORIDE	MG/L	12.000		
NITRATE	MG/L	2.700	J	
NITRITE	MG/L	0.010	UJ	
ORTHO-PHOSPHATE	MG/L	0.100	UJ	
SULFATE	MG/L	52.000		
AMMONIA	MG/L	0.050	U	
NITRATE+NITRITE	MG/L	2.400		
SULFIDE	MG/L	3.000	U	

The decimal places shown do not reflect the precision reported by the laboratory

*Verified
HRG 4/6/95*

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LOCKHEED ANALYTICAL SERVICES
COMMON IONS AND ADDITIONAL ANALYTES

Sample Results

Client Sample ID: B0DR05	Date Collected: 06-FEB-95
Matrix: Water	Date Received: 08-FEB-95

Constituent	Units	Method	Result	Reporting Det Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID	
Chloride	mg/L	300.0	12.	0.02		09-FEB-95	18909	L3777-3	Q
Nitrate-N	mg/L	300.0	2.7	0.02	H	09-FEB-95	18910	L3777-3	J
Nitrite-N	mg/L	300.0	< 0.01	0.01	H	09-FEB-95	18911	L3777-3	UJ
Ortho Phosphate	mg/L	300.0	< 0.1	0.1	H	09-FEB-95	18912	L3777-3	UJ
Sulfate	mg/L	300.0	52.	0.1		09-FEB-95	18913	L3777-3	
Ammonia Nitrogen	mg/L	350.1	< 0.05	0.05		16-FEB-95	18919	L3777-6	U
Nitrate-Nitrite-Nitrogen	mg/L	353.2	2.4	0.05		11-FEB-95	18918	L3777-4	
Sulfide	mg/L	9030	< 3	3		08-FEB-95	18916	L3777-5	U

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ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

Lockheed Analytical Services

Log-in No.: L3777
 Quotation No.: Q400000-B
 SAF: B94-127
 Document File No.: 0208596
 WHC Document File No.: 160
 SDG No.: LK3777
 Page2

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 sample was received for LK3777 and prepared as batch 208WH 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
BODR05	L3777-3	DUP, MS	300.0 CHLORIDE, NITRATE, NITRITE, ORTHOPHOSPHATE, AND SULFATE
	L3777-4	DUP, MS	353.2 NITRATE/NITRITE
	L3777-5	DUP, MS	9030 SULFIDE
	L3777-6	DUP, MS	350.1 AMMONIA

Holding Time Requirements

- All samples were analyzed within the specified holding time, except Method 300.0 Nitrate-N, Nitrite-N and Orthophosphate which were received from the client out 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

March 1, 1995

Prepared By

Date

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4/6/95
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L3777

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Data Turnaround
 Priority
 Normal

Collector K. Lee A. Rizzo	Company Contact R. Peterson	Telephone No. (509) 372-9638
Project Designation 100-HR-3 Groundwater Sampling, Round 8, Phase 2	Sampling Location 100 D	SAF No. B94-127
Ice Chest No. #168	Field Logbook No. EFL-1018	Method of Shipment Federal Express
Shipped To Lockheed	Offsite Property No. W95-0-0204-10	Bill of Lading/Air Bill No. 29009619056

Possible Sample Hazards/Remarks	Preservative											
	HNO3	Cool 4C	H2SO4	*1	H2SO4	HNO3	Cool 4C	Cool 4C		HNO3		
	G	G	P	P	P/G	G	G	P		G		
	1	1	1	1	1	6	1	1		1		
	Volume	1L	500mL	250mL	1L	500mL	1L	40mL	20mL	1L		

Special Handling and/or Storage Maintain between 2 C and 6 C.	Volume	ICP Metals	Anions-Cl, SO4, PO4, NO2, NO3	NO2, NO3	Sulfide	Ammonia	Total Alpha, Total Beta, Sr-90	Tritium	Activity Scan	ICP Metals							
		Unfiltered	Filtered														

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SAMPLE ANALYSIS

Sample No.	Matrix *	Date Sampled	Time Sampled	ICP Metals	Anions-Cl, SO4, PO4, NO2, NO3	NO2, NO3	Sulfide	Ammonia	Total Alpha, Total Beta, Sr-90	Tritium	Activity Scan	ICP Metals					
BODR05	W	2-6-95	1008	X	X	X	X	X	X	X	X						
BODR06	W	2-6-95	1008									X					

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By K. Lee Date/Time 2/6/95 1245	Received By ERC Date/Time 2-6-95	*1. ZnAc+NaOH	S = Soil
Relinquished By ERC Date/Time 0900	Received By BWH Date/Time 2-7-95	Data Deliverable - Standalone	SE = Sediment
Relinquished By	Received By	Sample analysis results for phosphate, nitrate, and nitrite by EPA 300.0 is for information only. The ERC Contractor acknowledges that the 48 hour hold time will not be met.	SO = Solid
Relinquished By	Received By		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 MM	Title Sample Custodian	Date/Time 2-8-95 / 0900
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

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9613426.0959

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100HR3 Phase II Rnd 8 GtzO			DATA PACKAGE: UK3777-LAS		
VALIDATOR: H. GREGERSON		LAB: LOCKHEED		DATE: 4/6/95	
CASE:			SDG:		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> Anions/IC	<input type="checkbox"/> TOC	<input type="checkbox"/> TOX	<input type="checkbox"/> TPH-418.1	Oil and Grease	Alkalinity
<input checked="" type="checkbox"/> Ammonia	<input type="checkbox"/> BOD/COD	<input type="checkbox"/> Chloride	<input type="checkbox"/> Chromium-VI	<input type="checkbox"/> pH	<input checked="" type="checkbox"/> NO ₃ /NO ₂
<input type="checkbox"/> Sulfate	<input type="checkbox"/> TDS	<input type="checkbox"/> TKN	<input type="checkbox"/> Phosphate	<input checked="" type="checkbox"/> Sulfide	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX BODROS / water					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? **Yes** No N/A
 Is a case narrative present? **Yes** No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? Yes **No**^{1.} N/A

Comments: _____
 1. The holding times for NO₃, NO₂, and PO₄ were exceeded. The associated sample was qualified. See supporting documents.

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

- Was initial calibration performed for all applicable analyses? Yes No N/A
- Are initial calibration results acceptable? Yes No N/A
- Was a calibration check performed for all applicable analyses? Yes No N/A
- Are calibration check results acceptable? Yes No N/A

Comments: _____

4. BLANKS

- Were laboratory blanks analyzed? Yes No N/A
- Are laboratory blank results acceptable? Yes No N/A
- Were field/trip blanks analyzed? Yes No N/A
- Are field/trip blank results acceptable? Yes No N/A

Comments: _____

5. ACCURACY

- Were spike samples analyzed at the required frequency? . . . Yes No N/A
- Are spike recoveries acceptable? Yes No N/A
- Were LCS analyses performed at the required frequency? . . . Yes No N/A
- Are LCS recoveries acceptable? Yes No N/A

Comments: _____

6. PRECISION

- Were laboratory duplicate samples analyzed at the required frequency? Yes No N/A
- Are laboratory duplicate sample RPD values acceptable? . . . Yes No N/A
- Are field duplicate RPD values acceptable? Yes No N/A
- Are field split RPD values acceptable? Yes No N/A

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments: _____

1. BODROS was identified as a split, the associated sample is in another delivery group and will be evaluated in the final summary.

7. ANALYTE QUANTITATION

Was analyte quantitation performed properly? Yes No N/A

Comments: _____

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? Yes No N/A

Are results supported in the raw data? Yes No N/A

Are results calculated properly? Yes No N/A

Do results meet the CRDLs? Yes No N/A

Comments: _____

HOLDING TIME SUMMARY

SDG: LK3777-LAS	VALIDATOR: HEIDI GREGERSON	DATE: 4/6/95	PAGE 1 OF 1				
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
60DROS	Anions	2/6/95		2/9/95		3	NO ₃ J NO ₂ UT
↓	NH ₃	2/6/95		2/16/95		10	none
	NO ₃ /NO ₂	2/6/95		2/11/95		5	none
	Sulfide	2/6/95		2/8/95		2	none

9613426.0963

MEMORANDUM



TO: 100 HR 3 Phase II Round 8 Groundwater Project QA Record
FR: Heidi Gregerson, Golder Associates Inc. HLG
RE: INORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE
LK3777-LAS (943-1610.088 LK3777INO.HR3)

INTRODUCTION

This memo presents the results of data validation on data package LK3777-LAS prepared by Lockheed Analytical Services. Sample information is provided in the following table.

SAMPLE ID	COMMENTS	ANALYSIS	MEDIA
BODR05* BODR06	SPLIT SPLIT	INORGANICS SEE ATTACHMENT 4	WATER WATER

* - Indicates sample results which were 100% recalculated.

Data validation was conducted to level D in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were met for all sample results.

Completeness. The data package was complete for all requested analyses. Two samples were validated in this data package with a total of 36 determinations reported, all of which were deemed valid. This results in a completeness of 100%, which meets the 90% objective of the work plan.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

The following minor deficiencies were identified during data validation which required qualification of data.

Laboratory Blanks

- Copper and manganese were detected in the continuing calibration blank at positive concentrations. Attachments 2 and 5 provide a summary of the samples affected, data qualification applied and supporting documentation.
- Iron and zinc were detected in the preparation blank at positive concentrations. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

Initial Calibration Verification

- The ICV recovery for cadmium is outside of control limits. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

FIELD QC

- Samples B0DR05 and B0DR06 were identified as field splits and will be evaluated in the final summary report. Data qualification is not required for field QC. Attachment 3 provides a summary of the results.

REFERENCES

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

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994; Westinghouse Hanford Company, Richland, Washington.

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ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

Glossary of Inorganic Data Reporting Qualifiers.

- B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.
- U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution 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 for and not detected. Due to a minor quality control deficiency identified during data validation the concentration may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.
- BJ - Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.
- J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.
- UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.
- R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

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ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: LK3777-LAS	REVIEWER: H. Gregerson	DATE: 4-5-95	PAGE <u>1</u> OF <u>1</u>
COMMENTS: INORGANICS			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
CADMIUM	UJ	ALL	ICV RECOVERY IS OUTSIDE OF CONTROL LIMITS
COPPER	U	B0DR05	DETECTED IN CONTINUING CALIBRATION BLANK AT POSITIVE CONCENTRATION
IRON	U	B0DR05	DETECTED IN PREPARATION BLANK AT POSITIVE CONCENTRATION
MANGANESE	U	B0DR05	DETECTED IN CONTINUING CALIBRATION BLANK AT POSITIVE CONCENTRATION
ZINC	U	B0DR05	DETECTED IN PREPARATION BLANK AT POSITIVE CONCENTRATION

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ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: LK3777-LAS

Parameter	Samp#	BODR05		BODR06	
	Date	2-6-95		2-6-95	
	Location	699-96-49		699-96-49	
	Depth	---		---	
	Type	WATER		WATER	
	Comments	SPLIT		SPLIT	
	Units	Result	Q	Result	Q
ALUMINUM	UG/L	26.000	U	26.000	U
ANTIMONY	UG/L	45.000	U	45.000	U
BARIUM	UG/L	77.000	B	72.500	B
BERYLLIUM	UG/L	1.000	U	1.000	U
CADMIUM	UG/L	3.000	UJ	3.000	UJ
CALCIUM	UG/L	44200.000		42400.000	
CHROMIUM	UG/L	43.800		40.100	
COBALT	UG/L	7.000	U	7.000	U
COPPER	UG/L	3.600	U	3.000	U
IRON	UG/L	68.100	U	6.000	U
MAGNESIUM	UG/L	10000.000		9620.000	
MANGANESE	UG/L	3.100	U	1.000	U
NICKEL	UG/L	12.000	U	12.000	U
POTASSIUM	UG/L	4760.000	B	4700.000	B
SILVER	UG/L	4.000	U	4.000	U
SODIUM	UG/L	13100.000		12300.000	
VANADIUM	UG/L	13.000	B	10.800	B
ZINC	UG/L	11.800	U	2.000	U

The decimal places shown do not reflect the precision reported by the laboratory

*Verified
HRG 4/6/95*

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CLP

1
INORGANIC ANALYSES DATA SHEET

CLIENT ID NO.

BODR05

Lab Name: LOCKHEED_ANALYTICAL_SVC Contract: HANFORD

Lab Code: LOCK Case No.: B94-12 SAS No.: SDG No.: LK3777

Matrix (soil/water): WATER Lab Sample ID: L3777-2

Level (low/med): LOW Date Received: 02/08/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	26.0	U		P	
7440-36-0	Antimony	45.0	U		P	
7440-39-3	Barium	77.0	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	3.0	B		P	UJ
7440-70-2	Calcium	44200	-		P	
7440-47-3	Chromium	43.8	-		P	
7440-48-4	Cobalt	7.0	U		P	
7440-50-8	Copper	3.6	B		P	U
7439-89-6	Iron	68.1	B		P	U
7439-95-4	Magnesium	10000	-		P	
7439-96-5	Manganese	3.1	B		P	U
7440-02-0	Nickel	12.0	U		P	
7440-09-7	Potassium	4760	B		P	
7440-22-4	Silver	4.0	U		P	
7440-23-5	Sodium	13100	-		P	
7440-62-2	Vanadium	13.0	B		P	
7440-66-6	Zinc	11.8	B		P	U

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

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CLP

1
INORGANIC ANALYSES DATA SHEET

CLIENT ID NO.

BODR06

Lab Name: LOCKHEED_ANALYTICAL_SVC Contract: HANFORD

Lab Code: LOCK Case No.: B94-12 SAS No.: SDG No.: LK3777

Matrix (soil/water): WATER Lab Sample ID: L3777-14

Level (low/med): LOW Date Received: 02/08/95

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	26.0	U		P	
7440-36-0	Antimony	45.0	U		P	
7440-39-3	Barium	72.5	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	3.0	U		P	UJ
7440-70-2	Calcium	42400	-		P	
7440-47-3	Chromium	40.1	-		P	
7440-48-4	Cobalt	7.0	U		P	
7440-50-8	Copper	3.0	U		P	
7439-89-6	Iron	6.0	U		P	
7439-95-4	Magnesium	9620	-		P	
7439-96-5	Manganese	1.0	U		P	
7440-02-0	Nickel	12.0	U		P	
7440-09-7	Potassium	4700	B		P	
7440-22-4	Silver	4.0	U		P	
7440-23-5	Sodium	12300	-		P	
7440-62-2	Vanadium	10.8	B		P	
7440-66-6	Zinc	2.0	U		P	

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

Lockheed Analytical Services

Log-in No:
Quotation No:
Document File No:
Page:

**CASE NARRATIVE
INORGANIC DISSOLVED 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 filtered water sample for dissolved metals analysis. As the measured turbidity of the sample was less than 1 NTU, it was batched as 208WHD for selected dissolved analytes as requested on the chain of custody. For this sample batch sample BODR06 (L3777-14) was used for matrix spike and matrix spike duplicate, post-digestion spike and serial dilution analyses. All data flags due to the performance of the above-mentioned QC sample are also associated with every sample analyzed with this batch.

Holding Time Requirements

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

Method Blanks

- The level of analytes in the method blanks were less than the reporting detection limits.

Internal Quality Control

All internal quality control were within acceptance limits.

Sample Results

The following qualifiers are reported on the basis of the techniques employed to perform the analyses:

"P" ICP-AES

Nalini Prabhakar

03/02/95

Prepared By

Date

012

HCG/4/95
8

Lockheed Analytical ServicesLog-in No.: L3777
Quotation No.: Q400000-B
SAF: B94-127
Document File No.: 0208596
WHC Document File No.: 160
SDG No.: LK3777
Page3**CASE NARRATIVE
INORGANIC TOTAL 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 sample was for total metals analysis. The sample was prepared as LAS Batch 208WHT and analyzed for selected analytes as requested on the chain of custody. Sample BODR05 (L3777-2) was used for matrix spike and duplicate, post-digestion spike and serial dilution analyses. All data flags due to the performance of the above-mentioned QC sample are also associated with every sample digested with this batch.

Holding Time Requirements

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

Method Blanks

- The level of analytes in the method blanks were less than the reporting detection limits.

Internal Quality Control

All internal quality control were within acceptance limits.

Sample Results

- The following qualifiers are reported on the basis of the techniques employed to perform the analyses:
P* ICP-AES

Nalini Prabhakar

03/02/95

Prepared By

Date

013

HCG 4/5/95
7

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

43777

Page 1 of 1

Data Turnaround

Priority
 Normal

Collector K. Lee A. Rizzo	Company Contact R. Peterson	Telephone No. (509) 372-9638
Project Designation 100-HR-3 Groundwater Sampling, Round 8, Phase 2	Sampling Location 100 D	SAF No. B94-127
Ice Chest No. #168	Field Logbook No. EFL-1018	Method of Shipment Federal Express
Shipped To Lockheed	Offsite Property No. W95-0-0204-10	Bill of Lading/Air Bill No. 29004618656

Possible Sample Hazards/Remarks	Preservative	HNO3	Cool 4C	H2SO4	*1	H2SO4	HNO3	Cool 4C	Cool 4C	HNO3				
	Type of Container	G	G	P	P	P/G	G	G	P	G				
	No. of Container(s)	1	1	1	1	1	6	1	1	1				
Special Handling and/or Storage Maintain between 2 C and 6 C.	Volume	1L	500mL	250mL	1L	500mL	1L	40mL	20mL	1L				
		ICP Metals Unfiltered	Anions-Cl, SO4, PO4, NO2, NO3	NO2, NO3	Sulfide	Ammonia	Total Alpha, Total Beta, Sr-90	Tritium	Activity Scan	ICP Metals Filtered				

014

SAMPLE ANALYSIS

Sample No.	Matrix*	Date Sampled	Time Sampled											
BODR05	W	2.6.95	1008	X	X	X	X	X	X	X				
BODR06	W	2.6.95	1008										X	

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix*
Relinquished By K. Lee Date/Time 2/6/95 1245	Received By ERC Date/Time 2-6-95	*1. ZnAc+NaOH Data Deliverable - Standalone	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
Relinquished By ERC Date/Time 0900	Received By BWH Date/Time 2-7-95	Sample analysis results for phosphate, nitrate, and nitrite by EPA 300.0 is for information only. The ERC Contractor acknowledges that the 48 hour hold time will not be met.	
Relinquished By	Received By		
Relinquished By	Received By		

LABORATORY SECTION	Received By MM	Title Sample Custodian	Date/Time 2-8-95 / 0900
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original - Sample Yellow - Sampler

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ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	<u>D</u>	E
PROJECT: 100HR3 Phase II Rnd 8 GHz			DATA PACKAGE: LK3777-LAS		
VALIDATOR: H. GREGERSON		LAB: LOCKHEED		DATE: 4/5/95	
CASE:			SDG:		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> CLP/ICP	<input type="checkbox"/> CLP/GFAA	<input type="checkbox"/> CLP/Hg	<input type="checkbox"/> CLP/Cyanide	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> SW-846/ICP	<input type="checkbox"/> SW-846/GFAA	<input type="checkbox"/> SW-846/Hg	<input type="checkbox"/> SW-846 Cyanide	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX	BODROS		BODROW / water		

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? Yes No N/A
 Is a case narrative present? Yes No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

- Were initial calibrations performed on all instruments? Yes No N/A
- Are initial calibrations acceptable? Yes No N/A
- Are ICP interference checks acceptable? Yes No N/A
- Were ICV and CCV checks performed on all instruments? Yes No N/A
- Are ICV and CCV checks acceptable? Yes No N/A

Comments:

1. The ICV % R for Cd is outside control limits. Associated samples were qualified, see supporting documents.

4. BLANKS

- Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
- Are ICB and CCB results acceptable? Yes No N/A
- Were preparation blanks analyzed? Yes No N/A
- Are preparation blank results acceptable? Yes No N/A
- Were field/trip blanks analyzed? Yes No N/A
- Are field/trip blank results acceptable? Yes No N/A

Comments:

1. Cu and Mn were detected in the CCB, associated samples were qualified. See supporting documents.

2. Fe and Zn were detected in the prep. blank, associated samples were qualified. See supporting document

5. ACCURACY

- Were spike samples analyzed? Yes No N/A
- Are spike sample recoveries acceptable? Yes No N/A
- Were laboratory control samples (LCS) analyzed? Yes No N/A
- Are LCS recoveries acceptable? Yes No N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

- Were laboratory duplicates analyzed? Yes No N/A
- Are laboratory duplicate samples RPD values acceptable? . . . Yes No N/A
- Were ICP serial dilution samples analyzed? Yes No N/A
- Are ICP serial dilution %D values acceptable? Yes No N/A
- Are field duplicate RPD values acceptable? Yes No N/A
- Are field split RPD values acceptable? Yes No N/A

Comments: _____

1. B0DR05 and B0DR06 are both splits, their associated samples are in another delivery group & the RPD values will be evaluated in the final summary.

7. FURNACE AA QUALITY CONTROL

- Were duplicate injections performed as required? Yes No N/A
- Are duplicate injection %RSD values acceptable? Yes No N/A
- Were analytical spikes performed as required? Yes No N/A
- Are analytical spike recoveries acceptable? Yes No N/A
- Was MSA performed as required? Yes No N/A
- Are MSA results acceptable? Yes No N/A

Comments: _____

8. REPORTED RESULTS AND DETECTION LIMITS

- Are results reported for all requested analyses? Yes No N/A
- Are all results supported in the raw data? Yes No N/A
- Are results calculated properly? Yes No N/A
- Do results meet the CRDLs? Yes No N/A

Comments: _____

HOLDING TIME SUMMARY

SDG: UK3777-LAS VALIDATOR: HEIDI GREGERSON DATE: 4/5/95 PAGE 1 OF 1

COMMENTS:

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BODR05	ICP	2/6/95	2/14/95	2/17/95	8	11	none
BODR06	ICP	2/6/95	2/14/95	2/17/95	8	11	none

B-1

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 WMC-SD-EN-SPP-002, Rev. 2

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CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: LOCKHEED_ANALYTICAL_SVC__

Contract: HANFORD__

Lab Code: LOCK__

Case No.: B94-12

SAS No.: _____

SDG No.: LK3777

Initial Calibration Source: NIST_____

Continuing Calibration Source: I.VENTURES__

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration				M	
	True	Found	%R(1)	True	Found	%R(1)	Found		%R(1)
Aluminum	100000.0	102360.7	102.4	25000.0	26008.37	104.0	25766.16	103.1	P
Antimony	10000.0	9746.72	97.5	10000.0	9995.19	100.0	9809.54	98.1	P
Barium	1000.0	988.67	98.9	1000.0	995.85	99.6	999.13	99.9	P
Beryllium	500.0	492.39	98.5	500.0	474.31	94.9	471.54	94.3	P
Cadmium	1000.0	895.89	89.6	1000.0	916.32	91.6	913.26	91.3	P
Calcium	100000.0	104284.1	104.3	25000.0	25606.86	102.4	25218.65	100.9	P
Chromium	10000.0	9976.01	99.8	10000.0	10204.35	102.0	10153.78	101.5	P
Cobalt	10000.0	10109.92	101.1	10000.0	10210.11	102.1	10156.67	101.6	P
Copper	10000.0	9925.78	99.3	10000.0	9948.68	99.5	9957.53	99.6	P
Iron	10000.0	10162.67	101.6	25000.0	25562.43	102.2	25420.31	101.7	P
Magnesium	100000.0	101521.8	101.5	25000.0	25327.89	101.3	24960.13	99.8	P
Manganese	10000.0	10060.29	100.6	10000.0	10110.05	101.1	10077.49	100.8	P
Nickel	10000.0	10104.01	101.0	10000.0	10239.39	102.4	10156.88	101.6	P
Potassium	100000.0	101397.1	101.4	50000.0	49574.51	99.1	49695.25	99.4	P
Silver	1000.0	1043.04	104.3	1000.0	1015.58	101.6	1013.32	101.3	P
Sodium	100000.0	102978.1	103.0	100000.0	99502.96	99.5	99223.87	99.2	P
Vanadium	5000.0	5005.40	100.1	10000.0	10191.60	101.9	10154.67	101.5	P
Zinc	10000.0	9954.72	99.5	10000.0	10154.85	101.5	10096.44	101.0	P

BODROS

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

BODRCL6

FORM II (PART 1) - IN

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CLP

3
BLANKS

Lab Name: LOCKHEED_ANALYTICAL_SVC__

Contract: HANFORD__

Lab Code: LOCK__

Case No.: B94-12

SAS No.: _____

SDG No.: LK3777

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank		M
		C	1	C	2	C	3	C		C	
Aluminum	26.0	U	50.1	B	26.0	U	26.0	U	26.000	U	P
Antimony	45.0	U	45.0	U	45.0	U	45.0	U	45.000	U	P
Barium	12.0	U	12.0	U	12.0	U	12.0	U	12.000	U	P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	1.000	U	P
Cadmium	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Calcium	20.0	U	52.4	B	20.0	U	20.0	U	20.000	U	P
Chromium	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Cobalt	7.0	U	7.0	U	7.0	U	7.0	U	7.000	U	P
Copper	3.0	U	3.6	B	3.0	U	3.4	B	3.000	U	P
Iron	6.0	U	23.4	B	6.0	U	6.0	U	17.820	B	P
Magnesium	37.0	U	57.2	B	37.0	U	37.0	U	37.000	U	P
Manganese	1.0	U	3.3	B	1.6	B	2.9	B	1.000	U	P
Nickel	12.0	U	12.0	U	12.0	U	12.0	U	12.000	U	P
Potassium	680.0	U	680.0	U	680.0	U	680.0	U	680.000	U	P
Silver	4.0	U	4.0	U	4.0	U	4.0	U	4.000	U	P
Sodium	23.0	U	52.3	B	23.0	U	38.9	B	96.560	B	P
Vanadium	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Zinc	2.0	U	3.7	B	2.7	B	3.3	B	9.500	B	P

B0DRO5
B0DRO6

B0DRO5
B0DRO6

B0DRO5

HRG 4/5/75
17