START 9713534.1790

0046802

LOCKHEED MARTIN

FEB 1997 RECEIVED EDM

Lockheed Analytical Services

NOV 1996 RECEIVED Data Log In

Ms. Joan Kessner
Bechtel Hanford, Inc.
P.O. Box 969
1022 Lee Boulevard
Richland, WA 99352

NOV 1996 RECEIVED Data Log In

ANALYTICAL DATA REPORT

FOR

CHLORIDE, NITRATE, NITRITE, SULFATE, PHOSPHATE, FLUORIDE, METALS, MERCURY, TOTAL RECOVERABLE PETROLEUM HYDROCARBONS AND OIL AND GREASE ORGANICS, GAMMA SPECTROMETRY, GROSS BETA, STRONTIUM-90 AND TRITIUM

LOG-IN NUMBER:	L8049
QUOTATION NUMBER:	Q400000-B
SAF:	B96-181
DOCUMENT FILE NUMBER:	0928596
BHI DOCUMENT FILE NO.:	402
SDG NUMBER:	LK8049

001

Lockheed Analytical Services

BECHTEL HANFORD

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Sample Login No. L8049

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This report contains 179 pages.

9713534.1792

Lockheed Environmental Systems & Technologies Co.
Lockheed Analytical Services
975 Kelly Johnson Drive Las Vegas, Nevada 89119-3705
Telephone 702-361-0220 800-582-7605 Facsimile 702-361-8146

LOCKHEED MARTIN

November 12, 1996

Ms. Joan Kessner
Bechtel Hanford, Inc.
P.O. Box 969
1022 Lee Boulevard
Richland, WA 99352

NOV 1996
RECEIVED
Data
Log In

RE:	Log-in No.:	L8049
	Quotation No.:	Q400000-B
	SAF:	B96-181
	Document File No.:	0928596
	BHI Document File No.:	402
	SDG No.:	LK8049

The attached data report contains the analytical results of samples that were submitted to Lockheed Analytical Services on September 28, 1996. The temperatures of the two coolers upon receipt were 2 and 3°C. Sample containers received agree with the chain-of-custody documentation. All 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 Mary Wolf at (702) 361-3955 ext. 311. If you are unable to contact the client services representative, please call Mary B. Ford, client services manager, at extension 326.

"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 Manager or a designee, as verified by the following signature."

Sincerely,

Mary K. Wolf

Mary K. Wolf
Client Services Representative

cc: Client Services
Document Control

003

A2LA, ISO/IEC Guide 25, Section 13.2: The following results relate only to those samples tested. This report shall not be reproduced except in full, without the written approval of LAS.

Lockheed Analytical Services

Log-in No.: L8049
Quotation No.: Q400000-B
SAF: B96-181
Document File No.: 0928596
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SDG No.: LK8049
Page No.: 1

CASE NARRATIVE
INORGANIC NON METALS ANALYSES

The routine calibration and quality control analyses performed for this batch include as applicable: initial and continuing calibration verification, initial and continuing calibration blanks, method blank(s), laboratory control sample(s), matrix spike sample(s), and duplicate sample(s).

Preparation and Analysis Requirements

- Tow water samples were for LK8049 and analyzed in batch 928 bh for selected analytes to be analyzed in client-specified order as requested on the chain of custody. Quality control analysis was performed on the following samples:

Client ID	LAL #		Method
BOJ1P1	L8049-15	DUP, MS	300.0 Chloride, Nitrate-Nitrogen, Nitrite-Nitrogen, Sulfate, Orthophosphate 340.2 Fluoride

Method Blanks

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

Holding Time Requirements

- All samples were analyzed within the method-specific holding times with the following exceptions:

  For Method 300.0 Nitrate-Nitrogen, Nitrite-Nitrogen and Orthophosphate, the samples were received and analyzed outside of method-specific holding time. The associated samples are flagged with an "H".

Internal Quality Control

- All Internal Quality Control were within acceptance limits.

Kay McCann
Prepared By

October 24, 1996
Date

Lockheed Analytical Services

Log-in No.: L8049
Quotation No.: Q400000-B
SAF: B96-181
Document File No.: 0928596
BHI Document File No.: 402
SDG No.: LK8049
Page No.: 2

CASE NARRATIVE
INORGANIC METALS ANALYSES
FILTERED WATER

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), and duplicate sample(s).

Preparation and Analysis Requirements

All samples were received on September 28, 1996. The samples were logged in as L8049 and were prepared and analyzed in batch 928 bh D for dissolved metals. The samples were analyzed by Method 7000 Furnace Metals for arsenic, selenium, thallium, lead, and antimony, Method 7470 Mercury and Method 6010 ICP Metals for all other analytes.

Holding Time Requirements

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

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 with the following exception: The matrix spike recovery for sellenium was outside of acceptance limits (62%). The recovery based on the LCS (98%) supports that the analytical system was operating within control limits.

Shellee McGrath
Prepared By

November 6, 1996
Date

Lockheed Analytical Services

Log-in No.: L8049
Quotation No.: Q400000-B
SAF: B96-181
Document File No.: 0928596
BHI Document File No.: 402
SDG No.: LK8049
Page No.: 3

CASE NARRATIVE
ORGANIC ANALYSES

Analytical Method 418.1

Analytical Batch 101596PM-418.1

NOTE: Client sample B0J1P0 (L8049-39) was the native sample used for the Matrix Spike (42573MS) and Matrix Spike Duplicate (42573MSD).

The samples were extracted and analyzed within the required holding time on October 15, 1996. All initial and continuing calibrations met criteria. Total Recoverable Petroleum Hydrocarbon (TRPH) was not detected in the Method Blank (42573MB). The recovery of TRPH was within QC limits in the 42573MS, 42573MSD and Laboratory Control Sample (42573LCS). The Relative Percent Difference (RPD) between the 42573MS and 42573MSD recoveries was within QC limits.

Analytical Method 413.1

Analytical Batch 100896-413.1

NOTE: Client sample B0J1P0 (L8049-35) was the native sample used for the 42319MS and 42319MSD.

The samples were extracted and analyzed within the required holding time on October 8, 1996. Oil and Grease was not detected in the 42319MB. The recovery of Oil and Grease was within QC limits in the 42319MS, 42319MSD and 42319LCS. The RPD between the 42319MS and 42319MSD recoveries was within QC limits.

Prepared By
Patricia Lonergan

November 12, 1996

CASE NARRATIVE
RADIOCHEMISTRY ANALYSES

The routine calibration and quality control (QC) 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, and duplicate samples.

Holding Time Requirements

All holding time requirements were met.

Chemical recoveries and minimum detectable activities (MDAs) can be found on the calculation and preparation sheets of the attached analytical raw data.

Gamma Spectrometry

Analytical Method Gamma Spectrometry

The gamma spectrometry analysis was performed using standard operating procedure (SOP), LAL-91-SOP-0063. The samples were analyzed in workgroup 42723. The instrument calibration verification met criteria. The method blank was within QC criteria. The laboratory control sample (LCS) recoveries were within QC criteria. The duplicate (DUP) recoveries were within QC criteria. No re-analyses were performed.

Gas Proportional Counter

Analytical Method Gross Beta

The gross beta analysis was performed using SOP, LAL-91-SOP-0060. The samples were analyzed in workgroup 42721. The instrument calibration verification met criteria. The method blank was within QC criteria. The LCS and matrix spike (MS) recoveries were within QC criteria. The DUP recoveries were within QC criteria. The MDA exceeded the reporting detection limit due to the residue weight limitations forcing a volume reduction. The associated samples were flagged with a "C" qualifier. No re-analyses were performed.

Analytical Method Strontium-90

The strontium-90 analysis was performed using SOP, LAL-91-SOP-0196. The samples were analyzed in workgroup 42720. The instrument calibration verification met criteria. The method blank was within QC criteria. The LCS recovery was within QC criteria. The DUP recoveries were within QC criteria. No re-analyses were performed.

Lockheed Analytical Services

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Liquid Scintillation Counter

Analytical Method Tritium

The tritium analysis was performed using SOP, LAL-91-SOP-0066. The samples were analyzed in workgroup 42432. The instrument calibration verification met criteria. The method blank was within QC criteria. The LCS recovery was within QC criteria. The MS activity was 9.99% of the MS sample activity, therefore the MS recovery is not applicable. Since all other QC criteria were met, data quality is not believed to be adversely affected. The DUP recoveries were within QC criteria. The quench value was within curve limitations. No re-analyses were performed.

Yvonne M. Jacoby
Prepared By

November 12, 1996
Date

Lockheed Analytical Services
DATA QUALIFIERS FOR INORGANIC ANALYSES
[Revised 08/28/92]

For Use on the Analytical Data Reporting Forms	
B	***For CLP Analyses Only*** -- Reported value is less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).
C	***For Routine, Non-CLP Analyses Only*** -- 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	***For CLP Analyses Only*** -- 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	***For CLP Reporting Only*** -- Constituent was analyzed for but not detected (sample quantitation must be corrected for dilution and percent moisture).
W	***For AAS Only*** -- 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	
a[1]	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.
b[1]	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 ORGANIC ANALYSES

[Revised 02/09/1996]

For Use On The Analytical Data Reporting Forms	
A	***For CLP analyses Only*** -- The TIC is a suspected aldol-condensation product.
B	Any constituent that was also detected in the associated blank whose concentration was greater than the practical or reporting detection limit (PQL or RDL).
C	Constituent confirmed by GC/MS analysis. *[pesticide/PCB analyses only]*
D	Constituent detected in the diluted sample. It also indicates that an accurate quantitation is not possible due to surrogates being diluted out of the samples during the course of the analysis.
E	Constituent concentration exceeded the calibration range.
G	The quantitation is not gasoline or diesel but believed to be some other combination of hydrocarbons.
H	Sample analysis performed outside of method- or client-specified maximum holding time requirement.
J	*Estimated value* -- (1) constituent detected at a level less than the RDL or PQL and greater than or equal to the MDL; (2) estimated concentration for TICs ***(For CLP Reporting Only)***.
N	***For CLP Reporting Only*** -- Tentatively identified constituents (TICs) identified based on mass spectral library search.
NQ	Analyte detected, but Not Quantified; see result from subsequent analysis
P	***For CLP Reporting Only*** -- The percent difference between the concentrations detected on both GC columns was greater than 25 percent *[pesticide/PCB analyses only]*.
U	***For CLP Reporting Only*** -- Constituent was analyzed for but not detected (sample quantitation must be corrected for dilution and percent moisture).
X, Y, or Z	Analyst-defined qualifier.
N/A (% Moisture)	N/A in the % moisture cell indicates that data are reported on an "*as received*" basis. A value in the % moisture cell indicates that data are reported based on a "*dry weight*" basis.
For Use On The QC Data Reporting Forms	
*****	QC data (i.e., percent recovery data for matrix spike, matrix spike duplicate, laboratory control standard, or surrogates; and RPD for matrix spike duplicate or unspiked duplicate) exceeded acceptance limits.
a[1]	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.
b[1]	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 04/05/96]

For Use on the Analytical Data Reporting Forms	
B	Any constituent that was detected in the associated method blank at a concentration was greater than the reporting detection limit (RDL).
C	The minimum detectable activity exceeded the RDL due to the residue weight limitations forcing a volume reduction.
D	Constituent detected in the diluted sample.
E	Constituent concentration exceeded the calibration or attenuation curve range.
F	***For Alpha Spectrometry Only***-- Full width half max exceeded the 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.
a[1]	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.
b[1]	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.

SAMPLE LOGIN AND CHAIN OF CUSTODY

9713534.1802

Revised

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
— Oct 04 1996, 07:02 am

Login Number: L8049
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L8049-1	B0JDW7	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: L8060-1					
Water 1 S NONE		Hold: 06-OCT-96			
L8049-2	B0J1P0	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 156-018					
Water 1 S SCREENING		Hold: 25-MAR-97			
L8049-3	B0J1P1	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 156-018					
Water 1 S SCREENING		Hold: 25-MAR-97			
L8049-4	B0JDW7	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: L8060-2					
Water 1 S NONE		Hold: 06-OCT-96			
L8049-5	B0JDW7	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: L8060-3					
L8049-6	B0JDW7	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: L8060-4					
L8049-7	B0JDW7	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: L8060-5					
L8049-8	B0JDW7	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: L8060-6					
L8049-9	B0JDW9	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: L8060-7					
Water 1 S NONE		Hold: 06-OCT-96			
L8049-10	B0JDW9	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: L8060-8					

login revised because of 2 SAFs logged together. 10-4-96 MW

013

0928596

9713534.1803

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Oct 04 1996, 07:02 am

Login Number: L8049
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L8049-11	B0JDW9	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: L8060-9					
L8049-12	B0JDW9	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: L8060-10					
L8049-13	B0JDW9	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: L8060-11					
L8049-14	B0J1P1	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 156CART-5					
Water 1 S TRITIUM(H3) LAL-0066 Hold:25-MAR-97					
L8049-15	B0J1P1	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 121					
Water 1 S 300.0 CHLORIDE Hold:24-OCT-96					
Water 1 S 300.0 NITRATE Hold:28-SEP-96					
Water 1 S 300.0 NITRITE Hold:28-SEP-96					
Water 1 S 300.0 PHOSPHATE Hold:28-SEP-96					
Water 1 S 300.0 SULFATE Hold:24-OCT-96					
Water 1 S 340.2 FLUORIDE Hold:24-OCT-96					
L8049-16	B0J1P0	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 121					
Water 1 S 300.0 CHLORIDE Hold:24-OCT-96					
Water 1 S 300.0 NITRATE Hold:28-SEP-96					
Water 1 S 300.0 NITRITE Hold:28-SEP-96					
Water 1 S 300.0 PHOSPHATE Hold:28-SEP-96					
Water 1 S 300.0 SULFATE Hold:24-OCT-96					
Water 1 S 340.2 FLUORIDE Hold:24-OCT-96					
L8049-17	B0J1P0	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: RFG02-28B					
Filt H2O 15 S 6010 ICP METALS Hold:25-MAR-97					
Filt H2O 15 S 7000 FURNACE METALS Hold:25-MAR-97					
Filt H2O 15 S 7470 MERCURY Hold:24-OCT-96					

0928596

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Oct 04 1996, 07:02 am

Login Number: L8049
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L8049-18	B0J1P1	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: RFG02-28B					
Filt H2O 15 S 6010	ICP METALS	Hold:25-MAR-97			
Filt H2O 15 S 7000	FURNACE METALS	Hold:25-MAR-97			
Filt H2O 15 S 7470	MERCURY	Hold:24-OCT-96			
L8049-19	B0JDW7	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3 "ICP+Tn,Pb"					
Location: L8060-12					
Water 1 S NONE		Hold:06-OCT-96			
L8049-20	B0JDW8	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3 "ICP+Tn,Pb"					
Location: L8060-13					
Water 1 S NONE		Hold:06-OCT-96			
L8049-21	B0J1P0	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 156CART-5					
Water 1 S GROSS BETA LAL-0060		Hold:25-MAR-97			
L8049-22	B0J1P1	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 156CART-5					
Water 1 S GROSS BETA LAL-0060		Hold:25-MAR-97			
L8049-23	B0J1P1	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 156CART-5					
Water 1 S GAMMA SPEC LAL-0063		Hold:25-MAR-97			
L8049-24	B0J1P1	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 156CART-5					
L8049-25	B0J1P1	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 156CART-5					
L8049-26	B0J1P1	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 156CART-5					

9713534.1805

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
— Oct 04 1996, 07:02 am

Login Number: L8049
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L8049-27	B0J1P1	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 156CART-5					
Water 1 S SR-90 LAL-0196		Hold:25-MAR-97			
L8049-28	B0J1P1	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 156CART-5					
L8049-29	B0J1P1	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 156CART-5					
L8049-30	B0J1P1	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 156CART-5					
L8049-31	B0J1P0	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 156CART-5					
Water 1 S SR-90 LAL-0196		Hold:25-MAR-97			
L8049-32	B0J1P0	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 156CART-5					
L8049-33	B0J1P0	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 156CART-5					
L8049-34	B0J1P0	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 156CART-5					
L8049-35	B0J1P0	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 157					
Water 1 S 413.1 OIL AND GREASE		Hold:24-OCT-96			
L8049-36	B0J1P0	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 157					

C928596

9713534.1806

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
— Oct 04 1996, 07:02 am

Login Number: L8049
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L8049-37	B0J1P0	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 157					
L8049-38	B0J1P0	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 157					
L8049-39	B0J1P0	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 157					
Water 1 S 418.1 TPH		Hold: 24-OCT-96			
L8049-40	B0J1P0	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 157					
L8049-41	B0J1P0	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 157					
L8049-42	B0J1P0	26-SEP-96	28-SEP-96		12-NOV-96
TEMP 2,3					
Location: 157					
L8049-43	REPORT TYPE	28-SEP-96	28-SEP-96		12-NOV-96
Location:					
Water 1 S EDD - DISK DEL.					
Water 1 S GC2					
Water 1 S GCMS2					
Water 1 S INORG TYPE 4A RPT					
Water 1 S RAD RPT TYPE 2					
Water 1 S WOLF					

017

Signature: Mary Kawey

Date: 10-4-96

C92854

L8049

Bechtel Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B96-181-39	Page 1 of 1

Collector A. Rice	**Company Contact** J. V. Borghese	**Telephone No.** (509) 373-4790	**Project Coordinator** Koerner, CC	**Data Turnaround** 45 Days
Project Designation 100-NR-2 Groundwater Sampling -- Round 10	**Sampling Location** 100 N		**SAF No.** B96-181	
Ice Chest No. EA-210	**Field Logbook No.** EFL-1288		**Method of Shipment** Federal Express	
Shipped To Lockheed	**Offsite Property No.** W96-0-0314-10		**Bill of Lading/Air Bill No.** 277 1632 866	

POSSIBLE SAMPLE HAZARDS/REMARKS
NA

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

SAMPLE ANALYSIS												
			Preservation	None	None	Cool 4C	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2			
			Type of Container	P	G	P	P	P	P	P			
			No. of Container(s)	1	1	1	1	1	4	4			
			Volume	20ml	500ml	500ml	500ml	1000ml	1000ml	1000ml			
				Activity Scan	Tritium - H3	See item (1) in Special Instructions.	ICP Metals - 6010A (TAL)	Gross Beta	Gamma Spectroscopy(Water)	Strontium-89,90			
Sample No.	Matrix *	Sample Date	Sample Time										
B0J1P1	Water	9-26-96	1330	X	X	X	X	X	X	X			

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

Relinquished By	Date/Time	Received By	Date/Time
A.G. Rice CERS	1630 9/26/96	K. Trapp / K. Trapp	1630 9/26/96
K. Trapp / K. Trapp	1050 9/27/96		

SPECIAL INSTRUCTIONS
** Sample analysis for nitrate, nitrite, and phosphate by EPA 300.0 is being requested for Information Only. The ERC Contractor acknowledges the 48-hour holding time will not be met. The sample for ICP Metals is filtered.

(1) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}

Matrix *

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

LABORATORY SECTION	Received By Pauline Dean	Title Sample Custodian	Date/Time 9-27-96 / 1730
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

9713534.1807

Bechtel Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B96-181-38	Page 1 of 1

Collector A. Rizza	**Company Contact** J. V. Borghese	**Telephone No.** (509) 373-4790	**Project Coordinator** Koerner, CC	**Data Turnaround** 45 Days
Project Designation 100-NR-2 Groundwater Sampling -- Round 10	**Sampling Location** 100 N		**SAF No.** B96-181	
Ice Chest No. ER-26	**Field Logbook No.** EFL-1238		**Method of Shipment** Federal Express	
Shipped To Lockheed	**Offsite Property No.** W96-0-0314-10		**Bill of Lading/Air Bill No.** 277 1632 857	

POSSIBLE SAMPLE HAZARDS/REMARKS
NA

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

Preservation	None	Cool 4C	HNO3 to pH <2	HNO3 to pH <2	H2SO4 to pH <2 Cool 4C	HCl to pH <2 Cool 4C	HNO3 to pH <2			
Type of Container	P	P	P	P	G	G	P			
No. of Container(s)	1	1	1	1	4	4	4		1	
Volume	20ml	500ml	500ml	1000ml	1000ml	1000ml	1000ml			
SAMPLE ANALYSIS	Activity Scan	See item (1) in Special Instructions.	ICP Metals - 6010A (TAL)	Gross Beta	Oil & Grease - 413.1	TPH (Total) - 418.1	Strontium-89,90			

Sample No.	Matrix *	Sample Date	Sample Time										
B0J1P0	Water	9-26-96	1002	X	X	X	X	X	X	X			

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

Relinquished By	Date/Time	Received By	Date/Time
A. Rizza (EFL)	9/26/96 1630	K. Jones / K. Tiegs	9/26/96 1630
K. Jones / K. Tiegs	9/27/96 1050		

SPECIAL INSTRUCTIONS
** Sample analysis for nitrate, nitrite, and phosphate by EPA 300.0 is being requested for Information Only. The ERC Contractor acknowledges the 48-hour holding time will not be met. The sample for ICP Metals is filtered.

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate)

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

LABORATORY SECTION	Received By	Title	Date/Time
	Paulette Davis	Sample Coordinator	9-28-96 / 9:40
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

9713534.1808

9713534

9713534.1809

028288

Environmental Restoration Contractor **ERC Team**

Interoffice Memorandum

Job No. 22192
Written Response Required: NO
CCN: N/A
OU: N/A
TSD: N/A
ERA: N/A
Subject Codes: 3530

TO:	W. S. Thompson	N1-28	DATE:	February 29, 1996
	G. C. Henckel	H4-80		
COPIES:	K. A. Smith	X0-23	FROM:	S. K. De Mers
	T. L. Lafreniere	X0-23		Radiological Controls
	D. E. Gergely	X0-23		T7-05/373-1913

SUBJECT: **Total Activities for Off-Site Shipments of Groundwater Samples to NRC Licensed Laboratories**

There is no need to perform total activities prior to offsite shipment to NRC licensed labs of samples taken from ground water wells located on the Hanford Site.

All wells reviewed to date for radiological content have shown no well with a total activity in excess of 2,000,000 pCi/l (2,000 pCi/gm), the Department Of Transportation limit for radioactive material. The highest activity in any known well is 1.56×10^6 pCi/l H^3.

While this does not constitute any release from radiological controls for worker protection, it does allow samples to be shipped based on historical laboratory data and save the expense of doing radiochemical analysis.

A copy of the most recent analytical data should be provided to the NRC licensed laboratory with the samples being shipped or if no data is available for new wells, the most recent data from adjacent wells.

020

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9713534.1810

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

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method
B0J1P0	L8049-2		Water	SCREENING
	L8049-16		Water	300.0 CHLORIDE
	L8049-16		Water	300.0 NITRATE
	L8049-16		Water	300.0 NITRITE
	L8049-16		Water	300.0 PHOSPHATE
	L8049-16		Water	300.0 SULFATE
	L8049-16		Water	340.2 FLUORIDE
	L8049-17		Filt H2O	6010 ICP METALS
	L8049-17		Filt H2O	7000 FURNACE MET
	L8049-17		Filt H2O	7470 MERCURY
	L8049-21		Water	GROSS BETA LAL-(
	L8049-31		Water	SR-90 LAL-0196
	L8049-35		Water	413.1 OIL AND GI
	L8049-39		Water	418.1 TPH
B0J1P1	L8049-3		Water	SCREENING
	L8049-14		Water	TRITIUM(H3) LAL-
	L8049-15		Water	300.0 CHLORIDE
	L8049-15		Water	300.0 NITRATE
	L8049-15		Water	300.0 NITRITE
	L8049-15		Water	300.0 PHOSPHATE
	L8049-15		Water	300.0 SULFATE
	L8049-15		Water	340.2 FLUORIDE
	L8049-18		Filt H2O	6010 ICP METALS
	L8049-18		Filt H2O	7000 FURNACE MET
	L8049-18		Filt H2O	7470 MERCURY
	L8049-22		Water	GROSS BETA LAL-(
	L8049-23		Water	GAMMA SPEC LAL-(
	L8049-27		Water	SR-90 LAL-0196
B0JDW7	L8049-1		Water	NONE
	L8049-4		Water	NONE
	L8049-19		Water	NONE
B0JDW8	L8049-20		Water	NONE
B0JDW9	L8049-9		Water	NONE
REPORT TYPE	L8049-43		Water	EDD - DISK DEL.
	L8049-43		Water	GC2
	L8049-43		Water	GCMS2
	L8049-43		Water	INORG TYPE 4A RI
	L8049-43		Water	RAD RPT TYPE 2
	L8049-43		Water	WOLF

091859

9713534.1811

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

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method
B0J1P0	L8049-2		Water	SCREENING
	L8049-16		Water	300.0 CHLORIDE
	L8049-16		Water	300.0 NITRATE
	L8049-16		Water	300.0 NITRITE
	L8049-16		Water	300.0 PHOSPHATE
	L8049-16		Water	300.0 SULFATE
	L8049-16		Water	340.2 FLUORIDE
	L8049-17		Filt H2O	6010 ICP METALS
	L8049-17		Filt H2O	7000 FURNACE ME
	L8049-17		Filt H2O	7470 MERCURY
	L8049-21		Water	GROSS BETA LAL-
	L8049-31		Water	SR-90 LAL-0196
	L8049-35		Water	413.2 OIL AND G
	L8049-39		Water	418.1 TPH
B0J1P1	L8049-3		Water	SCREENING
	L8049-14		Water	TRITIUM(H3) LAL
	L8049-15		Water	300.0 CHLORIDE
	L8049-15		Water	300.0 NITRATE
	L8049-15		Water	300.0 NITRITE
	L8049-15		Water	300.0 PHOSPHATE
	L8049-15		Water	300.0 SULFATE
	L8049-15		Water	340.2 FLUORIDE
	L8049-18		Filt H2O	6010 ICP METALS
	L8049-18		Filt H2O	7000 FURNACE ME
	L8049-18		Filt H2O	7470 MERCURY
	L8049-22		Water	GROSS BETA LAL-
	L8049-23		Water	GAMMA SPEC LAL-
	L8049-27		Water	SR-90 LAL-0196
B0JDW7	L8049-1		Water	SCREENING
	L8049-4		Water	8240 VOLATILES
	L8049-19		Water	6010 ICP METALS
	L8049-19		Water	7000 FURNACE ME
	L8049-19		Water	7470 MERCURY
B0JDW8	L8049-20		Water	6010 ICP METALS
	L8049-20		Water	7000 FURNACE ME
	L8049-20		Water	7470 MERCURY
B0JDW9	L8049-9		Water	8240 VOLATILES
REPORT TYPE	L8049-43		Water	EDD - DISK DEL.
	L8049-43		Water	GC2
	L8049-43		Water	GCMS2
	L8049-43		Water	INORG TYPE 4A R
	L8049-43		Water	RAD RPT TYPE 2
	L8049-43		Water	WOLF

97859

NON-METALS

WATER

9713534.1813

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: B0J1P1	Date Collected: 26-SEP-96
Matrix: Water	Date Received: 28-SEP-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch|ID	LAS Sample|ID
Chloride	mg/L	300.0	2.3	0.020		03-OCT-96	42004	L8049-15
Nitrate-N	mg/L	300.0	2.2	0.020	H	03-OCT-96	41995	L8049-15
Nitrite-N	mg/L	300.0	< 0.002	0.010	HU	03-OCT-96	42005	L8049-15
Ortho Phosphate	mg/L	300.0	0.023	0.10	HB	10-OCT-96	42006	L8049-15
Sulfate	mg/L	300.0	45.	0.10		03-OCT-96	42007	L8049-15
Fluoride	mg/L	340.2	0.38	0.050		21-OCT-96	42008	L8049-15

9713534.1814

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: B0J1P0	Date Collected: 26-SEP-96
Matrix: Water	Date Received: 28-SEP-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch|ID	LAS Sample|ID
Chloride	mg/L	300.0	22.	0.020		03-OCT-96	42004	L8049-16
Nitrate-N	mg/L	300.0	5.6	0.020	H	03-OCT-96	41995	L8049-16
Nitrite-N	mg/L	300.0	< 0.002	0.010	HU	03-OCT-96	42005	L8049-16
Ortho Phosphate	mg/L	300.0	0.070	0.10	HB	10-OCT-96	42006	L8049-16
Sulfate	mg/L	300.0	240	0.10		03-OCT-96	42007	L8049-16
Fluoride	mg/L	340.2	0.091	0.050		21-OCT-96	42008	L8049-16

LOCKHEED ANALYTICAL LABORATORY
QUALITY CONTROL DATA SUMMARY
DUPLICATE SAMPLE ANALYSES

LAL BATCH: 928-BH

DUPLICATE SAMPLES

LAS ID	ANALYTE	SAMPLE RESULT	DUPLICATE SAMPLE	RPD (%)	FLAG
L8049-15	CHLORIDE	2.32 mg/L	2.28 mg/L	2 %	
L8049-15	NITRITE-N	<0.002 ~~0.00~~ mg/L U	<0.002 ~~0.00~~ mg/L U		b CM 10-18-96
L8049-15	NITRATE-N	2.16 mg/L	2.16 mg/L	0 %	
L8049-15	SULFATE	44.53 mg/L	44.44 mg/L	0 %	

LOCKHEED ANALYTICAL LABORATORY
QUALITY CONTROL DATA SUMMARY
DUPLICATE SAMPLE ANALYSES

LAL BATCH: 928-BH

DUPLICATE SAMPLES

LAS ID	ANALYTE	SAMPLE RESULT	DUPLICATE SAMPLE	RPD (%)	FLAG
L8049-15	ORTHO-PHOSPHAT	0.0230 mg/L (B)	~~0.0172 mg/L (B)~~ < 0.0200 mg/L	~~xx~~ 10/21/96	b

METALS

FILTERED WATER

9713534.1818

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: B0J1P0	Date Collected: 26-SEP-96
Matrix: Filt H2O	Date Received: 28-SEP-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
ALUMINUM, DISSOLVED	mg/l	6010	< 0.048	0.048	0.20	U	1	23-OCT-96	42437	L8049-17
BARIUM, DISSOLVED	mg/l	6010	0.070	0.0080	0.20	B	1	23-OCT-96	42437	L8049-17
BERYLLIUM, DISSOLVED	mg/l	6010	< 0.0010	0.0010	0.0050	U	1	23-OCT-96	42437	L8049-17
CADMIUM, DISSOLVED	mg/l	6010	< 0.0030	0.0030	0.0050	U	1	23-OCT-96	42437	L8049-17
CALCIUM, DISSOLVED	mg/l	6010	140	0.010	5.0		1	23-OCT-96	42437	L8049-17
CHROMIUM, DISSOLVED	mg/l	6010	< 0.0060	0.0060	0.010	U	1	23-OCT-96	42437	L8049-17
COBALT, DISSOLVED	mg/l	6010	0.0097	0.0040	0.050	B	1	23-OCT-96	42437	L8049-17
COPPER, DISSOLVED	mg/l	6010	< 0.0060	0.0060	0.025	U	1	23-OCT-96	42437	L8049-17
IRON, DISSOLVED	mg/l	6010	0.0070	0.0060	0.10	B	1	23-OCT-96	42437	L8049-17
MAGNESIUM, DISSOLVED	mg/l	6010	23.	0.062	5.0		1	23-OCT-96	42437	L8049-17
MANGANESE, DISSOLVED	mg/l	6010	0.0020	0.0010	0.015	B	1	23-OCT-96	42437	L8049-17
NICKEL, DISSOLVED	mg/l	6010	< 0.012	0.012	0.040	U	1	23-OCT-96	42437	L8049-17
POTASSIUM, DISSOLVED	mg/l	6010	5.9	1.4	5.0		1	23-OCT-96	42437	L8049-17
SILVER, DISSOLVED	mg/l	6010	< 0.0060	0.0060	0.010	U	1	23-OCT-96	42437	L8049-17
SODIUM, DISSOLVED	mg/l	6010	50.	0.32	5.0		1	23-OCT-96	42437	L8049-17
VANADIUM, DISSOLVED	mg/l	6010	< 0.0060	0.0060	0.050	U	1	23-OCT-96	42437	L8049-17
ZINC, DISSOLVED	mg/l	6010	< 0.0030	0.0030	0.020	U	1	23-OCT-96	42437	L8049-17
ANTIMONY, DISSOLVED	mg/l	7041	< 0.0090	0.0090	0.060	U	1	05-NOV-96	42438	L8049-17
ARSENIC, DISSOLVED	mg/l	7060	< 0.0030	0.0030	0.010	U	1	28-OCT-96	42438	L8049-17
LEAD, DISSOLVED	mg/l	7421	< 0.0020	0.0020	0.0030	U	1	28-OCT-96	42438	L8049-17
SELENIUM, DISSOLVED	mg/l	7740	< 0.0030	0.0030	0.0050	NUW	1	28-OCT-96	42438	L8049-17
THALLIUM, DISSOLVED	mg/l	7840	< 0.0030	0.0030	0.010	UW	1	28-OCT-96	42438	L8049-17
MERCURY, DISSOLVED	mg/l	7470	< 0.00020	0.00020	0.00020	U	1	22-OCT-96	42439	L8049-17

9713534.1819

LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: B0J1P1	Date Collected: 26-SEP-96
Matrix: Filt H2O	Date Received: 28-SEP-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
ALUMINUM, DISSOLVED	mg/l	6010	< 0.048	0.048	0.20	U	1	23-OCT-96	42437	L8049-18
BARIUM, DISSOLVED	mg/l	6010	0.023	0.0080	0.20	B	1	23-OCT-96	42437	L8049-18
BERYLLIUM, DISSOLVED	mg/l	6010	< 0.0010	0.0010	0.0050	U	1	23-OCT-96	42437	L8049-18
CADMIUM, DISSOLVED	mg/l	6010	< 0.0030	0.0030	0.0050	U	1	23-OCT-96	42437	L8049-18
CALCIUM, DISSOLVED	mg/l	6010	30.	0.010	5.0		1	23-OCT-96	42437	L8049-18
CHROMIUM, DISSOLVED	mg/l	6010	0.19	0.0060	0.010		1	23-OCT-96	42437	L8049-18
COBALT, DISSOLVED	mg/l	6010	0.0041	0.0040	0.050	B	1	23-OCT-96	42437	L8049-18
COPPER, DISSOLVED	mg/l	6010	< 0.0060	0.0060	0.025	U	1	23-OCT-96	42437	L8049-18
IRON, DISSOLVED	mg/l	6010	< 0.0060	0.0060	0.10	U	1	23-OCT-96	42437	L8049-18
MAGNESIUM, DISSOLVED	mg/l	6010	15.	0.062	5.0		1	23-OCT-96	42437	L8049-18
MANGANESE, DISSOLVED	mg/l	6010	0.0032	0.0010	0.015	B	1	23-OCT-96	42437	L8049-18
NICKEL, DISSOLVED	mg/l	6010	< 0.012	0.012	0.040	U	1	23-OCT-96	42437	L8049-18
POTASSIUM, DISSOLVED	mg/l	6010	4.6	1.4	5.0	B	1	23-OCT-96	42437	L8049-18
SILVER, DISSOLVED	mg/l	6010	< 0.0060	0.0060	0.010	U	1	23-OCT-96	42437	L8049-18
SODIUM, DISSOLVED	mg/l	6010	23.	0.32	5.0		1	23-OCT-96	42437	L8049-18
VANADIUM, DISSOLVED	mg/l	6010	0.017	0.0060	0.050	B	1	23-OCT-96	42437	L8049-18
ZINC, DISSOLVED	mg/l	6010	< 0.0030	0.0030	0.020	U	1	23-OCT-96	42437	L8049-18
ANTIMONY, DISSOLVED	mg/l	7041	< 0.0090	0.0090	0.060	UW	1	05-NOV-96	42438	L8049-18
ARSENIC, DISSOLVED	mg/l	7060	0.0064	0.0030	0.010	B	1	28-OCT-96	42438	L8049-18
LEAD, DISSOLVED	mg/l	7421	< 0.0020	0.0020	0.0030	U	1	28-OCT-96	42438	L8049-18
SELENIUM, DISSOLVED	mg/l	7740	< 0.0030	0.0030	0.0050	NUW	1	28-OCT-96	42438	L8049-18
THALLIUM, DISSOLVED	mg/l	7840	< 0.0030	0.0030	0.010	U	1	28-OCT-96	42438	L8049-18
MERCURY, DISSOLVED	mg/l	7470	< 0.00020	0.00020	0.00020	U	1	22-OCT-96	42439	L8049-18

9713534.1820

LOCKHEED ANALYTICAL SERVICES

METALS RESULTS

QC Data Summary For Duplicate Sample Analysis

Client Sample ID B0J1P0 (DUP)

Constituent	Units	LAS Batch ID	LAS Sample ID	Date Analyzed	Sample Result	Duplicate Result	Relative Percent Difference	Control Limit	Data Qualifier
ALUMINUM, DISSOLVED	mg/l	42437	L8049-17	23-OCT-96	< 0.048	< 0.048	b		
BARIUM, DISSOLVED	mg/l	42437	L8049-17	23-OCT-96	0.07024	0.07439		0.20	
BERYLLIUM, DISSOLVED	mg/l	42437	L8049-17	23-OCT-96	< 0.0010	< 0.0010	b		
CADMIUM, DISSOLVED	mg/l	42437	L8049-17	23-OCT-96	< 0.0030	< 0.0030	b		
CALCIUM, DISSOLVED	mg/l	42437	L8049-17	23-OCT-96	137.4	144.6	5		
CHROMIUM, DISSOLVED	mg/l	42437	L8049-17	23-OCT-96	< 0.0060	0.006280	b		
COBALT, DISSOLVED	mg/l	42437	L8049-17	23-OCT-96	0.009730	0.007600		0.050	
COPPER, DISSOLVED	mg/l	42437	L8049-17	23-OCT-96	< 0.0060	< 0.0060	b		
IRON, DISSOLVED	mg/l	42437	L8049-17	23-OCT-96	0.006980	0.009290		0.10	
MAGNESIUM, DISSOLVED	mg/l	42437	L8049-17	23-OCT-96	22.82	24.13		5.0	
MANGANESE, DISSOLVED	mg/l	42437	L8049-17	23-OCT-96	0.002030	< 0.0010	b		
NICKEL, DISSOLVED	mg/l	42437	L8049-17	23-OCT-96	< 0.012	< 0.012	b		
POTASSIUM, DISSOLVED	mg/l	42437	L8049-17	23-OCT-96	5.909	5.954		5.0	
SILVER, DISSOLVED	mg/l	42437	L8049-17	23-OCT-96	< 0.0060	< 0.0060	b		
SODIUM, DISSOLVED	mg/l	42437	L8049-17	23-OCT-96	49.79	52.18	5		
VANADIUM, DISSOLVED	mg/l	42437	L8049-17	23-OCT-96	< 0.0060	< 0.0060	b		
ZINC, DISSOLVED	mg/l	42437	L8049-17	23-OCT-96	< 0.0030	< 0.0030	b		
ANTIMONY, DISSOLVED	mg/l	42438	L8049-17	05-NOV-96	< 0.0090	< 0.0090	b		
ARSENIC, DISSOLVED	mg/l	42438	L8049-17	28-OCT-96	< 0.0030	< 0.0030	b		
LEAD, DISSOLVED	mg/l	42438	L8049-17	28-OCT-96	< 0.0020	< 0.0020	b		
SELENIUM, DISSOLVED	mg/l	42438	L8049-17	28-OCT-96	< 0.0030	< 0.0030	b		
THALLIUM, DISSOLVED	mg/l	42438	L8049-17	28-OCT-96	< 0.0030	< 0.0030	b		
MERCURY, DISSOLVED	mg/l	42439	L8049-17	22-OCT-96	< 0.00020	0.0002026	b		

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LOCKHEED ANALYTICAL SERVICES

TOTAL PETROLEUM HYDROCARBONS BY FTIR
418.1 TPH

Client Sample ID:	B0J1P0	LAL Sample ID:	L8049-39
Date Collected:	26-SEP-96	Date Received:	28-SEP-96
Date Analyzed:	15-OCT-96	Analytical Batch ID:	101596PM-418.1
Date Extracted:	15-OCT-96	Analytical Dilution:	1
Matrix:	Water	Preparation Dilution:	1.0
		QC Group:	418.1 TPH_42573

CONSTITUENT	CAS NO.	RESULT mg/L	MDL mg/L	PQL/RDL mg/L	DATA QUALIFIER(S
TRPH		<1.0	0.20	1.0	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
TOTAL PETROLEUM HYDROCARBONS BY FTIR

Client Sample ID:	BOJ1P0	LAL Sample ID:	42573MS
Date Collected:	26-SEP-96	Date Received:	28-SEP-96
Date Analyzed:	15-OCT-96	Analytical Batch ID:	101596PM-418.1
Date Extracted:	15-OCT-96	Analytical Dilution:	1
		Preparation Dilution:	1.0
		QC Group:	418.1 TPH_42573

CONSTITUENT	CAS NO.	RESULT mg/L	MDL mg/L	PQL/RDL mg/L	DATA QUALIFIER(S
TRPH		2.3	0.20	1.0	

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LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
TOTAL PETROLEUM HYDROCARBONS BY FTIR

Client Sample ID:	BOJ1P0	LAL Sample ID:	42573MSD
Date Collected:	26-SEP-96	Date Received:	28-SEP-96
Date Analyzed:	15-OCT-96	Analytical Batch ID:	101596PM-418.1
Date Extracted:	15-OCT-96	Analytical Dilution:	1
		Preparation Dilution:	1.0
		QC Group:	418.1 TPH_42573

CONSTITUENT	CAS NO.	RESULT mg/L	MDL mg/L	PQL/RDL mg/L	DATA QUALIFIER(S
TRPH		2.3	0.20	1.0	

LOCKHEED ANALYTICAL SERVICES

OIL AND GREASE - GRAVIMETRIC METHOD
413.1 OIL AND GREASE

Client Sample ID:	B0J1P0	LAL Sample ID:	L8049-35
Date Collected:	26-SEP-96	Date Received:	28-SEP-96
Date Analyzed:	08-OCT-96	Analytical Batch ID:	100896AM-413.1
Date Extracted:	08-OCT-96	Analytical Dilution:	1
Matrix:	Water	Preparation Dilution:	1.0
		QC Group:	413.1 OIL AND GREASE_42319

CONSTITUENT	CAS NO.	RESULT	MDL	PQL/RDL	DATA QUALIFIER(S)
Oil and Grease	10-30-0	<5.0	2.0	5.0	

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RADIOCHEMISTRY

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LOCKHEED ANALYTICAL SERVICES

RADIOCHEMISTRY DATA REPORT
Account Name: Bechtel Hanford, Inc. * Richland, WA
Project Name: BECHTEL-HANFORD
Project Desc: Bechtel Hanford Project

Client Sample ID: B0J1P1
Date Collected: 26-SEP-96
Matrix: Water

Login Number: L8049
Date Received: 28-SEP-96

Constituent	Method	Batch	Activity	Error	MDA	Qualifier	Units	Analyzed	Lab ID
H-3	LAL-0066	42432	42600	2500	230		pCi/L	08-NOV-96	L8049-14

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LOCKHEED ANALYTICAL SERVICES

RADIOCHEMISTRY DATA REPORT
Account Name: Bechtel Hanford, Inc. * Richland, WA
Project Name: BECHTEL-HANFORD
Project Desc: Bechtel Hanford Project

Client Sample ID: B0J1P0
Date Collected: 26-SEP-96
Matrix: Water

Login Number: L8049
Date Received: 28-SEP-96

Constituent	Method	Batch	Activity	Error	MDA	Qualifier	Units	Analyzed	Lab ID
Gross Beta	LAL-0060	42721	834.	45.	4.9	C	pCi/L	22-OCT-96	L8049-21

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LOCKHEED ANALYTICAL SERVICES

RADIOCHEMISTRY DATA REPORT
Account Name: Bechtel Hanford, Inc. * Richland, WA
Project Name: BECHTEL-HANFORD
Project Desc: Bechtel Hanford Project

Client Sample ID: B0J1P1
Date Collected: 26-SEP-96
Matrix: Water

Login Number: L8049
Date Received: 28-SEP-96

Constituent	Method	Batch	Activity	Error	MDA	Qualifier	Units	Analyzed	Lab ID
Gross Beta	LAL-0060	42721	6.0	1.7	2.3		pCi/L	22-OCT-96	L8049-22

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LOCKHEED ANALYTICAL SERVICES

RADIOCHEMISTRY DATA REPORT
Account Name: Bechtel Hanford, Inc. * Richland, WA
Project Name: BECHTEL-HANFORD
Project Desc: Bechtel Hanford Project

Client Sample ID: B0J1P1
Date Collected: 26-SEP-96
Matrix: Water

Login Number: L8049
Date Received: 28-SEP-96

Constituent	Method	Batch	Activity	Error	MDA	Qualifier	Units	Analyzed	Lab ID
Ac-228(Ra-228)	LAL-0063	42723	-16.	17.	44.		pCi/L	24-OCT-96	L8049-23
Co-58	LAL-0063	42723	-3.5	6.1	11.		pCi/L	24-OCT-96	L8049-23
Co-60	LAL-0063	42723	-1.6	1.5	7.4		pCi/L	24-OCT-96	L8049-23
Cs-137	LAL-0063	42723	0.3	7.3	9.3		pCi/L	24-OCT-96	L8049-23
Eu-152	LAL-0063	42723	-10.1	7.9	45.		pCi/L	24-OCT-96	L8049-23
Eu-154	LAL-0063	42723	-23.	10.	50.		pCi/L	24-OCT-96	L8049-23
Eu-155	LAL-0063	42723	-3.9	5.8	18.		pCi/L	24-OCT-96	L8049-23
Fe-59	LAL-0063	42723	-5.6	6.1	26.		pCi/L	24-OCT-96	L8049-23
Pb-212	LAL-0063	42723	-8.	11.	16.		pCi/L	24-OCT-96	L8049-23
Pb-214(Ra-226)	LAL-0063	42723	-6.	13.	21.		pCi/L	24-OCT-96	L8049-23
Ra-226(GAMMA)	LAL-0063	42723	0.00	130	170		pCi/L	24-OCT-96	L8049-23
Ru-106	LAL-0063	42723	7.	62.	81.		pCi/L	24-OCT-96	L8049-23
U-235(GAMMA)	LAL-0063	42723	2.	31.	45.		pCi/L	24-OCT-96	L8049-23

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LOCKHEED ANALYTICAL SERVICES

RADIOCHEMISTRY DATA REPORT

Account Name: Bechtel Hanford, Inc. * Richland, WA
Project Name: BECHTEL-HANFORD
Project Desc: Bechtel Hanford Project

Client Sample ID: B0J1P1
Date Collected: 26-SEP-96
Matrix: Water

Login Number: L8049
Date Received: 28-SEP-96

Constituent	Method	Batch	Activity	Error	MDA	Qualifier	Units	Analyzed	Lab ID
Sr-89,90	LAL-0196	42720	0.49	0.44	0.73		pCi/L	25-OCT-96	L8049-27

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LOCKHEED ANALYTICAL SERVICES

RADIOCHEMISTRY DATA REPORT
Account Name: Bechtel Hanford, Inc. * Richland, WA
Project Name: BECHTEL-HANFORD
Project Desc: Bechtel Hanford Project

Client Sample ID: B0J1P0
Date Collected: 26-SEP-96
Matrix: Water

Login Number: L8049
Date Received: 28-SEP-96

Constituent	Method	Batch	Activity	Error	MDA	Qualifier	Units	Analyzed	Lab ID
Sr-89,90	LAL-0196	42720	420.	21.	0.77		pCi/L	25-OCT-96	L8049-31

LOCKHEED ANALYTICAL SERVICES

DUPLICATE DATA SUMMARY

Login/SDG Number: L8049

Analyte	Batch ID	Date Analyzed	Tech ID	Prep ID	Inst ID	Client ID	LAL ID	ORIG Result	UNCTY 2 Sigma	DUP Result	UNCTY 2 Sigma	Units	RER	RPD	Data Qual	RPD Limit
Sr-89,90	42720	25-OCT-96	JS	CS	LB1-B1	B0J0K5	L7919-2	670.	34.0	683.	34.6	pCi/L	0.185	2		25
Gross Beta	42721	22-OCT-96	JW	LV	LB1-C1	B0J1P0	L8049-21	834.	45.4	890.	48.2	pCi/L	0.598	6		30
Co-60	42723	24-OCT-96	WF	LV	GAM-1	B0J1P1	L8049-23	-1.56	1.52	1.25	8.29	pCi/L	0.290	1810		20
Cs-137	42723	24-OCT-96	WF	LV	GAM-1	B0J1P1	L8049-23	0.270	7.35	1.76	7.94	pCi/L	0.100	147		20
Pb-214(Ra-226)	42723	24-OCT-96	WF	LV	GAM-1	B0J1P1	L8049-23	-5.77	13.0	-10.7	9.05	pCi/L	0.220	60		20

NOTE: Data qualified as out of limits if RPD > 20% and RER > 1.

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095

427231.XLS

Client	Bechtel_Hanford	
Client ID	BOJ1P1	
Filename	427231.CHN	
LAL parent ID	42723DUP1	
Batch	6342723	
Live Time	10800	
Detector	1	LAS Detector 1, GMX-30200-P, Ser. No. 30-TN10223A
Geometry	N	
Aliquot (gms/L)	0.5	
Count date	10/24/96 18:00	
Collection Date	9/26/96	
delta T to midpoint of count	28.8	days
Efficiency data file	N194	
Background, Library files	WBKG1292	whc

V96119

Nuclide	keV	halflife (days)	chnl	GROSS	BKG	NET	Hand Calc NET	Sample cnts/sec	1 sig % err
Ra-226	186.1	5.84E+05	372	200	90	110		0.0101852	15.5
U-235	185.7	2.57E+11	372	200	90	110		0.0101852	15.5
	143.8	2.57E+11	288	152	106	46		0.0042593	34.9
	163.3	2.57E+11	327	135	122	13		0.0012037	123.3
Pb-214(Ra-226)	351.9	5.84E+05	704	80	58	22		0.002037	53.4
	295.1	5.84E+05	591	88	92	-4		-0.000386	322.1
Fe-59	1099.2	4.51E+01	2198	13	23	-10		-0.000957	58.3
	1291.6	4.51E+01	2583	10	13	-3		-0.000262	168.7
Co-58	810.8	7.08E+01	1622	25	26	-1		-6.17E-05	1067.7
Ac-228(Ra-228)	911.2	2.10E+03	1822	39	30	9		0.0007986	96.6
	969	2.10E+03	1938	31	24	7		0.0006481	105.9
Pb-212	238.6	5.11E+12	478	143	102	41		0.0037963	38.2
	300.1	5.11E+12	600	66	74	-8		-0.000741	147.9
Co-60	1332.5	1924	2665	15	15	0		0	0.0
	1173.3	1924	2347	28	17	12		0.0010648	58.0
Cs-137	661.7	10950	1324	43	35	8		0.0007716	105.8
Eu-155	105.3	1810	211	117	119	-2		-0.000201	709.3
Eu-152	1408.1	4.64E+03	2816	8	9	-1		-0.000123	312.2
	344.3	4.64E+03	689	75	53	23		0.0020833	50.2
Eu-154	723.3	3.11E+03	1447	33	30	3		0.0002469	298.4
	1004.8	3.11E+03	2009	22	15	7		0.0006327	89.2
	1274.5	3.11E+03	2549	13	20	-7		-0.000633	83.9
Ru-106	621.8	368.2	1244	42	35	7		0.0006481	125.4
	1050.1	368.2	2100	16	15	1		7.716E-05	669.9

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098

Client	Bechtel_Hanford
Client ID	BOJ1P1
Filename	427231.CHN
LAL parent ID	42723DUP1
Batch	6342723
Live Time	10800
Detector	1
Geometry	N
Aliquot (gms/L)	0.5
Count date	10/24/96 18:00
Collection Date	9/26/96
delta T to midpoint of count	28.8
Efficiency data file	N194
Background, Library files	WBKG1292

Nuclide	keV	WBKG cnts/sec	1 sig % err	NET Sample cnts/sec	NET 1 sig % err	Efficiency	1 sigma % Eff err	Branch
Ra-226	186.1	0.011331	5.9	-0.00134	167.06	0.055308	5	0.035
U-235	185.7	0.011331	5.9	-0.00115	195.84	0.055389	5	0.575
	143.8	0.002983	20.7	0.00128	164.89	0.063815	5	0.109
	163.3	0.001717	33.0	-0.00051	399.70	0.059981	5	0.05
Pb-214(Ra-226)	351.9	0.00245	18.2	-0.00041	371.46	0.03237	5	0.358
	295.1	0.001761	27.9	-0.00215	35.04	0.037986	5	0.185
Fe-59	1099.2	3.89E-05	574.5	-0.00100	33.62	0.011918	5	0.565
	1291.6	-0.00023	75.8	-0.00026	168.65	0.010338	5	0.432
Co-58	810.8	-0.00029	92.3	-0.00006	1067.71	0.015465	5	0.9945
Ac-228(Ra-228)	911.2	0.000802	40.0	0.00000	31442.53	0.014001	5	0.266
	969	0.000533	53.0	0.00011	844.43	0.013285	5	0.1617
Pb-212	238.6	0.006225	9.2	-0.00243	83.37	0.045721	5	0.4365
	300.1	0.000567	77.7	-0.00131	50.12	0.037416	5	0.03344
Co-60	1332.5	-0.00021	100.7	0.00000	0.00	0.010051	5	0.999
	1173.3	0.00055	43.0	0.00051	165.88	0.011258	5	0.999
Cs-137	661.7	0.000261	128.0	0.00051	225.33	0.018405	5	0.8521
Eu-155	105.3	0.000592	96.0	-0.00079	107.94	0.06833	5	0.218
Eu-152	1408.1	0.000025	773.2	-0.00015	129.47	0.009557	5	0.212
	344.3	0.000269	163.6	0.00181	81.95	0.033022	5	0.27
Eu-154	723.3	0.000594	50.2	-0.00035	297.86	0.017049	5	0.197
	1004.8	-0.00044	53.9	0.00063	89.22	0.012878	5	0.176
	1274.5	4.17E-05	440.9	-0.00067	51.43	0.010462	5	0.355
Ru-106	621.8	0.000397	82.9	0.00025	455.00	0.019424	5	0.0981
	1050.1	-0.00024	98.1	0.00008	669.93	0.012399	5	0.0146

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099

Client	Bechtel_Hanford
Client ID	BOJ1P1
Filename	427231.CHN
LAL parent ID	42723DUP1
Batch	6342723
Live Time	10800
Detector	1
Geometry	N
Aliquot (gms/L)	0.5
Count date	10/24/96 18:00
Collection Date	9/26/96
delta T to midpoint of count	28.8
Efficiency data file	N194
Background, Library files	WBKG1292

Nuclide	keV	Bq	pCi/L	MDA pCi/L	Decay factor	Corrected pCi/L	error 1 sigma	Corrected MDA pCi/L
Ra-226	186.1	-0.693605	-37.45467	182.03	1.000034	-37.46	62.60	182.04
U-235	185.7	-0.035963	-1.942006	11.06	1	-1.942	3.80	11.06
	143.8	0.183431	9.905275	41.24	1	9.905	16.34	41.24
	163.3	-0.171042	-9.236243	96.42	1	-9.236	36.92	96.42
Pb-214(Ra-226)	351.9	-0.035636	-1.924356	19.61	1.000034	-1.924	7.15	19.61
	295.1	-0.305508	-16.49744	36.81	1.000034	-16.498	5.84	36.82
Fe-59	1099.2	-0.147865	-7.984729	18.84	1.557105	-12.433	4.23	29.34
	1291.6	-0.058743	-3.172123	19.78	1.557105	-4.939	8.33	30.80
Co-58	810.8	-0.004014	-0.216733	8.06	1.325996	-0.287	3.07	10.69
Ac-228(Ra-228)	911.2	-0.000932	-0.050345	42.64	1.009556	-0.051	15.98	43.05
	969	0.053448	2.886218	65.35	1.009556	2.914	24.61	65.98
Pb-212	238.6	-0.121696	-6.571598	15.83	1	-6.572	5.49	15.83
	300.1	-1.044944	-56.42698	177.16	1	-56.427	28.42	177.16
Co-60	1332.5	0	0	9.62	1.010434	0.0000	0.00	9.72
	1173.3	0.045774	2.47177	11.00	1.010434	2.4976	4.14	11.11
Cs-137	661.7	0.032551	1.757728	9.94	1.001826	1.7609	3.97	9.96
Eu-155	105.3	-0.053188	-2.872131	18.40	1.011095	-2.904	3.138	18.603
Eu-152	1408.1	-0.073274	-3.95677	42.25	1.004314	-3.97	5.15	42.43
	344.3	0.203442	10.98588	20.93	1.004314	11.03	9.06	21.02
Eu-154	723.3	-0.103472	-5.587507	46.00	1.006453	-5.62	16.75	46.30
	1004.8	0.279155	15.07435	39.01	1.006453	15.17	13.56	39.26
	1274.5	-0.181574	-9.804995	31.84	1.006453	-9.87	5.10	32.05
Ru-106	621.8	1.32E-01	7.11E+00	8.36E+01	1.055739	7.5074	34.16	88.25
	1050.1	4.26E-01	2.30E+01	5.30E+02	1.055739	24.3006	162.80	559.52

9713534.1835

Client	Bechtel_Hanford
Client ID	BOJ1P1
Filename	427231.CHN
LAL parent ID	42723DUP1
Batch	6342723
Live Time	10800
Detector	1
Geometry	N
Aliquot (gms/L)	0.5
Count date	10/24/96 18:00
Collection Date	9/26/96
delta T to midpoint of count	28.8
Efficiency data file	N194
Background, Library files	WBKG1292

Nuclide	keV	Counting Error pCi/L	FINAL RESULT pCi/L	Total Error 2 sigma	MDA pCi/L
Ra-226	186.1	125.15	-37.46	125.21	182.04
U-235	185.7	7.61	-1.94	7.61	11.06
	143.8	20.64	6.77	29.89	41.24
	163.3				96.42
Pb-214(Ra-226)	351.9	7.44	-10.67	9.05	19.61
	295.1				36.82
Fe-59	1099.2	7.19	-10.90	7.54	29.34
	1291.6				30.80
Co-58	810.8	6.14	-0.29	6.14	10.69
Ac-228(Ra-228)	911.2	13.99	0.83	26.80	43.05
	969				65.98
Pb-212	238.6	5.65	-6.57	10.98	15.83
	300.1		-56.43	56.84	177.16
Co-60	1332.5	4.14	1.25	8.29	9.72
	1173.3				11.11
Cs-137	661.7	7.94	1.76	7.94	9.96
Eu-155	105.3	6.27	-2.90	6.28	18.60
Eu-152	1408.1	0.43	-0.31	8.95	42.43
	344.3				21.02
Eu-154	723.3	5.89	-6.68	9.18	46.30
	1004.8				39.26
	1274.5				32.05
Ru-106	621.8	61.85	8.216	66.865	88.25
	1050.1				559.52

RER:

Pb-214 -> $\left|\frac{-5.77 - -10.67}{12.98 + 9.05}\right| = 0.22.$

Co-60 -> $\left(\frac{-1.56 - 1.25}{1.52 + 8.29}\right| = 0.29.$

Cs-137 -> $\left|\frac{0.27 - 1.76}{7.35 + 7.94}\right| = 0.10.$

TJR 10/25/96

9713534.1836