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LK3969 76
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Environmental Services

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

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

April 7, 1995

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

RE:	Log-in No.:	L3969
	Quotation No.:	Q400000-B
	SAF:	B95-011
	Document File No.:	0303596
	WHC Document File No.:	185
	SDG No.:	LK3969



The attached data report contains the analytical results of samples that were submitted to Lockheed Analytical Services on 3 March 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

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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

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CASE NARRATIVE INORGANIC METALS ANALYSES

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

Preparation and Analysis Requirements

All samples were received on March 3, 1995. The samples were logged in as L3969 and were prepared and analyzed in batch 303 bh.

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.

Sample Results

- TCLP results are not bias corrected for matrix spike recovery. A ten fold dilution was performed in sample preparation to reduce the dissolved solids analyzed.

Shellee McGrath
Prepared By

March 29, 1995
Date

Lockheed Analytical Services

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CASE NARRATIVE ORGANIC ANALYSES

Analytical Method 8015M Total Petroleum Hydrocarbons (TPH)

Analytical Batch 030695-8015-D3

All associated samples were extracted within holding time on March 14, 1995 and analyzed within holding time on March 15, 1995. All initial and continuing calibrations were within QC criteria. Target compound Diesel Range Organics was not detected in the method blank (20363MB). The recovery of surrogate compound Di-n-octylphthalate was within QC criteria for all associated samples analyzed. The recoveries of Diesel Range Organics in the matrix spike (20363MS), matrix spike duplicate (20363MSD) and laboratory control sample (20363LCS) were within QC limits. The relative percent difference (RPD) between the MS and MSD recoveries was within QC limits. Diesel Range Organics was not detected in the associated client sample analyzed.

Lydia M. Coleman
Prepared By

April 7, 1995
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.

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Lockheed Analytical Services
DATA QUALIFIERS FOR ORGANIC ANALYSES

[Revised 01/19/1994]

For Use On The Analytical Data Reporting Forms	
A	<i>For CLP analyses Only</i> -- 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. [<i>pesticide/PCB analyses only</i>]
D	Constituent detected in the diluted sample. It also indicates that an accurate quantitation is not possible due to <u>surrogates</u> 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	<i>Estimated value</i> -- (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 (<i>For CLP Reporting Only</i>).
N	<i>For CLP Reporting Only</i> -- Tentatively identified constituents (TICs) identified based on mass spectral library search.
P	<i>For CLP Reporting Only</i> -- The percent difference between the concentrations detected on both GC columns was greater than 25 percent [<i>pesticide/PCB analyses only</i>].
U	<i>For CLP Reporting Only</i> -- 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. <i>For non-CLP work</i> , RDLs are not adjusted for % moisture even when data are reported 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.
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.

BECHTEL
Westinghouse Hanford
Company *cell 3/95*

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Data Turnaround

Priority
 Normal

Collector <i>3/1/95 H&H</i> W. V. SETZER <i>GG HAMILTON</i>	Company Contact <i>cell 3/95</i> W. V. SETZER <i>R. C. HAVENOR</i>	Telephone No. <i>cell 3/95 (509)</i> (509) 376-2443 <i>539 2134</i>
Project Designation N SPRINGS ERA PUMP AND TREAT SAMPLING	Sampling Location <i>199-N-104A</i>	SAF No. 95-011
Ice Chest No. <i>Home box</i>	Field Logbook No. EL-1234	Method of Shipment BY AIR
Shipped To LOCKHEED	Offsite Property No. <i>W95-0-0204-19</i>	Bill of Lading/Air Bill No. <i>2904620765</i>

L3969

Possible Sample Hazards/Remarks <i>NOISE DETECTED BY FIELD INSTRUMENTS</i>	Preservative	NONE	COOL 4	NONE	NONE	COOL 4
	Type of Container	aG	aG	P	aG	P
Special Handling and/or Storage COOL TO 4 DEGREES CENTIGRADE	No. of Container(s)	1	1	1	1	1
	Volume	250ml	120ml	500ml	1000ml	20ml
SAMPLE ANALYSIS	TCLP METALS		TPH DIESEL RANGE	1 * SEE BELOW	1 * SEE BELOW	ACTIVIT SCAN

Sample No.	Matrix*	Date Sampled	Time Sampled															
<i>BODRL3</i>	<i>S</i>	<i>3-1-95</i>	<i>0900</i>	X	X	X	X	X										
	<i>S</i>																	
	<i>S</i>																	
	<i>S</i>																	
	<i>S</i>																	
	<i>S</i>																	

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix*	
Relinquished By <i>[Signature]</i>	Date/Time <i>3/1/95</i>	Received By <i>[Signature]</i>	Date/Time <i>3/1/95</i>	*1- GROSS ALPHA, BETA (LAL-91SOP-0061) Sr-90 (LAL-91-SOP-0196) TRITIUM (LAL-91-SOP-0067) GAMMA SPEC TO INCLUDE- Co-60 (LAL-91-SOP-0064), Cs-137 (LAL-91-SOP-0063)				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>[Signature]</i>	Date/Time <i>3/2/95</i>	Received By <i>[Signature]</i>	Date/Time						
Relinquished By	Date/Time	Received By	Date/Time	SUMMARY DELIVERABLE					
Relinquished By	Date/Time	Received By	Date/Time						

LABORATORY SECTION	Received By <i>[Signature]</i>	Title <i>Sample Custodian</i>	Date/Time <i>3-3-95/0930</i>
FINAL SAMPLE DISPOSITION	Disposal Method <i>I</i>	Disposed By	Date/Time

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AMPLE STATUS REPORT FOR N 4619. RAD SCREEN BODRL2 TIME: 3/ 2/95 8:35
DISPATCHED: 1/27/95 10:42 SAMPLE HAS NOT BEEN SLURPED PAGE 1
RECEIVED: 3/ 2/95 7:56

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	*****	*****	***	***	*****
4271	TOT-ACT	5.00000E 01 pCi/G	N	Y	XR5308

END OF REPORT

BODRL2

BODRL3

KT 3/2/95

BODRL4

0303596

Sample Login

Login Review Checklist

Lot Number L3969

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, as 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/semivolatiles 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>X</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 seen, samples lost from breakage)</small> | — | — | <u>W</u> |
|----|---|---|---|----------|

M. Wall

3-4-05

Paul Jones

3-04-05

Primary review signature

Date

Secondary review signature

Date

Figure 1

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 3-3-95/0830 Client Name Westinghouse
 Project/Client # 95-011 Batch or Case # NA
 Cooler ID (if noted on outside of cooler) NA

- Condition of shipping container? good
- Custody Seals on cooler intact? Yes No
- Custody Seals dated and signed? Yes No
- Chain of Custody record is taped on inside of cooler lid? Yes No
- Vermiculite/packing material is: Wet Dry _____
- Each sample is in a plastic bag? Yes No _____
- Number of sample containers in cooler: 5
- Samples have: X tape _____ hazard labels
X custody seals X appropriate sample labels
- Samples are: X in good condition _____ leaking
 _____ broken _____ have air bubbles
 _____ other
- Coolant Present? Yes No Sample Temperature 4°C
- The following paperwork should be accounted for (N/A if not applicable):
 Chain of Custody #(s) NA
 Request for Analysis #(s) NA
 Airbill # 2904620765 Carrier FDX
- Have any anomalies been identified above? Yes No NA
- Memos have been initiated for all anomalies identified above? Yes No NA

Printed Name/Signature Anthony M. Miller Date/Time 3-4-95/0830

**Lockheed Analytical Services
Sample Receiving Checklist**

Client Name: Westinghouse

Job No. L3969

Cooler ID:

COOLER CONDITION UPON RECEIPT

Temperature of cooler upon receipt: 4°C

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):			///

MISCELLANEOUS ITEMS

	Yes	No	* Comments/Discrepancies
samples with short holding times		X	
samples to subcontract		X	

ADDITIONAL COMMENTS/DISCREPANCIES

Completed by / date: Almalt 3-4-95

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

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06/26/95 11:17

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

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method
BODRL3 -	L3969-1		Water	SCREENING -
	L3969-2		Soil	1311 TCLP REG. [
	L3969-2		TCLP Extr	6010 ICP METALS
	L3969-2		TCLP Extr	7000 FURNACE ME
	L3969-2		TCLP Extr	7470 MERCURY -
	L3969-2		Soil	PERCENT SOLIDS -
	L3969-3		Soil	8015M - TPH -
	L3969-4		Soil	GAMMA SPEC LAL-(
	L3969-4		Soil	GR ALP/BETA LAL-
	L3969-4		Soil	SR-90 LAL-0196
REPORT TYPE -	L3969-6		Water	TRITIUM(H3) LAL-
	L3969-6		Water	EDD - DISK DEL-
	L3969-6		Water	INORG TYPE 2 RP
				RAD RPT TYPE 2

0303596

TCLP ANALYSIS (SW-846 1311)

SAMPLE RESULTS

Client Sample ID: BODRL3	LAL Sample ID: L3969-2
LAL Batch ID: 303 bh	Matrix: soil (TCLP Extract)
TCLP Extraction Fluid Type: 1	Date Extracted: 03-20-95
Percent Solids (TCLP): 100	SAF 95-011

Constituent	Method of Analysis	Regulatory Limit (mg/L)	IDL (mg/L)	RDL (mg/L)	Result (mg/L)	Data Qualifier	Date Analyzed
Arsenic	6010	5.0	0.5	2.0	<0.5	U	03-24-95
Barium	6010	100	0.3	10	1.9	B	03-24-95
Cadmium	6010	1.0	0.04	0.1	<0.04	U	03-24-95
Chromium	6010	5.0	0.03	0.5	<0.03	U	03-24-95
Lead	6010	5.0	0.9	1.0	<0.9	U	03-24-95
Mercury	7471	0.2	0.002	0.02	<0.002	U	03-22-95
Selenium	7740	1.0	0.03	0.1	<0.03	U	03-22-95
Silver	6010	5.0	0.08	0.5	<0.08	U	03-24-95

Comments:

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LOCKHEED ANALYTICAL SERVICES

TOTAL PETROLEUM HYDROCARBONS (TPH)
8015M - TPH*

Client Sample ID:	BODRL3	LAL Sample ID:	L3969-3
Date Collected:	01-MAR-95	Date Received:	03-MAR-95
Date Analyzed:	15-MAR-95	Analytical Batch ID:	030695-8015-D-3
Date Extracted:	14-MAR-95	Analytical Dilution:	1
Matrix:	Soil	Preparation Dilution:	1.0
Percent Moisture:	N/A	QC Group:	8015M - TPH_20363

SURROGATE RECOVERY (%)	
	QC Limits
DI-N-OCTYLPHTHALATE	84 55-140

CONSTITUENT	CAS NO.	RESULT mg/kg	PRACTICAL QUANTITATION LIMIT mg/kg	DATA QUALIFIER(S)
Diesel Range Organics		<30.	30.	

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LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
 TOTAL PETROLEUM HYDROCARBONS (TPH)
 8015M - TPH

Client Sample ID:	BODRL3	LAL Sample ID:	20363MS
Date Collected:	01-MAR-95	Date Received:	03-MAR-95
Date Analyzed:	15-MAR-95	Analytical Batch ID:	030695-8015-D-3
Date Extracted:	14-MAR-95	Analytical Dilution:	1
Matrix:	Soil	Preparation Dilution:	0.99
Percent Moisture:	N/A	QC Group:	8015M - TPH_20363

SURROGATE RECOVERY (%)		
		QC Limits
DI-N-OCTYLPHthalate	105	55-140

CONSTITUENT	CAS NO.	RESULT mg/kg	PRACTICAL QUANTITATION LIMIT mg/kg	DATA QUALIFIER(S)
Diesel Range Organics		490	30.	

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
 TOTAL PETROLEUM HYDROCARBONS (TPH)
 8015M - TPH

Client Sample ID:	BODRL3	LAL Sample ID:	20363MSD
Date Collected:	01-MAR-95	Date Received:	03-MAR-95
Date Analyzed:	15-MAR-95	Analytical Batch ID:	030695-8015-D-3
Date Extracted:	14-MAR-95	Analytical Dilution:	1
Matrix:	Soil	Preparation Dilution:	0.98
Percent Moisture:	N/A	QC Group:	8015M - TPH_20363

SURROGATE RECOVERY (%)		
		QC Limits
DI-N-OCTYLPHTHALATE	95	55-140

CONSTITUENT	CAS NO.	RESULT mg/kg	PRACTICAL QUANTITATION LIMIT mg/kg	DATA QUALIFIER(S)
Diesel Range Organics		470	29.	

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LOCKHEED ANALYTICAL SERVICES

MATRIX SPIKE DATA SUMMARY
 TOTAL PETROLEUM HYDROCARBONS (TPH)
 8015M - TPH

Client Sample ID:	BODRL3	LAL Sample ID:	20363MS
Date Collected:	01-MAR-95	Date Received:	03-MAR-95
Date Analyzed:	15-MAR-95	Analytical Batch ID:	030695-8015-D-3
Date Extracted:	14-MAR-95	Analytical Dilution:	1
Matrix:	Soil	Preparation Dilution:	0.99
Percent Moisture:	N/A	QC Group:	8015M - TPH_20363

SURROGATE RECOVERY (%)		
		QC Limits
DI-N-OCTYLPHTHALATE	105	55-140

Constituent	Spike Added mg/kg	Sample Concentration mg/kg	MS Concentration mg/kg	% Recovery	QC Limits
					% Recovery
Diesel Range Organics	494	0.000	494	100	30-138

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LOCKHEED ANALYTICAL SERVICES

MATRIX SPIKE DUPLICATE DATA SUMMARY
 TOTAL PETROLEUM HYDROCARBONS (TPH)
 8015M - TPH

Client Sample ID:	BODRL3	LAL Sample ID:	20363MSD
Date Collected:	01-MAR-95	Date Received:	03-MAR-95
Date Analyzed:	15-MAR-95	Analytical Batch ID:	030695-8015-D-3
Date Extracted:	14-MAR-95	Analytical Dilution:	1
Matrix:	Soil	Preparation Dilution:	0.98
Percent Moisture:	N/A	QC Group:	8015M - TPH_20363

SURROGATE RECOVERY (%)		
		QC Limits
DI-N-OCTYLPHTHALATE	95	55-140

Constituent	Spike Added mg/kg	MSD Concentration mg/kg	% Recovery	RPD	QC Limits	
					RPD	% Recovery
Diesel Range Organics	489	472	97	4	30	30-138

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: BODRL3

LAL Sample ID: L3969-4

Date Collected: 01-MAR-95

Date Received: 03-MAR-95

Matrix: Soil

Login Number: L3969

SDG: LK3969

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
Ac-228(Ra-228)	25-MAR-95	GAMMA SPEC LAL-0064_20336	0.62	0.12	0.14		pCi/g
Co-58	25-MAR-95	GAMMA SPEC LAL-0064_20336	-0.015	0.015	0.038		pCi/g
Co-60	25-MAR-95	GAMMA SPEC LAL-0064_20336	0.137	0.027	0.037		pCi/g
Cs-137	25-MAR-95	GAMMA SPEC LAL-0064_20336	-0.009	0.018	0.032		pCi/g
Eu-152	25-MAR-95	GAMMA SPEC LAL-0064_20336	-0.028	0.028	0.14		pCi/g
Eu-154	25-MAR-95	GAMMA SPEC LAL-0064_20336	-0.005	0.042	0.13		pCi/g
Eu-155	25-MAR-95	GAMMA SPEC LAL-0064_20336	0.025	0.067	0.087		pCi/g
Fe-59	25-MAR-95	GAMMA SPEC LAL-0064_20336	0.037	0.039	0.078		pCi/g
Pb-212	25-MAR-95	GAMMA SPEC LAL-0064_20336	0.604	0.086	0.060		pCi/g
Pb-214(Ra-226)	25-MAR-95	GAMMA SPEC LAL-0064_20336	0.415	0.064	0.060		pCi/g
Ra-226(GAMMA)	25-MAR-95	GAMMA SPEC LAL-0064_20336	-0.08	0.47	0.64		pCi/g
U-235(GAMMA)	25-MAR-95	GAMMA SPEC LAL-0064_20336	-0.05	0.13	0.18		pCi/g
Gross Alpha	03-APR-95	GR ALP/BETA LAL-0061_20595	4.7	4.2	6.2	C	pCi/g
Gross Beta	03-APR-95	GR ALP/BETA LAL-0061_20595	21.4	4.4	5.4		pCi/g
Total radio-strontium	27-MAR-95	SR-90 LAL-0196_20604	0.25	0.20	0.33		pCi/g
H-3	04-APR-95	TRITIUM(H3) LAL-0067_20663	0.3	3.2	4.1		pCi/g

9615126.2126

LOCKHEED ANALYTICAL SERVICES

RADIOCHEMISTRY ANALYTES

QC Data Summary For Duplicate Sample Analysis

SDG: LK3969

Analyte	Batch ID	Client ID	LAL ID	Date Analyzed	Sample Result	Error 2 Sigma	Duplicate Result	Error 2 Sigma	RER	RPD	Q
Cs-137	20336	BODRL3	L3969-4	03/25/95	-0.00921	0.0178	0.00596	0.0321	0.4	934	
Gross Alpha	20595	BODRL3	L3969-4	04/03/95	4.75	4.2	6.59	4.36	0.216	32.5	
Gross Beta	20595	BODRL3	L3969-4	04/03/95	21.4	4.42	23.3	4.68	0.2	8.5	
Total radio	20604	BODRL3	L3969-4	03/27/95	0.25	0.203	0.637	0.233	0.888	87.3	
H-3	20663	BODRL3	L3969-4	04/04/95	0.336	3.19	0.883	4.02	0.076	89.7	

Uploaded
Done

9613426.2127

WORK GROUP REPORT (wk02)

Mar 18 1995, 04:20 pm

Work Group: SR-90 LAL-0196_20604 for Department: 12 Radiation Prep.

Created: 18-MAR-95 Due: 01-APR-95 Operator: a wong

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

Page 1							
20604DUP1	DUP	L3969-4	S SR-90 LAL-0196	Soil	WIP	U 18-MAR-95	
20604LCS1	LCS	Lab Ctrl Sample	S SR-90 LAL-0196	Soil	WIP	U 18-MAR-95	
20604MBB1	MB	Method Blank	S SR-90 LAL-0196	Soil	WIP	U 18-MAR-95	
L3969-4	Bechtel Hanford, Inc.	BCDR13	S SR-90 LAL-0196	Soil	WIP	U 02-APR-95	142

Comments:

20604DUP1 L3969-4
 20604LCS1 LCS
 20604MBB1 MB
 L3969-4 temp 4; SAF # 95-011

9613426.2128

*270+260
P/ur*

WORK GROUP REPORT (wk02)

Apr 03 1995, 08:29 am

Work Group: TRITIUM(H3) LAL-0067_20663 for Department: 12 Radiation Prep.

Created: 20-MAR-95 Due: 02-APR-95 Operator: d hogge

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

20663DUP1	DUP	L3969-4	S TRITIUM(H3) LAL-0067	Soil	DONE	U	20-MAR-95		
20663LCS1	LCS	Lab Ctrl Sample	S TRITIUM(H3) LAL-0067	Soil	DONE	U	20-MAR-95		
20663HBB1	MB	Method Blank	S TRITIUM(H3) LAL-0067	Soil	DONE	U	20-MAR-95		
20663MS1	MS	L3969-4	S TRITIUM(H3) LAL-0067	Soil	DONE	U	20-MAR-95		
L3969-4	Bechtel Hanford, Inc.	BODRL3	S TRITIUM(H3) LAL-0067	Soil	DONE	U	02-APR-95		155

Page 1

Comments:

20663DUP1	L3969-4
20663LCS1	LCS
20663HBB1	MB
20663MS1	L3969-4
L3969-4	temp 4; SAF # 95-011

PC/9

9615426.2129
RADIATION RESULTS CHECK REPORT

Workgroup Number: TRITIUM(H3) LAL-0067_20663

Sample	Parameter	Value	Error	MDA
20663DUP1	H-3	0.88304	4.01872	5.19025
20663LCS1	H-3	33.4281	5.90493	4.15974
20663MBB1	H-3	-0.0285895	3.19396	4.31304
20663MS1	H-3	58.1538	7.92613	4.66574
L3969-4	H-3	0.336344	3.1866	4.11416

9615426.2150

Golder Associates Inc.

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



October 23, 1995

Our ref: 943-1610.107.0400
94-1610/O/392

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

ATTENTION: Ms. Jeanette Duncan

RE: TRANSMITTAL OF DATA VALIDATION PACKAGE,
CONTRACT NO. MSH-SWV-315905



Dear Ms. Duncan:

This letter is to transmit the following data validation package:

<u>SAF#</u>	<u>Project</u>	<u>Data Package</u>	<u>Analyses</u>
B95-011	North Springs Expedited Response Action Pump and Treat Sampling	LK3969-LAS	Inorganics, Radiochemistry, General GC

Please call if you have any questions.

Sincerely,

GOLDER ASSOCIATES INC.

Thomas M. Stapp
Task Manager

Douglas Mather
Project Manager

Enclosures

p:\enviroe\whc\dv\dptran.ltr

MEMORANDUM

TO: N-Springs ERA Pump and Treat Sampling, Project QA Record November 10, 1995

FR: Heidi Gregerson, Golder Associates Inc. HRG

RE: GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE:
LK3969-LAS, (943-1610.107, 3969TPH.NS)

INTRODUCTION

This memo presents the results of data validation on the analysis specified below for data package LK3969-LAS prepared by Lockheed Analytical Services. Sample information is provided in the following table.

SAMPLE ID	COMMENTS	ANALYSIS	MEDIA
B0DRL3	SPLIT	DIESEL RANGE ORGANICS	SOIL
* Indicates sample results which were 100% recalculated.			

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

- 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.

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 one determination reported, which was deemed valid. This results in a completeness of 100 percent which meets the work plan completeness objective of 90 percent.

MAJOR DEFICIENCIES

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

001

Revised 11/10/95

MINOR DEFICIENCIES

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

FIELD QC

- B0DRL3 was identified as a field split. However, the associated field QC sample is in another sample delivery group and the RPD will be evaluated in the final summary report.

TENTATIVELY IDENTIFIED COMPOUNDS

No tentatively identified compounds (TICs) were reported by the laboratory.

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.

ATTACHMENT 1
GLOSSARY OF DATA REPORTING QUALIFIERS

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

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

- B -** Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. 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 quantitation 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 reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.
- J -** Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.
- NJ -** Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.
- N -** Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.
- JN -** Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.
- UJN -** Indicates a tentatively identified compound (TIC) that has been determined to be presumptive and valid (JN) in terms of identification and quantitation and has been qualified as undetected (U) due to associated blank contamination.
- UR -** Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major 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 has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

9613426.2135

ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

9613426.2136

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

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: LK3969-LAS	BY: H. Gregerson	DATE: 10/20/95	PAGE <u>1</u> OF <u>1</u>
COMMENTS: DIESEL RANGE ORGANICS			
COMPOUND/ ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
NO QUALIFICATION REQUIRED			

9613426.2137

ATTACHMENT 3
QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORT

Validated Data Summary, Data Package: LK3969-LAS

	Samp#	B0DRL3	
	Date	3-1-95	
Parameter	Location	199-N-104A	
	Depth	73.50 - 76.00	
	Type	SOIL	
	Comments	SPLIT	
	Units	Result	Q
DIESEL RANGE ORGANICS	MG/KG	30.000	U

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

Verified HRG
10/6/95

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960126239

9613426.2139

LOCKHEED ANALYTICAL SERVICESTOTAL PETROLEUM HYDROCARBONS (TPH)
8015M - TPH

Client Sample ID:	BODRL3	LAL Sample ID:	L3969-3
Date Collected:	01-MAR-95	Date Received:	03-MAR-95
Date Analyzed:	15-MAR-95	Analytical Batch ID:	030695-8015-D-3
Date Extracted:	14-MAR-95	Analytical Dilution:	1
Matrix:	Soil	Preparation Dilution:	1.0
Percent Moisture:	N/A	QC Group:	8015M - TPH_20363

SURROGATE RECOVERY (%)		
		QC Limits
DI-N-OCTYLPHTHALATE	84	55-140

CONSTITUENT	CAS NO.	RESULT mg/kg	PRACTICAL QUANTITATION LIMIT mg/kg	DATA QUALIFIER (S)
Diesel Range Organics		<30.	30.	Q u

9613426.2140

ATTACHMENT 4
LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

Lockheed Analytical ServicesLog-in No.: L3969
Quotation No.: Q40000-B
SAF: B95-011
Document File No.: 0303596
WHC Document File No.: 185
SDG No.: LK3969
Page3**CASE NARRATIVE
ORGANIC ANALYSES****Analytical Method 8015M Total Petroleum Hydrocarbons (TPH)****Analytical Batch 030695-8015-D3**

All associated samples were extracted within holding time on March 14, 1995 and analyzed within holding time on March 15, 1995. All initial and continuing calibrations were within QC criteria. Target compound Diesel Range Organics was not detected in the method blank (20363MB). The recovery of surrogate compound Di-n-octylphthalate was within QC criteria for all associated samples analyzed. The recoveries of Diesel Range Organics in the matrix spike (20363MS), matrix spike duplicate (20363MSD) and laboratory control sample (20363LCS) were within QC limits. The relative percent difference (RPD) between the MS and MSD recoveries was within QC limits. Diesel Range Organics was not detected in the associated client sample analyzed.

Lydia M. Coleman
Prepared ByApril 7, 1995
Date

Collector <i>3/1/95</i> W.V. SETZER <i>GG HAMILTON</i>	Company Contact <i>all 3/15</i> W.V. SETZER <i>R.C. HAVENOR</i>	Telephone No. <i>High 3/15 (509)</i> (509) 376-2443 <i>539 2136</i>
Project Designation N SPRINGS ERA PUMP AND TREAT SAMPLING	Sampling Location <i>199-N-104A</i>	SAF No. 95-011
Ice Chest No. <i>Home boy</i>	Field Logbook No. EL-1234	Method of Shipment BY AIR
Shipped To LOCKHEED	Offsite Property No. <i>W95-0-0204-19</i>	Bill of Lading/Air Bill No. <i>2904620765</i>

L3969

Possible Sample Hazards/Remarks <i>NONE DETECTED BY FIELD INSTRUMENTS</i>	Preservative	NONE	COOL 4	NONE	NONE	COOL 4	
	Type of Container	aG	aG	P	aG	P	
	No. of Container(s)	1	1	1	1	1	
Special Handling and/or Storage COOL TO 4 DEGREES CENTIGRADE	Volume	250ml	120ml	500ml	1000ml	20ml	
SAMPLE ANALYSIS		TCLP METALS	TPH DIESEL RANGE	1 * SEE BELOW	1 * SEE BELOW	ACTIVIT SCAN	

Sample No.	Matrix*	Date Sampled	Time Sampled						
<i>BODRL3</i>	s	<i>3-1-95</i>	<i>0900</i>	X	X	X	X	X	
	s								
	s								
	s								
	s								
	s								

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix*
Relinquished By <i>[Signature]</i>	Date/Time <i>3/1/95</i>	Received By <i>[Signature]</i>	Date/Time <i>1513</i>
Relinquished By <i>[Signature]</i>	Date/Time <i>3/1/95</i>	Received By <i>[Signature]</i>	Date/Time <i>3/1/95</i>
Relinquished By <i>[Signature]</i>	Date/Time <i>3/2/95</i>	Received By <i>[Signature]</i>	Date/Time <i>[Signature]</i>
Relinquished By	Date/Time	Received By	Date/Time

*1- GROSS ALPHA, BETA (LAL-91-SOP-0061) Sr-90 (LAL-91-SOP-0196) TRITIUM (LAL-91-SOP-0067) GAMMA SPEC TO INCLUDE- Co-60 (LAL-91-SOP-0064), Cs-137 (LAL-91-SOP-0063)

SUMMARY DELIVERABLE

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 <i>[Signature]</i>	Title <i>Sample Custodian</i>	Date/Time <i>3-3-95/0830</i>
FINAL SAMPLE DISPOSITION	Disposal Method <i>[Signature]</i>	Disposed By	Date/Time

012
HRC 105750-303594

9613426.2143

ATTACHMENT 5
DATA VALIDATION SUPPORTING DOCUMENTATION

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: N Springs ERAP and TS			DATA PACKAGE: UK3969-LAS		
VALIDATOR: H. GREGERSON		LAB: LOCKHEED		DATE: 10/4/95	
CASE:			SDG:		
ANALYSES PERFORMED					
<input type="checkbox"/> CLP Volatiles	<input type="checkbox"/> SW-846 8240 (cap column)	<input type="checkbox"/> SW-846 8260 (packed column)	<input type="checkbox"/> CLP Semivolatiles	<input type="checkbox"/> SW-846 8270 (cap column)	<input type="checkbox"/> SW-846 (packed column)
<input checked="" type="checkbox"/> TPH	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX BODRL3 / SOIL					

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: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? Yes No N/A

Are initial calibrations acceptable? Yes No N/A

Are continuing calibrations 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 surrogates/System Monitoring Compounds analyzed? Yes No ~~N/A~~ *MS/MSD 10/4/95*

Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A

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

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

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD 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

Comments:

1. BODRL3 is a split of BODRL2. BODRL2 is in another delivery group and the RPD will be evaluated in the final summary report.

7. SYSTEM PERFORMANCE

Were internal standards analyzed? Yes No N/A

Are internal standard areas acceptable? Yes No N/A

Are internal standard retention times acceptable? Yes No N/A

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? Yes No N/A

Is compound quantitation acceptable? Yes No N/A

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

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

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

Do results meet the CRQLs? Yes No N/A

Has the laboratory properly identified and coded all TIC? Yes No N/A

Comments:

MEMORANDUM

TO: N-Springs ERA Pump and Treat Sampling Project QA Record November 13, 1995

FR: Heidi Gregerson, Golder Associates Inc. HLG

RE: INORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE
LK3969-LAS (943-1610.107 3969INO.NS)

INTRODUCTION

This memo presents the results of data validation on the analysis specified below for data package LK3969-LAS prepared by Lockheed Analytical Services. Sample information is provided in the following table.

SAMPLE ID	COMMENTS	ANALYSIS	MEDIA
B0DRL3	SPLIT	INORGANICS SEE ATTACHMENT 4	SOIL
* - Indicates sample results which were 100% recalculated.			

Data validation was conducted to level C 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.

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

Completeness. The data package was complete for all requested analyses. 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.

001
Revised HLG
7-1995

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 B0DRL3 was identified as a field split. However, the associated field QC sample is in another sample delivery group and the RPD 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.

9613426.2150

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.

9613426.2152

ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

9613426.2155

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

DATA QUALIFICATION SUMMARY - FORM B-7

SDG:LK3969-LAS	REVIEWER: H. Gregerson	DATE: 10-4-95	PAGE <u>1</u> OF <u>1</u>
COMMENTS: INORGANICS			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
NO QUALIFICATIONS REQUIRED			

9613426.2154

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: LK3969-LAS

Parameter	Samp#		BODRL3	
	Date	3-1-95		
	Location	199-N-104A		
	Depth	73.50 - 76.00		
	Type	SOIL		
	Comments	SPLIT		
	Units	Result	Q	
ARSENIC	MG/L	0.500	U	
BARIUM	MG/L	1.900	B	
CADMIUM	MG/L	0.040	U	
CHROMIUM	MG/L	0.030	U	
LEAD	MG/L	0.900	U	
MERCURY	MG/L	0.002	U	
SELENIUM	MG/L	0.030	U	
SILVER	MG/L	0.080	U	

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

*Verified HRCG
10/4/95*

800

96151262195

TCLP ANALYSIS (SW-846 1311)

SAMPLE RESULTS

Client Sample ID: BODRL3	LAL Sample ID: L3969-2
LAL Batch ID: 303 bh	Matrix: soil (TCLP Extract)
TCLP Extraction Fluid Type: 1	Date Extracted: 03-20-95
Percent Solids (TCLP): 100	SAF 95-011

Constituent	Method of Analysis	Regulatory Limit (mg/L)	IDL (mg/L)	RDL (mg/L)	Result (mg/L)	Data Qualifier	Date Analyzed
Arsenic	6010	5.0	0.5	2.0	<0.5	U	03-24-95
Barium	6010	100	0.3	10	1.9	B	03-24-95
Cadmium	6010	1.0	0.04	0.1	<0.04	U	03-24-95
Chromium	6010	5.0	0.03	0.5	<0.03	U	03-24-95
Lead	6010	5.0	0.9	1.0	<0.9	U	03-24-95
Mercury	7471	0.2	0.002	0.02	<0.002	U	03-22-95
Selenium	7740	1.0	0.03	0.1	<0.03	U	03-22-95
Silver	6010	5.0	0.08	0.5	<0.08	U	03-24-95

Comments:

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

Lockheed Analytical Services

Log-in No.: L3969
Quotation No.: Q400000-B
SAF: B95-011
Document File No.: 0303596
WHC Document File No.: 185
SDG No.: LK3969
Page2

CASE NARRATIVE INORGANIC METALS ANALYSES

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

Preparation and Analysis Requirements

All samples were received on March 3, 1995. The samples were logged in as L3969 and were prepared and analyzed in batch 303 bh.

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.

Sample Results

- TCLP results are not bias corrected for matrix spike recovery. A ten fold dilution was performed in sample preparation to reduce the dissolved solids analyzed.

Shellee McGrath
Prepared By

March 29, 1995
Date

011

~~005~~
HRG
10/4/95

BECHTEL
Westinghouse Hanford
Company Hill 3/1/95

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Data Turnaround
 Priority
 Normal

Collector <i>3/1/95 Hill</i> W. V. SETZER	Company Contact <i>Hill 3/1/95</i> R. C. HAVENOR	Telephone No. <i>Hill 3/1/95 (509) 376-2443</i> 539 2136
Project Designation N SPRINGS ERA PUMP AND TREAT SAMPLING	Sampling Location 199-N-104A	SAF No. 95-011
Ice Chest No. <i>Homeboy</i>	Field Logbook No. EL-1234	Method of Shipment BY AIR
Shipped To LOCKHEED	Offsite Property No. <i>W95-0-0204-19</i>	Bill of Lading/Air Bill No. <i>2904620765</i>

L3969

Possible Sample Hazards/Remarks <i>NONE DETECTED BY FIELD INSTRUMENTS</i>	Preservative	NONE	COOL 4	NONE	NONE	COOL 4													
	Type of Container	aG	aG	P	aG	P													
	No. of Container(s)	1	1	1	1	1													
Special Handling and/or Storage COOL TO 4 DEGREES CENTIGRADE	Volume	250ml	120ml	500ml	1000ml	20ml													
SAMPLE ANALYSIS	TCLP METALS	TPH DIESEL RANGE	1 * SEE BELOW	1 * SEE BELOW	ACTIVIT SCAN														

Sample No.	Matrix*	Date Sampled	Time Sampled																
BODRL3	S	3-1-95	0900	X	X	X	X												
	S																		
	S																		
	S																		
	S																		
	S																		

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix*	
Relinquished By <i>[Signature]</i>	Date/Time <i>3/1/95</i>	Received By <i>[Signature]</i>	Date/Time <i>3/1/95</i>	*1- GROSS ALPHA, BETA (LAL-91-SOP-0061) Sr-90 (LAL-91-SOP-0196) TRITIUM (LAL-91-SOP-0067) GAMMA SPEC TO INCLUDE- Co-60 (LAL-91-SOP-0064), Cs-137 (LAL-91-SOP-0063)		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>[Signature]</i>	Date/Time <i>3/2/95</i>	Received By <i>[Signature]</i>	Date/Time <i>3/2/95</i>				
Relinquished By	Date/Time	Received By	Date/Time				
SUMMARY DELIVERABLE							

LABORATORY SECTION	Received By <i>[Signature]</i>	Title <i>Sample Custodian</i>	Date/Time <i>3-3-95/0930</i>
FINAL SAMPLE DISPOSITION	Disposal Method <i>[Signature]</i>	Disposed By	Date/Time

012
WV 3/1/95 030354

0634261250

9613426.2160

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: N Springs ERAP + T Sampling			DATA PACKAGE: UK 3969-LAS		
VALIDATOR: H. GREERSON		LAB: Lockheed		DATE: 10/4/95	
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 BODRL3 / SOIL					

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: _____

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: _____

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. BODRL3 is a field split of BODRL2.
BODRL2 is in another sample delivery group
and the RPD will be evaluated in the
final summary report.

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: _____

MEMORANDUM

TO: N-Springs ERA Pump and Treat Sampling, Project QA Record November 10, 1995

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

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE
LK3969-LAS (943-1610.107 3969RAD.NS)

INTRODUCTION

This memo presents the results of data validation on the analysis specified below for data package LK3969-LAS prepared by Lockheed Analytical Services. Sample information is provided in the following table.

SAMPLE ID	COMMENTS	ANALYSIS	MEDIA
B0DRL3	SPLIT	RADIOCHEMISTRY SEE ATTACHMENT 4	SOIL

Data validation was conducted to level C 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.

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 sixteen 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.

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Revised HKG
1/13/95

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.

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.

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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 concentration reported may not accurately reflect the sample MDA. 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.

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ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

9613426.2170

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

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: LK3969-LAS	REVIEWER: H. Gregerson	DATE: 10-5-95	PAGE <u>1</u> OF <u>1</u>
COMMENTS: RADIOCHEMISTRY			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
NO QUALIFICATION			

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: LK3969-LAS

Parameter	Samp#		BODRL3	
	Units	Result	Q	
	Date	3-1-95		
	Location	199-N-104A		
	Depth	73.50 - 76.00		
	Type	SOIL		
	Comments	SPLIT		
ACTINIUM-228	pCi/G	0.620		
COBALT-58	pCi/G	-0.015		U
COBALT-60	pCi/G	0.137		
CESIUM-137	pCi/G	-0.009		U
EUROPIUM-152	pCi/G	-0.028		U
EUROPIUM-154	pCi/G	-0.005		U
EUROPIUM-155	pCi/G	0.025		U
IRON-59	pCi/G	0.037		U
LEAD-212	pCi/G	0.604		
LEAD-214	pCi/G	0.415		
RADIUM-226	pCi/G	-0.080		U
URANIUM-235	pCi/G	0.050		U
GROSS ALPHA	pCi/G	4.700		U
GROSS BETA	pCi/G	21.400		
STRONTIUM	pCi/G	0.250		U
TRITIUM	pCi/G	0.300		U

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

Revised 11/26/95

96 3126 2772

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: BODRL3

LAL Sample ID: L3969-4

Date Collected: 01-MAR-95

Date Received: 03-MAR-95

Matrix: Soil

Login Number: L3969

SDG: LK3969

Constituent	Analyzed	Batch	Activity	Error	NDA	DataQual	Units
Ac-228(Ra-228)	25-MAR-95	GAMMA SPEC LAL-0064_20336	0.62	0.12	0.14		pCi/g
Co-58	25-MAR-95	GAMMA SPEC LAL-0064_20336	-0.015 U	0.015	0.038		pCi/g
Co-60	25-MAR-95	GAMMA SPEC LAL-0064_20336	0.137	0.027	0.037		pCi/g
Cs-137	25-MAR-95	GAMMA SPEC LAL-0064_20336	-0.009 U	0.018	0.032		pCi/g
Eu-152	25-MAR-95	GAMMA SPEC LAL-0064_20336	-0.028 U	0.028	0.14		pCi/g
Eu-154	25-MAR-95	GAMMA SPEC LAL-0064_20336	-0.005 U	0.042	0.13		pCi/g
Eu-155	25-MAR-95	GAMMA SPEC LAL-0064_20336	0.025 U	0.067	0.087		pCi/g
Fe-59	25-MAR-95	GAMMA SPEC LAL-0064_20336	0.037 U	0.039	0.078		pCi/g
Pb-212	25-MAR-95	GAMMA SPEC LAL-0064_20336	0.604	0.086	0.060		pCi/g
Pb-214(Ra-226)	25-MAR-95	GAMMA SPEC LAL-0064_20336	0.415	0.064	0.060		pCi/g
Ra-226(GAMMA)	25-MAR-95	GAMMA SPEC LAL-0064_20336	-0.08 U	0.47	0.64		pCi/g
U-235(GAMMA)	25-MAR-95	GAMMA SPEC LAL-0064_20336	0.05 U	0.13	0.18		pCi/g
Gross Alpha	03-APR-95	GR ALP/BETA LAL-0061_20595	4.7 U	4.2	6.2	C	pCi/g
Gross Beta	03-APR-95	GR ALP/BETA LAL-0061_20595	21.4	4.4	5.4		pCi/g
Total radio-strontium	27-MAR-95	SR-90 LAL-0196_20604	0.25 U	0.20	0.33		pCi/g
H-3	04-APR-95	TRITIUM(H3) LAL-0067_20663	0.3 U	3.2	4.1		pCi/g

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

Lockheed Analytical Services

Log-in No.: L3969
Quotation No.: Q400000-B
SAF: B95-011
Document File No.: 0303596
WHC Document File No.: 185
SDG No.: LK3969
Page4

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 time requirements were met.

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

Analytical Method

Gamma Spectrum Analysis

The Gamma Spectrum Analysis was performed using LAL-91-SOP-0064. No problems were encountered during analysis. All QC criteria were met.

Gross Alpha Beta

The Gross Alpha Beta Analysis was performed using LAL-91-SOP-0061. Due to inherent problems with direct spiking of soil samples, the matrix spike recovery was high; however the LCS recovered within control limits and the data is considered acceptable. All other QC criteria were met.

Strontium

The strontium analysis was performed using LAL-91-SOP-0196. There was apparent stable strontium content in the sample, however no significant activity was detected. The chemical recovery was set to 100% for calculations. All QC criteria were met.

Tritium

The tritium analysis was performed using LAL-91-SOP-0067. No problems were encountered during analysis. All QC criteria were met.

Yvonne Jacoby
Prepared By

April 7, 1995
Date

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10/5/95

Collector *3/1/95* *GG HAMILTON* Company Contact *cell 3/1/95* *W. V. SETZER R.C. HAVENOR* Telephone No. *cell 3/1/95 (509) 376-2413 539 2136*

Project Designation *N SPRINGS ERA PUMP AND TREAT SAMPLING* Sampling Location *199-N-104A* SAF No. *95-011*

Ice Chest No. *Home boy* Field Logbook No. *EL-1234* Method of Shipment *BY AIR*

Shipped To *LOCKHEED* Offsite Property No. *W95-0-0204-19* Bill of Lading/Air Bill No. *2904620765*

L3969

Possible Sample Hazards/Remarks <i>NONE DETECTED BY FIELD INSTRUMENTS</i>	Preservative	NONE	COOL 4	NONE	NONE	COOL 4													
	Type of Container	aG	aG	P	aG	P													
	No. of Container(s)	1	1	1	1	1													
Special Handling and/or Storage <i>COOL TO 4 DEGREES CENTIGRADE</i>	Volume	250ml	120ml	500ml	1000ml	20ml													
SAMPLE ANALYSIS		TCLP METALS	TPH DIESEL RANGE	1 * SEE BELOW	1 * SEE BELOW	ACTIVIT SCAN													

Sample No.	Matrix*	Date Sampled	Time Sampled																
<i>BODRL3</i>	<i>S</i>	<i>3-1-95</i>	<i>0900</i>	X	X	X	X	X											
	<i>S</i>																		
	<i>S</i>																		
	<i>S</i>																		
	<i>S</i>																		
	<i>S</i>																		

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix*	
Relinquished By <i>[Signature]</i>	Date/Time <i>3/1/95</i>	Received By <i>K. Trapp</i>	Date/Time <i>3/1/95</i>	*1- GROSS ALPHA, BETA (LAL-91SOP-0061) Sr-90 (LAL-91-SOP-0196) TRITIUM (LAL-91-SOP-0067) GAMMA SPEC TO INCLUDE- Co-60 (LAL-91-SOP-0064), Cs-137 (LAL-91-SOP-0063)		<ul style="list-style-type: none"> 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>K. Trapp</i>	Date/Time <i>3/2/95</i>	Received By	Date/Time				
Relinquished By	Date/Time	Received By	Date/Time				
Relinquished By	Date/Time	Received By	Date/Time				
				SUMMARY DELIVERABLE			

LABORATORY SECTION	Received By <i>[Signature]</i>	Title <i>Sample Custodian</i>	Date/Time <i>3-3-95/0930</i>
FINAL SAMPLE DISPOSITION	Disposal Method <i>CW</i>	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: NSprings ERAP and T Sanding			DATA PACKAGE: UK3969-LAS		
VALIDATOR: H. GREGERSON		LAB: LOCKHEED		DATE: 10/5/95	
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 checked="" type="checkbox"/> Gamma Spectroscopy	
<input type="checkbox"/> Total Uranium	<input type="checkbox"/> Radium-22	<input checked="" type="checkbox"/> Tritium	<input type="checkbox"/>		
SAMPLES/MATRIX B00RL3 / SOIL					

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: _____

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10/6/95

3. Continuing Calibration N/A

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10/12/95

- 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

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10/13/95

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: The gross alpha beta % recoveries are
being considered by the LIS only as
stated in the case narrative. See
Attachment 4. HLG 10/16/95

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

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10/5/95

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: _____

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? 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: _____
 1. BODRL3 was identified a a split, however, the associated sample is in another delivery group and the RPD will be evaluated in the final summary

10. Holding Times

Are sample holding times acceptable? Yes No N/A

Comments: _____

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

HRG 10/6/95

Comments: Reported sample results which are \leq MDA have been qualified U on the laboratory results 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.