

**START**

9713534.2033

**LOCKHEED MARTIN**



0046811

## *Lockheed Analytical Services*

Ms. Joan Kessner  
Bechtel Hanford, Inc.  
3350 George Washington Way  
MISN B1-35  
Richland, WA 99352



**ANALYTICAL DATA REPORT**

**FOR**

**NITRATE, TOTAL URANIUM BY KPA,  
STRONTIUM-90, TECHNETIUM-99, AND TRITIUM**



LOG-IN NUMBER: L8229  
QUOTATION NUMBER: Q400000-B  
SAF NUMBER: B97-023  
DOCUMENT FILE NUMBER: 1030596  
BHI DOCUMENT FILE NO.: 411  
SDG NUMBER: LK8229

000001



BECHTEL HANFORD  
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 Sample Delivery Group. LK8229

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This package contains a total of 105 pages.

9713534.2035

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Lockheed Analytical Services  
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LOCKHEED MARTIN 

November 25, 1996

Ms. Joan Kessner  
Bechtel Hanford, Inc.  
3350 George Washington Way  
MISN B1-35  
Richland, WA 99352

RE: Log-in No.: L8229  
Quotation No.: Q400000-B  
SAF No.: B97-023  
Document File No.: 1030596  
BHI Document File No.: 411  
SDG No.: LK8229



The attached data report contains the analytical results of samples that were submitted to Lockheed Analytical Services on October 30, 1996. The temperature of the cooler upon receipt was 2°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, extension 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  
Client Services Representative

cc: Client Services  
Document Control

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Lockheed Analytical Services

Log-in No.: L8229  
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**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 (predigestion) sample(s), duplicate sample(s).

**Preparation and Analysis Requirements**

- One water sample was received for LK8229 and analyzed in batch 1030 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                 |
|-----------|---------|------------|------------------------|
| BOJCS9    | L8229-3 | DUP,<br>MS | 300.0 Nitrate-Nitrogen |

**Holding Time Requirements**

- The sample was received and analyzed outside of the method-specific holding time. The associated sample is flagged with an "H".

**Method Blanks**

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

**Internal Quality Control**

- All Internal Quality Control were within acceptance limits.

Kay McCann  
 Prepared By

November 6, 1996  
 Date

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Lockheed Analytical Services

Log-in No.: L8229  
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## CASE NARRATIVE INORGANIC TOTAL URANIUM 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, and matrix spike duplicate samples.

### Preparation and Analysis Requirements

All samples were received on October 30, 1996. The samples were logged in as L8229 and were prepared and analyzed in batch 1029 bt.

### Holding Time Requirements

All holding time requirements were met.

### Total Uranium

The Total Uranium analysis was performed using LAL-91-SOP-0168. All samples were prepared in Workgroup U TOTAL KPA LAL-0168 43099 with a Method Blank (MBB1), Laboratory Control Sample (LCS1), Duplicate (DUP1) and Matrix Spike (MS1). No problems were encountered during preparation or analysis. All QC criteria were met and no reanalysis was performed.

Shellee McGrath  
Prepared By

November 20, 1996  
Date

Lockheed Analytical Services

Log-in No.: L8229  
Quotation No.: Q400000-B  
SAF No.: B97-023  
Document File No.: 1030596  
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## 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.

NOTE: Chemical recoveries and minimum detectable activities (MDAs) can be found on the preparation sheets and calculation sheets on the attached raw data for each method.

### Holding Time Requirements

All holding time requirements were met.

### Gas Proportional Counter

#### *Analytical Method Strontium-90*

The strontium-90 analysis was performed using standard operating procedure (SOP), LAL-91-SOP-0065. The samples were analyzed in workgroups 43149 and 43582. The samples in workgroup 43149 were re-analyzed in workgroup 43582 due to out-of-criteria laboratory control sample (LCS) and matrix spike (MS) recoveries. No analyses from workgroup 43149 were reported. The instrument calibration verification met criteria. The method blank was within QC criteria. The LCS and MS recoveries were within QC criteria. The duplicate (DUP) recoveries were within QC criteria. No other re-analyses were performed.

### Liquid Scintillation Counter

#### *Analytical Method Technetium-99*

The technetium-99 analysis was performed using SOP, LAL-91-SOP-0169. The samples were analyzed in workgroup 43151. The instrument calibration verification met criteria. The method blank was within QC criteria. The LCS and MS recoveries were within QC criteria. The DUP recoveries were within QC criteria. The quench value was within curve limitations. No re-analyses were performed.

**Lockheed Analytical Services**

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**Analytical Method Tritium**

The tritium analysis was performed using SOP, LAL-91-SOP-0066. The samples were analyzed in workgroup 43158. The instrument calibration verification met criteria. The method blank was within QC criteria. The LCS and MS recoveries were within QC criteria. The DUP recoveries were within QC criteria. The quench value was within curve limitations. No re-analyses were performed.

Andrea Tippet  
Prepared By

November 24, 1996  
Date

L9229

|                             |   |            |             |
|-----------------------------|---|------------|-------------|
| <b>Bechtel Hanford Inc.</b> | <b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b> | B97-023-51 | Page 1 of 1 |
|-----------------------------|---|------------|-------------|

|  |                                      |   |                                    |                            |
|--|--------------------------------------|---|------------------------------------|----------------------------|
| Collector<br><i>R. Fahlberg</i>  | Company Contact<br>Jane Borghese     | Telephone No.<br>(509) 373-4790           | Project Coordinator<br>Koerner, CC | Data Turnaround<br>45 Days |
| Project Designation<br>Pre-Startup Sampling for 100-HR-3 Interim Action Monitoring | Sampling Location<br>100 H and 100 D | SAF No.<br>B97-023                        |                                    |                            |
| Ice Chest No.<br>96-068  | Field Logbook No.<br>EL-1289         | Method of Shipment<br>Federal Express     |                                    |                            |
| Shipped To<br>Lockheed   | Offsite Property No.<br>W97-0001-6   | Bill of Lading/Air Bill No.<br>2771634503 |                                    |                            |

| POSSIBLE SAMPLE HAZARDS/REMARKS   | Preservation        | None         | None                                    | Cool 4C       | HNO3 to pH <  | HCl to pH <                | HNO3 to pH < |  |  |  |  |
|---|---------------------|--------------|---|---------------|---------------|----------------------------|--------------|--|--|--|--|
|   | Type of Container   | P            | G                                       | P             | P             | P                          | P            |  |  |  |  |
|   | No. of Container(s) | 1            | 1                                       | 1             | 1             | 4                          | 4            |  |  |  |  |
| Special Handling and/or Storage<br>Maintain samples between 2 degrees C and 6 degrees C | Volume              | 20ml         | 500ml                                   | 500ml         | 500ml         | 1000ml                     | 1000ml       |  |  |  |  |
| SAMPLE ANALYSIS   | Activity Scan       | Tritium - H3 | IC Anions - 300.0 (Nitrogen as Nitrate) | Total Uranium | Technetium-99 | Strontium-89.90 - Total Sr |              |  |  |  |  |

| Sample No. | Matrix * | Sample Date | Sample Time | Activity Scan | Tritium - H3 | IC Anions - 300.0 (Nitrogen as Nitrate) | Total Uranium | Technetium-99 | Strontium-89.90 - Total Sr |  |  |  |
|------------|----------|-------------|-------------|---------------|--------------|---|---------------|---------------|----------------------------|--|--|--|
| BOJCS9     | Water    | 10-28-96    | 1230        | X             | X            | X                                       | X             | X             | X                          |  |  |  |
|            |          |             |             |               |              |   |               |               |                            |  |  |  |
|            |          |             |             |               |              |   |               |               |                            |  |  |  |
|            |          |             |             |               |              |   |               |               |                            |  |  |  |
|            |          |             |             |               |              |   |               |               |                            |  |  |  |
|            |          |             |             |               |              |   |               |               |                            |  |  |  |
|            |          |             |             |               |              |   |               |               |                            |  |  |  |
|            |          |             |             |               |              |   |               |               |                            |  |  |  |

|                                       |                            |  |                   |
|---------------------------------------|----------------------------|--|-------------------|
| CHAIN OF POSSESSION                   | Sign/Print Names           | SPECIAL INSTRUCTIONS<br>** The ERC Contractor acknowledges the 48-hour holding time for nitrate is not likely achievable | Matrix *          |
| Relinquished By<br><i>R. Fahlberg</i> | Date/Time<br>10-28-96 1500 | Received By<br><i>R. Fahlberg</i>  | S - Soil          |
| Relinquished By<br><i>B. Whitten</i>  | Date/Time<br>10-28-96 0900 | Received By<br><i>B. Whitten</i>   | SE - Sediment     |
| Relinquished By<br><i>B. Whitten</i>  | Date/Time<br>10-29-96      | Received By<br><i>B. Whitten</i>   | SO - Solid        |
| Relinquished By                       | Date/Time                  | Received By  | SL - Sludge       |
| Relinquished By                       | Date/Time                  | Received By  | W - Water         |
| Relinquished By                       | Date/Time                  | Received By  | O - Oil           |
| Relinquished By                       | Date/Time                  | Received By  | A - Air           |
| Relinquished By                       | Date/Time                  | Received By  | DS - Drum Solids  |
| Relinquished By                       | Date/Time                  | Received By  | DL - Drum Liquids |
| Relinquished By                       | Date/Time                  | Received By  | T - Tissue        |
| Relinquished By                       | Date/Time                  | Received By  | WI - Wipe         |
| Relinquished By                       | Date/Time                  | Received By  | L - Liquid        |
| Relinquished By                       | Date/Time                  | Received By  | V - Vegetation    |
| Relinquished By                       | Date/Time                  | Received By  | X - Other         |

|                          |  |             |                       |
|--------------------------|--|-------------|-----------------------|
| LABORATORY SECTION       | Received By<br><i>Chris M. Glatton</i> | Title       | Date/Time<br>10-30-96 |
| FINAL SAMPLE DISPOSITION | Disposal Method                        | Disposed By | Date/Time             |

1030596

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LOCKHEED ANALYTICAL SERVICES

Sample Results

|                          |                           |
|--------------------------|---------------------------|
| Client Sample ID: BOJCS9 | Date Collected: 28-OCT-96 |
| Matrix: Water            | Date Received: 30-OCT-96  |
| Percent Solids: N/A      |                           |

| Constituent | Units | Method | Result | Project Reporting Limit | Data Qualifier(s) | Date Analyzed | LAS Batch ID | LAS Sample ID |
|-------------|-------|--------|--------|-------------------------|-------------------|---------------|--------------|---------------|
| Nitrate-N   | mg/L  | 300.0  | 1.5    | 0.020                   | H                 | 31-OCT-96     | 43042        | L8229-3       |

000021

9713534.2042

# 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: BOJCS9  
Date Collected: 28-OCT-96  
Matrix: Water

Login Number: L8229  
Date Received: 30-OCT-96

| Constituent | Method | Batch | Activity | Error | MDA  | Qualifier | Units | Analysed  | Lab ID  |
|-------------|--------|-------|----------|-------|------|-----------|-------|-----------|---------|
| Uranium     | KPA    | 43099 | 5.72     | 0.30  | 0.69 |           | ug/L  | 19-NOV-96 | L8229-4 |

9713534.2043

# 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: BOJCS9  
Date Collected: 28-OCT-96  
Matrix: Water

Login Number: L8229  
Date Received: 30-OCT-96

| Constituent | Method   | Batch | Activity | Error | MDA | Qualifier | Units | Analyzed  | Lab ID  |
|-------------|----------|-------|----------|-------|-----|-----------|-------|-----------|---------|
| H-3         | LAL-0066 | 43158 | 0        | 110   | 210 |           | pCi/L | 07-NOV-96 | L8229-2 |

9713534.2044

# 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: BOJCS9  
Date Collected: 28-OCT-96  
Matrix: Water

Login Number: L8229  
Date Received: 30-OCT-96

| Constituent | Method   | Batch | Activity | Error | MDA | Qualifier | Units | Analyzed  | Lab ID  |
|-------------|----------|-------|----------|-------|-----|-----------|-------|-----------|---------|
| Tc-99       | LAL-0169 | 43151 | 2.4      | 4.1   | 7.1 |           | pCi/L | 19-NOV-96 | L8229-5 |

9713534.2045

# 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: BOJCS9  
Date Collected: 28-OCT-96  
Matrix: Water

Login Number: L8229  
Date Received: 30-OCT-96

| Constituent | Method   | Batch | Activity | Error | MDA  | Qualifier | Units | Analyzed  | Lab ID  |
|-------------|----------|-------|----------|-------|------|-----------|-------|-----------|---------|
| Sr-89,90    | LAL-0065 | 43582 | -0.02    | 0.32  | 0.57 |           | pCi/L | 19-NOV-96 | L8229-9 |