9613476.1010

W0038-ITC-047

351
2

0045259



INTERNATIONAL TECHNOLOGY CORPORATION

Westinghouse Hanford Company
P.O. Box 1970
Richland, WA 99352

Dear J.A. Lerch

Thank you for purchasing analytical testing services from IT Corporation. It is our intention to supply our clients with data packages which not only meet the industry's highest standards for quality, but are also easy to use. Features which we point out are:

1. A Data Summary Packet which allows you to review your data without searching through the complete data package.

   Your Data Summary Packet contains the following items:

   - Case Narrative: listing of sample identifications, analyses performed, explanation of any problem associated with samples, corrective action taken.
   - Quality control sample identifications and analyses performed.
   - Data summary.

2. A data package which meets the specific requirements you requested and is easy to use as well. The package is organized in accordance with the Table of Contents which you will find at the beginning of each section. Sections are separated by color-coded tabs, making it easy to find individual analytical parameters which may be of particular interest to you. The data package is custody-sealed at the laboratory - your assurance that parts of the package are not missing.

We are constantly searching for ways to improve our service to you. This current product has many of the features which you have told us are important to you. Your suggestions regarding additional improvements will be appreciated.

Please contact me with any questions or suggestions.

Sincerely,

Sheree' Schneider
Project Manager



Regional Office
5815 Middlebrook Pike ▪ Knoxville, Tennessee 37921 ▪ 615-588-6401

9613476.1011

# OFFICE OF SAMPLE MANAGEMENT

# RECORD OF DISPOSITION

ROD-94-0107
Record of Disposition No.

DATE: May 2, 1994

LABORATORY: IT/TMA

PROJECT TITLE/NO.: 200-BP-5/94-130

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

All samples which were not analyzed prior to this notification.

DESCRIPTION OF EVENT:

The analysis for sulfate by methods EPA 300.0 and EPA 375.4 was requested on the Sampling Authorization Form (SAF). This redundancy in analysis is not necessary.

DISPOSITION OF SAMPLES:

Discontinue analysis for sulfate by EPA 375.4.

APPROVAL SIGNATURES:

R. C. Smith/ Claytt Smith — 5/4/94
OSM Project Coordinator (Print/Sign Name) — Date

D. B. Erb/ David B. Erb — 5/3/94
Technical Representative (Print/Sign Name) — Date

N/A
Quality Assurance (Print/Sign Name) — Date

9613476.1012

**DON'T SAY IT** --- *Write It!*

DATE: September 23, 1993

TO: W0038-ITC-047

FROM: Pat Reich H4-19

Telephone: 372-2785

cc:

SUBJECT: FINAL SUMMARY VALIDATION REPORT FOR 200-BP-5, GROUNDWATER SAMPLES.

THE FINAL SUMMARY VALIDATION REPORT FOR THIS DATA PACKAGE IS FILED IN SDG B0BRM3-TMA-755.

PAT REICH
DATA MANAGEMENT

INTERNATIONAL TECHNOLOGY CORPORATION

# ANALYTICAL SERVICES

## CERTIFICATE OF ANALYSIS

IT Corporation
2800 George Washington Way
Richland, WA 99352
Attn: Van Pettey

June 16, 1994

Job Number: 388; 418; 428; 439; 455

This is the Certificate of Analysis for the following samples:

| | |
|---|---|
| SDG: | W0038 |
| Client Project ID: | WHC SAF-94-130 200-BP-5 Groundwater-Round-1 |
| Date Received by Lab: | April 19, April 22, April 25, April 27 and April 29, 1994 |
| Number of Samples: | Twenty (20) |
| Sample Type: | Water |

### I. Introduction

On April 19, April 22, April 25, April 27 and April 29, 1994, twenty (20) water samples arrived at ITAS-Richland, Washington and were transferred to ITAS-Knoxville for chemical analysis. Sample BOBNP1 was received with a pH of 10. See attached CUR #1486. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

### II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results.

The samples were analyzed for Target Analyte List (TAL) metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) in accordance with the EPA CLP ILM03 Statement of Work.

Reviewed and Approved:

Sheree A. Schneider

Sheree' A. Schneider
Project Manager

IT Corporation
June 16, 1994
Job Number: 428; 439; 455; 388; 418
Client Project ID: WHC SAF-94-130 200-BP-5 Groundwater-Round-1

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

**II. Analytical Results/Methodology** (Continued)

The samples were analyzed for nitrate-nitrite based on EPA method 353.2.

The samples were analyzed for sulfate based on EPA method 375.4.

The alkalinity of the samples was determined using EPA method 310.1.

The total dissolved solids (TDS) content of the samples was determined using EPA method 160.1.

The samples were analyzed for anions by ion chromatography using EPA method 300.0.

**III. Quality Control**

The samples for work order #388 were digested on May 3, 1994 for ICP and GFAA. The GFAA analyses for selenium and bismuth were performed from May 6 through May 14, 1994; the remaining metals were analyzed by ICP on May 6, 1994. All run QC was acceptable. Samples were batched with QC from work order #379. The initial calibration verification standard/LCS and continuing calibration verification standard for cyanide were outside acceptance limits on the high side. However, as no cyanide was detected in the sample this does not adversely affect the results. The linear range for silicon was determined on May 24, 1994.

The samples for work order #418 were digested on May 20, 1994 for ICP and May 5, 1994 for GFAA. The GFAA analyses for selenium and bismuth were performed on May 11 and May 24, 1994; the remaining metals were analyzed by ICP on May 24, 1994. All run QC was acceptable. Samples were batched with QC from work order #379. The LCSW/ICV for cyanide exceeded acceptance criteria by 3%.

The samples for work order #428 were digested on May 26, 1994 for ICP and May 10, 1994 for GFAA. The GFAA analyses for selenium and bismuth were performed from May 12 through May 16, 1994; the remaining metals were analyzed by ICP on June 1, 1994. All run QC was acceptable. A duplicate/spike pair was prepared using sample numbers BOBNP7 and BOBNP8. Spike recovery (accuracy) results were within acceptance limits for all requested parameters. As the silicon concentration in sample BOBNP8 was greater than four times (4X) the spike added, spiking criteria did not apply for this analyte. Duplicate RPD (precision) results were within acceptance limits for all requested parameters except for iron by ICP analysis on sample BOBNP7. Poor precision for this analyte appears to be attributable to contamination during sample preparation. The samples were analyzed for cyanide outside of holding time due to original analysis results missing one sample and to confirm positive value on sample BOBNM5.

IT Corporation
June 16, 1994
Job Number: 428; 439; 455; 388; 418
Client Project ID: WHC SAF-94-130 200-BP-5 Groundwater-Round-1

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KNOXVILLE, TN

## III. Quality Control (Continued)

The samples for work order #439 were digested on May 11, 1994 for ICP and GFAA. The GFAA analyses for selenium and bismuth were performed from May 12 through May 16, 1994; the remaining metals were analyzed by ICP on May 24, 1994. All run QC was acceptable. The ICV/LCS for cyanide was outside acceptance limits on the high side by 3%. No cyanide was detected in the samples. The samples were batched with QC from work order #428.

The samples for work order #455 were digested on May 12, 1994 for ICP and GFAA. The GFAA analyses for selenium and bismuth were performed from May 16 through May 20, 1994; the remaining metals were analyzed by ICP on June 2, 1994. All run QC was acceptable. The ICV/LCS for cyanide was slightly outside acceptance limits on the high side. As the samples contained this analyte slightly above the CRDL, it should be noted that the sample results may be partially elevated. The samples were batched with QC from work order #428.

Data were reported with qualifiers as follows:

"C" Qualifiers

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
B - Value greater than instrument detection limit, but less than contract required quantitation limit.

"Q" Qualifiers

* - Duplicate analysis outside control limits.
N - Spiked sample recovery outside control limits.
W - Post-digestion spike for GFAA was out of control limits (85-115%), while sample absorbance was less than 50% of spike absorbance.
S - The reported value was determined by method of standard additions.

"M" Qualifiers

P - Analysis performed by ICP.
V - Analysis performed by CVAA.
F - Analysis performed by GFAA.
C - Cyanide analysis by manual distillation/colorimetric determination.

Miscellaneous

D - Duplicate.
S - Spike.
NR - Not required.
G - Native analyte > 4 times spike added, therefore, acceptance criteria do not apply.
X - Detection limits higher than normal due to sample matrix interferences.

IT Corporation
June 16, 1994
Job Number: 428; 439; 455; 388; 418
Client Project ID: WHC SAF-94-130 200-BP-5 Groundwater-Round-1

IT ANALYTICAL SERVICES
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KNOXVILLE, TN

## III. Quality Control (Continued)

A duplicate analysis was performed for alkalinity using sample number BOBNP7. Results were acceptable.

Matrix spike and matrix spike duplicate analyses were performed for nitrate/nitrite using sample number BOBNP7. Results were acceptable.

Matrix spike and matrix spike duplicate analyses were performed for sulfate using sample number BOBNP7. Results were acceptable.

A duplicate analysis was performed for total dissolved solids (TDS) using sample number BOBNP7. Results were acceptable.

Matrix spike and matrix spike duplicate analyses for anions were performed using sample number BOBNP7. Results were acceptable.

IT Corporation
June 16, 1994
Job Number: 428; 439; 455; 388; 418
Client Project ID: WHC SAF-94-130 200-BP-5 Groundwater-Round-1

IT ANALYTICAL SERVICES
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KNOXVILLE, TN

**III. Quality Control** (Continued)

Table I is a cross reference between client sample IDs and laboratory sample IDs.

**TABLE I**

| Knoxville ID | Richland ID | WHC ID | Test |
|---|---|---|---|
| AA7389 | 404427-01A | BOBNP7 | METALS-T |
| AA7390 | 404427-01B | " | ANIONS |
| AA7391 | 404427-01C | " | NO2NO3 |
| AA7392 | 404427-01D | " | ALKALINITY |
| AA7393 | 404427-01E | " | TDS |
| AA7394 | 404427-01F | " | SULFATE |
| AA7395 | 404427-01G | " | CYANIDE |
| AA7410 | 404427-02A | BOBNP8 | METALS-D |
| AA7396 | 404427-03A | BOBNP3 | METALS-T |
| AA7397 | 404427-03B | " | ANIONS |
| AA7398 | 404427-03C | " | NO2NO3 |
| AA7399 | 404427-03D | " | ALKALINITY |
| AA7400 | 404427-03E | " | TDS |
| AA7401 | 404427-03F | " | SULFATE |
| AA7402 | 404427-03G | " | CYANIDE |
| AA7411 | 404427-04A | BOBNP4 | METALS-D |
| AA7403 | 404427-05A | BOBNM5 | METALS -T |
| AA7404 | 404427-05B | " | ANIONS |
| AA7405 | 404427-05C | " | NO2NO3 |

IT Corporation
June 16, 1994
Job Number: 428; 439; 455; 388; 418
Client Project ID: WHC SAF-94-130 200-BP-5 Groundwater-Round-1

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

III. Quality Control (Continued)

Table I is a cross reference between client sample IDs and laboratory sample IDs.

**TABLE I**

| Knoxville ID | Richland ID | WHC ID | Test |
|---|---|---|---|
| AA7406 | 404427-05D | BOBNM5 | ALKALINITY |
| AA7407 | 404427-05E | " | TDS |
| AA7408 | 404427-05F | " | SULFATE |
| AA7409 | 404427-05G | " | CYANIDE |
| AA7412 | 404427-06A | BOBNM6 | METALS-D |
| AA7812 | 404495-01A | BOBNN1 | METALS-T |
| AA7813 | 404495-01B | " | ANIONS |
| AA7814 | 404495-01C | " | NO2NO3 |
| AA7815 | 404495-01D | " | ALKALINITY |
| AA7816 | 404495-01E | " | TDS |
| AA7818 | 404495-01G | " | CYANIDE |
| AA7826 | 404495-02A | BOBNN2 | METALS-D |
| AA7819 | 404495-03A | BOBRL7 | METALS-T |
| AA7820 | 404495-03B | " | ANIONS |
| AA7821 | 404495-03C | " | NO2NO3 |
| AA7822 | 404495-03D | " | ALKALINITY |
| AA7823 | 404495-03E | " | TDS |
| AA7824 | 404495-03G | " | CYANIDE |
| AA7827 | 404495-04A | BOBRL8 | METALS-D |

IT Corporation
June 16, 1994
Job Number: 428; 439; 455; 388; 418
Client Project ID: WHC SAF-94-130 200-BP-5 Groundwater-Round-1

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

**III. Quality Control** (Continued)

Table I is a cross reference between client sample IDs and laboratory sample IDs.

**TABLE I**

| Knoxville ID | Richland ID | WHC ID | Test |
|---|---|---|---|
| AA7571 | 404458-01A | BOBNP5 | METALS-T |
| AA7572 | 404458-01B | " | ANIONS |
| AA7573 | 404458-01C | " | NO2NO3 |
| AA7574 | 404458-01D | " | ALKALINITY |
| AA7575 | 404458-01E | " | TDS |
| AA7576 | 404458-01F | " | SULFATE |
| AA7577 | 404458-01G | " | CYANIDE |
| AA7585 | 404458-02A | BOBNP6 | METALS-D |
| AA7578 | 404458-03A | BOBRL3 | METALS-T |
| AA7579 | 404458-03B | " | ANIONS |
| AA7580 | 404458-03C | " | NO2NO3 |
| AA7581 | 404458-03D | " | ALKALINITY |
| AA7582 | 404458-03E | " | TDS |
| AA7853 | 404458-03F | " | SULFATE |
| AA7584 | 404458-03G | " | CYANIDE |
| AA7587 | 404458-04A | BOBRL4 | METALS-D |

IT Corporation
June 16, 1994
Job Number: 428; 439; 455; 388; 418
Client Project ID: WHC SAF-94-130 200-BP-5 Groundwater-Round-1

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

**III. Quality Control** (Continued)

Table I is a cross reference between client sample IDs and laboratory sample IDs.

**TABLE I**

| Knoxville ID | Richland ID | WHC ID | Test |
|---|---|---|---|
| AA6895 | 404320-01A | BOBNP1 | METALS-T |
| AA6896 | 404320-01B | " | ANIONS |
| AA6897 | 404320-01C | " | NO2NO3 |
| AA6898 | 404320-01D | " | ALKALINITY |
| AA6899 | 404320-01E | " | TDS |
| AA6900 | 404320-01F | " | SULFATE |
| AA6901 | 404320-01G | " | CYANIDE |
| AA6902 | 404320-02A | BOBNP2 | METALS-D |
| AA7287 | 404406-01A | BOBNN9 | METALS-T |
| AA7288 | 404406-01B | " | ANIONS |
| AA7289 | 404406-01C | " | NO2NO3 |
| AA7290 | 404406-01D | " | ALKALINITY |
| AA7291 | 404406-01E | " | TDS |
| AA7292 | 404406-01F | " | SULFATE |
| AA7293 | 404406-01G | " | CYANIDE |
| AA7301 | 404406-02A | BOBNP0 | METALS-D |

IT Corporation
June 16, 1994
Job Number: 428; 439; 455; 388; 418
Client Project ID: WHC SAF-94-130 200-BP-5 Groundwater-Round-1

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

**III. Quality Control** (Continued)

Table I is a cross reference between client sample IDs and laboratory sample IDs.

**TABLE I**

| Knoxville ID | Richland ID | WHC ID | Test |
|---|---|---|---|
| AA7294 | 404320-03A | BOBNM7 | METALS-T |
| AA7295 | 404320-03B | " | ANIONS |
| AA7296 | 404320-03C | " | NO2NO3 |
| AA7297 | 404320-03D | " | ALKALINITY |
| AA7298 | 404320-03E | " | TDS |
| AA7299 | 404320-03F | " | SULFATE |
| AA7300 | 404320-03G | " | CYANIDE |
| AA7302 | 404320-04A | BOBNM8 | METALS-D |

IT Corporation
June 16, 1994
Job Number: 428; 439; 455; 388; 418
Client Project ID: WHC SAF-94-130 200-BP-5 Groundwater-Round-1

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

## IV. Certification

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the laboratory manager or his designee, as verified by the following signature:

Reviewed and Approved:

Sheree' A. Schneider
Project Manager

CuR# 1486

Work Order No.: 388

# Condition Upon Receipt Variance Report

ITAS - KNOXVILLE Laboratory

Client: Westinghouse Hanford

Date: 4/20/94

Project No: 94-130

Initiated by: Bryan Blomquist

Analysis Requested: Cyanide

RFA/COC Numbers: 340387

Client Sample Numbers Affected: W0432001G

Condition/Variance (Check all that apply):

1. ☐ Not enough sample received for proper analysis. Received approximately: _____
2. ☐ Sample received broken/leaking.
3. ☑ Sample received without proper preservative.
   - ☐ Cooler temperature not within 4°C ± 2°C. Record temperature: _____
   - ☑ pH 10 should be >12
   - ☐ other: _____
4. ☐ Sample received in improper container.
5. ☐ Sample received without proper paperwork. Explain: _____
6. ☐ Paperwork received without sample.
7. ☐ No sample ID on sample container.
8. ☐ Custody tape disturbed/broken/missing.
9. ☐ Sample splits performed by lab.
10. ☐ Volatile sample received with approximately _____ mm headspace.
11. ☐ Sample ID on container does not match sample ID on paperwork. Explain: _____
12. ☐ All coolers on airbill not received with shipment.
13. ☐ Other (explain below): _____

Notes: _____

Corrective Action:

☐ Client's Name: _____ Informed verbally on: _____ By: _____

☐ Client's Name: _____ Informed in writing on: _____ By: _____

☐ Sample(s) processed "as is". Comments: _____

☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: Kerry R. Clemmer Date: 5/19/94

Project Management Review: _____ Date: _____

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNM5

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO428 SAS No.: _____ SDG No.: W0038_
Matrix (soil/water): WATER Lab Sample ID: AA7403
Level (low/med): LOW__ Date Received: 04/25/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum_ | 105 | B | | P |
| 7440-70-2 | Calcium__ | 86100 | | | P |
| 7439-89-6 | Iron_____ | 249 | | * | P |
| 7439-95-4 | Magnesium | 25300 | | | P |
| 7439-96-5 | Manganese | 4.0 | B | | P |
| 7440-09-7 | Potassium | 9000 | | | P |
| 7782-49-2 | Selenium_ | 8.9 | | S | F |
| 7440-23-5 | Sodium___ | 38200 | | | P |
| | Bismuth__ | 10.0 | U | | F |
| 7440-31-5 | Silicon__ | 16300 | | | P |
| 5955-70-0 | Cyanide__ | | | | NR |

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
TOTAL_____

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNM5

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO428 SAS No.: _____ SDG No.: W0038_
Matrix (soil/water): WATER Lab Sample ID: AA7409
Level (low/med): LOW__ Date Received: 04/25/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum_ | | | | NR |
| 7440-70-2 | Calcium__ | | | | NR |
| 7439-89-6 | Iron_____ | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium_ | | | | NR |
| 7440-23-5 | Sodium___ | | | | NR |
| | Bismuth__ | | | | NR |
| 7440-31-5 | Silicon__ | | | | NR |
| 5955-70-0 | Cyanide__ | 241 | | | AS |

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
TOTAL_CYANIDE_____

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNM6

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO428 SAS No.: _____ SDG No.: W0038_
Matrix (soil/water): WATER Lab Sample ID: AA7412
Level (low/med): LOW__ Date Received: 04/25/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P |
| 7440-70-2 | Calcium | 82300 | | | P |
| 7439-89-6 | Iron | 91.3 | B | | P |
| 7439-95-4 | Magnesium | 23900 | | | P |
| 7439-96-5 | Manganese | 2.0 | U | | P |
| 7440-09-7 | Potassium | 8230 | | | P |
| 7782-49-2 | Selenium | 10.3 | | | F |
| 7440-23-5 | Sodium | 35600 | | | P |
| | Bismuth | 10.0 | U | | F |
| 7440-31-5 | Silicon | 15300 | | | P |
| 5955-70-0 | Cyanide | | | | NR |

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____
Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:
DISSOLVED

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP3

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: WO428 SAS No.: SDG No.: W0038

Matrix (soil/water): WATER Lab Sample ID: AA7402

Level (low/med): LOW Date Received: 04/25/94

% Solids: 0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| | Bismuth | | | | NR |
| 7440-31-5 | Silicon | | | | NR |
| 5955-70-0 | Cyanide | 10.0 | U | | AS |

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

TOTAL CYANIDE

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP3

Lab Name: ITAS_KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: WO428 SAS No.: SDG No.: W0038

Matrix (soil/water): WATER Lab Sample ID: AA7396

Level (low/med): LOW Date Received: 04/25/94

% Solids: 0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P |
| 7440-70-2 | Calcium | 21100 | | | P |
| 7439-89-6 | Iron | 40.3 | B | * | P |
| 7439-95-4 | Magnesium | 6670 | | | P |
| 7439-96-5 | Manganese | 2.0 | U | | P |
| 7440-09-7 | Potassium | 3800 | B | | P |
| 7782-49-2 | Selenium | 2.6 | B | W | F |
| 7440-23-5 | Sodium | 24200 | | | P |
| | Bismuth | 10.0 | U | | F |
| 7440-31-5 | Silicon | 16200 | | | P |
| 5955-70-0 | Cyanide | | | | NR |

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

TOTAL

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP4

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: WO428 SAS No.: SDG No.: W0038
Matrix (soil/water): WATER Lab Sample ID: AA7411
Level (low/med): LOW Date Received: 04/25/94
% Solids: 0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 42.2 | B | | P |
| 7440-70-2 | Calcium | 20800 | | | P |
| 7439-89-6 | Iron | 31.8 | B | | P |
| 7439-95-4 | Magnesium | 6530 | | | P |
| 7439-96-5 | Manganese | 2.0 | U | | P |
| 7440-09-7 | Potassium | 4580 | B | | P |
| 7782-49-2 | Selenium | 2.9 | B | W | F |
| 7440-23-5 | Sodium | 23300 | | | P |
| | Bismuth | 10.0 | U | | F |
| 7440-31-5 | Silicon | 15900 | | | P |
| 5955-70-0 | Cyanide | | | | NR |

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
DISSOLVED

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP7

Lab Name: ITAS_KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: WO428 SAS No.: SDG No.: W0038
Matrix (soil/water): WATER Lab Sample ID: AA7395
Level (low/med): LOW Date Received: 04/25/94
% Solids: 0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| | Bismuth | | | | NR |
| 7440-31-5 | Silicon | | | | NR |
| 5955-70-0 | Cyanide | 10.0 | U | | AS |

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
TOTAL_CYANIDE

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP7

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: WO428 SAS No.: SDG No.: W0038

Matrix (soil/water): WATER Lab Sample ID: AA7389

Level (low/med): LOW Date Received: 04/25/94

% Solids: 0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P |
| 7440-70-2 | Calcium | 27500 | | | P |
| 7439-89-6 | Iron | 267 | | * | P |
| 7439-95-4 | Magnesium | 8220 | | | P |
| 7439-96-5 | Manganese | 5.9 | B | | P |
| 7440-09-7 | Potassium | 4570 | B | | P |
| 7782-49-2 | Selenium | 3.1 | B | W | F |
| 7440-23-5 | Sodium | 21900 | | | P |
| | Bismuth | 10.0 | U | | F |
| 7440-31-5 | Silicon | 15300 | | | P |
| 5955-70-0 | Cyanide | | | | NR |

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

TOTAL

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP8

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO428 SAS No.: _____ SDG No.: W0038_
Matrix (soil/water): WATER Lab Sample ID: AA7410
Level (low/med): LOW__ Date Received: 04/25/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum_ | 40.0 | U | | P |
| 7440-70-2 | Calcium__ | 27600 | | | P |
| 7439-89-6 | Iron____ | 10.6 | B | | P |
| 7439-95-4 | Magnesium | 8170 | | | P |
| 7439-96-5 | Manganese | 2.0 | U | | P |
| 7440-09-7 | Potassium | 4840 | B | | P |
| 7782-49-2 | Selenium_ | 2.0 | U | W | F |
| 7440-23-5 | Sodium___ | 21600 | | | P |
| | Bismuth__ | 10.0 | U | | F |
| 7440-31-5 | Silicon__ | 15200 | | | P |
| 5955-70-0 | Cyanide__ | | | | NR |
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Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
DISSOLVED_____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP5

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO439 SAS No.: _____ SDG No.: WO038_
Matrix (soil/water): WATER Lab Sample ID: AA7571
Level (low/med): LOW__ Date Received: 04/27/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum_ | 40.0 | U | | P |
| 7440-70-2 | Calcium__ | 16000 | | | P |
| 7439-89-6 | Iron____ | 34.3 | B | * | P |
| 7439-95-4 | Magnesium | 4660 | B | | P |
| 7439-96-5 | Manganese | 37.6 | | | P |
| 7440-09-7 | Potassium | 6480 | | | P |
| 7782-49-2 | Selenium_ | 2.0 | U | | F |
| 7440-23-5 | Sodium___ | 31700 | | | P |
| | Bismuth__ | 10.0 | U | | F |
| 7440-31-5 | Silicon__ | 16900 | | | P |
| 5955-70-0 | Cyanide__ | | | | NR |
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Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
TOTAL_____

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP5

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: WO439 SAS No.: SDG No.: WO038

Matrix (soil/water): WATER Lab Sample ID: AA7577

Level (low/med): LOW Date Received: 04/27/94

% Solids: 0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| | Bismuth | | | | NR |
| 7440-31-5 | Silicon | | | | NR |
| 5955-70-0 | Cyanide | 10.0 | U | | AS |

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

TOTAL CYANIDE

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP6

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: WO439 SAS No.: SDG No.: WO038

Matrix (soil/water): WATER Lab Sample ID: AA7585

Level (low/med): LOW Date Received: 04/27/94

% Solids: 0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P |
| 7440-70-2 | Calcium | 16800 | | | P |
| 7439-89-6 | Iron | 20.3 | B | | P |
| 7439-95-4 | Magnesium | 4870 | B | | P |
| 7439-96-5 | Manganese | 38.5 | | | P |
| 7440-09-7 | Potassium | 7270 | | | P |
| 7782-49-2 | Selenium | 2.0 | U | | F |
| 7440-23-5 | Sodium | 33200 | | | P |
| | Bismuth | 10.0 | U | | F |
| 7440-31-5 | Silicon | 17800 | | | P |
| 5955-70-0 | Cyanide | | | | NR |

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

DISSOLVED

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBRL3

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO439 SAS No.: _____ SDG No.: WO038_
Matrix (soil/water): WATER Lab Sample ID: AA7584
Level (low/med): LOW__ Date Received: 04/27/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum_ | | | | NR |
| 7440-70-2 | Calcium__ | | | | NR |
| 7439-89-6 | Iron_____ | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium_ | | | | NR |
| 7440-23-5 | Sodium___ | | | | NR |
| | Bismuth__ | | | | NR |
| 7440-31-5 | Silicon__ | | | | NR |
| 5955-70-0 | Cyanide__ | 10.0 | U | | AS |

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
TOTAL_CYANIDE_____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBRL3

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: WO439 SAS No.: SDG No.: WO038
Matrix (soil/water): WATER Lab Sample ID: AA7578
Level (low/med): LOW Date Received: 04/27/94
% Solids: 0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P |
| 7440-70-2 | Calcium | 104 | B | | P |
| 7439-89-6 | Iron | 10.0 | U | * | P |
| 7439-95-4 | Magnesium | 30.0 | U | | P |
| 7439-96-5 | Manganese | 2.0 | U | | P |
| 7440-09-7 | Potassium | 1400 | B | | P |
| 7782-49-2 | Selenium | 2.0 | U | | F |
| 7440-23-5 | Sodium | 205 | B | | P |
| | Bismuth | 10.0 | U | | F |
| 7440-31-5 | Silicon | 73.4 | B | | P |
| 5955-70-0 | Cyanide | | | | NR |

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
TOTAL

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBRL4

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO439 SAS No.: _____ SDG No.: WO038_
Matrix (soil/water): WATER Lab Sample ID: AA7587
Level (low/med): LOW__ Date Received: 04/27/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P |
| 7440-70-2 | Calcium | 56.5 | B | | P |
| 7439-89-6 | Iron | 12.2 | B | | P |
| 7439-95-4 | Magnesium | 30.0 | U | | P |
| 7439-96-5 | Manganese | 2.0 | U | | P |
| 7440-09-7 | Potassium | 1000 | U | | P |
| 7782-49-2 | Selenium | 2.0 | U | | F |
| 7440-23-5 | Sodium | 100 | B | | P |
| | Bismuth | 10.0 | U | | F |
| 7440-31-5 | Silicon | 40.4 | B | | P |
| 5955-70-0 | Cyanide | | | | NR |

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
DISSOLVED

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNN1

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: W0455 SAS No.: _______ SDG No.: W0038_
Matrix (soil/water): WATER Lab Sample ID: AA7812
Level (low/med): LOW__ Date Received: 04/29/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum_ | 40.0 | B | | P_ |
| 7440-70-2 | Calcium__ | 52700 | _ | | P_ |
| 7439-89-6 | Iron | 729 | _ | * | P_ |
| 7439-95-4 | Magnesium | 16300 | _ | | P_ |
| 7439-96-5 | Manganese | 18.4 | _ | | P_ |
| 7440-09-7 | Potassium | 8350 | _ | | P_ |
| 7782-49-2 | Selenium_ | 4.6 | B | S | F_ |
| 7440-23-5 | Sodium | 25200 | _ | | P_ |
| | Bismuth__ | 10.0 | U | | F_ |
| 7440-31-5 | Silicon__ | 15700 | _ | | P_ |
| 5955-70-0 | Cyanide__ | | _ | | NR |

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: ______
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: ______

Comments:
TOTAL

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNN1

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO455 SAS No.: _____ SDG No.: W0038_
Matrix (soil/water): WATER Lab Sample ID: AA7818
Level (low/med): LOW__ Date Received: 04/29/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| | Bismuth | | | | NR |
| 7440-31-5 | Silicon | | | | NR |
| 5955-70-0 | Cyanide | 28.0 | | | AS |
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Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
TOTAL_CYANIDE_____

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNN2

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: WO455 SAS No.: SDG No.: W0038

Matrix (soil/water): WATER Lab Sample ID: AA7826

Level (low/med): LOW Date Received: 04/29/94

% Solids: 0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P |
| 7440-70-2 | Calcium | 50300 | | | P |
| 7439-89-6 | Iron | 92.3 | B | | P |
| 7439-95-4 | Magnesium | 15700 | | | P |
| 7439-96-5 | Manganese | 11.8 | B | | P |
| 7440-09-7 | Potassium | 7750 | | | P |
| 7782-49-2 | Selenium | 3.2 | B | S | F |
| 7440-23-5 | Sodium | 24400 | | | P |
| | Bismuth | 10.0 | U | | F |
| 7440-31-5 | Silicon | 15200 | | | P |
| 5955-70-0 | Cyanide | | | | NR |

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

DISSOLVED

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBRL7

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO455 SAS No.: _____ SDG No.: W0038_
Matrix (soil/water): WATER Lab Sample ID: AA7825
Level (low/med): LOW__ Date Received: 04/29/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum_ | | _ | | NR |
| 7440-70-2 | Calcium__ | | _ | | NR |
| 7439-89-6 | Iron_____ | | _ | | NR |
| 7439-95-4 | Magnesium | | _ | | NR |
| 7439-96-5 | Manganese | | _ | | NR |
| 7440-09-7 | Potassium | | _ | | NR |
| 7782-49-2 | Selenium_ | | _ | | NR |
| 7440-23-5 | Sodium___ | | _ | | NR |
| | Bismuth__ | | _ | | NR |
| 7440-31-5 | Silicon__ | | _ | | NR |
| 5955-70-0 | Cyanide__ | 47.0 | _ | | AS |
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Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
TOTAL_CYANIDE_____

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBRL7

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: WO455 SAS No.: SDG No.: W0038
Matrix (soil/water): WATER Lab Sample ID: AA7819
Level (low/med): LOW Date Received: 04/29/94
% Solids: 0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P |
| 7440-70-2 | Calcium | 52300 | | | P |
| 7439-89-6 | Iron | 51.1 | B | * | P |
| 7439-95-4 | Magnesium | 14800 | | | P |
| 7439-96-5 | Manganese | 2.0 | U | | P |
| 7440-09-7 | Potassium | 7170 | | | P |
| 7782-49-2 | Selenium | 5.4 | | S | F |
| 7440-23-5 | Sodium | 22300 | | | P |
| | Bismuth | 10.0 | U | | F |
| 7440-31-5 | Silicon | 16700 | | | P |
| 5955-70-0 | Cyanide | | | | NR |

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
TOTAL

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBRL8

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: WO455 SAS No.: SDG No.: W0038
Matrix (soil/water): WATER Lab Sample ID: AA7827
Level (low/med): LOW Date Received: 04/29/94
% Solids: 0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P |
| 7440-70-2 | Calcium | 60000 | | | P |
| 7439-89-6 | Iron | 60.7 | B | | P |
| 7439-95-4 | Magnesium | 17000 | | | P |
| 7439-96-5 | Manganese | 2.0 | U | | P |
| 7440-09-7 | Potassium | 8410 | | | P |
| 7782-49-2 | Selenium | 5.7 | | S | F |
| 7440-23-5 | Sodium | 25700 | | | P |
| | Bismuth | 10.0 | U | | F |
| 7440-31-5 | Silicon | 19400 | | | P |
| 5955-70-0 | Cyanide | | | | NR |

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
DISSOLVED

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP1

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___

Lab Code: ITSTU_ Case No.: WO388 SAS No.: _____ SDG No.: ~~W0027~~ W00038

Matrix (soil/water): WATER Lab Sample ID: AA6895

Level (low/med): LOW__ Date Received: 04/19/94

% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 42.5 | B | | P |
| 7440-70-2 | Calcium | 26200 | | | P |
| 7439-89-6 | Iron | 72.7 | B | | P |
| 7439-95-4 | Magnesium | 8310 | | | P |
| 7439-96-5 | Manganese | 2.5 | B | | P |
| 7440-09-7 | Potassium | 4860 | B | | P |
| 7782-49-2 | Selenium | 2.0 | U | | F |
| 7440-23-5 | Sodium | 23900 | | | P |
| 7440-31-5 | Silicon | 17300 | | | P |
| | Bismuth | 10.0 | U | | F |
| 5955-70-0 | Cyanide | | | | NR |

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

TOTAL _____

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP1 W0038

Lab Name: ITAS_KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: WO388 SAS No.: SDG No.: ~~W0027~~ Use 6/7/94

Matrix (soil/water): WATER Lab Sample ID: AA6901

Level (low/med): LOW Date Received: 04/19/94

% Solids: 0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-31-5 | Silicon | | | | NR |
| | Bismuth | | | | NR |
| 5955-70-0 | Cyanide | 10.0 | U | | AS |

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: Clarity After: CLEAR Artifacts:

Comments:

CYANIDE_ONLY

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP2

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___ SDG No.: W0038

Lab Code: ITSTU_ Case No.: WO388 SAS No.: _____ ~~W0027~~ 6/7/94

Matrix (soil/water): WATER Lab Sample ID: AA6902

Level (low/med): LOW__ Date Received: 04/19/94

% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P |
| 7440-70-2 | Calcium | 26600 | | | P |
| 7439-89-6 | Iron | 19.4 | B | | P |
| 7439-95-4 | Magnesium | 8490 | | | P |
| 7439-96-5 | Manganese | 2.0 | U | | P |
| 7440-09-7 | Potassium | 4610 | B | | P |
| 7782-49-2 | Selenium | 2.0 | U | | F |
| 7440-23-5 | Sodium | 24500 | | | P |
| 7440-31-5 | Silicon | 17700 | | | P |
| | Bismuth | 10.0 | U | | F |
| 5955-70-0 | Cyanide | | | | NR |

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

DISSOLVED

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNM7

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: WO418 SAS No.: SDG No.: ~~WO027~~ W00038 JDR 6/7/97

Matrix (soil/water): WATER Lab Sample ID: AA7294

Level (low/med): LOW Date Received: 04/22/94

% Solids: 0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 651 | | | P |
| 7440-70-2 | Calcium | 35000 | | | P |
| 7439-89-6 | Iron | 5450 | | | P |
| 7439-95-4 | Magnesium | 9430 | | | P |
| 7439-96-5 | Manganese | 962 | | | P |
| 7440-09-7 | Potassium | 9670 | | | P |
| 7782-49-2 | Selenium | 2.0 | U | | F |
| 7440-23-5 | Sodium | 46300 | | | P |
| 7440-31-5 | Silicon | 9850 | | | P |
| | Bismuth | 10.0 | U | | F |
| 5955-70-0 | Cyanide | 10.0 | U | | AS |

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

TOTAL METALS

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNM8

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___ SDG No.: ~~W0027~~ W0038 10/7/94

Lab Code: ITSTU_ Case No.: WO418 SAS No.: _____

Matrix (soil/water): WATER Lab Sample ID: AA7302

Level (low/med): LOW__ Date Received: 04/22/94

% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P |
| 7440-70-2 | Calcium | 35700 | | | P |
| 7439-89-6 | Iron | 19.1 | B | | P |
| 7439-95-4 | Magnesium | 9240 | | | P |
| 7439-96-5 | Manganese | 674 | | | P |
| 7440-09-7 | Potassium | 9070 | | | P |
| 7782-49-2 | Selenium | 2.0 | U | | F |
| 7440-23-5 | Sodium | 47800 | | | P |
| 7440-31-5 | Silicon | 8740 | | | P |
| | Bismuth | 10.0 | U | | F |
| 5955-70-0 | Cyanide | | | | NR |

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

DISSOLVED_METALS

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNN9

W0038

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___

Lab Code: ITSTU_ Case No.: WO418 SAS No.: _____ SDG No.: ~~W0027~~ JDK 6/7/94

Matrix (soil/water): WATER Lab Sample ID: AA7287

Level (low/med): LOW__ Date Received: 04/22/94

% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P |
| 7440-70-2 | Calcium | 68400 | | | P |
| 7439-89-6 | Iron | 233 | | | P |
| 7439-95-4 | Magnesium | 19900 | | | P |
| 7439-96-5 | Manganese | 31.8 | | | P |
| 7440-09-7 | Potassium | 7610 | | | P |
| 7782-49-2 | Selenium | 11.1 | | | F |
| 7440-23-5 | Sodium | 26200 | | | P |
| 7440-31-5 | Silicon | 14300 | | | P |
| | Bismuth | 10.0 | U | | F |
| 5955-70-0 | Cyanide | 88.0 | | | AS |

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

TOTAL_METALS_____

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP0

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___

Lab Code: ITSTU_ Case No.: WO418 SAS No.: _____ SDG No.: ~~WO027~~ W0038

Matrix (soil/water): WATER Lab Sample ID: AA7301

Level (low/med): LOW__ Date Received: 04/22/94

% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P |
| 7440-70-2 | Calcium | 58000 | | | P |
| 7439-89-6 | Iron | 59.4 | B | | P |
| 7439-95-4 | Magnesium | 17300 | | | P |
| 7439-96-5 | Manganese | 36.2 | | | P |
| 7440-09-7 | Potassium | 6410 | | | P |
| 7782-49-2 | Selenium | 10 | | | F |
| 7440-23-5 | Sodium | 22500 | | | P |
| 7440-31-5 | Silicon | 11700 | | | P |
| | Bismuth | 10.0 | U | W | F |
| 5955-70-0 | Cyanide | | | | NR |

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

DISSOLVED_METALS_____

# ALKALINITY ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 428 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/02/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6143 | 2 | U |
| BOBNM5 | AA7406 | 96 | + |
| BOBNP3 | AA7399 | 106 | + |
| BOBNP7 | AA7392 | 108 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

# ALKALINITY ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 439 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/02/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6143 | 2 | U |
| BOBRL3 | AA7581 | 10 | + |
| BOBNP5 | AA7574 | 132 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## ALKALINITY ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 455 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/02/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6144 | 2 | U |
| Method Blank | P6145 | 2 | U |
| BOBRL7 | AA7822 | 110 | + |
| BOBNN1 | AA7815 | 104 | + |

Method Blank P6144 applies to sample: BOBRL7
Method Blank P6145 applies to samples: BOBNN1

\+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## ALKALINITY ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 388 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 04/26/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6157 | 2 | U |
| BOBNP1 | AA6898 | 96 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## ALKALINITY ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 418 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/02/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6143 | 2 | U |
| BOBNN9 | AA7290 | 98 | + |
| BOBNM7 | AA7297 | 100 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## SULFATE ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 439 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/05/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6200 | 5.0 | U |
| BOBRL3 | AA7583 | 5.5 | + |
| BOBNP5 | AA7576 | 12 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## SULFATE ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 428 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/02/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6180 | 5.0 | U |
| BOBNM5 | AA7408 | 166 | + |
| BOBNP3 | AA7401 | 34 | + |
| BOBNP7 | AA7394 | 44 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## SULFATE ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 388 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/02/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6180 | 5.0 | U |
| BOBNP1 | AA6900 | 40 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## SULFATE ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 418 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/02/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6180 | 5.0 | U |
| BOBNN9 | AA7292 | 108 | + |
| BOBNM7 | AA7299 | 108 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## NITRATE/NITRITE ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 439 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/17/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6205 | 0.02 | U |
| BOBNP5 | AA7573 | 0.03 | + |
| BOBRL3 | AA7580 | 0.02 | U |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## NITRATE/NITRITE ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 455 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/18/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6212 | 0.02 | U |
| BOBNN1 | AA7814 | 9.23 | + |
| BOBRL7 | AA7821 | 9.46 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## NITRATE/NITRITE ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 428 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/17/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6205 | 0.02 | U |
| BOBNP7 | AA7391 | 6.7 | + |
| BOBNP3 | AA7398 | 0.78 | + |
| BOBNM5 | AA7405 | 48 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## NITRATE/NITRITE ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 388 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/11/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6178 | 0.02 | U |
| BOBNP1 | AA6897 | 4.7 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## NITRATE/NITRITE ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 418 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/17/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6205 | 0.02 | U |
| BOBNN9 | AA7289 | 27 | + |
| BOBNM7 | AA7296 | 0.02 | U |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## TOTAL DISSOLVED SOLIDS ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 439 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 04/29/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6171 | 1.0 | U |
| BOBNP5 | AA7575 | 165 | + |
| BOBRL3 | AA7582 | 15 | + |

\+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## TOTAL DISSOLVED SOLIDS ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 455 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/02/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6169 | 1.0 | U |
| BOBRL7 | AA7823 | 370 | + |
| BOBNN1 | AA7816 | 362 | + |

\+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## TOTAL DISSOLVED SOLIDS ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 428 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 04/27/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6131 | 1.0 | U |
| Method Blank | P6118 | 1.0 | U |
| BOBNP7 | AA7393 | 382 | + |
| BOBNP3 | AA7400 | 3080 | + |
| BOBNM5 | AA7407 | 600 | + |

Method Blank P6131 applies to sample: BOBNP7
Method Blank P6118 applies to samples: BOBNP3 and BOBNM5

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

# TOTAL DISSOLVED SOLIDS ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 388 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 04/21/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6104 | 1.0 | U |
| BOBNP1 | AA6899 | 264 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

# TOTAL DISSOLVED SOLIDS ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 418 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 04/25/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6114 | 1.0 | U |
| BOBNN9 | AA7291 | 472 | + |
| BOBNM7 | AA7298 | 323 | + |

\+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

# ANION ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 428 |
| Client Sample ID: | BOBNP3 | Preparation Date: | 05/18/94 |
| Lab Sample ID: | AA7397 | Analysis Date: | 05/18/94 |
| Sample Matrix: | Water | Concentration Units: | mg/l |

| Compound | Result | Qualifier | Detection Limit |
|---|---|---|---|
| fluoride | 0.95 | + | 0.40 |
| chloride | 7.0 | + | 0.80 |
| nitrite | 0.40 | U | 0.40 |
| phosphate | 1.0 | U | 1.0 |
| sulfate | 27 | + | 1.5 |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## ANION ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 428 |
| Client Sample ID: | BOBNM5 | Preparation Date: | 05/18/94 |
| Lab Sample ID: | AA7404 | Analysis Date: | 05/18/94 |
| Sample Matrix: | Water | Concentration Units: | mg/l |

| Compound | Result | Qualifier | Detection Limit |
|---|---|---|---|
| fluoride | 0.40 | U | 0.40 |
| chloride | 21 | + | 2.0 |
| nitrite | 0.40 | U | 0.40 |
| phosphate | 1.0 | U | 1.0 |
| sulfate | 180 | + | 15 |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## ANION ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 428 |
| Client Sample ID: | BOBNP7 | Preparation Date: | 05/18/94 |
| Lab Sample ID: | AA7390 | Analysis Date: | 05/18/94 |
| Sample Matrix: | Water | Concentration Units: | mg/l |

| Compound | Result | Qualifier | Detection Limit |
|---|---|---|---|
| fluoride | 0.82 | + | 0.40 |
| chloride | 9.0 | + | 2.0 |
| nitrite | 0.40 | U | 0.40 |
| phosphate | 1.0 | U | 1.0 |
| sulfate | 38 | + | 7.5 |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

# ANION ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 439 |
| Client Sample ID: | BOBNP5 | Preparation Date: | 05/18/94 |
| Lab Sample ID: | AA7572 | Analysis Date: | 05/18/94 |
| Sample Matrix: | Water | Concentration Units: | mg/l |

| Compound | Result | Qualifier | Detection Limit |
|---|---|---|---|
| fluoride | 2.4 | + | 0.40 |
| chloride | 7.0 | + | 0.8 |
| nitrite | 0.40 | U | 0.40 |
| phosphate | 1.0 | U | 1.0 |
| sulfate | 13 | + | 1.5 |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## ANION ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 439 |
| Client Sample ID: | BOBRL3 | Preparation Date: | 05/18/94 |
| Lab Sample ID: | AA7579 | Analysis Date: | 05/18/94 |
| Sample Matrix: | Water | Concentration Units: | mg/l |

| Compound | Result | Qualifier | Detection Limit |
|---|---|---|---|
| fluoride | 0.40 | U | 0.40 |
| chloride | 0.40 | U | 0.40 |
| nitrite | 0.40 | U | 0.40 |
| phosphate | 1.0 | U | 1.0 |
| sulfate | 1.5 | U | 1.5 |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## ANION ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 455 |
| Client Sample ID: | BOBNN1 | Preparation Date: | 05/18/94 |
| Lab Sample ID: | AA7813 | Analysis Date: | 05/18/94 |
| Sample Matrix: | Water | Concentration Units: | mg/l |

| Compound | Result | Qualifier | Detection Limit |
|---|---|---|---|
| fluoride | 0.50 | + | 0.40 |
| chloride | 27 | + | 4.0 |
| nitrite | 0.40 | U | 0.40 |
| phosphate | 1.0 | U | 1.0 |
| sulfate | 150 | + | 15 |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

# ANION ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 455 |
| Client Sample ID: | BOBRL7 | Preparation Date: | 05/18/94 |
| Lab Sample ID: | AA7820 | Analysis Date: | 05/18/94 |
| Sample Matrix: | Water | Concentration Units: | mg/l |

| Compound | Result | Qualifier | Detection Limit |
|---|---|---|---|
| fluoride | 0.51 | + | 0.40 |
| chloride | 20 | + | 4.0 |
| nitrite | 0.40 | U | 0.40 |
| phosphate | 1.0 | U | 1.0 |
| sulfate | 110 | + | 15 |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

# ANION ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 388 |
| Client Sample ID: | BOBNP1 | Preparation Date: | 05/13/94 |
| Lab Sample ID: | AA6896 | Analysis Date: | 05/13/94 |
| Sample Matrix: | Water | Concentration Units: | mg/l |

| Compound | Result | Qualifier | Detection Limit |
|---|---|---|---|
| fluoride | 0.6 | + | 0.40 |
| sulfate | 35 | + | 7.5 |

+ - Positive result.

# ANION ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 418 |
| Client Sample ID: | BOBNN9 | Preparation Date: | 05/16/94 |
| Lab Sample ID: | AA7288 | Analysis Date: | 05/16/94 |
| Sample Matrix: | Water | Concentration Units: | mg/l |

| Compound | Result | Qualifier | Detection Limit |
|---|---|---|---|
| fluoride | 0.40 | U | 0.40 |
| sulfate | 130 | + | 7.5 |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## ANION ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 418 |
| Client Sample ID: | BOBNM7 | Preparation Date: | 05/16/94 |
| Lab Sample ID: | AA7295 | Analysis Date: | 05/16/94 |
| Sample Matrix: | Water | Concentration Units: | mg/l |

| Compound | Result | Qualifier | Detection Limit |
|---|---|---|---|
| fluoride | 0.7 | + | 0.40 |
| sulfate | 120 | + | 7.5 |

+ - Positive result.

INTERNATIONAL TECHNOLOGY CORPORATION

# CERTIFICATE OF ANALYSIS

Westinghouse Hanford Company
P.O. Box 1970
Richland, WA 99352

June 14, 1994

Attention: J.A.Lerch

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| | | |
|---|---|---|
| SAF Number | : | 94-130 |
| Date SDG Closed | : | April 27, 1994 |
| Number of Samples | : | Ten (10) |
| Sample Type | : | Water |
| SDG Number | : | W0038 |
| Data Deliverable | : | Stand Alone |

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## I. Introduction

On April 18, 21, 22, 25, and 27, 1994, ten water samples were received by ITAS-Richland for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the WHC specific IDs:

| ITAS-Richland ID | WHC ID | Matrix | Date of Receipt |
|---|---|---|---|
| 404321-01A | B0BNP1 | Water | 4/18/94 |
| 404407-01A | B0BNN9 | Water | 4/21/94 |
| 404407-02A | B0BNM7 | Water | 4/21/94 |
| 404428-01A | B0BNP7 | Water | 4/22/94 |
| 404428-02A | B0BNP3 | Water | 4/22/94 |
| 404428-03A | B0BNM5 | Water | 4/22/94 |
| 404459-01A | B0BNP5 | Water | 4/25/94 |
| 404459-02A | B0BRL3 | Water | 4/25/94 |
| 404496-01A | B0BNN1 | Water | 4/27/94 |
| 404496-02A | B0BRL7 | Water | 4/27/94 |

## II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were:

**Alpha Spectroscopy**
Plutonium-238, -239/40 by method ITAS-RD-3209
**Gamma Spectroscopy**
Gamma Scan by method ITAS-RD-3219
**Gas Proportional Counting**
Gross Alpha by method ITAS-RD-3222
Gross Beta by method ITAS-RD-3222
Strontium-90 by method ITAS-RD-3204
**Liquid Scintillation Counting**
Technetium-99 by method ITAS-IT-RS-0001
Tritium by method ITAS-RD-3205
**Total Uranium**
Total Uranium by method ITAS-RD-4200

## III. Quality Control

The analytical results for each analysis performed under SDG W0038 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate. Any exceptions have been noted in the "Comments" section.

Quality control sample results are reported in the same units as sample results.

## IV. Comments

Results from the initial radioactivity screening of these samples classified them as Category I.

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**Alpha Spectroscopy**

Plutonium-238, -239/40 by method ITAS-RD-3209
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BNP3) results are within contractual limits.

**Gamma Spectroscopy**

Gamma Scan by method ITAS-RD-3219
The detection limit for Eu-152 was not met on the first count of samples (B0BNN9) and (B0BNP5). The detection limits were achieved for all analytes on the recount. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BNP7) results are within contractual limits.

**Gas Proportional Counting**

Gross Alpha by method ITAS-RD-3222
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BNM5) results are within contractual limits.

Gross Beta by method ITAS-RD-3222
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BNM5) results are within contractual limits.

Strontium-90 by method ITAS-RD-3204
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BNM7) results are within contractual requirements.

**Liquid Scintillation Counting**
Technetium-99 by method ITAS-IT-RS-0001
One matrix spike was analyzed with this batch. The total propagated uncertainty on the matrix spike result is approximately equivalent to the spike level due to the high level of sample activity (matrix effect). The matrix spike is accepted and reported with the low resultant spike yield (49.2%). The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BNM7) results are within contractual requirements.

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Tritium by method ITAS-RD-3205
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BNN9) results are within contractual requirements.

**Total Uranium**

Total Uranium by method ITAS-RD-4200
The sample batch was reanalyzed due to quality control sample failure. The reanalysis results are accepted and reported. Two matrix spikes were analyzed with the batch. No matrix spike yield correction of the sample results was performed. The LCS, batch blank, sample and sample duplicate (duplicate of B0BRL3) results are within contractual requirements.

I certify that this Certificate of Analysis 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.

Reviewed and approved:

Suzanne Gaines

Suzanne Gaines
Project Manager

IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

SAMPLE RESULTS

| | | | |
|---|---|---|---|
| LAB NAME: | ITAS-RICHLAND | SDG NO.: | W0038 |
| LAB SAMPLE ID: | 40432101 | MATRIX: | WATER |
| WHC ID: | B0BNP1 | DATE RECEIVED: | 4/19/94 |
| REPORTING UNITS: | pCi/L & ug/g | | |

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| PU239/40 | 1.22E-01 | 1.73E-01 | 1.74E-01 | 1.65E-01 | 0.682 | RD3209 |
| PU-238 | -1.22E-02 | 2.45E-02 | 2.45E-02 | 2.93E-01 | 0.682 | RD3209 |
| CO-60 | -4.53E+00 | 6.10E+00 | 6.11E+00 | 9.46E+00 | N/A | RD3219 |
| FE-59 | -3.00E+00 | 1.53E+01 | 1.53E+01 | 2.65E+01 | N/A | RD3219 |
| EU-152 | 3.25E+00 | 1.66E+01 | 1.66E+01 | 3.54E+01 | N/A | RD3219 |
| CO-58 | -3.46E+00 | 4.48E+00 | 4.50E+00 | 7.32E+00 | N/A | RD3219 |
| CS-137DA | 0.00E+00 | 4.26E+00 | 4.26E+00 | N/A | N/A | RD3219 |
| RU-106DA | 3.24E+01 | 3.51E+01 | 3.52E+01 | 7.45E+01 | N/A | RD3219 |
| EU-155 | -3.16E+00 | 8.76E+00 | 8.77E+00 | 1.40E+01 | N/A | RD3219 |
| EU-154 | -4.48E+00 | 9.92E+00 | 9.93E+00 | 1.75E+01 | N/A | RD3219 |
| ALPHA | 2.96E+00 | 1.17E+00 | 1.22E+00 | 1.19E+00 | 1 | RD3222 |
| BETA | 2.11E+01 | 2.60E+00 | 3.00E+00 | 3.02E+00 | 1 | RD3222 |
| TOTAL-SR | -7.61E-02 | 2.67E-01 | 2.68E-01 | 7.86E-01 | 0.968 | RD3204 |
| TC-99 | 4.99E+01 | 1.58E+00 | 8.79E+00 | 2.15E+00 | 0.951 | ITAS-IT-RS-0001 |
| TRITIUM | 7.44E+04 | 7.48E+02 | 5.55E+03 | 2.34E+02 | 0.973 | RD3205 |
| URANIUM | 3.84E+00 | N/A | 5.76E-01 | 3.54E-03 | 1 | RD4200 |

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SAMPLE RESULTS

| | | | |
|---|---|---|---|
| **LAB NAME:** | ITAS-RICHLAND | **SDG NO.:** | W0038 |
| **LAB SAMPLE ID:** | 40440701 | **MATRIX:** | WATER |
| **WHC ID:** | B0BNN9 | **DATE RECEIVED:** | 4/21/94 |
| **REPORTING UNITS:** | pCi/L & ug/g | | |

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| PU239/40 | -4.27E-02 | 4.27E-02 | 4.31E-02 | 3.66E-01 | 0.781 | RD3209 |
| PU-238 | -2.14E-02 | 3.02E-02 | 3.04E-02 | 3.02E-01 | 0.781 | RD3209 |
| CO-60 | 5.04E+01 | 7.60E+00 | 9.12E+00 | N/A | N/A | RD3219 |
| FE-59 | 5.79E+00 | 1.16E+01 | 1.16E+01 | 2.18E+01 | N/A | RD3219 |
| EU-152 | -5.80E+00 | 1.17E+01 | 1.17E+01 | 2.03E+01 | N/A | RD3219 |
| CO-58 | -6.07E-01 | 4.57E+00 | 4.57E+00 | 8.03E+00 | N/A | RD3219 |
| CS-137DA | 1.22E+00 | 3.13E+00 | 3.14E+00 | 5.69E+00 | N/A | RD3219 |
| RU-106DA | 2.55E+01 | 2.75E+01 | 2.76E+01 | 5.19E+01 | N/A | RD3219 |
| EU-155 | -3.32E+00 | 6.55E+00 | 6.56E+00 | 1.01E+01 | N/A | RD3219 |
| EU-154 | -2.67E+00 | 9.82E+00 | 9.82E+00 | 1.74E+01 | N/A | RD3219 |
| ALPHA | 3.98E+00 | 1.66E+00 | 1.70E+00 | 1.69E+00 | 1 | RD3222 |
| BETA | 4.31E+02 | 1.04E+01 | 3.20E+01 | 3.19E+00 | 1 | RD3222 |
| TOTAL-SR | 4.43E-02 | 3.19E-01 | 3.19E-01 | 8.87E-01 | 0.794 | RD3204 |
| TC-99 | 2.10E+03 | 8.35E+00 | 2.31E+02 | 2.15E+00 | 0.951 | ITAS-IT-RS-0001 |
| TRITIUM | 5.72E+03 | 2.28E+02 | 5.66E+02 | 2.34E+02 | 0.973 | RD3205 |
| URANIUM | 4.42E+00 | N/A | 6.62E-01 | 3.54E-03 | 1 | RD4200 |

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SAMPLE RESULTS

| | | | |
|---|---|---|---|
| LAB NAME: | ITAS-RICHLAND | SDG NO.: | W0038 |
| LAB SAMPLE ID: | 40440702 | MATRIX: | WATER |
| WHC ID: | B0BNM7 | DATE RECEIVED: | 4/21/94 |
| REPORTING UNITS: | pCi/L & ug/g | | |

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| PU239/40 | 9.94E-02 | 1.58E-01 | 1.59E-01 | 2.64E-01 | 0.754 | RD3209 |
| PU-238 | 0.00E+00 | 0.00E+00 | 1.66E-01 | 1.50E-01 | 0.754 | RD3209 |
| CO-60 | 5.47E+00 | 4.89E+00 | 4.92E+00 | 1.16E+01 | N/A | RD3219 |
| FE-59 | -1.50E+01 | 1.69E+01 | 1.70E+01 | 2.55E+01 | N/A | RD3219 |
| EU-152 | -7.99E+00 | 2.13E+01 | 2.13E+01 | 3.65E+01 | N/A | RD3219 |
| CO-58 | -1.53E+00 | 5.78E+00 | 5.78E+00 | 1.04E+01 | N/A | RD3219 |
| CS-137DA | 3.98E+00 | 3.97E+00 | 3.99E+00 | 8.71E+00 | N/A | RD3219 |
| RU-106DA | -6.63E+00 | 3.75E+01 | 3.75E+01 | 6.59E+01 | N/A | RD3219 |
| EU-155 | -2.93E+00 | 9.53E+00 | 9.53E+00 | 1.58E+01 | N/A | RD3219 |
| EU-154 | -8.85E+00 | 1.27E+01 | 1.27E+01 | 2.11E+01 | N/A | RD3219 |
| ALPHA | 2.25E+00 | 1.27E+00 | 1.29E+00 | 1.73E+00 | 1 | RD3222 |
| BETA | 1.01E+01 | 2.04E+00 | 2.16E+00 | 3.00E+00 | 1 | RD3222 |
| TOTAL-SR | 1.28E-01 | 2.69E-01 | 2.71E-01 | 7.65E-01 | 0.942 | RD3204 |
| TC-99 | 2.74E+00 | 9.70E-01 | 4.36E+00 | 2.15E+00 | 0.951 | ITAS-IT-RS-0001 |
| TRITIUM | 1.14E+02 | 1.04E+02 | 1.96E+02 | 2.34E+02 | 0.973 | RD3205 |
| URANIUM | 1.43E+00 | N/A | 2.15E-01 | 3.54E-03 | 1 | RD4200 |

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## SAMPLE RESULTS

| | | | |
|---|---|---|---|
| **LAB NAME:** | ITAS-RICHLAND | **SDG NO.:** | W0038 |
| **LAB SAMPLE ID:** | 40442801 | **MATRIX:** | WATER |
| **WHC ID:** | B0BNP7 | **DATE RECEIVED:** | 4/22/94 |
| **REPORTING UNITS:** | pCi/L & ug/g | | |

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| PU239/40 | 0.00E+00 | 0.00E+00 | 1.52E-01 | 1.37E-01 | 0.82 | RD3209 |
| PU-238 | -2.03E-02 | 2.88E-02 | 2.89E-02 | 2.87E-01 | 0.82 | RD3209 |
| CO-60 | -4.61E-01 | 2.89E+00 | 2.89E+00 | 5.96E+00 | N/A | RD3219 |
| FE-59 | 3.41E+00 | 8.42E+00 | 8.43E+00 | 1.93E+01 | N/A | RD3219 |
| EU-152 | 8.82E+00 | 1.83E+01 | 1.84E+01 | 3.93E+01 | N/A | RD3219 |
| CO-58 | 1.22E+00 | 4.54E+00 | 4.54E+00 | 9.21E+00 | N/A | RD3219 |
| CS-137DA | -2.47E+00 | 4.20E+00 | 4.21E+00 | 6.76E+00 | N/A | RD3219 |
| RU-106DA | -3.75E+01 | 3.73E+01 | 3.74E+01 | 5.88E+01 | N/A | RD3219 |
| EU-155 | -2.82E+00 | 7.93E+00 | 7.94E+00 | 1.25E+01 | N/A | RD3219 |
| EU-154 | 6.72E+00 | 1.01E+01 | 1.02E+01 | 2.37E+01 | N/A | RD3219 |
| ALPHA | 1.10E+00 | 7.76E-01 | 7.88E-01 | 1.18E+00 | 1 | RD3222 |
| BETA | 3.33E+01 | 3.09E+00 | 3.88E+00 | 2.94E+00 | 1 | RD3222 |
| TOTAL-SR | -9.19E-02 | 1.91E-01 | 1.92E-01 | 7.89E-01 | 0.976 | RD3204 |
| TC-99 | 1.44E+02 | 2.36E+00 | 1.87E+01 | 2.15E+00 | 0.951 | ITAS-IT-RS-0001 |
| TRITIUM | 3.22E+04 | 4.95E+02 | 2.48E+03 | 2.34E+02 | 0.973 | RD3205 |
| URANIUM | 1.08E+00 | N/A | 1.62E-01 | 3.54E-03 | 1 | RD4200 |

**IT ANALYTICAL SERVICES**
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## SAMPLE RESULTS

| | | | |
|---|---|---|---|
| **LAB NAME:** | ITAS-RICHLAND | **SDG NO.:** | W0038 |
| **LAB SAMPLE ID:** | 40442802 | **MATRIX:** | WATER |
| **WHC ID:** | B0BNP3 | **DATE RECEIVED:** | 4/22/94 |
| **REPORTING UNITS:** | pCi/L & ug/g | | |

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| PU239/40 | -1.12E-02 | 2.23E-02 | 2.24E-02 | 2.67E-01 | 0.747 | RD3209 |
| PU-238 | -2.23E-02 | 3.16E-02 | 3.17E-02 | 3.16E-01 | 0.747 | RD3209 |
| CO-60 | 1.29E+00 | 3.74E+00 | 3.74E+00 | 8.41E+00 | N/A | RD3219 |
| FE-59 | 1.04E+01 | 1.36E+01 | 1.36E+01 | 2.89E+01 | N/A | RD3219 |
| EU-152 | 9.99E-01 | 2.37E+01 | 2.37E+01 | 4.75E+01 | N/A | RD3219 |
| CO-58 | -3.56E-01 | 5.31E+00 | 5.31E+00 | 9.29E+00 | N/A | RD3219 |
| CS-137DA | -1.33E+00 | 5.22E+00 | 5.23E+00 | 9.14E+00 | N/A | RD3219 |
| RU-106DA | 3.09E+01 | 3.01E+01 | 3.03E+01 | 6.86E+01 | N/A | RD3219 |
| EU-155 | -2.20E+00 | 1.01E+01 | 1.01E+01 | 1.66E+01 | N/A | RD3219 |
| EU-154 | 7.24E+00 | 1.09E+01 | 1.09E+01 | 2.55E+01 | N/A | RD3219 |
| ALPHA | 1.12E+00 | 7.38E-01 | 7.51E-01 | 1.01E+00 | 1 | RD3222 |
| BETA | 5.84E+01 | 3.89E+00 | 5.67E+00 | 2.75E+00 | 1 | RD3222 |
| TOTAL-SR | -1.08E-01 | 1.80E-01 | 1.82E-01 | 8.08E-01 | 0.865 | RD3204 |
| TC-99 | 2.21E+02 | 2.85E+00 | 2.71E+01 | 2.15E+00 | 0.951 | ITAS-IT-RS-0001 |
| TRITIUM | 5.97E+03 | 2.31E+02 | 5.83E+02 | 2.34E+02 | 0.973 | RD3205 |
| URANIUM | 4.48E-01 | N/A | 6.72E-02 | 3.54E-03 | 1 | RD4200 |

**IT ANALYTICAL SERVICES**
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## SAMPLE RESULTS

| | | | |
|---|---|---|---|
| **LAB NAME:** | ITAS-RICHLAND | **SDG NO.:** | W0038 |
| **LAB SAMPLE ID:** | 40442803 | **MATRIX:** | WATER |
| **WHC ID:** | B0BNM5 | **DATE RECEIVED:** | 4/22/94 |
| **REPORTING UNITS:** | pCi/L & ug/g | | |

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| PU239/40 | 5.23E-02 | 1.05E-01 | 1.05E-01 | 1.41E-01 | 0.797 | RD3209 |
| PU-238 | -1.05E-02 | 2.09E-02 | 2.10E-02 | 2.51E-01 | 0.797 | RD3209 |
| CO-60 | 7.43E+01 | 1.48E+01 | 1.66E+01 | N/A | N/A | RD3219 |
| FE-59 | -2.08E+01 | 1.92E+01 | 1.94E+01 | 2.87E+01 | N/A | RD3219 |
| EU-152 | 6.49E+00 | 1.88E+01 | 1.88E+01 | 4.23E+01 | N/A | RD3219 |
| CO-58 | 7.23E+00 | 6.11E+00 | 6.15E+00 | 1.31E+01 | N/A | RD3219 |
| CS-137DA | 4.04E+00 | 4.38E+00 | 4.39E+00 | 9.24E+00 | N/A | RD3219 |
| RU-106DA | 4.80E+01 | 3.72E+01 | 3.75E+01 | 8.28E+01 | N/A | RD3219 |
| EU-155 | -2.20E+00 | 1.01E+01 | 1.01E+01 | 1.67E+01 | N/A | RD3219 |
| EU-154 | -7.24E+00 | 1.78E+01 | 1.78E+01 | 3.19E+01 | N/A | RD3219 |
| ALPHA | 7.35E+00 | 2.58E+00 | 2.69E+00 | 2.33E+00 | 1 | RD3222 |
| BETA | 6.54E+02 | 1.28E+01 | 4.76E+01 | 3.04E+00 | 1 | RD3222 |
| TOTAL-SR | 4.09E-02 | 4.51E-01 | 4.51E-01 | 1.74E+00 | 0.383 | RD3204 |
| TC-99 | 4.31E+03 | 1.20E+01 | 4.73E+02 | 2.15E+00 | 0.951 | ITAS-IT-RS-0001 |
| TRITIUM | 3.56E+03 | 1.89E+02 | 4.14E+02 | 2.34E+02 | 0.973 | RD3205 |
| URANIUM | 6.65E+00 | N/A | 9.98E-01 | 3.54E-03 | 1 | RD4200 |

**IT ANALYTICAL SERVICES**
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## SAMPLE RESULTS

| | | | |
|---|---|---|---|
| **LAB NAME:** | ITAS-RICHLAND | **SDG NO.:** | W0038 |
| **LAB SAMPLE ID:** | 40445901 | **MATRIX:** | WATER |
| **WHC ID:** | B0BNP5 | **DATE RECEIVED:** | 4/25/94 |
| **REPORTING UNITS:** | pCi/L & ug/g | | |

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| PU239/40 | 1.17E-02 | 1.26E-01 | 1.26E-01 | 4.00E-01 | 0.715 | RD3209 |
| PU-238 | -1.17E-02 | 2.33E-02 | 2.34E-02 | 2.79E-01 | 0.715 | RD3209 |
| CO-60 | -7.29E-01 | 3.21E+00 | 3.21E+00 | 5.67E+00 | N/A | RD3219 |
| FE-59 | -9.05E+00 | 9.99E+00 | 1.00E+01 | 1.60E+01 | N/A | RD3219 |
| EU-152 | 3.22E+00 | 1.35E+01 | 1.35E+01 | 2.67E+01 | N/A | RD3219 |
| CO-58 | -7.12E-01 | 3.46E+00 | 3.46E+00 | 6.06E+00 | N/A | RD3219 |
| CS-137DA | -3.19E-01 | 2.75E+00 | 2.75E+00 | 4.84E+00 | N/A | RD3219 |
| RU-106DA | 1.29E+01 | 2.51E+01 | 2.51E+01 | 4.70E+01 | N/A | RD3219 |
| EU-155 | -8.47E-01 | 6.22E+00 | 6.22E+00 | 1.07E+01 | N/A | RD3219 |
| EU-154 | -5.68E+00 | 9.85E+00 | 9.86E+00 | 1.62E+01 | N/A | RD3219 |
| ALPHA | -3.20E-01 | 1.55E-01 | 1.61E-01 | 1.06E+00 | 1 | RD3222 |
| BETA | 6.70E+00 | 1.85E+00 | 1.91E+00 | 3.06E+00 | 1 | RD3222 |
| TOTAL-SR | 1.12E-01 | 2.59E-01 | 2.60E-01 | 9.48E-01 | 0.733 | RD3204 |
| TC-99 | 7.11E+00 | 1.04E+00 | 4.71E+00 | 2.15E+00 | 0.951 | ITAS-IT-RS-0001 |
| TRITIUM | 2.37E+02 | 1.08E+02 | 2.02E+02 | 2.34E+02 | 0.973 | RD3205 |
| URANIUM | 1.95E-01 | N/A | 2.93E-02 | 3.54E-03 | 1 | RD4200 |

**IT ANALYTICAL SERVICES**
**RICHLAND, WA**
**(509) 375-3131**

## SAMPLE RESULTS

| | | | |
|---|---|---|---|
| **LAB NAME:** | ITAS-RICHLAND | **SDG NO.:** | W0038 |
| **LAB SAMPLE ID:** | 40445902 | **MATRIX:** | WATER |
| **WHC ID:** | B0BRL3 | **DATE RECEIVED:** | 4/25/94 |
| **REPORTING UNITS:** | pCi/L & ug/g | | |

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| PU239/40 | 3.65E-02 | 9.30E-02 | 9.31E-02 | 2.18E-01 | 0.914 | RD3209 |
| PU-238 | 0.00E+00 | 0.00E+00 | 1.37E-01 | 1.24E-01 | 0.914 | RD3209 |
| CO-60 | -3.97E-01 | 4.57E+00 | 4.57E+00 | 8.95E+00 | N/A | RD3219 |
| FE-59 | -2.93E+00 | 1.50E+01 | 1.50E+01 | 2.64E+01 | N/A | RD3219 |
| EU-152 | -4.99E+00 | 2.22E+01 | 2.22E+01 | 3.97E+01 | N/A | RD3219 |
| CO-58 | 1.95E+00 | 4.29E+00 | 4.30E+00 | 9.14E+00 | N/A | RD3219 |
| CS-137DA | -1.39E+00 | 4.89E+00 | 4.89E+00 | 8.55E+00 | N/A | RD3219 |
| RU-106DA | -2.54E+01 | 4.06E+01 | 4.07E+01 | 6.53E+01 | N/A | RD3219 |
| EU-155 | -3.38E+00 | 8.22E+00 | 8.23E+00 | 1.36E+01 | N/A | RD3219 |
| EU-154 | 1.61E+00 | 1.25E+01 | 1.25E+01 | 2.55E+01 | N/A | RD3219 |
| ALPHA | -1.01E-01 | 2.03E-01 | 2.03E-01 | 6.64E-01 | 1 | RD3222 |
| BETA | 7.67E-01 | 1.31E+00 | 1.31E+00 | 2.79E+00 | 1 | RD3222 |
| TOTAL-SR | 8.09E-02 | 2.30E-01 | 2.31E-01 | 9.05E-01 | 0.757 | RD3204 |
| TC-99 | 2.42E+00 | 9.61E-01 | 4.33E+00 | 2.15E+00 | 0.951 | ITAS-IT-RS-0001 |
| TRITIUM | 1.64E+02 | 1.05E+02 | 1.98E+02 | 2.34E+02 | 0.973 | RD3205 |
| URANIUM | 9.00E-03 | N/A | 1.40E-03 | 3.54E-03 | 1 | RD4200 |

**IT ANALYTICAL SERVICES**
**RICHLAND, WA**
**(509) 375-3131**

## SAMPLE RESULTS

| | | | |
|---|---|---|---|
| **LAB NAME:** | ITAS-RICHLAND | **SDG NO.:** | W0038 |
| **LAB SAMPLE ID:** | 40449601 | **MATRIX:** | WATER |
| **WHC ID:** | B0BNN1 | **DATE RECEIVED:** | 4/27/94 |
| **REPORTING UNITS:** | pCi/L & ug/g | | |

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| PU239/40 | 5.86E-02 | 1.17E-01 | 1.18E-01 | 1.59E-01 | 0.711 | RD3209 |
| PU-238 | -2.34E-02 | 3.32E-02 | 3.33E-02 | 3.31E-01 | 0.711 | RD3209 |
| CO-60 | 1.02E+01 | 5.59E+00 | 5.68E+00 | 1.36E+01 | N/A | RD3219 |
| FE-59 | 9.13E+00 | 1.20E+01 | 1.20E+01 | 2.54E+01 | N/A | RD3219 |
| EU-152 | -8.35E+00 | 1.85E+01 | 1.85E+01 | 3.34E+01 | N/A | RD3219 |
| CO-58 | -1.98E+00 | 6.03E+00 | 6.03E+00 | 1.00E+01 | N/A | RD3219 |
| CS-137DA | 5.17E-01 | 2.96E+00 | 2.96E+00 | 6.05E+00 | N/A | RD3219 |
| RU-106DA | 1.99E+01 | 3.23E+01 | 3.24E+01 | 6.70E+01 | N/A | RD3219 |
| EU-155 | -5.83E+00 | 7.04E+00 | 7.06E+00 | 1.07E+01 | N/A | RD3219 |
| EU-154 | -1.12E+01 | 1.10E+01 | 1.10E+01 | 1.53E+01 | N/A | RD3219 |
| ALPHA | 2.19E+00 | 1.19E+00 | 1.21E+00 | 1.55E+00 | 1 | RD3222 |
| BETA | 1.45E+02 | 6.04E+00 | 1.18E+01 | 3.01E+00 | 1 | RD3222 |
| TOTAL-SR | 1.51E-01 | 2.61E-01 | 2.63E-01 | 1.00E+00 | 0.668 | RD3204 |
| TC-99 | 6.35E+02 | 4.65E+00 | 7.20E+01 | 2.15E+00 | 0.951 | ITAS-IT-RS-0001 |
| TRITIUM | 5.31E+02 | 1.18E+02 | 2.19E+02 | 2.34E+02 | 0.973 | RD3205 |
| URANIUM | 3.75E+00 | N/A | 5.63E-01 | 3.54E-03 | 1 | RD4200 |

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IT ANALYTICAL SERVICES
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## SAMPLE RESULTS

**LAB NAME:** ITAS-RICHLAND
**SDG NO.:** W0038
**LAB SAMPLE ID:** 40449602
**MATRIX:** WATER
**WHC ID:** B0BRL7
**DATE RECEIVED:** 4/27/94
**REPORTING UNITS:** pCi/L & ug/g

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| PU239/40 | 5.22E-02 | 1.33E-01 | 1.33E-01 | 3.12E-01 | 0.639 | RD3209 |
| PU-238 | -2.61E-02 | 3.69E-02 | 3.71E-02 | 3.69E-01 | 0.639 | RD3209 |
| CO-60 | 1.23E+01 | 8.30E+00 | 8.39E+00 | 1.75E+01 | N/A | RD3219 |
| FE-59 | 4.10E-01 | 7.61E+00 | 7.61E+00 | 1.49E+01 | N/A | RD3219 |
| EU-152 | -2.22E+01 | 2.48E+01 | 2.49E+01 | 3.88E+01 | N/A | RD3219 |
| CO-58 | 1.66E+00 | 2.96E+00 | 2.96E+00 | 6.40E+00 | N/A | RD3219 |
| CS-137DA | -3.21E+00 | 4.73E+00 | 4.74E+00 | 7.75E+00 | N/A | RD3219 |
| RU-106DA | -1.36E+01 | 3.33E+01 | 3.33E+01 | 5.78E+01 | N/A | RD3219 |
| EU-155 | 5.97E-01 | 6.49E+00 | 6.49E+00 | 1.13E+01 | N/A | RD3219 |
| EU-154 | -8.15E+00 | 1.17E+01 | 1.17E+01 | 1.89E+01 | N/A | RD3219 |
| ALPHA | 4.52E+00 | 1.58E+00 | 1.65E+00 | 1.35E+00 | 1 | RD3222 |
| BETA | 1.37E+02 | 5.88E+00 | 1.13E+01 | 2.84E+00 | 1 | RD3222 |
| TOTAL-SR | 7.44E-03 | 2.46E-01 | 2.46E-01 | 9.49E+00 | 0.762 | RD3204 |
| TC-99 | 6.65E+02 | 4.82E+00 | 7.53E+01 | 2.15E+00 | 0.951 | ITAS-IT-RS-0001 |
| TRITIUM | 3.80E+02 | 1.12E+02 | 2.10E+02 | 2.34E+02 | 0.973 | RD3205 |
| URANIUM | 4.41E+00 | N/A | 6.62E-01 | 3.54E-03 | 1 | RD4200 |

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INTERNATIONAL TECHNOLOGY CORPORATION

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LABORATORY NONCONFORMANCE MEMO (NCM) (ITAS-Richland)

PROJECT ID (Name/Number): WHC

NCM INITIATED BY (Name/Date): Joel T Kempema 5-30-94

PARAMETER(S): Gamma

SAMPLE NUMBER(S) AFFECTED: 4044590l, 4044070l W0038

MATRIX: 5-30-94 ~~Air~~ ~~Soil~~ Water

AREA: ☐ SHIP/REC ☒ RADIOCHEM ☐ COUNTING ☐ BIOASSAY
☐ DATA VERIF ☐ REPORTING ☐ OTHER:

## NONCONFORMANCE [check appropriate item(s)]:

1. ☐ Not enough sample received for proper analysis.
2. ☐ Holding time exceeded by _____ days due to:
   - 2.1. ☐ CATEGORY I: Out of Laboratory Control
     - ☐ Holding time expired at receipt.
   - 2.2. ☐ CATEGORY II: Laboratory Dependent
     - ☐ work backlog ☐ instrument failure
     - ☐ communication ☐ other (see #10)
   - 2.3. ☒ CATEGORY III: Laboratory Reruns
     - 2.3.1. ☐ *QA/QC:*
       - ☐ surrogates ☐ internal standards
       - ☐ spike recoveries ☐ blank contamination
     - 2.3.2. ☐ *CONFIRMATION:*
       - ☐ second column ☐ contamination check
       - ☐ other (see #10)
     - 2.3.3. ☐ *DILUTION:*
       - ☐ over calibration ☐ under calibration
       - ☐ other (see #10)
     - 2.3.4. ☒ *OTHER: (see #10)*
3. ☐ Sample lost during extraction/analysis; no re-prep or re-analysis possible.
4. ☐ QC data reported to client outside of:
   - ☐ method limits ☐ internal limits
   - ☐ QAPP limits ☐ contract limits
   - ☐ regulatory limits ☐ blank criteria
5. ☐ Incorrect procedure(s) used. (See #10)
6. ☐ Invalid instrument calibration. (See #10)
7. ☐ Incorrect/incomplete data reported to client. (See #10)
8. ☐ Reported detection limit(s) higher than:
   - ☐ method limits ☐ QAPP limits
   - ☐ contract limits ☐ other (see #10)

   Due to:
   - ☐ sample matrix ☐ insufficient sample
   - ☐ instrumentation ☐ other (see #10)
9. ☐ Other (specify):
10. ☒ Comments/Explanation: MDA for Eu 152 > Contract Detection Limit

## NOTIFICATION [check appropriate item(s)]:

1. ☐ Client notified by (name and date): _____
   - ☐ in writing ☐ by FAX
   - ☐ by phone ☐ Other (explain)
2. ☐ Client's name _____ and response:
   - ☐ process "as is" ☐ resample
   - ☐ on hold til ____ ☐ Other (explain)

PROJECT MANAGER (signature & date): Suzy Daines 6/10/94

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2

0038

**IT CORPORATION** LOG #: RD-94-_____ page 2 of 2

## CORRECTIVE ACTION

☒ **ROOT CAUSE:** INITIALS/DATE TK 5-30-94

404/0701 - 6060 present
404/5901 - uncertain

☒ **CORRECTIVE ACTION:** INITIALS/DATE TK 5-30-94

Recount 200 min - Recount data accepted MDA's < CL

☐ **RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:**

☐ **ACTIONS TO PREVENT RECURRENCE:** INITIALS/DATE _____

**FIRST LEVEL SUPERVISOR:** Jeff T Kenyon DATE: 5-30-94

**RESPONSIBLE MANAGER:** W Mackler DATE: 6/10/94

## QC REVIEW

☐ **NONCONFORMANCE** ☐ **DEFICIENCY** ☒ **RERUN**

☐ **FURTHER ACTION REQUIRED:**

**ASSIGNED TO:**

**QC COORDINATOR:** [signature] DATE: 6/10/94

## CORRECTIVE ACTION VERIFICATION

☒ **VERIFIED** ☐ **CANNOT VERIFY (specify reason)**

**REASON:**

## NCM CLOSURE

**QC COORDINATOR:** [signature] DATE: 6/10/94

**SIGNED ORIGINAL MUST BE RETAINED IN FILE:** ☐ **QUALITY/OPERATIONS FILE** ☒ **PROJECT FILE**

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INTERNATIONAL TECHNOLOGY CORPORATION

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0269

ITAS-Richland
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): WHC W0038
NCM INITIATED BY (Name/Date): LFR. 6/6/94
PARAMETER(S): Tc99
SAMPLE NUMBER(S) AFFECTED: WC44803
MATRIX: H2O

AREA: ☐ SHIP/REC ☒ RADIOCHEM ☐ COUNTING ☐ BIOASSAY
☐ DATA VERIF ☐ REPORTING ☐ OTHER:

## NONCONFORMANCE [check appropriate item(s)]:

1. ☐ Not enough sample received for proper analysis.
2. ☐ Holding time exceeded by _____ days due to:
   - 2.1. ☐ CATEGORY I: Out of Laboratory Control
     - ☐ Holding time expired at receipt.
   - 2.2. ☐ CATEGORY II: Laboratory Dependent
     - ☐ work backlog ☐ instrument failure
     - ☐ communication ☐ other (see #10)
   - 2.3. ☐ CATEGORY III: Laboratory Reruns
     - 2.3.1. ☐ *QA/QC:*
       - ☐ surrogates ☐ internal standards
       - ☐ spike recoveries ☐ blank contamination
     - 2.3.2. ☐ *CONFIRMATION:*
       - ☐ second column ☐ contamination check
       - ☐ other (see #10)
     - 2.3.3. ☐ *DILUTION:*
       - ☐ over calibration ☐ under calibration
       - ☐ other (see #10)
     - 2.3.4. ☐ *OTHER: (see #10)*
3. ☐ Sample lost during extraction/analysis; no re-prep or re-analysis possible.
4. ☐ QC data reported to client outside of:
   - ☐ method limits ☐ internal limits
   - ☐ QAPP limits ☐ contract limits
   - ☐ regulatory limits ☐ blank criteria
5. ☐ Incorrect procedure(s) used. (See #10)
6. ☐ Invalid instrument calibration. (See #10)
7. ☐ Incorrect/incomplete data reported to client. (See #10)
8. ☐ Reported detection limit(s) higher than:
   - ☐ method limits ☐ QAPP limits
   - ☐ contract limits ☐ other (see #10)

   Due to:
   - ☐ sample matrix ☐ insufficient sample
   - ☐ instrumentation ☐ other (see #10)
9. ☒ Other (specify): Low MS.
10. ☐ Comments/Explanation:

## NOTIFICATION [check appropriate item(s)]:

1. ☐ Client notified by (name and date):_____
   - ☐ in writing ☐ by FAX
   - ☐ by phone ☐ Other (explain)
2. ☐ Client's name _____ and response:
   - ☐ process "as is" ☐ resample
   - ☐ on hold til ____ ☐ Other (explain)

PROJECT MANAGER (signature & date): Suzy Davies 6/13/94

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2

0038

9613476.1098

**IT CORPORATION** LOG #: RD-94-_____ page 2 of 2

03169

## CORRECTIVE ACTION

☒ **ROOT CAUSE:** INITIALS/DATE LEV 6/6/94

TPU on MS results ≅ to spike level. This is a result of high level sample activity (Note: 243 pCi/l TPU vs 270 pCi/l spike)

☒ **CORRECTIVE ACTION:** INITIALS/DATE LEV 6/6/94

Report Results

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☐ **ACTIONS TO PREVENT RECURRENCE:** INITIALS/DATE_____

FIRST LEVEL SUPERVISOR: Steven E. McLaurin DATE: 6/6/94

RESPONSIBLE MANAGER: W. MacKellar DATE: 6/14/94

## QC REVIEW

☐ NONCONFORMANCE ☒ DEFICIENCY ☐ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO:

QC COORDINATOR: Jodie Cox DATE: 6/14/94

## CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

## NCM CLOSURE

QC COORDINATOR: Jodie Cox DATE: 6/14/94

0039

SIGNED ORIGINAL MUST BE RETAINED IN FILE: ☐ QUALITY/OPERATIONS FILE ☒ PROJECT FILE

9613476.1099

0176

INTERNATIONAL TECHNOLOGY CORPORATION

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ITAS-Richland
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): WHC W0038

NCM INITIATED BY (Name/Date): PKenitzer 5/31/94

PARAMETER(S): U nat

SAMPLE NUMBER(S) AFFECTED: 404407, 404321, 404459, 404428, 404496

MATRIX: Water

AREA: ☐ SHIP/REC ☒ RADIOCHEM ☐ COUNTING ☐ BIOASSAY
☐ DATA VERIF ☐ REPORTING ☐ OTHER:

## NONCONFORMANCE [check appropriate item(s)]:

1. ☐ Not enough sample received for proper analysis.
2. ☐ Holding time exceeded by _____ days due to:
   - 2.1 ☐ CATEGORY I: Out of Laboratory Control
     - ☐ Holding time expired at receipt.
   - 2.2. ☐ CATEGORY II: Laboratory Dependent
     - ☐ work backlog ☐ instrument failure
     - ☐ communication ☐ other (see #10)
   - 2.3 ☐ CATEGORY III: Laboratory Reruns
     - 2.3.1. ☐ *QA/QC:*
       - ☐ surrogates ☐ internal standards
       - ☐ spike recoveries ☐ blank contamination
     - 2.3.2. ☐ *CONFIRMATION:*
       - ☐ second column ☐ contamination check
       - ☐ other (see #10)
     - 2.3.3. ☐ *DILUTION:*
       - ☐ over calibration ☐ under calibration
       - ☐ other (see #10)
     - 2.3.4. ☐ *OTHER: (see #10)*
3. ☐ Sample lost during extraction/analysis; no re-prep or re-analysis possible.
4. ☐ QC data reported to client outside of:
   - ☐ method limits ☐ internal limits
   - ☐ QAPP limits ☐ contract limits
   - ☐ regulatory limits ☐ blank criteria
5. ☐ Incorrect procedure(s) used. (See #10)
6. ☐ Invalid instrument calibration. (See #10)
7. ☐ Incorrect/incomplete data reported to client. (See #10)
8. ☐ Reported detection limit(s) higher than:
   - ☐ method limits ☐ QAPP limits
   - ☐ contract limits ☐ other (see #10)

   Due to:
   - ☐ sample matrix ☐ insufficient sample
   - ☐ instrumentation ☐ other (see #10)
9. ☐ **Other (specify):** Samples were reanalyzed when QC failed; matrix spike failed, dups did not agree. Reanalysis OK.
10. ☐ **Comments/Explanation:**

## NOTIFICATION [check appropriate item(s)]:

1. ☐ Client notified by (name and date):_____
   - ☐ in writing ☐ by FAX
   - ☐ by phone ☐ Other (explain)
2. ☐ Client's name _____ and response:
   - ☐ process "as is" ☐ resample
   - ☐ on hold til ____ ☐ Other (explain)

PROJECT MANAGER (signature & date): Suzy Dinas 6/6/94

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2

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0176

IT CORPORATION

LOG #: RD-94-_____ page 2 of 2

## CORRECTIVE ACTION

☐ ROOT CAUSE: INITIALS/DATE_____

☐ CORRECTIVE ACTION: INITIALS/DATE_____

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☐ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE_____

FIRST LEVEL SUPERVISOR: Pam Kramitzer DATE: 5-31-94

RESPONSIBLE MANAGER: M. MacKillop DATE: 6/9/94

## QC REVIEW

☐ NONCONFORMANCE ☐ DEFICIENCY ☒ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO

QC COORDINATOR: Jodie Cox DATE: 6/9/94

## CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

## NCM CLOSURE

QC COORDINATOR: Jodie Cox DATE: 6/9/94

0043

SIGNED ORIGINAL MUST BE RETAINED IN FILE: ☐ QUALITY/OPERATIONS FILE ☒ PROJECT FILE

9613476.1101

INTERNATIONAL TECHNOLOGY CORPORATION

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0367

ITAS-Richland
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): WHC W0038

NCM INITIATED BY (Name/Date): PKenitzer 6/6/94

PARAMETER(S): U nat

SAMPLE NUMBER(S) AFFECTED: 40442801 + F0442801

MATRIX: water

AREA: ☐ SHIP/REC ☐ RADIOCHEM ☒ COUNTING ☐ BIOASSAY ☐ DATA VERIF ☐ REPORTING ☐ OTHER:

## NONCONFORMANCE [check appropriate item(s)]:

1. ☐ Not enough sample received for proper analysis.
2. ☐ Holding time exceeded by _____ days due to:
   - 2.1 ☐ CATEGORY I: Out of Laboratory Control
     - ☐ Holding time expired at receipt.
   - 2.2. ☐ CATEGORY II: Laboratory Dependent
     - ☐ work backlog ☐ instrument failure
     - ☐ communication ☐ other (see #10)
   - 2.3 ☐ CATEGORY III: Laboratory Reruns
     - 2.3.1. ☐ QA/QC:
       - ☐ surrogates ☐ internal standards
       - ☐ spike recoveries ☐ blank contamination
     - 2.3.2. ☐ CONFIRMATION:
       - ☐ second column ☐ contamination check
       - ☐ other (see #10)
     - 2.3.3. ☐ DILUTION:
       - ☐ over calibration ☐ under calibration
       - ☐ other (see #10)
     - 2.3.4. ☐ OTHER: (see #10)
3. ☐ Sample lost during extraction/analysis; no re-prep or re-analysis possible.
4. ☐ QC data reported to client outside of:
   - ☐ method limits ☐ internal limits
   - ☐ QAPP limits ☐ contract limits
   - ☐ regulatory limits ☐ blank criteria
5. ☐ Incorrect procedure(s) used. (See #10)
6. ☐ Invalid instrument calibration. (See #10)
7. ☐ Incorrect/incomplete data reported to client. (See #10)
8. ☐ Reported detection limit(s) higher than:
   - ☐ method limits ☐ QAPP limits
   - ☐ contract limits ☐ other (see #10)

   Due to:
   - ☐ sample matrix ☐ insufficient sample
   - ☐ instrumentation ☐ other (see #10)
9. ☐ Other (specify): dup does not agree well with original sample. The water had a lot of interfering salts. - considered matrix effect. The other dup + QC looked good.
10. ☐ Comments/Explanation:

## NOTIFICATION [check appropriate item(s)]:

1. ☐ Client notified by (name and date):_____
   - ☐ in writing ☐ by FAX
   - ☐ by phone ☐ Other (explain)
2. ☐ Client's name _____ and response:
   - ☐ process "as is" ☐ resample
   - ☐ on hold til ____ ☐ Other (explain)

PROJECT MANAGER (signature & date): Suzy Davies 6/7/94

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2

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0307

IT CORPORATION

LOG #: RD-94-_____ page 2 of 2

## CORRECTIVE ACTION

☐ ROOT CAUSE: INITIALS/DATE_____

☐ CORRECTIVE ACTION: INITIALS/DATE_____

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☐ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE_____

FIRST LEVEL SUPERVISOR: Pam Kinsey DATE: 6/6/94

RESPONSIBLE MANAGER: M. Mackillop DATE: 6/9/94

## QC REVIEW

☐ NONCONFORMANCE ☑ DEFICIENCY ☐ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO:

QC COORDINATOR: Jodie Cox DATE: 6/9/94

## CORRECTIVE ACTION VERIFICATION

☑ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

## NCM CLOSURE

QC COORDINATOR: Jodie Cox DATE: 6/9/94

0045

SIGNED ORIGINAL MUST BE RETAINED IN FILE: ☐ QUALITY/OPERATIONS FILE ☑ PROJECT FILE

**Westinghouse Hanford Company**

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: ☐ Priority ☒ Normal

| | | |
|---|---|---|
| Collector: K.D. Lee | Company Contact: P. H. Butcher | Telephone No.: (509) 376-4388 |
| Project Designation: 200-BP-5 | Sampling Location: 200 East | SAF No.: 94-130 |
| Ice Chest No.: EFS11 | Field Logbook No.: EFL-1025 | Method of Shipment: HAND DELIVERED |
| Shipped To: IT | Offsite Property No.: 1094-0-0518-12 | Bill of Lading/Air Bill No.: NONE |
| Possible Sample Hazards/Remarks: None | | |

PURGE-$H_2O$ HAD A SEWAGE ODOR

Special Handling and/or Storage: Cool to 4 C. Refrig 2C ATS

SAMPLE ANALYSIS 404495 — 1550 4/25/94

| Sample No. | Matrix* | Date Sampled | Time Sampled | Preservative | HNO3 | COOL 4C | H2SO4 | COOL 4C | COOL 4C | COOL 4C | NaOH | HNO3 | NONE | HCl | HNO3 | N/A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Type of Container | P | G | P | P | P | P | P | P | Gs | P | P | G |
| | | | | No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 |
| | | | | Volume | 1L | 500 mL | 500 mL | 250 mL | 250 mL | 250 mL | 1L | 4L | 1L | 1L | 1L | 40ml |
| | | | | SAMPLE ANALYSIS | *1 | IC ANIONS-F, Cl, SO4, NO2 PO4. | NO2, NO3. | ALKA-LINITY | TDS | SULFATE | CYANIDE | *2 | TRITIUM | Tc-99 | *3 | TOTAL ACTIVITY |
| | | | | | A | B | C | D | E | F | G | 404496001 | | | 02 A | |
| BOBNN1 01 | W | 04/25/94 | 1330 | | X | X | X | X | X | X | X | X | X | X | | X |
| BOBNN2 02 | W | 04/25/94 | 1330 | | | | | | | | | | | | X | |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By: K.D. Lee | Date/Time: 4/25/94 1528 | Received By: A J SIMPSON | Date/Time: 4/25/94 1550 |
| Relinquished By: A J Simpson | Date/Time: 4/27/94 0919 | Received By: L Sweeney | Date/Time: 4/27/94 0919 |
| Relinquished By: L Sweeney | Date/Time: 4/27/94 1210 | Received By: H Heidelberg | Date/Time: 4/27 1210 |
| Relinquished By: | Date/Time: | Received By: | Date/Time: |

**SPECIAL INSTRUCTIONS**

*1. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (UNFILTERED). *2. GROSS ALPHA/BETA, GAMMA SPEC (to include Cs-137, Co-60, Ru-106), Pu-238/239/240, Sr-90, TOTAL URANIUM. *3. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (FILTERED). DATA DELIVERABLE - STANDALONE

**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 |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

0094-1102

0094-1

**Westinghouse Hanford Company**

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: ☐ Priority ☒ Normal

| | | |
|---|---|---|
| Collector: K.D. Lee | Company Contact: P. M. Butcher | Telephone No.: (509) 376-4388 |
| Project Designation: 200-BP-5 | Sampling Location: 200 East | SAF No.: 94-130 |
| Ice Chest No.: ER-11 | Field Logbook No.: EFL-1125 | Method of Shipment: HAND DELIVERED |
| Shipped To: IT | Offsite Property No.: W94-0-0578-12 | Bill of Lading/Air Bill No.: NONE |
| Possible Sample Hazards/Remarks: None | | |

Special Handling and/or Storage: Cool to 4 C. ref: 3A AJS

SAMPLE ANALYSIS: 404495

| Sample No. | Matrix* | Date Sampled | Time Sampled | Preservative | HNO3 | COOL 4C | H2SO4 | COOL 4C | COOL 4C | COOL 4C | NaOH | HNO3 | NONE | HCl | HNO3 | NONE | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Type of Container | G P | G | P | P | P | P | P | P | Gs | P | G P | ~~aGs~~ | | | G |
| | | | | No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | ~~1~~ | | | 1 |
| | | | | Volume | 1L | 500 mL | 500 mL | 250 mL | 250 mL | 250 mL | 1L | 4L | 1L | 2L | 1L | ~~40mL~~ | | 1L/pl | 40mL |
| | | | | | *1 | IC ANIONS-F, Cl, SO4, NO2 PO4. | NO2, NO3. | ALKA-LINITY | TDS | SULFATE | CYANIDE | *2 | TRITIUM | Tc-99 | *3 | ACTIVITY SCAN | | 4/21/94 | Total activity |
| | | | | | A | B | C | D | E | F | G | 404496 | 02 | | 04 A | | | | |
| BOBRL7 03 | W | 04/25/94 | 1130 04/25/94 | | X | X | X | X | X | X | X | X | X | X | | X | | | X |
| BOBRL8 04 | W | 04/25/94 | 1130 04/25/94 | | | | | | | | | | | | X | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

2nd Lc 4/27/94

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

| Relinquished By | Date/Time | Received By | Date/Time |
|---|---|---|---|
| Kathy D. Lee K.D. Lee | 4/25/94 1528 | AJ Simpson | 4/25/94 1530 |
| AJ Simpson | 4/27/94 0920 | L Sweeney L Sweeney | 4/27/94 0920 |
| L Sweeney L Sweeney | 4/27/94 1210 | S Heidelberg | 4/27 1210 |
| | | | |

**SPECIAL INSTRUCTIONS**

*1. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (UNFILTERED). *2. GROSS ALPHA/BETA, GAMMA SPEC (to include Cs-137, Co-60, Ru-106), Pu-238/239/240, Sr-90, TOTAL URANIUM. *3. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (FILTERED). DATA DELIVERABLE - STANDALONE

**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

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

0048

9406276.1101

**Westinghouse Hanford Company**

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priority [X] Normal

| | | |
|---|---|---|
| Collector: B.T. WHITTEN | Company Contact: P. H. Butcher | Telephone No.: (509) 376-4388 |
| Project Designation: 200-BP-5 | Sampling Location: 200 East | SAF No.: 94-130 |
| Ice Chest No.: SML-144 | Field Logbook No.: EFL-1125 | Method of Shipment: HAND DELIVERED |
| Shipped To: IT | Offsite Property No.: W94-0-0518-8 | Bill of Lading/Air Bill No.: NONE |
| Possible Sample Hazards/Remarks: None | | |

| Preservative | HNO3 | COOL 4C | H2SO4 | COOL 4C | COOL 4C | COOL 4C | NaOH | HNO3 | NONE | HCl | HNO3 | N/A | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type of Container | P G | G | P | P | P | P | P | P | Gs | P | P G | G | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | | | |
| Volume | 1L | 500 mL | 500 mL | 250 mL | 250 mL | 250 mL | 1L | 4L | 1L | 2L | 1L | 40mL | | | |
| SAMPLE ANALYSIS | *1 | IC ANIONS-F, Cl, SO4, NO2 PO4. | NO2, NO3. | ALKA-LINITY | TDS | SULFATE | CYANIDE | *2 | TRITIUM | Tc-99 | *3 | TOTAL ACTIVITY | | | |
| 404458 | A | B | C | D | E | F | G | 40445901 | | | 02A | | | | |

| Sample No. | Matrix* | Date Sampled | Time Sampled | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 BOBNP5 | W | 04/22/94 | 1052 | X | X | X | X | X | X | X | X | X | X | | X | | |
| 02 BOBNP6 | W | 04/22/94 | 1052 | | | | | | | | | | | X | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

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

| Relinquished By | Date/Time | Received By | Date/Time |
|---|---|---|---|
| K.L. Lee K.L. Lee | 04/25/94 0713 | L Sweeney L Sweeney | 4/25/94 0713 |
| L Sweeney L Sweeney | 4/25/94 1300 | L. Boyd IT | 4/25/94 1300 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

*1. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (UNFILTERED). *2. GROSS ALPHA/BETA, GAMMA SPEC (to include Cs-137, Co-60, Ru-106), Pu-238/239/240, Sr-90, TOTAL URANIUM. *3. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (FILTERED). DATA DELIVERABLE - STANDALONE

**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

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9613476.1105

**Westinghouse Hanford Company**

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: ☐ Priority ☒ Normal

| | | |
|---|---|---|
| Collector: A. RIZZO / K. O Lee | Company Contact: P. M. Butcher | Telephone No.: (509) 376-4388 |
| Project Designation: 200-BP-5 | Sampling Location: 200 East | SAF No.: 94-130 |
| Ice Chest No.: EFS 11 | Field Logbook No.: EFL-1125 | Method of Shipment: HAND DELIVERED |
| Shipped To: IT | Offsite Property No.: W94-0 0578-8 | Bill of Lading/Air Bill No.: NONE |
| Possible Sample Hazards/Remarks: None | | |

SAMPLE ANALYSIS: 404458

| Sample No. | Matrix* | Date Sampled | Time Sampled | Preservative | HNO3 | COOL 4C | H2SO4 | COOL 4C | COOL 4C | COOL 4C | NaOH | HNO3 | NONE | HCl | HNO3 | NONE | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Type of Container | P G | G | P | P | P | P | P | P | Gs | P | P G | aGs | | | |
| | | | | No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | | | |
| | | | | Volume | 1L | 500 mL | 500 mL | 250 mL | 250 mL | 250 mL | 1L | 4L | 1L | 2L | 1L | 40mL | | | |
| | | | | | *1 | IC ANIONS-F, Cl, SO4, NO2 PO4. | NO2, NO3. | ALKA-LINITY | TDS | SULFATE | CYANIDE | *2 | TRITIUM | Tc-99 | *3 | ACTIVI-TY SCAN | | | |
| | | | | | A | B | C | D | E | F | G | 40445802 | | | 04A | | | | |
| BOBRL3 | W | 04/22/94 | 0800 | | X | X | X | X | X | X | X | X | X | X | | X | | | |
| BOBRL4 | W | 04/22/94 | 0800 | | | | | | | | | | | | X | | | | |

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

| Relinquished By | Date/Time | Received By | Date/Time |
|---|---|---|---|
| Kelly A Lee KALee | 04/25/94 0713 | L Sweeney L Sweeney | 4/25/94 0713 |
| L Sweeney L Sweeney | 4/25/94 1300 | R Boyd | 4/25/94 1300 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

*1. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (UNFILTERED). *2. GROSS ALPHA/BETA, GAMMA SPEC (to include Cs-137, Co-60, Ru-106), Pu-238/239/240, Sr-90, TOTAL URANIUM. *3. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (FILTERED). DATA DELIVERABLE - STANDALONE

**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

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9613476.1106

**Westinghouse Hanford Company**

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: ☐ Priority ☒ Normal

| | | |
|---|---|---|
| Collector: K. D. Lee | Company Contact: P. H. Butcher | Telephone No.: (509) 376-4388 |
| Project Designation: 200-BP-5 | Sampling Location: 200 East | SAF No.: 94-130 |
| Ice Chest No.: SMC144 | Field Logbook No.: EFL-1125 | Method of Shipment: HAND DELIVERED |
| Shipped To: IT | Offsite Property No.: W94-0-0518-5 | Bill of Lading/Air Bill No.: NONE |

Possible Sample Hazards/Remarks: None

SAMPLE ANALYSIS: 404427

| Preservative | HNO3 | COOL 4C | H2SO4 | COOL 4C | COOL 4C | COOL 4C | NaOH | HNO3 | NONE | HCl | HNO3 | N/A | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type of Container | P G | G | P | P | P | P | P | P | Gs | P | G P | P | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | | | |
| Volume | 1L | 500 mL | 500 mL | 250 mL | 250 mL | 250 mL | 1L | 4L | 1L | 2L | 1L | 20 mR | | | |
| | *1 | IC ANIONS-F, Cl, SO4, NO2 PO4. | NO2, NO3. | ALKA-LINITY | TDS | SULFATE | CYANIDE | *2 | TRITIUM | Tc-99 | *3 | TOTAL ACTIVITY | | | |
| | A | B | C | D | E | F | G | 404428 | | 01 | 02 A | | | | |

| Sample No. | Matrix* | Date Sampled | Time Sampled | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BOBNP7 01 | W | 04/21/94 | 1142 | X | X | X | X | X | X | X | X | X | X | | X | | |
| BOBNP8 02 | W | 04/21/94 | 1142 | | | | | | | | | | | X | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

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

| Relinquished By | Date/Time | Received By | Date/Time |
|---|---|---|---|
| K. D. Lee K. D. Lee | 04/21/94 1305 | T Sweeney L Sweeney | 4/21/94 1305 |
| T Sweeney L Sweeney | 4/22/94 1400 | R. Boyd IT | 4/22/94 1400 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

*1. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (UNFILTERED). *2. GROSS ALPHA/BETA, GAMMA SPEC (to include Cs-137, Co-60, Ru-106), Pu-238/239/240, Sr-90, TOTAL URANIUM. *3. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (FILTERED). DATA DELIVERABLE - STANDALONE

**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

**FINAL SAMPLE DISPOSITION**: Disposal Method | Disposed By | Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9615976.1107

**Westinghouse Hanford Company**

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: ☐ Priority ☒ Normal

| | | |
|---|---|---|
| Collector: K.D. Lee | Company Contact: P. H. Butcher | Telephone No.: (509) 376-4388 |
| Project Designation: 200-BP-5 | Sampling Location: 200 East | SAF No.: 94-130 |
| Ice Chest No.: ER-05 | Field Logbook No.: EFL-1125 | Method of Shipment: HAND DELIVERED |
| Shipped To: IT | Offsite Property No.: W94-0-0578-6 | Bill of Lading/Air Bill No.: NONE |
| Possible Sample Hazards/Remarks: None | | |

| Sample No. | Matrix* | Date Sampled | Time Sampled | Preservative | HNO3 | COOL 4C | H2SO4 | COOL 4C | COOL 4C | COOL 4C | NaOH | HNO3 | NONE | HCl | HNO3 | N/a | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Type of Container | P G | G | P | P | P | P | P | P | Gs | P | P G | G | | | |
| | | | | No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | | | |
| | | | | Volume | 1L | 500 mL | 500 mL | 250 mL | 250 mL | 250 mL | 1L | 4L | 1L | 2L | 1L | 2 mL | | | |
| | | | | SAMPLE ANALYSIS | *1 | IC ANIONS-F, Cl, SO4, NO2 PO4. | NO2, NO3. | ALKA-LINITY | TDS | SULFATE | CYANIDE | *2 | TRITIUM | Tc-99 | *3 | TOTAL ACTIVITY | | | |
| 404427 | | | | | A | B | C | D | E | F | G | 404 | 42802 | | 04 A | | | | |
| BOBNP3 03 | W | 04/21/94 | 1109 | | X | X | X | X | X | X | X | X | X | X | | X | | | |
| BOBNP4 04 | W | 04/21/94 | 1109 | | | | | | | | | | | | X | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By | Date/Time | Received By | Date/Time |
| K.D. Lee K.D. Lee | 04/21/94 1305 | L Sweeney L Sweeney | 4/21/94 1305 |
| Relinquished By | Date/Time | Received By | Date/Time |
| L Sweeney L Sweeney | 4/22/94 1400 | R Boyd ET | 4/22/94 1400 |
| Relinquished By | Date/Time | Received By | Date/Time |
| Relinquished By | Date/Time | Received By | Date/Time |

**SPECIAL INSTRUCTIONS**

*1. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (UNFILTERED). *2. GROSS ALPHA/BETA, GAMMA SPEC (to include Cs-137, Co-60, Ru-106), Pu-238/239/240, Sr-90, TOTAL URANIUM. *3. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (FILTERED). DATA DELIVERABLE - STANDALONE

**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 |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

**Westinghouse Hanford Company**

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: ☐ Priority ☒ Normal

| | | |
|---|---|---|
| Collector: K.D. Lee | Company Contact: P. H. Butcher | Telephone No.: (509) 376-4388 |
| Project Designation: 200-BP-5 | Sampling Location: 200 East | SAF No.: 94-130 |
| Ice Chest No.: EFS 11 | Field Logbook No.: EFL-1125 | Method of Shipment: HAND DELIVERED |
| Shipped To: IT | Offsite Property No.: W94-0-0518-5 | Bill of Lading/Air Bill No.: NONE |
| Possible Sample Hazards/Remarks: None | | |

| Preservative | HNO3 | COOL 4C | H2SO4 | COOL 4C | COOL 4C | COOL 4C | NaOH | HNO3 | NONE | HCl | HNO3 | N/A | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type of Container | ~~P~~ G | G | P | P | P | P | P | P | Gs | P | ~~P~~ G | G | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 ~~1~~ | 1 | 1 | | | |
| Volume | 1L | 500 mL | 500 mL | 250 mL | 250 mL | 250 mL | 1L | 4L | 1L | 1 ~~2~~L | 1L | 20mL | | | |
| SAMPLE ANALYSIS: 404427 | *1 | IC ANIONS-F, Cl, SO4, NO2 PO4. | NO2, NO3. | ALKA-LINITY | TDS | SULFATE | CYANIDE | *2 | TRITIUM | Tc-99 | *3 | TOTAL ACTIVITY | | | |
| | A | B | C | D | E | F | G | 404428 | | 03 | 06 A | | | | |

| Sample No. | Matrix* | Date Sampled | Time Sampled | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BOBNM5 05 | W | 04/21/94 | 0835 | X | X | X | X | X | X | X | X | X | X | | X | |
| BOBNM6 06 | W | 04/21/94 | 0835 | | | | | | | | | | | X | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

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

| Relinquished By | Date/Time | Received By | Date/Time |
|---|---|---|---|
| K.D. Lee | 04/21/94 1305 | L Sweeney | 4/21/94 1305 |
| L Sweeney | 4/22/94 1400 | R. Boyd FT | 4/20/94 1400 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

*1. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (UNFILTERED). *2. GROSS ALPHA/BETA, GAMMA SPEC (to include Cs-137, Co-60, Ru-106), Pu-238/239/240, Sr-90, TOTAL URANIUM. *3. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (FILTERED). DATA DELIVERABLE - STANDALONE

**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

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

0004

9613476.1109

WCH

**Westinghouse Hanford Company**

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: ☐ Priority ☒ Normal

| | | |
|---|---|---|
| Collector: B. T. WHITTEN | Company Contact: P. H. Butcher | Telephone No.: (509) 376-4388 |
| Project Designation: 200-BP-5 | Sampling Location: 200 East | SAF No.: 94-130 |
| Ice Chest No.: ER-05 | Field Logbook No.: EFL-1125 | Method of Shipment: HAND DELIVERED |
| Shipped To: IT | Offsite Property No.: W94-C-C3360-52 | Bill of Lading/Air Bill No.: NONE |
| Possible Sample Hazards/Remarks: None | | |

| Sample No. | Matrix* | Date Sampled | Time Sampled | SAMPLE ANALYSIS 404406 | Preservative | HNO3 | COOL 4C | H2SO4 | COOL 4C | COOL 4C | COOL 4C | NaOH | HNO3 | NONE | HCl | HNO3 | N/A | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Type of Container | G/P | G | P | P | P | P | P | P | Gs | P | G/P | G | | | |
| | | | | | No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | | | |
| | | | | Special Handling and/or Storage: Cool to 4 C. | Volume | 1L | 500 mL | 500 mL | 250 mL | 250 mL | 250 mL | 1L | 4L | 1L | 2L | 1L | 2x2 | | | |
| | | | | | | *1 | IC ANIONS-F, Cl, SO4, NO2 PO4. | NO2, NO3. | ALKA-LINITY | TDS | SULFATE | CYANIDE | *2 | TRITIUM | Tc-99 | *3 | TOTAL ALKALINITY | | | |
| | | | | | | A | B | C | D | E | F | G | 404/407 | | 01 | 1 | | | | |
| 01 | BOBN N9 | W | 04/19/94 | | | X | X | X | X | X | X | X | X | X | X | | X | | | |
| 02 | BOBN P0 | W | 04/19/94 | | | | | | | | | | | | | XA | | | | |

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

| Relinquished By | Date/Time | Received By | Date/Time |
|---|---|---|---|
| R.W. Bell Lee w/ ice | 04/19/94 1354 | L Sweeney L Sweeney | 4/19/94 1354 |
| L Sweeney L Sweeney | 4/21/94 1210 | L Boyd IT | 4-21-94 1210 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

*1. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (UNFILTERED). *2. GROSS ALPHA/BETA, GAMMA SPEC (to include Cs-137, Co-60, Ru-106), Pu-238/239/240, Sr-90, TOTAL URANIUM. *3. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (FILTERED). DATA DELIVERABLE - STANDALONE

**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

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

DISTRIBUTION: Original Sample — Yellow - Sampler

BC-6000-828 (12/92)

9603176.0110

**Westinghouse Hanford Company**

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: ☐ Priority ☒ Normal

| | | |
|---|---|---|
| Collector | Company Contact: P. H. Butcher | Telephone No.: (509) 376-4388 |
| Project Designation: 200-BP-5 | Sampling Location: 200 East | SAF No.: 94-130 |
| Ice Chest No.: ER-7 | Field Logbook No.: EFL-1125 | Method of Shipment: HAND DELIVERED |
| Shipped To: IT | Offsite Property No.: W24-0-0336-50 | Bill of Lading/Air Bill No.: NONE |
| Possible Sample Hazards/Remarks: None | | |

| Preservative | HNO3 | COOL 4C | H2SO4 | COOL 4C | COOL 4C | COOL 4C | NaOH | HNO3 | NONE | HCl | HNO3 | N/A | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type of Container | P | G | P | P | P | P | P | P | Gs | P | G P | G | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | | | |
| Special Handling and/or Storage: Cool to 4 C. / Volume | 1L | 500 mL | 500 mL | 250 mL | 250 mL | 250 mL | 1L | 4L | 1L | 2L | 1L | 2mL | | | |
| SAMPLE ANALYSIS | *1 | IC ANIONS-F, Cl, SO4, NO2 PO4. | NO2, NO3. | ALKA-LINITY | TDS | SULFATE | CYANIDE | *2 | TRITIUM | Tc-99 | *3 | TOTAL ACTIVITY | | | |
| 4044406 | A | B | C | D | E | F | G | 4044702 | | | | | | | |

| Sample No. | Matrix* | Date Sampled | Time Sampled | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 03 BOBNM7 | W | 04/20/94 | | X | X | X | X | X | X | X | X | X | X | | X | | |
| 04 BOBNM8 | W | 04/20/94 | | | | | | | | | | | | XA | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| 00 | | | | | | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | | | | | |
| GI | | | | | | | | | | | | | | | | | |

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

| Relinquished By | Date/Time | Received By | Date/Time |
|---|---|---|---|
| P. H. Butcher | 4/21/94 1310 | L. Sweeney | 4/21/94 130 |
| L. Sweeney | 4/21/94 1210 | R. Boyd IT | 4-21-94 1210 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

*1. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (UNFILTERED). *2. GROSS ALPHA/BETA, GAMMA SPEC (to include Cs-137, Co-60, Ru-106), Pu-238/239/240, Sr-90, TOTAL URANIUM. *3. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (FILTERED). DATA DELIVERABLE - STANDALONE

**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

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

**Westinghouse Hanford Company**

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: ☐ Priority ☒ Normal

| | | |
|---|---|---|
| Collector: K.D Lee | Company Contact: P. H. Butcher | Telephone No.: (509) 376-4388 |
| Project Designation: 200-BP-5 | Sampling Location: 200 East | SAF No.: 94-130 |
| Ice Chest No.: 7WS015 | Field Logbook No.: EFL-1125 | Method of Shipment: HAND DELIVERED |
| Shipped To: IT | Offsite Property No.: W94-0-C336-45 | Bill of Lading/Air Bill No.: NONE |
| Possible Sample Hazards/Remarks: None | | |

| Preservative | HNO3 | COOL 4C | H2SO4 | COOL 4C | COOL 4C | COOL 4C | NaOH | HNO3 | NONE | HCl | HNO3 | N/A | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type of Container | G P | G | P | P | P | P | P | P | Gs | P | G P | G | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 4 2 | 2 1 | 1 | 1 | | | |
| Special Handling and/or Storage: Cool to 4 C. — Volume | 1L | 500 mL | 500 mL | 250 mL | 250 mL | 250 mL | 1L | 4L | 500 mL 1L | 1L 2L | 1L | 20 mL | | | |
| SAMPLE ANALYSIS | *1 | IC ANIONS-F, Cl, SO4, NO2 PO4. | NO2, NO3. | ALKA-LINITY | TDS | SULFATE | CYANIDE | *2 | TRITIUM | Tc-99 | *3 | TOTAL ACTIVITY | | | |
| 404320 | 01A | B | C | D | E | F | G | 4043210 | | | 02A | | | | |

| Sample No. | Matrix* | Date Sampled | Time Sampled | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B0BNP1 | W | 04/15/94 | 1006 | X | X | X | X | X | X | X | X | X | X | | X | | |
| B0BNP2 | W | 04/15/94 | 1006 | | | | | | | | | | | X | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

0088

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

| Relinquished By | Date/Time | Received By | Date/Time |
|---|---|---|---|
| K D Lee K D Lee | 04/15/94 1157 | Joann E. Rogers | 4-15-94 1157 |
| Joann E. Rogers | 4-15-94 1206 | L Sweeney L Sweeney | 4/15/94 1206 |
| L Sweeney L Sweeney | 4/18/94 1310 | T Gilmore T Gilmore | 4/18/94 1310 |
| | | | |

**SPECIAL INSTRUCTIONS**

*1. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (UNFILTERED). *2. GROSS ALPHA/BETA, GAMMA SPEC (to include Cs-137, Co-60, Ru-106), Pu-238/239/240, Sr-90, TOTAL URANIUM. *3. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (FILTERED). DATA DELIVERABLE - STANDALONE

**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

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9405276.0112

9613476.1113

INTERNATIONAL TECHNOLOGY CORPORATION

DUE DATE 6/1/94

~~REANALYSIS~~ / RECOUNT 5-27-94

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

ANALYSIS Gamma

NAME/DATE JTK / 5-27-94

CUSTOMER WHC

SAMPLE DELIVERY GROUP L00038

MATRIX Water

BATCH NUMBER N/A

| ITAS ID | CUSTOMER ID | COMMENTS |
|---|---|---|
| 1 ) 40445901 | | 200 mm |
| 2 ) 40440701 | | " " ✓ |
| 3 ) | | |
| 4 ) | | |
| 5 ) | | |
| 6 ) | | |
| 7 ) | | |
| 8 ) | | |
| 9 ) | | |
| 10) | | |

## REANALYSIS

JTK 5-27-94

*REFERENCED QC*

ITAS ID - BLANK _____

ITAS ID - SPIKE _____

CLIENT CODE _____

ACTIONS (Initial & Date)

PREP LAB RECEIVED _____

SAMPLE REMAINDER RETURNED TO SCG ____ ☐ (CHECK ONE)

NO SAMPLE REMAINING ☐

SEPARATION LAB _____

COUNTING/MEASUREMENT _____

DATA REVIEWED _____

ANALYTICAL PREP STORED _____

## RECOUNT

ACTIONS (Initial & Date)

COUNTING/MEASUREMENT 5/31/94 MD

DATA REVIEWED JTK 5-30-94

ANALYTICAL PREP STORED _____

ADDITIONAL COMMENTS:

Transfer Recount Data

RC-048 12/92 REV 2

0095

9613476.1114

INTERNATIONAL TECHNOLOGY CORPORATION

DUE DATE 5/20

# REANALYSIS / RECOUNT

## CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

ANALYSIS U nat

NAME/DATE PK / 5/26/94

CUSTOMER WHC

SAMPLE DELIVERY GROUP W0038 ~~W0037~~ SCG 4374N

MATRIX water

BATCH NUMBER NA

| ITAS ID | CUSTOMER ID | COMMENTS |
|---|---|---|
| 1) L0440713 | | 100 ml |
| 2) L0440715 | | |
| 3) W0440702 | | |
| 4) W0445901 | | |
| 5) 40440701,02 | | |
| 6) 40432101 | | |
| 7) 40445901,02 | | |
| 8) 40442801,02,03 | | |
| 9) 40449601,02 | | |
| 10) F0445902 F0442801 | | |

## REANALYSIS

*REFERENCED QC*

ITAS ID - BLANK NA

ITAS ID - SPIKE NA

CLIENT CODE WHC

ACTIONS (Initial & Date)

PREP LAB RECEIVED ~~fw~~ 5-26-94

SAMPLE REMAINDER
RETURNED TO SCG ☒ (CHECK ONE)
NO SAMPLE REMAINING ☐

SEPARATION LAB NA

COUNTING/MEASUREMENT M. Vulkel 5/30/94

DATA REVIEWED PK 5/31/94

ANALYTICAL PREP STORED

## RECOUNT

ACTIONS (Initial & Date)

COUNTING/MEASUREMENT

DATA REVIEWED

ANALYTICAL PREP STORED

ADDITIONAL COMMENTS:

RC-048 12/92 REV 2

CUR # 1525

Work Order No.: 428

# Condition Upon Receipt Variance Report

## ITAS - KNOXVILLE Laboratory

Client: Westinghouse HANFORD Date: 4/25/94

Project No: 94-130 Initiated by: Bryan Blomquist

Analysis Requested: Cyanide, TDS RFA/COC Numbers: 453680

Client Sample Numbers Affected: 404427-01G, 404427-03G, 404427-05G, 404427-01E

**Condition/Variance (Check all that apply):**

1. ☐ Not enough sample received for proper analysis. Received approximately: _____
2. ☑ Sample received broken/leaking. 404427-01E
3. ☑ Sample received without proper preservative.
   - ☐ Cooler temperature not within 4°C ± 2°C. Record temperature: _____
   - ☑ pH pH = 11
   - ☐ other: _____
4. ☐ Sample received in improper container.
5. ☐ Sample received without proper paperwork. Explain: _____
6. ☐ Paperwork received without sample.
7. ☐ No sample ID on sample container.
8. ☐ Custody tape disturbed/broken/missing.
9. ☐ Sample splits performed by lab.
10. ☐ Volatile sample received with approximately _____ mm headspace.
11. ☐ Sample ID on container does not match sample ID on paperwork. Explain: _____
12. ☐ All coolers on airbill not received with shipment.
13. ☑ Other (explain below): Anions ($NO_3$) Received Past H.T.

Notes:

**Corrective Action:**

- ☐ Client's Name: _____ Informed verbally on: _____ By: _____
- ☐ Client's Name: _____ Informed in writing on: _____ By: _____
- ☐ Sample(s) processed "as is". Comments: _____
- ☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: Kenya K Klemm Date: 4-26-94

Project Management Review: _____ Date: _____

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

CuR# 1536

Work Order No.: 439

# Condition Upon Receipt Variance Report

## ITAS - KNOXVILLE Laboratory

Client: Westinghouse HANFORD

Date: 4/27/94

Project No: 94-130

Initiated by: Bryan Blomquist

Analysis Requested: $CN^-$

RFA/COC Numbers: 453604

Client Sample Numbers Affected: 40445801G, 40445863-G

**Condition/Variance (Check all that apply):**

1. ☐ Not enough sample received for proper analysis. Received approximately: _____
2. ☐ Sample received broken/leaking.
3. ☑ Sample received without proper preservative.
   - ☐ Cooler temperature not within 4°C ± 2°C. Record temperature: _____
   - ☑ pH 801 = pH 10, 803 = pH 11
   - ☐ other: _____
4. ☐ Sample received in improper container.
5. ☐ Sample received without proper paperwork. Explain: _____
6. ☐ Paperwork received without sample.
7. ☐ No sample ID on sample container.
8. ☐ Custody tape disturbed/broken/missing.
9. ☐ Sample splits performed by lab.
10. ☐ Volatile sample received with approximately _____ mm headspace.
11. ☐ Sample ID on container does not match sample ID on paperwork. Explain: _____
12. ☐ All coolers on airbill not received with shipment.
13. ☐ Other (explain below): _____

Notes: _____

**Corrective Action:**

☐ Client's Name: _____ Informed verbally on: _____ By: _____

☐ Client's Name: _____ Informed in writing on: _____ By: _____

☐ Sample(s) processed "as is". Comments: _____

☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: _____ Date: _____

Project Management Review: _____ Date: _____

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

CUR #1551

Work Order No.: 455

# Condition Upon Receipt Variance Report

## ITAS - KNOXVILLE Laboratory

Client: Westinghouse Hanford Date: 4/29/94

Project No: SAF 94-130 Initiated by: Bryan Blomquist

Analysis Requested: Cyanide RFA/COC Numbers: 453607

Client Sample Numbers Affected: 404495-01G, 404495-03BKBG

**Condition/Variance (Check all that apply):**

1. ☐ Not enough sample received for proper analysis. Received approximately: _____
2. ☐ Sample received broken/leaking.
3. ☑ Sample received without proper preservative.
   - ☐ Cooler temperature not within 4°C ± 2°C. Record temperature: _____
   - ☑ pH 10
   - ☐ other: _____
4. ☐ Sample received in improper container.
5. ☐ Sample received without proper paperwork. Explain: _____
6. ☐ Paperwork received without sample.
7. ☐ No sample ID on sample container.
8. ☐ Custody tape disturbed/broken/missing.
9. ☐ Sample splits performed by lab.
10. ☐ Volatile sample received with approximately _____ mm headspace.
11. ☐ Sample ID on container does not match sample ID on paperwork. Explain: _____
12. ☐ All coolers on airbill not received with shipment.
13. ☐ Other (explain below): _____

Notes: _____

**Corrective Action:**

- ☐ Client's Name: _____ Informed verbally on: _____ By: _____
- ☐ Client's Name: _____ Informed in writing on: _____ By: _____
- ☐ Sample(s) processed "as is". Comments: _____
- ☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: Kenya K Clemmons Date: 4-29-94

Project Management Review: _____ Date: _____

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

WO #388

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
1330 George Washington Way
Richland, Washington 99352

# SAMPLE CHECK-IN LIST

( Per Shipping Container)

Date/Time Received 4/18/94 1310 Client Name WHC

Project/Client # 94-130 Batch or Case # N/A

Cooler ID (if noted on the outside of cooler) GWS 015

1. Condition of shipping container? ok
2. Custody Seals on cooler intact? Yes ☑ No ☐
3. Custody Seals dated and signed? Yes ☑ No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes ☑ No ☐
5. Vermiculite/packing material is: Wet ☐ Dry ☑
6. Each sample is in a plastic bag? Yes ☐ No ☑ all in 1 bag
7. Number of sample containers in cooler: 16
8. Samples have: ____ tape ____ hazard labels
   ✓ custody seals ✓ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☑ No ☐

Sample temperature 2°C

11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #'(s) N/A
    Request for analysis #(s) N/A
    Airbill # N/A Carrier N/A
12. Have any anomalies been identified above? Yes ☐ No ☑
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature Tom Gilmore Tom Gilmore Date/Time 4/18/94 1310

FORM NO. LS-042, Rev.0, 2/94

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WC 710

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
1835 George Washington Way
Richland, Washington 99352

# SAMPLE CHECK-IN LIST

(Per Shipping Container)

Date/Time Received 4-21-94 1300 Client Name WHC

Project/Client # 94-125 Batch or Case # _____

Cooler ID (if noted on the outside of cooler) ER-7

1. Condition of shipping container? OK
2. Custody Seals on cooler intact? Yes ☒ No ☐
3. Custody Seals dated and signed? Yes ☒ No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes ☒ No ☐
5. Vermiculite/packing material is: Wet ☐ Dry ☒
6. Each sample is in a plastic bag? Yes ☒ No ☐
7. Number of sample containers in cooler: 14
8. Samples have: ____ tape ____ hazard labels
   ____X custody seals ____X appropriate sample labels
9. Samples are: ____Y in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☒ No ☐

Sample temperature 3°C

11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #'(s) N/A
    Request for analysis #(s) N/A
    Airbill # N/A Carrier _____
12. Have any anomalies been identified above? Yes ☐ No ☒
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature E Boyd E. Boyd Date/Time 4-21-94 1314

FORM NO. LS-042, Rev.0, 2/94

WO#428

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
1300 George Washington Way
Richland, Washington 99352

# SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 4/22 1400 Client Name WHC

Project/Client # 94-130 Batch or Case # NA

Cooler ID (if noted on the outside of cooler) SMC 144

1. Condition of shipping container? OK
2. Custody Seals on cooler intact? Yes ☒ No ☐
3. Custody Seals dated and signed? Yes ☒ No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes ☒ No ☐
5. Vermiculite/packing material is: Wet ☐ Dry ☒
6. Each sample is in a plastic bag? Yes ☒ No ☐
7. Number of sample containers in cooler: 14
8. Samples have: ____ tape ____ hazard labels
   ✓ custody seals ____ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☒ No ☐

Sample temperature 2°C

11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #'(s) NA
    Request for analysis #(s) NA
    Airbill # NA Carrier NA
12. Have any anomalies been identified above? Yes ☐ No ☒
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature Middleburg Date/Time 4/22 1400

FORM NO. LS-042, Rev.0, 2/94

WO#428

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
1330 George Washington Way
Richland, Washington 99352

## SAMPLE CHECK-IN LIST

( Per Shipping Container)

Date/Time Received 4/22 1400 Client Name WHC

Project/Client # 94-130 Batch or Case # na

Cooler ID (if noted on the outside of cooler) ER-05

1. Condition of shipping container? OK
2. Custody Seals on cooler intact? Yes ☒ No ☐
3. Custody Seals dated and signed? Yes ☒ No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes ☒ No ☐
5. Vermiculite/packing material is: Wet ☐ Dry ☒
6. Each sample is in a plastic bag? Yes ☒ No ☐
7. Number of sample containers in cooler: 14
8. Samples have: ____ tape ____ hazard labels
   ✓ custody seals ____ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☒ No ☐
    Sample temperature 4°C.
11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #'(s) na
    Request for analysis #(s) na
    Airbill # na Carrier ____
12. Have any anomalies been identified above? Yes ☐ No ☒
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature Heidelberg Date/Time 4/22/94 1400

FORM NO. LS-042, Rev.0, 2/94

WO#428

INTERNATIONAL TECHNOLOGY CORPORATION
Regional Office
2600 George Washington Way
Richland, Washington 99352

## SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 4/22 1400 Client Name WHC

Project/Client # 94-130 Batch or Case # _____

Cooler ID (if noted on the outside of cooler) EFS11

1. Condition of shipping container? OK
2. Custody Seals on cooler intact? Yes ☒ No ☐
3. Custody Seals dated and signed? Yes ☒ No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes ☒ No ☐
5. Vermiculite/packing material is: Wet ☐ Dry ☒
6. Each sample is in a plastic bag? Yes ☒ No ☐
7. Number of sample containers in cooler: 15
8. Samples have: ____ tape ____ hazard labels
   ✓ custody seals ____ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☒ No ☐

Sample temperature 7°C

11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #'(s) NA
    Request for analysis #(s) NA
    Airbill # NA Carrier NA
12. Have any anomalies been identified above? Yes ☐ No ☒
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature Hildebrand Date/Time 4/22/94 1400

FORM NO. LS-042, Rev.0, 2.94

WO#439

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
2800 George Washington Way
Richland, Washington 99352

## SAMPLE CHECK-IN LIST

1 Per Shipping Container

Date/Time Received 4-25-94 1300 Client Name IWTC

Project/Client # SAF 94-130 Batch or Case # _____

Cooler ID (if noted on the outside of cooler) SNL-144

1. Condition of shipping container? OK
2. Custody Seals on cooler intact? Yes ☑ No ☐
3. Custody Seals dated and signed? Yes ☑ No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes ☑ No ☐
5. Vermiculite/packing material is: Wet ☐ Dry ☑
6. Each sample is in a plastic bag? Yes ☑ No ☐
7. Number of sample containers in cooler: 14
8. Samples have: ____ tape ____ hazard labels
   ☑ custody seals ☑ appropriate sample labels
9. Samples are: ☑ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☑ No ☐

Sample temperature 20

11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #'(s) N/A
    Request for analysis #(s) N/A
    Airbill # N/A Carrier N/A
12. Have any anomalies been identified above? Yes ☐ No ☑
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature R. Boyd R. Boyd Date/Time 4/25/94 1300

FORM NO. LS-042, Rev.0, 2.94

WO#439

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
1330 George Washington Way
Richland, Washington 99352

# SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 4-25-94 1300 Client Name WHC

Project/Client # SAF 94-130 Batch or Case # _____

Cooler ID (if noted on the outside of cooler) FS-11

1. Condition of shipping container? OK
2. Custody Seals on cooler intact? Yes ☒ No ☐
3. Custody Seals dated and signed? Yes ☒ No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes ☒ No ☐
5. Vermiculite/packing material is: Wet ☐ Dry ☒
6. Each sample is in a plastic bag? Yes ☒ No ☐
7. Number of sample containers in cooler: 14
8. Samples have: ____ tape ____ hazard labels
   X custody seals X appropriate sample labels
9. Samples are: X in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes X No ☐

Sample temperature 20°

11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #'(s) N/A
    Request for analysis #(s) N/A
    Airbill # N/A Carrier N/A
12. Have any anomalies been identified above? Yes ☐ No ☒
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature R. Boyd R. Boyd Date/Time 4-25-94 1300

FORM NO. LS-042, Rev.0, 2/94

WO#455

INTERNATIONAL TECHNOLOGY CORPORATION

[illegible] Office
[illegible] George Washington Way
Richland, Washington 99352

# SAMPLE CHECK-IN LIST

Per shipping Container

Date/Time Received 4/27 1210 Client Name LC1+C

Project/Client # 94-130 Batch or Case # NA

Cooler ID (if noted on the outside of cooler) ER11

1. Condition of shipping container? GC
2. Custody Seals on cooler intact? Yes X No ☐
3. Custody Seals dated and signed? Yes X No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes X No ☐
5. Vermiculite/packing material is: Wet ☐ Dry X
6. Each sample is in a plastic bag? Yes X No ☐
7. Number of sample containers in cooler: 14
8. Samples have: ____ tape ____ hazard labels
   ✓ custody seals ____ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☐ No ☐
    Sample temperature 4°
11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #'(s) ____
    Request for analysis #(s) [illegible]
    Airbill # ____ Carrier ____
12. Have any anomalies been identified above? Yes ☐ No X
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature [illegible] Date/Time 4/27 1210

FORM NO. LS-042 Rev 0, 2 94

WO#455

INTERNATIONAL TECHNOLOGY CORPORATION

National Office
[illegible] George Washington Way
Richland, Washington 99352

# SAMPLE CHECK-IN LIST

Per Shipping Container

Date/Time Received 4-27-94 1210 Client Name IT HC

Project/Client # 94-130 Batch or Case # NA

Cooler ID (if noted on the outside of cooler) EFS1

1. Condition of shipping container? OK
2. Custody Seals on cooler intact? Yes X No ☐
3. Custody Seals dated and signed? Yes X No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes X No ☐
5. Vermiculite/packing material is: Wet ☐ Dry X
6. Each sample is in a plastic bag? Yes X No ☐
7. Number of sample containers in cooler: 15
8. Samples have: ____ tape ____ hazard labels
   ✓ custody seals ____ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☐ No ☐
    Sample temperature 22 C
11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #(s) N/A
    Request for analysis #(s) _____
    Airbill # _____ Carrier _____
12. Have any anomalies been identified above? Yes ☐ No X
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature: [signature] Date/Time 4/27 1710

FORM NO. LS-042, Rev 0, 2 94

9613476.1127

0000045

WO # 388

| Contractor | OFF-SITE PROPERTY CONTROL | CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT) |
|---|---|---|
| WHC | | W94-0-0336-45 |

**PART I – TO BE COMPLETED BY ORIGINATOR**

| Department | Section | Unit |
|---|---|---|
| ENV. Eng. & Tech | EFS | ER Field Sampling |

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing ☒ Contractor ☐ Vendor

| Shipped to | Off-site Custodian |
|---|---|
| IT Analytical ~~Services~~ Services ~~Samp~~ 4/18/94<br>2800 GW. WAY<br>Richland, WA 99352 | Full Title |

| Quantity | Description (Include Serial and any Government Tag Numbers) | Original Cost |
|---|---|---|
| 1 | Sample #: B0BNP1, B0B1NP2<br>Cooler ID: GWS015<br>Polycooler with ground water samples packed in wet ice and vermiculite | N/A |
| 1 | Sample No:<br>Cooler ID:<br>Polycooler with ground NA water samples packed in wet ice and vermiculite | ~~N/A~~ |

☐ Classified ☒ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Permit Contract

**Necessity for the Off-Site Use of this Property**

Samplins Supports RI/FS work in The 200 AREA

***CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.***

| RM Clearance for Public Release | RM Survey No. | Date |
|---|---|---|
| Lilli Bilin | 157879 | 4-18-94 |

| Location of Property (Area & Bldg.) | Contact | Phone |
|---|---|---|
| 200-BP-5 | PH Butcher | 509 376 4386 |

| Date Ready for Shipment | Cost Code to be Charged | Approximate Date This Property will be Returned |
|---|---|---|
| 4-18-94 | 8B410 PL53A | NA |

| Originated By | Date | Authorized By | Date |
|---|---|---|---|
| PH Butcher | 4/18/94 | PH Butcher | 4/18/94 |
| **Signature and Name of Property Control** | **Custodian Date** | **Property Management Approval** | **Date** |
| | | J Hankel | 4/18/94 |

**PART II – TO BE COMPLETED BY SHIPPING**

| Signature of Recipient | Return Order No. | Date Issued | Purchase Order No. | Date Issued |
|---|---|---|---|---|
| Date | | | | |

**DISTRIBUTION**

| By Originator | Shipping Operation – Sign all Copies and Forward to: |
|---|---|
| White, Green, Yellow, Pink – Property Management<br>Goldenrod – Retain | White – Property Management Green – Property Control Custodian (Issuing Office)<br>Yellow – Retain Pink – Originator |

ITAS 4/18/94 1310

54-3000-479 (09/89)

| Contractor | OFF-SITE PROPERTY CONTROL | CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT) |
|---|---|---|
| WHC | | W91-C-0336-50 |

**PART I – TO BE COMPLETED BY ORIGINATOR**

| Department | Section | Unit |
|---|---|---|
| ER Eng Support | Field & Analytical Supp | ER Field Sampling |

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing ☒ Contractor ☐ Vendor

Shipped to: IT Analytical Services
2800 George Washington Way
Richland, WA 99352

Off-site Custodian

Full Title

| Quantity | Description (Include Serial and any Government Tag Numbers) | Original Cost |
|---|---|---|
| 1<br>lbs. | Sample #: B0BNM7, B0BNM8<br>Cooler ID: ER-[illegible]<br>Polycooler with groundwater samples packed in wet ice and vermiculite | N/A |
| 1<br>lbs. | Sample #: B0BNN9, B0BNP0<br>Cooler ID: ER-05<br>Polycooler with groundwater samples packed in wet ice and vermiculite | N/A |

☐ Classified ☒ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Permit Contract

Necessity for the Off-Site Use of this Property

Sampling supports RI/FS work in the 200 AREA

Bill of lading # NONE

*CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.*

| RM Clearance for Public Release | RM Survey No. 15293 | Date 4/21/94 |
|---|---|---|
| Location of Property (Area & Bldg.) 200-BP-5 | Contact P. H. Butcher | Phone (509) 376-4388 |
| Date Ready for Shipment 4/21/94 | Cost Code to be Charged 8B410 PL53A | Approximate Date This Property will be Returned NA |
| Originated By PH Butcher | Date 4/21/94 | Authorized By PH Butcher / JP Hankel — Date 4/21/94 |
| Signature and Name of Property Control | Custodian Date | Property Management Approval — Date |

**PART II – TO BE COMPLETED BY SHIPPING**

| Signature of Recipient | Return Order No. | Date Issued | Purchase Order No. | Date Issued |
|---|---|---|---|---|
| [illegible] | | | | |
| Date 4/21/1310 | | | | |

**DISTRIBUTION**

| By Originator | Shipping Operation – Sign all Copies and Forward to: |
|---|---|
| White, Green, Yellow, Pink – Property Management<br>Goldenrod – Retain | White – Property Management<br>Yellow – Retain<br>Green – Property Control Custodian (Issuing Office)<br>Pink – Originator |

0000047

| Contractor | OFF-SITE PROPERTY CONTROL | CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT) |
|---|---|---|
| WHC | | W94-0-0518-5 |

**PART I – TO BE COMPLETED BY ORIGINATOR**

| Department | ER Eng Support | Section | Field & Analytical Supp | Unit | ER Field Sampling |
|---|---|---|---|---|---|
| The following items are to be shipped from | | ☒ Contractor | ☐ Vendor | | |
| Routing | | ☒ Contractor | ☐ Vendor | | |

| Shipped to | Off-site Custodian |
|---|---|
| IT Analytical Services<br>2800 George Washington Way<br>Richland, WA 99352 | Full Title |

| Quantity | Description (Include Serial and any Government Tag Numbers) | Original Cost |
|---|---|---|
| 1<br>lbs. | Sample #: B0BNP7, B0BNP8.<br>Cooler ID: SMC 144<br>Polycooler with groundwater samples packed in wet ice and vermiculite | N/A |
| 1<br>lbs. | Sample #: B0BNM5, B0BNM6<br>Cooler ID: EFS 11<br>Polycooler with groundwater samples packed in wet ice and vermiculite | N/A |

☐ Classified ☒ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Permit Contract

Necessity for the Off-Site Use of this Property

Sampling supports RI/FS work in the 200 AREA

Bill of lading # NONE

*CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.*

| RM Clearance for Public Release | RM Survey No. | Date |
|---|---|---|
| [signature] | 157906 | 4-22-94 |

| Location of Property (Area & Bldg.) | Contact | Phone |
|---|---|---|
| 200 BP-5 | P. H. Butcher | (509) 376-4388 |

| Date Ready for Shipment | Cost Code to be Charged | Approximate Date This Property will be Returned |
|---|---|---|
| 4-22-94 | 88410 PL53A | N/A |

| Originated By | Date | Authorized By | Date |
|---|---|---|---|
| PH Butcher | 4/22/94 | PH Butcher | 4/22/94 |
| Signature and Name of Property Control | Custodian Date | Property Management Approval | Date |
| | | [signature] | 4/22/94 |

**PART II – TO BE COMPLETED BY SHIPPING**

| Signature of Recipient | Return Order No. | Date Issued | Purchase Order No. | Date Issued |
|---|---|---|---|---|
| K Boyle JT | | | | |
| Date 4-22-94 1400 | | | | |

**DISTRIBUTION**

| By Originator | Shipping Operation – Sign all Copies and Forward to: |
|---|---|
| White, Green, Yellow, Pink – Property Management<br>Goldenrod – Retain | White – Property Management<br>Yellow – Retain<br>Green – Property Control Custodian (Issuing Office)<br>Pink – Originator |

0000048

| Contractor | OFF-SITE PROPERTY CONTROL | CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT) |
|---|---|---|
| WHC | | 100-C-6 518-6 |

**PART I – TO BE COMPLETED BY ORIGINATOR**

| Department | Section | Unit |
|---|---|---|
| ER Eng Support | Field & Analytical Supp | ER Field Sampling |

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing ☒ Contractor ☐ Vendor

| Shipped to | Off-site Custodian |
|---|---|
| IT Analytical Services<br>2800 George Washington Way<br>Richland, WA 99352 | Full Title |

| Quantity | Description (Include Serial and any Government Tag Numbers) | Original Cost |
|---|---|---|
| 1<br>lbs. | Sample #: 100BNP3, 100BNP4<br>Cooler ID: ER-05<br>Polycooler with groundwater samples packed in wet ice and vermiculite | N/A |
| 1<br>lbs. | Sample #:<br>Cooler ID: NA<br>Polycooler with groundwater samples packed in wet ice and vermiculite | N/A |

☐ Classified ☒ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Permit Contract

Necessity for the Off-Site Use of this Property

Sampling supports RI/FS work in the 200 Area

Bill of lading # NONE

*CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.*

| RM Clearance for Public Release | RM Survey No. | Date |
|---|---|---|
| K Nelson | 157806 | 4-22-94 |

| Location of Property (Area & Bldg.) | Contact | Phone |
|---|---|---|
| 200 Area ER-5 | P. H. Butcher | (509) 376-4388 |

| Date Ready for Shipment | Cost Code to be Charged | Approximate Date This Property will be Returned |
|---|---|---|
| 4/22/94 | 8B410 PL53A | NA |

| Originated By | Date | Authorized By | Date |
|---|---|---|---|
| P H Butcher | 4/22/94 | P H Butcher | |
| Signature and Name of Property Control | Custodian Date | Property Management Approval | Date |
| | | P Tanner | 4/22/94 |

**PART II – TO BE COMPLETED BY SHIPPING**

| Signature of Recipient | Return Order No. | Date Issued | Purchase Order No. | Date Issued |
|---|---|---|---|---|
| K Boyd 2T | | | | |
| Date 4-22-94 1400 | | | | |

**DISTRIBUTION**

| By Originator | Shipping Operation – Sign all Copies and Forward to: |
|---|---|
| White, Green, Yellow, Pink – Property Management<br>Goldenrod – Retain | White – Property Management<br>Yellow – Retain<br>Green – Property Control Custodian (Issuing Office)<br>Pink – Originator |

54-3000-479 (09/89)

0000049

| Contractor | OFF-SITE PROPERTY CONTROL | CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT) |
|---|---|---|
| WHC | | [illegible]-C-0515-8 |

**PART I – TO BE COMPLETED BY ORIGINATOR**

| Department | Section | Unit |
|---|---|---|
| ER Eng Support | Field & Analytical Supp | ER Field Sampling |

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing ☒ Contractor ☐ Vendor

| Shipped to | Off-site Custodian |
|---|---|
| IT Analytical Services<br>2800 George Washington Way<br>Richland, WA 99352 | Full Title |

| Quantity | Description (Include Serial and any Government Tag Numbers) | Original Cost |
|---|---|---|
| 1<br>lbs. | Sample #: BOFLL3, BOFLL4<br>Cooler ID: EFS-11<br>Polycooler with groundwater samples packed in wet ice and vermiculite | N/A |
| 1<br>lbs. | Sample #: [illegible]<br>Cooler ID: [illegible]<br>Polycooler with groundwater samples packed in wet ice and vermiculite | N/A |

☐ Classified ☒ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Permit Contract

Necessity for the Off-Site Use of this Property

Sampling supports RI/FS work in the 200 AREA

Bill of lading # NONE

*CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.*

| RM Clearance for Public Release | RM Survey No | Date |
|---|---|---|
| Glenda McTic | 157916 | 4-25-94 |

| Location of Property (Area & Bldg.) | Contact | Phone |
|---|---|---|
| 200-E-5 | P. H. Butcher | (509) 376-4388 |

| Date Ready for Shipment | Cost Code to be Charged | Approximate Date This Property will be Returned |
|---|---|---|
| 4/25/94 | 8B410 | NA |

| Originated By | Date | Authorized By | Date |
|---|---|---|---|
| P.H. Butcher | 4/25/94 | [illegible] | 4/25/94 |

| Signature and Name of Property Control | Custodian Date | Property Management Approval | Date |
|---|---|---|---|
| | | [illegible] | 4/25/94 |

**PART II – TO BE COMPLETED BY SHIPPING**

| Signature of Recipient | Return Order No. | Date Issued | Purchase Order No. | Date Issued |
|---|---|---|---|---|
| R Bryf IT | | | | |
| Date 4-25-94 | | | | |

**DISTRIBUTION**

| By Originator | Shipping Operation – Sign all Copies and Forward to: |
|---|---|
| White, Green, Yellow, Pink – Property Management<br>Goldenrod – Retain | White – Property Management<br>Yellow – Retain<br>Green – Property Control Custodian (Issuing Office)<br>Pink – Originator |

0000050

| Contractor | OFF-SITE PROPERTY CONTROL | CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT) |
|---|---|---|
| WHC | | WN 91-C-0518-12. |

**PART I – TO BE COMPLETED BY ORIGINATOR**

| Department | Section | Unit |
|---|---|---|
| ER Eng Support | Field & Analytical Supp | ER Field Sampling |

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing ☒ Contractor ☐ Vendor

| Shipped to | Off-site Custodian |
|---|---|
| IT Analytical Services<br>2800 George Washington Way<br>Richland, WA 99352 | Full Title |

| Quantity | Description (Include Serial and any Government Tag Numbers) | Original Cost |
|---|---|---|
| 1<br>lbs. | Sample #: B0BKL7, BCBR18<br>Cooler ID: EFS-11<br>Polycooler with groundwater samples packed in wet ice and vermiculite | N/A |
| 1<br>lbs. | Sample #: B0BNN1, B0BNN2<br>Cooler ID: EFS-11<br>Polycooler with groundwater samples packed in wet ice and vermiculite | N/A |

☐ Classified ☒ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Permit Contract

Necessity for the Off-Site Use of this Property

Sampling supports RI/FS work in the 200 AREA

Bill of lading # UNK

*CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.*

| RM Clearance for Public Release | RM Survey No. 150983 | Date 4/27/94 |
|---|---|---|
| Location of Property (Area & Bldg.) 200 Area | Contact P. H. Butcher | Phone (509) 376-4388 |
| Date Ready for Shipment 11/23/94 | Cost Code to be Charged 88410 P153A | Approximate Date This Property will be Returned UA |
| Originated By PH Butcher | Date 4/27/94 Authorized By | Date 4/27/94 |
| Signature and Name of Property Control | Custodian Date Property Management Approval | Date 4/27/94 |

**PART II – TO BE COMPLETED BY SHIPPING**

| Signature of Recipient | Return Order No. | Date Issued | Purchase Order No. | Date Issued |
|---|---|---|---|---|
| Date 4/27/94 | | | | |

**DISTRIBUTION**

| By Originator | Shipping Operation – Sign all Copies and Forward to: |
|---|---|
| White, Green, Yellow, Pink – Property Management<br>Goldenrod – Retain | White – Property Management Green – Property Control Custodian (Issuing Office)<br>Yellow – Retain Pink – Originator |

54-3000-479 (09/89)

INTERNATIONAL TECHNOLOGY CORPORATION

COC NO. *0001486*

# ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

WO# 388 RL # 501

Reference Document No. 340387
Page 1 of 1

Project Name/No.[1] 94-130
Sample Team Members[2]
Profit Center No.[3] 4632
Project Manager[4] VanPetten
Purchase Order No.[6]
Required Report Date[11]

Samples Shipment Date[7] 4/18/94
Lab Destination[8] Middlebrook
Lab Contact[9]
Project Contact/Phone[12]
Carrier/Waybill No.[13] 112 8260 646

Bill to:[5] ITAS Richland
Report to:[10] ITAS Richland

**ONE CONTAINER PER LINE**

| Sample Number[14] | Sample Description/Type[15] | Date/Time Collected[16] | Container Type[17] | Sample Volume[18] | Preservative[19] | Requested Testing Program[20] | Condition on Receipt[21] | Disposal Record No.[22] |
|---|---|---|---|---|---|---|---|---|
| W40432001 A | BOBNP1 / H2O | 4/15/94 1000 | Glass | 1000 ml | HNO3 4°C | Metals | 2°C BPP 4/19/94 pH=<2 | |
| B | | | 1 | 500ml | | Anions50 | FOR LAB USE ONLY | |
| C | | | Poly | 1 | H2SO4 | NO2/NO3 | | |
| D | | | | 250 ml | | Alkalinity | | |
| E | | | | 1 | | TDS | | |
| F | | | | 1 | | Sulfate | FOR LAB USE ONLY | |
| G | | | | 1000ml | NaOH | CN | pH 10 | |
| 02A | BOBNP2/H2O | | Glass | 1 | HNO3 | Metals | pH=<2 | |

Special Instructions:[23]

Possible Hazard Identification:[24]
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☒

Sample Disposal:[25]
Return to Client ☐ Disposal by Lab ☐ Archive ___ (mos.)

Turnaround Time Required:[26]
Normal ☒ Rush ☐

QC Level:[27]
I. ☐ II. ☐ III. ☐ Project Specific (specify): SDG W0027

| | |
|---|---|
| 1. Relinquished by[28] (Signature/Affiliation) ITAS — Date: 4/18/94 Time: 1600 | 1. Received by[28] (Signature/Affiliation) ITAS KM — Date: 4/19/94 Time: 8:55 |
| 2. Relinquished by (Signature/Affiliation) — Date: Time: | 2. Received by (Signature/Affiliation) — Date: Time: |
| 3. Relinquished by (Signature/Affiliation) — Date: Time: | 3. Received by (Signature/Affiliation) — Date: Time: |

Comments:[29]

MCA 3/15/91

9615479.1133

0000051

INTERNATIONAL TECHNOLOGY CORPORATION

COC NO. *0001517*

Recpt lot 530 WO# 418

# ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. 340394

Page 1 of 2

Project Name/No.[1] 94-130

Sample Team Members[2]

Profit Center No.[3] 4632

Project Manager[4] Van Petty

Purchase Order No.[6]

Required Report Date[11]

Samples Shipment Date[7] 4-21-94

Lab Destination[8] MiddleBrook

Lab Contact[9]

Project Contact/Phone[12]

Carrier/Waybill No.[13] 112 9779 402 Fed EX

Bill to:[5] IT Richland

Report to:[10] IT Richland

**ONE CONTAINER PER LINE**

| Sample Number[14] | Sample Description/Type[15] | Date/Time Collected[16] | Container Type[17] | Sample Volume[18] | Preservative[19] | Requested Testing Program[20] | Condition on Receipt[21] | Disposal Record No.[22] |
|---|---|---|---|---|---|---|---|---|
| 40440601 A | BOBNW9/water | 4-19-94 | G | 1000 ml | Cool 4° | Metals *1 | Rec'd at 3°C KAK 4.22.94 | |
| B | | | G | 500 | | Anions | FOR LAB USE ONLY | |
| C | | | P | 1 | | NO2/NO3 | | |
| D | | | P | 250 | | Alkalinity | | |
| E | | | P | | | TDS | | |
| F | | | P | 1 | | Sulfate | FOR LAB USE ONLY | |
| G | | | P | 1000 | | Cyanide | | |
| 40440602 A | BOBNPD | | G | 1000 | | Metals *3 | | |

Special Instructions:[23]

Possible Hazard Identification:[24] Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☒

Sample Disposal:[25] Return to Client ☒ Disposal by Lab ☐ Archive _____ (mos.)

Turnaround Time Required:[26] Normal ☐ Rush ☐

QC Level:[27] I. ☐ II. ☐ III. ☐ Project Specific (specify): SOW WOO27

| | | | |
|---|---|---|---|
| 1. Relinquished by[28] (Signature/Affiliation) R. Boyd IT | Date: 4-21-94 Time: 1600 | 1. Received by[28] (Signature/Affiliation) Kerry A Klemm ITAS-KN | Date: 4-22-94 Time: 08:55 |
| 2. Relinquished by (Signature/Affiliation) | Date: Time: | 2. Received by (Signature/Affiliation) | Date: Time: |
| 3. Relinquished by (Signature/Affiliation) | Date: Time: | 3. Received by (Signature/Affiliation) | Date: Time: |

Comments:[29]

MCA 3/15/91

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WO# 418

INTERNATIONAL TECHNOLOGY CORPORATION

# ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[30] 340394

Page 2 of 2

Project Name WHC

Project No. 94-130

Samples Shipment Date 4-21-94

**ONE CONTAINER PER LINE**

| Sample[14] Number | Sample[15] Description/Type | Date/Time[16] Collected | Container[17] Type | Sample[18] Volume | Pre-[19] servative | Requested Testing[20] Program | Condition on[21] Receipt | Disposal[22] Record No. |
|---|---|---|---|---|---|---|---|---|
| 40440603 A | BOBNM7/water | 4-20-94 | G | 1000 ml | Cool to 4°C | metals *1 | Rec'd at 3°C KAK 4-22-94 | |
| B | | | G | 500 ml | | Anions | FOR LAB USE ONLY | |
| C | | | P | 1 | | NO2/NO3 | | |
| D | | | P | 250 | | Alkalenity | | |
| E | | | P | 1 | | TDS | | |
| F | | | P | 1 | | Sulfate | | |
| G | | | P | 1000 | | cyanide | | |
| 40440604 A | BOBNM8 | | G | 1 | | Metal *3 | | |

White: To accompany samples Yellow: Field copy *See back of form for special instructions.

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INTERNATIONAL TECHNOLOGY CORPORATION

COC NO. *0001525*

# ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

WO #428 RI #540

Reference Document No. 453600
Page 1 of ___

Project Name/No.[1] 3AF 94-130
Sample Team Members[2]
Profit Center No.[3] 4632
Project Manager[4] Van Petley
Purchase Order No.[6]
Required Report Date[11]

Samples Shipment Date[7] 4-23-94
Lab Destination[8] Middlebrook
Lab Contact[9]
Project Contact/Phone[12]
Carrier/Waybill No.[13]

Bill to:[5] IT Richland
Report to:[10] IT Richland

**ONE CONTAINER PER LINE**

| Sample Number[14] | Sample Description/Type[15] | Date/Time Collected[16] | Container Type[17] | Sample Volume[18] | Pre-servative[19] | Requested Testing Program[20] | Condition on Receipt[21] | Disposal Record No.[22] |
|---|---|---|---|---|---|---|---|---|
| 40442701 A | BOBNP7 / Water | 4/21 1142 | glass | 1 L. | Cool 4° | Metals, GFAA | 5°C 8/25/94 <2 | |
| B | | | ↓ | 500 ml | | IC ANIONS, CL SO4, NO2, PO4 | FOR LAB USE ONLY | |
| C | | | poly | ↓ | | NO2, NO3 | <2 | |
| D | | | | 250 ml | | ALKa. | | |
| E | | | | ↓ | | TDS | | |
| F | | | | ↓ | | Sulfate | FOR LAB USE ONLY | |
| G | ↓ | ↓ | ↓ | 1 L. | | Cyanide | #11 | |
| 02 A | BOBNP8 / Water | ↓ | glass | 1 L. | ↓ | Metals, GFAA | <2 | |

Special Instructions:[23] As per WHC Contract

Possible Hazard Identification:[24] Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☒

Sample Disposal:[25] Return to Client ☒ Disposal by Lab ☐ Archive ____ (mos.)

Turnaround Time Required:[26] Normal ☒ Rush ☐

QC Level:[27] I. ☐ II. ☐ III. ☐ Project Specific (specify): SDG W0038

| | | | |
|---|---|---|---|
| 1. Relinquished by[28] (Signature/Affiliation) Hudelberg | Date: 4-23-94 Time: 12:00 | 1. Received by[28] (Signature/Affiliation) Byron Blomquist ITASKN | Date: 4/25/94 Time: 8:55 |
| 2. Relinquished by (Signature/Affiliation) | Date: Time: | 2. Received by (Signature/Affiliation) | Date: Time: |
| 3. Relinquished by (Signature/Affiliation) | Date: Time: | 3. Received by (Signature/Affiliation) | Date: Time: |

Comments:[29]

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INTERNATIONAL TECHNOLOGY CORPORATION

WO# 428

# ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[30] 453600

Page 2 of 2

Project Name SAF 94-130

Project No. SDG-W0038

Samples Shipment Date 4-23-94

**ONE CONTAINER PER LINE**

| Sample[14] Number | Sample[15] Description/Type | Date/Time[16] Collected | Container[17] Type | Sample[18] Volume | Pre-servative[19] | Requested Testing[20] Program | Condition on[21] Receipt | Disposal[22] Record No. |
|---|---|---|---|---|---|---|---|---|
| 404427 03 A | B0BNP3 /water | 4/21 1109 | glass | 1 L. | Cool 4° | Metals /GFAA | 5°C BPB 4/25/94 <2 | |
| B | | | ↓ | 500ml | | IC ANIONS. CL SO4, NO2, PO4 | | |
| C | | | poly | ↓ | | NO2, NO3 | <2 | |
| D | | | | 250ml | | AlKa. | | |
| E | | | | ↓ | | TDS | | |
| F | | | | ↓ | | Sulfate | | |
| G | ↓ | | ↓ | 1 L. | | Cyanide | 11 | |
| 04 A | B0BNP4 /water | ↓ | glass | ↓ | | METALS/GFAA | <2 | |
| 05 A | B0BNM5 /water | 4/21 0835 | | 500ml | | METALS /GFAA | <2 | |
| B | | | ↓ | ↓ | | IC ANIONS. CL SO4, NO2, PO4 | | |
| C | | | poly | 250ml | | NO2 NO3 | <2 | |
| D | | | | | | AlKa. | | |
| E | | | | | | TDS | | |
| F | | | | | | Sulfate | | |
| G | | | | 1 L. | | Cyanide | 11 | |
| 06 A | B0BNM6 /water | | glass | | | Metals, GFAA | <2 | |
| | | | | | | | | |
| | | | | | | | | |
| | | 4/23/94 | | | | | | |
| | | | | | | | | |

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Write: 10 accompany samples Yellow: Field copy

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INTERNATIONAL TECHNOLOGY CORPORATION

COC NO. *0001536*

# ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

WO#439 PR#550

Reference Document No. 453604

Page 1 of 2

Project Name/No.[1] SAF 94-130

Sample Team Members[2]

Profit Center No.[3] 4632

Project Manager[4] Van Pettey

Purchase Order No.[6]

Required Report Date[11]

Samples Shipment Date[7] 4-26-94

Lab Destination[8] Middle Brook

Lab Contact[9]

Project Contact/Phone[12]

Carrier/Waybill No.[13]

Bill to:[5] IT Richland

Report to:[10] IT Richland

**ONE CONTAINER PER LINE**

| Sample Number[14] | Sample Description/Type[15] | Date/Time Collected[16] | Container Type[17] | Sample Volume[18] | Pre-servative[19] | Requested Testing Program[20] | Condition on Receipt[21] | Disposal Record No.[22] |
|---|---|---|---|---|---|---|---|---|
| 40445801A | BOBNP5 / water | 4-22-1050 | G | 1000 ml | Cool 4° | ICP, GFAA *1 | 6°C 4/27/94 | |
| B | | | ↓ | 500 | | Anions | FOR LAB USE ONLY | |
| C | | | P | ↓ | | NO2/NO3 | | |
| D | | | | 250 | | Alkalinity | | |
| E | | | | ↓ | | TDS | | |
| F | | | | ↓ | | Sulfate | FOR LAB USE ONLY | |
| G | | | ↓ | 1000 ml | | cyanide | | |
| 40445802A | BOBNP6 | ↓ | ↓ | 1000 ml | ↓ | ICP, GFAA *3 | ↓ | |

Special Instructions:[23]

Possible Hazard Identification:[24] Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☒

Sample Disposal:[25] Return to Client ☒ Disposal by Lab ☐ Archive _____ (mos.)

Turnaround Time Required:[26] Normal ☒ Rush ☐ As Per WHC Contract

QC Level:[27] I. ☐ II. ☐ III. ☐ Project Specific (specify): SAS W0038

| | |
|---|---|
| 1. Relinquished by[28] (Signature/Affiliation) ITAS — Date: 4/26/94 Time: 1600 | 1. Received by[28] (Signature/Affiliation) Bryan Blomquist ITASKN — Date: 4/27/94 Time: 9:20 |
| 2. Relinquished by (Signature/Affiliation) — Date: Time: | 2. Received by (Signature/Affiliation) — Date: Time: |
| 3. Relinquished by (Signature/Affiliation) — Date: Time: | 3. Received by (Signature/Affiliation) — Date: Time: |

Comments:[29]

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INTERNATIONAL TECHNOLOGY CORPORATION

WO#439

# ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[30] 453604

Page 2 of 2

Project Name SAF 94-130

Project No. SDG W0038

Samples Shipment Date 4-26-94

**ONE CONTAINER PER LINE**

| Sample[14] Number | Sample[15] Description/Type | Date/Time[16] Collected | Container[17] Type | Sample[18] Volume | Pre-[19] servative | Requested Testing[20] Program | Condition on[21] Receipt | Disposal[22] Record No. |
|---|---|---|---|---|---|---|---|---|
| 40445803A | BOBRL3 / water | 4-22-94 0800 | G | 1000 ml | COOL 4° | ICP, GFAA *1 | 4°C BPB 4/27/94 | |
| B | ↓ | ↓ | ↓ | 500 ml | ↓ | Anions | ↓ | |
| C | ↓ | ↓ | P | ↓ | ↓ | NO2/NO3 | ↓ | |
| D | ↓ | ↓ | ↓ | 250 | ↓ | Alkalinity | ↓ | |
| E | ↓ | ↓ | ↓ | ↓ | ↓ | TDS | ↓ | |
| F | ↓ | ↓ | ↓ | ↓ | ↓ | Sulfate | ↓ | |
| G | ↓ | ↓ | ↓ | 1000 | ↓ | cyanide | ↓ | |
| 40445804A | BOBRL4 | ↓ | G | ↓ | ↓ | ICP, GFAA *3 | ↓ | |
| | | | | | | | | |
| 4/26/94 | | | | | | | | |

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INTERNATIONAL TECHNOLOGY CORPORATION

COC NO. *0001551*

# ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

WO #455 RL #564

Reference Document No. 453607

Page 1 of 2

Project Name/No.[1] SAF 94-130

Sample Team Members[2]

Profit Center No.[3] 4632

Project Manager[4] VAN PETTEY

Purchase Order No.[6]

Required Report Date[11]

Samples Shipment Date[7] 4-28-94

Lab Destination[8] Middlebrook

Lab Contact[9]

Project Contact/Phone[12]

Carrier/Waybill No.[13] 150 9385 096

Bill to:[5] IT Richland

Report to:[10] IT Richland

**ONE CONTAINER PER LINE**

| Sample Number[14] | Sample Description/Type[15] | Date/Time Collected[16] | Container Type[17] | Sample Volume[18] | Pre-servative[19] | Requested Testing Program[20] | Condition on Receipt[21] | Disposal Record No.[22] |
|---|---|---|---|---|---|---|---|---|
| 40449501 A | B0BNN1/water | 4/25 1330 | glass | 1 L. | cool 4° | Metals, 6-FAA | 5°C BBB 4/29/94 <2 | |
| B | | | ↓ | 500ml | | ANIONS, SO4, NO2, PO4 | FOR LAB USE ONLY | |
| C | | | poly | ↓ | | NO2, NO3 | <2 | |
| D | | | | 250ml | | alka. | | |
| E | | | | | | TDS | | |
| F | | | | ↓ | | Sulfate | FOR LAB USE ONLY | |
| G | ↓ | ↓ | ↓ | 1 L. | | Cyanide | >12 | |
| 40449502A | B0BNN2/water | ↓ | glass | 1 L. | ↓ | Metals, 6-FAA | <2 | |

Special Instructions:[23] As per WHC Contract

Possible Hazard Identification:[24] Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☒

Sample Disposal:[25] Return to Client ☒ Disposal by Lab ☐ Archive _____ (mos.)

Turnaround Time Required:[26] Normal ☒ Rush ☐

QC Level:[27] I. ☐ II. ☐ III. ☐ Project Specific (specify): SDG W0038

| | | | |
|---|---|---|---|
| 1. Relinquished by[28] (Signature/Affiliation) Heidelberg IT | Date: 4-28-94 Time: 16:00 | 1. Received by[28] (Signature/Affiliation) Bryan Blomquist FAA | Date: 4/29/94 Time: 8:45 |
| 2. Relinquished by (Signature/Affiliation) | Date: Time: | 2. Received by (Signature/Affiliation) | Date: Time: |
| 3. Relinquished by (Signature/Affiliation) | Date: Time: | 3. Received by (Signature/Affiliation) | Date: Time: |

Comments:[29]

MCA 3/15/91

VHA08: IU accompany samples

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INTERNATIONAL TECHNOLOGY CORPORATION

# ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

WO# 455

Reference Document No.[30] 453607

Page 2 of 2

Project Name SAF 94-130

Project No. SDG W0038

Samples Shipment Date 4-28-94

**ONE CONTAINER PER LINE**

| Sample[14] Number | Sample[15] Description/Type | Date/Time[16] Collected | Container[17] Type | Sample[18] Volume | Pre-[19] servative | Requested Testing[20] Program | Condition on[21] Receipt | Disposal[22] Record No. |
|---|---|---|---|---|---|---|---|---|
| 40449503A | BOBRL7 / water | 4/25 1130 | glass | 1 L. | cool 4° | Metals, 6-FAA | 5°C BBB 4/29/94 <2 | |
| B | | | ↓ | 500ml | | Anions, $SO_4$, $NO_2$, $PO_4$ | | |
| C | | | poly | ↓ | | $NO_2$, $NO_3$ | <2 | |
| D | | | | 250ml | | alka. | | |
| E | | | | | | TDS | | |
| F | | | | ↓ | | Sulfate | | |
| G | | | ↓ | 1 L. | | Cyanide | >12 | |
| 40449504A | BOBRL8 / water | ↓ | glass | 1 L. | | Metals, 6-FAA | <2 | |

JAT 4/28/94

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White: To accompany samples | Yellow: Field copy

*See back of form for special instructions.

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WO # 388

TENNELEC #1 SCREENING CALCULATION SPREADSHEET

| Customer Code WHC | Recieved Date | Time | Screening Prep Date | Time | Count Date | Mnts Cntd | BACKGROUND Alpha | Beta | Mnts |
|---|---|---|---|---|---|---|---|---|---|
| | | | 41894 | | 418 | 10 | 6 | 61 | 60 |

All category I
JRR 18 Apr 94

| Customer ID WHC/WATER | pH <2 Rcvd/Reiq | RESIDUE Wght (mGrms) | Vol. Anal. mG | mL | Sample Size Gm | L | SMPLE CNT DATA Hldr Num. | Total Counts Alpha | Beta | Net Sample Counts/Minute Alpha | Beta | DPM / Aliqout Alpha | Beta | uCi per Sample Alpha | Beta | 2 Sigma Error uCi per Sample Alpha | Beta | pCi/(Gm or L) Alpha | Beta | Catagory 1 Yes/No | Aliquot to Cat 1 Gm or Ltr Alpha | Beta |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B0BNP1 | | 1.2 | 5 | | 4.0 | | 50 | 1 | 23 | 0.00 | 1.28 | -4E-02 | 2.7E+00 | -1E-05 | 9.9E-04 | -9E-09 | 5.8E-07 | -1E+00 | 2.5E+02 | Yes | -3E+03 | 4.1E+02 |
| B0BMN6 | | 4.9 | 5 | | 2.0 | | 51 | 9 | 153 | 0.80 | 14.28 | 2.9E+00 | 3.0E+01 | 5.2E-04 | 5.4E-03 | 4.7E-07 | 1.1E-06 | 2.8E+02 | 2.7E+03 | Yes | 3.9E+01 | 3.7E+01 |
| B0BNZ2 | | 1.7 | 5 | | 1.0 | | 52 | 0 | 20 | -0.10 | 0.98 | -4E-01 | 2.2E+00 | -4E-05 | 2.0E-04 | -8E-06 | 6.2E-07 | -4E+01 | 2.0E+02 | Yes | -3E+02 | 5.1E+02 |
| B0BP22 | | 1.0 | 5 | | 1.0 | | 53 | 3 | 16 | 0.20 | 0.58 | 7.7E-01 | 1.1E+00 | 6.9E-05 | 1.0E-04 | 1.1E-07 | 1.4E-07 | 6.9E+01 | 1.0E+02 | Yes | 1.4E+02 | 1.0E+03 |
| B0BNZ4 | | 1.2 | 5 | | 1.0 | | 54 | 4 | 12 | 0.30 | 0.18 | 1.2E+00 | 1.9E-01 | 1.1E-04 | 1.7E-05 | 1.3E-07 | 9.7E-09 | 1.1E+02 | 1.7E+01 | Yes | 9.5E+01 | 5.8E+03 |

WO 418

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TENNELEC #1

SCREENING CALCULATION SPREADSHEET

Category I
JRM 21 Apr 94

| Customer Code | Recieved Date | Time | Screening Prep Date | Time | Count Date | Mnts. Cntd | BACKGROUND Alpha | Beta | Mnts |
|---|---|---|---|---|---|---|---|---|---|
| WHC | | | 42194 | | 421 | 10 | 11 | 178 | 180 |

| Customer ID | pH | RESIDUE Wght | Vol. Anal. | Sample Size | SMPLE CNT DATA Hldr | Total Counts | Net Sample Counts/Minute | | DPM / Aliqout | | uCi per Sample | | 2 Sigma Error uCi per Sample | | pCi/(Gm or L) | | Catagory 1 | Aliquot to Cat 1 Gm or Ltr | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WHC/SOIL | <2 Rcvd/Reiq | (mGrms) | mG mL | Gm L | Num. | Alpha Beta | Alpha | Beta | Alpha | Beta | Alpha | Beta | Alpha | Beta | Alpha | Beta | Yes/No | Alpha | Beta |
| B0BJ10 | | 99.6 | 100 | 1350.0 | 10 | 2 27 | 0.14 | 1.71 | 1.4E+00 | 4.2E+00 | 8.5E-03 | 2.6E-02 | 1.6E-05 | 1.4E-05 | 6.3E+00 | 1.9E+01 | Yes | 1.6E+03 | 5.3E+03 |

WO# 457

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TENNELEC #1 SCREENING CALCULATION SPREADSHEET

| Customer Code | Recieved Date | Time | Screening Prep Date | Time | Count Date | Mnts. Cntd | BACKGROUND Alpha | Beta | Mnts |
|---|---|---|---|---|---|---|---|---|---|
| WHC | | | 42594 | | 425 | 10 | 6 | 52 | 60 |

Cat Category I
JRM 25 Apr 94

| Customer ID | pH | RESIDUE | Vol. | Sample | SMPLE CNT DATA | | | Net Sample | | DPM / Aliqout | | uCi per Sample | | 2 Sigma Error | | pCi/(Gm or L) | | Catagory | Aliquot to Cat 1 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Hldr | Total | Counts | Counts/Minute | | | | | | uCi per Sample | | | | 1 | Gm or Ltr | |
| WHC/WATER | <2 Rcvd/Relq | Wght (mGrms) | Anal. mG mL | Size Gm L | Num. | Alpha | Beta | Alpha | Beta | Alpha | Beta | Alpha | Beta | Alpha | Beta | Alpha | Beta | Yes/No | Alpha | Beta |
| B0BRL3 | | 0.2 | 5 | 4.0 | 1 | 0 | 15 | -0.10 | 0.63 | -4E-01 | 1.4E+00 | -1E-04 | 5.1E-04 | -3E-07 | 4.0E-07 | -4E+01 | 1.3E+02 | Yes | -3E+02 | 7.9E+02 |
| B0BNZ6 | | 1.9 | 5 | 1.0 | 2 | 1 | 29 | 0.00 | 2.03 | -6E-02 | 4.3E+00 | -6E-06 | 3.9E-04 | -3E-09 | 1.8E-07 | -6E+00 | 3.9E+02 | Yes | -2E+03 | 2.6E+02 |
| B0BNZ0 | | 1.6 | 5 | 1.0 | 3 | 5 | 25 | 0.40 | 1.63 | 1.5E+00 | 3.2E+00 | 1.4E-04 | 2.9E-04 | 1.6E-07 | 3.4E-07 | 1.4E+02 | 2.9E+02 | Yes | 7.2E+01 | 3.4E+02 |
| B0BP04 | | 1.6 | 5 | 1.0 | 4 | 1 | 23 | 0.00 | 1.43 | -5E-02 | 3.1E+00 | -4E-06 | 2.8E-04 | -3E-09 | 9.8E-06 | -4E+00 | 2.8E+02 | Yes | -2E+03 | 3.6E+02 |
| B0BNP5 | | 1.2 | 5 | 4.0 | 5 | 0 | 9 | -0.10 | 0.03 | -4E-01 | 1.4E-01 | -1E-04 | 4.9E-05 | -3E-07 | 3.6E-06 | -4E+01 | 1.2E+01 | Yes | -3E+02 | 8.1E+03 |
| B0BNZ8 | | 0.7 | 5 | 1.0 | 6 | 2 | 6 | 0.10 | -0.07 | 3.9E-01 | -2E-01 | 3.5E-05 | -2E-05 | 7.3E-06 | -2E-06 | 3.5E+01 | -2E+01 | Yes | 2.8E+02 | -5E+03 |
| TOTAL | uCi | | | | | | | -0.10 | -0.67 | -4E-01 | -2E+00 | -1E-04 | 1.5E-03 | ERR | ERR | ERR | ERR | Yes | ERR | ERR |

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WO# 455

all below m m f 4-27-94

all Cat I m m Forby 4-27-94

TENNELEC #1 SCREENING CALCULATION SPREADSHEET

| Customer Code WHC | Recieved Date | Time | Screening Prep Date | Time | Count Date | Mnts. Cntd | BACKGROUND Alpha | Beta | Mnts |
|---|---|---|---|---|---|---|---|---|---|
| | | | 42794 | | 427 | 10 | 20 | 228 | 240 |

| Customer ID WHC/WATER | pH <2 Rcvd/Relq | RESIDUE Wght (mGrms) | Vol. Anal. mG | mL | Sample Size Gm | L | SMPLE CNT DATA Hldr Num. | Total Alpha | Counts Beta | Net Sample Counts/Minute Alpha | Beta | DPM / Aliqout Alpha | Beta | uCi per Sample Alpha | Beta | 2 Sigma Error uCi per Sample Alpha | Beta | pCi/(Gm or L) Alpha | Beta | Catagory 1 Yes/No | Aliquot to Cat 1 Gm or Ltr Alpha | Beta |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B0BNM9 | | 0.9 | 5 | | 4.0 | | 1 | 8 | 42 | 0.72 | 3.25 | 2.7E+00 | 6.5E+00 | 9.7E-04 | 2.3E-03 | 8.4E-07 | 9.5E-07 | 2.4E+02 | 5.8E+02 | Yes | 4.1E+01 | 1.7E+02 |
| B0BNN1 | | 1.8 | 5 | | 4.0 | | 2 | 3 | 49 | 0.22 | 3.95 | 7.4E-01 | 8.3E+00 | 2.7E-04 | 3.0E-03 | 4.5E-07 | 1.0E-06 | 6.6E+01 | 7.5E+02 | Yes | 1.5E+02 | 1.3E+02 |
| B0BNK1 | | 1.5 | 5 | | 4.0 | | 3 | 2 | 48 | 0.12 | 3.85 | 3.4E-01 | 8.1E+00 | 1.2E-04 | 2.9E-03 | 3.2E-07 | 2.3E-05 | 3.1E+01 | 7.3E+02 | Yes | 3.3E+02 | 1.4E+02 |
| B0BRK9 | | 0.1 | 5 | | 4.0 | | 4 | 1 | 9 | 0.02 | -0.05 | 6.8E-02 | -1E-01 | 2.4E-05 | -4E-05 | 1.2E-07 | -2E-07 | 5.9E+00 | -1E+01 | Yes | 1.7E+03 | -9E+03 |
| B0BP06 | | 0.5 | 5 | | 1.0 | | 5 | 2 | 14 | 0.12 | 0.45 | 4.4E-01 | 8.8E-01 | 4.0E-05 | 7.9E-05 | 7.9E-08 | 1.7E-07 | 4.0E+01 | 7.9E+01 | Yes | 2.5E+02 | 1.3E+03 |
| B0BNN5 | | 1.1 | 5 | | 4.0 | | 6 | 5 | 23 | 0.42 | 1.35 | 1.6E+00 | 2.6E+00 | 5.7E-04 | 9.4E-04 | 6.3E-07 | 9.6E-07 | 1.4E+02 | 2.3E+02 | Yes | 7.0E+01 | 4.3E+02 |
| B0BP30 | | 0.2 | 5 | | 1.0 | | 7 | 0 | 11 | -0.08 | 0.15 | -3E-01 | 3.7E-01 | -3E-05 | 3.4E-05 | -7E-08 | 5.6E-06 | -3E+01 | 3.4E+01 | Yes | -3E+02 | 3.0E+03 |
| B0BP20 | | 1.7 | 5 | | 1.0 | | 8 | 5 | 20 | 0.42 | 1.05 | 1.6E+00 | 2.0E+00 | 1.5E-04 | 1.8E-04 | 1.6E-07 | 1.6E-07 | 1.5E+02 | 1.8E+02 | Yes | 6.9E+01 | 5.6E+02 |
| B0BRL7 | | 1.7 | 5 | | 4.0 | | 9 | 2 | 42 | 0.12 | 3.25 | 3.6E-01 | 6.9E+00 | 1.3E-04 | 2.5E-03 | 3.2E-07 | 1.7E-05 | 3.2E+01 | 6.2E+02 | Yes | 3.1E+02 | 1.6E+02 |
| B0BNN3 | | 2.2 | 5 | | 4.0 | | 10 | 1 | 41 | 0.02 | 3.15 | -3E-02 | 6.7E+00 | -1E-05 | 2.4E-03 | -1E-07 | 1.7E-04 | -3E+00 | 6.1E+02 | Yes | -3E+03 | 1.7E+02 |
| B0BP12 | | 1.8 | 5 | | 1.0 | | 11 | 1 | 16 | 0.02 | 0.65 | 4.6E-02 | 1.4E+00 | 4.1E-06 | 1.2E-04 | 3.0E-08 | 3.0E-06 | 4.1E+00 | 1.2E+02 | Yes | 2.4E+03 | 8.1E+02 |
| B0BRL5 | | 0.3 | 5 | | 4.0 | | 12 | 1 | 10 | 0.02 | 0.05 | 6.3E-02 | 9.6E-02 | 2.3E-05 | 3.4E-05 | 1.2E-07 | 1.7E-07 | 5.7E+00 | 8.6E+00 | Yes | 1.8E+03 | 1.2E+04 |
| B0BNY8 | | 1.7 | 5 | | 1.0 | | 13 | 1 | 24 | 0.02 | 1.45 | 2.0E-02 | 3.1E+00 | 1.8E-06 | 2.8E-04 | 2.9E-08 | 2.2E-05 | 1.8E+00 | 2.8E+02 | Yes | 5.5E+03 | 3.6E+02 |
| B0BNY6 | | 1.8 | 5 | | 1.0 | | 14 | 1 | 19 | 0.02 | 0.95 | 3.6E-02 | 2.0E+00 | 3.3E-06 | 1.8E-04 | 3.0E-08 | 6.6E-06 | 3.3E+00 | 1.8E+02 | Yes | 3.1E+03 | 5.5E+02 |
| B0BP42 | | 0.1 | 5 | | 1.0 | | 15 | 1 | 11 | 0.02 | 0.15 | 6.0E-02 | 3.1E-01 | 5.4E-06 | 2.8E-05 | 2.9E-06 | 2.4E-07 | 5.4E+00 | 2.8E+01 | Yes | 1.9E+03 | 3.6E+03 |
| TOTAL | uCi | | | | | | | | | -0.08 | -0.95 | -3E-01 | -2E+00 | 2.3E-03 | 1.5E-02 | ERR | ERR | ERR | ERR | Yes | ERR | ERR |

Rec'd at 3:11:5 pm

5111-9/13/96

961347 p. 1116

WO #388
00058.6

SAMPLE STATUS REPORT FOR E 6232. E-BLANK 69957-59 TIME: 4/18/94 8:25
DISPATCHED: 4/ 1/94 14: 7 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 4/15/94 14:37

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

END OF REPORT

BOBNP1
BOBNP2

LCS
4/18/94

W0418

000587

04/20/94 07:22 ☎373 3178 222S 3B 005

SAMPLE STATUS REPORT FOR E 6231. E-BLANK 59955-57 TIME: 4/20/94 8:18
DISPATCHED: 4/ 1/94 14: 6 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 4/19/94 15: 9

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

END OF REPORT

BCBNN7

BCBNPC

LCS
4/21/94

WO 418 00058.8

SAMPLE STATUS REPORT FOR E 6225. E-BLANK 69952-57 TIME: 4/21/94 8:43
DISPATCHED: 4/ 1/94 14: 2 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 4/20/94 14: 8

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

END OF REPORT

BO BNM7
BO BNM8
hCG
4/21/94

WO#428
00058.9

SAMPLE STATUS REPORT FOR E 6224. E-BLANK 69952-54 TIME: 4/22/94 8:19
DISPATCHED: 4/ 1/94 14: 1 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 4/21/94 13:39

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

END OF REPORT

BOBNM5
BOBNM6
LCS
4/22/94

WO#428
000 58.10

SAMPLE STATUS REPORT FOR E 6233. E-BLANK 69959-58 TIME: 4/22/94 8:19
DISPATCHED: 4/ 1/94 14: 8 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 4/21/94 13:39

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

END OF REPORT

BOBNP3
BOBNP4

hCS
~~4/22/94~~
4/22/94

WO#428 00058.11

SAMPLE STATUS REPORT FOR E 6235. E-BLANK 69960-60 TIME: 4/22/94 8:19
DISPATCHED: 4/ 1/94 14: 9 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 4/22/94 8:16

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

END OF REPORT

BOBNP7
BOBNP8
LCS
4/22/94

961472.1152

00058.12
WO#439

04/25/94 09:35 ☎373 3176 222S 3B 009

SAMPLE STATUS REPORT FOR E 6234. E-BLANK 69960-57 TIME: 4/25/94 10:12
DISPATCHED: 4/ 1/94 14: 8 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 4/25/94 8:48

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

END OF REPORT

BOBNP5
BOBNP6

LCS
4/25/94

WO#439

00058.13

04/25/94 08:35 ☎373 3176 222S 3B ☑010

SAMPLE STATUS REPORT FOR E 6637. E-BLANK FTBLK-1 TIME: 4/25/94 10:12
DISPATCHED: 4/11/94 8:15 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 4/25/94 8:48

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

END OF REPORT

BOBRL3
BOBRL4
KS
4/25/94

9613476.1154

WO# 455

00058.14

013

04/26/94 09:36 ☎373 3176 222S 3B

SAMPLE STATUS REPORT FOR E 6227. E-BLANK 6995355B TIME: 4/26/94 10:24
DISPATCHED: 4/ 1/94 14: 4 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 4/26/94 8: 8

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

END OF REPORT ✓

BO BNN1 AJS
BO BNN2 4/26/94

9613476.1155

WO#455

00058.14

04/26/94 09:37 ☎373 3176 222S 3B ☑014

SAMPLE STATUS REPORT FOR E 6228. E-BLANK 6995355C TIME: 4/26/94 10:24
DISPATCHED: 4/ 1/94 14: 4 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 4/26/94 8: 8

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

END OF REPORT ✓

BO BRL7
BO BRL8 AJS 4/26/94

BO BRM3
BO BRM4

BOBNN3
BOBNN4

9613476.1156

Los Alamos Technical Associates, Inc.

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

September 16, 1994

Jeanette Duncan
CH2M Hill
450 Hills
Richland, WA 99352

Dear Jeanette,

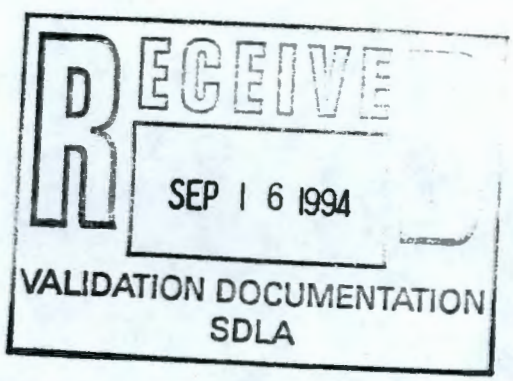
Attached is the data validation report for analytical results for 200-BP-5 Groundwater Operable Unit (SDG W0038-ITC-047). The package was received by Los Alamos Technical Associates on September 14, 1994. Validation of this package began on September 14, and was completed on September 15, 1994.

If you have any questions, please let me know.

Sincerely,

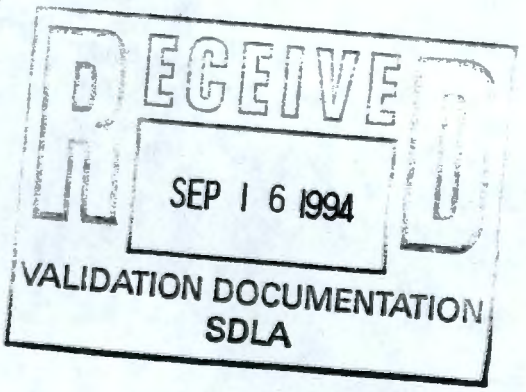
Donald J. Smith
Project Manager

cc: Chris Haecker, LATA
VW402.81

# DATA VALIDATION REPORT
# for
# 200-BP-5 Groundwater Operable Unit
# SDG W0038-ITC-047
# LATA VW402.81


Westinghouse Hanford Company
P.O. Box 1970
Richland, Washington 99352




September 15, 1994

## Table of Contents

# 200-BP-5 Groundwater Operable Unit
# Data Validation Narrative

## INTRODUCTION

All samples in Sample Delivery Group (SDG) W0038-ITC-047 were validated at level "D" as defined in the Data Validation Procedures for Chemical Analyses (WHC-SD-EN-SPP-002) and/or Data Validation Procedures for Radiochemical Analyses (WHC-SD-EN-SPP-001).

The data package was received by Los Alamos Technical Associates (LATA) on September 14, 1994. Validation began on September 14, 1994 and was completed on September 15, 1994.

The chemical and radiochemical analyses were performed by ITC.

## ANALYSES REQUESTED

Twenty (20) water samples numbered BOBNP7, BOBNP8, BOBNP3, BOBNP4, BOBNM5, BOBNM6, BOBNN1, BOBNN2, BOBRL7, BOBRL8, BOBNP5, BOBNP6, BOBRL3, BOBRL4, BOBNP1, BOBNP2, BOBNN9, BOBNP0, BOBNM7, and BOBNM8 were collected by WHC and transferred to ITC for analysis. The table below shows the determinations that were conducted on the samples in this SDG:

Analyses Requested

| Sample ID | Date Collected by WHC | Date Received by ITC | Metals[1] | General Chemistry +Total Cyanide[2] | Radiochemistry[3] |
|---|---|---|---|---|---|
| BOBNP7 | 4/21/94 | 4/22/94 | X | X | X |
| BOBNP8 | 4/21/94 | 4/22/94 | X | | |
| BOBNP3 | 4/21/94 | 4/22/94 | X | X | X |
| BOBNP4 | 4/21/94 | 4/22/94 | X | | |
| BOBNM5 | 4/21/94 | 4/22/94 | X | X | X |
| BOBNM6 | 4/21/94 | 4/22/94 | X | | |
| BOBNN1 | 4/25/94 | 4/27/94 | X | X | X |
| BOBNN2 | 4/25/94 | 4/27/94 | X | | |
| BOBRL7 | 4/25/94 | 4/27/94 | X | X | X |
| BOBRL8 | 4/25/94 | 4/27/94 | X | | |
| BOBNP5 | 4/22/94 | 4/25/94 | X | X | X |
| BOBNP6 | 4/22/94 | 4/25/94 | X | | |
| BOBRL3 | 4/22/94 | 4/25/94 | X | X | X |

| Sample ID | Date Collected by WHC | Date Received by ITC | Metals[1] | General Chemistry +Total Cyanide[2] | Radiochemistry[3] |
|---|---|---|---|---|---|
| BOBNP1 | 4/15/94 | 4/18/94 | X | X | X |
| BOBNP2 | 4/15/94 | 4/18/94 | X | | |
| BOBNN9 | 4/19/94 | 4/21/94 | X | X | X |
| BOBNP0 | 4/19/94 | 4/21/94 | X | | |
| BOBNM7 | 4/20/94 | 4/21/94 | X | X | X |
| BOBNM8 | 4/20/94 | 4/21/94 | X | | |

[1]Metals:

| | |
|---|---|
| ICP | Method CLP |
| Selenium | Method CLP |

[2]General Chemistry + Total Cyanide

| | |
|---|---|
| Total Cyanide | Method CLP |
| Sulfate | Method 375.4 |
| Total Dissolved Solids | Method 160.1 |
| Alkalinity | Method 310.1 |
| Nitrate+Nitrite | Method 353.2 |
| Anions (F, Cl, $SO_4$, $NO_2$, $PO_4$) | Method 300.0 |

[3]Radiochemistry

| | |
|---|---|
| Gross Alpha/Beta | Method ITAS-RD-3222 |
| Plutonium 238, 239/240 | Method ITAS-RD-3209 |
| Strontium 89/90 | Method ITAS-RD-3204 |
| Total Uranium | Method ITAS-RD-4200 |
| Gamma Spectrometry | Method ITAS-RD-3219 |
| Technetium-99 | Method ITAS-RD-3205 |
| Tritium | Method ITAS-RD-3205 |

## DATA QUALITY OBJECTIVES

The data quality objectives for 200-BP-5 Groundwater Operable Unit are specified in the *Quality Assurance Program Plan for the 200-BP-5 Groundwater Operable Unit* (DOE/RL 88-32, Rev. 1).

DATA QUALITY OBJECTIVES (cont.)

The primary objective of the data validation effort was to ensure these data quality objectives were met, and that the data are usable and defensible. This was accomplished through a detailed examination of the data package to recreate the analytical process and verify that proper and acceptable analytical techniques had been applied. The data package was checked for correct submission of required deliverables, correct transcription of raw data to the summary forms, and for proper calculation of a number of parameters.

**Precision.** Goals for precision were met with the exception of iron.

**Accuracy.** Goals for accuracy were met with the exception of cyanide, bismuth and selenium.

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

**Detection Limits.** Detection limits goals were met for all sample results as specified in the work plan (DOE/RL 88-32).

**Completeness.** The data package was 96% complete for all requested analyses.

Data qualifiers are assigned to any results that have been determined to be deficient. These are discussed below.

MAJOR DEFICIENCIES (REJECTED DATA)

The following major deficiencies resulted in the qualification of the results as unusable.

METALS

- Cyanide was qualified as unusable (UR) for samples BOBNP7 and BOBNP3 for exceeding the maximum holding times by greater than 2 times.

GENERAL CHEMISTRY

- IC anions $NO_2$ and $PO_4$ were qualified unusable (UR) for exceeding the holding time requirement by more than 2 times.

## MINOR DEFICIENCIES

The following minor deficiencies were discovered. These minor shortcomings are not expected to significantly affect the overall quality of the data.

### METALS

- Samples BOBNM5 and BOBNN9 were qualified as estimated (J) for missed holding times for cyanide.
- Iron was qualified as non-detect (U) for positive preparation blank contamination for samples BOBNP1 and BOBNP2.
- Potassium was qualified as non-detect (U) for positive blank contamination for sample BOBRL7.
- Selenium was qualified as non-detect (U) for positive blank contamination for samples BOBNP7, BOBNP3, BOBNP4, BOBNM5, and BOBNM6.
- Iron was qualified as estimated (J/BJ) for duplicate RPDs greater than 20% for samples BOBNM5, BOBNM6, BOBNP3, BOBNP4, BOBNP7, and BOBNP8.
- Cyanide results for samples BOBNN9 and BOBNM5 were qualified as estimated (J) for LCS recoveries outside 80-120%.
- Selenium and bismuth were qualified as estimated for low analytical spike recovery for sample BOBNP0 (UJ for bismuth), for sample BOBNP7, BOBNP8, BOBNP3, and BOBNP4 (J/UJ for selenium).

### GENERAL CHEMISTRY

- No deficiencies were observed.

### RADIOCHEMISTRY

- BOBRL3 was qualified as non-detect (U) due to uranium being detected in the blank.

**COMMENTS**

- Several sample result forms were marked by the lab with an asterisk for duplicate RPD outside acceptance criteria for iron. Examination of the prep and run logs revealed the application of the these qualifiers were erroneous for some samples. In these cases, the lab qualifiers have been crossed-out.

- Only fluoride and sulfate were reported for IC anions for samples BOBNM7, BOBNP1, and BOBNN9. Chloride, phosphorous, and nitrite were requested, analyzed, but not reported by the laboratory. The Form 1's were edited by the validator.

- BOBRL7 and B0BRL8 were field duplicate samples. Only the metals analyses were performed on these samples. The RPD comparison between BOBRL7 and B0BRL8 was acceptable .

- Page 19 of the ITC data package has a U-total RPD that was calculated using data that had been rejected by the laboratory. On page 24 of the ITC data package, the correct RPD comparison is reported. Pages 19 and 24 are included in the checklist. All U-total data was thoroughly checked for data entry errors.

- The sulfate analysis for sample BOBRL7 by method 375.4 was cancelled per WHC (see record of disposition on page 178a). As a result, there is no Form 1 for sulfate by this method. The result originally reported on page 18 was a false entry and has been deleted from the Data Summary Table.

- Sample BOBNP1 was received at the laboratory at pH 10. A pH of 12 or higher is required tby the CLP protocol to ensure that the cyanide remains in solution as the CN anion and does not evolve as HCN, a gas. Consequently, all samples improperly preserved or received at a pH less than 12 are subject to a low bias for the cyanide analysis. However, the WHC validation procedure does not allow qualification due to a low pH. Only missed holding times can warrant the qualification of data according to the validation procedure. Preservation deficiencies cannot warrant qualification.

## REFERENCES

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

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

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

DOE 1994, *Quality Assurance Program Plan for the 200-BP-5 Groundwater Operable Unit*, DOE/RL 88-32, Rev. 1, Department of Energy-Hanford, Richland, Washington.

## DATA VALIDATION APPLIED QUALIFIERS

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

U- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ- Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during data validation, the associated quantitation limit is an estimate.

J- Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, but the data are usable for decision making purposes.

BJ- Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R- Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency the data are unusable.

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

JN- Indicates a tentatively identified compound (TIC) that has been determined to be valid in terms of identification and quantitation.

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.

NJ- Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific application (i.e., usable for decision making purposes).

N- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision making purposes).

## LABORATORY APPLIED QUALIFIERS

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

Organic Data Qualifiers

U- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

J- Indicates an estimated value. This flag is used when estimating concentrations of tentatively identified compounds (TICs) or when the presence of a TCL compound is confirmed at a concentration of less than the CRQL but greater than the IDL.

N- Indicates presumptive evidence of a compound. This flag is used only by the laboratory for TIC results when the identification is based on a mass spectral library search.

P- This flag is used for pesticide/Aroclor target analytes when there is greater than 25% difference for detected values between the quantitation and confirmation GC columns. The lower of the two concentrations is reported on the report form and the result is flagged with a "P".

C- This flag applies to pesticide results where the identification has been confirmed by GC/MS. This flag should not be used by the laboratory if GC/MS confirmation was attempted but unsuccessful, in which case, the laboratory should use an "X" flag as defined below. The "X" flag is then defined in the SDG narrative.

B- This flag applies to results in which the analyte was detected in both the sample and the associated blank. The combination of the "B" flag with the "U" flag ("BU" or "UB") is expressly prohibited in the analytical SOW.

E- This flag identifies compounds whose concentrations exceed the calibrated range of the GC/MS instrument.

D- This flag identifies compounds identified in an analysis at a secondary dilution factor.

A- Indicates a TIC which is a suspected aldol-condensate product.

X- This is a non-specific flag used to properly define the results. If used, this flag must be properly defined within the body of the SDG.

## LABORATORY APPLIED QUALIFIERS

Inorganic Qualifiers

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

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

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

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

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

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

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

*- Indicates duplicate analysis was not within control limits.

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

# Data Qualification Summary

## INORGANICS QUALIFICATION SUMMARY

| ANALYTE | DISCREPANCY TYPE | QUALIFIER | SAMPLES AFFECTED | DQO | REASON |
|---|---|---|---|---|---|
| Cyanide | Major | UR | B0BNP7,B0BNP3 | Hold Time | The hold time was exceeded by greater than 2x. |
| Cyanide | Minor | J | B0BNM5 | Hold Time | The hold time was exceeded by greater than 2x. |
| Cyanide | Minor | J | B0BNN9 | Hold Time | The hold time was exceeded by less than 2x. |
| Iron | Minor | J/BJ | B0BNM5,B0BNM6, B0BNP3, B0BNP4,B0BNP7, B0BNP8 | Precision | The duplicate RPD was greater than 20% for sample results >5X the IDL. |
| Cyanide | Minor | J | B0BNN9,B0BNM5 | Accuracy | The LCS recovery was outside the limit of 80-120%. |
| Bismuth | Minor | UJ | BOBNP0 | Accuracy | The analytical spike recovery was outside the limit of 85 - 115%. |
| Selenium | Minor | J/UJ | B0BNP7,B0BNP8, B0BNP3,B0BNP4 | Accuracy | The analytical spike recovery was outside the limit of 85 - 115%. |
| Selenium | Minor | U | B0BNP7,B0BNP3, B0BNP4,B0BNM5, B0BNM6 | Blank | The calibration blank values were between the IDL and the CRDL with associated sample results less than 5x the highest blank concentration. |
| Potassium | Minor | U | BOBRL7 | Blank | The calibration blank values were between the IDL and the CRDL with the associated sample results less than 5x the highest blank concentration. |
| Iron | Minor | U | B0BNP1,B0BNP2 | Blank | The preparation blank value was between the IDL and the CRDL with associated sample results less than 5X the highest blank concentration. |

entered by: WJC
date: 9-17-94



checked by:
date: 9-28-9

9613476.1170

## GENERAL CHEMISTRY QUALIFICATION SUMMARY

| ANALYTE | DISCREPANCY TYPE | QUALIFIER | SAMPLES AFFECTED | DQO | REASON |
|---|---|---|---|---|---|
| Nitrite | Major | UR | B0BNP3,B0BNM5<br>B0BNP7,B0BNP5<br>B0BRL3,B0BNN1<br>B0BRL7,BOBNN9<br>BOBNM7,BOBNP1 | Hold Time | The holding times were exceeded by greater than two times. |
| Phosphate | Major | UR | B0BNP3,B0BNM5<br>B0BNP7,B0BNP5<br>B0BRL3,B0BNN1<br>B0BRL7,BOBNN9<br>BOBNM7,BOBNP1 | Hold Time | The holding times were exceeded by greater than two times. |

entered by: MW
date: 9-16-94

40281QLS.XLT, Qualification Summary

checked by: [illegible]
date: 9/16/9[illegible]

000013 MW 9-16-9[illegible]

9613476.1171

## RADIOCHEMISTRY QUALIFICATION SUMMARY

| ANALYTE | DISCREPANCY TYPE | QUALIFIER | SAMPLES AFFECTED | DQO | REASON |
|---|---|---|---|---|---|
| Total Uranium | Minor | U | B0BRL3 | Blank | The sample result was less than 5x the blank result. |

entered by: JM
date: 9/15/99

40281QLS.XLT, Qualification Summary

checked by: MJP
date: 9/15/99

# Data Summary Tables

# METALS/CYANIDE DATA SUMMARY TABLE

| FILE #VW402.81 | | HEIS #: | B0BNM5 | | B0BNM6 | | B0BNP3 | | B0BNP4 | | B0BNP7 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Date: | 21-Apr-94 | | 21-Apr-94 | | 21-Apr-94 | | 21-Apr-94 | | 21-Apr-94 | |
| Constituent | | Matrix: | WATER | | WATER | | WATER | | WATER | | WATER | |
| | CAS # | Units | Results | Q | Results | Q | Results | Q | Results | Q | Results | Q |
| Aluminum | 7429-90-5 | ug/L | 105 | B | 40.0 | U | 40.0 | U | 42.2 | B | 40.0 | U |
| Calcium | 7440-70-2 | ug/L | 86100 | | 82300 | | 21100 | | 20800 | | 27500 | |
| Iron | 7439-89-6 | ug/L | 249 | J | 91.3 | BJ | 40.3 | BJ | 31.8 | BJ | 267 | J |
| Magnesium | 7439-95-4 | ug/L | 25300 | | 23900 | | 6670 | | 6530 | | 8220 | |
| Manganese | 7439-96-5 | ug/L | 4.0 | B | 2.0 | U | 2.0 | U | 2.0 | U | 5.9 | B |
| Potassium | 7440-09-7 | ug/L | 9000 | | 8230 | | 3800 | B | 4580 | B | 4570 | B |
| Selenium | 7782-49-2 | ug/L | 8.9 | U | 10.3 | U | 2.6 | UJ | 2.9 | UJ | 3.1 | UJ |
| Sodium | 7440-23-5 | ug/L | 38200 | | 35600 | | 24200 | | 23300 | | 21900 | |
| Bismuth | 7440-69-9 | ug/L | 10.0 | U | 10.0 | U | 10.0 | U | 10.0 | U | 10.0 | U |
| Silicon | 7440-21-3 | ug/L | 16300 | | 15300 | | 16200 | | 15900 | | 15300 | |
| Cyanide | CYANIDE | ug/L | 241 | J | | | 10.0 | UR | | | 10.0 | UR |

| FILE #VW402.81 | | HEIS #: | BOBNP8 | | BOBNN1 | | BOBNN2 | | BOBRL7 | | BOBRL8 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Date: | 21-Apr-94 | | 25-Apr-94 | | 25-Apr-94 | | 25-Apr-94 | | 25-Apr-94 | |
| Constituent | | Matrix: | WATER | | WATER | | WATER | | WATER | | WATER | |
| | CAS # | Units | Results | Q | Results | Q | Results | Q | Results | Q | Results | Q |
| Aluminum | 7429-90-5 | ug/L | 40.0 | U | 40.0 | B | 40.0 | U | 40.0 | U | 40.0 | U |
| Calcium | 7440-70-2 | ug/L | 27600 | | 52700 | | 50300 | | 52300 | | 60000 | |
| Iron | 7439-89-6 | ug/L | 10.6 | BJ | 729 | | 92.3 | B | 51.1 | B | 60.7 | B |
| Magnesium | 7439-95-4 | ug/L | 8170 | | 16300 | | 15700 | | 14800 | | 17000 | |
| Manganese | 7439-96-5 | ug/L | 2 | U | 18.4 | | 11.8 | B | 2.0 | U | 2.0 | U |
| Potassium | 7440-09-7 | ug/L | 4840 | B | 8350 | | 7750 | | 7170 | U | 8410 | |
| Selenium | 7782-49-2 | ug/L | 2 | UJ | 4.6 | B | 3.2 | B | 5.4 | | 5.7 | |
| Sodium | 7440-23-5 | ug/L | 21600 | | 25200 | | 24400 | | 22300 | | 25700 | |
| Bismuth | 7440-69-9 | ug/L | 10.0 | U | 10.0 | U | 10.0 | U | 10.0 | U | 10.0 | U |
| Silicon | 7440-21-3 | ug/L | 15200 | | 15700 | | 15200 | | 16700 | | 19400 | |
| Cyanide | CYANIDE | ug/L | | | 28.0 | | | | 47.0 | | | |

| FILE #VW402.81 | | HEIS #: | BOBNP5 | | BOBNP6 | | BOBRL3 | | BOBRL4 | | BOBNP1 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Date: | 22-Apr-94 | | 22-Apr-94 | | 22-Apr-94 | | 22-Apr-94 | | 15-Apr-94 | |
| Constituent | | Matrix: | WATER | | WATER | | WATER | | WATER | | WATER | |
| | CAS # | Units | Results | Q | Results | Q | Results | Q | Results | Q | Results | Q |
| Aluminum | 7429-90-5 | ug/L | 40.0 | U | 40.0 | U | 40.0 | U | 40.0 | U | 42.5 | B |
| Calcium | 7440-70-2 | ug/L | 16000 | | 16800 | | 104 | B | 56.5 | B | 26200 | |
| Iron | 7439-89-6 | ug/L | 34.3 | B | 20.3 | B | 10.0 | U | 12.2 | B | 72.7 | U |
| Magnesium | 7439-95-4 | ug/L | 4660 | B | 4870 | B | 30.0 | U | 30.0 | U | 8310 | |
| Manganese | 7439-96-5 | ug/L | 37.6 | | 38.5 | | 2.0 | U | 2.0 | U | 2.5 | B |
| Potassium | 7440-09-7 | ug/L | 6480 | | 7270 | | 1400 | B | 1000 | U | 4860 | B |
| Selenium | 7782-49-2 | ug/L | 2.0 | U | 2.0 | U | 2.0 | U | 2.0 | U | 2.0 | U |
| Sodium | 7440-23-5 | ug/L | 31700 | | 33200 | | 205 | B | 100 | B | 23900 | |
| Bismuth | 7440-69-9 | ug/L | 10.0 | U | 10.0 | U | 10.0 | U | 10.0 | U | 17300 | |
| Silicon | 7440-21-3 | ug/L | 16900 | | 17800 | | 73.4 | B | 40.4 | B | 10.0 | U |
| Cyanide | CYANIDE | ug/L | 10.0 | U | | | 10.0 | U | | | 10.0 | U |

Shaded area represents changes by validator

ITC047.XLS

entered by: [illegible] date: 9-23-94 checked by: [illegible] date: 9-24-94

## METALS/CYANIDE DATA SUMMARY TABLE

| FILE #VW402.81 | | HEIS #: | BOBNP2 | | BOBNN9 | | BOBNP0 | | BOBNM7 | | BOBNM8 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Date: | 15-Apr-94 | | 19-Apr-94 | | 19-Apr-94 | | 20-Apr-94 | | 20-Apr-94 | |
| Constituent | | Matrix: | WATER | | WATER | | WATER | | WATER | | WATER | |
| | CAS # | Units | Results | Q | Results | Q | Results | Q | Results | Q | Results | Q |
| Aluminum | 7429-90-5 | ug/L | 40.0 | U | 40.0 | U | 40.0 | U | 651 | | 40.0 | U |
| Calcium | 7440-70-2 | ug/L | 26600 | | 68400 | | 58000 | | 35000 | | 35700 | |
| Iron | 7439-89-6 | ug/L | 19.4 | U | 233 | | 59.4 | B | 5450 | | 19.1 | B |
| Magnesium | 7439-95-4 | ug/L | 8490 | | 19900 | | 17300 | | 9430 | | 9240 | |
| Manganese | 7439-96-5 | ug/L | 2.0 | U | 31.8 | | 36.2 | | 962 | | 674 | |
| Potassium | 7440-09-7 | ug/L | 4610 | B | 7610 | | 6410 | | 9670 | | 9070 | |
| Selenium | 7782-49-2 | ug/L | 2.0 | U | 11.1 | | 10.0 | | 2.0 | U | 2.0 | U |
| Sodium | 7440-23-5 | ug/L | 24500 | | 26200 | | 22500 | | 46300 | | 47800 | |
| Silicon | 7440-21-3 | ug/L | 17700 | | 14300 | | 11700 | | 9850 | | 8740 | |
| Bismuth | 7440-69-9 | ug/L | 10.0 | U | 10.0 | U | 10.0 | UJ | 10.0 | U | 10.0 | U |
| Cyanide | CYANIDE | ug/L | | | 88.0 | J | | | 10.0 | U | | |

entered by: CMO date: 9/15/94

Shaded area represents changes by validator
ITC047.XLS

checked by: gm date: 9/15/9

9613476.1175

# GENERAL CHEMISTRY DATA SUMMARY TABLE

| FILE#402.81 | | HEIS #: | B0BNP5 | | B0BRL3 | | B0BRL7 | | B0BNN1 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Date: | 22-Apr-94 | | 22-Apr-94 | | 25-Apr-94 | | 25-Apr-94 | |
| Constituent | | Matrix: | WATER | | WATER | | WATER | | WATER | |
| | CAS # | Units | Results | Q | Results | Q | Results | Q | Results | Q |
| Fluoride by IC | 16984-48-8 | mg/L | 2.4 | | 0.4 | U | 0.5 | | 0.5 | |
| Chloride by IC | 16887-00-6 | mg/L | 7.0 | | 0.4 | U | 20 | | 27 | |
| Nitrite by IC | 14797-65-0 | mg/L | 0.4 | UR | 0.4 | UR | 0.4 | UR | 0.4 | UR |
| Phosphate by IC | 14265-44-2 | mg/L | 1.0 | UR | 1.0 | UR | 1.0 | UR | 1.0 | UR |
| Sulfate by IC | 14808-79-8 | mg/L | 13 | | 1.5 | | 110 | | 150 | |
| Sulfate | 14808-79-8 | mg/L | 12 | | 5.5 | U | 44 | | | |
| N02+NO3 | NO2+NO3-N | mg/L | 0.03 | | 0.02 | U | 9.46 | | 9.23 | |
| Alkalinity | ALKALINITY | mg/L | 132 | | 10 | | 110 | | 104 | |
| Total Dissolved Solids | TDS | mg/L | 165 | | 15 | | 370 | | 362 | |

| FILE#402.81 | | HEIS #: | B0BNP7 | | B0BNP3 | | B0BNM5 | |
|---|---|---|---|---|---|---|---|---|
| | | Date: | 21-Apr-94 | | 21-Apr-94 | | 21-Apr-94 | |
| Constituent | | Matrix: | WATER | | WATER | | WATER | |
| | CAS # | Units | Results | Q | Results | Q | Results | Q |
| Fluoride by IC | 16984-48-8 | mg/L | 0.8 | | 1.0 | | 0.4 | |
| Chloride by IC | 16887-00-6 | mg/L | 9.0 | | 7.0 | | 21 | |
| Nitrite by IC | 14797-65-0 | mg/L | 0.4 | UR | 0.4 | UR | 0.4 | UR |
| Phosphate by IC | 14265-44-2 | mg/L | 1.0 | UR | 1.0 | UR | 1.0 | UR |
| Sulfate by IC | 14808-79-8 | mg/L | 38 | | 27 | | 180 | |
| Sulfate | 14808-79-8 | mg/L | 44 | | 34 | | 166 | |
| N02+NO3 | NO2+NO3-N | mg/L | 6.7 | | 0.78 | | 48 | |
| Alkalinity | ALKALINITY | mg/L | 108 | | 106 | | 96 | |
| Total Dissolved Solids | TDS | mg/L | 382 | | 3080 | | 600 | |

| FILE#402.81 | | HEIS #: | BOBNM7 | | BOBNP1 | | BOBNN9 | |
|---|---|---|---|---|---|---|---|---|
| | | Date: | 20-Apr-94 | | 15-Apr-94 | | 19-Apr-94 | |
| Constituent | | Matrix: | WATER | | WATER | | WATER | |
| | CAS # | Units | Results | Q | Results | Q | Results | Q |
| Fluoride by IC | 16984-48-8 | mg/L | 0.7 | | 0.6 | | 0.40 | U |
| Chloride by IC | 16887-00-6 | mg/L | 16 | | 12 | | 20 | |
| Nitrite by IC | 14797-65-0 | mg/L | 0.4 | UR | 0.4 | UR | 0.4 | UR |
| Phosphate by IC | 14265-44-2 | mg/L | 1 | UR | 1 | UR | 1 | UR |
| Sulfate by IC | 14808-79-8 | mg/L | 120 | | 35 | | 130 | |
| Sulfate | 14808-79-8 | mg/L | 108 | | 40 | | 108 | |
| N02+NO3 | NO2+NO3-N | mg/L | 0.02 | U | 4.7 | | 27 | |
| Alkalinity | ALKALINITY | mg/L | 100 | | 96 | | 98 | |
| Total Dissolved Solids | TDS | mg/L | 323 | | 264 | | 472 | |

shaded area means a change
by validator
ITC047.XLS

entered by: [illegible] date: 9-23-94

checked by: [illegible] date: 9-24-94

9613476.1176

# RADIOCHEMISTRY DATA SUMMARY TABLE

| FILE #: VW402.81 | | HEIS #: | B0BNM5 | | | B0BNM7 | | |
|---|---|---|---|---|---|---|---|---|
| | | Date: | 21-Apr-94 | | | 20-Apr-94 | | |
| Constituent | | Matrix: | WATER | | | WATER | | |
| | CAS # | Units | Results | Q | MDA | Results | Q | MDA |
| Plutonium-239/240 | PU-239/240 | pCi/L | 5.23E-01 | U | 1.41E-01 | 9.40E-02 | U | 2.64E-01 |
| Plutonium-238 | 13981-16-3 | pCi/L | -1.05E-02 | U | 2.51E-01 | 0.00E+00 | U | 1.50E-01 |
| Cobalt-60 | 10198-40-0 | pCi/L | 7.43E+01 | | N/A | 5.47E+00 | U | 1.16E+01 |
| Iron-59 | 14596-12-4 | pCi/L | -2.08E+01 | U | 2.87E+01 | -1.50E+01 | U | 2.55E+01 |
| Europium-152 | 14683-23-9 | pCi/L | 6.49E+00 | U | 4.23E+01 | -7.99E+00 | U | 3.65E+01 |
| Cobalt-58 | 13981-38-9 | pCi/L | 7.23E+00 | U | 1.31E+01 | -1.53E+00 | U | 1.04E+01 |
| Cesium-137 | 10045-97-3 | pCi/L | 4.04E+00 | U | 9.24E+00 | 3.98E+00 | U | 8.71E+00 |
| Ruthenium-106 | 13967-48-1 | pCi/L | 4.80E+00 | U | 8.28E+01 | -6.63E+00 | U | 6.59E+01 |
| Europium-155 | 14391-16-3 | pCi/L | -2.20E+00 | U | 1.67E+01 | -2.93E+00 | U | 1.58E+01 |
| Europium-154 | 15585-10-1 | pCi/L | -7.24E+00 | U | 3.19E+01 | -8.85E+00 | U | 2.11E+01 |
| Gross Alpha | ALPHA | pCi/L | 7.35E+00 | | 2.33E+00 | 2.25E+00 | | 1.73E+00 |
| Gross Beta | BETA | pCi/L | 6.54E+02 | | 3.04E+00 | 1.01E+01 | | 3.00E+00 |
| Strontium-90 | 10098-97-2 | pCi/L | 4.09E-02 | U | 1.74E+00 | 1.28E-01 | U | 7.65E-01 |
| Technetium-99 | 14133-76-7 | pCi/L | 4.31E+03 | | 2.15E+00 | 2.74E+00 | | 2.15E+00 |
| Tritium | 10028-17-8 | pCi/L | 3.56E+03 | | 2.34E+02 | 1.14E+02 | U | 2.34E+02 |
| Total Uranium | 7440-61-1 | UG/L | 6.65E+00 | | 3.54E-03 | 1.43E+00 | | 3.54E-03 |

| FILE #: VW402.81 | | HEIS #: | B0BNN1 | | | B0BNN9 | | |
|---|---|---|---|---|---|---|---|---|
| | | Date: | 25-Apr-94 | | | 19-Apr-94 | | |
| Constituent | | Matrix: | WATER | | | WATER | | |
| | CAS # | Units | Results | Q | MDA | Results | Q | MDA |
| Plutonium-239/240 | PU-239/240 | pCi/L | 5.60E-02 | U | 1.59E-01 | -4.27E-02 | U | 3.36E-01 |
| Plutonium-238 | 13981-16-3 | pCi/L | -2.34E-02 | U | 3.31E-01 | 2.14E-02 | U | 3.02E-01 |
| Cobalt-60 | 10198-40-0 | pCi/L | 1.02E+01 | U | 1.36E+01 | 5.04E+01 | | N/A |
| Iron-59 | 14596-12-4 | pCi/L | 9.13E+00 | U | 2.54E+01 | 5.79E+00 | U | 2.18E+01 |
| Europium-152 | 14683-23-9 | pCi/L | -8.35E+00 | U | 3.34E+01 | -5.80E+00 | U | 2.03E+01 |
| Cobalt-58 | 13981-38-9 | pCi/L | -1.98E+00 | U | 1.00E+01 | -6.07E-02 | U | 8.03E+00 |
| Cesium-137 | 10045-97-3 | pCi/L | 5.17E-01 | U | 6.05E+00 | 1.22E+00 | U | 5.69E+00 |
| Ruthenium-106 | 13967-48-1 | pCi/L | 1.99E+01 | U | 6.70E+01 | 2.55E+01 | U | 5.19E+01 |
| Europium-155 | 14391-16-3 | pCi/L | -5.83E+00 | U | 1.07E+01 | -3.32E+00 | U | 1.01E+01 |
| Europium-154 | 15585-10-1 | pCi/L | -1.12E+01 | U | 1.53E+01 | -2.67E+00 | U | 1.74E+01 |
| Gross Alpha | ALPHA | pCi/L | 2.19E+00 | | 1.55E+00 | 3.98E+00 | | 1.69E+00 |
| Gross Beta | BETA | pCi/L | 1.45E+02 | | 3.01E+00 | 4.31E+02 | | 3.19E+00 |
| Strontium-90 | 10098-97-2 | pCi/L | 1.51E-01 | U | 1.00E+00 | 4.43E-02 | U | 8.87E-01 |
| Technetium-99 | 14133-76-7 | pCi/L | 6.35E+02 | | 2.15E+00 | 2.10E+03 | | 2.15E+00 |
| Tritium | 10028-17-8 | pCi/L | 5.31E+02 | | 2.34E+02 | 5.72E+03 | | 2.34E+02 |
| Total Uranium | 7440-61-1 | UG/L | 3.75E+00 | | 3.54E-03 | 4.42E+00 | | 3.54E-03 |

shaded area indicates changes by the validator

entered by: CMD date: 9/15/94 ITC047.XLS checked by: gm date: 9/15/9

9613476.1177

# RADIOCHEMISTRY DATA SUMMARY TABLE

| FILE#:VW402.81 | | HEIS #: | BOBNP1 | | | BOBNP3 | | |
|---|---|---|---|---|---|---|---|---|
| Constituent | | Date: | 15-Apr-94 | | | 21-Apr-94 | | |
| | | Matrix: | WATER | | | WATER | | |
| | CAS # | Units | Results | Q | MDA | Results | Q | MDA |
| Plutonium-239/240 | PU-239/240 | pCi/L | 1.22E-01 | U | 1.65E-01 | -1.12E-02 | U | 2.67E-01 |
| Plutonium-238 | 13981-16-3 | pCi/L | -1.22E-02 | U | 2.93E-01 | -2.23E-02 | U | 3.16E-01 |
| Cobalt-60 | 10198-40-0 | pCi/L | -4.53E+00 | U | 9.46E+00 | 1.29E+00 | U | 8.41E+00 |
| Iron-59 | 14596-12-4 | pCi/L | -3.00E+00 | U | 2.65E+01 | 1.04E+01 | U | 2.89E+01 |
| Europium-152 | 14683-23-9 | pCi/L | 3.25E+00 | U | 3.54E+01 | 9.99E-01 | U | 4.75E+01 |
| Cobalt-58 | 13981-38-9 | pCi/L | -3.46E+00 | U | 7.32E+00 | -3.56E-01 | U | 9.29E+00 |
| Cesium-137 | 10045-97-3 | pCi/L | 0.00E+00 | U | N/A | -1.33E+00 | U | 9.14E+00 |
| Ruthenium-106 | 13967-48-1 | pCi/L | 3.24E+01 | U | 7.45E+01 | 3.09E+01 | U | 6.86E+01 |
| Europium-155 | 14391-16-3 | pCi/L | -3.16E+00 | U | 1.40E+01 | -2.20E+00 | U | 1.66E+01 |
| Europium-154 | 15585-10-1 | pCi/L | -4.48E+00 | U | 1.75E+01 | 7.24E+00 | U | 2.55E+01 |
| Gross Alpha | ALPHA | pCi/L | 2.96E+00 | | 1.19E+00 | 1.12E+00 | | 1.01E+00 |
| Gross Beta | BETA | pCi/L | 2.11E+01 | | 3.02E+00 | 5.84E+01 | | 2.75E+00 |
| Strontium-90 | 10098-97-2 | pCi/L | -7.61E-02 | U | 7.86E-01 | -1.08E+02 | U | 8.08E-01 |
| Technetium-99 | 14133-76-7 | pCi/L | 4.99E+01 | | 2.15E+00 | 2.21E+02 | | 2.15E+00 |
| Tritium | 10028-17-8 | pCi/L | 7.44E+04 | | 2.34E+02 | 5.97E+03 | | 2.34E+02 |
| Total Uranium | 7440-61-1 | UG/L | 3.84E+00 | | 3.54E-03 | 4.48E-01 | | 3.54E-03 |

| FILE#:VW402.81 | | HEIS #: | BOBNP5 | | | BOBNP7 | | |
|---|---|---|---|---|---|---|---|---|
| Constituent | | Date: | 22-Apr-94 | | | 21-Apr-94 | | |
| | | Matrix: | WATER | | | WATER | | |
| | CAS # | Units | Results | Q | MDA | Results | Q | MDA |
| Plutonium-239/240 | PU-239/240 | pCi/L | 1.17E-02 | U | 4.00E-01 | 0.00E+00 | U | 1.37E-01 |
| Plutonium-238 | 13981-16-3 | pCi/L | -1.17E-02 | U | 2.79E-01 | -2.03E-02 | U | 2.87E-01 |
| Cobalt-60 | 10198-40-0 | pCi/L | -7.29E-02 | U | 5.67E+00 | -4.66E-01 | U | 5.96E+00 |
| Iron-59 | 14596-12-4 | pCi/L | -9.05E+00 | U | 1.60E+01 | 3.14E+00 | U | 1.93E+01 |
| Europium-152 | 14683-23-9 | pCi/L | 3.22E+00 | U | 2.67E+01 | 8.82E+00 | U | 3.93E+01 |
| Cobalt-58 | 13981-38-9 | pCi/L | -7.12E-01 | U | 6.06E+00 | 1.22E+00 | U | 9.21E+00 |
| Cesium-137 | 10045-97-3 | pCi/L | -3.19E-01 | U | 4.84E+00 | -2.47E+00 | U | 6.76E+00 |
| Ruthenium-106 | 13967-48-1 | pCi/L | 1.29E+01 | U | 4.70E+01 | -3.75E+01 | U | 5.88E+01 |
| Europium-155 | 14391-16-3 | pCi/L | -8.47E-01 | U | 1.07E+01 | -2.82E+00 | U | 1.25E+01 |
| Europium-154 | 15585-10-1 | pCi/L | -5.68E+00 | U | 1.62E+01 | 6.72E+00 | U | 2.37E+01 |
| Gross Alpha | ALPHA | pCi/L | -3.20E-01 | U | 1.06E+00 | 1.10E+00 | U | 1.18E+00 |
| Gross Beta | BETA | pCi/L | 6.70E+00 | | 3.06E+00 | 3.33E+01 | | 2.94E+00 |
| Strontium-90 | 10098-97-2 | pCi/L | 1.12E-01 | U | 9.48E-01 | -9.19E-02 | U | 7.89E-01 |
| Technetium-99 | 14133-76-7 | pCi/L | 7.11E+00 | | 2.15E+00 | 1.44E+02 | | 2.15E+00 |
| Tritium | 10028-17-8 | pCi/L | 2.37E+02 | | 2.34E+02 | 3.22E+04 | | 2.34E+02 |
| Total Uranium | 7440-61-1 | UG/L | 1.95E-01 | | 3.54E-03 | 1.08E+00 | | 3.54E-02 |

shaded area indicates changes by the validator

entered by: CMS date: 9/15/94 ITC047.XLS checked by: gm date: 9/16/94

9613476.1178

## RADIOCHEMISTRY DATA SUMMARY TABLE

| FILE#:VW402.81 | | HEIS #: | BOBRL3 | | | BOBRL7 | | |
|---|---|---|---|---|---|---|---|---|
| | | Date: | 22-Apr-94 | | | 25-Apr-94 | | |
| Constituent | | Matrix: | WATER | | | WATER | | |
| | CAS # | Units | Results | Q | MDA | Results | Q | MDA |
| Plutonium-239/240 | PU-239/240 | pCi/L | 3.65E-02 | U | 2.18E-01 | 5.22E-02 | U | 3.12E-01 |
| Plutonium-238 | 13981-16-3 | pCi/L | 0.00E+00 | U | 1.24E-01 | -2.61E-02 | U | 3.69E-01 |
| Cobalt-60 | 10198-40-0 | pCi/L | -3.97E-02 | U | 8.95E+00 | 1.23E+01 | U | 1.75E+01 |
| Iron-59 | 14596-12-4 | pCi/L | -2.93E+00 | U | 2.64E+01 | 4.10E-01 | U | 1.49E+01 |
| Europium-152 | 14683-23-9 | pCi/L | -4.99E+00 | U | 3.97E+01 | -2.22E+01 | U | 3.88E+01 |
| Cobalt-58 | 13981-38-9 | pCi/L | 1.95E+00 | U | 9.14E+00 | 1.66E+00 | U | 6.40E+00 |
| Cesium-137 | 10045-97-3 | pCi/L | -1.39E+00 | U | 8.55E+00 | -3.21E+00 | U | 7.75E+00 |
| Ruthenium-106 | 13967-48-1 | pCi/L | -2.54E+01 | U | 6.53E+01 | -1.36E+01 | U | 5.78E+01 |
| Europium-155 | 14391-16-3 | pCi/L | -3.38E+00 | U | 1.36E+01 | 5.97E-01 | U | 1.13E+01 |
| Europium-154 | 15585-10-1 | pCi/L | 1.61E+00 | U | 2.55E+01 | -8.15E+00 | U | 1.89E+01 |
| Gross Alpha | ALPHA | pCi/L | -1.01E-01 | U | 6.64E-01 | 4.52E+00 | | 1.35E+00 |
| Gross Beta | BETA | pCi/L | 7.67E-01 | U | 2.79E+00 | 1.37E+02 | | 2.84E+00 |
| Strontium-90 | 10098-97-2 | pCi/L | 8.09E-02 | U | 9.05E-01 | 7.44E-03 | U | 9.49E+00 |
| Technetium-99 | 14133-76-7 | pCi/L | 2.42E+00 | | 2.15E+00 | 6.65E+02 | | 2.15E+00 |
| Tritium | 10028-17-8 | pCi/L | 1.64E+02 | U | 2.34E+02 | 3.80E+02 | | 2.34E+02 |
| Total Uranium | 7440-61-1 | UG/L | 9.00E-03 | U | 3.54E-03 | 4.41E+00 | | 3.54E-03 |

shaded area indicates changes by the validator

entered by: CMO date: 9/15/94 ITC047.XLS checked by: gm date: 9/16/

# Sample Results (Form I's)

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP7

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: WO428 SAS No.: SDG No.: W0038
Matrix (soil/water): WATER Lab Sample ID: AA7389
Level (low/med): LOW Date Received: 04/25/94
% Solids: 0.0

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

| CAS No. | Analyte | Concentration | C | Q | M | |
|---|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P | |
| 7440-70-2 | Calcium | 27500 | | | P | |
| 7439-89-6 | Iron | 267 | | * | P | J |
| 7439-95-4 | Magnesium | 8220 | | | P | |
| 7439-96-5 | Manganese | 5.9 | B | | P | |
| 7440-09-7 | Potassium | 4570 | B | | P | |
| 7782-49-2 | Selenium | 3.1 | ~~B~~ | W | F | UJ |
| 7440-23-5 | Sodium | 21900 | | | P | |
| | Bismuth | 10.0 | U | | F | |
| 7440-31-5 | Silicon | 15300 | | | P | |
| 5955-70-0 | Cyanide | | | | NR | |

7/13/94

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
TOTAL

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP7

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO428 SAS No.: _____ SDG No.: W0038_
Matrix (soil/water): WATER Lab Sample ID: AA7395
Level (low/med): LOW__ Date Received: 04/25/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum_ | | | | NR |
| 7440-70-2 | Calcium__ | | | | NR |
| 7439-89-6 | Iron_____ | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium_ | | | | NR |
| 7440-23-5 | Sodium___ | | | | NR |
| | Bismuth__ | | | | NR |
| 7440-31-5 | Silicon__ | | | | NR |
| 5955-70-0 | Cyanide__ | 10.0 | U | | AS |

UR 9/15/94

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
TOTAL_CYANIDE_____

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP8

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: W0428 SAS No.: _____ SDG No.: W0038_
Matrix (soil/water): WATER Lab Sample ID: AA7410
Level (low/med): LOW__ Date Received: 04/25/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P |
| 7440-70-2 | Calcium | 27600 | | | P |
| 7439-89-6 | Iron | 10.6 | B | | P |
| 7439-95-4 | Magnesium | 8170 | | | P |
| 7439-96-5 | Manganese | 2.0 | U | | P |
| 7440-09-7 | Potassium | 4840 | B | | P |
| 7782-49-2 | Selenium | 2.0 | U | W | F |
| 7440-23-5 | Sodium | 21600 | | | P |
| | Bismuth | 10.0 | U | | F |
| 7440-31-5 | Silicon | 15200 | | | P |
| 5955-70-0 | Cyanide | | | | NR |

BJ 9-24-94 (WSC)

UJ DJS 9/13/94

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
DISSOLVED

FORM I - IN

ILM02.1

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP3

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO428 SAS No.: _____ SDG No.: W0038_
Matrix (soil/water): WATER Lab Sample ID: AA7396
Level (low/med): LOW__ Date Received: 04/25/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M | |
|---|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P | |
| 7440-70-2 | Calcium | 21100 | | | P | |
| 7439-89-6 | Iron | 40.3 | ~~B~~ | * | P | BJ |
| 7439-95-4 | Magnesium | 6670 | | | P | |
| 7439-96-5 | Manganese | 2.0 | U | | P | |
| 7440-09-7 | Potassium | 3800 | B | | P | |
| 7782-49-2 | Selenium | 2.6 | ~~B~~ | W | F | UJ EJS 9/15/94 |
| 7440-23-5 | Sodium | 24200 | | | P | |
| | Bismuth | 10.0 | U | | F | |
| 7440-31-5 | Silicon | 16200 | | | P | |
| 5955-70-0 | Cyanide | | | | NR | |

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____
Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:
TOTAL_____

FORM I - IN

ILM02.1

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP3

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO428 SAS No.: _____ SDG No.: W0038_
Matrix (soil/water): WATER Lab Sample ID: AA7402
Level (low/med): LOW__ Date Received: 04/25/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| | Bismuth | | | | NR |
| 7440-31-5 | Silicon | | | | NR |
| 5955-70-0 | Cyanide | 10.0 | U | | AS |

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9/14/94

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
TOTAL_CYANIDE_____

FORM I - IN

ILM02.1

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP4

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO428 SAS No.: _____ SDG No.: W0038_
Matrix (soil/water): WATER Lab Sample ID: AA7411
Level (low/med): LOW__ Date Received: 04/25/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 42.2 | B | | P |
| 7440-70-2 | Calcium | 20800 | | | P |
| 7439-89-6 | Iron | 31.8 | B | | P |
| 7439-95-4 | Magnesium | 6530 | | | P |
| 7439-96-5 | Manganese | 2.0 | U | | P |
| 7440-09-7 | Potassium | 4580 | B | | P |
| 7782-49-2 | Selenium | 2.9 | B | W | F |
| 7440-23-5 | Sodium | 23300 | | | P |
| | Bismuth | 10.0 | U | | F |
| 7440-31-5 | Silicon | 15900 | | | P |
| 5955-70-0 | Cyanide | | | | NR |

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WJ GJS 9/13/94

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
DISSOLVED_____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNM5

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: WO428 SAS No.: SDG No.: W0038

Matrix (soil/water): WATER Lab Sample ID: AA7403

Level (low/med): LOW Date Received: 04/25/94

% Solids: 0.0

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

| CAS No. | Analyte | Concentration | C | Q | M | |
|---|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 105 | B | | P | |
| 7440-70-2 | Calcium | 86100 | | | P | |
| 7439-89-6 | Iron | 249 | | * | P | J |
| 7439-95-4 | Magnesium | 25300 | | | P | |
| 7439-96-5 | Manganese | 4.0 | B | | P | |
| 7440-09-7 | Potassium | 9000 | | | P | |
| 7782-49-2 | Selenium | 8.9 | | S | F | U |
| 7440-23-5 | Sodium | 38200 | | | P | |
| | Bismuth | 10.0 | U | | F | |
| 7440-31-5 | Silicon | 16300 | | | P | |
| 5955-70-0 | Cyanide | | | | NR | |

9/13/94

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

TOTAL

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNM5

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO428 SAS No.: _____ SDG No.: W0038_
Matrix (soil/water): WATER Lab Sample ID: AA7409
Level (low/med): LOW__ Date Received: 04/25/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M | |
|---|---|---|---|---|---|---|
| 7429-90-5 | Aluminum_ | | _ | | NR | |
| 7440-70-2 | Calcium__ | | _ | | NR | |
| 7439-89-6 | Iron_____ | | _ | | NR | |
| 7439-95-4 | Magnesium | | _ | | NR | |
| 7439-96-5 | Manganese | | _ | | NR | |
| 7440-09-7 | Potassium | | _ | | NR | |
| 7782-49-2 | Selenium_ | | _ | | NR | |
| 7440-23-5 | Sodium___ | | _ | | NR | |
| | Bismuth__ | | _ | | NR | |
| 7440-31-5 | Silicon__ | | _ | | NR | |
| 5955-70-0 | Cyanide__ | 241 | _ | | AS | J |
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QS 9/14/94

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
TOTAL_CYANIDE_____

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EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

BOBNM6

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: WO428 SAS No.: SDG No.: W0038
Matrix (soil/water): WATER Lab Sample ID: AA7412
Level (low/med): LOW Date Received: 04/25/94
% Solids: 0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P |
| 7440-70-2 | Calcium | 82300 | | | P |
| 7439-89-6 | Iron | 91.3 | B | | P |
| 7439-95-4 | Magnesium | 23900 | | | P |
| 7439-96-5 | Manganese | 2.0 | U | | P |
| 7440-09-7 | Potassium | 8230 | | | P |
| 7782-49-2 | Selenium | 10.3 | | | F |
| 7440-23-5 | Sodium | 35600 | | | P |
| | Bismuth | 10.0 | U | | F |
| 7440-31-5 | Silicon | 15300 | | | P |
| 5955-70-0 | Cyanide | | | | NR |

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QS 7/14/94

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
DISSOLVED

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNN1

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO455 SAS No.: _____ SDG No.: W0038_
Matrix (soil/water): WATER Lab Sample ID: AA7812
Level (low/med): LOW__ Date Received: 04/29/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | B | | P |
| 7440-70-2 | Calcium | 52700 | | | P |
| 7439-89-6 | Iron | 729 | | | P |
| 7439-95-4 | Magnesium | 16300 | | | P |
| 7439-96-5 | Manganese | 18.4 | | | P |
| 7440-09-7 | Potassium | 8350 | | | P |
| 7782-49-2 | Selenium | 4.6 | B | S | F |
| 7440-23-5 | Sodium | 25200 | | | P |
| | Bismuth | 10.0 | U | | F |
| 7440-31-5 | Silicon | 15700 | | | P |
| 5955-70-0 | Cyanide | | | | NR |

9/13/94

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____
Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:
TOTAL _____

FORM I - IN

ILM02.1

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNN1

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO455 SAS No.: _____ SDG No.: W0038_
Matrix (soil/water): WATER Lab Sample ID: AA7818
Level (low/med): LOW__ Date Received: 04/29/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum_ | | _ | | NR |
| 7440-70-2 | Calcium__ | | _ | | NR |
| 7439-89-6 | Iron_____ | | _ | | NR |
| 7439-95-4 | Magnesium | | _ | | NR |
| 7439-96-5 | Manganese | | _ | | NR |
| 7440-09-7 | Potassium | | _ | | NR |
| 7782-49-2 | Selenium_ | | _ | | NR |
| 7440-23-5 | Sodium___ | | _ | | NR |
| | Bismuth__ | | _ | | NR |
| 7440-31-5 | Silicon__ | | _ | | NR |
| 5955-70-0 | Cyanide__ | 28.0 | _ | | AS |
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9/1/94

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
TOTAL_CYANIDE_____

FORM I - IN

ILM02.1

U.S. EPA - CLP

1.

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNN2

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO455 SAS No.: _____ SDG No.: W0038_
Matrix (soil/water): WATER Lab Sample ID: AA7826
Level (low/med): LOW__ Date Received: 04/29/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P |
| 7440-70-2 | Calcium | 50300 | | | P |
| 7439-89-6 | Iron | 92.3 | B | | P |
| 7439-95-4 | Magnesium | 15700 | | | P |
| 7439-96-5 | Manganese | 11.8 | B | | P |
| 7440-09-7 | Potassium | 7750 | | | P |
| 7782-49-2 | Selenium | 3.2 | B | S | F |
| 7440-23-5 | Sodium | 24400 | | | P |
| | Bismuth | 10.0 | U | | F |
| 7440-31-5 | Silicon | 15200 | | | P |
| 5955-70-0 | Cyanide | | | | NR |

GJS 9/13/94

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____
Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:
DISSOLVED

FORM I - IN

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBRL7

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO455 SAS No.: _____ SDG No.: W0038_
Matrix (soil/water): WATER Lab Sample ID: AA7819
Level (low/med): LOW__ Date Received: 04/29/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum_ | 40.0 | U | | P |
| 7440-70-2 | Calcium__ | 52300 | | | P |
| 7439-89-6 | Iron_____ | 51.1 | B | | P |
| 7439-95-4 | Magnesium | 14800 | | | P |
| 7439-96-5 | Manganese | 2.0 | U | | P |
| 7440-09-7 | Potassium | 7170 | | | P |
| 7782-49-2 | Selenium_ | 5.4 | | S | F |
| 7440-23-5 | Sodium___ | 22300 | | | P |
| | Bismuth__ | 10.0 | U | | F |
| 7440-31-5 | Silicon__ | 16700 | | | P |
| 5955-70-0 | Cyanide__ | | | | NR |

GJ 9/13/94

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
TOTAL

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBRL7

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO455 SAS No.: _____ SDG No.: W0038_
Matrix (soil/water): WATER Lab Sample ID: AA7825
Level (low/med): LOW__ Date Received: 04/29/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum_ | | | | NR |
| 7440-70-2 | Calcium__ | | | | NR |
| 7439-89-6 | Iron_____ | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium_ | | | | NR |
| 7440-23-5 | Sodium___ | | | | NR |
| | Bismuth__ | | | | NR |
| 7440-31-5 | Silicon__ | | | | NR |
| 5955-70-0 | Cyanide__ | 47.0 | | | AS |

~~9/13/94~~ 9/14/94

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
TOTAL_CYANIDE

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBRL8

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO455 SAS No.: _____ SDG No.: W0038_
Matrix (soil/water): WATER Lab Sample ID: AA7827
Level (low/med): LOW__ Date Received: 04/29/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum_ | 40.0 | U | | P |
| 7440-70-2 | Calcium__ | 60000 | | | P |
| 7439-89-6 | Iron____ | 60.7 | B | | P |
| 7439-95-4 | Magnesium | 17000 | | | P |
| 7439-96-5 | Manganese | 2.0 | U | | P |
| 7440-09-7 | Potassium | 8410 | | | P |
| 7782-49-2 | Selenium_ | 5.7 | | S | F |
| 7440-23-5 | Sodium___ | 25700 | | | P |
| | Bismuth__ | 10.0 | U | | F |
| 7440-31-5 | Silicon__ | 19400 | | | P |
| 5955-70-0 | Cyanide__ | | | | NR |

9/13/94
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Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
DISSOLVED_____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP5

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO439 SAS No.: _____ SDG No.: WO038_
Matrix (soil/water): WATER Lab Sample ID: AA7571
Level (low/med): LOW__ Date Received: 04/27/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum_ | 40.0 | U | | P |
| 7440-70-2 | Calcium__ | 16000 | | | P |
| 7439-89-6 | Iron____ | 34.3 | B | | P |
| 7439-95-4 | Magnesium | 4660 | B | | P |
| 7439-96-5 | Manganese | 37.6 | | | P |
| 7440-09-7 | Potassium | 6480 | | | P |
| 7782-49-2 | Selenium_ | 2.0 | U | | F |
| 7440-23-5 | Sodium___ | 31700 | | | P |
| | Bismuth__ | 10.0 | U | | F |
| 7440-31-5 | Silicon__ | 16900 | | | P |
| 5955-70-0 | Cyanide__ | | | | NR |
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Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
TOTAL_____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP5

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO439 SAS No.: _____ SDG No.: WO038_
Matrix (soil/water): WATER Lab Sample ID: AA7577
Level (low/med): LOW__ Date Received: 04/27/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum_ | | _ | | NR |
| 7440-70-2 | Calcium__ | | _ | | NR |
| 7439-89-6 | Iron_____ | | _ | | NR |
| 7439-95-4 | Magnesium | | _ | | NR |
| 7439-96-5 | Manganese | | _ | | NR |
| 7440-09-7 | Potassium | | _ | | NR |
| 7782-49-2 | Selenium_ | | _ | | NR |
| 7440-23-5 | Sodium___ | | _ | | NR |
| | Bismuth__ | | _ | | NR |
| 7440-31-5 | Silicon__ | | _ | | NR |
| 5955-70-0 | Cyanide__ | 10.0 | U | | AS |

9/15/94

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
TOTAL_CYANIDE_____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP6

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: WO439 SAS No.: SDG No.: WO038
Matrix (soil/water): WATER Lab Sample ID: AA7585
Level (low/med): LOW Date Received: 04/27/94
% Solids: 0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P |
| 7440-70-2 | Calcium | 16800 | | | P |
| 7439-89-6 | Iron | 20.3 | B | | P |
| 7439-95-4 | Magnesium | 4870 | B | | P |
| 7439-96-5 | Manganese | 38.5 | | | P |
| 7440-09-7 | Potassium | 7270 | | | P |
| 7782-49-2 | Selenium | 2.0 | U | | F |
| 7440-23-5 | Sodium | 33200 | | | P |
| | Bismuth | 10.0 | U | | F |
| 7440-31-5 | Silicon | 17800 | | | P |
| 5955-70-0 | Cyanide | | | | NR |

~~4/15/94~~ 9/14/94

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
DISSOLVED

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBRL3

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO439 SAS No.: _____ SDG No.: WO038_
Matrix (soil/water): WATER Lab Sample ID: AA7578
Level (low/med): LOW__ Date Received: 04/27/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum_ | 40.0 | U | | P |
| 7440-70-2 | Calcium__ | 104 | B | | P |
| 7439-89-6 | Iron_____ | 10.0 | U | | P |
| 7439-95-4 | Magnesium | 30.0 | U | | P |
| 7439-96-5 | Manganese | 2.0 | U | | P |
| 7440-09-7 | Potassium | 1400 | B | | P |
| 7782-49-2 | Selenium_ | 2.0 | U | | F |
| 7440-23-5 | Sodium___ | 205 | B | | P |
| | Bismuth__ | 10.0 | U | | F |
| 7440-31-5 | Silicon__ | 73.4 | B | | P |
| 5955-70-0 | Cyanide__ | | | | NR |

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
TOTAL_____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBRL3

Lab Name: ITAS_KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: WO439 SAS No.: SDG No.: WO038
Matrix (soil/water): WATER Lab Sample ID: AA7584
Level (low/med): LOW Date Received: 04/27/94
% Solids: 0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| | Bismuth | | | | NR |
| 7440-31-5 | Silicon | | | | NR |
| 5955-70-0 | Cyanide | 10.0 | U | | AS |

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Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
TOTAL CYANIDE

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBRL4

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO439 SAS No.: _____ SDG No.: WO038_
Matrix (soil/water): WATER Lab Sample ID: AA7587
Level (low/med): LOW__ Date Received: 04/27/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum_ | 40.0 | U | | P |
| 7440-70-2 | Calcium__ | 56.5 | B | | P |
| 7439-89-6 | Iron_____ | 12.2 | B | | P |
| 7439-95-4 | Magnesium | 30.0 | U | | P |
| 7439-96-5 | Manganese | 2.0 | U | | P |
| 7440-09-7 | Potassium | 1000 | U | | P |
| 7782-49-2 | Selenium_ | 2.0 | U | | F |
| 7440-23-5 | Sodium___ | 100 | B | | P |
| | Bismuth__ | 10.0 | U | | F |
| 7440-31-5 | Silicon__ | 40.4 | B | | P |
| 5955-70-0 | Cyanide__ | | | | NR |

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Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
DISSOLVED_____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP1 W0038

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO388 SAS No.: _____ SDG No.: ~~W0027~~ W0038
Matrix (soil/water): WATER Lab Sample ID: AA6895
Level (low/med): LOW__ Date Received: 04/19/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 42.5 | B | | P |
| 7440-70-2 | Calcium | 26200 | | | P |
| 7439-89-6 | Iron | ~~72.7~~ | ~~B~~ | | P |
| 7439-95-4 | Magnesium | 8310 | | | P |
| 7439-96-5 | Manganese | 2.5 | B | | P |
| 7440-09-7 | Potassium | 4860 | B | | P |
| 7782-49-2 | Selenium | 2.0 | U | | F |
| 7440-23-5 | Sodium | 23900 | | | P |
| 7440-31-5 | Silicon | 17300 | | | P |
| | Bismuth | 10.0 | U | | F |
| 5955-70-0 | Cyanide | | | | NR |

9/14/94

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____
Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:
TOTAL

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP1W0038

Lab Name: ITAS_KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: WO388 SAS No.: SDG No.: ~~W0027~~ W0038 6/17/94

Matrix (soil/water): WATER Lab Sample ID: AA6901

Level (low/med): LOW Date Received: 04/19/94

% Solids: 0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | | | | NR |
| 7440-70-2 | Calcium | | | | NR |
| 7439-89-6 | Iron | | | | NR |
| 7439-95-4 | Magnesium | | | | NR |
| 7439-96-5 | Manganese | | | | NR |
| 7440-09-7 | Potassium | | | | NR |
| 7782-49-2 | Selenium | | | | NR |
| 7440-23-5 | Sodium | | | | NR |
| 7440-31-5 | Silicon | | | | NR |
| | Bismuth | | | | NR |
| 5955-70-0 | Cyanide | 10.0 | U | | AS |

4/15/94 9/14/94

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: Clarity After: CLEAR Artifacts:

Comments:

CYANIDE_ONLY

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP2 W0038

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO388 SAS No.: _____ SDG No.: ~~W0027~~ W0038 6/7/94
Matrix (soil/water): WATER Lab Sample ID: AA6902
Level (low/med): LOW__ Date Received: 04/19/94
% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P |
| 7440-70-2 | Calcium | 26600 | | | P |
| 7439-89-6 | Iron | 19.4 | ~~B~~ | | P |
| 7439-95-4 | Magnesium | 8490 | | | P |
| 7439-96-5 | Manganese | 2.0 | U | | P |
| 7440-09-7 | Potassium | 4610 | B | | P |
| 7782-49-2 | Selenium | 2.0 | U | | F |
| 7440-23-5 | Sodium | 24500 | | | P |
| 7440-31-5 | Silicon | 17700 | | | P |
| | Bismuth | 10.0 | U | | F |
| 5955-70-0 | Cyanide | | | | NR |

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Color Before: COLORLESS Clarity Before: CLEAR Texture: _____
Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:
DISSOLVED

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNN9

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___ SDG No.: ~~W0027~~ W0038 JDK 6/7/94

Lab Code: ITSTU_ Case No.: WO418 SAS No.: _____

Matrix (soil/water): WATER Lab Sample ID: AA7287

Level (low/med): LOW__ Date Received: 04/22/94

% Solids: __0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P |
| 7440-70-2 | Calcium | 68400 | | | P |
| 7439-89-6 | Iron | 233 | | | P |
| 7439-95-4 | Magnesium | 19900 | | | P |
| 7439-96-5 | Manganese | 31.8 | | | P |
| 7440-09-7 | Potassium | 7610 | | | P |
| 7782-49-2 | Selenium | 11.1 | | | F |
| 7440-23-5 | Sodium | 26200 | | | P |
| 7440-31-5 | Silicon | 14300 | | | P |
| | Bismuth | 10.0 | U | | F |
| 5955-70-0 | Cyanide | 88.0 | | | AS |

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Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

TOTAL_METALS

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNP0

Lab Name: ITAS_KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: WO418 SAS No.: SDG No.: ~~WO027~~ WO038

Matrix (soil/water): WATER Lab Sample ID: AA7301

Level (low/med): LOW Date Received: 04/22/94

% Solids: 0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P |
| 7440-70-2 | Calcium | 58000 | | | P |
| 7439-89-6 | Iron | 59.4 | B | | P |
| 7439-95-4 | Magnesium | 17300 | | | P |
| 7439-96-5 | Manganese | 36.2 | | | P |
| 7440-09-7 | Potassium | 6410 | | | P |
| 7782-49-2 | Selenium | 10 | | | F |
| 7440-23-5 | Sodium | 22500 | | | P |
| 7440-31-5 | Silicon | 11700 | | | P |
| | Bismuth | 10.0 | ~~U~~ UJ | W | F |
| 5955-70-0 | Cyanide | | | | NR |

9/14/94

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

DISSOLVED_METALS

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EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

BOBNM7

Lab Name: ITAS_KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: WO418 SAS No.: SDG No.: ~~WO027~~ W0038 JDR 6/7/97

Matrix (soil/water): WATER Lab Sample ID: AA7294

Level (low/med): LOW Date Received: 04/22/94

% Solids: 0.0

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 651 | | | P |
| 7440-70-2 | Calcium | 35000 | | | P |
| 7439-89-6 | Iron | 5450 | | | P |
| 7439-95-4 | Magnesium | 9430 | | | P |
| 7439-96-5 | Manganese | 962 | | | P |
| 7440-09-7 | Potassium | 9670 | | | P |
| 7782-49-2 | Selenium | 2.0 | U | | F |
| 7440-23-5 | Sodium | 46300 | | | P |
| 7440-31-5 | Silicon | 9850 | | | P |
| | Bismuth | 10.0 | U | | F |
| 5955-70-0 | Cyanide | 10.0 | U | | AS |

9/13/94
9/14/94

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

TOTAL_METALS

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNM8

Lab Name: ITAS_KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: WO418 SAS No.: SDG No.: ~~WO027~~ W0038

Matrix (soil/water): WATER Lab Sample ID: AA7302

Level (low/med): LOW Date Received: 04/22/94

% Solids: 0.0

6/7/94

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

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 40.0 | U | | P |
| 7440-70-2 | Calcium | 35700 | | | P |
| 7439-89-6 | Iron | 19.1 | B | | P |
| 7439-95-4 | Magnesium | 9240 | | | P |
| 7439-96-5 | Manganese | 674 | | | P |
| 7440-09-7 | Potassium | 9070 | | | P |
| 7782-49-2 | Selenium | 2.0 | U | | F |
| 7440-23-5 | Sodium | 47800 | | | P |
| 7440-31-5 | Silicon | 8740 | | | P |
| | Bismuth | 10.0 | U | | F |
| 5955-70-0 | Cyanide | | | | NR |

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Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

DISSOLVED_METALS

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## TOTAL DISSOLVED SOLIDS ANALYSIS

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|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 439 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 04/29/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6171 | 1.0 | U |
| BOBNP5 | AA7575 | 165 | + |
| BOBRL3 | AA7582 | 15 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## TOTAL DISSOLVED SOLIDS ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 455 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/02/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6169 | 1.0 | U |
| BOBRL7 | AA7823 | 370 | + |
| BOBNN1 | AA7816 | 362 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.



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## TOTAL DISSOLVED SOLIDS ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 428 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 04/27/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6131 | 1.0 | U |
| Method Blank | P6118 | 1.0 | U |
| BOBNP7 | AA7393 | 382 | + |
| BOBNP3 | AA7400 | 3080 | + |
| BOBNM5 | AA7407 | 600 | + |

Method Blank P6131 applies to sample: BOBNP7
Method Blank P6118 applies to samples: BOBNP3 and BOBNM5

\+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

## TOTAL DISSOLVED SOLIDS ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 388 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 04/21/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6104 | 1.0 | U |
| BOBNP1 | AA6899 | 264 | + |

\+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

# TOTAL DISSOLVED SOLIDS ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 418 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 04/25/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6114 | 1.0 | U |
| BOBNN9 | AA7291 | 472 | + |
| BOBNM7 | AA7298 | 323 | + |

\+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

9-14-94

## ALKALINITY ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 418 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/02/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6143 | 2 | U |
| BOBNN9 | AA7290 | 98 | + |
| BOBNM7 | AA7297 | 100 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

RDS 9-14-94

## ALKALINITY ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 388 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 04/26/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6157 | 2 | U |
| BOBNP1 | AA6898 | 96 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

9-14-94

## ALKALINITY ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 439 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/02/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6143 | 2 | U |
| BOBRL3 | AA7581 | 10 | + |
| BOBNP5 | AA7574 | 132 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

9-14-94

# ALKALINITY ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 455 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/02/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6144 | 2 | U |
| Method Blank | P6145 | 2 | U |
| BOBRL7 | AA7822 | 110 | + |
| BOBNN1 | AA7815 | 104 | + |

Method Blank P6144 applies to sample: BOBRL7
Method Blank P6145 applies to samples: BOBNN1

\+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

9-19-94

## ALKALINITY ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 428 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/02/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6143 | 2 | U |
| BOBNM5 | AA7406 | 96 | + |
| BOBNP3 | AA7399 | 106 | + |
| BOBNP7 | AA7392 | 108 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

9-14-94

## NITRATE/NITRITE ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 439 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/17/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6205 | 0.02 | U |
| BOBNP5 | AA7573 | 0.03 | + |
| BOBRL3 | AA7580 | 0.02 | U |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.



9-14-94

## NITRATE/NITRITE ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 455 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/18/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6212 | 0.02 | U |
| BOBNN1 | AA7814 | 9.23 | + |
| BOBRL7 | AA7821 | 9.46 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.



ds 9-19-94

## NITRATE/NITRITE ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 418 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/17/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6205 | 0.02 | U |
| BOBNN9 | AA7289 | 27 | + |
| BOBNM7 | AA7296 | 0.02 | U |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

DCS 9-14-94

## NITRATE/NITRITE ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 388 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/11/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6178 | 0.02 | U |
| BOBNP1 | AA6897 | 4.7 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

KAS 9-19-94

## NITRATE/NITRITE ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 428 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/17/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6205 | 0.02 | U |
| BOBNP7 | AA7391 | 6.7 | + |
| BOBNP3 | AA7398 | 0.78 | + |
| BOBNM5 | AA7405 | 48 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.



DLS 9-14-94

## SULFATE ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 388 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/02/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6180 | 5.0 | U |
| BOBNP1 | AA6900 | 40 | + |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

9-14-94

## SULFATE ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 418 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/02/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6180 | 5.0 | U |
| BOBNN9 | AA7292 | 108 | + |
| BOBNM7 | AA7299 | 108 | + |

\+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

RLS 9-14-94

## SULFATE ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 439 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/05/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6200 | 5.0 | U |
| BOBRL3 | AA7583 | 5.5 | + |
| BOBNP5 | AA7576 | 12 | + |

\+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.



RS 9-14-94

## SULFATE ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 428 |
| Sample Matrix: | Water | Extraction Date: | N/A |
| Concentration Units: | mg/l | Analysis Date: | 05/02/94 |

| Client Sample ID | Lab Sample ID | Result | Qualifiers |
|---|---|---|---|
| Method Blank | P6180 | 5.0 | U |
| BOBNM5 | AA7408 | 166 | + |
| BOBNP3 | AA7401 | 34 | + |
| BOBNP7 | AA7394 | 44 | + |

\+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.



9-14-94

## ANION ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 439 |
| Client Sample ID: | BOBNP5 | Preparation Date: | 05/18/94 |
| Lab Sample ID: | AA7572 | Analysis Date: | 05/18/94 |
| Sample Matrix: | Water | Concentration Units: | mg/l |

| Compound | Result | Qualifier | Detection Limit | |
|---|---|---|---|---|
| fluoride | 2.4 | + | 0.40 | |
| chloride | 7.0 | + | 0.8 | |
| nitrite | 0.40 | U | 0.40 | UR |
| phosphate | 1.0 | U | 1.0 | UR |
| sulfate | 13 | + | 1.5 | |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

ars 9-14-94

## ANION ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 439 |
| Client Sample ID: | BOBRL3 | Preparation Date: | 05/18/94 |
| Lab Sample ID: | AA7579 | Analysis Date: | 05/18/94 |
| Sample Matrix: | Water | Concentration Units: | mg/l |

| Compound | Result | Qualifier | Detection Limit | |
|---|---|---|---|---|
| fluoride | 0.40 | U | 0.40 | |
| chloride | 0.40 | U | 0.40 | |
| nitrite | 0.40 | U | 0.40 | UR |
| phosphate | 1.0 | U | 1.0 | UR |
| sulfate | 1.5 | U | 1.5 | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

9-14-94

# ANION ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 455 |
| Client Sample ID: | BOBRL7 | Preparation Date: | 05/18/94 |
| Lab Sample ID: | AA7820 | Analysis Date: | 05/18/94 |
| Sample Matrix: | Water | Concentration Units: | mg/l |

| Compound | Result | Qualifier | Detection Limit | |
|---|---|---|---|---|
| fluoride | 0.51 | + | 0.40 | |
| chloride | 20 | + | 4.0 | |
| nitrite | 0.40 | U | 0.40 | UR |
| phosphate | 1.0 | U | 1.0 | UR |
| sulfate | 110 | + | 15 | |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

ves 9-14-94

## ANION ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 455 |
| Client Sample ID: | BOBNN1 | Preparation Date: | 05/18/94 |
| Lab Sample ID: | AA7813 | Analysis Date: | 05/18/94 |
| Sample Matrix: | Water | Concentration Units: | mg/l |

| Compound | Result | Qualifier | Detection Limit | |
|---|---|---|---|---|
| fluoride | 0.50 | + | 0.40 | |
| chloride | 27 | + | 4.0 | |
| nitrite | 0.40 | U | 0.40 | UR |
| phosphate | 1.0 | U | 1.0 | UR |
| sulfate | 150 | + | 15 | |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

9-14-94

## ANION ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 428 |
| Client Sample ID: | BOBNP7 | Preparation Date: | 05/18/94 |
| Lab Sample ID: | AA7390 | Analysis Date: | 05/18/94 |
| Sample Matrix: | Water | Concentration Units: | mg/l |

| Compound | Result | Qualifier | Detection Limit | |
|---|---|---|---|---|
| fluoride | 0.82 | + | 0.40 | |
| chloride | 9.0 | + | 2.0 | |
| nitrite | 0.40 | U | 0.40 | UR |
| phosphate | 1.0 | U | 1.0 | UR |
| sulfate | 38 | + | 7.5 | |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Jad 9-19-94

# ANION ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 428 |
| Client Sample ID: | BOBNP3 | Preparation Date: | 05/18/94 |
| Lab Sample ID: | AA7397 | Analysis Date: | 05/18/94 |
| Sample Matrix: | Water | Concentration Units: | mg/l |

| Compound | Result | Qualifier | Detection Limit | |
|---|---|---|---|---|
| fluoride | 0.95 | + | 0.40 | |
| chloride | 7.0 | + | 0.80 | |
| nitrite | 0.40 | U | 0.40 | UR |
| phosphate | 1.0 | U | 1.0 | UR |
| sulfate | 27 | + | 1.5 | |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

9-14-94

# ANION ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 428 |
| Client Sample ID: | BOBNM5 | Preparation Date: | 05/18/94 |
| Lab Sample ID: | AA7404 | Analysis Date: | 05/18/94 |
| Sample Matrix: | Water | Concentration Units: | mg/l |

| Compound | Result | Qualifier | Detection Limit | |
|---|---|---|---|---|
| fluoride | 0.40 | U | 0.40 | |
| chloride | 21 | + | 2.0 | |
| nitrite | 0.40 | U | 0.40 | UR |
| phosphate | 1.0 | U | 1.0 | UR |
| sulfate | 180 | + | 15 | |

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

MAS 9-14-94

# ANION ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 418 |
| Client Sample ID: | BOBNM7 | Preparation Date: | 05/16/94 |
| Lab Sample ID: | AA7295 | Analysis Date: | 05/16/94 |
| Sample Matrix: | Water | Concentration Units: | mg/l |

| Compound | Result | Qualifier | Detection Limit | |
|---|---|---|---|---|
| fluoride | 0.7 | + | 0.40 | |
| sulfate | 120 | + | 7.5 | |
| Chloride | 16 | + | 10 | |
| Nitrite | 0.40 | ~~U~~ | 0.40 | UR |
| phosphate | 1.0 | ~~U~~ | 1.0 | UR |

+ - Positive result.

MW 5-16-94

## ANION ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 388 |
| Client Sample ID: | BOBNP1 | Preparation Date: | 05/13/94 |
| Lab Sample ID: | AA6896 | Analysis Date: | 05/13/94 |
| Sample Matrix: | Water | Concentration Units: | mg/l |

| Compound | Result | Qualifier | Detection Limit |
|---|---|---|---|
| fluoride | 0.6 | + | 0.40 |
| sulfate | 35 | + | 7.5 |
| Chloride | 12 | + | 10 |
| ~~ND~~ Nitrite | 0.4 | U | 0.4 UR |
| Phosphate | 1.0 | U | 1.0 UR |

amw 6-16-94

+ - Positive result.

amw 6/16/94.

# ANION ANALYSIS

| | | | |
|---|---|---|---|
| Laboratory Name: | ITAS-Knoxville | SDG Number: | W0038 |
| Contract Name: | Westinghouse Hanford | Job Number: | 418 |
| Client Sample ID: | BOBNN9 | Preparation Date: | 05/16/94 |
| Lab Sample ID: | AA7288 | Analysis Date: | 05/16/94 |
| Sample Matrix: | Water | Concentration Units: | mg/l |

| Compound | Result | Qualifier | Detection Limit | |
|---|---|---|---|---|
| fluoride | 0.40 | U | 0.40 | |
| sulfate | 130 | + | 7.5 | |
| chloride | 20 | + | 10 | |
| nitrite | 0.40 | ~~U~~ | 0.40 | UR |
| phosphate | 1.0 | ~~U~~ | 1.0 | UR |

MW 9-15-94

\+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

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MW 9-16-94

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IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

SAMPLE RESULTS

| | | | |
|---|---|---|---|
| LAB NAME: | ITAS-RICHLAND | SDG NO.: | W0038 |
| LAB SAMPLE ID: | 40432101 | MATRIX: | WATER |
| WHC ID: | B0BNP1 | DATE RECEIVED: | 4/19/94 |
| REPORTING UNITS: | pCi/L & ug/g | | |

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| PU239/40 | U 1.22E-01 | 1.73E-01 | 1.74E-01 | 1.65E-01 | 0.682 | RD3209 |
| PU-238 | U -1.22E-02 | 2.45E-02 | 2.45E-02 | 2.93E-01 | 0.682 | RD3209 |
| CO-60 | U -4.53E+00 | 6.10E+00 | 6.11E+00 | 9.46E+00 | N/A | RD3219 |
| FE-59 | U -3.00E+00 | 1.53E+01 | 1.53E+01 | 2.65E+01 | N/A | RD3219 |
| EU-152 | U 3.25E+00 | 1.66E+01 | 1.66E+01 | 3.54E+01 | N/A | RD3219 |
| CO-58 | U -3.46E+00 | 4.48E+00 | 4.50E+00 | 7.32E+00 | N/A | RD3219 |
| CS-137DA | U 0.00E+00 | 4.26E+00 | 4.26E+00 | N/A | N/A | RD3219 |
| RU-106DA | U 3.24E+01 | 3.51E+01 | 3.52E+01 | 7.45E+01 | N/A | RD3219 |
| EU-155 | U -3.16E+00 | 8.76E+00 | 8.77E+00 | 1.40E+01 | N/A | RD3219 |
| EU-154 | U -4.48E+00 | 9.92E+00 | 9.93E+00 | 1.75E+01 | N/A | RD3219 |
| ALPHA | 2.96E+00 | 1.17E+00 | 1.22E+00 | 1.19E+00 | 1 | RD3222 |
| BETA | 2.11E+01 | 2.60E+00 | 3.00E+00 | 3.02E+00 | 1 | RD3222 |
| TOTAL-SR | U -7.61E-02 | 2.67E-01 | 2.68E-01 | 7.86E-01 | 0.968 | RD3204 |
| TC-99 | 4.99E+01 | 1.58E+00 | 8.79E+00 | 2.15E+00 | 0.951 | ITAS-IT-RS-0001 |
| TRITIUM | 7.44E+04 | 7.48E+02 | 5.55E+03 | 2.34E+02 | 0.973 | RD3205 |
| URANIUM | 3.84E+00 | N/A | 5.76E-01 | 3.54E-03 | 1 | RD4200 |

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**IT ANALYTICAL SERVICES**
**RICHLAND, WA**
**(509) 375-3131**

## SAMPLE RESULTS

| | | | |
|---|---|---|---|
| **LAB NAME:** | ITAS-RICHLAND | **SDG NO.:** | W0038 |
| **LAB SAMPLE ID:** | 40440701 | **MATRIX:** | WATER |
| **WHC ID:** | B0BNN9 | **DATE RECEIVED:** | 4/21/94 |
| **REPORTING UNITS:** | pCi/L & ug/g | | |

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| PU239/40 | U -4.27E-02 | 4.27E-02 | 4.31E-02 | 3.66E-01 | 0.781 | RD3209 |
| PU-238 | U -2.14E-02 | 3.02E-02 | 3.04E-02 | 3.02E-01 | 0.781 | RD3209 |
| CO-60 | 5.04E+01 | 7.60E+00 | 9.12E+00 | N/A | N/A | RD3219 |
| FE-59 | U 5.79E+00 | 1.16E+01 | 1.16E+01 | 2.18E+01 | N/A | RD3219 |
| EU-152 | U -5.80E+00 | 1.17E+01 | 1.17E+01 | 2.03E+01 | N/A | RD3219 |
| CO-58 | U -6.07E-01 | 4.57E+00 | 4.57E+00 | 8.03E+00 | N/A | RD3219 |
| CS-137DA | U 1.22E+00 | 3.13E+00 | 3.14E+00 | 5.69E+00 | N/A | RD3219 |
| RU-106DA | U 2.55E+01 | 2.75E+01 | 2.76E+01 | 5.19E+01 | N/A | RD3219 |
| EU-155 | U -3.32E+00 | 6.55E+00 | 6.56E+00 | 1.01E+01 | N/A | RD3219 |
| EU-154 | U -2.67E+00 | 9.82E+00 | 9.82E+00 | 1.74E+01 | N/A | RD3219 |
| ALPHA | 3.98E+00 | 1.66E+00 | 1.70E+00 | 1.69E+00 | 1 | RD3222 |
| BETA | 4.31E+02 | 1.04E+01 | 3.20E+01 | 3.19E+00 | 1 | RD3222 |
| TOTAL-SR | U 4.43E-02 | 3.19E-01 | 3.19E-01 | 8.87E-01 | 0.794 | RD3204 |
| TC-99 | 2.10E+03 | 8.35E+00 | 2.31E+02 | 2.15E+00 | 0.951 | ITAS-IT-RS-0001 |
| TRITIUM | 5.72E+03 | 2.28E+02 | 5.66E+02 | 2.34E+02 | 0.973 | RD3205 |
| URANIUM | 4.42E+00 | N/A | 6.62E-01 | 3.54E-03 | 1 | RD4200 |

mw 9-14-94

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IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND
LAB SAMPLE ID: 40440702
WHC ID: B0BNM7
REPORTING UNITS: pCi/L & ug/g

SDG NO.: W0038
MATRIX: WATER
DATE RECEIVED: 4/21/94

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| PU239/40 | U 9.94E-02 | 1.58E-01 | 1.59E-01 | 2.64E-01 | 0.754 | RD3209 |
| PU-238 | U 0.00E+00 | 0.00E+00 | 1.66E-01 | 1.50E-01 | 0.754 | RD3209 |
| CO-60 | U 5.47E+00 | 4.89E+00 | 4.92E+00 | 1.16E+01 | N/A | RD3219 |
| FE-59 | U -1.50E+01 | 1.69E+01 | 1.70E+01 | 2.55E+01 | N/A | RD3219 |
| EU-152 | U -7.99E+00 | 2.13E+01 | 2.13E+01 | 3.65E+01 | N/A | RD3219 |
| CO-58 | U -1.53E+00 | 5.78E+00 | 5.78E+00 | 1.04E+01 | N/A | RD3219 |
| CS-137DA | U 3.98E+00 | 3.97E+00 | 3.99E+00 | 8.71E+00 | N/A | RD3219 |
| RU-106DA | U -6.63E+00 | 3.75E+01 | 3.75E+01 | 6.59E+01 | N/A | RD3219 |
| EU-155 | U -2.93E+00 | 9.53E+00 | 9.53E+00 | 1.58E+01 | N/A | RD3219 |
| EU-154 | U -8.85E+00 | 1.27E+01 | 1.27E+01 | 2.11E+01 | N/A | RD3219 |
| ALPHA | 2.25E+00 | 1.27E+00 | 1.29E+00 | 1.73E+00 | 1 | RD3222 |
| BETA | 1.01E+01 | 2.04E+00 | 2.16E+00 | 3.00E+00 | 1 | RD3222 |
| TOTAL-SR | U 1.28E-01 | 2.69E-01 | 2.71E-01 | 7.65E-01 | 0.942 | RD3204 |
| TC-99 | 2.74E+00 | 9.70E-01 | 4.36E+00 | 2.15E+00 | 0.951 | ITAS-IT-RS-0001 |
| TRITIUM | U 1.14E+02 | 1.04E+02 | 1.96E+02 | 2.34E+02 | 0.973 | RD3205 |
| URANIUM | 1.43E+00 | N/A | 2.15E-01 | 3.54E-03 | 1 | RD4200 |

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IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

SAMPLE RESULTS

| | | | |
|---|---|---|---|
| **LAB NAME:** | ITAS-RICHLAND | **SDG NO.:** | W0038 |
| **LAB SAMPLE ID:** | 40442801 | **MATRIX:** | WATER |
| **WHC ID:** | B0BNP7 | **DATE RECEIVED:** | 4/22/94 |
| **REPORTING UNITS:** | pCi/L & ug/g | | |

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| PU239/40 | U 0.00E+00 | 0.00E+00 | 1.52E-01 | 1.37E-01 | 0.82 | RD3209 |
| PU-238 | U -2.03E-02 | 2.88E-02 | 2.89E-02 | 2.87E-01 | 0.82 | RD3209 |
| CO-60 | U -4.61E-01 | 2.89E+00 | 2.89E+00 | 5.96E+00 | N/A | RD3219 |
| FE-59 | U 3.41E+00 | 8.42E+00 | 8.43E+00 | 1.93E+01 | N/A | RD3219 |
| EU-152 | U 8.82E+00 | 1.83E+01 | 1.84E+01 | 3.93E+01 | N/A | RD3219 |
| CO-58 | U 1.22E+00 | 4.54E+00 | 4.54E+00 | 9.21E+00 | N/A | RD3219 |
| CS-137DA | U -2.47E+00 | 4.20E+00 | 4.21E+00 | 6.76E+00 | N/A | RD3219 |
| RU-106DA | U -3.75E+01 | 3.73E+01 | 3.74E+01 | 5.88E+01 | N/A | RD3219 |
| EU-155 | U -2.82E+00 | 7.93E+00 | 7.94E+00 | 1.25E+01 | N/A | RD3219 |
| EU-154 | U 6.72E+00 | 1.01E+01 | 1.02E+01 | 2.37E+01 | N/A | RD3219 |
| ALPHA | U 1.10E+00 | 7.76E-01 | 7.88E-01 | 1.18E+00 | 1 | RD3222 |
| BETA | 3.33E+01 | 3.09E+00 | 3.88E+00 | 2.94E+00 | 1 | RD3222 |
| TOTAL-SR | U -9.19E-02 | 1.91E-01 | 1.92E-01 | 7.89E-01 | 0.976 | RD3204 |
| TC-99 | 1.44E+02 | 2.36E+00 | 1.87E+01 | 2.15E+00 | 0.951 | ITAS-IT-RS-0001 |
| TRITIUM | 3.22E+04 | 4.95E+02 | 2.48E+03 | 2.34E+02 | 0.973 | RD3205 |
| URANIUM | 1.08E+00 | N/A | 1.62E-01 | 3.54E-03 | 1 | RD4200 |

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IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

SAMPLE RESULTS

| | | | |
|---|---|---|---|
| **LAB NAME:** | ITAS-RICHLAND | **SDG NO.:** | W0038 |
| **LAB SAMPLE ID:** | 40442802 | **MATRIX:** | WATER |
| **WHC ID:** | B0BNP3 | **DATE RECEIVED:** | 4/22/94 |
| **REPORTING UNITS:** | pCi/L & ug/g | | |

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| PU239/40 | U -1.12E-02 | 2.23E-02 | 2.24E-02 | 2.67E-01 | 0.747 | RD3209 |
| PU-238 | U -2.23E-02 | 3.16E-02 | 3.17E-02 | 3.16E-01 | 0.747 | RD3209 |
| CO-60 | U 1.29E+00 | 3.74E+00 | 3.74E+00 | 8.41E+00 | N/A | RD3219 |
| FE-59 | U 1.04E+01 | 1.36E+01 | 1.36E+01 | 2.89E+01 | N/A | RD3219 |
| EU-152 | U 9.99E-01 | 2.37E+01 | 2.37E+01 | 4.75E+01 | N/A | RD3219 |
| CO-58 | U -3.56E-01 | 5.31E+00 | 5.31E+00 | 9.29E+00 | N/A | RD3219 |
| CS-137DA | U -1.33E+00 | 5.22E+00 | 5.23E+00 | 9.14E+00 | N/A | RD3219 |
| RU-106DA | U 3.09E+01 | 3.01E+01 | 3.03E+01 | 6.86E+01 | N/A | RD3219 |
| EU-155 | U -2.20E+00 | 1.01E+01 | 1.01E+01 | 1.66E+01 | N/A | RD3219 |
| EU-154 | U 7.24E+00 | 1.09E+01 | 1.09E+01 | 2.55E+01 | N/A | RD3219 |
| ALPHA | 1.12E+00 | 7.38E-01 | 7.51E-01 | 1.01E+00 | 1 | RD3222 |
| BETA | 5.84E+01 | 3.89E+00 | 5.67E+00 | 2.75E+00 | 1 | RD3222 |
| TOTAL-SR | U -1.08E-01 | 1.80E-01 | 1.82E-01 | 8.08E-01 | 0.865 | RD3204 |
| TC-99 | 2.21E+02 | 2.85E+00 | 2.71E+01 | 2.15E+00 | 0.951 | ITAS-IT-RS-0001 |
| TRITIUM | 5.97E+03 | 2.31E+02 | 5.83E+02 | 2.34E+02 | 0.973 | RD3205 |
| URANIUM | 4.48E-01 | N/A | 6.72E-02 | 3.54E-03 | 1 | RD4200 |

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IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

SAMPLE RESULTS

| | | | |
|---|---|---|---|
| **LAB NAME:** | ITAS-RICHLAND | **SDG NO.:** | W0038 |
| **LAB SAMPLE ID:** | 40442803 | **MATRIX:** | WATER |
| **WHC ID:** | B0BNM5 | **DATE RECEIVED:** | 4/22/94 |
| **REPORTING UNITS:** | pCi/L & ug/g | | |

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| PU239/40 | U 5.23E-02 | 1.05E-01 | 1.05E-01 | 1.41E-01 | 0.797 | RD3209 |
| PU-238 | U -1.05E-02 | 2.09E-02 | 2.10E-02 | 2.51E-01 | 0.797 | RD3209 |
| CO-60 | 7.43E+01 | 1.48E+01 | 1.66E+01 | N/A | N/A | RD3219 |
| FE-59 | U -2.08E+01 | 1.92E+01 | 1.94E+01 | 2.87E+01 | N/A | RD3219 |
| EU-152 | U 6.49E+00 | 1.88E+01 | 1.88E+01 | 4.23E+01 | N/A | RD3219 |
| CO-58 | U 7.23E+00 | 6.11E+00 | 6.15E+00 | 1.31E+01 | N/A | RD3219 |
| CS-137DA | U 4.04E+00 | 4.38E+00 | 4.39E+00 | 9.24E+00 | N/A | RD3219 |
| RU-106DA | U 4.80E+01 | 3.72E+01 | 3.75E+01 | 8.28E+01 | N/A | RD3219 |
| EU-155 | U -2.20E+00 | 1.01E+01 | 1.01E+01 | 1.67E+01 | N/A | RD3219 |
| EU-154 | U -7.24E+00 | 1.78E+01 | 1.78E+01 | 3.19E+01 | N/A | RD3219 |
| ALPHA | 7.35E+00 | 2.58E+00 | 2.69E+00 | 2.33E+00 | 1 | RD3222 |
| BETA | 6.54E+02 | 1.28E+01 | 4.76E+01 | 3.04E+00 | 1 | RD3222 |
| TOTAL-SR | U 4.09E-02 | 4.51E-01 | 4.51E-01 | 1.74E+00 | 0.383 | RD3204 |
| TC-99 | 4.31E+03 | 1.20E+01 | 4.73E+02 | 2.15E+00 | 0.951 | ITAS-IT-RS-0001 |
| TRITIUM | 3.56E+03 | 1.89E+02 | 4.14E+02 | 2.34E+02 | 0.973 | RD3205 |
| URANIUM | 6.65E+00 | N/A | 9.98E-01 | 3.54E-03 | 1 | RD4200 |

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IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

SAMPLE RESULTS

| | | | |
|---|---|---|---|
| LAB NAME: | ITAS-RICHLAND | SDG NO.: | W0038 |
| LAB SAMPLE ID: | 40445901 | MATRIX: | WATER |
| WHC ID: | B0BNP5 | DATE RECEIVED: | 4/25/94 |
| REPORTING UNITS: | pCi/L & ug/g | | |

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| PU239/40 | U 1.17E-02 | 1.26E-01 | 1.26E-01 | 4.00E-01 | 0.715 | RD3209 |
| PU-238 | U -1.17E-02 | 2.33E-02 | 2.34E-02 | 2.79E-01 | 0.715 | RD3209 |
| CO-60 | U -7.29E-01 | 3.21E+00 | 3.21E+00 | 5.67E+00 | N/A | RD3219 |
| FE-59 | U -9.05E+00 | 9.99E+00 | 1.00E+01 | 1.60E+01 | N/A | RD3219 |
| EU-152 | U 3.22E+00 | 1.35E+01 | 1.35E+01 | 2.67E+01 | N/A | RD3219 |
| CO-58 | U -7.12E-01 | 3.46E+00 | 3.46E+00 | 6.06E+00 | N/A | RD3219 |
| CS-137DA | U -3.19E-01 | 2.75E+00 | 2.75E+00 | 4.84E+00 | N/A | RD3219 |
| RU-106DA | U 1.29E+01 | 2.51E+01 | 2.51E+01 | 4.70E+01 | N/A | RD3219 |
| EU-155 | U -8.47E-01 | 6.22E+00 | 6.22E+00 | 1.07E+01 | N/A | RD3219 |
| EU-154 | U -5.68E+00 | 9.85E+00 | 9.86E+00 | 1.62E+01 | N/A | RD3219 |
| ALPHA | U -3.20E-01 | 1.55E-01 | 1.61E-01 | 1.06E+00 | 1 | RD3222 |
| BETA | 6.70E+00 | 1.85E+00 | 1.91E+00 | 3.06E+00 | 1 | RD3222 |
| TOTAL-SR | U 1.12E-01 | 2.59E-01 | 2.60E-01 | 9.48E-01 | 0.733 | RD3204 |
| TC-99 | 7.11E+00 | 1.04E+00 | 4.71E+00 | 2.15E+00 | 0.951 | ITAS-IT-RS-0001 |
| TRITIUM | 2.37E+02 | 1.08E+02 | 2.02E+02 | 2.34E+02 | 0.973 | RD3205 |
| URANIUM | 1.95E-01 | N/A | 2.93E-02 | 3.54E-03 | 1 | RD4200 |

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IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

SAMPLE RESULTS

| | | | |
|---|---|---|---|
| **LAB NAME:** | ITAS-RICHLAND | **SDG NO.:** | W0038 |
| **LAB SAMPLE ID:** | 40445902 | **MATRIX:** | WATER |
| **WHC ID:** | B0BRL3 | **DATE RECEIVED:** | 4/25/94 |
| **REPORTING UNITS:** | pCi/L & ug/g | | |

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| PU239/40 | U 3.65E-02 | 9.30E-02 | 9.31E-02 | 2.18E-01 | 0.914 | RD3209 |
| PU-238 | U 0.00E+00 | 0.00E+00 | 1.37E-01 | 1.24E-01 | 0.914 | RD3209 |
| CO-60 | U -3.97E-01 | 4.57E+00 | 4.57E+00 | 8.95E+00 | N/A | RD3219 |
| FE-59 | U -2.93E+00 | 1.50E+01 | 1.50E+01 | 2.64E+01 | N/A | RD3219 |
| EU-152 | U -4.99E+00 | 2.22E+01 | 2.22E+01 | 3.97E+01 | N/A | RD3219 |
| CO-58 | U 1.95E+00 | 4.29E+00 | 4.30E+00 | 9.14E+00 | N/A | RD3219 |
| CS-137DA | U -1.39E+00 | 4.89E+00 | 4.89E+00 | 8.55E+00 | N/A | RD3219 |
| RU-106DA | U -2.54E+01 | 4.06E+01 | 4.07E+01 | 6.53E+01 | N/A | RD3219 |
| EU-155 | U -3.38E+00 | 8.22E+00 | 8.23E+00 | 1.36E+01 | N/A | RD3219 |
| EU-154 | U 1.61E+00 | 1.25E+01 | 1.25E+01 | 2.55E+01 | N/A | RD3219 |
| ALPHA | U -1.01E-01 | 2.03E-01 | 2.03E-01 | 6.64E-01 | 1 | RD3222 |
| BETA | U 7.67E-01 | 1.31E+00 | 1.31E+00 | 2.79E+00 | 1 | RD3222 |
| TOTAL-SR | U 8.09E-02 | 2.30E-01 | 2.31E-01 | 9.05E-01 | 0.757 | RD3204 |
| TC-99 | 2.42E+00 | 9.61E-01 | 4.33E+00 | 2.15E+00 | 0.951 | ITAS-IT-RS-0001 |
| TRITIUM | U 1.64E+02 | 1.05E+02 | 1.98E+02 | 2.34E+02 | 0.973 | RD3205 |
| URANIUM | 9.00E-03 | N/A | 1.40E-03 | 3.54E-03 | 1 | RD4200 |

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IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

SAMPLE RESULTS

| | | | |
|---|---|---|---|
| **LAB NAME:** | ITAS-RICHLAND | **SDG NO.:** | W0038 |
| **LAB SAMPLE ID:** | 40449601 | **MATRIX:** | WATER |
| **WHC ID:** | B0BNN1 | **DATE RECEIVED:** | 4/27/94 |
| **REPORTING UNITS:** | pCi/L & ug/g | | |

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| PU239/40 | U 5.86E-02 | 1.17E-01 | 1.18E-01 | 1.59E-01 | 0.711 | RD3209 |
| PU-238 | U -2.34E-02 | 3.32E-02 | 3.33E-02 | 3.31E-01 | 0.711 | RD3209 |
| CO-60 | U 1.02E+01 | 5.59E+00 | 5.68E+00 | 1.36E+01 | N/A | RD3219 |
| FE-59 | U 9.13E+00 | 1.20E+01 | 1.20E+01 | 2.54E+01 | N/A | RD3219 |
| EU-152 | U -8.35E+00 | 1.85E+01 | 1.85E+01 | 3.34E+01 | N/A | RD3219 |
| CO-58 | U -1.98E+00 | 6.03E+00 | 6.03E+00 | 1.00E+01 | N/A | RD3219 |
| CS-137DA | U 5.17E-01 | 2.96E+00 | 2.96E+00 | 6.05E+00 | N/A | RD3219 |
| RU-106DA | U 1.99E+01 | 3.23E+01 | 3.24E+01 | 6.70E+01 | N/A | RD3219 |
| EU-155 | U -5.83E+00 | 7.04E+00 | 7.06E+00 | 1.07E+01 | N/A | RD3219 |
| EU-154 | U -1.12E+01 | 1.10E+01 | 1.10E+01 | 1.53E+01 | N/A | RD3219 |
| ALPHA | 2.19E+00 | 1.19E+00 | 1.21E+00 | 1.55E+00 | 1 | RD3222 |
| BETA | 1.45E+02 | 6.04E+00 | 1.18E+01 | 3.01E+00 | 1 | RD3222 |
| TOTAL-SR | U 1.51E-01 | 2.61E-01 | 2.63E-01 | 1.00E+00 | 0.668 | RD3204 |
| TC-99 | 6.35E+02 | 4.65E+00 | 7.20E+01 | 2.15E+00 | 0.951 | ITAS-IT-RS-0001 |
| TRITIUM | 5.31E+02 | 1.18E+02 | 2.19E+02 | 2.34E+02 | 0.973 | RD3205 |
| URANIUM | 3.75E+00 | N/A | 5.63E-01 | 3.54E-03 | 1 | RD4200 |

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IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND
SDG NO.: W0038
LAB SAMPLE ID: 40449602
MATRIX: WATER
WHC ID: B0BRL7
DATE RECEIVED: 4/27/94
REPORTING UNITS: pCi/L & ug/g

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| PU239/40 | U 5.22E-02 | 1.33E-01 | 1.33E-01 | 3.12E-01 | 0.639 | RD3209 |
| PU-238 | U -2.61E-02 | 3.69E-02 | 3.71E-02 | 3.69E-01 | 0.639 | RD3209 |
| CO-60 | U 1.23E+01 | 8.30E+00 | 8.39E+00 | 1.75E+01 | N/A | RD3219 |
| FE-59 | U 4.10E-01 | 7.61E+00 | 7.61E+00 | 1.49E+01 | N/A | RD3219 |
| EU-152 | U -2.22E+01 | 2.48E+01 | 2.49E+01 | 3.88E+01 | N/A | RD3219 |
| CO-58 | U 1.66E+00 | 2.96E+00 | 2.96E+00 | 6.40E+00 | N/A | RD3219 |
| CS-137DA | U -3.21E+00 | 4.73E+00 | 4.74E+00 | 7.75E+00 | N/A | RD3219 |
| RU-106DA | U -1.36E+01 | 3.33E+01 | 3.33E+01 | 5.78E+01 | N/A | RD3219 |
| EU-155 | U 5.97E-01 | 6.49E+00 | 6.49E+00 | 1.13E+01 | N/A | RD3219 |
| EU-154 | U -8.15E+00 | 1.17E+01 | 1.17E+01 | 1.89E+01 | N/A | RD3219 |
| ALPHA | 4.52E+00 | 1.58E+00 | 1.65E+00 | 1.35E+00 | 1 | RD3222 |
| BETA | 1.37E+02 | 5.88E+00 | 1.13E+01 | 2.84E+00 | 1 | RD3222 |
| • TOTAL-SR | U 7.44E-03 | 2.46E-01 | 2.46E-01 | 9.49E+00 | 0.762 | RD3204 |
| TC-99 | 6.65E+02 | 4.82E+00 | 7.53E+01 | 2.15E+00 | 0.951 | ITAS-IT-RS-0001 |
| TRITIUM | 3.80E+02 | 1.12E+02 | 2.10E+02 | 2.34E+02 | 0.973 | RD3205 |
| URANIUM | 4.41E+00 | N/A | 6.62E-01 | 3.54E-03 | 1 | RD4200 |

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# Checklists

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# LATA INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

| VALIDATION LEVEL: | A | B | C | D | E |
|---|---|---|---|---|---|
| PROJECT: 200-BP-5 | | | SDG:W0038-ITC-047 | | |
| VALIDATOR: Smith | | LATA NO.: WW402.81 | | DATE: 9-14-94 | |
| SAF NO.: 94-130 | | LAB: ITC KNOXVILLE | | CASE: | |
| QAPP REFERENCE: | | | SAP REFERENCE: | | |
| If there is no QAPP or SAP reference, contact the WHC Technical Representative. If the document(s) are not provided, default to the Method acceptance criteria. | | | | | |
| ANALYSES PERFORMED | | | | | |
| ☒ CLP/ICP ILM03 | ☒ CLP/GFAA | ☐ CLP/Hg | ☒ CLP/CN | ☐ | ☐ |
| ☐ SW-846/ICP | ☐ SW-846/GFAA | ☐ SW-846/Hg | ☐ SW-846/CN | ☐ | ☐ |
| SAMPLES/MATRIX BOBNP7, NP8, NP3, NP4, NM5, NM6, NM1, NM2 RL7, RL8, NP5, NP6, RL3, RL4, NP1, NP2, NM9, NP0, NM7, NM8 | | | | | |

## 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 *(see HOLDING TIME SUMMARY form)*

Are sample holding times acceptable? ..... Yes (No) N/A

Comments: Sample BOBNP1 was received at pH = 10. CLP requires preservation to > pH 12 for CN. This could bias the CN results low. CN qualified estimated. In addition, the following samples were < pH 12 BOBNN1, RL7, NP5, RL5, NP7, NP3 NM5, NP1 See holding time summary and attached laboratory variance reports. (lab narrative)



Peer Review Pw 9-15-94

## LATA INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

**3. INSTRUMENT PERFORMANCE AND CALIBRATIONS** *(see CALIBRATION DATA SUMMARY form)*

Were initial calibrations performed on all instruments? ..... (Yes) No N/A

Are initial calibrations acceptable? ..... (Yes) No N/A

★ Recalculate the correlation coefficient (r) of the standard curves for atomic absorption and cyanide analyses.

Correlation Coefficient (r)

$$r = \frac{N \sum x_i y_i - \sum x_i \sum y_i}{[N \sum x_i^2 - (\sum x_i)^2]^{1/2} \; [N \sum y_i^2 - (\sum y_i)^2]^{1/2}}$$

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

★ Recalculate at least one ICV and CCV recovery for each method.

★

ICV/CCV Recovery

$$\%R = \frac{\text{observed value}}{\text{true value}} \times 100$$

Comments: See attached Excel sheets

**4. BLANKS** *(see BLANK AND SAMPLE DATA SUMMARY form)*

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

Comments: See attached blank summary form

## LATA INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

**5. ACCURACY** *(see ACCURACY DATA SUMMARY form)*

Were spike samples analyzed? ..... (Yes) No N/A

Are all spike sample recoveries acceptable? ..... (Yes) No N/A

Were laboratory control samples (LCS) analyzed? ..... (Yes) No N/A

Are all LCS recoveries acceptable? ..... Yes (No) N/A

★

$$\%R = \frac{SSR - SR}{SA} \times 100$$

where:
SSR = spiked sample result
SR = sample result
SA = spike added

Comments: The CN LCS recovery for 5/10/94 was high (131.5%). Qualified sample BOBAM5 J. The CN LCS recovery for CN for 5/4/94 was 123.0%. Qualified sample BOBAM9 J.

**6. PRECISION** *(see PRECISION DATA SUMMARY form)*

Were laboratory duplicates analyzed? ..... (Yes) No N/A

Are all duplicate RPD values acceptable? ..... Yes (No) N/A

★

$$RPD = \frac{|OS - D|}{\left(\frac{OS + D}{2}\right)} \times 100$$

where:
OS = sample concentration (original sample/MS)
D = duplicate concentration (duplicate sample/MSD)

Comments: Iron was qualified J. for a duplicate RPD > 20% in samples BOBAM5, AM6, AP3, AP4, AP7, and AP8

## LATA INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

**6. PRECISION (continued)** *(see PRECISION DATA SUMMARY form)*

Were ICP serial dilution samples analyzed? ..... (Yes) No N/A

Are all ICP serial dilution %D values acceptable? ..... (Yes) No N/A

★

$$\%D = \frac{\text{Percent Difference } |I - S|}{I} \times 100$$

where:
I = analyte concentration before dilution
S = analyte concentration after serial dilution

Comments:

**7. FIELD QC SAMPLES**

Were field QC samples (field/trip blanks, duplicates, splits, performance audit) identified? (Yes) No N/A

Are field/trip blank results 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)

Are performance audit sample results acceptable? ..... Yes No (N/A)

Comments: Samples 20BR17 and 20BR18 were identified as field duplicates for metals. All RPDs were <20%.

## LATA INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

### 8. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required? . . . . . (Yes) No N/A

Are all duplicate injection %RSD values acceptable? . . . . . (Yes) No N/A

Were analytical spikes performed as required? . . . . . (Yes) No N/A

Are all analytical spike recoveries acceptable? . . . . . Yes (No) N/A

Was MSA performed as required? . . . . . (Yes) No N/A

Are all MSA results acceptable? . . . . . (Yes) No N/A

Comments: Se) Samples BOBNP7, NP8, NP3, NP4, ~~NP5~~ Spike all had analytical spikes recoveries <85%. Sample absorbance is <50% of spike absorbance. Qualify J/UJ.

Selenium analytical spikes for samples BOBNM5, ~~NM6~~ NM1, NM2, RL7, RL8 also had recoveries <85%. Since the sample absorbance for these samples was >50% of spike, MSA was performed. All correlation coefficients were acceptable (>0.995).

Bismuth results for BOBNP0 was qualified UJ. for an analytical spike recovery <85%.

## LATA INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

### 9. 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

★

Inorganics Analysis Results Calculation, water sample

Concentration (µg/L) = CONCW × DFW

where:

CONCW = concentration off calibration curve (µg/L)

DFW = dilution factor (if any)

★

Inorganics Analysis Results Calculation, soil sample

$$\text{Concentration (mg/Kg)} = \frac{\text{CONCS} \times \text{DFS} \times \text{VOL}}{\text{WS} \times \text{SS}}$$

where:

CONCS = concentration off calibration curve (mg/L)

DFS = dilution factor (if any)

VOL = volume of final extract (ml)

WS = weight of sample (g)

SS = dry weight conversion factor [(100 - %moisture) × 100]

Do results meet the CRDLs? . . . . . (Yes) No N/A

Comments: See attached excel spreadsheet. -

# LATA INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

## VALIDATION SUMMARY

**MAJOR DEFICIENCIES:**

Cyanide was qualified UR for samples BOBNP7 and BOBNP3 for exceeding the maximum hold times by > 2 times

9-15-94 (WJC)

**MINOR DEFICIENCIES:** Samples BOBNM5, ~~NP6~~, RE4, NA9 qualified estimated for missed hold times for CN.

Iron was qualified U for positive prep blank contamination for samples BOBNP1 and BOBNP2

- Potassium was qualified U for positive blank contamination for BOBRE
- Selenium was qualified U for positive blank contamination for samples BOBNP7, NP3, NP4, NM5 and NM6
- Iron was qualified as estimated (J, BJ) 10/19/94 for duplicate RPDs > 20% for samples BOBNM5, NM6, NP3, NP4, NP7 and NP8.

Cyanide results for samples BOBNA9 and BOBNM5 were qualified as estimated for LCS recoveries outside 80-120%.

Selenium and bismuth were qualified estimated for low analytical spike recoveries for samples BOBNP0 (UJ Bi), Se BOBNP7 (J), NP8 (UJ), NP3 (J) and NP4 (J)

**COMMENTS:**

Several sample result forms were marked by the lab with an asterisk for duplicate RPD for iron. Examination of the prep and run logs revealed the the application of these qualifiers was erroneous for some samples. In these cases, the lab qualifiers have been crossed-out.

# HOLDING TIME SUMMARY

| SDG: W0038-ITC-047 | VALIDATOR: SMITH/COWAN | DATE: 9-14-94 | PAGE 1 OF 4 |
|---|---|---|---|
| COMMENTS: INORGANIC ANALYSES | | | |

| | FIELD SAMPLE ID | ANALYSIS TYPE | DATE SAMPLED | DATE PREPARED | DATE ANALYZED | PREP. HOLDING TIME, DAYS | ANALYSIS HOLDING TIME, DAYS | QUALIFIER | |
|---|---|---|---|---|---|---|---|---|---|
| ✓ | BOBNP7 | CLP/ICP | 4-21-94 | | between 5-6-94 & 6-2-94 | | 180 | NONE | |
| | | CLP/GFAA Bi, SE | " | | " | | 180 | ↓ | |
| | | CLP/CN | " | | 6-7-94 | 47 > 2X | ~~28~~ 14 | ~~UJ~~ UR | UR |
| X | BOBNP8 | CLP/ICP | 4-21-94 | | between 5-6-94 & 6-2-94 | | 180 | NONE | (use) 9-14-94 |
| | | CLP/GFAA Bi, SE | " | | " | | 180 | ↓ | |
| | | CLP/CN | N/A | | N/A | | ~~28~~ 14 | N/A | |
| ✓ | BOBNP3 | CLP/ICP | 4-21-94 | | between 5-6-94 & 6-2-94 | ~~47~~ | 180 | NONE | |
| | | CLP/GFAA Bi, SE | " | | " | | 180 | ↓ | |
| | | CLP/CN | " | | 6-7-94 | 47 > 2X | ~~28~~ 14 | ~~UJ~~ UR | UR |
| X | BOBNP4 | CLP/ICP | 4-21-94 | | between 5-6-94 & 6-2-94 | | 180 | NONE | |
| | | CLP/GFAA Bi, SE | " | | " | | 180 | ↓ | |
| | | CLP/CN | N/A | | N/A | | ~~28~~ 14 | N/A | |
| ✓ | BOBNP5 | CLP/ICP | 4-21-94 | | between 5-6-94 & 6-2-94 | | 180 | NONE | |
| | | CLP/GFAA Bi, Se | " | | " | | 180 | ↓ | |
| | | CLP/CN | " | | 6-7-94 | 47 > 2X | ~~28~~ 14 | J | J- |
| | | | | | | | | | |
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# HOLDING TIME SUMMARY

| SDG: W0038-ITC-047 | VALIDATOR: SMITH/COWAN | DATE: 9-14-94 | PAGE 1 OF 4 |
|---|---|---|---|

COMMENTS: INORGANIC ANALYSES

| | FIELD SAMPLE ID | ANALYSIS TYPE | DATE SAMPLED | DATE PREPARED | DATE ANALYZED | PREP. HOLDING TIME, DAYS | ANALYSIS HOLDING TIME, DAYS | QUALIFIER |
|---|---|---|---|---|---|---|---|---|
| X | B0B3N16 | CLP/ICP | 4-11-94 | | between 5-6-94 & 6-2-94 | | 180 | None |
| | | CLP/GFAA Bi, SE | " | | " | | 180 | ↓ |
| | | CLP/CN | N/A | | N/A | | ~~28~~ 14 | N/A |
| ✓ | B0B3N11 | CLP/ICP | 4-15-94 | | between 5-6-94 & 6-2-94 | | 180 | None |
| | | CLP/GFAA Bi, SE | " | | " | | 180 | ↓ |
| | | CLP/CN | " | | 5-3-94 | | ~~28~~ 14 | ↓ |
| X | B0B3N12 | CLP/ICP | 4-13-94 | | between 5-6-94 & 6-2-94 | | 180 | None |
| | | CLP/GFAA Bi, SE | " | | " | | 180 | ↓ |
| | | CLP/CN | N/A | | N/A | | ~~28~~ 14 | N/A |
| ✓ | B0B3R17 | CLP/ICP | 4-15-94 | | between 5-6-94 & 6-2-94 | | 180 | None |
| | | CLP/GFAA Bi, SE | " | | " | | 180 | ↓ |
| | | CLP/CN | " | | 5-3-94 | | ~~28~~ 14 | ↓ |
| X | B0B3R18 | CLP/ICP | 4-15-94 | | between 5-6-94 & 6-2-94 | | 180 | None |
| | | CLP/GFAA Bi, SE | " | | " | | 180 | ↓ |
| | | CLP/CN | N/A | | N/A | | ~~28~~ 14 | N/A |
| | | | | | | | | |
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# HOLDING TIME SUMMARY

| SDG: 160038-ITC-647 | VALIDATOR: SMITH/COWAN | DATE: 9-14-94 | PAGE 3 OF 4 |
|---|---|---|---|

COMMENTS: INORGANIC ANALYSES

| FIELD SAMPLE ID | ANALYSIS TYPE | DATE SAMPLED | DATE PREPARED | DATE ANALYZED | PREP. HOLDING TIME, DAYS | ANALYSIS HOLDING TIME, DAYS | QUALIFIER |
|---|---|---|---|---|---|---|---|
| ✓ BOBNP5 | CLP/ICP | 4-12-94 | | between 5-6-94 & 6-2-94 | | 180 | NONE |
| | CLP/GFAA Bi, SE | " | | " | | 180 | ↓ |
| | CLP/CN | " | | ~~5-11-94~~ | 5-3-94 (WJC) | ~~28~~ 14 | ↓ |
| X BOBNP6 | CLP/ICP | 4-12-94 | | between 5-6-94 & 6-2-94 | | 180 | NONE |
| | CLP/GFAA Bi, SE | " | | " | | 180 | 9-15-94 (WJC) |
| | CLP/CN | " | | ~~5-11-94~~ | 19 7 | ~~28~~ 14 | ~~UJ~~ UJ |
| ✓ BOBRL3 | CLP/ICP | 4-11-94 | | between 5-6-94 & 6-2-94 | | 180 | NONE |
| | CLP/GFAA Bi, SE | " | | " | | 180 | ↓ |
| | CLP/CN | " | | ~~5-11-94~~ | 5-3-94 (WJC) | ~~28~~ 14 | ↓ |
| X BOBRL4 | CLP/ICP | 4-12-94 | | between 5-6-94 & 6-2-94 | | 180 | NONE |
| | CLP/GFAA Bi, SE | " | | " | | 180 | ↓ |
| | CLP/CN | " | | ~~5-11-94~~ | 19 7 | ~~28~~ 14 | ~~UJ~~ UJ |
| ✓ BOBNP1 | CLP/ICP | 4-15-94 | | between 5-6-94 & 6-2-94 | | 180 | NONE |
| | CLP/GFAA Bi, Se | " | | " | | 180 | ↓ |
| | CLP/CN | " | | 4-27-94 | | ~~28~~ 17 | ↓ |
| | | | | | | | |
| | | | | | | | |

9-15-94 (WJC) UJ

9-13-94 UJ

# HOLDING TIME SUMMARY

| SDG: MC038-ITC-047 | VALIDATOR: SMITH/COWAN | DATE: 9-14-94 | PAGE 4 OF 4 |
|---|---|---|---|

COMMENTS: INORGANIC ANALYSES

| | FIELD SAMPLE ID | ANALYSIS TYPE | DATE SAMPLED | DATE PREPARED | DATE ANALYZED | PREP. HOLDING TIME, DAYS | ANALYSIS HOLDING TIME, DAYS | QUALIFIER |
|---|---|---|---|---|---|---|---|---|
| X | BOBNP2 | CLP/ICP | 4-15-94 | | between 5-6-94 and 6-2-94 | | 180 | NONE |
| | | CLP/GFAA Bi, SE | " | | " | | 180 | ↓ |
| | | CLP/CN | N/A | | N/A | | ~~28~~ 14 | N/A |
| J | BOBNJ9 | CLP/ICP | 4-19-94 | | between 5-6-94 & 6-2-94 | | 180 | NONE |
| | | CLP/GFAA Bi, SE | " | | " | | 180 | ↓ |
| | | CLP/CN | " | | 5-4-94 | | ~~28~~ 14 | ↓ J J |
| X | BOBNP0 | CLP/ICP | 4-19-94 | | between 5-6-94 & 6-2-94 | | 180 | NONE |
| | | CLP/GFAA Bi, SE | " | | " | | 180 | ↓ |
| | | CLP/CN | N/A | | N/A | | ~~28~~ 14 | N/A |
| J | BOBNM7 | CLP/ICP | 4-20-94 | | between 5-6-94 & 6-2-94 | | 180 | NONE |
| | | CLP/GFAA Bi, SE | " | | " | | 180 | ↓ |
| | | CLP/CN | " | | 5-4-94 | | ~~28~~ 14 | ↓ |
| X | BOBNM8 | CLP/ICP | 4-20-94 | | between 5-6-94 & 6-2-94 | | 180 | NONE |
| | | CLP/GFAA Bi, SE | " | | " | | 180 | ↓ |
| | | CLP/CN | N/A | | N/A | | ~~28~~ 14 | N/A |
| | | | | | | | | |
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ACCURACY DATA SUMMARY

| SDG: W0038-ITC-047 | VALIDATOR: D. J. SMITH | DATE: 9/13/94 | PAGE__OF__ |
|---|---|---|---|
| COMMENTS: INORGANIC ANALYSES | | | |

| FIELD SAMPLE ID | COMPOUND | % RECOVERY | SAMPLE(S) AFFECTED | QUALIFIER |
|---|---|---|---|---|
| LCS (5/4/94) | CYANIDE | 123.0 % | BOBLN9 | J |
| LCS (5/10/94) | CYANIDE | 131.5% | BOBNM5 | J |
| BOBNP7 | Selenium (Analytical Spk) | 78.2% | SAME | J |
| BOBNP8 | | 82.9 % | | UJ |
| BOBNP3 | | 72.4 % | | J |
| BOBNP4 | | 71.4 % | | J |
| BOBNP0 | Bismuth (A.S) | 68.8 % | BOBNP0 | UJ |
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PNO-DVF-014, R1

BLANK AND SAMPLE DATA SUMMARY

| SDG: W0038-ITC-047 | VALIDATOR: D.J. SMITH | DATE: 9/13/94 | PAGE__OF__ |
|---|---|---|---|

COMMENTS: INORGANIC ANALYSES

| FIELD SAMPLE ID | COMPOUND | RESULT | Q | RT | UNITS | 5X RESULT | 10X RESULT | SAMPLES AFFECTED | QUALIFIER |
|---|---|---|---|---|---|---|---|---|---|
| PB | ~~Aluminum~~ Fe | 20.66 | B | — | ug/L | 103 | — | BOBNP1, NP2 | U |
| ~~PB2~~ CCB2 | K | 1484 | B | — | ug/L | 7420 | — | BOBRL7 | U |
| ~~CCB1~~ | ~~K~~ | ~~1752~~ | ~~B~~ | ~~—~~ | ~~ug/L~~ | ~~8760~~ | ~~—~~ | | ~~U~~ |
| CCB1 (5/13/94) | Se | 2.2 | B | — | ug/L | 11.0 | — | BOBNP7, ~~NP8~~ NP3, NP4, NM5, NM6 | U |
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PNO-DVF-014, R1

000103

PRECISION DATA SUMMARY

| SDG: W0038-ITC-047 | VALIDATOR: D. J. SMITH | | DATE: 9/13/94 | | PAGE__OF__ |
|---|---|---|---|---|---|
| COMMENTS: INORGANIC ANALYSES | | | | | |
| COMPOUND | SAMPLE ID: | SAMPLE ID: | RPD | SAMPLES AFFECTED | QUALIFIER |
| IRON | BOBNP7 | BOBNP7D | 49.4 | BOBNM5 | J/BJ |
| | | | | BOBNM6 | 9-24-94 DJS |
| | | | | BOBNP3 | |
| | | | | BOBNP4 | |
| | | | | BOBNP7 | |
| | | | | BOBNP8 | |
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U.S. EPA - CLP

3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___ W0038

Lab Code: ITSTU_ Case No.: WO388 SAS No.: _____ SDG No.: ~~W0027~~ JDF 9/7/94

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_ PB AFBW05D3A (AA8093) PBW05D3A (AA8096)

| Analyte | Initial Calib. Blank (ug/L) | C | Continuing Calibration Blank (ug/L) 1 | C | 2 | C | 3 | C | Prepa-ration Blank | C | M |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 40.0 | U | 40.0 | U | 40.0 | U | 40.0 | U | 40.000 | U | P |
| Calcium | 20.0 | U | 20.0 | U | 20.0 | U | 20.0 | U | 59.290 | B | P |
| Iron | 10.0 | U | 10.0 | U | 10.0 | U | 10.0 | U | 20.660 | B | P |
| Magnesium | -79.0 | B | -35.5 | B | -50.0 | B | -40.3 | B | -64.490 | B | P |
| Manganese | 2.0 | U | 2.6 | B | 2.0 | U | 2.0 | U | 2.000 | U | P |
| Potassium | -1067.4 | B | -1103.4 | B | 1000.0 | U | -1170.0 | B | 1000.000 | U | P |
| Selenium | 2.0 | U | 2.0 | U | 2.0 | U | 2.0 | U | 2.000 | U | F |
| Sodium | 100.0 | U | 100.0 | U | 100.0 | U | 100.0 | U | 264.120 | B | P |
| Silicon | 30.0 | U | 30.0 | U | 30.0 | U | 30.0 | U | 48.200 | B | P |
| Bismuth | 10.0 | U | 10.0 | U | 10.0 | U | 10.0 | U | 10.000 | U | F |
| Cyanide | 10.0 | U | 10.0 | U | | | | | 10.000 | U | AS |

FORM III - IN 9/14/94 ILM02.1

U.S. EPA - CLP

3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___

Lab Code: ITSTU_ Case No.: WO455 SAS No.: _____ SDG No.: W0038_

Preparation Blank Matrix (soil/water): WATER AS- PB

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_ ICP-PBW0512A-AA859
GFAA-APBW0512A-AA859

| Analyte | Initial Calib. Blank (ug/L) | C | Continuing Calibration Blank (ug/L) 1 | C | 2 | C | 3 | C | Prepa-ration Blank | C | M |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 40.0 | U | 40.0 | U | 40.0 | U | 40.0 | U | 40.000 | U | P |
| Calcium | 20.0 | U | 20.0 | U | 20.0 | U | 20.0 | U | 61.990 | B | P |
| Iron | 10.0 | U | 10.0 | U | 10.0 | U | 10.0 | U | 10.000 | U | P |
| Magnesium | 30.0 | U | 30.0 | U | 37.0 | B | 30.0 | U | 30.000 | U | P |
| Manganese | 2.0 | U | 2.0 | U | 2.0 | U | 2.0 | U | 2.000 | U | P |
| Potassium | 1000.0 | U | 1000.0 | U | 1483.5 | B | 1000.0 | U | 1000.000 | U | P |
| Selenium | 2.0 | U | 2.0 | U | 2.0 | U | 2.0 | U | 2.000 | U | F |
| Sodium | 100.0 | U | 100.0 | U | 100.0 | U | 100.0 | U | 100.000 | U | P |
| Bismuth | 10.0 | U | 10.0 | U | 10.0 | U | 10.0 | U | 10.000 | U | F |
| Silicon | 30.0 | U | 30.0 | U | 30.0 | U | 30.0 | U | 76.830 | B | P |
| Cyanide | 10.0 | U | 10.0 | U | | | | | 10.000 | U | AS |

U.S. EPA - CLP

3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___

Lab Code: ITSTU_ Case No.: WO428 SAS No.: _____ SDG No.: W0038_

Preparation Blank Matrix (soil/water): WATER AS - PB

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_ ICP - PBW0526A - AA9788
GFAA - APBW0510B - AA8376

| Analyte | Initial Calib. Blank (ug/L) | C | Continuing Calibration Blank (ug/L) 1 | C | 2 | C | 3 | C | Prep. Blank | C | M |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 40.0 | U | 40.0 | U | 40.0 | U | 40.0 | U | 0.400 | U | P |
| Calcium | 20.0 | U | 20.0 | U | 20.0 | U | 20.0 | U | 0.377 | B | P |
| Iron | 10.0 | U | 10.0 | U | 10.0 | U | 10.0 | U | 0.100 | U | P |
| Magnesium | 30.0 | U | 30.0 | U | 30.0 | U | 30.0 | U | 0.300 | U | P |
| Manganese | 2.0 | U | 2.0 | U | 2.0 | U | 2.0 | U | 0.020 | U | P |
| Potassium | 1000.0 | U | 1000.0 | U | 1000.0 | U | 1000.0 | U | 10.000 | U | P |
| Selenium | 2.0 | U | 2.2 | B | 2.0 | U | 2.1 | B | 2.000 | U | F |
| Sodium | 100.0 | U | 100.0 | U | 100.0 | U | 100.0 | U | 1.000 | U | P |
| Bismuth | 10.0 | U | 10.0 | U | 10.0 | U | 10.0 | U | 10.000 | U | F |
| Silicon | 30.0 | U | 30.0 | U | 30.0 | U | 30.0 | U | 0.521 | B | P |
| Cyanide | 10.0 | U | 10.0 | U | 10.0 | U | | | 10.000 | U | AS |

FORM III - IN 9/4/94 ILM02.1

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

BOBNP7

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___

Lab Code: ITSTU_ Case No.: WO428 SAS No.: _____ SDG No.: W0038_

Matrix (soil/water): WATER Level (low/med): _LOW__

% Solids for Sample: __0.0 % Solids for Duplicate: ___0.0

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

| Analyte | Control Limit | Sample (S) | C | Duplicate (D) | C | RPD | Q | M |
|---|---|---|---|---|---|---|---|---|
| Aluminum | | 40.0000 | U | 43.2100 | B | 200.0 | | P |
| Calcium | | 27493.1300 | | 27359.6000 | | 0.5 | | P |
| Iron | 100.0 | 266.7500 | | 441.8600 | | 49.4 | * | P |
| Magnesium | 5000.0 | 8221.7900 | | 8150.3500 | | 0.9 | | P |
| Manganese | | 5.8600 | B | 7.2600 | B | 21.3 | | P |
| Potassium | 5000.0 | 4565.2000 | B | 5308.6700 | | 15.1 | | P |
| Selenium | | 3.0900 | B | 3.4200 | B | 10.1 | | F |
| Sodium | 5000.0 | 21943.7700 | | 21655.4500 | | 1.3 | | P |
| Bismuth | | 10.0000 | U | 10.0000 | U | | | F |
| Silicon | | 15275.4000 | | 15207.4100 | | 0.4 | | P |
| Cyanide | | | | | | | | NR |



3/14/94

U.S. EPA - CLP

7

LABORATORY CONTROL SAMPLE

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___ W0038

Lab Code: ITSTU_ Case No.: W0418 SAS No.: _____ SDG No.: ~~W0027~~ 10C 9/1/94

Solid LCS Source: _____

Aqueous LCS Source: SPEX_____

BOBLM7 – NO
BOBLM9

| Analyte | Aqueous (ug/L) True | Found | %R | Solid (mg/kg) True | Found | C | Limits | | %R |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | | | | | | | | | |
| Calcium | | | | | | | | | |
| Iron | | | | | | | | | |
| Magnesium | | | | | | | | | |
| Manganese | | | | | | | | | |
| Potassium | | | | | | | | | |
| Selenium | | | | | | | | | |
| Sodium | | | | | | | | | |
| Silicon | | | | | | | | | |
| Bismuth | | | | | | | | | |
| Cyanide | 200.0 | 246.00 | 123.0 | | | | | | |

GJS 9/14/94

FORM VII - IN

ILM02.1

U.S. EPA - CLP

7

LABORATORY CONTROL SAMPLE

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___ W0038

Lab Code: ITSTU_ Case No.: WO388 SAS No.: _____ SDG No.: ~~W0027~~ W0038 6/7/94

Solid LCS Source: _____

Aqueous LCS Source: SPEX_____

LCSW / ICV

| Analyte | Aqueous (ug/L) True | Found | %R | Solid (mg/kg) True | Found | C | Limits | | %R |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | | | | | | | | | |
| Calcium | | | | | | | | | |
| Iron | | | | | | | | | |
| Magnesium | | | | | | | | | |
| Manganese | | | | | | | | | |
| Potassium | | | | | | | | | |
| Selenium | | | | | | | | | |
| Sodium | | | | | | | | | |
| Silicon | | | | | | | | | |
| Bismuth | | | | | | | | | |
| Cyanide | 200.0 | 263.00 | 131.5 | | | | | | |

9/14/94

FORM VII - IN

ILM02.1

# FURNACE DATA SHEET

File: 2SE0512_ Element: SE__ Instrument: PEZ1_____

Start Run Date: 05/12/94 End Run Date: 05/13/94

Correlation Coefficient: __0.999506 Slope: __0.004369 Intercept: __0.001872

Concentration Units: Ug/L

| # | SAMPLE ID | Time | Dil Factor | Sample (Absorb) | Sample (Conc) | %R/R | Flag | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | S0 | 16:52 | 1.00 | -0.00538 | 0.0000 | | | | |
| 2 | S5 | 16:57 | 1.00 | 0.02762 | 5.0000 | | M | | |
| 3 | S10 | 17:02 | 1.00 | 0.04931 | 10.0000 | | | | |
| 4 | S20 | 17:08 | 1.00 | 0.08880 | 20.0000 | | | | |
| 5 | S40 | 17:13 | 1.00 | 0.17797 | 40.0000 | | | | |
| 6 | S80 | 17:19 | 1.00 | 0.35015 | 80.0000 | | | | |
| 7 | ICV | 17:25 | 1.00 | 0.12019 | 27.2800 | 109.1 | | | |
| 8 | ICB | 17:30 | 1.00 | 0.00872 | 1.9800 | | | | |
| 9 | CRA | 17:35 | 1.00 | 0.02482 | 5.6300 | 112.6 | | | |
| 10 | CRAA | 17:40 | 1.00 | 0.07448 | 16.9100 | 112.8 | | | |
| 11 | CCV1 | 17:45 | 1.00 | 0.17417 | 39.5400 | 98.9 | | | |
| 12 | CCB1 | 17:50 | 1.00 | 0.00952 | 2.1600 | | | | |
| 13 | APBW0510B R | 17:55 | 1.00 | 0.00947 | 2.1500 | | | | |
| 14 | APBW0510BA | 18:01 | 1.00 | 0.04083 | 9.2700 | 71.2 | * | ① Rec | |
| 15 | ALCSW0510B | 18:06 | 1.00 | 0.04237 | 9.6200 | 96.2 | | | |
| 16 | ALCSW0510BA | 18:11 | 1.00 | 0.08064 | 18.3100 | 86.9 | | | |
| 17 | AA7389 | 18:16 | 1.00 | 0.01362 | 3.0900 | | B | | |
| 18 | AA7389A | 18:22 | 1.00 | 0.04495 | 10.2000 | 71.1 | *W | | |
| 19 | AA7389D | 18:27 | 1.00 | 0.01507 | 3.4200 | | B | | |
| 20 | AA7389DA ~~R2S5 B~~ | 18:32 | 1.00 | 0.04952 | 11.2400 | 78.2 | *W | | |
| 21 | AA7389S | 18:38 | 1.00 | 0.04774 | 10.8400 | | | | |
| 22 | ZZZZZZ | 18:43 | 1.00 | 0.08479 | 19.2500 | | | | |
| 23 | CCV2 | 18:48 | 1.00 | 0.17899 | 40.6300 | 101.6 | | | |
| 24 | CCB2 | 18:53 | 1.00 | 0.00742 | 1.6800 | | | | |
| 25 | AA7396 | 18:58 | 1.00 | 0.01146 | 2.6000 | | B | | |
| 26 | AA7396A R2BAP3 | 19:04 | 1.00 | 0.04333 | 9.8400 | 72.4 | *W | | |
| 27 | AA7403 R | 19:09 | 1.00 | 0.05513 | 12.5200 | | | | |
| 28 | AA7403A | 19:14 | 1.00 | 0.08350 | 18.9600 | 64.4 | * | ① Rec | |
| 29 | AA7410 | 19:20 | 1.00 | 0.00545 | 1.2400 | | | | |
| 30 | AA7410A R2BAP4 | 19:25 | 1.00 | 0.03652 | 8.2900 | 82.9 | *W | | |
| 31 | AA7410D | 19:30 | 1.00 | 0.01480 | 3.3600 | | B | | |
| 32 | AA7410DA | 19:35 | 1.00 | 0.05212 | 11.8300 | 84.7 | W | | |
| 33 | AA7410S | 19:41 | 1.00 | 0.05124 | 11.6300 | | | | |
| 34 | ZZZZZZ | 19:46 | 1.00 | 0.08852 | 20.0900 | | | | |
| 35 | CCV3 | 19:51 | 1.00 | 0.17370 | 39.4300 | 98.6 | | | |
| 36 | CCB3 | 19:56 | 1.00 | 0.00942 | 2.1400 | | B | | |
| 37 | AA7411 R2BAP4 | 20:01 | 1.00 | 0.01272 | 2.8900 | | B | | |
| 38 | AA7411A | 20:06 | 1.00 | 0.04416 | 10.0300 | 71.4 | *W | | |
| 39 | AA7412 | 20:11 | 1.00 | 0.04554 | 10.3400 | | | | |
| 40 | AA7412A | 20:16 | 1.00 | 0.08343 | 18.9400 | 86.0 | | | |

Analyst: frouzan_____ QC Reviewer: _____

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9/15/94

FF 5/13/94

① analytical spk rec <85%

9613476.1269

A0000534

# FURNACE DATA SHEET

File: 5BI0524_ Element: BI__ Instrument: PEZ4_____

Start Run Date: 05/24/94 End Run Date: 05/25/94

Correlation Coefficient: __0.998058 Slope: __0.002186 Intercept: __0.004408

Concentration Units: Ug/L

| # | SAMPLE ID | Time | Dil Factor | Sample (Absorb) | Sample (Conc) | %R/R | Flag | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | S0 | 16:25 | 1.00 | 0.00183 | 0.0000 | | | | |
| 2 | S10 | 16:30 | 1.00 | 0.02276 | 10.0000 | | | | |
| 3 | S20 | 16:36 | 1.00 | 0.05125 | 20.0000 | | | | |
| 4 | S40 | 16:41 | 1.00 | 0.09710 | 40.0000 | | | | |
| 5 | S60 | 16:46 | 1.00 | 0.13823 | 60.0000 | | | | |
| 6 | S80 | 16:52 | 1.00 | 0.17428 | 80.0000 | | | | |
| 7 | ICV | 16:58 | 1.00 | 0.06034 | 26.6200 | 106.5 | | | |
| 8 | ICB | 17:03 | 1.00 | 0.00059 | 0.2600 | | | | |
| 9 | CRA | 17:09 | 1.00 | 0.02259 | 9.9600 | 99.6 | | | |
| 10 | CRAA | 17:14 | 1.00 | 0.07059 | 31.1400 | 105.9 | | | |
| 11 | CCV1 | 17:19 | 1.00 | 0.09458 | 41.7200 | 104.3 | | | |
| 12 | CCB1 | 17:24 | 1.00 | 0.00166 | 0.7300 | | | | |
| 13 | APBW0505BA | 17:30 | 1.00 | 0.00028 | 0.1200 | | | | |
| 14 | APBW0505BAA | 17:35 | 1.00 | 0.04362 | 19.2400 | 96.2 | | | |
| 15 | ALCSW0505BA | 17:41 | 1.00 | 0.04630 | 20.4300 | 102.2 | | | |
| 16 | ALCSW0505BAA | 17:46 | 1.00 | 0.08610 | 37.9800 | 87.8 | | | |
| 17 | AA7301 BOBNPC | 17:51 | 1.00 | -0.00086 | -0.3800 | | | | |
| 18 | AA7301A | 17:57 | 1.00 | 0.03121 | 13.7700 | 68.8 | * W | | |
| 19 | AA7302 | 18:02 | 1.00 | 0.00135 | 0.5900 | | | | |
| 20 | AA7302A | 18:08 | 1.00 | 0.04271 | 18.8400 | 94.2 | | | |
| 21 | AA7287 | 18:13 | 1.00 | 0.00017 | 0.0700 | | | | |
| 22 | AA7287A | 18:19 | 1.00 | 0.04457 | 19.6600 | 98.3 | | | |
| 23 | CCV2 | 18:24 | 1.00 | 0.09497 | 41.8900 | 104.7 | | | |
| 24 | CCB2 | 18:29 | 1.00 | -0.00066 | -0.2900 | | | | |
| 25 | AA7294 | 18:34 | 1.00 | -0.00103 | -0.4600 | | | | |
| 26 | AA7294A | 18:40 | 1.00 | 0.04767 | 21.0300 | 105.2 | | | |
| 27 | AA7904 | 18:45 | 1.00 | -0.00022 | -0.1000 | | | | |
| 28 | AA7904A | 18:51 | 1.00 | 0.04395 | 19.3800 | 96.9 | | | |
| 29 | AA7911 | 18:56 | 1.00 | 0.00130 | 0.5800 | | | | |
| 30 | AA7911A | 19:02 | 1.00 | 0.04542 | 20.0300 | 100.2 | | | |
| 31 | AA7912 | 19:07 | 1.00 | -0.00109 | -0.4800 | | | | |
| 32 | AA7912A | 19:13 | 1.00 | 0.03857 | 17.0100 | 85.0 | | | |
| 33 | AA7919 | 19:18 | 1.00 | -0.00189 | -0.8300 | | | | |
| 34 | AA7919A | 19:23 | 1.00 | 0.04407 | 19.4400 | 97.2 | | | |
| 35 | CCV3 | 19:29 | 1.00 | 0.09548 | 42.1200 | 105.3 | | | |
| 36 | CCB3 | 19:34 | 1.00 | 0.00058 | 0.2500 | | | | |
| 37 | AA7920 | 19:39 | 1.00 | -0.00038 | -0.1700 | | | | |
| 38 | AA7920A | 19:44 | 1.00 | 0.04252 | 18.7600 | 93.8 | | | |
| 39 | AA7927 | 19:50 | 1.00 | -0.00194 | -0.8600 | | | | |
| 40 | AA7927A | 19:55 | 1.00 | 0.04448 | 19.6200 | 98.1 | | | |

Analyst: frouzan_____ QC Reviewer: _____

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FF 5/25/94

COJ 9/15/94

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## LINEAR REGRESSION ANALYSIS

Analysis: Inorganic (metals/CN)
Constituent: Selenium
SDG: W0038-ITC-047

Calibration Date: 12-May-94

Date: 14-Sep-94
Validator: SMITH/COWAN

| Concentration | Absorbance |
|---|---|
| 0.0000 | -0.0014 |
| 5.0000 | 0.0170 |
| 10.0000 | 0.0323 |
| 20.0000 | 0.0645 |
| 40.0000 | 0.1175 |
| 80.0000 | 0.2198 |
| | |
| | |

| r | $r^2$ |
|---|---|
| 0.9987 | 0.9973 |
| slope | x intercept |
| 364.6609 | -1.4895 |
| 1/slope | y intercept |
| 0.0027 | 0.0043 |

## LINEAR REGRESSION ANALYSIS

Analysis: Inorganic (metals/CN)
Constituent: CN
SDG: W0038-ITC-047

Calibration Date: 25-May-94

Date: 14-Sep-94
Validator: SMITH/COWAN

| Concentration | Absorbance |
|---|---|
| 0.50 | 0.226 |
| 0.40 | 0.186 |
| 0.20 | 0.096 |
| 0.10 | 0.049 |
| 0.05 | 0.024 |
| | |
| | |
| | |

| r | $r^2$ |
|---|---|
| 0.9996 | 0.9991 |
| slope | x intercept |
| 2.2224 | -0.0078 |
| 1/slope | y intercept |
| 0.4500 | 0.0036 |

## PERCENT RECOVERY (ICV/CCV)

Analysis: Inorganic (metals/CN) Date: 14-Sep-94
SDG: W0038-ITC-047 Validator: SMITH/COWAN

| Constituent | Observed Value | True Value | %R |
|---|---|---|---|
| | O | A | |
| Aluminum | 41033 | 40000 | 102.6% |
| Selenium | 39.54 | 40 | 98.9% |
| Cyanide | 194 | 200 | 97.0% |

## MATRIX SPIKE RECOVERY (MS)

Analysis: Inorganic (metals/CN)
SDG: W0038-ITC-047
Sample ID: See Below

Date: 14-Sep-94
Validator: SMITH/COWAN

| Constituent | Spike Sample SSR | Sample Result SR | Spike Added SA | %R |
|---|---|---|---|---|
| Cyanide (Blank Spike) | 190.00 | 10.00 | 200.00 | 90.0% |
| Aluminum (B0BNP7) | 1939.43 | 0.40 | 2000.00 | 97.0% |
| Selenium (B0BNP8) | 11.63 | 2.00 | 10.00 | 96.3% |

## PERCENT RECOVERY (LCS)

Analysis: Inorganic (metals/CN)
SDG: W0038-ITC-047

Date: 14-Sep-94
Validator: SMITH/COWAN

| Constituent | Observed value | True value | %R |
|---|---|---|---|
| | OLCS | ALCS | |
| Aluminum | 1920.85 | 2000.00 | 96.0% |
| Selenium | 9.62 | 10.00 | 96.2% |
| Cyanide | 199.00 | 200.00 | 99.5% |

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## RELATIVE PERCENT DIFFERENCE

Analysis: Inorganic (metals/CN)
SDG: W0038-ITC-047
Sample ID: See Below

Date: 14-Sep-94
Validator: SMITH/COWAN

| Constituent | Original (Sample) concentration | Duplicate concentration | RPD |
|---|---|---|---|
| | OS | D | |
| Cyanide (Blank Spike) | 190.00 | 196.00 | 3.1% |
| Aluminum (B0BNP7) | 40.00 | 43.21 | 7.7% |
| Selenium (B0BNP7) | 3.09 | 3.42 | 10.1% |

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## PERCENT DIFFERENCE (ICP SERIAL DILUTION)

Analysis: ICP
SDG: W0038-ITC-047
Sample ID: B0BNP7

Date: 14-Sep-94
Validator: SMITH/COWAN

| Constituent | Analyte Concentration before Dilution | Analyte Concentration after Serial Dilution | %D |
|---|---|---|---|
| | I | S | |
| Calcium | 27493 | 27603 | 0.4% |

## INORGANICS RESULTS CALCULATION, WATER

Analysis: Inorganic (metals/CN)
SDG: W0038-ITC-047
Sample ID: B0BMN9

Date: 14-Sep-94
Validator: SMITH/COWAN

| Constituent | Concentration from curve | Dilution Factor | Concentration (µg/L) |
|---|---|---|---|
| | CONCW | DFW | |
| Bismuth | 0.070 | 1 | 0.070 |
| CN | 0.088 | 1 | 0.088 |

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# LATA GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

| VALIDATION LEVEL: | A | B | C | (D) | E |
|---|---|---|---|---|---|
| PROJECT: 200-BP-5 | | | SDG: W0038-ITC-047 | | |
| VALIDATOR: D.E. Stroup | | LATA NO: VW401 2.81 | | DATE: 9-14-94 | |
| SAF NO.: 94-130 | | LAB: ITC | | CASE: | |
| QAPP REFERENCE: | | | SAP REFERENCE: | | |

If there is no QAPP or SAP reference, contact the WHC Technical Representative.
If the document(s) are not provided, default to the Method acceptance criteria.

## ANALYSES PERFORMED

| | | | | | |
|---|---|---|---|---|---|
| ☒ Alkalinity 310.1 | ☐ Chloride 325.3 | ☐ pH 9040/150.1 | ☐ TOC 9060/415.1 | ☒ TDS 160.1 ☐ TSS 160.2 | ☐ |
| ☒ Anions 300.0 | ☐ Chromium+6 7196 | ☐ Phenols 9065/420.1 | ☐ TOX 9020/9022 | ☒ Sulfate 375.4 | ☐ |
| ☐ Ammonia 350.3 | ☐ COD 410.1 | ☐ Phosphorus 365.2 | ☐ TKN 351.3 | ☐ Sulfide 9030/376.1 | ☐ |
| ☐ BOD 405.1 | ☒ Nitrate+Nitrite 353.2 | ☐ Oil & Grease 413.1 | ☐ TPH 9070/418.1 | ☐ | ☐ |

SAMPLES/MATRIX B0BNP5, B0BRL3, B0BRL7, B0BNN1, B0BNP7, B0BNP3, B0BNM5, B0BNM7, B0BNP1, B0BNN9, Water

## 1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments: _____

## 2. HOLDING TIMES *(see HOLDING TIME SUMMARY form)*

Are sample holding times acceptable? . . . . . Yes (No) N/A

Comments: The $NO_2$ & $PO_4$ IC Anions exceeded the required holding time for a liquid sample. B0BNH7, B0BNP1, & B0BNN9 have only Fluoride & Sulfate reported for the IC Anions Analysis. $PO_4^{=}$, $Cl^-$, $NO_2^-$ (IC) reported by MW 9-16-94 JM 9/15/94



Peer Review MW 9-15-94

## LATA GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

**3. INSTRUMENT CALIBRATION** *(see CALIBRATION DATA SUMMARY form)*

Was initial calibration performed for all applicable analyses? . . . . . (Yes) No N/A

Are initial calibration results acceptable? . . . . . (Yes) No N/A

Was a calibration check performed for all applicable analyses? . . . . . (Yes) No N/A

Are calibration check results acceptable? . . . . . (Yes) No N/A

★ For methods requiring a calibration curve (three standards and a blank) use the following equation for correlation coefficient (r).

Correlation Coefficient (r)

$$r = \frac{N \sum x_i y_i - \sum x_i \sum y_i}{[N \sum x_i^2 - (\sum x_i)^2]^{1/2} \; [N \sum y_i^2 - (\sum y_i)^2]^{1/2}}$$

★ For methods requiring ICV/CCV or a calibration check standard, calculate recovery as follows:

Recovery

$$\%R = \frac{\text{observed value}}{\text{true value}} \times 100$$

Comments: Sulfate and NO3NO2 calibrations yield correlation coefficients > 0.995. IC Anions calibration fit to a coefficients of least squares fit to a quadratic equation - unable to check. The %Ds for IC Anions are less than 10%.

Linearity ($R^2$) checked for IC MW 9-16-94 (used calculator $R^2 > .995$ and acceptable)

9/15/94

## LATA GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

**4. BLANKS** *(see BLANK AND SAMPLE DATA SUMMARY form)*

Were laboratory blanks analyzed? ..... (Yes) No N/A

Are laboratory blank results acceptable? ..... (Yes) No N/A

Comments: All non detects.

**5. ACCURACY** *(see ACCURACY DATA SUMMARY form)*

Were spike samples analyzed at the required frequency? ..... (Yes) No N/A

Are all spike recoveries acceptable? ..... (Yes) No N/A

★

$$\%R = \frac{\text{Spike Recovery: SSR - SR}}{SA} \times 100$$

where:
SSR = spiked sample result
SR = sample result
SA = spike added

Were LCS analyses performed at the required frequency? ..... (Yes) No N/A

Are all LCS recoveries acceptable? ..... (Yes) No N/A

★

$$\%R = \frac{\text{Recovery: observed value}}{\text{true value}} \times 100$$

Comments:

## LATA GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

**6. PRECISION** *(see PRECISION DATA SUMMARY form)*

Were laboratory duplicate samples analyzed at the required frequency? . . . . . (Yes) No N/A

Are all duplicate RPD values acceptable? . . . . . (Yes) No N/A

★

$$\text{RPD} = \frac{|OS - D|}{\left(\frac{OS + D}{2}\right)} \times 100$$

Relative Percent Difference

where:
OS = sample concentration (original sample/MS)
D = duplicate concentration (duplicate sample/MSD)

Comments:

**7. FIELD QC SAMPLES**

Were field QC samples (field/trip blanks, duplicates, splits, performance audit) identified? (Yes) No N/A

Are field/trip blank results 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

Are performance audit sample results acceptable? . . . . . Yes No N/A

Comments: BOBRL8 is field duplicate of BOBRL7. No Wet or GenChem analysis was done for BOBRL8 and no checks could be completed.

## LATA GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

### 8. ANALYTE QUANTITATION

Was analyte quantitation performed properly? ..... (Yes) No N/A

Are results calculated properly? ..... (Yes) No N/A

★ For methods with calibration curves:

General Chemistry Results Calculation, water sample

Concentration (µg/L) = CONCW × DfW

where:

CONCW = concentration off calibration curve (µg/L)

DfW = dilution factor (if any)

or

General Chemistry Results Calculation, soil sample

$$\text{Concentration (mg/Kg)} = \frac{(\text{CONCS} \times \text{DfS} \times \text{VOL})}{(\text{WS} \times \text{SS})}$$

where:

CONCS = concentration off calibration curve (mg/L)

VOL = volume of final extract (ml)

WS = weight of sample (g)

DfS = dilution factor (if any)

SS = dry weight conversion [(100 - %moisture) × 100 ]

★ For all other results calculations, see the analytical method.

Comments: _____

### 9. REPORTED RESULTS AND DETECTION LIMITS

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

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

Do results meet the CRDLs? ..... Yes No (N/A)

Comments: Only Fluoride & Sulfate are reported for IC Anions samples BOBNH7, BOBNP1, & BOBNN9 analyses. Analysis included all ions requested ($F^-$, $Cl^-$, $SO_4^=$, $PO_4^=$, $NO_2^-$) $Cl^-$, $PO_4^=$, $NO_2^-$ added to Form I by MW 9-16-94.

MW 9/15/94

## LATA GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

### VALIDATION SUMMARY

**MAJOR DEFICIENCIES:** IC Anions $NO_2$ & $PO_4$ qualified UR for exceeding the holding time requirement by more than 2x 2 days.

Nitrate's Phosphate for all samples were qualified as unusable due to exceeding the holding time MJS 9-16-94

**MINOR DEFICIENCIES:** None

**COMMENTS:** Fluoride & Sulfate only reported for IC Anions samples BOBXH7, BOBNP1, & BOBNN9.

Nitrate, Chloride & Phosphate were analyzed by the laboratory, but did not get reported on the Form 1s. Form 1's were edited to include data. Nitrate's Phosphate exceeded the holding Time >2 Times & were qualified as UR

SJM 9/15/94

CALCULATION SUMMARY

| SDG: W0038-MC-047 | VALIDATOR: Stroup | DATE: 9-14-94 | PAGE 1 OF __ |
|---|---|---|---|

COMMENTS: INORGANIC ANALYSES

Sulfate:

| Cal - Std | NTO |
|---|---|
| 1 | 0.14 |
| 5 | 1.3 |
| 10 | 22 |
| 20 | 68 |
| 40 | 130 |
| 80 | 270 |
| 100 | 355 |

Range 5 - 100 mg/l
Using statistical function of a hand calculator r = 0.999

Range 1 - 20 mg/l

| | | |
|---|---|---|
| 1 | 0.14 | r = 0.978 |
| 5 | 1.3 | Range is linear from |
| 10 | 22 | 5 to 20 mg/l |
| 20 | 68 | |

NO3 NO2:

| Cal - Known | Determined | |
|---|---|---|
| 2.0 | 2.025 | r = 0.999 |
| 1.0 | 0.956 | |
| 0.4 | 0.392 | |
| 0.1 | 0.098 | |
| 0.04 | 0.046 | |
| 0.02 | 0.028 | |
| 0 | 0.009 | |

Duplicates:

TDS 382 & 360 $\frac{382-360}{(382+360)/2} = 0.059 \times 100 = 5.9$

Alk2 108 & 110 $\frac{108-110}{(108+110)/2} = 0.018 \times 100 = 1.8$

LCS:

Fluoride - spike 2 mg/l 2.1 Recovered $\frac{2.1}{2.0} = 1.05 \times 100 = 105\%$

Sulfate - spike 15 " 15 " $\frac{15}{15} = 1 \times 100 = 100\%$

CALCULATION SUMMARY

| SDG: W0038-ITC-097 | VALIDATOR: Stroup | DATE: 9-14-94 | PAGE 2 OF __ |
|---|---|---|---|

COMMENTS: INORGANIC ANALYSES

MS/MSD:

Fluoride Spike 2.0 Org. Sam 0.82 Rec 2.5

$\frac{2.5 - 0.82}{2.0} = 0.84 \times 100 = 84\%$ as reported.

Chloride spike 15 Org. Sam 9.0 Rec 26

$\frac{26 - 9.0}{15} = 1.13 \times 100 = 1.13\%$ as reported

Results:

IC Anions - results from the raw data are in ppm and reported in mg/L which directly translates. Checked from raw data to reported results and all are as reported.

TDS: Conc. = Rec. Wt. x 1000/Sam. Wt

74.1254 - 74.1063 (tare) = 0.0191 g x 1000 = 19.1 mg

19.1 x 1000/50ml = 382 mg/L as reported.

Remaining analyses are reported direct from the worksheets. Milliliter of titrant x conversion factor = result.

HOLDING TIME SUMMARY

| SDG: W0038-ITC-047 | VALIDATOR: Stroup | DATE: 9-14-94 | PAGE 1 OF 3 |
|---|---|---|---|

COMMENTS: GENERAL CHEMISTRY ANALYSES

| FIELD SAMPLE ID | ANALYSIS TYPE | DATE SAMPLED | DATE PREPARED | DATE ANALYZED | PREP. HOLDING TIME, DAYS | ANALYSIS HOLDING TIME, DAYS | QUALIFIER |
|---|---|---|---|---|---|---|---|
| BOBNP5 | TDS | 4-22-94 | | 4-29-94 | | 7 | None |
| BOBRL3 | | 4-22-94 | | 4-29-94 | | 7 | |
| BOBRL7 | | 4-25-94 | | 5-2-94 | | 7 | |
| BOBNN1 | | 4-25-94 | | 5-2-94 | | 7 | |
| BOBNP7 | | 4-21-94 | | 4-27-94 | | 6 | |
| BOBNP3 | | 4-21-94 | | 4-27-94 | | 6 | |
| BOBNH5 | | 4-21-94 | | 4-27-94 | | 6 | |
| BOBNP1 | | 4-15-94 | | 4-21-94 | | 6 | |
| BOBNN9 | | 4-19-94 | | 4-25-94 | | 6 | |
| BOBNH7 | | 4-20-94 | | 4-25-94 | | 5 | |
| BOBRL3 | Alkalinity | 4-22-94 | | 5-2-94 | | 10 | None |
| BOBNP3 | | 4-21-94 | | 5-2-94 | | 11 | |
| BOBRL7 | | 4-25-94 | | 5-2-94 | | 7 | |
| BOBNN1 | | 4-25-94 | | 5-2-94 | | 7 | |
| BOBNH5 | | 4-21-94 | | 5-2-94 | | 11 | |
| BOBNP5 | | 4-22-94 | | 5-2-94 | | 10 | |
| BOBNP7 | | 4-21-94 | | 5-2-94 | | 11 | |

HOLDING TIME SUMMARY

| SDG: W0038-ITC-047 | VALIDATOR: Stroup | DATE: 9-14-94 | PAGE 2 OF 3 |
|---|---|---|---|

COMMENTS: GENERAL CHEMISTRY ANALYSES

| FIELD SAMPLE ID | ANALYSIS TYPE | DATE SAMPLED | DATE PREPARED | DATE ANALYZED | PREP. HOLDING TIME, DAYS | ANALYSIS HOLDING TIME, DAYS | QUALIFIER |
|---|---|---|---|---|---|---|---|
| BOBNN9 | Alkalinity | 4-15-94 | | 4-21-94 | | 6 | None |
| BOBNM7 | ↓ | 4-19-94 | | 4-25-94 | | 6 | ↓ |
| BOBNP1 | ↓ | 4-20-94 | | 4-25-94 | | 5 | ↓ |
| BOBRL3 | Sulfate | 4-25-94 | | 5-5-94 | | 10 | None |
| BOBNP5 | ↓ | 4-22-94 | | 5-5-94 | | 13 | ↓ |
| BOBNM5 | ↓ | 4-21-94 | | 5-2-94 | | 11 | ↓ |
| BOBNP3 | ↓ | 4-21-94 | | 5-2-94 | | 11 | ↓ |
| BOBNP7 | ↓ | 4-21-94 | | 5-2-94 | | 11 | ↓ |
| BOBNP5 | NO3NO2 | 4-22-94 | | 5-17-94 | | 25 | None |
| BOBRL3 | ↓ | 4-25-94 | | 5-17-94 | | 22 | ↓ |
| BOBNN1 | ↓ | 4-25-94 | | 5-18-94 | | 23 | ↓ |
| BOBRL7 | ↓ | 4-25-94 | | 5-18-94 | | 23 | ↓ |
| BOBNP7 | ↓ | 4-21-94 | | 5-17-94 | | 26 | ↓ |
| BOBNP3 | ↓ | 4-21-94 | | 5-17-94 | | 26 | ↓ |
| BOBNM5 | ↓ | 4-21-94 | | 5-17-94 | | 26 | ↓ |
| BOBNN9 | ↓ | 4-19-94 | | 5-17-94 | | 28 | ↓ |
| BOBNM7 | ↓ | 4-20-94 | | 5-17-94 | | 27 | ↓ |

SJ # 5

HOLDING TIME SUMMARY

| SDG: | VALIDATOR: | DATE: | PAGE 3 OF 3 |
|---|---|---|---|
| COMMENTS: GENERAL CHEMISTRY ANALYSES | | | |

| FIELD SAMPLE ID | ANALYSIS TYPE | DATE SAMPLED | DATE PREPARED | DATE ANALYZED | PREP. HOLDING TIME, DAYS | ANALYSIS HOLDING TIME, DAYS | QUALIFIER |
|---|---|---|---|---|---|---|---|
| BOBNP1 | NO3NO2 | 4-15-94 | | 5-11-94 | | 26 | None |
| BOBNP3 | IC Anions | 4-21-94 | | 5-18-94 | | 27 | ~~None~~ UR |
| BOBNM5 | | 4-21-94 | | | | 27 | Nitrite + phosphate only |
| BOBNP7 | | 4-21-94 | | | | 27 | |
| BOBNP5 | | 4-22-94 | | | | 16 | |
| BOBRL3 | | 4-25-94 | | | | 23 | |
| BOBNN1 | | 4-25-94 | | | | 23 | |
| BOBRL7 | | 4-25-94 | | | | 23 | |
| BOBNH7 | | 4-20-94 | | 5-16-94 | | 26 | |
| BOBNP1 | | 4-15-94 | | 5-13-94 | | 28 | |
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9-24-94 (NJC)

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## GENERAL CHEMISTRY DATA QUALIFICATION SUMMARY

Project: 200-BP-5 SDG: W0088-ITC-047 Sample ID: B0BNP3

| Compound, Element, or Analysis | CAS Identifier | QUALIFIERS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Hold Time | Initial Cal. | ICV CCV | Blanks | MS MSD | LCS | Dupl | Quan & Det Lim | Assigned Qualifier |
| %Solids | WT%SOLIDS | | | | | | | | | |
| Chloride IC | 16887-00-6 | | | | | | | | | |
| Fluoride IC | 16984-48-8 | | | | | | | | | |
| Formate IC | na | | | | | | | | | |
| Sulfate IC | 14808-79-8 | | | | | | | | | |
| Cyanide, Total | CYANIDE | | | | | | | | | |
| Corrosivity | na | | | | | | | | | |
| Fluoride ISE | na | | | | | | | | | |
| Nitrate Nitrite | NO2+NO3-N | | | | | | | | | |
| TOC | TOC | | | | | | | | | |
| pH | 207 | | | | | | | | | |
| Phosphate | 14265-44-2 | | | | | | | | | |
| TIC | TIC | | | | | | | | | |
| Nitrite IC | NO2 | UJR | | | | | | | | UR |
| PO4 IC | | UR | | | | | | | | UR |
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Validator: Stroup Date: 9-14-94 Pg 1 of 7

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## GENERAL CHEMISTRY DATA QUALIFICATION SUMMARY

Project: 200-BP-5 SDG: W0038-ITC-047 Sample ID: BOBNH5

| Compound, Element, or Analysis | CAS Identifier | QUALIFIERS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Hold Time | Initial Cal. | ICV CCV | Blanks | MS MSD | LCS | Dupl | Quan & Det Lim | Assigned Qualifier |
| %Solids | WT%SOLIDS | | | | | | | | | |
| Chloride IC | 16887-00-6 | | | | | | | | | |
| Fluoride IC | 16984-48-8 | | | | | | | | | |
| Formate IC | na | | | | | | | | | |
| Sulfate IC | 14808-79-8 | | | | | | | | | |
| Cyanide, Total | CYANIDE | | | | | | | | | |
| Corrosivity | na | | | | | | | | | |
| Fluoride ISE | na | | | | | | | | | |
| Nitrate Nitrite | NO2+NO3-N | | | | | | | | | |
| TOC | TOC | | | | | | | | | |
| pH | 207 | | | | | | | | | |
| Phosphate | 14265-44-2 | | | | | | | | | |
| TIC | TIC | | | | | | | | | |
| Nitrite IC | NO2 | UJR | | | | | | | | UR |
| PO4 IC | | UR | | | | | | | | UR |
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Validator: Stroup Date: 8-14-94 Pg 2 of 7

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## GENERAL CHEMISTRY DATA QUALIFICATION SUMMARY

Project: 200-BP-5 SDG: W0038-ITC-047 Sample ID: BOBNP7

| Compound, Element, or Analysis | CAS Identifier | QUALIFIERS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Hold Time | Initial Cal. | ICV CCV | Blanks | MS MSD | LCS | Dupl | Quan & Det Lim | Assigned Qualifier |
| %Solids | WT%SOLIDS | | | | | | | | | |
| Chloride IC | 16887-00-6 | | | | | | | | | |
| Fluoride IC | 16984-48-8 | | | | | | | | | |
| Formate IC | na | | | | | | | | | |
| Sulfate IC | 14808-79-8 | | | | | | | | | |
| Cyanide, Total | CYANIDE | | | | | | | | | |
| Corrosivity | na | | | | | | | | | |
| Fluoride ISE | na | | | | | | | | | |
| Nitrate Nitrite | NO2+NO3-N | | | | | | | | | |
| TOC | TOC | | | | | | | | | |
| pH | 207 | | | | | | | | | |
| Phosphate | 14265-44-2 | | | | | | | | | |
| TIC | TIC | | | | | | | | | |
| Nitrite IC | NO2 | UJR | | | | | | | | UR |
| $PO_4$ = IC | | UR | | | | | | | | UR |
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Validator: Stroup Date: 9-14-94 Pg 3 of 7

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## GENERAL CHEMISTRY DATA QUALIFICATION SUMMARY

Project: 200-BP-5 SDG: W0088-ITC-047 Sample ID: BOBNP5

| Compound, Element, or Analysis | CAS Identifier | QUALIFIERS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Hold Time | Initial Cal. | ICV CCV | Blanks | MS MSD | LCS | Dupl | Quan & Det Lim | Assigned Qualifier |
| %Solids | WT%SOLIDS | | | | | | | | | |
| Chloride IC | 16887-00-6 | | | | | | | | | |
| Fluoride IC | 16984-48-8 | | | | | | | | | |
| Formate IC | na | | | | | | | | | |
| Sulfate IC | 14808-79-8 | | | | | | | | | |
| Cyanide, Total | CYANIDE | | | | | | | | | |
| Corrosivity | na | | | | | | | | | |
| Fluoride ISE | na | | | | | | | | | |
| Nitrate Nitrite | NO2+NO3-N | | | | | | | | | |
| TOC | TOC | | | | | | | | | |
| pH | 207 | | | | | | | | | |
| Phosphate | 14265-44-2 | | | | | | | | | |
| TIC | TIC | | | | | | | | | |
| Nitrite IC | NO2 | UJR | | | | | | | | UR |
| PO4= IC | | UR | | | | | | | | UR |
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Validator: Stroup Date: 9-14-94 Pg 2 of 7

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## GENERAL CHEMISTRY DATA QUALIFICATION SUMMARY

Project: 200-BP-5 SDG: W0038-ITC-047 Sample ID: BOBRL3

| Compound, Element, or Analysis | CAS Identifier | QUALIFIERS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Hold Time | Initial Cal. | ICV CCV | Blanks | MS MSD | LCS | Dupl | Quan & Det Lim | Assigned Qualifier |
| %Solids | WT%SOLIDS | | | | | | | | | |
| Chloride IC | 16887-00-6 | | | | | | | | | |
| Fluoride IC | 16984-48-8 | | | | | | | | | |
| Formate IC | na | | | | | | | | | |
| Sulfate IC | 14808-79-8 | | | | | | | | | |
| Cyanide, Total | CYANIDE | | | | | | | | | |
| Corrosivity | na | | | | | | | | | |
| Fluoride ISE | na | | | | | | | | | |
| Nitrate Nitrite | NO2+NO3-N | | | | | | | | | |
| TOC | TOC | | | | | | | | | |
| pH | 207 | | | | | | | | | |
| Phosphate | 14265-44-2 | | | | | | | | | |
| TIC | TIC | | | | | | | | | |
| Nitrite IC | NO2 | UJR | | | | | | | | UR |
| PO4= IC | | UR | | | | | | | | UR |
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Validator: Stroup Date: 9-14-94 Pg 5 of 7

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## GENERAL CHEMISTRY DATA QUALIFICATION SUMMARY

Project: 200-BP-5 SDG: W0038-ITC-047 Sample ID: BOBNN1

| Compound, Element, or Analysis | CAS Identifier | QUALIFIERS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Hold Time | Initial Cal. | ICV CCV | Blanks | MS MSD | LCS | Dupl | Quan & Det Lim | Assigned Qualifier |
| %Solids | WT%SOLIDS | | | | | | | | | |
| Chloride IC | 16887-00-6 | | | | | | | | | |
| Fluoride IC | 16984-48-8 | | | | | | | | | |
| Formate IC | na | | | | | | | | | |
| Sulfate IC | 14808-79-8 | | | | | | | | | |
| Cyanide, Total | CYANIDE | | | | | | | | | |
| Corrosivity | na | | | | | | | | | |
| Fluoride ISE | na | | | | | | | | | |
| Nitrate Nitrite | NO2+NO3-N | | | | | | | | | |
| TOC | TOC | | | | | | | | | |
| pH | 207 | | | | | | | | | |
| Phosphate | 14265-44-2 | | | | | | | | | |
| TIC | TIC | | | | | | | | | |
| Nitrite IC | NO2 | UJR | | | | | | | | UR |
| PO4 IC | | UR | | | | | | | | UR |
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Validator: Stroup Date: 9-14-94 Pg 6 of 7

## GENERAL CHEMISTRY DATA QUALIFICATION SUMMARY

Project: 200-BP-5 SDG: W0088-ITC-047 Sample ID: BOBRL7

| Compound, Element, or Analysis | CAS Identifier | QUALIFIERS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Hold Time | Initial Cal. | ICV CCV | Blanks | MS MSD | LCS | Dupl | Quan & Det Lim | Assigned Qualifier |
| %Solids | WT%SOLIDS | | | | | | | | | |
| Chloride IC | 16887-00-6 | | | | | | | | | |
| Fluoride IC | 16984-48-8 | | | | | | | | | |
| Formate IC | na | | | | | | | | | |
| Sulfate IC | 14808-79-8 | | | | | | | | | |
| Cyanide, Total | CYANIDE | | | | | | | | | |
| Corrosivity | na | | | | | | | | | |
| Fluoride ISE | na | | | | | | | | | |
| Nitrate Nitrite | NO2+NO3-N | | | | | | | | | |
| TOC | TOC | | | | | | | | | |
| pH | 207 | | | | | | | | | |
| Phosphate | 14265-44-2 | | | | | | | | | |
| TIC | TIC | | | | | | | | | |
| Nitrite IC | NO2 | UJR | | | | | | | | UR |
| PO4 IC | | UR | | | | | | | | UR |
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Validator: Stroup Date: 9-14-94 Pg 7 of 7

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## GENERAL CHEMISTRY DATA QUALIFICATION SUMMARY

Project: 200 BP5 SDG: 0W0038-ITC-047 Sample ID: B0B0M7

| Compound, Element, or Analysis | CAS Identifier | QUALIFIERS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Hold Time | Initial Cal. | ICV CCV | Blanks | MS MSD | LCS | Dupl | Quan & Det Lim | Assigned Qualifier |
| %Solids | WT%SOLIDS | | | | | | | | | |
| Chloride IC | 16887-00-6 | | | | | | | | | |
| Fluoride IC | 16984-48-8 | | | | | | | | | |
| Formate IC | na | | | | | | | | | |
| Sulfate IC | 14808-79-8 | | | | | | | | | |
| Cyanide, Total | CYANIDE | | | | | | | | | |
| Corrosivity | na | | | | | | | | | |
| Fluoride ISE | na | | | | | | | | | |
| Nitrate Nitrite | NO2+NO3-N | | | | | | | | | |
| TOC | TOC | | | | | | | | | |
| pH | 207 | | | | | | | | | |
| Phosphate | 14265-44-2 | | | | | | | | | |
| TIC | TIC | | | | | | | | | |
| $PO_4^=$ IC | | UR | | | | | | | | UR |
| $NO_2^=$ IC | | UR | | | | | | | | UR |
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Validator: MWebb Date: 9-16-14 Pg 1 of 3

## GENERAL CHEMISTRY DATA QUALIFICATION SUMMARY

Project: 200 BP 5 SDG: W0034 - ITC - 047 Sample ID: BOB NN9

| Compound, Element, or Analysis | CAS Identifier | QUALIFIERS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Hold Time | Initial Cal. | ICV CCV | Blanks | MS MSD | LCS | Dupl | Quan & Det Lim | Assigned Qualifier |
| %Solids | WT%SOLIDS | | | | | | | | | |
| Chloride IC | 16887-00-6 | | | | | | | | | |
| Fluoride IC | 16984-48-8 | | | | | | | | | |
| Formate IC | na | | | | | | | | | |
| Sulfate IC | 14808-79-8 | | | | | | | | | |
| Cyanide, Total | CYANIDE | | | | | | | | | |
| Corrosivity | na | | | | | | | | | |
| Fluoride ISE | na | | | | | | | | | |
| Nitrate Nitrite | NO2+NO3-N | | | | | | | | | |
| TOC | TOC | | | | | | | | | |
| pH | 207 | | | | | | | | | |
| Phosphate | 14265-44-2 | | | | | | | | | |
| TIC | TIC | | | | | | | | | |
| PON = IC | | UR | | | | | | | | UR |
| NO2 = IC | | UR | | | | | | | | UR |
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Validator: MWebb Date: 9-16-94 Pg 2 of 3

## GENERAL CHEMISTRY DATA QUALIFICATION SUMMARY

Project: 200-BP-5 SDG: W0038-ITC-047 Sample ID: Batch NP1

| Compound, Element, or Analysis | CAS Identifier | QUALIFIERS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Hold Time | Initial Cal. | ICV CCV | Blanks | MS MSD | LCS | Dupl | Quan & Det Lim | Assigned Qualifier |
| %Solids | WT%SOLIDS | | | | | | | | | |
| Chloride IC | 16887-00-6 | | | | | | | | | |
| Fluoride IC | 16984-48-8 | | | | | | | | | |
| Formate IC | na | | | | | | | | | |
| Sulfate IC | 14808-79-8 | | | | | | | | | |
| Cyanide, Total | CYANIDE | | | | | | | | | |
| Corrosivity | na | | | | | | | | | |
| Fluoride ISE | na | | | | | | | | | |
| Nitrate Nitrite | NO2+NO3-N | | | | | | | | | |
| TOC | TOC | | | | | | | | | |
| pH | 207 | | | | | | | | | |
| Phosphate | 14265-44-2 | | | | | | | | | |
| TIC | TIC | | | | | | | | | |
| $PO_4^{=}$ IC | | UR | | | | | | | | UR |
| $NO_2^{=}$ IC | | UR | | | | | | | | UR |
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Validator: MWebb Date: 9-16-94 Pg 3 of 3

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# LATA RADIOCHEMISTRY DATA VALIDATION CHECKLIST

| VALIDATION LEVEL: | A | B | C | (D) | E |
|---|---|---|---|---|---|

| | | |
|---|---|---|
| PROJECT: 200-BP-5 | SDG: W0038-ITC-047 | |
| VALIDATOR: MWebb | LATA NO.: ~~VW401.~~ MW 9-14-94 402.81 | DATE: 9-14-94 |
| SAF NO.: 94-130 | LAB: ITC | CASE: — |
| QAPP REFERENCE: | SAP REFERENCE: | |

If there is no QAPP or SAP reference, contact the WHC Technical Representative.
If the document(s) are not provided, default to the Method acceptance criteria.

ANALYSES PERFORMED

| | | | | | |
|---|---|---|---|---|---|
| ☒ Gross Alpha<br>☒ Gross Beta | ☐ Strontium-89<br>☒ Strontium-90 | ☒ Technetium-99 | ☒ Isotopic Anal. Alpha Spec. $P_U$ | ☒ Gamma Spectroscopy | ☐ Iodine-129 |
| ☒ Total Uranium (KPA) | ☐ Radium-226<br>☐ Radium-228 | ☒ (LSC) Liquid Scintillation #3 | ☐ | ☐ | ☐ |

SAMPLES/MATRIX BOBNP1, NN9, NM7, NP7, NP3, NM5, NP5
BOBRL3, NN1, RL7 (10 waters)

* BOBNP1 & BOBNN9 were calculated to satisfy the 20%.

** BOBRL7 dup with BOBRL8 (another package)

## 1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification forms present? (Yes) No N/A

Compliance screening form present? (Yes) No N/A

Is a case narrative present? (Yes) No N/A

Were all analyses requested reported? (Yes) No N/A

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

Comments: _____

## 2. CHAIN-OF-CUSTODY/HOLDING TIMES

Are sample holding times acceptable? (Yes) No N/A

Are samples preserved correctly? (Yes) No N/A

Was the pH of the sample checked prior to analysis? (Yes) No N/A

Comments: _____

Reviewed [signature] 9/15/94

## LATA RADIOCHEMISTRY DATA VALIDATION CHECKLIST

### 3. INITIAL CALIBRATION

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: Continuing Calibration is acceptable. Initial Calibration accepted. The fact that the detectors were not re-calibrated w/i the year has no effect on the data

### 4. CONTINUING CALIBRATION

Background checked at proper frequency? . . . . . (Yes) No N/A

Background check acceptable? . . . . . (Yes) No N/A

Efficiency checked at proper frequency? . . . . . (Yes) No N/A

Efficiency check acceptable? . . . . . (Yes) No N/A

Calibration check standards NIST traceable? . . . . . (Yes) No N/A

Calibration check standards expired? . . . . . Yes (No) N/A

Comments:

### 5. BLANKS *(see BLANK AND SAMPLE DATA SUMMARY form)*

Method blank analyzed? . . . . . (Yes) No N/A

Method blank results acceptable? . . . . . Yes (No) N/A

Analytes detected in method blank? . . . . . (Yes) No N/A

Transcription/Calculation Errors? . . . . . Yes (No) N/A

Comments: U-total blank result had a pos. result of .011 ug/L (MDA = .00354 ug/L) BOBRL3 will be qualified as non-detect (U).

## LATA RADIOCHEMISTRY DATA VALIDATION CHECKLIST

**6. MATRIX SPIKES** *(see ACCURACY DATA SUMMARY form)*

| | | | |
|---|---|---|---|
| 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 |

★

$$\%R = \frac{SSR - SR}{SA} \times 100$$

Spike Recovery

where:
SSR = spiked sample result
SR = sample result
SA = spike added

Comments: Tc99 MS was spiked at an inappropriate level. No reanalysis necessary MWG-27-94

**7. LABORATORY CONTROL SAMPLES** *(see ACCURACY DATA SUMMARY form)*

| | | | |
|---|---|---|---|
| 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 |

★

$$\%R = \frac{\text{observed value}}{\text{true value}} \times 100$$

Recovery

Comments:

DM 9/15/94

Js #2

## LATA RADIOCHEMISTRY DATA VALIDATION CHECKLIST

### 10. FIELD QC SAMPLES

| | | | |
|---|---|---|---|
| Field blank(s) identified? | Yes | (No) | N/A |
| Field blank results acceptable? | Yes | No | (N/A) |
| Analytes detected in field blank(s)? | Yes | No | (N/A) |
| Field duplicate sample(s) identified? | (Yes) | No | N/A |
| Field duplicate RPD values acceptable? | Yes | No | (N/A) |
| Field split sample(s) identified? | Yes | (No) | N/A |
| Field split RPD values acceptable? | Yes | No | (N/A) |
| Performance audit sample(s) identified? | Yes | (No) | N/A |
| Performance audit sample results acceptable? | Yes | No | (N/A) |

Comments: Field duplicate B0BRL7 is a duplicate of B0BRL8 the RPD will be in the summary report (B0BRL8 is not in this data package

### 11. DETECTION LIMITS (LEVELS D & E)

| | | | |
|---|---|---|---|
| MDA's meet required detection limits? | (Yes) | No | N/A |
| Transcription/calculation errors? | Yes | (No) | N/A |

★

$$\text{Minimum Detectable Activity (MDA)} = \frac{4.66 \times \sqrt{(B.2)(T.2)}}{2.22(E.2)(I.2)(R.2)(D.2)(V.2)(Y.2)(T.2)}$$

where:

- B.2 = background counts per minute (cpm) or the reported standard deviation of the background (S) cpm
- T.2 = counting time for associated sample
- 2.22 = conversion dpm/pCi
- E.2 = detector efficiency
- I.2 = ingrowth correction factor (if applicable or 1)
- R.2 = carrier recovery factor (if applicable or 1)
- D.2 = decay factor (if applicable or 1)
- Y.2 = chemical yield factor (if applicable or 1)
- V.2 = sample volume in liters or grams

Comments: Y nuclides with positive hits do not have MDAs reported. See attached memo from HASM

## LATA RADIOCHEMISTRY DATA VALIDATION CHECKLIST

### 8. CHEMICAL RECOVERY *(see ACCURACY DATA SUMMARY form)*

| | | | |
|---|---|---|---|
| Chemical carrier added? | (Yes) | No | N/A |
| Chemical recovery acceptable? | (Yes) | No | N/A |
| Tracer added? | (Yes) | No | N/A |
| Tracer recovery acceptable? | (Yes) | No | N/A |
| Standards traceable? | (Yes) | No | N/A |
| Standards expired? | Yes | (No) | N/A |
| Transcription/Calculation errors? | Yes | (No) | N/A |

★

$$\text{Alpha Spec Tracer Recovery} = \frac{A.1 - B.1}{(2.22)(E.1)(T.1)}$$

where:
- A.1 = gross counts per minute
- B.1 = background counts per minute of tracer
- 2.22 = conversion factor, dpm/pCi
- E.1 = detector efficiency
- T.1 = activity (pCi) of tracer added to sample (can be determined by taking dpm of tracer added divided by 2.22)

Comments:_____

_____

### 9. DUPLICATES *(see PRECISION DATA SUMMARY form)*

| | | | |
|---|---|---|---|
| Duplicates Analyzed? | (Yes) | No | N/A |
| RPD Values Acceptable? | (Yes) | No | N/A |
| Transcription/Calculation Errors? | Yes | (No) | N/A |

★

$$\text{Relative Percent Difference} \quad RPD = \frac{|OS - D|}{\left(\frac{OS + D}{2}\right)} \times 100$$

where:
- OS = sample concentration (original sample/MS)
- D = duplicate concentration (duplicate sample/MSD)

Comments:_____

_____

| Validator | Date | SDG | VW Number |
|---|---|---|---|
| MC Webb | 9-15-94 | WOO38-ITC-047 | VW402.81 |

**DATA VALIDATION SUMMARY**

**MAJOR DEFICIENCIES:**

1. None

**MINOR DEFICIENCIES:**

1. BOBRL3 is qualified as non-detect (U) due to uranium being detected in the method blank.

**COMMENTS:**

1. BOBRL7 is identified as a field duplicate sample. It is a duplicate with BOBRL8. BOBRL8 did not have wet chemistry analyses.
2. Page 19 of the data package contains uranium data from the first analysis, which was rejected. This should not have been reported by the laboratory. The correct RPD comparison can be found on page 24 of the data package. All U-total data was checked for entry errors.

## LATA RADIOCHEMISTRY DATA VALIDATION CHECKLIST

Results Calculation Equations

Gross α/β and Tritium

$$\frac{(A.3 - B.3) \times C.3}{(2.22)(E.3)(V.3)}$$

where:
A.3 = gross counts per minute
B.3 = background counts per minute
C.3 = activity of α fraction in β channel*
2.22 = conversion factor, dpm/pCi
E.3 = detector efficiency
V.3 = sample volume, liters or grams
*if for calculation of gross β, otherwise substitute 1

---

*Strontium (total)*

$$\frac{A.4 - B.4}{(2.22)(E.4)(I.4)(D.4)(R.4)(V.4)}$$

*where:*
*A.4 = gross counts per minute*
*B.4 = background counts per minute*
*2.22 = conversion factor, dpm/pCi*
*E.4 = detector efficiency*
*I.4 = ingrowth correction factor*
*R.4 = carrier recovery factor*
*D.4 = strontium decay factor*
*V.4 = sample volume, liters or grams*

---

Strontium-90 (corrected for Sr-89)

$$\frac{A.5 - B.5}{(2.22)(Y.5)(E.5)(I.5)(D.5)(R.5)(V.5)}$$

where:
A.5 = gross counts per minute
B.5 = background counts per minute
Y.5 = yttrium-90 yield factor
2.22 = conversion factor, dpm/pCi
E.5 = detector efficiency
I.5 = ingrowth correction factor
R.5 = strontium-89 yield factor
D.5 = strontium decay factor
V.5 = sample volume, liters or grams

Results Calculation Equations, continued

Technetium-99

$$\frac{A.6 - B.6}{(2.22)(E.6)(R.6)(V.6)}$$

where:
- A.6 = gross counts per minute
- B.6 = background counts per minute
- 2.22 = conversion factor, dpm/pCi
- E.6 = detector efficiency
- R.6 = carrier recovery factor
- V.6 = sample volume, liters or grams

---

Alpha Spec Isotopes

$$\frac{A.7 - B.7}{(2.22)(E.7)(R.7)(V.7)}$$

where:
- A.7 = gross counts per minute for isotope
- B.7 = background counts per minute for detector
- 2.22 = conversion factor, dpm/pCi
- E.7 = detector efficiency
- R.7 = tracer recovery factor
- V.7 = sample amount, liters or grams

---

Gamma Spec Isotopes

$$\frac{A.8}{(2.22)(B.8)(D.8)(E.8)(V.8)(T.8)}$$

where:
- A.8 = peak area for isotope
- D.8 = decay factor for isotope
- 2.22 = conversion factor, dpm/pCi
- B.8 = abundance factor for isotope
- E.8 = efficiency factor for isotope
- V.8 = sample amount, liters or grams
- T.8 = live time (minutes)

Results Calculation Equations, continued

Total Uranium by Laser Fluorometry

$$\frac{(W.9 - I.9)(R.9)(D.9)}{U.9 - W.9}$$

where:
W.9 = sample reading with Fluran
I.9 = initial sample reading
R.9 = concentration of uranium standard after dilution with sample (µg/L)
D.9 = dilution factor
U.9 = sample reading with uranium standard

---

Radium-226 by Radon Emanation

$$D = \frac{COUNT}{(2.22)(CAL)(VOL)} \times \frac{1}{1 - e^{-\lambda t_1}} \times \frac{1}{e^{-\lambda t_2}} \times \frac{t_3}{1 - e^{-\lambda t_3}}$$

where:
COUNT = net count rate, cpm
CAL = calibration constant of the de-emanation system and the scintillation cell in counts per minutes/disintigrations per minute of radon-222
VOL = sample aliquot in liters
$t_1$ = the elapsed time in days between the first and second de-emanations, and $\lambda$ is the decay constant for radon-222 (0.181 $d^{-1}$)
$t_2$ = the time interval in hours between the second de-emanation and counting, and $\lambda$ is the decay constant of radon-222 (0.00755$hr^{-1}$)
$t_3$ = the counting time in minutes, and $\lambda$ is the decay constant of radon-222 ($1.26 \times 10^{-4}$ $min^{-1}$)
2.22 = conversion factor, dpm/pCi

| Validator | Date | SDG | VW Number |
|---|---|---|---|
| MC Webb | 9-15-94 | WOO38-ITC-047 | VW402.81 |

**DATA VALIDATION SUMMARY**

| Analyte | Qualifier | Sample | Reason |
|---|---|---|---|
| U-total | U | BOBRL3 | Uranium detected in the method blank. |
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IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

DUPLICATE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0038

LAB SAMPLE ID: F0442801

WHC ID: B0BNP7

REPORTING UNITS: pCi/L & ug/g

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| CO-60 | -1.89E+00 | 7.07E+00 | 7.07E+00 | 1.17E+01 | N/A | RD3219 |
| FE-59 | 7.39E-01 | 1.37E+01 | 1.37E+01 | 2.49E+01 | N/A | RD3219 |
| EU-152 | -1.35E+01 | 2.58E+01 | 2.58E+01 | 4.27E+01 | N/A | RD3219 |
| CO-58 | 1.34E+00 | 4.95E+00 | 4.96E+00 | 9.94E+00 | N/A | RD3219 |
| CS-137DA | -4.74E+00 | 4.70E+00 | 4.73E+00 | 7.25E+00 | N/A | RD3219 |
| RU-106DA | 1.16E+01 | 3.00E+01 | 3.00E+01 | 6.23E+01 | N/A | RD3219 |
| EU-155 | 6.77E+00 | 8.76E+00 | 8.78E+00 | 1.63E+01 | N/A | RD3219 |
| EU-154 | -4.83E+00 | 1.61E-01 | 1.61E+01 | 2.91E+01 | N/A | RD3219 |
| URANIUM | 1.89E+00 | N/A | 2.84E-01 | 3.54E-03 | 1 | RD4200 |

RPD CALCULATIONS

The uranium result reported on this page is from the first analysis. Re analysis was rejected because of this QC item being out of control. Rej. results should not be reported. The correct RPD comparison is found on pg 24 of the data package

LAB SAMPLE ID: 40442801

WHC ID: B0BNP7

REPORTING UNITS: pCi/L & ug/g

| ISOTOPE | SAMPLE RESULT | DUPLICATE RESULT | RPD |
|---|---|---|---|
| CO-60 | -4.61E-01 | -1.89E+00 | 121.57 |
| FE-59 | 3.41E+00 | 7.39E-01 | 128.75 |
| EU-152 | 8.82E+00 | -1.35E+01 | 953.85 |
| CO-58 | 1.22E+00 | 1.34E+00 | 9.38 |
| CS-137DA | -2.47E+00 | -4.74E+00 | 62.97 |
| RU-106DA | -3.75E+01 | 1.16E+01 | 379.15 |
| EU-155 | -2.82E+00 | 6.77E+00 | 485.57 |
| EU-154 | 6.72E+00 | -4.83E+00 | 1222.22 |
| URANIUM | 1.08E+00 | 1.89E+00 | 54.55 |

explanation above
JMW 9-15-94

9613476.1309

IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

## BLANK RESULTS

**LAB NAME:** ITAS - RICHLAND **SDG NO.:** W0038

**LAB SAMPLE ID:** L043211B

**REPORTING UNITS:** pCi/L

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| PU239/40 | U -1.84E-02 | 3.67E-02 | 3.69E-02 | 4.40E-01 | 0.454 | RD3209 |
| PU-238 | U -3.68E-02 | 5.20E-02 | 5.24E-02 | 5.19E-01 | 0.454 | RD3209 |
| ALPHA | U 2.52E-01 | 2.96E-01 | 2.99E-01 | 5.43E-01 | 1 | RD3222 |
| BETA | U 8.65E-01 | 1.23E+00 | 1.23E+00 | 2.58E+00 | 1 | RD3222 |
| TOTAL-SR | U 3.74E-02 | 2.52E-01 | 2.52E-01 | 9.51E-01 | 0.76 | RD3204 |
| TC-99 | U -1.04E-01 | 9.37E-01 | 4.15E+00 | 2.15E+00 | 0.951 | ITAS-IT-RS-0001 |

**LAB SAMPLE ID:** L044071B

**REPORTING UNITS:** pCi/L & ug/g

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| CO-60 | U -4.25E+00 | 4.46E+00 | 4.48E+00 | 6.70E+00 | N/A | RD3219 |
| FE-59 | U -1.81E+00 | 6.27E+00 | 6.27E+00 | 1.16E+01 | N/A | RD3219 |
| EU-152 | U -1.90E+00 | 2.18E+01 | 2.18E+01 | 4.05E+01 | N/A | RD3219 |
| CO-58 | U -2.18E+00 | 3.41E+00 | 3.41E+00 | 5.58E+00 | N/A | RD3219 |
| CS-137DA | U -7.06E-01 | 4.24E+00 | 4.24E+00 | 7.54E+00 | N/A | RD3219 |
| RU-106DA | U -8.84E+00 | 3.28E+01 | 3.28E+01 | 5.96E+01 | N/A | RD3219 |
| EU-155 | U 3.43E+00 | 7.42E+00 | 7.43E+00 | 1.38E+01 | N/A | RD3219 |
| EU-154 | U 3.58E+00 | 1.29E+01 | 1.29E+01 | 2.67E+01 | N/A | RD3219 |
| URANIUM | 1.10E-02 | N/A | 1.65E-03 | 3.54E-03 | 1 | RD4200 |

$U_{TOT}$ + blank .0110 MDA (.00354)

5x .0110 = .0550

BOBL3 .009 qualified U

MW 9-15-94

~~0.025~~

BLANK AND SAMPLE DATA SUMMARY

| SDG: W0038 - ITC - 047 | VALIDATOR: MW066 | DATE: 9-15-94 | PAGE_1_OF_1_ |
|---|---|---|---|

COMMENTS: RADIOCHEMICAL ANALYSES

| FIELD SAMPLE ID | CONSTITUENT | RESULT | MDA | RDL | UNITS | 5X RESULT | SAMPLES AFFECTED | QUALIFIER |
|---|---|---|---|---|---|---|---|---|
| | U-total | .011 | .00354 | .1 | µg/L | .055 | BOBRL3 | U |
| | | | | | | | | |
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PNO-DVF-015, R1

000149

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9613476.1311

IT ANALYTICAL SERVICES
RICHLAND, WA
(509) 375-3131

## DUPLICATE RESULTS

**LAB NAME:** ITAS-RICHLAND **SDG NO.:** W0038

**LAB SAMPLE ID:** F0440702

**WHC ID:** B0BNM7

**REPORTING UNITS:** pCi/L

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| TOTAL-SR | 2.50E-01 | 2.72E-01 | 2.80E-01 | 7.37E-01 | 0.99 | RD3204 |
| TC-99 | 2.26E+00 | 9.61E-01 | 4.32E+00 | 2.15E+00 | 0.951 | ITAS -IT-RS-0001 |

## RPD CALCULATIONS

**LAB NAME:** ITAS-RICHLAND **SDG NO.:** W0038

**LAB SAMPLE ID:** 40440702

**WHC ID:** B0BNM7

**REPORTING UNITS:** pCi/L

| ISOTOPE | SAMPLE RESULT | DUPLICATE RESULT | RPD |
|---|---|---|---|
| TOTAL-SR | 1.28E-01 | 2.50E-01 | 64.55 |
| TC-99 | 2.74E+00 | 2.26E+00 | 19.20 |

RDL
2 < 5 RDL
OK

MW 9-15-94

~~0023~~ 000150

IT ANALYTICAL SERVICES
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(509) 375-3131

## DUPLICATE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0038

LAB SAMPLE ID: F0442803

WHC ID: B0BNM5

REPORTING UNITS: pCi/L

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| ALPHA | 4.92E+00 | 2.20E+00 | 2.26E+00 | 2.46E+00 | 1 | RD3222 |
| BETA | 6.63E+02 | 1.29E+01 | 4.82E+01 | 3.17E+00 | 1 | RD3222 |

## RPD CALCULATIONS

LAB NAME: ITAS-RICHLAND SDG NO.: W0038

LAB SAMPLE ID: 40442803

WHC ID: B0BNM5

REPORTING UNITS: pCi/L

| ISOTOPE | SAMPLE RESULT | DUPLICATE RESULT | RPD | |
|---|---|---|---|---|
| | | | | RDL |
| ALPHA | 7.35E+00 | 4.92E+00 | 39.61 | 3 < 5*CRDL OK |
| BETA | 6.54E+02 | 6.63E+02 | 1.37 | OK |

MW 9-15-94

~~0027~~ 000151

9613476.1313

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## DUPLICATE RESULTS

**LAB NAME:** ITAS-RICHLAND **SDG NO.:** W0038

**LAB SAMPLE ID:** F0445902

**WHC ID:** B0BRL3

**REPORTING UNITS:** ug/g

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | YIELD | METHOD NUMBER |
|---|---|---|---|---|---|---|
| URANIUM | 9.00E-03 | 0.00E+00 | 1.40E-03 | 3.54E-03 | 1 | RD4200 |

## RPD CALCULATIONS

**LAB NAME:** ITAS-RICHLAND **SDG NO.:** W0038

**LAB SAMPLE ID:** 40445902

**WHC ID:** B0BRL3

**REPORTING UNITS:** ug/g

| ISOTOPE | SAMPLE RESULT | DUPLICATE RESULT | RPD |
|---|---|---|---|
| URANIUM | 9.00E-03 | 9.00E-03 | 0.00 |

OK

Utotal RPD

PWO
5-15-94

~~0024~~

## MATRIX SPIKE RECOVERY (MS)

Analysis: Radiochemistry
SDG: WOO38-ITC-047
Sample ID:

Date: 14-Sep-94
Validator: MC Webb

| Constituent | Spike Sample Result SSR | Sample Result SR | Spike Added SA | %R |
|---|---|---|---|---|
| Tc99 BOBNM5 | Sample activity >4 times spike level | | | |
| U-total BOBNM7 | 2.260 | 1.430 | 0.905 | 91.7% |
| U-total BOBNP5 | 0.930 | 0.195 | 0.900 | 81.7% |

000153

## PERCENT RECOVERY (LCS)

Analysis: Radiochemistry
SDG: WOO38-ITC-047

Date: 14-Sep-94
Validator: MC Webb

| Constituent | Observed value | True value | %R |
|---|---|---|---|
| | OLCS | ALCS | |
| Pu239 | 4.08 | 4.56 | 89.6% |
| Co60 | 28.34 | 24.84 | 114.1% |
| Cs137 | 46.26 | 49.66 | 93.2% |
| Eu152 | 58.85 | 49.81 | 118.1% |
| Alpha | 16.92 | 22.59 | 74.9% |
| Beta | 24.67 | 22.57 | 109.3% |
| Sr-total | 12.70 | 13.53 | 93.9% |
| Tc99 | 271.30 | 270.50 | 100.3% |
| Tritium | 2610.00 | 2800.00 | 93.2% |
| U-total | 0.77 | 0.91 | 84.2% |

# MINIMUM DETECTABLE ACTIVITY (MDA)

Analysis: Radiochemistry
SDG: WOO38-ITC-047

Date: 14-Sep-94
Validator: MC Webb

| Constituent | Background counts per minute (cpm) or Standard Deviation of background (cpm) | Counting time for associated sample | Detector Efficiency | Ingrowth correction factor | Carrier recovery factor | Decay factor | Chemical yield factor | Sample volume (L or g) | MDA |
|---|---|---|---|---|---|---|---|---|---|
| | B.2 | T.2 | E.2 | I.2 | R.2 | D.2 | Y.2 | V.2 | |
| Pu238 BOBNP1 | 0.001 | 200 | 3.703 | 1.000 | 1.000 | 1.001 | 0.682 | 0.20 | 0.293 |
| Pu239 BOBNP1 | 0.000 | 200 | 3.700 | 1.000 | 1.000 | 1.000 | 0.682 | 0.20 | 0.166 |
| Pu238 BOBNN9 | 0.002 | 200 | 3.703 | 1.000 | 1.000 | 1.001 | 0.781 | 0.20 | 0.301 |
| Pu239 BOBNN9 | 0.004 | 200 | 3.700 | 1.000 | 1.000 | 1.000 | 0.781 | 0.20 | 0.366 |
| Alpha BOBNP1 | 0.04 | 100.00 | 4.39 | 1.00 | 1.00 | 1.00 | 1.00 | 0.20 | 1.187 |
| Alpha BOBNN9 | 0.03 | 100.00 | 6.65 | 1.00 | 1.00 | 1.00 | 1.00 | 0.20 | 1.689 |
| Beta BOBNP1 | 1.10 | 100.00 | 2.60 | 1.00 | 1.00 | 1.00 | 1.00 | 0.20 | 3.017 |
| Beta BOBNN9 | 1.14 | 100.00 | 2.70 | 1.00 | 1.00 | 1.00 | 1.00 | 0.20 | 3.189 |
| Sr BOBNP1 | 1.07 | 50.00 | 2.30 | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 0.786 |
| Sr BOBNN9 | 1.015 | 50.00 | 2.18 | 1.00 | 1.00 | 1.00 | 0.79 | 1.00 | 0.887 |
| Tc99 Blank | 26.43 | 125.00 | 1.05 | 1.00 | 1.00 | 1.00 | 0.95 | 0.50 | 2.150 |
| Tritium Blank | 5.98 | 125.00 | 2.44 | 1.00 | 1.00 | 1.00 | 0.97 | 0.01 | 234.961 |
| U-total Blank | 0.00354 | MDA for Water | | | | | | | |

## RESULTS CALCULATION GROSS ALPHA/BETA AND TRITIUM

Analysis: Radiochemistry
SDG: WOO38-ITC-047

Date: 14-Sep-94
Validator: MC Webb

| Constituent | | Gross Counts per minute | Background Counts per minute | Activity of alpha fraction in beta channel | Detector Efficiency | Sample volume (L or g) | Result |
|---|---|---|---|---|---|---|---|
| | | A.3 | B.3 | C.3 | E.3 | V.3 | |
| Alpha | BOBNP1 | 0.340 | 0.040 | 1 | 4.387 | 0.2 | 2.964 |
| Alpha | BOBNN9 | 0.300 | 0.034 | 1 | 6.645 | 0.2 | 3.981 |
| Beta | BOBNP1 | 4.710 | 1.102 | 1 | 2.600 | 0.2 | 21.128 |
| Beta | BOBNN9 | 72.030 | 1.142 | 1 | 2.702 | 0.2 | 431.395 |
| | | | | | | | |
| TRITIUM | | DPM Sample | DPM Blank | Yield | Decay | Volume | |
| | BOBNP1 | 812.84 | 14.61 | 0.97 | 1.01 | 0.01 | 74351.58 |
| | BOBNN9 | 76.10 | 14.61 | 0.97 | 1.01 | 0.01 | 5721.83 |

#6

# ALPHA SPEC TRACER RECOVERY

Analysis: Radiochemistry
SDG: WOO38-ITC-047
Sample ID:

Date: 14-Sep-94
Validator: MC Webb

| Constituent | | Gross counts per minute | Background counts per minute of tracer | Detector efficiency | Activity (pCi) of tracer added to sample | %R |
|---|---|---|---|---|---|---|
| | | A.1 | B.1 | E.1 | T.1 | |
| Pu242 | BOBNP1 | 1.295 | 0.000 | 3.7 | 7.0230 | 68.226 |
| Pu242 | BOBNN9 | 1.495 | 0.004 | 3.7 | 7.0611 | 78.128 |

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9-23-94

## RELATIVE PERCENT DIFFERENCE

Analysis: Radiochemistry
SDG: WOO38-ITC-047
Sample ID:

Date: 14-Sep-94
Validator: MC Webb

| Constituent | | Original (Sample) concentration | Duplicate concentration | RPD |
|---|---|---|---|---|
| | | OS | D | |
| Pu239 | BOBNP3 | Non-detect | Non-detect | NC |
| GEA (all) | BOBNP7 | Non-detect | Non-detect | NC |
| Alpha | BOBNM5 | 7.35 | 4.92 | 39.6% |
| Beta | BOBNM5 | 654.00 | 662.50 | 1.3% |
| Sr-total | BOBNM7 | 0.13 | 0.25 | 64.6% |
| Tritium | BOBNN9 | 5724.00 | 5656.00 | 1.2% |
| Tc99 | BOBNM7 | 2.74 | 2.26 | 19.2% |
| U-total | BOBRL3 | 0.009 | 0.009 | 0.0% |

## RESULTS CALCULATION TOTAL STRONTIUM

Analysis: Radiochemistry
SDG: WOO38-ITC-047

Date: 14-Sep-94
Validator: MC Webb

| Constituent | | Gross Counts per minute | Background Counts per minute | Ingrowth correction Factor | Detector Efficiency | Carrier recovery factor | Strontium decay factor | Sample volume (L or g) | Result |
|---|---|---|---|---|---|---|---|---|---|
| | | A.4 | B.4 | I.4 | E.4 | R.4 | D.4 | V.4 | |
| Sr-total | BOBNP1 | 0.98 | 1.070 | 1.2653 | 2.299 | 0.968 | 1 | 1.00 | -0.076 |
| Sr-total | BOBNN9 | 1.06 | 1.015 | 1.2582 | 2.181 | 0.794 | 1 | 1.00 | 0.044 |
| | | | | | | | | | |
| INGROWTH FACTOR | | Sr D/C | Y D/C | delta T (hr) | e**(-Lt) | L =1.083E-2 | | | |
| | BOBNP1 | 2.299 | 2.020 | 24.50 | 0.7669 | X | X | X | 1.2653 |
| | BOBNN9 | 2.181 | 1.969 | 24.50 | 0.7669 | X | X | X | 1.2582 |

## RESULTS CALCULATION TECHNETIUM-99

Analysis: Radiochemistry
SDG: WOO38-ITC-047

Date: 14-Sep-94
Validator: MC Webb

| Constituent | | DPM Sample | DPM Blank | Detector Efficiency | Yield | Sample volume (L or g) | Result |
|---|---|---|---|---|---|---|---|
| | | A.6 | B.6 | E.6 | R.6 | V.6 | |
| Tc99 | BPBNP1 | 80.50 | 27.78 | 1.00 | 0.95 | 0.50 | 49.94 |
| Tc99 | BOBNN9 | 2241.58 | 27.78 | 1.00 | 0.95 | 0.50 | 2097.18 |

000160

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# RESULTS CALCULATION ALPHA SPEC ISOTOPES

Analysis: Radiochemistry
SDG: WOO38-ITC-047

Date: 14-Sep-94
Validator: MC Webb

| Constituent | | Gross Counts per minute | Background Counts per minute | Detector Efficiency | Tracer recovery factor | Sample volume (L or g) | Result |
|---|---|---|---|---|---|---|---|
| | | A.7 | B.7 | E.7 | R.7 | V.7 | |
| Pu238 | BOBNP1 | 0.000 | 0.001 | 3.703 | 0.682 | 0.20 | -0.0122 |
| Pu239 | BOBNP1 | 0.010 | 0.000 | 3.700 | 0.682 | 0.20 | 0.1222 |
| Pu238 | BOBNN9 | 0.000 | 0.002 | 3.703 | 0.781 | 0.20 | -0.0214 |
| Pu239 | BOBNN9 | 0.000 | 0.004 | 3.700 | 0.781 | 0.20 | -0.0427 |

## RESULTS CALCULATION TOTAL URANIUM BY LASER FLUOROMETRY

Analysis: Radiochemistry
SDG: WOO38-ITC-047

Date: 14-Sep-94
Validator: MC Webb

| Constituent | | Sample reading | Dilution factor | | | | Result |
|---|---|---|---|---|---|---|---|
| | | W.9 | I.9 | R.9 | D.9 | U.9 | |
| U-total | BOBNP1 | 3.84 | 1.00 | 1.00 | 1.00 | 1.00 | 3.84 |
| U-total | BOBNN9 | 4.42 | 1.00 | 1.00 | 1.00 | 1.00 | 4.42 |

# Laboratory Case Narratives

INTERNATIONAL TECHNOLOGY CORPORATION

# ANALYTICAL SERVICES

## CERTIFICATE OF ANALYSIS

IT Corporation
2800 George Washington Way
Richland, WA 99352
Attn: Van Pettey

June 16, 1994

Job Number: 388; 418; 428; 439; 455

This is the Certificate of Analysis for the following samples:

| | |
|---|---|
| SDG: | W0038 |
| Client Project ID: | WHC SAF-94-130 200-BP-5 Groundwater-Round-1 |
| Date Received by Lab: | April 19, April 22, April 25, April 27 and April 29, 1994 |
| Number of Samples: | Twenty (20) |
| Sample Type: | Water |

### I. Introduction

On April 19, April 22, April 25, April 27 and April 29, 1994, twenty (20) water samples arrived at ITAS-Richland, Washington and were transferred to ITAS-Knoxville for chemical analysis. Sample BOBNP1 was received with a pH of 10. See attached CUR #1486. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

### II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results.

The samples were analyzed for Target Analyte List (TAL) metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) in accordance with the EPA CLP ILM03 Statement of Work.

Reviewed and Approved:

Sheree A. Schneider

Sheree' A. Schneider
Project Manager

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
June 16, 1994
Job Number: 428; 439; 455; 388; 418
Client Project ID: WHC SAF-94-130 200-BP-5 Groundwater-Round-1

II. Analytical Results/Methodology (Continued)

The samples were analyzed for nitrate-nitrite based on EPA method 353.2.

The samples were analyzed for sulfate based on EPA method 375.4.

The alkalinity of the samples was determined using EPA method 310.1.

The total dissolved solids (TDS) content of the samples was determined using EPA method 160.1.

The samples were analyzed for anions by ion chromatography using EPA method 300.0.

III. Quality Control

The samples for work order #388 were digested on May 3, 1994 for ICP and GFAA. The GFAA analyses for selenium and bismuth were performed from May 6 through May 14, 1994; the remaining metals were analyzed by ICP on May 6, 1994. All run QC was acceptable. Samples were batched with QC from work order #379. The initial calibration verification standard/LCS and continuing calibration verification standard for cyanide were outside acceptance limits on the high side. However, as no cyanide was detected in the sample this does not adversely affect the results. The linear range for silicon was determined on May 24, 1994.

The samples for work order #418 were digested on May 20, 1994 for ICP and May 5, 1994 for GFAA. The GFAA analyses for selenium and bismuth were performed on May 11 and May 24, 1994; the remaining metals were analyzed by ICP on May 24, 1994. All run QC was acceptable. Samples were batched with QC from work order #379. The LCSW/ICV for cyanide exceeded acceptance criteria by 3%.

The samples for work order #428 were digested on May 26, 1994 for ICP and May 10, 1994 for GFAA. The GFAA analyses for selenium and bismuth were performed from May 12 through May 16, 1994; the remaining metals were analyzed by ICP on June 1, 1994. All run QC was acceptable. A duplicate/spike pair was prepared using sample numbers BOBNP7 and BOBNP8. Spike recovery (accuracy) results were within acceptance limits for all requested parameters. As the silicon concentration in sample BOBNP8 was greater than four times (4X) the spike added, spiking criteria did not apply for this analyte. Duplicate RPD (precision) results were within acceptance limits for all requested parameters except for iron by ICP analysis on sample BOBNP7. Poor precision for this analyte appears to be attributable to contamination during sample preparation. The samples were analyzed for cyanide outside of holding time due to original analysis results missing one sample and to confirm positive value on sample BOBNM5.

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

IT Corporation
June 16, 1994
Job Number: 428; 439; 455; 388; 418
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III. Quality Control (Continued)

The samples for work order #439 were digested on May 11, 1994 for ICP and GFAA. The GFAA analyses for selenium and bismuth were performed from May 12 through May 16, 1994; the remaining metals were analyzed by ICP on May 24, 1994. All run QC was acceptable. The ICV/LCS for cyanide was outside acceptance limits on the high side by 3%. No cyanide was detected in the samples. The samples were batched with QC from work order #428.

The samples for work order #455 were digested on May 12, 1994 for ICP and GFAA. The GFAA analyses for selenium and bismuth were performed from May 16 through May 20, 1994; the remaining metals were analyzed by ICP on June 2, 1994. All run QC was acceptable. The ICV/LCS for cyanide was slightly outside acceptance limits on the high side. As the samples contained this analyte slightly above the CRDL, it should be noted that the sample results may be partially elevated. The samples were batched with QC from work order #428.

Data were reported with qualifiers as follows:

"C" Qualifiers

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
B - Value greater than instrument detection limit, but less than contract required quantitation limit.

"Q" Qualifiers

* - Duplicate analysis outside control limits.
N - Spiked sample recovery outside control limits.
W - Post-digestion spike for GFAA was out of control limits (85-115%), while sample absorbance was less than 50% of spike absorbance.
S - The reported value was determined by method of standard additions.

"M" Qualifiers

P - Analysis performed by ICP.
V - Analysis performed by CVAA.
F - Analysis performed by GFAA.
C - Cyanide analysis by manual distillation/colorimetric determination.

Miscellaneous

D - Duplicate.
S - Spike.
NR - Not required.
G - Native analyte > 4 times spike added, therefore, acceptance criteria do not apply.
X - Detection limits higher than normal due to sample matrix interferences.

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IT Corporation
June 16, 1994
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III. Quality Control (Continued)

A duplicate analysis was performed for alkalinity using sample number BOBNP7. Results were acceptable.

Matrix spike and matrix spike duplicate analyses were performed for nitrate/nitrite using sample number BOBNP7. Results were acceptable.

Matrix spike and matrix spike duplicate analyses were performed for sulfate using sample number BOBNP7. Results were acceptable.

A duplicate analysis was performed for total dissolved solids (TDS) using sample number BOBNP7. Results were acceptable.

Matrix spike and matrix spike duplicate analyses for anions were performed using sample number BOBNP7. Results were acceptable.

IT Corporation
June 16, 1994
Job Number: 428; 439; 455; 388; 418
Client Project ID: WHC SAF-94-130 200-BP-5 Groundwater-Round-1

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

III. Quality Control (Continued)

Table I is a cross reference between client sample IDs and laboratory sample IDs.

TABLE I

| Knoxville ID | Richland ID | WHC ID | Test |
|---|---|---|---|
| AA7389 | 404427-01A | BOBNP7 | METALS-T |
| AA7390 | 404427-01B | " | ANIONS |
| AA7391 | 404427-01C | " | NO2NO3 |
| AA7392 | 404427-01D | " | ALKALINITY |
| AA7393 | 404427-01E | " | TDS |
| AA7394 | 404427-01F | " | SULFATE |
| AA7395 | 404427-01G | " | CYANIDE |
| AA7410 | 404427-02A | BOBNP8 | METALS-D |
| AA7396 | 404427-03A | BOBNP3 | METALS-T |
| AA7397 | 404427-03B | " | ANIONS |
| AA7398 | 404427-03C | " | NO2NO3 |
| AA7399 | 404427-03D | " | ALKALINITY |
| AA7400 | 404427-03E | " | TDS |
| AA7401 | 404427-03F | " | SULFATE |
| AA7402 | 404427-03G | " | CYANIDE |
| AA7411 | 404427-04A | BOBNP4 | METALS-D |
| AA7403 | 404427-05A | BOBNM5 | METALS -T |
| AA7404 | 404427-05B | " | ANIONS |
| AA7405 | 404427-05C | " | NO2NO3 |

IT Corporation
June 16, 1994
Job Number: 428; 439; 455; 388; 418
Client Project ID: WHC SAF-94-130 200-BP-5 Groundwater-Round-1

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

III. Quality Control (Continued)

Table I is a cross reference between client sample IDs and laboratory sample IDs.

TABLE I

| Knoxville ID | Richland ID | WHC ID | Test |
|---|---|---|---|
| AA7406 | 404427-05D | BOBNM5 | ALKALINITY |
| AA7407 | 404427-05E | " | TDS |
| AA7408 | 404427-05F | " | SULFATE |
| AA7409 | 404427-05G | " | CYANIDE |
| AA7412 | 404427-06A | BOBNM6 | METALS-D |
| AA7812 | 404495-01A | BOBNN1 | METALS-T |
| AA7813 | 404495-01B | " | ANIONS |
| AA7814 | 404495-01C | " | NO2NO3 |
| AA7815 | 404495-01D | " | ALKALINITY |
| AA7816 | 404495-01E | " | TDS |
| AA7818 | 404495-01G | " | CYANIDE |
| AA7826 | 404495-02A | BOBNN2 | METALS-D |
| AA7819 | 404495-03A | BOBRL7 | METALS-T |
| AA7820 | 404495-03B | " | ANIONS |
| AA7821 | 404495-03C | " | NO2NO3 |
| AA7822 | 404495-03D | " | ALKALINITY |
| AA7823 | 404495-03E | " | TDS |
| AA7824 | 404495-03G | " | CYANIDE |
| AA7827 | 404495-04A | BOBRL8 | METALS-D |

IT Corporation
June 16, 1994
Job Number: 428; 439; 455; 388; 418
Client Project ID: WHC SAF-94-130 200-BP-5 Groundwater-Round-1

IT ANALYTICAL SERVICES
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KNOXVILLE, TN

III. Quality Control (Continued)

Table I is a cross reference between client sample IDs and laboratory sample IDs.

TABLE I

| Knoxville ID | Richland ID | WHC ID | Test |
|---|---|---|---|
| AA7571 | 404458-01A | BOBNP5 | METALS-T |
| AA7572 | 404458-01B | " | ANIONS |
| AA7573 | 404458-01C | " | NO2NO3 |
| AA7574 | 404458-01D | " | ALKALINITY |
| AA7575 | 404458-01E | " | TDS |
| AA7576 | 404458-01F | " | SULFATE |
| AA7577 | 404458-01G | " | CYANIDE |
| AA7585 | 404458-02A | BOBNP6 | METALS-D |
| AA7578 | 404458-03A | BOBRL3 | METALS-T |
| AA7579 | 404458-03B | " | ANIONS |
| AA7580 | 404458-03C | " | NO2NO3 |
| AA7581 | 404458-03D | " | ALKALINITY |
| AA7582 | 404458-03E | " | TDS |
| AA7853 | 404458-03F | " | SULFATE |
| AA7584 | 404458-03G | " | CYANIDE |
| AA7587 | 404458-04A | BOBRL4 | METALS-D |

IT Corporation
June 16, 1994
Job Number: 428; 439; 455; 388; 418
Client Project ID: WHC SAF-94-130 200-BP-5 Groundwater-Round-1

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

III. Quality Control (Continued)

Table I is a cross reference between client sample IDs and laboratory sample IDs.

TABLE I

| Knoxville ID | Richland ID | WHC ID | Test |
|---|---|---|---|
| AA6895 | 404320-01A | BOBNP1 | METALS-T |
| AA6896 | 404320-01B | " | ANIONS |
| AA6897 | 404320-01C | " | NO2NO3 |
| AA6898 | 404320-01D | " | ALKALINITY |
| AA6899 | 404320-01E | " | TDS |
| AA6900 | 404320-01F | " | SULFATE |
| AA6901 | 404320-01G | " | CYANIDE |
| AA6902 | 404320-02A | BOBNP2 | METALS-D |
| AA7287 | 404406-01A | BOBNN9 | METALS-T |
| AA7288 | 404406-01B | " | ANIONS |
| AA7289 | 404406-01C | " | NO2NO3 |
| AA7290 | 404406-01D | " | ALKALINITY |
| AA7291 | 404406-01E | " | TDS |
| AA7292 | 404406-01F | " | SULFATE |
| AA7293 | 404406-01G | " | CYANIDE |
| AA7301 | 404406-02A | BOBNP0 | METALS-D |

IT Corporation
June 16, 1994
Job Number: 428; 439; 455; 388; 418
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IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

III. Quality Control (Continued)

Table I is a cross reference between client sample IDs and laboratory sample IDs.

TABLE I

| Knoxville ID | Richland ID | WHC ID | Test |
|---|---|---|---|
| AA7294 | 404320-03A | BOBNM7 | METALS-T |
| AA7295 | 404320-03B | " | ANIONS |
| AA7296 | 404320-03C | " | NO2NO3 |
| AA7297 | 404320-03D | " | ALKALINITY |
| AA7298 | 404320-03E | " | TDS |
| AA7299 | 404320-03F | " | SULFATE |
| AA7300 | 404320-03G | " | CYANIDE |
| AA7302 | 404320-04A | BOBNM8 | METALS-D |

IT Corporation
June 16, 1994
Job Number: 428; 439; 455; 388; 418
Client Project ID: WHC SAF-94-130 200-BP-5 Groundwater-Round-1

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

## IV. Certification

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the laboratory manager or his designee, as verified by the following signature:

Reviewed and Approved:

Sheree' A. Schneider
Project Manager

INTERNATIONAL TECHNOLOGY CORPORATION

# CERTIFICATE OF ANALYSIS

Westinghouse Hanford Company
P.O. Box 1970
Richland, WA 99352

June 14, 1994

Attention: J.A.Lerch

---

| | | |
|---|---|---|
| SAF Number | : | 94-130 |
| Date SDG Closed | : | April 27, 1994 |
| Number of Samples | : | Ten (10) |
| Sample Type | : | Water |
| SDG Number | : | W0038 |
| Data Deliverable | : | Stand Alone |

---

## I. Introduction

On April 18, 21, 22, 25, and 27, 1994, ten water samples were received by ITAS-Richland for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the WHC specific IDs:

| ITAS-Richland ID | WHC ID | Matrix | Date of Receipt |
|---|---|---|---|
| 404321-01A | B0BNP1 | Water | 4/18/94 |
| 404407-01A | B0BNN9 | Water | 4/21/94 |
| 404407-02A | B0BNM7 | Water | 4/21/94 |
| 404428-01A | B0BNP7 | Water | 4/22/94 |
| 404428-02A | B0BNP3 | Water | 4/22/94 |
| 404428-03A | B0BNM5 | Water | 4/22/94 |
| 404459-01A | B0BNP5 | Water | 4/25/94 |
| 404459-02A | B0BRL3 | Water | 4/25/94 |
| 404496-01A | B0BNN1 | Water | 4/27/94 |
| 404496-02A | B0BRL7 | Water | 4/27/94 |

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II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were:

**Alpha Spectroscopy**
Plutonium-238, -239/40 by method ITAS-RD-3209
**Gamma Spectroscopy**
Gamma Scan by method ITAS-RD-3219
**Gas Proportional Counting**
Gross Alpha by method ITAS-RD-3222
Gross Beta by method ITAS-RD-3222
Strontium-90 by method ITAS-RD-3204
**Liquid Scintillation Counting**
Technetium-99 by method ITAS-IT-RS-0001
Tritium by method ITAS-RD-3205
**Total Uranium**
Total Uranium by method ITAS-RD-4200

III. Quality Control

The analytical results for each analysis performed under SDG W0038 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate. Any exceptions have been noted in the "Comments" section.

Quality control sample results are reported in the same units as sample results.

IV. Comments

Results from the initial radioactivity screening of these samples classified them as Category I.

9/14/94
0006

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**Alpha Spectroscopy**

Plutonium-238, -239/40 by method ITAS-RD-3209
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BNP3) results are within contractual limits.

**Gamma Spectroscopy**

Gamma Scan by method ITAS-RD-3219
The detection limit for Eu-152 was not met on the first count of samples (B0BNN9) and (B0BNP5). The detection limits were achieved for all analytes on the recount. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BNP7) results are within contractual limits.

**Gas Proportional Counting**

Gross Alpha by method ITAS-RD-3222
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BNM5) results are within contractual limits.

Gross Beta by method ITAS-RD-3222
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BNM5) results are within contractual limits.

Strontium-90 by method ITAS-RD-3204
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BNM7) results are within contractual requirements.

**Liquid Scintillation Counting**
Technetium-99 by method ITAS-IT-RS-0001
One matrix spike was analyzed with this batch. The total propagated uncertainty on the matrix spike result is approximately equivalent to the spike level due to the high level of sample activity (matrix effect). The matrix spike is accepted and reported with the low resultant spike yield (49.2%). The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BNM7) results are within contractual requirements.

9/15/94
Jon
1007

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Tritium by method ITAS-RD-3205
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BNN9) results are within contractual requirements.

**Total Uranium**

Total Uranium by method ITAS-RD-4200
The sample batch was reanalyzed due to quality control sample failure. The reanalysis results are accepted and reported. Two matrix spikes were analyzed with the batch. No matrix spike yield correction of the sample results was performed. The LCS, batch blank, sample and sample duplicate (duplicate of B0BRL3) results are within contractual requirements.

I certify that this Certificate of Analysis 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.

Reviewed and approved:

Suzanne Gaines

Suzanne Gaines
Project Manager

9/15/94
0208

# Chain-of-Custody Information

9613476.1340

# OFFICE OF SAMPLE MANAGEMENT

# RECORD OF DISPOSITION

ROD-94-0107
Record of Disposition No.

DATE: May 2, 1994 | LABORATORY: IT/TMA

PROJECT TITLE/NO.: 200-BP-5/94-130 | NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

All samples which were not analyzed prior to this notification.

DESCRIPTION OF EVENT:

The analysis for sulfate by methods EPA 300.0 and EPA 375.4 was requested on the Sampling Authorization Form (SAF). This redundancy in analysis is not necessary.

DISPOSITION OF SAMPLES:

Discontinue analysis for sulfate by EPA 375.4.

APPROVAL SIGNATURES:

R. C. Smith/ Claytie Smith — 5/4/94
OSM Project Coordinator (Print/Sign Name) — Date

D. B. Erb/ David B. Erb — 5/3/94
Technical Representative (Print/Sign Name) — Date

N/A
Quality Assurance (Print/Sign Name) — Date

p. 178A

April 20, 1994

VAN PETTY
**IT RICHLAND ANALYTICAL SERVICES**
2800 GEORGE WASHINGTON WAY
RICHLAND, WA 99352

Re: WESTINGHOUSE HANFORD COMPANY
P.O. #

Dear VAN PETTY:

This confirms the receipt of samples for analysis on April 19, 1994 at our ITAS-KNOXVILLE (MIDDLEBROOK FACILITY) laboratory. These samples were received in good condition unless otherwise noted on an attached Condition Upon Receipt variance form. The samples were logged into our tracking system as Work Order #388. Please review the attached outline for samples received and test assignments for any discrepancies. If you discover any problems please call me at (615) 588-6401.

We appreciate the opportunity to support your analytical requirements. Your report will be sent to you at the above address on or before May 24, 1994 unless advised otherwise.

Again, if you have any questions or comments on our performance, please feel free to call me at (615) 588-6401.

Sincerely,

Sheree Schneider

SHEREE SCHNEIDER
Project Manager
ITAS-KNOXVILLE (MIDDLEBROOK FACILITY)

June 8, 1994

VAN PETTY
**IT RICHLAND ANALYTICAL SERVICES**
2800 GEORGE WASHINGTON WAY
RICHLAND, WA 99352

Re: WESTINGHOUSE HANFORD COMPANY
P.O. #

Dear VAN PETTY:

This confirms the receipt of samples for analysis on April 22, 1994 at our ITAS-KNOXVILLE (MIDDLEBROOK FACILITY) laboratory. These samples were received in good condition unless otherwise noted on an attached Condition Upon Receipt variance form. The samples were logged into our tracking system as Work Order #418. Please review the attached outline for samples received and test assignments for any discrepancies. If you discover any problems please call me at (615) 588-6401.

We appreciate the opportunity to support your analytical requirements. Your report will be sent to you at the above address on or before June 3, 1994 unless advised otherwise.

Again, if you have any questions or comments on our performance, please feel free to call me at (615) 588-6401.

Sincerely,

Vicki Shaver for
SHEREE SCHNEIDER
Project Manager
ITAS-KNOXVILLE (MIDDLEBROOK FACILITY)

June 7, 1994

VAN PETTY
**IT RICHLAND ANALYTICAL SERVICES**
2800 GEORGE WASHINGTON WAY
RICHLAND, WA 99352

Re: WESTINGHOUSE HANFORD COMPANY
P.O. #

Dear VAN PETTY:

This confirms the receipt of samples for analysis on April 25, 1994 at our ITAS-KNOXVILLE (MIDDLEBROOK FACILITY) laboratory. These samples were received in good condition unless otherwise noted on an attached Condition Upon Receipt variance form. The samples were logged into our tracking system as Work Order #428. Please review the attached outline for samples received and test assignments for any discrepancies. If you discover any problems please call me at (615) 588-6401.

We appreciate the opportunity to support your analytical requirements. Your report will be sent to you at the above address on or before June 3, 1994 unless advised otherwise.

Again, if you have any questions or comments on our performance, please feel free to call me at (615) 588-6401.

Sincerely,

Vicki Shaw for
SHEREE SCHNEIDER
Project Manager
ITAS-KNOXVILLE (MIDDLEBROOK FACILITY)

June 7, 1994

VAN PETTY
**IT RICHLAND ANALYTICAL SERVICES**
2800 GEORGE WASHINGTON WAY
RICHLAND, WA 99352

Re: WESTINGHOUSE HANFORD COMPANY
P.O. #

Dear VAN PETTY:

This confirms the receipt of samples for analysis on April 27, 1994 at our ITAS-KNOXVILLE (MIDDLEBROOK FACILITY) laboratory. These samples were received in good condition unless otherwise noted on an attached Condition Upon Receipt variance form. The samples were logged into our tracking system as Work Order #439. Please review the attached outline for samples received and test assignments for any discrepancies. If you discover any problems please call me at (615) 588-6401.

We appreciate the opportunity to support your analytical requirements. Your report will be sent to you at the above address on or before June 3, 1994 unless advised otherwise.

Again, if you have any questions or comments on our performance, please feel free to call me at (615) 588-6401.

Sincerely,

Vicki Graves for
SHEREE SCHNEIDER
Project Manager
ITAS-KNOXVILLE (MIDDLEBROOK FACILITY)

June 7, 1994

VAN PETTY
**IT RICHLAND ANALYTICAL SERVICES**
2800 GEORGE WASHINGTON WAY
RICHLAND, WA 99352

Re: WESTINGHOUSE HANFORD COMPANY
P.O. #

Dear VAN PETTY:

This confirms the receipt of samples for analysis on April 29, 1994 at our ITAS-KNOXVILLE (MIDDLEBROOK FACILITY) laboratory. These samples were received in good condition unless otherwise noted on an attached Condition Upon Receipt variance form. The samples were logged into our tracking system as Work Order #455. Please review the attached outline for samples received and test assignments for any discrepancies. If you discover any problems please call me at (615) 588-6401.

We appreciate the opportunity to support your analytical requirements. Your report will be sent to you at the above address on or before June 3, 1994 unless advised otherwise.

Again, if you have any questions or comments on our performance, please feel free to call me at (615) 588-6401.

Sincerely,

Vicki Shaw for

SHEREE SCHNEIDER
Project Manager
ITAS-KNOXVILLE (MIDDLEBROOK FACILITY)

9613476.1346

000023.C

CuR# 1486

Work Order No.: 388

# Condition Upon Receipt Variance Report

ITAS - KNOXVILLE Laboratory

Client: Westinghouse Hanford

Date: 4/20/94

Project No: 94-130

Initiated by: Bryan Blomquist

Analysis Requested: Cyanide

RFA/COC Numbers: 340387

Client Sample Numbers Affected: W0432001G

Condition/Variance (Check all that apply):

1. ☐ Not enough sample received for proper analysis. Received approximately: _____
2. ☐ Sample received broken/leaking.
3. ☑ Sample received without proper preservative.
   - ☐ Cooler temperature not within 4°C ± 2°C. Record temperature: _____
   - ☑ pH 10 should be >12
   - ☐ other: _____
4. ☐ Sample received in improper container.
5. ☐ Sample received without proper paperwork. Explain: _____
6. ☐ Paperwork received without sample.
7. ☐ No sample ID on sample container.
8. ☐ Custody tape disturbed/broken/missing.
9. ☐ Sample splits performed by lab.
10. ☐ Volatile sample received with approximately _____ mm headspace.
11. ☐ Sample ID on container does not match sample ID on paperwork. Explain: _____
12. ☐ All coolers on airbill not received with shipment.
13. ☐ Other (explain below): _____

Notes: _____

Corrective Action:

☐ Client's Name: _____ Informed verbally on: _____ By: _____

☐ Client's Name: _____ Informed in writing on: _____ By: _____

☐ Sample(s) processed "as is". Comments: _____

☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: Kenneth R. Thomas Date: 5/19/94

Project Management Review: _____ Date: _____

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

000184

CUR # 1525

Work Order No.: 428

# Condition Upon Receipt Variance Report

ITAS - KNOXVILLE Laboratory

Client: Westinghouse Hanford

Date: 4/25/94

Project No: 94-130

Initiated by: Bryan Blomquist

Analysis Requested: Cyanide, TDS

RFA/COC Numbers: 453680

Client Sample Numbers Affected: 404427-01G, 404427-03G, 404427-05G, 404427-01E

**Condition/Variance (Check all that apply):**

1. ☐ Not enough sample received for proper analysis. Received approximately: _____
2. ☑ Sample received broken/leaking. 404427-01E
3. ☑ Sample received without proper preservative.
   - ☐ Cooler temperature not within 4°C ± 2°C. Record temperature: _____
   - ☑ pH pH = 11
   - ☐ other: _____
4. ☐ Sample received in improper container.
5. ☐ Sample received without proper paperwork. Explain: _____
6. ☐ Paperwork received without sample.
7. ☐ No sample ID on sample container.
8. ☐ Custody tape disturbed/broken/missing.
9. ☐ Sample splits performed by lab.
10. ☐ Volatile sample received with approximately _____ mm headspace.
11. ☐ Sample ID on container does not match sample ID on paperwork. Explain: _____
12. ☐ All coolers on airbill not received with shipment.
13. ☑ Other (explain below): Anions (No) Received Past H.T.

Notes:

**Corrective Action:**

- ☐ Client's Name: _____ Informed verbally on: _____ By: _____
- ☐ Client's Name: _____ Informed in writing on: _____ By: _____
- ☐ Sample(s) processed "as is". Comments: _____
- ☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: Kenny A Klemm Date: 4-26-94

Project Management Review: _____ Date: _____

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

CuR# 1536

Work Order No.: 439

# Condition Upon Receipt Variance Report

## ITAS - KNOXVILLE Laboratory

Client: Westinghouse HANFORD

Date: 4/27/94

Project No: 94-130

Initiated by: Bryan Blomquist

Analysis Requested: CN⁻

RFA/COC Numbers: 453604

Client Sample Numbers Affected: 40445801G 40445863-G

Condition/Variance (Check all that apply):

1. ☐ Not enough sample received for proper analysis. Received approximately: _____
2. ☐ Sample received broken/leaking.
3. ☑ Sample received without proper preservative.
   - ☐ Cooler temperature not within 4°C ± 2°C. Record temperature: _____
   - ☑ pH 801 = pH 10, 803 = pH 11
   - ☐ other: _____
4. ☐ Sample received in improper container.
5. ☐ Sample received without proper paperwork. Explain: _____
6. ☐ Paperwork received without sample.
7. ☐ No sample ID on sample container.
8. ☐ Custody tape disturbed/broken/missing.
9. ☐ Sample splits performed by lab.
10. ☐ Volatile sample received with approximately _____ mm headspace.
11. ☐ Sample ID on container does not match sample ID on paperwork. Explain: _____
12. ☐ All coolers on airbill not received with shipment.
13. ☐ Other (explain below): _____

Notes: _____

Corrective Action:

☐ Client's Name: _____ Informed verbally on: _____ By: _____

☐ Client's Name: _____ Informed in writing on: _____ By: _____

☐ Sample(s) processed "as is". Comments: _____

☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: _____ Date: _____

Project Management Review: _____ Date: _____

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

CUR #1551

Work Order No.: 455

# Condition Upon Receipt Variance Report

## ITAS - KNOXVILLE Laboratory

Client: Westinghouse Hanford Date: 4/29/94

Project No: SAF 94-130 Initiated by: Bryan Blomquist

Analysis Requested: Cyanide RFA/COC Numbers: 453607

Client Sample Numbers Affected: 404495-01G, 404495-03BRG

Condition/Variance (Check all that apply):

1. ☐ Not enough sample received for proper analysis. Received approximately: _____
2. ☐ Sample received broken/leaking.
3. ☑ Sample received without proper preservative.
   - ☐ Cooler temperature not within 4°C ± 2°C. Record temperature: _____
   - ☑ pH 10
   - ☐ other: _____
4. ☐ Sample received in improper container.
5. ☐ Sample received without proper paperwork. Explain: _____
6. ☐ Paperwork received without sample.
7. ☐ No sample ID on sample container.
8. ☐ Custody tape disturbed/broken/missing.
9. ☐ Sample splits performed by lab.
10. ☐ Volatile sample received with approximately _____ mm headspace.
11. ☐ Sample ID on container does not match sample ID on paperwork. Explain: _____
12. ☐ All coolers on airbill not received with shipment.
13. ☐ Other (explain below): _____

Notes: _____

Corrective Action:

- ☐ Client's Name: _____ Informed verbally on: _____ By: _____
- ☐ Client's Name: _____ Informed in writing on: _____ By: _____
- ☐ Sample(s) processed "as is". Comments: _____
- ☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: Kenya A. Klemm Date: 4-29-94

Project Management Review: _____ Date: _____

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

# Westinghouse Hanford Company

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

000188

Data Turnaround: [ ] Priority [X] Normal

| | | |
|---|---|---|
| Collector: B. T. WHITTEN | Company Contact: P. H. Butcher | Telephone No.: (509) 376-4388 |
| Project Designation: 200-BP-5 | Sampling Location: 200 East | SAF No.: 94-130 |
| Ice Chest No.: ER-65 | Field Logbook No.: EFL-1123 | Method of Shipment: HAND DELIVERED |
| Shipped To: IT | Offsite Property No.: W94-C-C33X-52 | Bill of Lading/Air Bill No.: W04X= |
| Possible Sample Hazards/Remarks: None | | |

| Sample No. | Matrix* | Date Sampled | Time Sampled | Preservative | HNO3 | COOL 4C | H2SO4 | COOL 4C | COOL 4C | COOL 4C | NaOH | HNO3 | NONE | HCl | HNO3 | N/A | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Type of Container | S P | G | P | P | P | P | P | P | Gs | P | S P | G | | | |
| | | | | No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | | | |
| | | | | Volume | 1L | 500 mL | 500 mL | 250 mL | 250 mL | 250 mL | 1L | 4L | 1L | 2L | 1L | 20mL | | | |
| | | | | SAMPLE ANALYSIS | *1 | IC ANIONS-F, Cl, SO4, NO2 PO4. | NO2, NO3. | ALKA-LINITY | TDS | SULFATE | CYANIDE | *2 | TRITIUM | Tc-99 | *3 | TOTAL ALKALINITY | | | |
| | | | | 404406 | A | B | C | D | E | F | G | 404407 01 | | | I | | | | |
| 01 BOBN N9 | W | 04/19/94 | | | X | X | X | X | X | X | X | X | X | X | | X | | | |
| 02 BOBN PO | W | 04/19/94 | | | | | | | | | | | | | XA | | | | |
| | | | | | | | | | | | | | | | | | | | |
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9613476 1350

| CHAIN OF POSSESSION | Sign/Print Names | |
|---|---|---|
| Relinquished By: R. Bud Lee (K.D. Lee) | Date/Time: 04/19/94 1354 | Received By: L Sweeney L Sweeney | Date/Time: 4/19/94 1354 |
| Relinquished By: L Sweeney L Sweeney | Date/Time: 4/21/94 1210 | Received By: E Boyd IT | Date/Time: 4-21-94 1210 |
| Relinquished By: | Date/Time: | Received By: | Date/Time: |
| Relinquished By: | Date/Time: | Received By: | Date/Time: |

SPECIAL INSTRUCTIONS

*1. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (UNFILTERED). *2. GROSS ALPHA/BETA, GAMMA SPEC (to include Cs-137, Co-60, Ru-106), Pu-238/239/240, Sr-90, TOTAL URANIUM. *3. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (FILTERED). DATA DELIVERABLE - STANDALONE

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

000189

**Westinghouse Hanford Company**

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: ☐ Priority ☒ Normal

| | | |
|---|---|---|
| Collector | Company Contact: P. H. Butcher | Telephone No.: (509) 376-4388 |
| Project Designation: 200-BP-5 | Sampling Location: 200 East | SAF No.: 94-130 |
| Ice Chest No.: ER-7 | Field Logbook No.: EFL-1125 | Method of Shipment: HAND DELIVERED |
| Shipped To: IT | Offsite Property No.: W74-0-0336-50 | Bill of Lading/Air Bill No.: NOWE |
| Possible Sample Hazards/Remarks: None | | |

| SAMPLE ANALYSIS | Preservative | Type of Container | No. of Container(s) | Volume | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Special Handling and/or Storage: Cool to 4 C. | HNO3 | P | 1 | 1L | *1 | | | | | | | | | | | | | |
| | COOL 4C | G | 1 | 500 mL | IC ANIONS-F, Cl, SO4, NO2 PO4. | | | | | | | | | | | | | |
| | H2SO4 | P | 1 | 500 mL | NO2, NO3. | | | | | | | | | | | | | |
| | COOL 4C | P | 1 | 250 mL | ALKA-LINITY | | | | | | | | | | | | | |
| | COOL 4C | P | 1 | 250 mL | TDS | | | | | | | | | | | | | |
| | COOL 4C | P | 1 | 250 mL | SULFATE | | | | | | | | | | | | | |
| | NaOH | P | 1 | 1L | CYANIDE | | | | | | | | | | | | | |
| | HNO3 | P | 2 | 4L | *2 | | | | | | | | | | | | | |
| | NONE | Gs | 2 | 1L | TRITIUM | | | | | | | | | | | | | |
| | HCl | P | 1 | 2L | Tc-99 | | | | | | | | | | | | | |
| | HNO3 | P | 1 | 1L | *3 | | | | | | | | | | | | | |
| | N/A | G | 1 | 2 mL | TOTAL ACTIVITY | | | | | | | | | | | | | |
| 404406 | | | | | A | B | C | D | E | F | G | 40440702 | | | | | | |

| Sample No. | Matrix* | Date Sampled | Time Sampled | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 03 BOBNM7 | W | 04/20/94 | | X | X | X | X | X | X | X | X | X | X | | X | | |
| 04 BOBNM8 | W | 04/20/94 | | | | | | | | | | | | XA | | | |
| | | | | | | | | | | | | | | | | | |
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**CHAIN OF POSSESSION** — Sign/Print Names

| Relinquished By | Date/Time | Received By | Date/Time |
|---|---|---|---|
| P. H. Butcher | 4/20/94 1310 | L. Sweeney | 4/20/94 1310 |
| L. Sweeney | 4/21/94 1210 | R. Boyd | 4-21-94 1210 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

*1. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (UNFILTERED). *2. GROSS ALPHA/BETA, GAMMA SPEC (to include Cs-137, Co-60, Ru-106), Pu-238/239/240, Sr-90, TOTAL URANIUM. *3. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (FILTERED). DATA DELIVERABLE - STANDALONE

**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

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

0001190

**Westinghouse Hanford Company**

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priority [X] Normal

| | | |
|---|---|---|
| Collector: K. D. Lee | Company Contact: P. H. Butcher | Telephone No.: (509) 376-4388 |
| Project Designation: 200-BP-5 | Sampling Location: 200 East | SAF No.: 94-130 |
| Ice Chest No.: SMC144 | Field Logbook No.: EFL-1125 | Method of Shipment: HAND DELIVERED |
| Shipped To: IT | Offsite Property No.: W94-0-0518-5 | Bill of Lading/Air Bill No.: NONE |
| Possible Sample Hazards/Remarks: None | | |

| Sample No. | Matrix* | Date Sampled | Time Sampled | Preservative | HNO3 | COOL 4C | H2SO4 | COOL 4C | COOL 4C | COOL 4C | NaOH | HNO3 | NONE | HCl | HNO3 | N/a | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Type of Container | G P | G | P | P | P | P | P | P | Gs | P | G P | G | | | |
| | | | | No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | | | |
| | | | | Volume | 1L | 500 mL | 500 mL | 250 mL | 250 mL | 250 mL | 1L | 4L | 1L | 2L | 1L | 20 mL | | | |
| SAMPLE ANALYSIS 404427 | | | | | *1 A | IC ANIONS-F, Cl, SO4, NO2 PO4. B | NO2, NO3. C | ALKA-LINITY D | TDS E | SULFATE F | CYANIDE G | *2 404428 | TRITIUM 01 | Tc-99 | *3 02 A | TOTAL ACTIVITY | | | |
| BOBNP7 | 01 | W | 04/21/94 | 1142 | X | X | X | X | X | X | X | X | X | X | | X | | | |
| BOBNP8 | 02 | W | 04/21/94 | 1142 | | | | | | | | | | | X | | | | |
| | | | | | | | | | | | | | | | | | | | |
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**CHAIN OF POSSESSION**

| Relinquished By | Date/Time | Received By | Date/Time |
|---|---|---|---|
| K. D. Lee K. D. Lee | 04/21/94 1305 | L Sweeney L Sweeney | 4/21/94 1305 |
| L Sweeney L Sweeney | 4/22/94 1400 | R. Boyd IT | 4/22/94 1400 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

*1. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (UNFILTERED). *2. GROSS ALPHA/BETA, GAMMA SPEC (to include Cs-137, Co-60, Ru-106), Pu-238/239/240, Sr-90, TOTAL URANIUM. *3. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (FILTERED). DATA DELIVERABLE - STANDALONE

**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

**FINAL SAMPLE DISPOSITION**: Disposal Method | Disposed By | Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9613476.1352

0001191

**Westinghouse Hanford Company**

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priority [X] Normal

| | | |
|---|---|---|
| Collector: K.D Lee | Company Contact: P. H. Butcher | Telephone No.: (509) 376-4388 |
| Project Designation: 200-BP-5 | Sampling Location: 200 East | SAF No.: 94-130 |
| Ice Chest No.: ER-05 | Field Logbook No.: EFL-1125 | Method of Shipment: HAND DELIVERED |
| Shipped To: IT | Offsite Property No.: W94-0-0518-6 | Bill of Lading/Air Bill No.: NONE |
| Possible Sample Hazards/Remarks: None | | |

| Preservative | HNO3 | COOL 4C | H2SO4 | COOL 4C | COOL 4C | COOL 4C | NaOH | HNO3 | NONE | HCl | HNO3 | N/A | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type of Container | P G | G | P | P | P | P | P | P | Gs | P | P G | G | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | | | |
| Special Handling and/or Storage: Cool to 4 C. — Volume | 1L | 500 mL | 500 mL | 250 mL | 250 mL | 250 mL | 1L | 4L | 1L | 2L | 1L | 2 mL | | | |
| SAMPLE ANALYSIS: 404427 | *1 A | IC ANIONS-F, Cl, SO4, NO2 PO4. B | NO2, NO3. C | ALKA-LINITY D | TDS E | SULFATE F | CYANIDE G | *2 404 | TRITIUM 42802 | Tc-99 | *3 04 A | TOTAL ACTIVITY | | | |

| Sample No. | Matrix* | Date Sampled | Time Sampled | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BOBNP3 03 | W | 04/21/94 | 1109 | X | X | X | X | X | X | X | X | X | X | | X | |
| BOBNP4 04 | W | 04/21/94 | 1109 | | | | | | | | | | | X | | |
| | | | | | | | | | | | | | | | | |
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**CHAIN OF POSSESSION** — Sign/Print Names

| Relinquished By | Date/Time | Received By | Date/Time |
|---|---|---|---|
| K D Lee K D Lee | 04/21/94 1305 | L Sweeney L Sweeney | 4/21/94 1305 |
| L Sweeney L Sweeney | 4/22/94 1400 | R Boyd ST | 4/22/94 1400 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

*1. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (UNFILTERED). *2. GROSS ALPHA/BETA, GAMMA SPEC (to include Cs-137, Co-60, Ru-106), Pu-238/239/240, Sr-90, TOTAL URANIUM. *3. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (FILTERED). DATA DELIVERABLE - STANDALONE

**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 ____

**FINAL SAMPLE DISPOSITION**: Disposal Method ____ Disposed By ____ Date/Time ____

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9613476.1353

000192

**Westinghouse Hanford Company**

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: ☐ Priority ☒ Normal

| | | |
|---|---|---|
| Collector: K. D. Lee | Company Contact: P. H. Butcher | Telephone No.: (509) 376-4388 |
| Project Designation: 200-BP-5 | Sampling Location: 200 East | SAF No.: 94-130 |
| Ice Chest No.: EFS 11 | Field Logbook No.: EFL-1125 | Method of Shipment: HAND DELIVERED |
| Shipped To: IT | Offsite Property No.: W94-0-0518-5 | Bill of Lading/Air Bill No.: NONE |
| Possible Sample Hazards/Remarks: None | | |

| Preservative | HNO3 | COOL 4C | H2SO4 | COOL 4C | COOL 4C | COOL 4C | NaOH | HNO3 | NONE | HCl | HNO3 | N/A | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type of Container | ~~P~~ G | G | P | P | P | P | P | P | Gs | P | ~~P~~ G | G | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | ~~2~~ 1 | 1 | 1 | | | |
| Volume | 1L | 500 mL | 500 mL | 250 mL | 250 mL | 250 mL | 1L | 4L | 1L | ~~1L~~ 2L | 1L | 20mL | | | |
| SAMPLE ANALYSIS: 404427 | *1 A | IC ANIONS-F, Cl, SO4, NO2 PO4. B | NO2, NO3. C | ALKA-LINITY D | TDS E | SULFATE F | CYANIDE G | *2 404428 | TRITIUM 03 | Tc-99 | *3 06 A | TOTAL ACTIVITY | | | |

| Sample No. | Matrix* | Date Sampled | Time Sampled | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BOBNM5 05 | W | 04/21/94 | 0835 | X | X | X | X | X | X | X | X | X | X | | X | | |
| BOBNM6 06 | W | 04/21/94 | 0835 | | | | | | | | | | | X | | | |
| | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | |

**CHAIN OF POSSESSION**

| Relinquished By | Date/Time | Received By | Date/Time |
|---|---|---|---|
| K. D. Lee | 04/21/94 1305 | L Sweeney | 4/21/94 1305 |
| L Sweeney | 4/22/94 1400 | R Boyd FT | 4/22/94 1400 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

*1. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (UNFILTERED). *2. GROSS ALPHA/BETA, GAMMA SPEC (to include Cs-137, Co-60, Ru-106), Pu-238/239/240, Sr-90, TOTAL URANIUM. *3. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (FILTERED). DATA DELIVERABLE - STANDALONE

**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

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9613476.1354

# Westinghouse Hanford Company

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: ☐ Priority ☒ Normal

0001193

| | | |
|---|---|---|
| Collector: B.T. WHITTEN | Company Contact: P. H. Butcher | Telephone No.: (509) 376-4388 |
| Project Designation: 200-BP-5 | Sampling Location: 200 East | SAF No.: 94-130 |
| Ice Chest No.: SML-144 | Field Logbook No.: EFL-1125 | Method of Shipment: HAND DELIVERED |
| Shipped To: IT | Offsite Property No.: W94-0-0518-8 | Bill of Lading/Air Bill No.: NONE |
| Possible Sample Hazards/Remarks: None | | |

| Preservative | HNO3 | COOL 4C | H2SO4 | COOL 4C | COOL 4C | COOL 4C | NaOH | HNO3 | NONE | HCl | HNO3 | N/A | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type of Container | P G | G | P | P | P | P | P | P | Gs | P | P G | G | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | | | |
| Volume | 1L | 500 mL | 500 mL | 250 mL | 250 mL | 250 mL | 1L | 4L | 1L | 2L | 1L | ~~500~~ mL | | | |
| SAMPLE ANALYSIS: 404458 | *1 | IC ANIONS-F, Cl, SO4, NO2 PO4. | NO2, NO3. | ALKA-LINITY | TDS | SULFATE | CYANIDE | *2 | TRITIUM | Tc-99 | *3 | TOTAL ACTIVITY | | | |
| | A | B | C | D | E | F | G | 40445901 | | | 02A | | | | |

| Sample No. | Matrix* | Date Sampled | Time Sampled | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 BOBNP5 | W | 04/22/94 | 1052 | X | X | X | X | X | X | X | X | X | X | | X | | |
| 02 BOBNP6 | W | 04/22/94 | 1052 | | | | | | | | | | | X | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
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961476.1355

| CHAIN OF POSSESSION | Sign/Print Names | |
|---|---|---|
| Relinquished By / Date/Time | Kimberlee Kaiser 04/25/94 0713 | Received By / Date/Time: L Sweeney L Sweeney 4/25/94 0713 |
| Relinquished By / Date/Time | L Sweeney L Sweeney 4/25/94 1300 | Received By / Date/Time: R. Boyd IT 4/25/94 1300 |
| Relinquished By / Date/Time | | Received By / Date/Time |
| Relinquished By / Date/Time | | Received By / Date/Time |

**SPECIAL INSTRUCTIONS**

*1. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (UNFILTERED). *2. GROSS ALPHA/BETA, GAMMA SPEC (to include Cs-137, Co-60, Ru-106), Pu-238/239/240, Sr-90, TOTAL URANIUM. *3. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (FILTERED). DATA DELIVERABLE - STANDALONE

**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 |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

0001194

**Westinghouse Hanford Company**

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: ☐ Priority ☒ Normal

| | | |
|---|---|---|
| Collector: A. RIZZO / K. D Lee | Company Contact: P. H. Butcher | Telephone No.: (509) 376-4388 |
| Project Designation: 200-BP-5 | Sampling Location: 200 East | SAF No.: 94-130 |
| Ice Chest No.: EFS 11 | Field Logbook No.: EFL-1125 | Method of Shipment: HAND DELIVERED |
| Shipped To: IT | Offsite Property No.: W94-00518-8 | Bill of Lading/Air Bill No.: NONE |
| Possible Sample Hazards/Remarks: None | | |

| Preservative | HNO3 | COOL 4C | H2SO4 | COOL 4C | COOL 4C | COOL 4C | NaOH | HNO3 | NONE | HCl | HNO3 | NONE | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type of Container | P G | G | P | P | P | P | P | P | Gs | P | P G | aGs | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | | | |
| Volume | 1L | 500 mL | 500 mL | 250 mL | 250 mL | 250 mL | 1L | 4L | 1L | 2L | 1L | 40mL | | | |
| SAMPLE ANALYSIS 404458 | *1 A | IC ANIONS-F, Cl, SO4, NO2 PO4. B | NO2, NO3. C | ALKA-LINITY D | TDS E | SULFATE F | CYANIDE G | *2 40414502 | TRITIUM | Tc-99 | *3 04A | ACTIVI-TY SCAN | | | |

| Sample No. | Matrix* | Date Sampled | Time Sampled | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 03 B0BRL3 | W | 04/22/94 | 0800 | X | X | X | X | X | X | X | X | X | X | | X | | | |
| 04 B0BRL4 | W | 04/22/94 | 0800 | | | | | | | | | | | X | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
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**CHAIN OF POSSESSION** — Sign/Print Names

| Relinquished By | Date/Time | Received By | Date/Time |
|---|---|---|---|
| Kelly D. Lee K D Lee | 04/25/94 0713 | L Sweeney L Sweeney | 4/25/94 0713 |
| L Sweeney L Sweeney | 4/25/94 1320 | R Boyd | 4/25/94 1320 |
| Relinquished By | Date/Time | Received By | Date/Time |
| Relinquished By | Date/Time | Received By | Date/Time |

**SPECIAL INSTRUCTIONS**

*1. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (UNFILTERED). *2. GROSS ALPHA/BETA, GAMMA SPEC (to include Cs-137, Co-60, Ru-106), Pu-238/239/240, Sr-90, TOTAL URANIUM. *3. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (FILTERED). DATA DELIVERABLE - STANDALONE

**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 |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

96134761356

**Westinghouse Hanford Company**

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: ☐ Priority ☒ Normal

0001195

| | | |
|---|---|---|
| Collector: K-D. Lee | Company Contact: P. H. Butcher | Telephone No.: (509) 376-4388 |
| Project Designation: 200-BP-5 | Sampling Location: 200 East | SAF No.: 94-130 |
| Ice Chest No.: EFS11 | Field Logbook No.: EFL-1025 | Method of Shipment: HAND DELIVERED |
| Shipped To: IT | Offsite Property No.: W94-0-0518-12 | Bill of Lading/Air Bill No.: NONE |
| Possible Sample Hazards/Remarks: None | | |
| PURGE-$H_2O$ HAD A SEWAGE ODOR | | |
| Special Handling and/or Storage: Cool to 4 C. Refrig 2C NTS | | |

SAMPLE ANALYSIS: 404495 — 1550 4/25/94

| Sample No. | Matrix* | Date Sampled | Time Sampled | Preservative | HNO3 | COOL 4C | H2SO4 | COOL 4C | COOL 4C | COOL 4C | NaOH | HNO3 | NONE | HCl | HNO3 | NA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Type of Container | P | G | P | P | P | P | P | P | Gs | P | G | G | | | |
| | | | | No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | | | |
| | | | | Volume | 1L | 500 mL | 500 mL | 250 mL | 250 mL | 250 mL | 1L | 4L | 1L | 1L | 1L | 40ml | | | |
| | | | | *1 | IC ANIONS-F, Cl, SO4, NO2 PO4. | NO2, NO3. | ALKA-LINITY | TDS | SULFATE | CYANIDE | *2 | TRITIUM | Tc-99 | *3 | TOTAL ACTIVITY | | | | |
| | | | | | A | B | C | D | E | F | G | 404496001 | | | 02 A | | | | |
| BOBNN1 01 | W | 04/25/94 | 1330 | | X | X | X | X | X | X | X | X | X | X | | X | | | |
| BOBNN2 02 | W | 04/25/94 | 1330 | | | | | | | | | | | | X | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By: K-D Lee K.D.Lee | Date/Time: 4/25/94 1528 | Received By: A J SIMPSON A J Simpson | Date/Time: 4/25/94 1550 |
| Relinquished By: A J Simpson | Date/Time: 4/27/94 0919 | Received By: L Sweeney L Sweeney | Date/Time: 4/27/94 0919 |
| Relinquished By: L Sweeney L Sweeney | Date/Time: 4/27/94 1210 | Received By: H Heidelberg | Date/Time: 4/27/94 1210 |
| Relinquished By: | Date/Time: | Received By: | Date/Time: |

SPECIAL INSTRUCTIONS

*1. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (UNFILTERED). *2. GROSS ALPHA/BETA, GAMMA SPEC (to include Cs-137, Co-60, Ru-106), Pu-238/239/240, Sr-90, TOTAL URANIUM. *3. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (FILTERED). DATA DELIVERABLE - STANDALONE

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9619476-1357

0001195

**Westinghouse Hanford Company**

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: ☐ Priority ☒ Normal

0001196

| | | |
|---|---|---|
| Collector: K.D.Lee | Company Contact: P. H. Butcher | Telephone No.: (509) 376-4388 |
| Project Designation: 200-BP-5 | Sampling Location: 200 East | SAF No.: 94-130 |
| Ice Chest No.: ER-11 | Field Logbook No.: EFL-1125 | Method of Shipment: HAND DELIVERED |
| Shipped To: IT | Offsite Property No.: W94-0-0578-12 | Bill of Lading/Air Bill No.: NONE |
| Possible Sample Hazards/Remarks: None | | |
| Special Handling and/or Storage: Cool to 4 C. refrig 3A AJS | | |

| Preservative | HNO3 | COOL 4C | H2SO4 | COOL 4C | COOL 4C | COOL 4C | NaOH | HNO3 | NONE | HCl | HNO3 | NONE | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type of Container | P G | G | P | P | P | P | P | P | Gs | P | P G | ~~aGs~~ | | | G |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | ~~1~~ | | | 1 |
| Volume | 1L | 500 mL | 500 mL | 250 mL | 250 mL | 250 mL | 1L | 4L | 1L | 2L | 1L | ~~40mL~~ | | 40mL | 40mL |
| SAMPLE ANALYSIS | *1 | IC ANIONS-F, Cl, SO4, NO2 PO4. | NO2, NO3. | ALKA-LINITY | TDS | SULFATE | CYANIDE | *2 | TRITIUM | Tc-99 | *3 | ACTIVITY SCAN | | 4/21/94 | TOTAL ACTIVITY |
| 404495 | A | B | C | D | E | F | G | 404496 | | 02 | 04 A | | | | |

| Sample No. | Matrix* | Date Sampled | Time Sampled | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BOBRL7 03 | W | 04/25/94 | 1130 04/25/94 | X | X | X | X | X | X | X | X | X | X | | ~~X~~ | | X |
| BOBRL8 04 | W | 04/25/94 | 1130 04/25/94 | | | | | | | | | | | X | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

**CHAIN OF POSSESSION**

| Relinquished By / Date/Time | Received By / Date/Time |
|---|---|
| Kathy D. Lee K.D.Lee 4/25/94 1528 | AJ Simpson 4/25/94 1530 |
| AJ Simpson 4/27/94 0920 | L Sweeney L Sweeney 4/27/94 0920 |
| L Sweeney L Sweeney 4/27/94 1210 | J Heidelberg 4/27 1210 |
| Relinquished By / Date/Time | Received By / Date/Time |

**SPECIAL INSTRUCTIONS**

*1. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (UNFILTERED). *2. GROSS ALPHA/BETA, GAMMA SPEC (to include Cs-137, Co-60, Ru-106), Pu-238/239/240, Sr-90, TOTAL URANIUM. *3. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (FILTERED). DATA DELIVERABLE - STANDALONE

**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

**FINAL SAMPLE DISPOSITION**: Disposal Method | Disposed By | Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9613476.1358

0048

# Westinghouse Hanford Company

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

000197

Data Turnaround: ☐ Priority ☒ Normal

| | | |
|---|---|---|
| Collector: K.D Lee | Company Contact: P. H. Butcher | Telephone No.: (509) 376-4388 |
| Project Designation: 200-BP-5 | Sampling Location: 200 East | SAF No.: 94-130 |
| Ice Chest No.: 7WS015 | Field Logbook No.: EFL-1125 | Method of Shipment: HAND DELIVERED |
| Shipped To: IT | Offsite Property No.: W94-0-C336-45 | Bill of Lading/Air Bill No.: NONE |

Possible Sample Hazards/Remarks: None

| Preservative | HNO3 | COOL 4C | H2SO4 | COOL 4C | COOL 4C | COOL 4C | NaOH | HNO3 | NONE | HCl | HNO3 | N/A | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type of Container | ~~P~~ G | G | P | P | P | P | P | P | Gs | P | ~~P~~ G | G | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 4-~~2~~ 1 | ~~2~~ 1 Tritium 1 2L | 1 | 1 | | | |
| Volume | 1L | 500 mL | 500 mL | 250 mL | 250 mL | 250 mL | 1L | 4L | 500 mL ~~1L~~ | 1L ~~2L~~ | 1L | 20 g | | | |
| SAMPLE ANALYSIS | *1 | IC ANIONS-F, Cl, SO4, NO2 PO4. | NO2, NO3. | ALKALINITY | TDS | SULFATE | CYANIDE | *2 | TRITIUM | Tc-99 | *3 | TOTAL BETA ACTIVITY | | | |
| 404320 | 01A | B | C | D | E | F | G | 40432101 | | | 02A | | | | |

| Sample No. | Matrix* | Date Sampled | Time Sampled | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BOBN P1 | W | 04/15/94 | 1006 | X | X | X | X | X | X | X | X | X | X | | X | | |
| BOBN P2 | W | 04/15/94 | 1006 | | | | | | | | | | | X | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

CHAIN OF POSSESSION — Sign/Print Names

| Relinquished By | Date/Time | Received By | Date/Time |
|---|---|---|---|
| K.D Lee K D Lee | 04/15/94 1151 | Joan E. Rogers | 4-15-94 1151 |
| Joan E. Rogers | 4-15-94 1200 | L Sweeney L Sweeney | 4/15/94 1206 |
| L Sweeney L Sweeney | 4/18/94 1310 | T Gilmore | 4/18/94 1310 |
| Relinquished By | Date/Time | Received By | Date/Time |

SPECIAL INSTRUCTIONS

*1. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (UNFILTERED). *2. GROSS ALPHA/BETA, GAMMA SPEC (to include Cs-137, Co-60, Ru-106), Pu-238/239/240, Sr-90, TOTAL URANIUM. *3. METALS - to include Ca, Mg, Na, K, Fe, Mn, Si, Al, Bi. AA METALS - Se (FILTERED). DATA DELIVERABLE - STANDALONE

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

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

# VEDD Printout

# VALIDATION ELECTRONIC DELIVERABLE SDG W0038-ITC-047

Thursday, September 15, 1994 

| HEIS-SN | Form | FormNr | LabCode | ConstID | Media | Value | ConcFlag | Qual | CountErr | Units |
|---|---|---|---|---|---|---|---|---|---|---|
| B0BRL3 | NCLP | NA | ITASRL | 7440-61-1 | SW | | | U | | |
| B0BNP5 | NCLP | NA | ITASRL | 14797-65-0 | SW | | | UR | | |
| B0BRL3 | NCLP | NA | ITASRL | 14797-65-0 | SW | | | UR | | |
| B0BRL7 | NCLP | NA | ITASRL | 14797-65-0 | SW | | | UR | | |
| B0BNN1 | NCLP | NA | ITASRL | 14797-65-0 | SW | | | UR | | |
| B0BNP7 | NCLP | NA | ITASRL | 14797-65-0 | SW | | | UR | | |
| B0BNP3 | NCLP | NA | ITASRL | 14797-65-0 | SW | | | UR | | |
| B0BNM5 | NCLP | NA | ITASRL | 14797-65-0 | SW | | | UR | | |
| B0BNM7 | NCLP | NA | ITASRL | 14797-65-0 | SW | | | UR | | |
| B0BNP1 | NCLP | NA | ITASRL | 14797-65-0 | SW | | | UR | | |
| B0BNN9 | NCLP | NA | ITASRL | 14797-65-0 | SW | | | UR | | |
| B0BNP5 | NCLP | NA | ITASRL | 14265-44-2 | SW | | | UR | | |
| B0BRL3 | NCLP | NA | ITASRL | 14265-44-2 | SW | | | UR | | |
| B0BRL7 | NCLP | NA | ITASRL | 14265-44-2 | SW | | | UR | | |
| B0BNN1 | NCLP | NA | ITASRL | 14265-44-2 | SW | | | UR | | |
| B0BNP7 | NCLP | NA | ITASRL | 14265-44-2 | SW | | | UR | | |
| B0BNP3 | NCLP | NA | ITASRL | 14265-44-2 | SW | | | UR | | |
| B0BNM5 | NCLP | NA | ITASRL | 14265-44-2 | SW | | | UR | | |
| B0BNM7 | NCLP | NA | ITASRL | 14265-44-2 | SW | | | UR | | |
| B0BNP1 | NCLP | NA | ITASRL | 14265-44-2 | SW | | | UR | | |
| B0BNN9 | NCLP | NA | ITASRL | 14265-44-2 | SW | | | UR | | |
| B0BNM5 | NCLP | NA | ITASRL | 7439-89-6 | SW | | | J | | |
| B0BNM6 | NCLP | NA | ITASRL | 7439-89-6 | SW | | | BJ | | |
| B0BNP3 | NCLP | NA | ITASRL | 7439-89-6 | SW | | | BJ | | |
| B0BNP4 | NCLP | NA | ITASRL | 7439-89-6 | SW | | | BJ | | |
| B0BNP7 | NCLP | NA | ITASRL | 7439-89-6 | SW | | | J | | |
| B0BNP8 | NCLP | NA | ITASRL | 7439-89-6 | SW | | | J | | |
| B0BNP1 | NCLP | NA | ITASRL | 7439-89-6 | SW | | | U | | |
| B0BNP2 | NCLP | NA | ITASRL | 7439-89-6 | SW | | | U | | |
| B0BRL7 | NCLP | NA | ITASRL | 7440-09-7 | SW | | | U | | |
| B0BNM5 | NCLP | NA | ITASRL | 7782-49-2 | SW | | | U | | |
| B0BNM6 | NCLP | NA | ITASRL | 7782-49-2 | SW | | | U | | |
| B0BNP3 | NCLP | NA | ITASRL | 7782-49-2 | SW | | | UJ | | |

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Checked by: 9/16/94

| HEIS-SN | Form | FormNr | LabCode | ConstID | Media | Value | ConcFlag | Qual | CountErr | Units |
|---|---|---|---|---|---|---|---|---|---|---|
| B0BNP4 | NCLP | NA | ITASRL | 7782-49-2 | SW | | | UJ | | |
| B0BNP7 | NCLP | NA | ITASRL | 7782-49-2 | SW | | | UJ | | |
| B0BNP8 | NCLP | NA | ITASRL | 7782-49-2 | SW | | | UJ | | |
| B0BNPO | NCLP | NA | ITASRL | 7440-69-9 | SW | | | UJ | | |
| B0BNM5 | NCLP | NA | ITASRL | CYANIDE | SW | | | J | | |
| B0BNP3 | NCLP | NA | ITASRL | CYANIDE | SW | | | UR | | |
| B0BNP7 | NCLP | NA | ITASRL | CYANIDE | SW | | | UR | | |
| B0BNN9 | NCLP | NA | ITASRL | CYANIDE | SW | | | J | | |





Entered by: Jon 9/15/94

Checked by: 9/16/94

# END OF PACKAGE