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## 1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0510 is composed of seven solid (soil) samples designated under SAF No. B99-078 with a Project Designation of: 200 Area Source characterization-200-CW-1 OU.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the TNU Sample Receipt Checklists. The results were transmitted to BHI via facsimile on October 19, 1999 (Nickel-63, Technetium-99, Tritium, Total Strontium, Total Uranium and Americium-241), October 21 (Isotopic Uranium and Isotopic Thorium) and October 22 (Gamma Scan).

## 2.0 ANALYSIS NOTES

### 2.1 Total Strontium Analyses

No problems were encountered during the course of the analyses.

### 2.2 Total and Isotopic Uranium Analyses

Isotopic analyses were to be based on the results from the total uranium analyses. Isotopic Uranium was requested on sample B0W6B4. No problems were encountered during the course of the analyses.

### 2.3 Gamma Spec Analyses

No problems were encountered during the course of the analyses.

### 2.4 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses. A recount was performed on sample B0W6B6.

### 2.5 Americium-241 Analyses

No problems were encountered during the course of the analyses. A recount was performed on sample B0W6B5.

### 2.6 Tritium Analyses

No problems were encountered during the course of the analyses.

### 2.7 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

### 2.8 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

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## 2.9 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

## LAB SAMPLE SUMMARY

SDG 7191
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0510

| LAB SAMPLE ID | CLIENT SAMPLE ID | LOCATION | MATRIX | LEVEL | SAF NO | CHAIN OF CUSTODY | COLLECTED |
|---|---|---|---|---|---|---|---|
| N908172-09 | Lab Control Sample | | SOLID | | B99-078 | | |
| N908172-10 | Method Blank | | SOLID | | B99-078 | | |
| N909019-01 | BOW6B7 | GP-5>15'bgs | SOLID | | B99-078 | B99-078-94 | 08/30/99 09:04 |
| N909019-02 | BOW6B8 | GP-5>15'bgs | SOLID | | B99-078 | B99-078-94 | 08/30/99 09:25 |
| N909019-03 | BOW6B2 | GP-5>15'bgs | SOLID | | B99-078 | B99-078-89 | 08/30/99 07:45 |
| N909019-04 | BOW6B3 | GP-5>15'bgs | SOLID | | B99-078 | B99-078-89 | 08/30/99 08:00 |
| N909019-05 | BOW6B4 | GP-5>15'bgs | SOLID | | B99-078 | B99-078-89 | 08/30/99 08:11 |
| N909019-06 | BOW6B5 | GP-5>15'bgs | SOLID | | B99-078 | B99-078-89 | 08/30/99 08:31 |
| N909019-07 | BOW6B6 | GP-5>15'bgs | SOLID | | B99-078 | B99-078-89 | 08/30/99 08:48 |
| N909019-08 | Lab Control Sample | | SOLID | | B99-078 | | |
| N909019-09 | Method Blank | | SOLID | | B99-078 | | |
| N909019-10 | Duplicate (N909019-01) | GP-5>15'bgs | SOLID | | B99-078 | | 08/30/99 09:04 |
| N909019-11 | Duplicate (N909019-03) | GP-5>15'bgs | SOLID | | B99-078 | | 08/30/99 07:45 |
| N909019-12 | Duplicate (N909019-05) | GP-5>15'bgs | SOLID | | B99-078 | | 08/30/99 08:11 |



Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 10/22/99

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

## QC SUMMARY

SDG 7191
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0510

| QC BATCH | CHAIN OF CUSTODY | CLIENT SAMPLE ID | MATRIX | % SOLIDS | SAMPLE AMOUNT | BASIS AMOUNT | DAYS SINCE RECEIVED | DAYS SINCE COLL | LAB SAMPLE ID | DEPARTMENT SAMPLE ID |
|---|---|---|---|---|---|---|---|---|---|---|
| 7189 | | Method Blank | SOLID | | | | | | N908172-10 | 7189-010 |
| | | Lab Control Sample | SOLID | | | | | | N908172-09 | 7189-009 |
| 7191 | B99-078-89 | BOW6B2 | SOLID | 93.3 | | | 09/01/99 | 2 | N909019-03 | 7191-003 |
| | | BOW6B3 | SOLID | 97.0 | | | 09/01/99 | 2 | N909019-04 | 7191-004 |
| | | BOW6B4 | SOLID | 96.0 | | | 09/01/99 | 2 | N909019-05 | 7191-005 |
| | | BOW6B5 | SOLID | 97.0 | | | 09/01/99 | 2 | N909019-06 | 7191-006 |
| | | BOW6B6 | SOLID | 94.8 | | | 09/01/99 | 2 | N909019-07 | 7191-007 |
| | B99-078-94 | BOW6B7 | SOLID | 94.0 | | | 09/01/99 | 2 | N909019-01 | 7191-001 |
| | | BOW6B8 | SOLID | 96.3 | | | 09/01/99 | 2 | N909019-02 | 7191-002 |
| | | Method Blank | SOLID | | | | | | N909019-09 | 7191-009 |
| | | Lab Control Sample | SOLID | | | | | | N909019-08 | 7191-008 |
| | | Duplicate (N909019-01) | SOLID | 94.0 | | | 09/01/99 | 2 | N909019-10 | 7191-010 |
| | | Duplicate (N909019-03) | SOLID | 93.3 | | | 09/01/99 | 2 | N909019-11 | 7191-011 |
| | | Duplicate (N909019-05) | SOLID | | | | 09/01/99 | 2 | N909019-12 | 7191-012 |



Lab id TMANC
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# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

SDG 7191
Contact Kevin C. Johnson

## PREP BATCH SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0510

| TEST | MATRIX | METHOD | PREPARATION BATCH | ERROR 2σ % | PLANCHETS ANALYZED CLIENT | MORE | RE | BLANK | LCS | DUP/ORIG | MS/ORIG | QUALIFIERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alpha Spectroscopy | | | | | | | | | | | | |
| AM | SOLID | Americium 241 in Soil | 6893-137 | 5.0 | 7 | | | 1 | 1 | 1/1 | | |
| PU | SOLID | Plutonium, Isotopic in Solids | 6893-137 | 5.0 | 7 | | | 1 | 1 | 1/1 | | |
| TH | SOLID | Thorium, Isotopic in Soil | 6893-137 | 5.0 | 7 | | | 1 | 1 | 1/1 | | |
| U | SOLID | Uranium, Isotopic in Soil | 6893-137 | 5.0 | 1 | | | | | 1/1 | | |
| Beta Counting | | | | | | | | | | | | |
| SR | SOLID | Total Strontium in Soil | 6893-137 | 10.0 | 7 | | | 1 | 1 | 1/1 | | |
| TC | SOLID | Technetium 99 in Soil | 6893-125 | 10.0 | 2 | | | 1 | 1 | 1/1 | | |
| Gamma Spectroscopy | | | | | | | | | | | | |
| GAM | SOLID | Gamma Scan | 6893-137 | 15.0 | 7 | | | 1 | 1 | 1/1 | | |
| Kinetic Phosphorimetry | | | | | | | | | | | | |
| U_T | SOLID | Uranium, Total in Soil | 6893-137 | 9.0 | 7 | | | 1 | 1 | 1/1 | | |
| Liquid Scintillation Counting | | | | | | | | | | | | |
| H | SOLID | Tritium in Soil | 6893-130 | 10.0 | 2 | | | 1 | 1 | 1/1 | | |
| NI_L | SOLID | Nickel 63 in Soil | 6893-125 | 10.0 | 2 | | | 1 | 1 | 1/1 | | |

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.



Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 10/22/99

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

SDG 7191
Contact Kevin C. Johnson

## LAB WORK SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0510

| LAB SAMPLE COLLECTED RECEIVED | CLIENT SAMPLE ID LOCATION CUSTODY | SAF No | MATRIX | PLANCHET | TEST | SUF-FIX | ANALYZED | REVIEWED | BY | METHOD |
|---|---|---|---|---|---|---|---|---|---|---|
| N908172-09 | Lab Control Sample | | | 7189-009 | H | | 10/04/99 | 10/18/99 | NJV | Tritium in Soil |
| | | | SOLID | | | | | | | |
| | | B99-078 | | | | | | | | |
| N908172-10 | Method Blank | | | 7189-010 | H | | 10/04/99 | 10/18/99 | NJV | Tritium in Soil |
| | | | SOLID | | | | | | | |
| | | B99-078 | | | | | | | | |
| N909019-01 | BOW6B7 | | | 7191-001 | AM | | 10/15/99 | 10/19/99 | NJV | Americium 241 in Soil |
| 08/30/99 | GP-5>15'bgs | | SOLID | 7191-001 | GAM | | 10/21/99 | 10/22/99 | NJV | Gamma Scan |
| 09/01/99 | B99-078-94 | B99-078 | | 7191-001 | H | | 10/05/99 | 10/19/99 | NJV | Tritium in Soil |
| | | | | 7191-001 | NI_L | | 10/07/99 | 10/19/99 | NJV | Nickel 63 in Soil |
| | | | | 7191-001 | PU | | 10/18/99 | 10/21/99 | NJV | Plutonium, Isotopic in Solids |
| | | | | 7191-001 | SR | | 10/07/99 | 10/19/99 | NJV | Total Strontium in Soil |
| | | | | 7191-001 | TC | | 10/12/99 | 10/19/99 | NJV | Technetium 99 in Soil |
| | | | | 7191-001 | TH | | 10/18/99 | 10/21/99 | NJV | Thorium, Isotopic in Soil |
| | | | | 7191-001 | U_T | | 10/19/99 | 10/19/99 | NJV | Uranium, Total in Soil |
| N909019-02 | BOW6B8 | | | 7191-002 | AM | | 10/15/99 | 10/19/99 | NJV | Americium 241 in Soil |
| 08/30/99 | GP-5>15'bgs | | SOLID | 7191-002 | GAM | | 10/21/99 | 10/22/99 | NJV | Gamma Scan |
| 09/01/99 | B99-078-94 | B99-078 | | 7191-002 | H | | 10/05/99 | 10/19/99 | NJV | Tritium in Soil |
| | | | | 7191-002 | NI_L | | 10/07/99 | 10/19/99 | NJV | Nickel 63 in Soil |
| | | | | 7191-002 | PU | | 10/18/99 | 10/21/99 | NJV | Plutonium, Isotopic in Solids |
| | | | | 7191-002 | SR | | 10/07/99 | 10/19/99 | NJV | Total Strontium in Soil |
| | | | | 7191-002 | TC | | 10/13/99 | 10/19/99 | NJV | Technetium 99 in Soil |
| | | | | 7191-002 | TH | | 10/18/99 | 10/21/99 | NJV | Thorium, Isotopic in Soil |
| | | | | 7191-002 | U_T | | 10/19/99 | 10/19/99 | NJV | Uranium, Total in Soil |
| N909019-03 | BOW6B2 | | | 7191-003 | AM | | 10/15/99 | 10/19/99 | NJV | Americium 241 in Soil |
| 08/30/99 | GP-5>15'bgs | | SOLID | 7191-003 | GAM | | 10/19/99 | 10/22/99 | NJV | Gamma Scan |
| 09/01/99 | B99-078-89 | B99-078 | | 7191-003 | PU | | 10/18/99 | 10/21/99 | NJV | Plutonium, Isotopic in Solids |
| | | | | 7191-003 | SR | | 10/07/99 | 10/19/99 | NJV | Total Strontium in Soil |
| | | | | 7191-003 | TH | | 10/18/99 | 10/21/99 | NJV | Thorium, Isotopic in Soil |
| | | | | 7191-003 | U_T | | 10/19/99 | 10/19/99 | NJV | Uranium, Total in Soil |



Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 10/22/99

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

SDG 7191
Contact Kevin C. Johnson

## WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0510

| LAB SAMPLE COLLECTED RECEIVED | CLIENT SAMPLE ID LOCATION CUSTODY | SAF No | MATRIX | PLANCHET | TEST | SUF-FIX | ANALYZED | REVIEWED | BY | METHOD |
|---|---|---|---|---|---|---|---|---|---|---|
| N909019-04 | BOW6B3 | | | 7191-004 | AM | | 10/15/99 | 10/19/99 | NJV | Americium 241 in Soil |
| 08/30/99 | GP-5>15'bgs | | SOLID | 7191-004 | GAM | | 10/21/99 | 10/22/99 | NJV | Gamma Scan |
| 09/01/99 | B99-078-89 | B99-078 | | 7191-004 | PU | | 10/18/99 | 10/21/99 | NJV | Plutonium, Isotopic in Solids |
| | | | | 7191-004 | SR | | 10/07/99 | 10/19/99 | NJV | Total Strontium in Soil |
| | | | | 7191-004 | TH | | 10/18/99 | 10/21/99 | NJV | Thorium, Isotopic in Soil |
| | | | | 7191-004 | U_T | | 10/19/99 | 10/19/99 | NJV | Uranium, Total in Soil |
| N909019-05 | BOW6B4 | | | 7191-005 | AM | | 10/16/99 | 10/19/99 | NJV | Americium 241 in Soil |
| 08/30/99 | GP-5>15'bgs | | SOLID | 7191-005 | GAM | | 10/12/99 | 10/22/99 | NJV | Gamma Scan |
| 09/01/99 | B99-078-89 | B99-078 | | 7191-005 | PU | | 10/18/99 | 10/21/99 | NJV | Plutonium, Isotopic in Solids |
| | | | | 7191-005 | SR | | 10/07/99 | 10/19/99 | NJV | Total Strontium in Soil |
| | | | | 7191-005 | TH | | 10/18/99 | 10/21/99 | NJV | Thorium, Isotopic in Soil |
| | | | | 7191-005 | U | | 10/14/99 | 10/21/99 | NJV | Uranium, Isotopic in Soil |
| | | | | 7191-005 | U_T | | 10/19/99 | 10/19/99 | NJV | Uranium, Total in Soil |
| N909019-06 | BOW6B5 | | | 7191-006 | AM | | 10/18/99 | 10/19/99 | NJV | Americium 241 in Soil |
| 08/30/99 | GP-5>15'bgs | | SOLID | 7191-006 | GAM | | 10/12/99 | 10/22/99 | NJV | Gamma Scan |
| 09/01/99 | B99-078-89 | B99-078 | | 7191-006 | PU | | 10/18/99 | 10/21/99 | NJV | Plutonium, Isotopic in Solids |
| | | | | 7191-006 | SR | | 10/07/99 | 10/19/99 | NJV | Total Strontium in Soil |
| | | | | 7191-006 | TH | | 10/19/99 | 10/21/99 | NJV | Thorium, Isotopic in Soil |
| | | | | 7191-006 | U_T | | 10/19/99 | 10/19/99 | NJV | Uranium, Total in Soil |
| N909019-07 | BOW6B6 | | | 7191-007 | AM | | 10/16/99 | 10/19/99 | NJV | Americium 241 in Soil |
| 08/30/99 | GP-5>15'bgs | | SOLID | 7191-007 | GAM | | 10/21/99 | 10/22/99 | NJV | Gamma Scan |
| 09/01/99 | B99-078-89 | B99-078 | | 7191-007 | PU | | 10/19/99 | 10/21/99 | NJV | Plutonium, Isotopic in Solids |
| | | | | 7191-007 | SR | | 10/07/99 | 10/19/99 | NJV | Total Strontium in Soil |
| | | | | 7191-007 | TH | | 10/20/99 | 10/21/99 | NJV | Thorium, Isotopic in Soil |
| | | | | 7191-007 | U_T | | 10/19/99 | 10/19/99 | NJV | Uranium, Total in Soil |
| N909019-08 | Lab Control Sample | | | 7191-008 | AM | | 10/15/99 | 10/19/99 | NJV | Americium 241 in Soil |
| | | | SOLID | 7191-008 | GAM | | 10/12/99 | 10/22/99 | NJV | Gamma Scan |
| | | B99-078 | | 7191-008 | NI_L | | 10/07/99 | 10/19/99 | NJV | Nickel 63 in Soil |
| | | | | 7191-008 | PU | | 10/19/99 | 10/21/99 | NJV | Plutonium, Isotopic in Solids |
| | | | | 7191-008 | SR | | 10/07/99 | 10/19/99 | NJV | Total Strontium in Soil |
| | | | | 7191-008 | TC | | 10/11/99 | 10/19/99 | NJV | Technetium 99 in Soil |
| | | | | 7191-008 | TH | | 10/18/99 | 10/21/99 | NJV | Thorium, Isotopic in Soil |
| | | | | 7191-008 | U_T | | 10/19/99 | 10/19/99 | NJV | Uranium, Total in Soil |



Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 10/22/99

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

SDG 7191
Contact Kevin C. Johnson

## WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0510

| LAB SAMPLE COLLECTED RECEIVED | CLIENT SAMPLE ID LOCATION CUSTODY | SAF No | MATRIX | PLANCHET | TEST | SUF-FIX | ANALYZED | REVIEWED | BY | METHOD |
|---|---|---|---|---|---|---|---|---|---|---|
| N909019-09 | Method Blank | | | 7191-009 | AM | | 10/16/99 | 10/19/99 | NJV | Americium 241 in Soil |
| | | | SOLID | 7191-009 | GAM | | 10/12/99 | 10/22/99 | NJV | Gamma Scan |
| | | B99-078 | | 7191-009 | NI_L | | 10/07/99 | 10/19/99 | NJV | Nickel 63 in Soil |
| | | | | 7191-009 | PU | | 10/19/99 | 10/21/99 | NJV | Plutonium, Isotopic in Solids |
| | | | | 7191-009 | SR | | 10/07/99 | 10/19/99 | NJV | Total Strontium in Soil |
| | | | | 7191-009 | TC | | 10/11/99 | 10/19/99 | NJV | Technetium 99 in Soil |
| | | | | 7191-009 | TH | | 10/18/99 | 10/21/99 | NJV | Thorium, Isotopic in Soil |
| | | | | 7191-009 | U_T | | 10/19/99 | 10/19/99 | NJV | Uranium, Total in Soil |
| N909019-10 | Duplicate (N909019-01) | | | 7191-010 | H | | 10/05/99 | 10/19/99 | NJV | Tritium in Soil |
| 08/30/99 | GP-5>15'bgs | | SOLID | 7191-010 | NI_L | | 10/07/99 | 10/19/99 | NJV | Nickel 63 in Soil |
| 09/01/99 | | B99-078 | | 7191-010 | TC | | 10/12/99 | 10/19/99 | NJV | Technetium 99 in Soil |
| N909019-11 | Duplicate (N909019-03) | | | 7191-011 | AM | | 10/16/99 | 10/19/99 | NJV | Americium 241 in Soil |
| 08/30/99 | GP-5>15'bgs | | SOLID | 7191-011 | GAM | | 10/13/99 | 10/22/99 | NJV | Gamma Scan |
| 09/01/99 | | B99-078 | | 7191-011 | PU | | 10/20/99 | 10/21/99 | NJV | Plutonium, Isotopic in Solids |
| | | | | 7191-011 | SR | | 10/07/99 | 10/19/99 | NJV | Total Strontium in Soil |
| | | | | 7191-011 | TH | | 10/18/99 | 10/21/99 | NJV | Thorium, Isotopic in Soil |
| | | | | 7191-011 | U_T | | 10/19/99 | 10/19/99 | NJV | Uranium, Total in Soil |
| N909019-12 | Duplicate (N909019-05) | | | 7191-012 | U | | 10/15/99 | 10/21/99 | NJV | Uranium, Isotopic in Soil |
| 08/30/99 | GP-5>15'bgs | | SOLID | | | | | | | |
| 09/01/99 | | B99-078 | | | | | | | | |

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 10/22/99

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

SDG 7191
Contact Kevin C. Johnson

## WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0510

### COUNTS OF TESTS BY SAMPLE TYPE

| TEST | SAF No | METHOD | REFERENCE | CLIENT | MORE | RE | BLANK | LCS | DUP SPIKE | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| AM | B99-078 | Americium 241 in Soil | AM/CMPLATE | 7 | | | 1 | 1 | 1 | 10 |
| GAM | B99-078 | Gamma Scan | GAMMAHI | 7 | | | 1 | 1 | 1 | 10 |
| H | B99-078 | Tritium in Soil | EPA906.0 | 2 | | | 1 | 1 | 1 | 5 |
| NI_L | B99-078 | Nickel 63 in Soil | NI63LSC | 2 | | | 1 | 1 | 1 | 5 |
| PU | B99-078 | Plutonium, Isotopic in Solids | PUPLATE | 7 | | | 1 | 1 | 1 | 10 |
| SR | B99-078 | Total Strontium in Soil | SRTOTAL | 7 | | | 1 | 1 | 1 | 10 |
| TC | B99-078 | Technetium 99 in Soil | TC99TRLSC | 2 | | | 1 | 1 | 1 | 5 |
| TH | B99-078 | Thorium, Isotopic in Soil | THPLATE | 7 | | | 1 | 1 | 1 | 10 |
| U | B99-078 | Uranium, Isotopic in Soil | UPLATE | 1 | | | | | 1 | 2 |
| U_T | B99-078 | Uranium, Total in Soil | UKPA | 7 | | | 1 | 1 | 1 | 10 |
| TOTALS | | | | 49 | | | 9 | 9 | 10 | 77 |



Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 10/22/99

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

7189-010 Method Blank

## METHOD BLANK

| | | | |
|---|---|---|---|
| SDG | 7191 | Client/Case no | Hanford SDG-H0510 |
| Contact | Kevin C. Johnson | Contract | TRB-SBB-207925 |
| Lab sample id | N908172-10 | Client sample id | Method Blank |
| Dept sample id | 7189-010 | Material/Matrix | SOLID |
| | | SAF No | B99-078 |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Tritium | 10028-17-8 | -0.020 | 0.040 | 0.070 | 400 | U | H |
| Total Uranium (ug/g) | 7440-61-1 | N.A. | | | 1.0 | | U_T |
| Plutonium 238 | 13981-16-3 | N.A. | | | 1.0 | | PU |
| Plutonium 239/240 | PU-239/240 | N.A. | | | 1.0 | | PU |
| Americium 241 | 14596-10-2 | N.A. | | | 1.0 | | AM |
| Total Strontium | SR-RAD | N.A. | | | 1.0 | | SR |
| Thorium 228 | 14274-82-9 | N.A. | | | 1.0 | | TH |
| Thorium 230 | 14269-63-7 | N.A. | | | 1.0 | | TH |
| Thorium 232 | TH-232 | N.A. | | | 1.0 | | TH |
| Potassium 40 | 13966-00-2 | N.A. | | | | | GAM |
| Cobalt 60 | 10198-40-0 | N.A. | | | 0.050 | | GAM |
| Cesium 137 | 10045-97-3 | N.A. | | | 0.10 | | GAM |
| Europium 152 | 14683-23-9 | N.A. | | | 0.10 | | GAM |
| Europium 154 | 15585-10-1 | N.A. | | | 0.10 | | GAM |
| Europium 155 | 14391-16-3 | N.A. | | | 0.10 | | GAM |
| Radium 226 | 13982-63-3 | N.A. | | | 0.10 | | GAM |
| Radium 228 | 15262-20-1 | N.A. | | | 0.20 | | GAM |
| Thorium 228 | 14274-82-9 | N.A. | | | | | GAM |
| Thorium 232 | TH-232 | N.A. | | | | | GAM |
| Americium 241 | 14596-10-2 | N.A. | | | | | GAM |
| Uranium 238 | U-238 | N.A. | | | | | GAM |
| Uranium 235 | 15117-96-1 | N.A. | | | | | GAM |

200 Area Source chrctztn-200-CW-1 OU

QC-BLANK 31847



| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

7191-009 Method Blank

## METHOD BLANK

| | | | |
|---|---|---|---|
| SDG | 7191 | Client/Case no | Hanford SDG-H0510 |
| Contact | Kevin C. Johnson | Contract | TRB-SBB-207925 |
| Lab sample id | N909019-09 | Client sample id | Method Blank |
| Dept sample id | 7191-009 | Material/Matrix | SOLID |
| | | SAF No | B99-078 |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Technetium 99 | 14133-76-7 | 0.243 | 0.66 | 0.30 | 15 | U | TC |
| Total Uranium (ug/g) | 7440-61-1 | 0 | 0.003 | 0.007 | 1.0 | U | U_T |
| Plutonium 238 | 13981-16-3 | 0 | 0.027 | 0.064 | 1.0 | U | PU |
| Plutonium 239/240 | PU-239/240 | -0.004 | 0.018 | 0.049 | 1.0 | U | PU |
| Nickel 63 | 13981-37-8 | -2.71 | 1.5 | 2.6 | 30 | U | NI_L |
| Americium 241 | 14596-10-2 | 0.019 | 0.056 | 0.092 | 1.0 | U | AM |
| Total Strontium | SR-RAD | -0.102 | 0.39 | 0.39 | 1.0 | U | SR |
| Thorium 228 | 14274-82-9 | -0.017 | 0.057 | 0.12 | 1.0 | U | TH |
| Thorium 230 | 14269-63-7 | 0.029 | 0.091 | 0.16 | 1.0 | U | TH |
| Thorium 232 | TH-232 | 0.011 | 0.023 | 0.044 | 1.0 | U | TH |
| Potassium 40 | 13966-00-2 | U | | 0.33 | | U | GAM |
| Cobalt 60 | 10198-40-0 | U | | 0.011 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 0.009 | 0.10 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 0.031 | 0.10 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 0.034 | 0.10 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 0.037 | 0.10 | U | GAM |
| Radium 226 | 13982-63-3 | U | | 0.022 | 0.10 | U | GAM |
| Radium 228 | 15262-20-1 | U | | 0.044 | 0.20 | U | GAM |
| Thorium 228 | 14274-82-9 | U | | 0.019 | | U | GAM |
| Thorium 232 | TH-232 | U | | 0.044 | | U | GAM |
| Americium 241 | 14596-10-2 | U | | 0.068 | | U | GAM |
| Uranium 238 | U-238 | U | | 1.4 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 0.050 | | U | GAM |

200 Area Source chrctztn-200-CW-1 OU

QC-BLANK 31857



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|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

7189-009

Lab Control Sample

# LAB CONTROL SAMPLE

SDG 7191

Contact Kevin C. Johnson

Client/Case no Hanford SDG-H0510

Case no TRB-SBB-207925

Lab sample id N908172-09

Dept sample id 7189-009

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No B99-078

| ANALYTE | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST | ADDED pCi/g | 2σ ERR pCi/g | REC % | 3σ LMTS (TOTAL) | PROTOCOL LIMITS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tritium | 6.33 | 0.14 | 0.071 | 400 | J | H | 6.03 | 0.24 | 105 | 83-117 | 80-120 |
| Total Uranium (ug/g) | N.A. | | | 1.0 | | U_T | | | | | 80-120 |
| Plutonium 238 | N.A. | | | 1.0 | | PU | | | | | 80-120 |
| Plutonium 239/240 | N.A. | | | 1.0 | | PU | | | | | 80-120 |
| Americium 241 | N.A. | | | 1.0 | | AM | | | | | 80-120 |
| Total Strontium | N.A. | | | 1.0 | | SR | | | | | |
| Thorium 230 | N.A. | | | 1.0 | | TH | | | | | |
| Cobalt 60 | N.A. | | | 0.050 | | GAM | | | | | 80-120 |
| Cesium 137 | N.A. | | | 0.10 | | GAM | | | | | 80-120 |

200 Area Source chrctztn-200-CW-1 OU

QC-LCS 31846

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 10/22/99

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

7191-008 Lab Control Sample

## LAB CONTROL SAMPLE

SDG 7191 Client/Case no Hanford SDG-H0510

Contact Kevin C. Johnson Case no TRB-SBB-207925

Lab sample id N909019-08 Client sample id Lab Control Sample

Dept sample id 7191-008 Material/Matrix SOLID

SAF No B99-078

| ANALYTE | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST | ADDED pCi/g | 2σ ERR pCi/g | REC % | 3σ LMTS (TOTAL) | PROTOCOL LIMITS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Technetium 99 | 45.5 | 0.74 | 0.23 | 15 | | TC | 48.0 | 1.9 | 95 | 84-116 | 80-120 |
| Total Uranium (ug/g) | 40.6 | 12 | 0.073 | 1.0 | | U_T | 41.2 | 1.6 | 99 | 54-146 | 80-120 |
| Plutonium 238 | 11.4 | 0.90 | 0.052 | 1.0 | | PU | 12.5 | 0.50 | 91 | 86-114 | 80-120 |
| Plutonium 239/240 | 12.3 | 0.96 | 0.046 | 1.0 | | PU | 13.2 | 0.53 | 93 | 86-114 | 80-120 |
| Nickel 63 | 170 | 4.0 | 2.5 | 30 | | NI_L | 167 | 6.7 | 102 | 83-117 | |
| Americium 241 | 10.0 | 0.60 | 0.034 | 1.0 | | AM | 11.5 | 0.46 | 87 | 88-112 | 80-120 |
| Total Strontium | 13.6 | 0.78 | 0.50 | 1.0 | | SR | 12.4 | 0.50 | 110 | 80-120 | |
| Thorium 230 | 23.6 | 1.1 | 0.17 | 1.0 | | TH | 22.4 | 0.90 | 105 | 88-112 | |
| Cobalt 60 | 0.375 | 0.017 | 0.010 | 0.050 | | GAM | 0.373 | 0.015 | 100 | 76-124 | 80-120 |
| Cesium 137 | 0.322 | 0.013 | 0.010 | 0.10 | | GAM | 0.404 | 0.016 | 80 | 80-120 | 80-120 |

200 Area Source chrctztn-200-CW-1 OU

QC-LCS 31856

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 10/22/99

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

7191-010

BOW6B7

## DUPLICATE

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7191 | | | Client/Case no | Hanford SDG-H0510 |
| Contact | Kevin C. Johnson | | | Case no | TRB-SBB-207925 |
| | DUPLICATE | | ORIGINAL | | |
| Lab sample id | N909019-10 | Lab sample id | N909019-01 | Client sample id | BOW6B7 |
| Dept sample id | 7191-010 | Dept sample id | 7191-001 | Location/Matrix | GP-5>15'bgs SOLID |
| | | Received | 09/01/99 | Collected | 08/30/99 09:04 |
| % solids | 94.0 | % solids | 94.0 | Custody/SAF No | B99-078-94 B99-078 |

| ANALYTE | DUPLICATE pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST | ORIGINAL pCi/g | 2σ ERR (COUNT) | MDA pCi/g | QUALI-FIERS | RPD % | 3σ TOT | PROT LIMIT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tritium | 0.004 | 0.042 | 0.071 | 400 | U | H | -0.026 | 0.040 | 0.070 | U | - | | |
| Technetium 99 | -0.142 | 0.24 | 0.40 | 15 | U | TC | 0.194 | 0.19 | 0.48 | U | - | | |
| Nickel 63 | -2.59 | 1.7 | 3.0 | 30 | U | NI_L | -2.22 | 2.0 | 3.4 | U | - | | |

200 Area Source chrctztn-200-CW-1 OU

QC-DUP#1 31858

| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DUP |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

7191-011 BOW6B2

## DUPLICATE

| | | | |
|---|---|---|---|
| SDG | 7191 | Client/Case no | Hanford SDG-H0510 |
| Contact | Kevin C. Johnson | Case no | TRB-SBB-207925 |
| DUPLICATE | | ORIGINAL | |
| Lab sample id | N909019-11 | Lab sample id | N909019-03 |
| Dept sample id | 7191-011 | Dept sample id | 7191-003 |
| | | Received | 09/01/99 |
| % solids | 93.3 | % solids | 93.3 |
| Client sample id | BOW6B2 | | |
| Location/Matrix | GP-5>15'bgs SOLID | | |
| Collected | 08/30/99 07:45 | | |
| Custody/SAF No | B99-078-89 B99-078 | | |

| ANALYTE | DUPLICATE pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST | ORIGINAL pCi/g | 2σ ERR (COUNT) | MDA pCi/g | QUALI-FIERS | RPD % | 3σ PROT TOT LIMIT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Uranium (ug/g) | 0.532 | 0.16 | 0.007 | 1.0 | J | U_T | 0.563 | 0.17 | 0.007 | J | 6 | 67 |
| Plutonium 238 | 0.005 | 0.021 | 0.051 | 1.0 | U | PU | 0.019 | 0.031 | 0.047 | U | - | |
| Plutonium 239/240 | -0.005 | 0.021 | 0.051 | 1.0 | U | PU | 0.004 | 0.015 | 0.029 | U | - | |
| Americium 241 | 0.004 | 0.040 | 0.070 | 1.0 | U | AM | -0.003 | 0.019 | 0.039 | U | - | |
| Total Strontium | -0.023 | 0.083 | 0.15 | 1.0 | U | SR | -0.006 | 0.14 | 0.19 | U | - | |
| Thorium 228 | 0.463 | 0.13 | 0.12 | 1.0 | J | TH | 0.509 | 0.16 | 0.15 | J | 9 | 65 |
| Thorium 230 | 0.448 | 0.14 | 0.16 | 1.0 | J | TH | 0.551 | 0.17 | 0.16 | J | 21 | 67 |
| Thorium 232 | 0.434 | 0.11 | 0.054 | 1.0 | J | TH | 0.430 | 0.12 | 0.082 | J | 1 | 58 |
| Potassium 40 | 10.7 | 0.60 | 0.29 | | | GAM | 11.8 | 0.60 | 0.32 | | 10 | 34 |
| Cobalt 60 | U | | 0.035 | 0.050 | U | GAM | U | | 0.031 | U | - | |
| Cesium 137 | U | | 0.034 | 0.10 | U | GAM | U | | 0.028 | U | - | |
| Europium 152 | U | | 0.082 | 0.10 | U | GAM | U | | 0.076 | U | - | |
| Europium 154 | U | | 0.12 | 0.10 | U | GAM | U | | 0.099 | U | - | |
| Europium 155 | U | | 0.094 | 0.10 | U | GAM | U | | 0.11 | U | - | |
| Radium 226 | 0.717 | 0.064 | 0.059 | 0.10 | | GAM | 0.730 | 0.060 | 0.054 | | 2 | 37 |
| Radium 228 | 0.984 | 0.15 | 0.15 | 0.20 | | GAM | 1.01 | 0.12 | 0.11 | | 3 | 43 |
| Thorium 228 | 0.981 | 0.042 | 0.039 | | | GAM | 0.916 | 0.044 | 0.040 | | 7 | 33 |
| Thorium 232 | 0.984 | 0.15 | 0.15 | | | GAM | 1.01 | 0.12 | 0.11 | | 3 | 43 |
| Americium 241 | U | | 0.14 | | U | GAM | U | | 0.26 | U | - | |
| Uranium 238 | U | | 4.2 | | U | GAM | U | | 3.5 | U | - | |
| Uranium 235 | U | | 0.14 | | U | GAM | U | | 0.13 | U | - | |

200 Area Source chrctztn-200-CW-1 OU

QC-DUP#3 31859

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 10/22/99

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

7191-012

BOW6B4

# DUPLICATE

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7191 | | | Client/Case no | Hanford SDG-H0510 |
| Contact | Kevin C. Johnson | | | Case no | TRB-SBB-207925 |
| | DUPLICATE | | ORIGINAL | | |
| Lab sample id | N909019-12 | Lab sample id | N909019-05 | Client sample id | BOW6B4 |
| Dept sample id | 7191-012 | Dept sample id | 7191-005 | Location/Matrix | GP-5>15'bgs SOLID |
| | | Received | 09/01/99 | Collected | 08/30/99 08:11 |
| | | % solids | 96.0 | Custody/SAF No | B99-078-89 B99-078 |

| ANALYTE | DUPLICATE pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST | ORIGINAL pCi/g | 2σ ERR (COUNT) | MDA pCi/g | QUALI-FIERS | RPD % | 3σ TOT | PROT LIMIT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Uranium 233/234 | 0.542 | 0.15 | 0.067 | 1.0 | J | U | 0.443 | 0.14 | 0.071 | J | 20 | 63 | |
| Uranium 235 | 0.053 | 0.043 | 0.081 | 1.0 | U | U | 0.045 | 0.045 | 0.086 | U | - | | |
| Uranium 238 | 0.472 | 0.13 | 0.067 | 1.0 | J | U | 0.480 | 0.14 | 0.071 | J | 2 | 61 | |

200 Area Source chrctztn-200-CW-1 OU

QC-DUP#5 32043

| | |
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| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DUP |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

7191-001 BOW6B7

## DATA SHEET

| | | | |
|---|---|---|---|
| SDG | 7191 | Client/Case no | Hanford SDG-H0510 |
| Contact | Kevin C. Johnson | Contract | TRB-SBB-207925 |
| Lab sample id | N909019-01 | Client sample id | BOW6B7 |
| Dept sample id | 7191-001 | Location/Matrix | GP-5>15'bgs SOLID |
| Received | 09/01/99 | Collected | 08/30/99 09:04 |
| % solids | 94.0 | Custody/SAF No | B99-078-94 B99-078 |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Tritium | 10028-17-8 | -0.026 | 0.040 | 0.070 | 400 | U | H |
| Technetium 99 | 14133-76-7 | 0.194 | 0.19 | 0.48 | 15 | U | TC |
| Total Uranium (ug/g) | 7440-61-1 | 0.510 | 0.15 | 0.007 | 1.0 | J | U_T |
| Plutonium 238 | 13981-16-3 | 0.011 | 0.022 | 0.036 | 1.0 | U | PU |
| Plutonium 239/240 | PU-239/240 | 0.019 | 0.022 | 0.041 | 1.0 | U | PU |
| Nickel 63 | 13981-37-8 | -2.22 | 2.0 | 3.4 | 30 | U | NI_L |
| Americium 241 | 14596-10-2 | 0.033 | 0.037 | 0.051 | 1.0 | U | AM |
| Total Strontium | SR-RAD | 0.019 | 0.095 | 0.13 | 1.0 | U | SR |
| Thorium 228 | 14274-82-9 | 0.205 | 0.11 | 0.15 | 1.0 | J | TH |
| Thorium 230 | 14269-63-7 | 0.241 | 0.11 | 0.13 | 1.0 | J | TH |
| Thorium 232 | TH-232 | 0.204 | 0.075 | 0.047 | 1.0 | J | TH |
| Potassium 40 | 13966-00-2 | 11.2 | 0.67 | 0.32 | | | GAM |
| Cobalt 60 | 10198-40-0 | U | | 0.032 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 0.030 | 0.10 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 0.078 | 0.10 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 0.11 | 0.10 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 0.081 | 0.10 | U | GAM |
| Radium 226 | 13982-63-3 | 0.490 | 0.062 | 0.060 | 0.10 | | GAM |
| Radium 228 | 15262-20-1 | 0.692 | 0.13 | 0.13 | 0.20 | | GAM |
| Thorium 228 | 14274-82-9 | 0.603 | 0.038 | 0.038 | | | GAM |
| Thorium 232 | TH-232 | 0.692 | 0.13 | 0.13 | | | GAM |
| Americium 241 | 14596-10-2 | U | | 0.12 | | U | GAM |
| Uranium 238 | U-238 | U | | 3.7 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 0.11 | | U | GAM |

200 Area Source chrctztn-200-CW-1 OU



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|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

7191-002 BOW6B8

## DATA SHEET

| | | | |
|---|---|---|---|
| SDG | 7191 | Client/Case no | Hanford SDG-H0510 |
| Contact | Kevin C. Johnson | Contract | TRB-SBB-207925 |
| Lab sample id | N909019-02 | Client sample id | BOW6B8 |
| Dept sample id | 7191-002 | Location/Matrix | GP-5>15'bgs SOLID |
| Received | 09/01/99 | Collected | 08/30/99 09:25 |
| % solids | 96.3 | Custody/SAF No | B99-078-94 B99-078 |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Tritium | 10028-17-8 | -0.036 | 0.040 | 0.070 | 400 | U | H |
| Technetium 99 | 14133-76-7 | -0.058 | 0.15 | 0.46 | 15 | U | TC |
| Total Uranium (ug/g) | 7440-61-1 | 0.629 | 0.19 | 0.007 | 1.0 | J | U_T |
| Plutonium 238 | 13981-16-3 | -0.020 | 0.020 | 0.051 | 1.0 | U | PU |
| Plutonium 239/240 | PU-239/240 | -0.010 | 0.013 | 0.041 | 1.0 | U | PU |
| Nickel 63 | 13981-37-8 | -3.73 | 2.8 | 4.9 | 30 | U | NI_L |
| Americium 241 | 14596-10-2 | 0 | 0.017 | 0.027 | 1.0 | U | AM |
| Total Strontium | SR-RAD | -0.027 | 0.12 | 0.17 | 1.0 | U | SR |
| Thorium 228 | 14274-82-9 | 0.477 | 0.13 | 0.13 | 1.0 | J | TH |
| Thorium 230 | 14269-63-7 | 0.388 | 0.15 | 0.17 | 1.0 | J | TH |
| Thorium 232 | TH-232 | 0.366 | 0.12 | 0.081 | 1.0 | J | TH |
| Potassium 40 | 13966-00-2 | 10.4 | 0.40 | 0.18 | | | GAM |
| Cobalt 60 | 10198-40-0 | U | | 0.017 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 0.016 | 0.10 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 0.041 | 0.10 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 0.060 | 0.10 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 0.043 | 0.10 | U | GAM |
| Radium 226 | 13982-63-3 | 0.369 | 0.036 | 0.035 | 0.10 | | GAM |
| Radium 228 | 15262-20-1 | 0.543 | 0.082 | 0.080 | 0.20 | | GAM |
| Thorium 228 | 14274-82-9 | 0.497 | 0.023 | 0.021 | | | GAM |
| Thorium 232 | TH-232 | 0.543 | 0.082 | 0.080 | | | GAM |
| Americium 241 | 14596-10-2 | U | | 0.054 | | U | GAM |
| Uranium 238 | U-238 | U | | 2.0 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 0.068 | | U | GAM |

200 Area Source chrctztn-200-CW-1 OU



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|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

7191-003 BOW6B2

## DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7191 | Client/Case no | Hanford | SDG-H0510 | |
| Contact | Kevin C. Johnson | Contract | TRB-SBB-207925 | | |
| Lab sample id | N909019-03 | Client sample id | BOW6B2 | | |
| Dept sample id | 7191-003 | Location/Matrix | GP-5>15'bgs | SOLID | |
| Received | 09/01/99 | Collected | 08/30/99 07:45 | | |
| % solids | 93.3 | Custody/SAF No | B99-078-89 | B99-078 | |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Total Uranium (ug/g) | 7440-61-1 | 0.563 | 0.17 | 0.007 | 1.0 | J | U_T |
| Plutonium 238 | 13981-16-3 | 0.019 | 0.031 | 0.047 | 1.0 | U | PU |
| Plutonium 239/240 | PU-239/240 | 0.004 | 0.015 | 0.029 | 1.0 | U | PU |
| Americium 241 | 14596-10-2 | -0.003 | 0.019 | 0.039 | 1.0 | U | AM |
| Total Strontium | SR-RAD | -0.006 | 0.14 | 0.19 | 1.0 | U | SR |
| Thorium 228 | 14274-82-9 | 0.509 | 0.16 | 0.15 | 1.0 | J | TH |
| Thorium 230 | 14269-63-7 | 0.551 | 0.17 | 0.16 | 1.0 | J | TH |
| Thorium 232 | TH-232 | 0.430 | 0.12 | 0.082 | 1.0 | J | TH |
| Potassium 40 | 13966-00-2 | 11.8 | 0.60 | 0.32 | | | GAM |
| Cobalt 60 | 10198-40-0 | U | | 0.031 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 0.028 | 0.10 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 0.076 | 0.10 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 0.099 | 0.10 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 0.11 | 0.10 | U | GAM |
| Radium 226 | 13982-63-3 | 0.730 | 0.060 | 0.054 | 0.10 | | GAM |
| Radium 228 | 15262-20-1 | 1.01 | 0.12 | 0.11 | 0.20 | | GAM |
| Thorium 228 | 14274-82-9 | 0.916 | 0.044 | 0.040 | | | GAM |
| Thorium 232 | TH-232 | 1.01 | 0.12 | 0.11 | | | GAM |
| Americium 241 | 14596-10-2 | U | | 0.26 | | U | GAM |
| Uranium 238 | U-238 | U | | 3.5 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 0.13 | | U | GAM |

200 Area Source chrctztn-200-CW-1 OU



| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

7191-004 BOW6B3

## DATA SHEET

| | | | |
|---|---|---|---|
| SDG | 7191 | Client/Case no | Hanford SDG-H0510 |
| Contact | Kevin C. Johnson | Contract | TRB-SBB-207925 |
| Lab sample id | N909019-04 | Client sample id | BOW6B3 |
| Dept sample id | 7191-004 | Location/Matrix | GP-5>15'bgs SOLID |
| Received | 09/01/99 | Collected | 08/30/99 08:00 |
| % solids | 97.0 | Custody/SAF No | B99-078-89 B99-078 |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Total Uranium (ug/g) | 7440-61-1 | 0.418 | 0.12 | 0.007 | 1.0 | J | U_T |
| Plutonium 238 | 13981-16-3 | -0.007 | 0.021 | 0.047 | 1.0 | U | PU |
| Plutonium 239/240 | PU-239/240 | 0.011 | 0.028 | 0.047 | 1.0 | U | PU |
| Americium 241 | 14596-10-2 | -0.008 | 0.016 | 0.043 | 1.0 | U | AM |
| Total Strontium | SR-RAD | 0.163 | 0.13 | 0.17 | 1.0 | U | SR |
| Thorium 228 | 14274-82-9 | 0.240 | 0.11 | 0.14 | 1.0 | J | TH |
| Thorium 230 | 14269-63-7 | 0.146 | 0.12 | 0.17 | 1.0 | U | TH |
| Thorium 232 | TH-232 | 0.166 | 0.080 | 0.089 | 1.0 | J | TH |
| Potassium 40 | 13966-00-2 | 9.24 | 0.46 | 0.20 | | | GAM |
| Cobalt 60 | 10198-40-0 | U | | 0.022 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 0.020 | 0.10 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 0.054 | 0.10 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 0.076 | 0.10 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 0.078 | 0.10 | U | GAM |
| Radium 226 | 13982-63-3 | 0.398 | 0.050 | 0.047 | 0.10 | | GAM |
| Radium 228 | 15262-20-1 | 0.565 | 0.10 | 0.097 | 0.20 | | GAM |
| Thorium 228 | 14274-82-9 | 0.637 | 0.048 | 0.045 | | | GAM |
| Thorium 232 | TH-232 | 0.565 | 0.10 | 0.097 | | | GAM |
| Americium 241 | 14596-10-2 | U | | 0.19 | | U | GAM |
| Uranium 238 | U-238 | U | | 2.8 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 0.096 | | U | GAM |

200 Area Source chrctztn-200-CW-1 OU



| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

7191-005 BOW6B4

## DATA SHEET

| | | | |
|---|---|---|---|
| SDG | 7191 | Client/Case no | Hanford SDG-H0510 |
| Contact | Kevin C. Johnson | Contract | TRB-SBB-207925 |
| Lab sample id | N909019-05 | Client sample id | BOW6B4 |
| Dept sample id | 7191-005 | Location/Matrix | GP-5>15'bgs SOLID |
| Received | 09/01/99 | Collected | 08/30/99 08:11 |
| % solids | 96.0 | Custody/SAF No | B99-078-89 B99-078 |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Uranium 233/234 | U-233/234 | 0.443 | 0.14 | 0.071 | 1.0 | J | U |
| Uranium 235 | 15117-96-1 | 0.045 | 0.045 | 0.086 | 1.0 | U | U |
| Uranium 238 | U-238 | 0.480 | 0.14 | 0.071 | 1.0 | J | U |
| Total Uranium (ug/g) | 7440-61-1 | 1.24 | 0.37 | 0.007 | 1.0 | | U_T |
| Plutonium 238 | 13981-16-3 | 0 | 0.008 | 0.030 | 1.0 | U | PU |
| Plutonium 239/240 | PU-239/240 | 0.004 | 0.016 | 0.038 | 1.0 | U | PU |
| Americium 241 | 14596-10-2 | -0.024 | 0.049 | 0.11 | 1.0 | U | AM |
| Total Strontium | SR-RAD | 0.052 | 0.14 | 0.19 | 1.0 | U | SR |
| Thorium 228 | 14274-82-9 | 0.168 | 0.084 | 0.12 | 1.0 | J | TH |
| Thorium 230 | 14269-63-7 | 0.189 | 0.11 | 0.16 | 1.0 | J | TH |
| Thorium 232 | TH-232 | 0.238 | 0.084 | 0.054 | 1.0 | J | TH |
| Potassium 40 | 13966-00-2 | 10.4 | 0.65 | 0.30 | | | GAM |
| Cobalt 60 | 10198-40-0 | U | | 0.035 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 0.031 | 0.10 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 0.077 | 0.10 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 0.11 | 0.10 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 0.087 | 0.10 | U | GAM |
| Radium 226 | 13982-63-3 | 0.448 | 0.058 | 0.051 | 0.10 | | GAM |
| Radium 228 | 15262-20-1 | 0.632 | 0.13 | 0.12 | 0.20 | | GAM |
| Thorium 228 | 14274-82-9 | 0.558 | 0.037 | 0.036 | | | GAM |
| Thorium 232 | TH-232 | 0.632 | 0.13 | 0.12 | | | GAM |
| Americium 241 | 14596-10-2 | U | | 0.12 | | U | GAM |
| Uranium 238 | U-238 | U | | 4.4 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 0.13 | | U | GAM |

200 Area Source chrctztn-200-CW-1 OU



| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

7191-006 BOW6B5

## DATA SHEET

| | | | |
|---|---|---|---|
| SDG | 7191 | Client/Case no | Hanford SDG-H0510 |
| Contact | Kevin C. Johnson | Contract | TRB-SBB-207925 |
| Lab sample id | N909019-06 | Client sample id | BOW6B5 |
| Dept sample id | 7191-006 | Location/Matrix | GP-5>15'bgs SOLID |
| Received | 09/01/99 | Collected | 08/30/99 08:31 |
| % solids | 97.0 | Custody/SAF No | B99-078-89 B99-078 |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Total Uranium (ug/g) | 7440-61-1 | 0.430 | 0.13 | 0.007 | 1.0 | J | U_T |
| Plutonium 238 | 13981-16-3 | -0.004 | 0.015 | 0.037 | 1.0 | U | PU |
| Plutonium 239/240 | PU-239/240 | -0.012 | 0.015 | 0.042 | 1.0 | U | PU |
| Americium 241 | 14596-10-2 | 0.028 | 0.032 | 0.050 | 1.0 | U | AM |
| Total Strontium | SR-RAD | 0.092 | 0.14 | 0.19 | 1.0 | U | SR |
| Thorium 228 | 14274-82-9 | 0.257 | 0.19 | 0.28 | 1.0 | U | TH |
| Thorium 230 | 14269-63-7 | 0.500 | 0.19 | 0.17 | 1.0 | J | TH |
| Thorium 232 | TH-232 | 0.174 | 0.093 | 0.11 | 1.0 | J | TH |
| Potassium 40 | 13966-00-2 | 9.70 | 0.38 | 0.15 | | | GAM |
| Cobalt 60 | 10198-40-0 | U | | 0.016 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 0.015 | 0.10 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 0.038 | 0.10 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 0.059 | 0.10 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 0.044 | 0.10 | U | GAM |
| Radium 226 | 13982-63-3 | 0.373 | 0.033 | 0.028 | 0.10 | | GAM |
| Radium 228 | 15262-20-1 | 0.483 | 0.076 | 0.075 | 0.20 | | GAM |
| Thorium 228 | 14274-82-9 | 0.479 | 0.022 | 0.020 | | | GAM |
| Thorium 232 | TH-232 | 0.483 | 0.076 | 0.075 | | | GAM |
| Americium 241 | 14596-10-2 | U | | 0.053 | | U | GAM |
| Uranium 238 | U-238 | U | | 2.2 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 0.063 | | U | GAM |

200 Area Source chrctztn-200-CW-1 OU



| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

7191-007 BOW6B6

## DATA SHEET

| | | | |
|---|---|---|---|
| SDG | 7191 | Client/Case no | Hanford SDG-H0510 |
| Contact | Kevin C. Johnson | Contract | TRB-SBB-207925 |
| Lab sample id | N909019-07 | Client sample id | BOW6B6 |
| Dept sample id | 7191-007 | Location/Matrix | GP-5>15'bgs SOLID |
| Received | 09/01/99 | Collected | 08/30/99 08:48 |
| % solids | 94.8 | Custody/SAF No | B99-078-89 B99-078 |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Total Uranium (ug/g) | 7440-61-1 | 0.481 | 0.14 | 0.007 | 1.0 | J | U_T |
| Plutonium 238 | 13981-16-3 | -0.005 | 0.030 | 0.072 | 1.0 | U | PU |
| Plutonium 239/240 | PU-239/240 | 0.005 | 0.030 | 0.055 | 1.0 | U | PU |
| Americium 241 | 14596-10-2 | 0.004 | 0.035 | 0.067 | 1.0 | U | AM |
| Total Strontium | SR-RAD | -0.048 | 0.14 | 0.19 | 1.0 | U | SR |
| Thorium 228 | 14274-82-9 | 0.315 | 0.14 | 0.18 | 1.0 | J | TH |
| Thorium 230 | 14269-63-7 | 0.349 | 0.14 | 0.15 | 1.0 | J | TH |
| Thorium 232 | TH-232 | 0.233 | 0.090 | 0.069 | 1.0 | J | TH |
| Potassium 40 | 13966-00-2 | 10.9 | 0.67 | 0.40 | | | GAM |
| Cobalt 60 | 10198-40-0 | U | | 0.033 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 0.030 | 0.10 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 0.082 | 0.10 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 0.11 | 0.10 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 0.082 | 0.10 | U | GAM |
| Radium 226 | 13982-63-3 | 0.504 | 0.068 | 0.064 | 0.10 | | GAM |
| Radium 228 | 15262-20-1 | 0.764 | 0.16 | 0.15 | 0.20 | | GAM |
| Thorium 228 | 14274-82-9 | 0.610 | 0.039 | 0.039 | | | GAM |
| Thorium 232 | TH-232 | 0.764 | 0.16 | 0.15 | | | GAM |
| Americium 241 | 14596-10-2 | U | | 0.12 | | U | GAM |
| Uranium 238 | U-238 | U | | 3.7 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 0.12 | | U | GAM |

200 Area Source chrctztn-200-CW-1 OU



| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

| | |
|---|---|
| Test | AM |
| Matrix | SOLID |
| SDG | 7191 |
| Contact | Kevin C. Johnson |

# LAB METHOD SUMMARY

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

| | |
|---|---|
| Client | Hanford |
| Contract | TRB-SBB-207925 |
| Case no | SDG-H0510 |

## RESULTS

| LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Americium 241 | |
|---|---|---|---|---|---|---|
| Preparation batch 6893-137 | | | | | | |
| N909019-01 | | | 7191-001 | BOW6B7 | U | |
| N909019-02 | | | 7191-002 | BOW6B8 | U | |
| N909019-03 | | | 7191-003 | BOW6B2 | U | |
| N909019-04 | | | 7191-004 | BOW6B3 | U | |
| N909019-05 | | | 7191-005 | BOW6B4 | U | |
| N909019-06 | | | 7191-006 | BOW6B5 | U | |
| N909019-07 | | | 7191-007 | BOW6B6 | U | |
| N909019-08 | | | 7191-008 | LCS (QC ID=31856) | LOW | |
| N909019-09 | | | 7191-009 | BLK (QC ID=31857) | U | |
| N909019-11 | | | 7191-011 | Duplicate (N909019-03) | - | U |
| Nominal values and limits from method | | | | RDLs (pCi/g) | 1.0 | |
| 200 Area Source chrctztn-200-CW-1 OU | | | | | | |

## METHOD PERFORMANCE

| LAB SAMPLE ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6893-137 | | | 2σ prep error 5.0 % | Reference Lab Notebook 6893 pg.137 | | | | | | | | | | | | |
| N909019-01 | | | BOW6B7 | 0.051 | 0.500 | | | 49 | | 1060 | | | 46 | 10/15/99 | 10/15 | SS-015 |
| N909019-02 | | | BOW6B8 | 0.027 | 0.500 | | | 82 | | 1060 | | | 46 | 10/15/99 | 10/15 | SS-016 |
| N909019-03 | | | BOW6B2 | 0.039 | 0.500 | | | 73 | | 1004 | | | 46 | 10/15/99 | 10/15 | SS-005 |
| N909019-04 | | | BOW6B3 | 0.043 | 0.500 | | | 58 | | 1004 | | | 46 | 10/15/99 | 10/15 | SS-006 |
| N909019-05 | | | BOW6B4 | 0.11 | 0.500 | | | 52 | | 721 | | | 47 | 10/15/99 | 10/16 | SS-049 |
| N909019-06 | | | BOW6B5 | 0.050 | 0.500 | | | 68 | | 862 | | | 49 | 10/15/99 | 10/18 | SS-008 |
| N909019-07 | | | BOW6B6 | 0.067 | 0.500 | | | 73 | | 722 | | | 47 | 10/15/99 | 10/16 | SS-044 |
| N909019-08 | | | LCS (QC ID=31856) | 0.034 | 0.500 | | | 84 | | 1025 | | | | 10/15/99 | 10/15 | SS-066 |
| N909019-09 | | | BLK (QC ID=31857) | 0.092 | 0.500 | | | 67 | | 722 | | | | 10/15/99 | 10/16 | SS-045 |
| N909019-11 | | | Duplicate (N909019-03) (QC ID=31859) | 0.070 | 0.500 | | | 80 | | 721 | | | 47 | 10/15/99 | 10/16 | SS-048 |
| Nominal values and limits from method | | | | 1.0 | 0.500 | | | 20-105 | | 700 | 100 | | 180 | | | |

| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

| | |
|---|---|
| Test AM | Matrix SOLID |
| SDG 7191 | |
| Contact Kevin C. Johnson | |

## LAB METHOD SUMMARY, cont.

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

| | |
|---|---|
| Client Hanford | |
| Contract TRB-SBB-207925 | |
| Case no SDG-H0510 | |

| PROCEDURES | REFERENCE | AM/CMPLATE |
|---|---|---|
| | EP-060 | Soil Preparation, rev 0 |
| | EP-070 | Soil Dissolution, rev 0 |
| | EP-940 | Plutonium Purification, rev 0 |
| | EP-960 | Americium-Curium Purification, rev 0 |
| | EP-008 | Heavy Elements Electroplating, rev 0 |

| | | | | |
|---|---|---|---|---|
| AVERAGES ± 2 SD | MDA | 0.058 | ± | 0.053 |
| FOR 10 SAMPLES | YIELD | 69 | ± | 25 |



| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

| | |
|---|---|
| Test | PU |
| Matrix | SOLID |
| SDG | 7191 |
| Contact | Kevin C. Johnson |

## LAB METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

| | |
|---|---|
| Client | Hanford |
| Contract | TRB-SBB-207925 |
| Case no | SDG-H0510 |

## RESULTS

| LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Plutonium 238 | | Plutonium 239/240 | |
|---|---|---|---|---|---|---|---|---|
| Preparation batch 6893-137 | | | | | | | | |
| N909019-01 | | | 7191-001 | BOW6B7 | U | | U | |
| N909019-02 | | | 7191-002 | BOW6B8 | U | | U | |
| N909019-03 | | | 7191-003 | BOW6B2 | U | | U | |
| N909019-04 | | | 7191-004 | BOW6B3 | U | | U | |
| N909019-05 | | | 7191-005 | BOW6B4 | U | | U | |
| N909019-06 | | | 7191-006 | BOW6B5 | U | | U | |
| N909019-07 | | | 7191-007 | BOW6B6 | U | | U | |
| N909019-08 | | | 7191-008 | LCS (QC ID=31856) | ok | | ok | |
| N909019-09 | | | 7191-009 | BLK (QC ID=31857) | U | | U | |
| N909019-11 | | | 7191-011 | Duplicate (N909019-03) | - | U | - | U |
| Nominal values and limits from method | | | | RDLs (pCi/g) | 1.0 | | 1.0 | |
| 200 Area Source chrctztn-200-CW-1 OU | | | | | | | | |

## METHOD PERFORMANCE

| LAB SAMPLE ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MAX MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6893-137 | | | 2σ prep error 5.0 % | Reference Lab Notebook 6893 pg.137 | | | | | | | | | | | | |
| N909019-01 | | | BOW6B7 | 0.041 | 0.500 | | | 71 | | 863 | | | 49 | 10/18/99 | 10/18 | SS-010 |
| N909019-02 | | | BOW6B8 | 0.051 | 0.500 | | | 84 | | 863 | | | 49 | 10/18/99 | 10/18 | SS-012 |
| N909019-03 | | | BOW6B2 | 0.047 | 0.500 | | | 74 | | 863 | | | 49 | 10/18/99 | 10/18 | SS-013 |
| N909019-04 | | | BOW6B3 | 0.047 | 0.500 | | | 78 | | 863 | | | 49 | 10/18/99 | 10/18 | SS-014 |
| N909019-05 | | | BOW6B4 | 0.038 | 0.500 | | | 72 | | 863 | | | 49 | 10/18/99 | 10/18 | SS-015 |
| N909019-06 | | | BOW6B5 | 0.042 | 0.500 | | | 73 | | 863 | | | 49 | 10/18/99 | 10/18 | SS-016 |
| N909019-07 | | | BOW6B6 | 0.072 | 0.500 | | | 67 | | 681 | | | 50 | 10/18/99 | 10/19 | SS-031 |
| N909019-08 | | | LCS (QC ID=31856) | 0.052 | 0.500 | | | 79 | | 716 | | | | 10/18/99 | 10/19 | SS-057 |
| N909019-09 | | | BLK (QC ID=31857) | 0.064 | 0.500 | | | 72 | | 709 | | | | 10/18/99 | 10/19 | SS-064 |
| N909019-11 | | | Duplicate (N909019-03) (QC ID=31859) | 0.051 | 0.500 | | | 71 | | 599 | | | 51 | 10/18/99 | 10/20 | SS-063 |
| Nominal values and limits from method | | | | 1.0 | 0.500 | | | 20-105 | | 10 | 100 | | 180 | | | |

| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

| | |
|---|---|
| Test | PU |
| Matrix | SOLID |
| SDG | 7191 |
| Contact | Kevin C. Johnson |

## LAB METHOD SUMMARY, cont.

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

| | |
|---|---|
| Client | Hanford |
| Contract | TRB-SBB-207925 |
| Case no | SDG-H0510 |

| PROCEDURES | REFERENCE | PUPLATE |
|---|---|---|
| | EP-060 | Soil Preparation, rev 0 |
| | EP-070 | Soil Dissolution, rev 0 |
| | EP-940 | Plutonium Purification, rev 0 |
| | EP-008 | Heavy Elements Electroplating, rev 0 |

| | | | | |
|---|---|---|---|---|
| AVERAGES ± 2 SD | MDA | 0.050 | ± | 0.021 |
| FOR 10 SAMPLES | YIELD | 74 | ± | 10 |

| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

| | |
|---|---|
| Test TH | Matrix SOLID |
| SDG 7191 | |
| Contact Kevin C. Johnson | |

## LAB METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

| | |
|---|---|
| Client Hanford | |
| Contract TRB-SBB-207925 | |
| Case no SDG-H0510 | |

## RESULTS

| LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Thorium 228 | Thorium 230 | Thorium 232 |
|---|---|---|---|---|---|---|---|
| Preparation batch 6893-137 | | | | | | | |
| N909019-01 | | | 7191-001 | BOW6B7 | 0.205 J | 0.241 J | 0.204 J |
| N909019-02 | | | 7191-002 | BOW6B8 | 0.477 J | 0.388 J | 0.366 J |
| N909019-03 | | | 7191-003 | BOW6B2 | 0.509 J | 0.551 J | 0.430 J |
| N909019-04 | | | 7191-004 | BOW6B3 | 0.240 J | U | 0.166 J |
| N909019-05 | | | 7191-005 | BOW6B4 | 0.168 J | 0.189 J | 0.238 J |
| N909019-06 | | | 7191-006 | BOW6B5 | U | 0.500 J | 0.174 J |
| N909019-07 | | | 7191-007 | BOW6B6 | 0.315 J | 0.349 J | 0.233 J |
| N909019-08 | | | 7191-008 | LCS (QC ID=31856) | | ok | |
| N909019-09 | | | 7191-009 | BLK (QC ID=31857) | U | U | U |
| N909019-11 | | | 7191-011 | Duplicate (N909019-03) | ok J | ok J | ok J |
| Nominal values and limits from method 200 Area Source chrctztn-200-CW-1 OU | | | | RDLs (pCi/g) | 1.0 | 1.0 | 1.0 |

## METHOD PERFORMANCE

| LAB SAMPLE ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MAX MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6893-137 2σ prep error 5.0 % Reference Lab Notebook 6893 pg.137 | | | | | | | | | | | | | | | | |
| N909019-01 | | | BOW6B7 | 0.15 | 0.250 | | | 87 | | 865 | | | 49 | 10/18/99 | 10/18 | SS-033 |
| N909019-02 | | | BOW6B8 | 0.17 | 0.250 | | | 75 | | 865 | | | 49 | 10/18/99 | 10/18 | SS-034 |
| N909019-03 | | | BOW6B2 | 0.16 | 0.250 | | | 64 | | 865 | | | 49 | 10/18/99 | 10/18 | SS-035 |
| N909019-04 | | | BOW6B3 | 0.17 | 0.250 | | | 84 | | 865 | | | 49 | 10/18/99 | 10/18 | SS-036 |
| N909019-05 | | | BOW6B4 | 0.16 | 0.250 | | | 81 | | 865 | | | 49 | 10/18/99 | 10/18 | SS-038 |
| N909019-06 | | | BOW6B5 | 0.28 | 0.250 | | | 58 | | 671 | | | 50 | 10/18/99 | 10/19 | SS-040 |
| N909019-07 | | | BOW6B6 | 0.18 | 0.250 | | | 84 | | 619 | | | 51 | 10/18/99 | 10/20 | SS-033 |
| N909019-08 | | | LCS (QC ID=31856) | 0.17 | 0.250 | | | 87 | | 867 | | | | 10/18/99 | 10/18 | SS-044 |
| N909019-09 | | | BLK (QC ID=31857) | 0.16 | 0.250 | | | 92 | | 867 | | | | 10/18/99 | 10/18 | SS-045 |
| N909019-11 | | | Duplicate (N909019-03) (QC ID=31859) | 0.16 | 0.250 | | | 75 | | 868 | | | 49 | 10/18/99 | 10/18 | SS-048 |
| Nominal values and limits from method | | | | 1.0 | 0.250 | | | 20-105 | | 200 | | | 180 | | | |

| | |
|---|---|
| Lab id TMANC | |
| Protocol Hanford | |
| Version Ver 1.0 | |
| Form DVD-LMS | |
| Version 3.06 | |
| Report date 10/22/99 | |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

| | |
|---|---|
| Test | TH |
| Matrix | SOLID |
| SDG | 7191 |
| Contact | Kevin C. Johnson |

## LAB METHOD SUMMARY, cont.

THORIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

| | |
|---|---|
| Client | Hanford |
| Contract | TRB-SBB-207925 |
| Case no | SDG-H0510 |

| PROCEDURES | REFERENCE | THPLATE |
|---|---|---|
| | EP-000 | Data Entry and Document Preparation, rev 0 |
| | EP-001 | Q.C. Preparation, rev 0 |
| | EP-003 | Tracing, rev 0 |
| | EP-008 | Heavy Elements Electroplating, rev 0 |
| | EP-070 | Soil Dissolution, rev 0 |
| | RP-901 | Thorium Purification - Small Aliquot, rev 0 |

| | | | | |
|---|---|---|---|---|
| AVERAGES ± 2 SD | MDA | 0.18 | ± | 0.075 |
| FOR 10 SAMPLES | YIELD | 79 | ± | 22 |

| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

| | |
|---|---|
| Test U | Matrix SOLID |
| SDG 7191 | |
| Contact Kevin C. Johnson | |

## LAB METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

| | |
|---|---|
| Client Hanford | |
| Contract TRB-SBB-207925 | |
| Case no SDG-H0510 | |

## RESULTS

| LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | 1: Uranium 233/234 | 2: Uranium 235 | 3: Uranium 238 | RESULT RATIOS (%) 1+3 | 2σ | 2+3 | 2σ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6893-137 | | | | | | | | | | | |
| N909019-05 | | | 7191-005 | BOW6B4 | 0.443 J | U | 0.480 J | 92 | 40 | 9 | 10 |
| N909019-12 | | | 7191-012 | Duplicate (N909019-05) | ok J | - U | ok J | 115 | 45 | 11 | 10 |
| Nominal values and limits from method | | | | RDLs (pCi/g) | 1.0 | 1.0 | 1.0 | 100 | | 4 | |
| 200 Area Source chrctztn-200-CW-1 OU | | | | | | | | Averages 104 | | 10 | |

## METHOD PERFORMANCE

| LAB SAMPLE ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MAX MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6893-137 | | | 2σ prep error 5.0 % | Reference Lab Notebook 6893 pg.137 | | | | | | | | | | | | |
| N909019-05 | | | BOW6B4 | 0.086 | 1.00 | | | 86 | | 155 | | | 45 | 10/13/99 | 10/14 | SS-038 |
| N909019-12 | | | Duplicate (N909019-05) (QC ID=32043) | 0.081 | 1.00 | | | 87 | | 151 | | | 46 | 10/13/99 | 10/15 | SS-027 |
| Nominal values and limits from method | | | | 1.0 | 1.00 | | | 30-105 | | 150 | 100 | | 180 | | | |

| PROCEDURES | REFERENCE | UPLATE |
|---|---|---|
| | EP-060 | Soil Preparation, rev 0 |
| | EP-070 | Soil Dissolution, rev 0 |
| | EP-910 | Uranium Purification, rev 0 |
| | EP-008 | Heavy Elements Electroplating, rev 0 |

| | | | |
|---|---|---|---|
| AVERAGES ± 2 SD | MDA | 0.084 | ± 0.007 |
| FOR 2 SAMPLES | YIELD | 86 | ± 1 |



| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

Test SR Matrix SOLID
SDG 7191
Contact Kevin C. Johnson

## LAB METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0510

## RESULTS

| LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Total Strontium | |
|---|---|---|---|---|---|---|
| Preparation batch 6893-137 | | | | | | |
| N909019-01 | | | 7191-001 | BOW6B7 | U | |
| N909019-02 | | | 7191-002 | BOW6B8 | U | |
| N909019-03 | | | 7191-003 | BOW6B2 | U | |
| N909019-04 | | | 7191-004 | BOW6B3 | U | |
| N909019-05 | | | 7191-005 | BOW6B4 | U | |
| N909019-06 | | | 7191-006 | BOW6B5 | U | |
| N909019-07 | | | 7191-007 | BOW6B6 | U | |
| N909019-08 | | | 7191-008 | LCS (QC ID=31856) | ok | |
| N909019-09 | | | 7191-009 | BLK (QC ID=31857) | U | |
| N909019-11 | | | 7191-011 | Duplicate (N909019-03) | - | U |
| Nominal values and limits from method | | | | RDLs (pCi/g) | 1.0 | |
| 200 Area Source chrctztn-200-CW-1 OU | | | | | | |

## METHOD PERFORMANCE

| LAB SAMPLE ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MAX MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6893-137 | | | 2σ prep error 10.0 % Reference Lab Notebook 6893 pg.137 | | | | | | | | | | | | | |
| N909019-01 | | | BOW6B7 | 0.13 | 1.00 | | | 88 | | 400 | | | 38 | 10/07/99 | 10/07 | GRB-217 |
| N909019-02 | | | BOW6B8 | 0.17 | 1.00 | | | 95 | | 400 | | | 38 | 10/07/99 | 10/07 | GRB-218 |
| N909019-03 | | | BOW6B2 | 0.19 | 1.00 | | | 83 | | 400 | | | 38 | 10/07/99 | 10/07 | GRB-219 |
| N909019-04 | | | BOW6B3 | 0.17 | 1.00 | | | 90 | | 400 | | | 38 | 10/07/99 | 10/07 | GRB-220 |
| N909019-05 | | | BOW6B4 | 0.19 | 1.00 | | | 87 | | 400 | | | 38 | 10/07/99 | 10/07 | GRB-221 |
| N909019-06 | | | BOW6B5 | 0.19 | 1.00 | | | 83 | | 400 | | | 38 | 10/07/99 | 10/07 | GRB-222 |
| N909019-07 | | | BOW6B6 | 0.19 | 1.00 | | | 89 | | 400 | | | 38 | 10/07/99 | 10/07 | GRB-223 |
| N909019-08 | | | LCS (QC ID=31856) | 0.50 | 1.00 | | | 80 | | 400 | | | | 10/07/99 | 10/07 | GRB-224 |
| N909019-09 | | | BLK (QC ID=31857) | 0.39 | 1.00 | | | 81 | | 200 | | | | 10/07/99 | 10/07 | GRB-214 |
| N909019-11 | | | Duplicate (N909019-03) (QC ID=31859) | 0.15 | 1.00 | | | 85 | | 200 | | | 38 | 10/07/99 | 10/07 | GRB-221 |
| Nominal values and limits from method | | | | 1.0 | 1.00 | | | | | 100 | | | 180 | | | |

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 10/22/99

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

| | |
|---|---|
| Test | SR |
| Matrix | SOLID |
| SDG | 7191 |
| Contact | Kevin C. Johnson |

## LAB METHOD SUMMARY, cont.

TOTAL STRONTIUM IN SOIL

BETA COUNTING

| | |
|---|---|
| Client | Hanford |
| Contract | TRB-SBB-207925 |
| Case no | SDG-H0510 |

| PROCEDURES | REFERENCE | SRTOTAL |
|---|---|---|
| | RP-500 | Strontium - Initial Separation, rev 0 |
| | RP-519 | Strontium-89,90 Demounting and Yttrium Purification, rev 0 |

| | | | | |
|---|---|---|---|---|
| AVERAGES ± 2 SD | MDA | 0.23 | ± | 0.24 |
| FOR 10 SAMPLES | YIELD | 86 | ± | 9 |



| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

| | |
|---|---|
| Test TC | Matrix SOLID |
| SDG 7191 | |
| Contact Kevin C. Johnson | |

## LAB METHOD SUMMARY

TECHNETIUM 99 IN SOIL

BETA COUNTING

| | |
|---|---|
| Client Hanford | |
| Contract TRB-SBB-207925 | |
| Case no SDG-H0510 | |

## RESULTS

| LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Technetium 99 | |
|---|---|---|---|---|---|---|
| Preparation batch 6893-125 | | | | | | |
| N909019-01 | | | 7191-001 | BOW6B7 | U | |
| N909019-02 | | | 7191-002 | BOW6B8 | U | |
| N909019-08 | | | 7191-008 | LCS (QC ID=31856) | ok | |
| N909019-09 | | | 7191-009 | BLK (QC ID=31857) | U | |
| N909019-10 | | | 7191-010 | Duplicate (N909019-01) | - | U |
| Nominal values and limits from method | | | | RDLs (pCi/g) | 15 | |
| 200 Area Source chrctztn-200-CW-1 OU | | | | | | |

## METHOD PERFORMANCE

| LAB SAMPLE ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6893-125 | | | 2σ prep error 10.0 % Reference Lab Notebook 6893 pg.125 | | | | | | | | | | | | | |
| N909019-01 | | | BOW6B7 | 0.48 | 1.00 | | | 72 | | 101 | | | 43 | 10/05/99 | 10/12 | GRB-218 |
| N909019-02 | | | BOW6B8 | 0.46 | 1.00 | | | 74 | | 101 | | | 44 | 10/05/99 | 10/13 | GRB-222 |
| N909019-08 | | | LCS (QC ID=31856) | 0.23 | 1.00 | | | 76 | | 400 | | | | 10/05/99 | 10/11 | GRB-229 |
| N909019-09 | | | BLK (QC ID=31857) | 0.30 | 1.00 | | | 55 | | 400 | | | | 10/05/99 | 10/11 | GRB-230 |
| N909019-10 | | | Duplicate (N909019-01) (QC ID=31858) | 0.40 | 1.00 | | | 67 | | 200 | | | 43 | 10/05/99 | 10/12 | GRB-225 |
| Nominal values and limits from method | | | | 15 | 1.00 | | | 20-105 | | 50 | | | 180 | | | |

| PROCEDURES | REFERENCE | TC99TRLSC |
|---|---|---|
| | EP-060 | Soil Preparation, rev 0 |
| | EP-020 | Sample Leach For Technetium-99, rev 0 |
| | EP-540 | Technetium-99 Purification, rev 0 |

| AVERAGES ± 2 SD | MDA 0.37 ± 0.21 |
|---|---|
| FOR 5 SAMPLES | YIELD 69 ± 17 |

| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

Test GAM Matrix SOLID
SDG 7191
Contact Kevin C. Johnson

## LAB METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0510

## RESULTS

| LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Cobalt 60 | | Cesium 137 | |
|---|---|---|---|---|---|---|---|---|
| Preparation batch 6893-137 | | | | | | | | |
| N909019-01 | | | 7191-001 | BOW6B7 | U | | U | |
| N909019-02 | | | 7191-002 | BOW6B8 | U | | U | |
| N909019-03 | | | 7191-003 | BOW6B2 | U | | U | |
| N909019-04 | | | 7191-004 | BOW6B3 | U | | U | |
| N909019-05 | | | 7191-005 | BOW6B4 | U | | U | |
| N909019-06 | | | 7191-006 | BOW6B5 | U | | U | |
| N909019-07 | | | 7191-007 | BOW6B6 | U | | U | |
| N909019-08 | | | 7191-008 | LCS (QC ID=31856) | ok | | ok | |
| N909019-09 | | | 7191-009 | BLK (QC ID=31857) | U | | U | |
| N909019-11 | | | 7191-011 | Duplicate (N909019-03) | - | U | - | U |
| Nominal values and limits from method | | | | RDLs (pCi/g) | 0.050 | | 0.10 | |
| 200 Area Source chrctztn-200-CW-1 OU | | | | | | | | |

## METHOD PERFORMANCE

| LAB SAMPLE ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MAX MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6893-137 | | | 2σ prep error 15.0 % Reference Lab Notebook 6893 pg.137 | | | | | | | | | | | | | |
| N909019-01 | | | BOW6B7 | 0.089 | 797 | | | | | 206 | | | 52 | 09/22/99 | 10/21 | 02,03,00 |
| N909019-02 | | | BOW6B8 | 0.048 | 811 | | | | | 206 | | | 52 | 09/22/99 | 10/21 | 02,04,00 |
| N909019-03 | | | BOW6B2 | 0.092 | 741 | | | | | 203 | | | 50 | 09/22/99 | 10/19 | MB,05,00 |
| N909019-04 | | | BOW6B3 | 0.071 | 868 | | | | | 206 | | | 52 | 09/22/99 | 10/21 | MB,05,00 |
| N909019-05 | | | BOW6B4 | 0.087 | 829 | | | | | 179 | | | 43 | 09/22/99 | 10/12 | 02,03,00 |
| N909019-06 | | | BOW6B5 | 0.051 | 855 | | | | | 179 | | | 43 | 09/22/99 | 10/12 | 02,04,00 |
| N909019-07 | | | BOW6B6 | 0.083 | 756 | | | | | 207 | | | 52 | 09/22/99 | 10/21 | 02,03,00 |
| N909019-08 | | | LCS (QC ID=31856) | 0.010 | 700 | | | | | 323 | | | | 09/22/99 | 10/12 | MB,08,00 |
| N909019-09 | | | BLK (QC ID=31857) | 0.023 | 700 | | | | | 180 | | | | 09/22/99 | 10/12 | MB,08,00 |
| N909019-11 | | | Duplicate (N909019-03) (QC ID=31859) | 0.086 | 741 | | | | | 249 | | | 44 | 09/22/99 | 10/13 | 02,03,00 |
| Nominal values and limits from method | | | | 0.050 | 700 | | | | | 100 | | | 180 | | | |

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 10/22/99

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

| | |
|---|---|
| Test GAM | Matrix SOLID |
| SDG 7191 | |
| Contact Kevin C. Johnson | |

## LAB METHOD SUMMARY, cont.

GAMMA SCAN

GAMMA SPECTROSCOPY

| | |
|---|---|
| Client Hanford | |
| Contract TRB-SBB-207925 | |
| Case no SDG-H0510 | |

| PROCEDURES | REFERENCE | GAMMAHI |
|---|---|---|
| | EP-060 | Soil Preparation, rev 0 |
| | EP-100 | Ge(Li) Preparation for Environmental Samples, rev 0 |

| | | |
|---|---|---|
| AVERAGES ± 2 SD | MDA | 0.064 ± 0.059 |
| FOR 10 SAMPLES | YIELD | ____ ± ____ |

| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

Test U T Matrix SOLID
SDG 7191
Contact Kevin C. Johnson

## LAB METHOD SUMMARY

URANIUM, TOTAL IN SOIL
KINETIC PHOSPHORIMETRY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0510

## RESULTS

| LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Total Uranium |
|---|---|---|---|---|---|
| Preparation batch 6893-137 | | | | | |
| N909019-01 | | | 7191-001 | BOW6B7 | 0.510 J |
| N909019-02 | | | 7191-002 | BOW6B8 | 0.629 J |
| N909019-03 | | | 7191-003 | BOW6B2 | 0.563 J |
| N909019-04 | | | 7191-004 | BOW6B3 | 0.418 J |
| N909019-05 | | | 7191-005 | BOW6B4 | 1.24 |
| N909019-06 | | | 7191-006 | BOW6B5 | 0.430 J |
| N909019-07 | | | 7191-007 | BOW6B6 | 0.481 J |
| N909019-08 | | | 7191-008 | LCS (QC ID=31856) | ok |
| N909019-09 | | | 7191-009 | BLK (QC ID=31857) | U |
| N909019-11 | | | 7191-011 | Duplicate (N909019-03) | ok J |

Nominal values and limits from method RDLs (ug/g) 1.0
200 Area Source chrctztn-200-CW-1 OU

## METHOD PERFORMANCE

| LAB SAMPLE ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MDA ug/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6893-137 | | | 2σ prep error 9.0 % Reference Lab Notebook 6893 pg.137 | | | | | | | | | | | | | |
| N909019-01 | | | BOW6B7 | 0.007 | 0.0500 | | | | | | | | 50 | 10/06/99 | 10/19 | KPA-001 |
| N909019-02 | | | BOW6B8 | 0.007 | 0.0500 | | | | | | | | 50 | 10/06/99 | 10/19 | KPA-001 |
| N909019-03 | | | BOW6B2 | 0.007 | 0.0500 | | | | | | | | 50 | 10/06/99 | 10/19 | KPA-001 |
| N909019-04 | | | BOW6B3 | 0.007 | 0.0500 | | | | | | | | 50 | 10/06/99 | 10/19 | KPA-001 |
| N909019-05 | | | BOW6B4 | 0.007 | 0.0500 | | | | | | | | 50 | 10/06/99 | 10/19 | KPA-001 |
| N909019-06 | | | BOW6B5 | 0.007 | 0.0500 | | | | | | | | 50 | 10/06/99 | 10/19 | KPA-001 |
| N909019-07 | | | BOW6B6 | 0.007 | 0.0500 | | | | | | | | 50 | 10/06/99 | 10/19 | KPA-001 |
| N909019-08 | | | LCS (QC ID=31856) | 0.073 | 0.0500 | | | | | | | | | 10/06/99 | 10/19 | KPA-001 |
| N909019-09 | | | BLK (QC ID=31857) | 0.007 | 0.0500 | | | | | | | | | 10/06/99 | 10/19 | KPA-001 |
| N909019-11 | | | Duplicate (N909019-03) (QC ID=31859) | 0.007 | 0.0500 | | | | | | | | 50 | 10/06/99 | 10/19 | KPA-001 |
| Nominal values and limits from method | | | | 1.0 | 0.0550 | | | | | | | | 180 | | | |



Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 10/22/99

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

| | |
|---|---|
| Test U T Matrix SOLID | |
| SDG 7191 | |
| Contact Kevin C. Johnson | |

## LAB METHOD SUMMARY, cont.

URANIUM, TOTAL IN SOIL

KINETIC PHOSPHORIMETRY

| | |
|---|---|
| Client Hanford | |
| Contract TRB-SBB-207925 | |
| Case no SDG-H0510 | |

| PROCEDURES | REFERENCE | UKPA |
|---|---|---|
| | EP-060 | Soil Preparation, rev 0 |
| | EP-070 | Soil Dissolution, rev 0 |
| | EP-044 | Preparation of Total Uranium by Kinetic Phosphorimetry, rev 1 |
| | EP-928 | Total Uranium by Kinetic Phosphorimetry, rev 0 |

| | | |
|---|---|---|
| AVERAGES ± 2 SD | MDA 0.014 | ± 0.042 |
| FOR 10 SAMPLES | YIELD | ± |

| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

| | |
|---|---|
| Test H | Matrix SOLID |
| SDG 7191 | |
| Contact Kevin C. Johnson | |

## LAB METHOD SUMMARY

TRITIUM IN SOIL

LIQUID SCINTILLATION COUNTING

| | |
|---|---|
| Client Hanford | |
| Contract TRB-SBB-207925 | |
| Case no SDG-H0510 | |

## RESULTS

| LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Tritium | |
|---|---|---|---|---|---|---|
| Preparation batch 6893-130 | | | | | | |
| N908172-09 | | | 7189-009 | LCS (QC ID=31846) | ok | J |
| N908172-10 | | | 7189-010 | BLK (QC ID=31847) | U | |
| N909019-01 | | | 7191-001 | BOW6B7 | U | |
| N909019-02 | | | 7191-002 | BOW6B8 | U | |
| N909019-10 | | | 7191-010 | Duplicate (N909019-01) | - | U |

Nominal values and limits from method RDLs (pCi/g) 400

200 Area Source chrctztn-200-CW-1 OU

## METHOD PERFORMANCE

| LAB SAMPLE ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6893-130 | | | 2σ prep error 10.0 % | Reference Lab Notebook 6893 pg.130 | | | | | | | | | | | | |
| N908172-09 | | | LCS (QC ID=31846) | 0.071 | 20.4 | | | 100 | | 120 | | | | 10/02/99 | 10/04 | LSC-007 |
| N908172-10 | | | BLK (QC ID=31847) | 0.070 | 20.4 | | | 100 | | 120 | | | | 10/02/99 | 10/04 | LSC-007 |
| N909019-01 | | | BOW6B7 | 0.070 | 20.3 | | | 100 | | 120 | | | 36 | 10/02/99 | 10/05 | LSC-007 |
| N909019-02 | | | BOW6B8 | 0.070 | 20.6 | | | 100 | | 120 | | | 36 | 10/02/99 | 10/05 | LSC-007 |
| N909019-10 | | | Duplicate (N909019-01) (QC ID=31858) | 0.071 | 20.4 | | | 100 | | 120 | | | 36 | 10/02/99 | 10/05 | LSC-007 |
| Nominal values and limits from method | | | | 400 | 20.4 | | | | | 25 | | | 180 | | | |

| PROCEDURES | REFERENCE | EPA906.0 |
|---|---|---|
| | EP-060 | Soil Preparation, rev 0 |
| | EP-211 | Tritium in Solid Samples by Azeotropic Distillation, rev 0 |

| | | | | |
|---|---|---|---|---|
| AVERAGES ± 2 SD | MDA | 0.070 | ± | 0.001 |
| FOR 5 SAMPLES | YIELD | 100 | ± | 0 |

| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
| Report date | 10/22/99 |

# TMA/RICHMOND

SAMPLE DELIVERY GROUP H0510

| | |
|---|---|
| Test | NI L Matrix SOLID |
| SDG | 7191 |
| Contact | Kevin C. Johnson |

## LAB METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

| | |
|---|---|
| Client | Hanford |
| Contract | TRB-SBB-207925 |
| Case no | SDG-H0510 |

## RESULTS

| LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Nickel 63 | |
|---|---|---|---|---|---|---|
| Preparation batch 6893-125 | | | | | | |
| N909019-01 | | | 7191-001 | BOW6B7 | U | |
| N909019-02 | | | 7191-002 | BOW6B8 | U | |
| N909019-08 | | | 7191-008 | LCS (QC ID=31856) | ok | |
| N909019-09 | | | 7191-009 | BLK (QC ID=31857) | U | |
| N909019-10 | | | 7191-010 | Duplicate (N909019-01) | - | U |

Nominal values and limits from method RDLs (pCi/g) 30

200 Area Source chrctztn-200-CW-1 OU

## METHOD PERFORMANCE

| LAB SAMPLE ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6893-125 | | | 2σ prep error 10.0 % Reference Lab Notebook 6893 pg.125 | | | | | | | | | | | | | |
| N909019-01 | | | BOW6B7 | 3.4 | 0.500 | | | 66 | | 100 | | | 38 | 10/06/99 | 10/07 | LSC-004 |
| N909019-02 | | | BOW6B8 | 4.9 | 0.500 | | | 47 | | 100 | | | 38 | 10/06/99 | 10/07 | LSC-004 |
| N909019-08 | | | LCS (QC ID=31856) | 2.5 | 0.500 | | | 89 | | 100 | | | | 10/06/99 | 10/07 | LSC-004 |
| N909019-09 | | | BLK (QC ID=31857) | 2.6 | 0.500 | | | 88 | | 100 | | | | 10/06/99 | 10/07 | LSC-004 |
| N909019-10 | | | Duplicate (N909019-01) (QC ID=31858) | 3.0 | 0.500 | | | 75 | | 100 | | | 38 | 10/06/99 | 10/07 | LSC-004 |
| Nominal values and limits from method | | | | 30 | 0.500 | | | | | 10 | | | 180 | | | |

| PROCEDURES | REFERENCE | NI63LSC |
|---|---|---|
| | EP-060 | Soil Preparation, rev 0 |
| | EP-431 | Nickel-63 Purification, rev 0 |

| | | | |
|---|---|---|---|
| AVERAGES ± 2 SD | MDA | 3.3 | ± 1.9 |
| FOR 5 SAMPLES | YIELD | 73 | ± 35 |

| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
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Contact Kevin C. Johnson

# REPORT GUIDE

Client Hanford
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## SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

  QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.



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REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
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# PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

  Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.



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## WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.



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## DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

  The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).



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# DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

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GUIDE, cont.

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# DATA SHEET

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.



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# REPORT GUIDE

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## LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.



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## DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.



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DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

  Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.



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## MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits



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# MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.



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## METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'



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means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant



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results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.



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| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B99-078-89 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: Bowers/Porter/Nielson | Company Contact: Chris Cearlock | Telephone No.: 372-9574 | Project Coordinator: TRENT, SJ |
| Price Code: 8N | Data Turnaround: 45 Days | | |
| Project Designation: 200 Area Source characterization - 200-CW-1 OU | Sampling Location: GP-5 <15' bgs | SAF No.: B99-078 | SDC HOS10 |
| Ice Chest No.: ERC 96-014 | Field Logbook No.: EL-1511 | Method of Shipment: Federal Express | |
| Shipped To: TMA/RECRA 8-30-99 | Offsite Property No.: A99 0237 | Bill of Lading/Air Bill No.: 4235 7952 8874 | |
| | | COA: B20CW1 67/C | |

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | Cool 4C | None | Cool 4C | None | Cool 4C | None | | | |
| Type of Container | aG | aG | aG | aG | aG | aG | aG | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Volume | 60mL | 250mL | 250mL | 500mL | 500mL | 1000mL | 1000mL | | | |
| SAMPLE ANALYSIS | Isotopic Uranium | VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol) | pH (Soil) - 9045 | Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082 | See item (1) in Special Instructions. | See item (2) in Special Instructions. | See item (3) in Special Instructions. | | | |

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B0W6B2 | Soil | 8-30-99 | 0745 | X | | | | | | X | 3.4' | |
| BOW6B3 | Soil | 8-30-99 | 0800 | X | | | | | | X | 5.5'-6.5' | |
| BOW6B4 | Soil | 8-30-99 | 0811 | X | | | | | | X | 8'-9' | |
| BOW6B5 | Soil | 8-30-99 | 0831 | X | | | | | | X | 10.5' | 11.5' |
| BOW6B6 | Soil | 8-30-99 | 0848 | X | | | | | | X | 14' | 15' |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By: Doug Bowers / Doug Bowers | Date/Time: 8-30-99/1130 | Received By: Ref 1B | Date/Time: 8-30-99/1130 |
| Relinquished By: REF 1B | Date/Time: 8-30-99/1500 | Received By: C Price | Date/Time: 9-30/99 1500 |
| Relinquished By: C Price | Date/Time: 9-31-99 1300 | Received By: FEDEX | Date/Time: 8-31-99 1300 |
| Relinquished By: FedEx | Date/Time: 9-1-99 10:00 | Received By: TNV M. Goldenberg | Date/Time: 9-1-99 10:00 |
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

COLLECTOR UNAVAILABLE TO SIGN COC

(1) ICP Metals - 6010A (Superfrace) (Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196

(2) NO2/NO3 - 353.1; IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

(3) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241

use Bow 5L8 to ship

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B99-078-94 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector<br>Bowers/Porter/Nielson | Company Contact<br>Chris Cearlock | Telephone No.<br>372-9574 | Project Coordinator<br>TRENT, SJ | Price Code 8N<br>SDG HOS 10 | Data Turnaround<br>45 Days |
| Project Designation<br>200 Area Source characterization - 200-CW-1 OU | Sampling Location<br>GP-5 >15' bgs | | SAF No.<br>B99-078 | | |
| Ice Chest No.<br>ERC 96-014 | Field Logbook No.<br>EL-1511 | | Method of Shipment<br>Federal Express | | |
| Shipped To<br>TMA/~~REORA~~ 8-30-99 | Offsite Property No.<br>A99 0237 | | Bill of Lading/Air Bill No.<br>4235 7952 8874 | | |
| | | | COA B20CW1 671C | | |

| POSSIBLE SAMPLE HAZARDS/REMARKS | Preservation | None | None | None | None | Cool 4C | None | Cool 4C | None | Cool 4C | None |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type of Container | aG | aG | aG | aG | aG | aG | aG | aG | aG | aG |
| | No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Special Handling and/or Storage | Volume | 60mL | 60mL | 60mL | 120mL | 250mL | 250mL | 500mL | 500mL | 1000mL | 1000mL |
| SAMPLE ANALYSIS | | Isotopic Uranium | Nickel-63 | Technetium-99 | Tritium - H3 | VOA - 8260A (TCL); VOA - 8260A (Add-On) {1-Propanol, Ethanol} | pH (Soil) - 9045 | Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082 | See item (1) in Special Instructions. | See item (2) in Special Instructions. | See item (3) in Special Instructions. |

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ✓ B0W6B7 | Soil | 8/30/99 | 09:04 | X | X | X | X | | | | | | X |
| ✓ B0W6B8 | Soil | 8/30/99 | 09:25 | X | X | X | X | | | | | | X |
| | | | | | | | | | | | | DJO 8-30-99 | X |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By Doug Bowers | Date/Time 8-30-99/1130 | Received By B.F. IB | Date/Time 8-30-99/1130 |
| Relinquished By RJF IB | Date/Time 8/30/99 1400 | Received By C. Cearlock | Date/Time 8/30/99 1400 |
| Relinquished By C. Cearlock | Date/Time 8/30/99 1400 | Received By FEDEX | Date/Time 8/31/99 1400 |
| Relinquished By FedEx | Date/Time 9-1-99 10:00 | Received By TNV M. Goldenberg 10:00 | Date/Time 9-1-99 |

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

COLLECTOR UNAVAILABLE TO SIGN COC

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

(2) NO2/NO3 - 353.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

(3) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241} Strontium-89,90 – Total Sr Total Uranium {Uranium} Isotopic Plutonium Isotopic Thorium {Thorium-232} Americium-241

use BOW5L8 to ship

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

| LABORATORY SECTION | Received By | Title | Date/Time |
|---|---|---|---|
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

Thermo NUtech - Richmond

## SAMPLE RECEIPT CHECKLIST

### SAMPLE RECEIPT

Client: Bechtel Hanford Inc Date/Time received 9-1-99 10:00

CoC No. B99-078-89, 94

Container I.D. No. ERC 96-014 Requested TAT (Days) 45 P.O. Received Yes [ ] No [✓]

### INSPECTION

1. Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [✓] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Cooler Temperature: _____ Packing material is: Wet [ ] Dry [ ]
6. Number of samples in shipping container: 7
7. Number of containers per sample: _____ (Or see CoC ✓ )
8. Paperwork agrees with samples? Yes [✓] No [ ]
9. Samples have: Tape [ ] Hazard labels [ ] Rad labels [✓] Appropriate sample labels [✓]
10. Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]
11. Describe any anomalies: _____

13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
14. Received by M. Goldenberg Date: 9-1-99 Time: 10:00

### LOGIN

TNU W.O. No. _____ Group No. _____ Client W.O. No. _____

### PROGRAM MANAGER

Sample holding times exceeded? Yes [ ] No [ ]

Client Notified: Name _____ Date/time _____

RECRA
ENVIRONMENTAL
INC.

*Chemical and Environmental Measurement Information*

DEC 1999
RECEIVED
Data
Log In

**Recra LabNet Philadelphia**
**Analytical Report**

**Client :** TNU-HANFORD B99-078
**RFW# :** 9909L951
**SDG/SAF #:** H0510/B99-078

**W.O. #:** 10985-001-001-9999-00
**Date Received:** 09-01-99

**SEMIVOLATILE**

Seven (7) soil samples were collected on 08-30-99.

The samples and their associated QC samples were extracted on 09-08-99 and analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8270B for TCL Semivolatile target compounds on 09-24,25-99.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperatures upon receipt have been recorded on the chain-of-custody.

2. The required holding times for extraction and analysis were met.

3. Non-target compounds were detected in the samples.

4. These samples were spectrally searched for Butylated Hydroxytoluene; however, it was not identified in the samples.

5. All surrogate recoveries were within EPA QC limits.

6. All matrix spike recoveries were within EPA QC limits.

7. All blank spike recoveries were within EPA QC limits.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

10-13-99
Date

som\gorup\data\bna\tnu09951.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 18 pages.



208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

# GLOSSARY OF BNA DATA

## DATA QUALIFIERS

| | | |
|---|---|---|
| **U** | = | Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture. |
| **J** | = | Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J. |
| **B** | = | This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound. |
| **E** | = | Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution. |
| **D** | = | Identifies all compounds identified in an analysis at a secondary dilution factor. |
| **I** | = | Interference. |
| **NQ** | = | Result qualitatively confirmed but not able to quantify. |
| **A** | = | Indicates that a TIC is a suspected aldol-condensation product. |
| **N** | = | Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used. |
| **X** | = | This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard). |
| **Y** | = | Additional qualifiers used as required are explained in the case narrative. |

mmz\10-94\gloss.bna

# GLOSSARY OF BNA DATA

## ABBREVIATIONS

| | | |
|---|---|---|
| **BS** | = | Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported. |
| **BSD** | = | Indicates blank spike duplicate. |
| **MS** | = | Indicates matrix spike. |
| **MSD** | = | Indicates matrix spike duplicate. |
| **DL** | = | Suffix added to sample number to indicate that results are from a diluted analysis. |
| **NA** | = | Not Applicable. |
| **DF** | = | Dilution Factor. |
| **NR** | = | Not Required. |
| **SP, Z** | = | Indicates Spiked Compound. |

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**Recra LabNet - Lionville Laboratory**

Semivolatiles by GC/MS, HSL List

Report Date: 09/30/99 16:08

RFW Batch Number: **9909L951** Client: **TNU-HANFORD B99-078** Work Order: 10985001001 Page: 1a

| | Cust ID: | B0W6B2 | | B0W6B2 | | B0W6B2 | | B0W6B3 | | B0W6B4 | | B0W6B5 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 001 | | 001 MS | | 001 MSD | | 002 | | 003 | | 004 | |
| | Matrix: | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | |
| | D.F.: | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| | Units: | UG/KG | | UG/KG | | UG/KG | | UG/KG | | UG/KG | | UG/KG | |
| Surrogate Recovery | Nitrobenzene-d5 | 86 | % | 75 | % | 77 | % | 75 | % | 77 | % | 85 | % |
| | 2-Fluorobiphenyl | 83 | % | 74 | % | 79 | % | 74 | % | 78 | % | 86 | % |
| | Terphenyl-d14 | 90 | % | 78 | % | 79 | % | 78 | % | 78 | % | 91 | % |
| | Phenol-d5 | 77 | % | 64 | % | 67 | % | 64 | % | 66 | % | 74 | % |
| | 2-Fluorophenol | 75 | % | 65 | % | 67 | % | 63 | % | 65 | % | 72 | % |
| | 2,4,6-Tribromophenol | 69 | % | 65 | % | 62 | % | 54 | % | 54 | % | 56 | % |
| | | | fl | | fl | | fl | | fl | | fl | | fl |
| Phenol | | 360 | U | 65 | % | 64 | % | 340 | U | 350 | U | 340 | U |
| bis(2-Chloroethyl)ether | | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| 2-Chlorophenol | | 360 | U | 67 | % | 66 | % | 340 | U | 350 | U | 340 | U |
| 1,3-Dichlorobenzene | | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| 1,4-Dichlorobenzene | | 360 | U | 74 | % | 74 | % | 340 | U | 350 | U | 340 | U |
| 1,2-Dichlorobenzene | | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| 2-Methylphenol* | | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| 2,2'-oxybis(1-Chloropropane) | | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| 4-Methylphenol | | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| N-Nitroso-di-n-propylamine | | 360 | U | 84 | % | 85 | % | 340 | U | 350 | U | 340 | U |
| Hexachloroethane | | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| Nitrobenzene | | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| Isophorone | | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| 2-Nitrophenol | | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| 2,4-Dimethylphenol | | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| bis(2-Chloroethoxy)methane | | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| 2,4-Dichlorophenol | | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| 1,2,4-Trichlorobenzene | | 360 | U | 76 | % | 77 | % | 340 | U | 350 | U | 340 | U |
| Naphthalene | | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| 4-Chloroaniline | | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| Hexachlorobutadiene | | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| 4-Chloro-3-methylphenol | | 360 | U | 64 | % | 60 | % | 340 | U | 350 | U | 340 | U |
| 2-Methylnaphthalene | | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| Hexachlorocyclopentadiene | | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| 2,4,6-Trichlorophenol | | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| 2,4,5-Trichlorophenol | | 900 | U | 900 | U | 900 | U | 860 | U | 860 | U | 860 | U |

*= Outside of EPA CLP QC limits.

RFW Batch Number: 9909L951 Client: TNU-HANFORD B99-078 Work Order: 10985001001 Page: 1b

| Cust ID: | B0W6B2 | | B0W6B2 | | B0W6B2 | | B0W6B3 | | B0W6B4 | | B0W6B5 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RFW#: | 001 | | 001 MS | | 001 MSD | | 002 | | 003 | | 004 | |
| 2-Chloronaphthalene | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| 2-Nitroaniline | 900 | U | 900 | U | 900 | U | 860 | U | 860 | U | 860 | U |
| Dimethylphthalate | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| Acenaphthylene | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| 2,6-Dinitrotoluene | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| 3-Nitroaniline | 900 | U | 900 | U | 900 | U | 860 | U | 860 | U | 860 | U |
| Acenaphthene | 360 | U | 80 | % | 80 | % | 340 | U | 350 | U | 340 | U |
| 2,4-Dinitrophenol | 900 | U | 900 | U | 900 | U | 860 | U | 860 | U | 860 | U |
| 4-Nitrophenol | 900 | U | 53 | % | 45 | % | 860 | U | 860 | U | 860 | U |
| Dibenzofuran | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| 2,4-Dinitrotoluene | 360 | U | 77 | % | 74 | % | 340 | U | 350 | U | 340 | U |
| Diethylphthalate | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| 4-Chlorophenyl-phenylether | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| Fluorene | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| 4-Nitroaniline | 900 | U | 900 | U | 900 | U | 860 | U | 860 | U | 860 | U |
| 4,6-Dinitro-2-methylphenol | 900 | U | 900 | U | 900 | U | 860 | U | 860 | U | 860 | U |
| N-Nitrosodiphenylamine (1) | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| 4-Bromophenyl-phenylether | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| Hexachlorobenzene | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| Pentachlorophenol | 900 | U | 63 | % | 58 | % | 860 | U | 860 | U | 860 | U |
| Phenanthrene | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| Anthracene | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| Carbazole | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| Di-n-butylphthalate | 360 | U | 20 | J | 360 | U | 340 | U | 21 | J | 340 | U |
| Fluoranthene | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| Pyrene | 360 | U | 81 | % | 82 | % | 340 | U | 350 | U | 340 | U |
| Butylbenzylphthalate | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| 3,3'-Dichlorobenzidine | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| Benzo(a)anthracene | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| Chrysene | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| bis(2-Ethylhexyl)phthalate | 360 | U | 26 | J | 360 | U | 340 | U | 350 | U | 340 | U |
| Di-n-octyl phthalate | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| Benzo(b)fluoranthene | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| Benzo(k)fluoranthene | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| Benzo(a)pyrene | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| Indeno(1,2,3-cd)pyrene | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| Dibenz(a,h)anthracene | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |
| Benzo(g,h,i)perylene | 360 | U | 360 | U | 360 | U | 340 | U | 350 | U | 340 | U |

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

**Recra LabNet - Lionville Laboratory**

Semivolatiles by GC/MS, HSL List

Report Date: 09/30/99 16:08

RFW Batch Number: **9909L951** Client: **TNU-HANFORD B99-078** Work Order: 10985001001 Page: 2a

| | Cust ID: | B0W6B6 | B0W6B7 | B0W6B8 | SBLKCM | SBLKCM BS |
|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 005 | 006 | 007 | 99LE1098-MB1 | 99LE1098-MB1 |
| | Matrix: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | D.F.: | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | Units: | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG |
| Surrogate Recovery | Nitrobenzene-d5 | 81 % | 75 % | 83 % | 89 % | 86 % |
| | 2-Fluorobiphenyl | 77 % | 74 % | 80 % | 89 % | 84 % |
| | Terphenyl-d14 | 81 % | 75 % | 88 % | 90 % | 86 % |
| | Phenol-d5 | 68 % | 65 % | 70 % | 75 % | 74 % |
| | 2-Fluorophenol | 68 % | 64 % | 67 % | 75 % | 72 % |
| | 2,4,6-Tribromophenol | 56 % | 50 % | 51 % | 64 % | 71 % |
| Phenol | | 350 U | 360 U | 350 U | 330 U | 69 % |
| bis(2-Chloroethyl)ether | | 350 U | 360 U | 350 U | 330 U | 330 U |
| 2-Chlorophenol | | 350 U | 360 U | 350 U | 330 U | 71 % |
| 1,3-Dichlorobenzene | | 350 U | 360 U | 350 U | 330 U | 330 U |
| 1,4-Dichlorobenzene | | 350 U | 360 U | 350 U | 330 U | 81 % |
| 1,2-Dichlorobenzene | | 350 U | 360 U | 350 U | 330 U | 330 U |
| 2-Methylphenol | | 350 U | 360 U | 350 U | 330 U | 330 U |
| 2,2'-oxybis(1-Chloropropane) | | 350 U | 360 U | 350 U | 330 U | 330 U |
| 4-Methylphenol | | 350 U | 360 U | 350 U | 330 U | 330 U |
| N-Nitroso-di-n-propylamine | | 350 U | 360 U | 350 U | 330 U | 90 % |
| Hexachloroethane | | 350 U | 360 U | 350 U | 330 U | 330 U |
| Nitrobenzene | | 350 U | 360 U | 350 U | 330 U | 330 U |
| Isophorone | | 350 U | 360 U | 350 U | 330 U | 330 U |
| 2-Nitrophenol | | 350 U | 360 U | 350 U | 330 U | 330 U |
| 2,4-Dimethylphenol | | 350 U | 360 U | 350 U | 330 U | 330 U |
| bis(2-Chloroethoxy)methane | | 350 U | 360 U | 350 U | 330 U | 330 U |
| 2,4-Dichlorophenol | | 350 U | 360 U | 350 U | 330 U | 330 U |
| 1,2,4-Trichlorobenzene | | 350 U | 360 U | 350 U | 330 U | 83 % |
| Naphthalene | | 350 U | 360 U | 350 U | 330 U | 330 U |
| 4-Chloroaniline | | 350 U | 360 U | 350 U | 330 U | 330 U |
| Hexachlorobutadiene | | 350 U | 360 U | 350 U | 330 U | 330 U |
| 4-Chloro-3-methylphenol | | 350 U | 360 U | 350 U | 330 U | 67 % |
| 2-Methylnaphthalene | | 350 U | 360 U | 350 U | 330 U | 330 U |
| Hexachlorocyclopentadiene | | 350 U | 360 U | 350 U | 330 U | 330 U |
| 2,4,6-Trichlorophenol | | 350 U | 360 U | 350 U | 330 U | 330 U |
| 2,4,5-Trichlorophenol | | 880 U | 900 U | 860 U | 840 U | 840 U |

*= Outside of EPA CLP QC limits.

| Cust ID: | B0W6B6 | | B0W6B7 | | B0W6B8 | | SBLKCM | | SBLKCM BS | |
|---|---|---|---|---|---|---|---|---|---|---|
| RFW#: | 005 | | 006 | | 007 | | 99LE1098-MB1 | | 99LE1098-MB1 | |
| 2-Chloronaphthalene | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| 2-Nitroaniline | 880 | U | 900 | U | 860 | U | 840 | U | 840 | U |
| Dimethylphthalate | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| Acenaphthylene | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| 2,6-Dinitrotoluene | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| 3-Nitroaniline | 880 | U | 900 | U | 860 | U | 840 | U | 840 | U |
| Acenaphthene | 350 | U | 360 | U | 350 | U | 330 | U | 84 | % |
| 2,4-Dinitrophenol | 880 | U | 900 | U | 860 | U | 840 | U | 840 | U |
| 4-Nitrophenol | 880 | U | 900 | U | 860 | U | 840 | U | 55 | % |
| Dibenzofuran | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| 2,4-Dinitrotoluene | 350 | U | 360 | U | 350 | U | 330 | U | 81 | % |
| Diethylphthalate | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| 4-Chlorophenyl-phenylether | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| Fluorene | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| 4-Nitroaniline | 880 | U | 900 | U | 860 | U | 840 | U | 840 | U |
| 4,6-Dinitro-2-methylphenol | 880 | U | 900 | U | 860 | U | 840 | U | 840 | U |
| N-Nitrosodiphenylamine (1) | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| 4-Bromophenyl-phenylether | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| Hexachlorobenzene | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| Pentachlorophenol | 880 | U | 900 | U | 860 | U | 840 | U | 69 | % |
| Phenanthrene | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| Anthracene | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| Carbazole | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| Di-n-butylphthalate | 22 | J | 360 | U | 350 | U | 330 | U | 330 | U |
| Fluoranthene | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| Pyrene | 350 | U | 360 | U | 350 | U | 330 | U | 83 | % |
| Butylbenzylphthalate | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| 3,3'-Dichlorobenzidine | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| Benzo(a)anthracene | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| Chrysene | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| bis(2-Ethylhexyl)phthalate | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| Di-n-octyl phthalate | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| Benzo(b)fluoranthene | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| Benzo(k)fluoranthene | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| Benzo(a)pyrene | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| Indeno(1,2,3-cd)pyrene | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| Dibenz(a,h)anthracene | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |
| Benzo(g,h,i)perylene | 350 | U | 360 | U | 350 | U | 330 | U | 330 | U |

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B0W6B2

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 9909L951-001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D092415

Level: (low/med) LOW Date Received: 09/01/99

% Moisture: 7 decanted: (Y/N) __ Date Extracted: 09/08/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | ALDOL CONDENSATE | 10.01 | 70 | JA |
| 2. | ADIPATE | 23.38 | 200 | J |
| 3. | ADIPATE | 23.42 | 1000 | J |
| 4. | ADIPATE | 23.46 | 2000 | J |
| 5. | ADIPATE | 23.82 | 4000 | J |
| 6. | ADIPATE | 24.00 | 70 | J |
| 7. | ADIPATE | 24.18 | 3000 | J |
| 8. | ADIPATE | 24.42 | 100 | J |
| 9. | ADIPATE | 24.47 | 500 | J |
| 10. | ADIPATE | 24.59 | 200 | J |
| 11. | ADIPATE | 24.64 | 600 | J |
| 12. | ADIPATE | 24.73 | 800 | J |
| 13. | ADIPATE | 24.78 | 2000 | J |
| 14. | ADIPATE | 24.89 | 400 | J |
| 15. | ADIPATE | 25.06 | 600 | J |
| 16. | ADIPATE | 25.22 | 2000 | J |
| 17. | ADIPATE | 25.30 | 2000 | J |
| 18. | ADIPATE | 25.78 | 1000 | J |
| 19. | ADIPATE | 26.07 | 90 | J |
| 20. | ADIPATE | 26.49 | 90 | J |

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B0W6B3

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 9909L951-002

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D092508

Level: (low/med) LOW Date Received: 09/01/99

% Moisture: 3 decanted: (Y/N) __ Date Extracted: 09/08/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/25/99

Injection Volume: 2.0 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | UNKNOWN | 25.33 | 300 | J |

FORM 1 SV-TIC RFW (v3.3)

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B0W6B4

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 9909L951-003

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D092509

Level: (low/med) LOW Date Received: 09/01/99

% Moisture: 4 decanted: (Y/N) Date Extracted: 09/08/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/25/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | ALKANE | 23.13 | 80 | J |
| 2. | UNKNOWN | 25.32 | 300 | J |

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B0W6B5

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 9909L951-004

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D092510

Level: (low/med) LOW Date Received: 09/01/99

% Moisture: 3 decanted: (Y/N) __ Date Extracted: 09/08/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/25/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | ALDOL CONDENSATE | 9.23 | 70 | JA |
| 2. | ALKANE | 23.13 | 90 | J |
| 3. | UNKNOWN | 25.35 | 70 | J |

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B0W6B6

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 9909L951-005

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D092511

Level: (low/med) LOW Date Received: 09/01/99

% Moisture: 6 decanted: (Y/N) Date Extracted: 09/08/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/25/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | ALKANE | 23.13 | 100 | J |
| 2. | UNKNOWN | 25.34 | 90 | J |

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B0W6B7

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 9909L951-006

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D092512

Level: (low/med) LOW Date Received: 09/01/99

% Moisture: 7 decanted: (Y/N) __ Date Extracted: 09/08/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/25/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | | | | |

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B0W6B8

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 9909L951-007

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D092513

Level: (low/med) LOW Date Received: 09/01/99

% Moisture: 4 decanted: (Y/N)__ Date Extracted: 09/08/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/25/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | ALDOL CONDENSATE | 9.23 | 100 | J |
| 2. | UNKNOWN | 25.33 | 100 | J |

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKCM

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-078

Matrix: (soil/water) SOIL Lab Sample ID: 99LE1098-MB1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D092404

Level: (low/med) LOW Date Received: 09/08/99

% Moisture: _____ decanted: (Y/N)__ Date Extracted: 09/08/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/99

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | | | | |

Recra LabNet - Lionville Laboratory
BNA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/01/99 RFW LOT # :9909L951

| CLIENT ID | RFW # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| B0W6B2 | 001 | S | 99LE1098 | 08/30/99 | 09/08/99 | 09/24/99 |
| B0W6B2 | 001 MS | S | 99LE1098 | 08/30/99 | 09/08/99 | 09/25/99 |
| B0W6B2 | 001 MSD | S | 99LE1098 | 08/30/99 | 09/08/99 | 09/25/99 |
| B0W6B3 | 002 | S | 99LE1098 | 08/30/99 | 09/08/99 | 09/25/99 |
| B0W6B4 | 003 | S | 99LE1098 | 08/30/99 | 09/08/99 | 09/25/99 |
| B0W6B5 | 004 | S | 99LE1098 | 08/30/99 | 09/08/99 | 09/25/99 |
| B0W6B6 | 005 | S | 99LE1098 | 08/30/99 | 09/08/99 | 09/25/99 |
| B0W6B7 | 006 | S | 99LE1098 | 08/30/99 | 09/08/99 | 09/25/99 |
| B0W6B8 | 007 | S | 99LE1098 | 08/30/99 | 09/08/99 | 09/25/99 |

LAB QC:

| | | | | | | |
|---|---|---|---|---|---|---|
| SBLKCM | MB1 | S | 99LE1098 | N/A | 09/08/99 | 09/24/99 |
| SBLKCM | MB1 BS | S | 99LE1098 | N/A | 09/08/99 | 09/24/99 |

| RECRA LabNet Use Only |
|---|
| 99091951 |

# Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

**ALL** FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS (8) perrone wet lab

Client: TNU-Hanford B99-078
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: spec Del: std TAT: 30 day
Date Rec'd: 9/1/99 Date Due: 10/1/99
Account #:

| Refrigerator # | | 1 | 6-1 | | | | | 6 | | 6 | 6 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #/Type Container | Liquid | | | | | | | | | | | | | | |
| | Solid | 1g | 1g-1 | | | | | 1g | | 1g | 1g | | | | |
| Volume | Liquid | | | | | | | | | | | | | | |
| | Solid | 250 | 500-1 | | | | | 500 | | 250 | 4oz | | | | |
| Preservatives | | | | | | | | | | | | | | | |
| ANALYSES REQUESTED → | | ORGANIC: VOA | BNA | Pest/PCB | Herb | | | INORG: Metal | CN | | | | | | |
| RECRA LabNet Use Only | | 0024H OGCSC | 0025H ODRO | OPCB | | | | Met① | | 1PH | Ang① | | | | |

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | 0024H OGCSC | 0025H ODRO | OPCB | Met① | 1PH | Ang① |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | BØW6BB2 | | | S | 8/30/99 | 0745 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 002 | 3 | | | | | 0800 | | | | | | |
| 003 | 4 | | | | | 0812 | | | | | | |
| 004 | 5 | | | | | 0831 | | | | | | |
| 005 | 6 | | | | | 0848 | | | | | | |
| 006 | 7 | | | | | 0904 | | | | | | |
| 007 | 8 | | | | | 0925 | | | | | | |

Met① = As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, Ag, V, Zn, Hg, ICRC

Special Instructions:

Run matrix QC
Saf# B99-078

**COMPOSITE WASTE**

9/8/99 - IN3N2 added to Inorg① List.

OGCSC = 1-propanol + ethanol

DATE/REVISIONS:

1. Sample 001 (1000ml ag) was
2. received broken.
3. Run analyses from other
4. jars.
5. Ang① = ICCL, ICFL, ICNO2, ICNO3, ICPO4,
6. ICSO4, ISFD, INH3N, ICNTU, IN3N2

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___
Airbill #*
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was: 1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N
Cooler Temp. 5.5 °C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:
*4235795288 63-4.3' 4235795288 52

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Fed Ex | D. Smith | 9/1/99 | 0930 |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Original | | | |
| | Rewritten | | |

9909L951

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B99-078-89 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: Bowers/Porter/Nielson | Company Contact: Chris Cearlock | Telephone No.: 372-9574 | Project Coordinator: TRENT, SJ |
| Price Code: 8N | Data Turnaround: 45 Days | | |
| Project Designation: 200 Area Source characterization - 200-CW-1 OU | Sampling Location: GP-5 <15' bgs | | SAF No.: B99-078 |
| Ice Chest No.: ERC96-066 / ERC96-063 | Field Logbook No.: EL-1511 | | Method of Shipment: Federal Express |
| Shipped To: TMA/RECRA 8-30-99 | Offsite Property No.: A990236 | | Bill of Lading/Air Bill No.: 4235 7952 8852 (6B2-6B4) 8863 (6B5-6B6) |
| | | | COA: B20CW1 67/C |

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | Cool 4C | None | Cool 4C | None | Cool 4C | None | | | |
| Type of Container | aG | aG | aG | aG | aG | aG | aG | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Volume | 60mL | 250mL | 250mL | 500mL | 500mL | 1000mL | 1000mL | | | |
| SAMPLE ANALYSIS | Isotopic Uranium | VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol) | pH (Soil) - 9045 | Semi-VOA - 8270A (TCL), TPH-Diesel Range - WTPH-D, PCBs - 8082 | See item (1) in Special Instructions | See item (2) in Special Instructions | See item (3) in Special Instructions | | | |

| | Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | B0W6B2 | Soil | 8-30-99 | 0745 | | X | X | X | X | X | | 3-4' | |
| 02 | BOW6B3 | Soil | 8-30-99 | 0800 | | X | X | X | X | X | | 5.5-6.5' | |
| 03 | BOW6B4 | Soil | 8-30-99 | 0812 | | X | X | X | X | X | | 8'-9' | |
| 04 | BOW6B5 | Soil | 8-30-99 | 0831 | | X | X | X | X | X | | 10.5'-11.5' | |
| 05 | BOW6B6 | Soil | 8-30-99 | 0848 | | X | X | X | X | X | | 14' | 15' |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By: Doug Bowers | Date/Time: 8-30-99/1130 | Received By: Ref IB | Date/Time: 8-30-99/1130 |
| Relinquished By: Ref IB | Date/Time: 8-30-99 1530 | Received By: C Hile | Date/Time: 8/30/99 1530 |
| Relinquished By: C Hile | Date/Time: 8/31/99 1300 | Received By: FEDEX | Date/Time: 8/31/99 1300 |
| Relinquished By: Fed Ex | Date/Time: 9.1.99/0930 | Received By: D Smith | Date/Time: 9.1.99/0930 |

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

COLLECTOR UNAVAILABLE TO SIGN

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

(2) NO2/NO3 - 353.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

(3) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241}; Strontium-89,90 -- Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241

use Box 528 to ship

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

| LABORATORY SECTION | Received By | Title | Date/Time |
|---|---|---|---|
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

4235 7952 8863 -4.3' 4235 7952 8852 -5.5'

RECRA ENVIRONMENTAL INC.
Chemical and Environmental Measurement Information

DEC 1999 RECEIVED Data Log In

**Recra LabNet Philadelphia**
**Analytical Report**

**Client:** TNU-HANFORD B99-078
**RFW#:** 9909L951
**SDG/SAF#:** H0510/B99-078

**W.O.#:** 10985-001-001-9999-00
**Date Received:** 09-01-99

**PCB**

The set of samples consisted of seven (7) soil samples collected on 08-30-99.

The samples and their associated QC samples were extracted on 09-07-99 and analyzed according to Recra OPs based on SW846, 3rd Edition procedures on 09-25-99. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All cooler temperatures have been recorded on the chain-of-custody.
2. All required holding times for extraction and analysis have been met.
3. The samples and their associated QC samples received a sulfuric acid cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. One (1) of twenty-two (22) surrogate recoveries were outside QC limits; however, the surrogate recovery acceptance criteria were met (i.e., no more than one outlier per sample).
6. The blank spike recovery was within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

for J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

09-30-99
Date

pef\r:\group\data\pest\09L-951.pcb

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.



208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

# GLOSSARY OF PESTICIDE/PCB DATA

## DATA QUALIFIERS

**U** = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

**J** = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

**B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

**E** = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

**I** = Interference.

## ABBREVIATIONS

**BS** = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

**BSD** = Indicates blank spike duplicate.

**MS** = Indicates matrix spike.

**MSD** = Indicates matrix spike duplicate.

**DL** = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

**NA** = Not Applicable.

**DF** = Dilution Factor.

**NR** = Not Required.

**SP** = Indicates Spiked Compound.

# GLOSSARY OF PESTICIDE/PCB DATA

**P** = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".

**D** = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

**C** = This flag applies to a compound that has been confirmed by GC/MS.

**Recra LabNet - Lionville Laboratory**

PCBs by GC

Report Date: 09/29/99 15:14

RFW Batch Number: **9909L951** Client: **TNU-HANFORD B99-078** Work Order: 10985001001 Page: 1

| | Cust ID: | B0W6B2 | B0W6B2 | B0W6B2 | B0W6B3 | B0W6B4 | B0W6B5 |
|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 001 | 001 MS | 001 MSD | 002 | 003 | 004 |
| | Matrix: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | D.F.: | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | Units: | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG |
| Surrogate: | Tetrachloro-m-xylene | 62 % | 95 % | 120 * % | 88 % | 98 % | 85 % |
| | Decachlorobiphenyl | 68 % | 92 % | 112 % | 88 % | 90 % | 89 % |
| Aroclor-1016 | | 36 U | 36 U | 36 U | 34 U | 35 U | 34 U |
| Aroclor-1221 | | 72 U | 72 U | 72 U | 69 U | 69 U | 69 U |
| Aroclor-1232 | | 36 U | 36 U | 36 U | 34 U | 35 U | 34 U |
| Aroclor-1242 | | 36 U | 36 U | 36 U | 34 U | 35 U | 34 U |
| Aroclor-1248 | | 36 U | 36 U | 36 U | 34 U | 35 U | 34 U |
| Aroclor-1254 | | 36 U | 61 % | 69 % | 34 U | 35 U | 34 U |
| Aroclor-1260 | | 36 U | 36 U | 36 U | 34 U | 35 U | 34 U |

| | Cust ID: | B0W6B6 | B0W6B7 | B0W6B8 | PBLKUJ | PBLKUJ BS |
|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 005 | 006 | 007 | 99LE1088-MB1 | 99LE1088-MB1 |
| | Matrix: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | D.F.: | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | Units: | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG |
| Surrogate: | Tetrachloro-m-xylene | 55 % | 88 % | 108 % | 115 % | 105 % |
| | Decachlorobiphenyl | 59 % | 87 % | 107 % | 107 % | 98 % |
| Aroclor-1016 | | 35 U | 36 U | 35 U | 33 U | 33 U |
| Aroclor-1221 | | 71 U | 71 U | 69 U | 67 U | 67 U |
| Aroclor-1232 | | 35 U | 36 U | 35 U | 33 U | 33 U |
| Aroclor-1242 | | 35 U | 36 U | 35 U | 33 U | 33 U |
| Aroclor-1248 | | 35 U | 36 U | 35 U | 33 U | 33 U |
| Aroclor-1254 | | 35 U | 36 U | 35 U | 33 U | 65 % |
| Aroclor-1260 | | 35 U | 36 U | 35 U | 33 U | 33 U |

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

JW 09-30-99

Recra LabNet - Lionville Laboratory
PCB ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/01/99 RFW LOT # :9909L951

| CLIENT ID | RFW # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| B0W6B2 | 001 | S | 99LE1088 | 08/30/99 | 09/07/99 | 09/25/99 |
| B0W6B2 | 001 MS | S | 99LE1088 | 08/30/99 | 09/07/99 | 09/25/99 |
| B0W6B2 | 001 MSD | S | 99LE1088 | 08/30/99 | 09/07/99 | 09/25/99 |
| B0W6B3 | 002 | S | 99LE1088 | 08/30/99 | 09/07/99 | 09/25/99 |
| B0W6B4 | 003 | S | 99LE1088 | 08/30/99 | 09/07/99 | 09/25/99 |
| B0W6B5 | 004 | S | 99LE1088 | 08/30/99 | 09/07/99 | 09/25/99 |
| B0W6B6 | 005 | S | 99LE1088 | 08/30/99 | 09/07/99 | 09/25/99 |
| B0W6B7 | 006 | S | 99LE1088 | 08/30/99 | 09/07/99 | 09/25/99 |
| B0W6B8 | 007 | S | 99LE1088 | 08/30/99 | 09/07/99 | 09/25/99 |

LAB QC:

| | | | | | | |
|---|---|---|---|---|---|---|
| PBLKUJ | MB1 | S | 99LE1088 | N/A | 09/07/99 | 09/25/99 |
| PBLKUJ | MB1 BS | S | 99LE1088 | N/A | 09/07/99 | 09/25/99 |

9-30-99

| RECRA LabNet Use Only |
|---|
| 99091951 |

# Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

**ALL** FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS (8) perrone wet lab

Client: TNU-Hanford B99-078
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: spec Del: std TAT: 30 day
Date Rec'd: 9/1/99 Date Due: 10/1/99
Account #:

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | 1 | 6-1 | | | | | | 6 | | 6 | 6 | | | | | |
| #/Type Container | Liquid | | | | | | | | | | | | | | | | |
| | Solid | 1g | 1g-1 | | | | | | 1g | | 1g | 1g | | | | | |
| Volume | Liquid | | | | | | | | | | | | | | | | |
| | Solid | 250 | 500-1 | | | | | | 500 | | 250 | 1/4 | | | | | |
| Preservatives | | | | | | | | | | | | | | | | | |
| ANALYSES REQUESTED | | ORGANIC | | | | | | | INORG | | | | | | | | |
| | | VOA | BNA | Pest/PCB | Herb | | | | Metal | CN | | | | | | | |

| MATRIX CODES: | Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | 0624H OGCSC | 0625H ODRO | OPCB | | | Metal | | 1PH | Anig | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S - Soil | 001 | BØW6B32 | | | S | 8/30/99 | 0745 | ✓ | ✓ | ✓ | | | ✓ | | ✓ | ✓ | | | | | |
| SE - Sediment | 002 | 3 | | | | | 0800 | | | | | | | | | | | | | | |
| SO - Solid | 003 | 4 | | | | | 0812 | | | | | | | | | | | | | | |
| SL - Sludge | 004 | 5 | | | | | 0831 | | | | | | | | | | | | | | |
| W - Water | 005 | 6 | | | | | 0848 | | | | | | | | | | | | | | |
| O - Oil | 006 | 7 | | | | | 0904 | | | | | | | | | | | | | | |
| A - Air | 007 | 8 | | | | | 0925 | | | | | | | | | | | | | | |
| DS - Drum Solids | | | | | | | | | | | | | | | | | | | | | |
| DL - Drum Liquids | | | | | | | | | | | | | | | | | | | | | |
| L - EP/TCLP Leachate | | | | | | | | | | | | | | | | | | | | | |
| WI - Wipe | | | | | | | | | | | | | | | | | | | | | |
| X - Other | | | | | | | | | | | | | | | | | | | | | |
| F - Fish | | | | | | | | | | | | | | | | | | | | | |

RECRA LabNet Use Only

Met① = As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, Ag, V, Zn, Hg, ICRG

Special Instructions:

Run matrix QC
Saf# B99-078

**COMPOSITE WASTE**

9/8/99 - 1N3N2 added to Inorg① list.

OGCSC = 1-propanol + ethanol

DATE/REVISIONS:

1. Sample #001 (1000ml ag) was
2. received broken.
3. Run analyses from other
4. jars.
5. Anig① = ICCL, ICFL, ICNO2, ICNO3, ICPO4,
6. ICSO4, ISFD, INH3N, KNTU, IN3N2

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # *
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N
Cooler Temp. 5.5 °C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:
*4235795288 63-4.3° 4235795288 52

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Fed Ex | [illegible] | 9/1/99 | 0930 |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Original | Rewritten | | |
| | | | |

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B99-078-89 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: Bowers/Porter/Nielson | Company Contact: Chris Cearlock | Telephone No.: 372-9574 | Project Coordinator: TRENT, SJ |
| Price Code: 8N | Data Turnaround: 45 Days | | |
| Project Designation: 200 Area Source characterization - 200-CW-1 OU | Sampling Location: GP-5 <15' bgs | | SAF No.: B99-078 |
| Ice Chest No.: ERC96-066 / ERC96-063 | Field Logbook No.: EL-1511 | | Method of Shipment: Federal Express |
| Shipped To: TMA/RECRA 8-30-99 | Offsite Property No.: A990236 | | Bill of Lading/Air Bill No.: 4235 7952 8852 (6B2-6B4), 8863 (6B5-6B6) |
| | | | COA: B20CW1 67/C |

| POSSIBLE SAMPLE HAZARDS/REMARKS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Preservation | None | Cool 4C | None | Cool 4C | None | Cool 4C | None | | | |
| | Type of Container | aG | aG | aG | aG | aG | aG | aG | | | |
| | No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Special Handling and/or Storage | Volume | 60mL | 250mL | 250mL | 500mL | 500mL | 1000mL | 1000mL | | | |
| SAMPLE ANALYSIS | | Isotopic Uranium | VOA - 8260A (TCL), VOA - 8260A (Add-On) (1-Propanol, Ethanol) | pH (Soil) - 9045 | Semi-VOA - 8270A (TCL), TPH-Diesel Range - WTPH-D, PCBs - 8082 | See item (1) in Special Instructions | See item (2) in Special Instructions | See item (3) in Special Instructions | | | |

| | Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | B0W6B2 | Soil | 8-30-99 | 0745 | | X | X | X | X | X | | 3'-4' | |
| 02 | BOW6B3 | Soil | 8-30-99 | 0800 | | X | X | X | X | X | | 5.5'-6.5' | |
| 03 | BOW6B4 | Soil | 8-30-99 | 0812 | | X | X | X | X | X | | 8'-9' | |
| 04 | BOW6B5 | Soil | 8-30-99 | 0831 | | X | X | X | X | X | | 10.5'-11.5' | |
| 05 | BOW6B6 | Soil | 8-30-99 | 0848 | | X | X | X | X | X | | 14' | 15' |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By: Doug Bowers / Doug Bowers | Date/Time: 8-30-99/1130 | Received By: Ref IB | Date/Time: 8-30-99/1130 |
| Relinquished By: Ref IB | Date/Time: 8-30-99 1530 | Received By: C Nielson | Date/Time: 8/30/99 1530 |
| Relinquished By: C Nielson | Date/Time: 8/31/99 1300 | Received By: FEDEX | Date/Time: 8/31/99 1300 |
| Relinquished By: Fed Ex | Date/Time: 9-1-99/0930 | Received By: D Smith | Date/Time: 9-1-99/0930 |

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

COLLECTOR UNAVAILABLE TO SIGN

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196

(2) NO2/NO3 - 353.1; IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

(3) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241

use Box 528 to Ship

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

| LABORATORY SECTION | Received By | Title | Date/Time |
|---|---|---|---|
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

4235 7952 8863 -4.3°

4235 7952 8852 -5.5°

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B99-078-94 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: Bowers/Porter/Nielson | Company Contact: Chris Cearlock | Telephone No.: 372-9574 | Project Coordinator: TRENT, SJ |
| Price Code: 8N | Data Turnaround: 45 Days | | |
| Project Designation: 200 Area Source characterization - 200-CW-1 OU | Sampling Location: GP-5 >15' bgs | SAF No.: B99-078 | |
| Ice Chest No.: ERC 96-066 / ERC 96-063 | Field Logbook No.: EL-1511 | Method of Shipment: Federal Express | |
| Shipped To: TMA/RECRA D78 8-30-99 | Offsite Property No.: A99 02316 | Bill of Lading/Air Bill No.: 4235 7952 8852 (6B2-6B4) 8863 (6B5-6B8) | |
| | | COA: B20CW1 671C | |

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | None | None | None | Cool 4C | None | Cool 4C | None | Cool 4C | None |
| Type of Container | aG | aG | aG | aG | aG | aG | aG | aG | aG | aG |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Volume | 60mL | 60mL | 60mL | 120mL | 250mL | 250mL | 500mL | 500mL | 1000mL | 1000mL |
| SAMPLE ANALYSIS | Isotopic Uranium | Nickel-63 | Technetium-99 | Tritium - H3 | VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol) | pH (Soil) - 9045 | Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082 | See item (1) in Special Instructions | See item (2) in Special Instructions | See item (3) in Special Instructions |

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B0W6B7 | Soil | 8/30/99 | 09:04 | | | | | X | X | X | X | X | 19'-19' |
| B0W6B8 | Soil | 8/30/99 | 09:25 | | | | | X | X | X | X | X | 20-21' |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | Date/Time | Received By | Date/Time |
|---|---|---|---|---|
| Relinquished By | Doug Bowers | 8-30-99/1130 | | 8-30-99/1130 |
| Relinquished By | REF IB | 8/30/99 1300 | | 1300/8-30-99 |
| Relinquished By | | 8/31/99 1400 | CAEDEX | 8/31/99 1400 |
| Relinquished By | Ged Ex | 9.1.99/0930 | | 9.1.99/0930 |

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

COLLECTOR UNAVAILABLE TO SIGN COC

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196

(2) NO2/NO3 - 353.1; IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

(3) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241

use BOWSLR to strip

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

| LABORATORY SECTION | Received By | Title | Date/Time |
|---|---|---|---|
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

RECRA
ENVIRONMENTAL
INC.

*Chemical and Environmental Measurement Information*

DEC 1999
RECEIVED
Data
Log In

**Recra LabNet Philadelphia**
**Analytical Report**

**Client** : TNU-HANFORD B99-078
**RFW#** : 9909L951
**SDG/SAF#:** H0510/B99-078

**W.O #:** 10985-001-001-9999-00
**Date Received:** 09-01-99

**DIESEL RANGE ORGANICS**

The set of samples consisted of seven (7) soil samples collected on 08-27-99.

The samples and their associated QC samples were prepared on 09-10-99 and analyzed by methodology based on EPA Method 8015B for Diesel Range Petroleum Hydrocarbons on 09-17,18-99. The analysis met the intent of method WTPH-D.

1. The cooler temperature has been recorded on the chain-of-custody.

2. All required holding times for extraction and analysis were met.

3. All initial calibrations associated with this data set were within acceptance criteria.

4. All diesel continuing calibration standards analyzed prior to the sample extracts were within acceptance criteria.

5. All surrogate recoveries were within acceptance criteria.

6. All blank spike recoveries were within acceptance criteria.

7. All matrix spike recoveries were within acceptance criteria.

Pat E

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

9-27-99
Date

R:\SHARE\LC\GCSCAN\09-951d.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 7 pages.



208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

# GLOSSARY OF DIESEL DATA

## DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

## ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates spiked compound.

**Recra LabNet - Lionville Laboratory**

DIESEL RANGE ORGANICS BY GC

Report Date: 09/22/99 08:40

RFW Batch Number: **9909L951** Client: **TNU-HANFORD B99-078** Work Order: **10985-001-001-9999-00** Page: 1

| | Cust ID: | B0W6B2 | B0W6B2 | B0W6B2 | B0W6B3 | B0W6B4 | B0W6B5 |
|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 001 | 001 MS | 001 MSD | 002 | 003 | 004 |
| | Matrix: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | D.F.: | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | Units: | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| Surrogate: | p-Terphenyl | 57 % | 69 % | 65 % | 88 % | 72 % | 61 % |
| Diesel Range Organics | | 4.2 U | 75 % | 66 % | 4.0 U | 4.1 U | 4.1 U |

| | Cust ID: | B0W6B6 | B0W6B7 | B0W6B8 | BLK | BLK BS |
|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 005 | 006 | 007 | 99LE1105-MB1 | 99LE1105-MB1 |
| | Matrix: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | D.F.: | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | Units: | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| Surrogate: | p-Terphenyl | 49 % | 47 % | 46 % | 64 % | 74 % |
| Diesel Range Organics | | 4.2 U | 4.3 U | 4.1 U | 4.0 U | 73 % |

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of Advisory limits.

9/22/99

9/24/99

Recra LabNet - Lionville Laboratory
DRO ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/01/99 RFW LOT # :9909L951

| CLIENT ID | RFW # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| B0W6B2 | 001 | S | 99LE1105 | 08/30/99 | 09/10/99 | 09/18/99 |
| B0W6B2 | 001 MS | S | 99LE1105 | 08/30/99 | 09/10/99 | 09/18/99 |
| B0W6B2 | 001 MSD | S | 99LE1105 | 08/30/99 | 09/10/99 | 09/18/99 |
| B0W6B3 | 002 | S | 99LE1105 | 08/30/99 | 09/10/99 | 09/18/99 |
| B0W6B4 | 003 | S | 99LE1105 | 08/30/99 | 09/10/99 | 09/18/99 |
| B0W6B5 | 004 | S | 99LE1105 | 08/30/99 | 09/10/99 | 09/18/99 |
| B0W6B6 | 005 | S | 99LE1105 | 08/30/99 | 09/10/99 | 09/18/99 |
| B0W6B7 | 006 | S | 99LE1105 | 08/30/99 | 09/10/99 | 09/18/99 |
| B0W6B8 | 007 | S | 99LE1105 | 08/30/99 | 09/10/99 | 09/18/99 |

LAB QC:

| | | | | | | |
|---|---|---|---|---|---|---|
| BLK | MB1 | S | 99LE1105 | N/A | 09/10/99 | 09/17/99 |
| BLK | MB1 BS | S | 99LE1105 | N/A | 09/10/99 | 09/17/99 |

| RECRA LabNet Use Only |
|---|
| 99091951 |

# Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

**ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Client: TNU-Hanford B99-078
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: Spec Del: std TAT: 30 day
Date Rec'd: 9/1/99 Date Due: 10/1/99
Account #:

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | 1 | 6-1 | | | | | | 6 | | 6 | 6 | | | | 005 |
| #/Type Container | Liquid | | | | | | | | | | | | | | | |
| | Solid | 1qt | 1qt-1 | | | | | | 1qt | | 1qt | 1qt | | | | |
| Volume | Liquid | | | | | | | | | | | | | | | |
| | Solid | 250 | 500-1 | | | | | | 500 | | 250 | 1/4 | | | | |
| Preservatives | | | | | | | | | | | | | | | | |
| ANALYSES REQUESTED → | | ORGANIC | | | | | | | INORG | | | | | | | |
| | | VOA | BNA | Pest/PCB | Herb | | | | Metal | CN | | | | | | |
| | | RECRA LabNet Use Only | | | | | | | | | | | | | | |
| | | 8260 24H OGCSC | 8270 25H ADRO | 8082 | | | | | Met① | | 1PH | Ang① | | | | |

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
Wi - Wipe
X - Other
F - Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | 8260 24H OGCSC | 8270 25H ADRO | 8082 | Met① | 1PH | Ang① |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | BØW6B32 | | | S | 8/30/99 | 0745 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 002 | 43 | | | | | 0800 | | | | | | |
| 003 | 54 | | | | | 0812 | | | | | | |
| 004 | 65 | | | | | 0831 | | | | | | |
| 005 | 6 | | | | | 0848 | | | | | | |
| 006 | 7 | | | | | 0904 | | | | | | |
| 007 | 8 | | | | | 0925 | | | | | | |

Met① = As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, Ag, V, Zn, Hg, ICP6

Special Instructions:

Run matrix QC
Sep # B99-078

**COMPOSITE WASTE**

OGCSC = 1-propanol + ethanol

DATE/REVISIONS:

1. Sample 001 (1000 ml ag) was received broken.
2. Run analyses from other
3. jars.
4.
5. Ang① = ICCL, ICFL, ICNO2, ICNO3, ICPO4,
6. ICSO4, ISFD, INH3N, KNTU

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___
Airbill # *
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was: 1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec'd Y or N
Cooler Temp 5.5 C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES: *4235795288 63-4.3' 4235795288 52

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Fed Ex | D. Ignito | 9/1/99 | 0930 |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Original | | | |
| | Rewritten | | |

9904L451

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B99-078-89 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: Bowers/Porter/Nielson | Company Contact: Chris Cearlock — Telephone No.: 372-9574 | Project Coordinator: TRENT, SJ | Price Code: 8N — Data Turnaround: 45 Days |
| Project Designation: 200 Area Source characterization - 200-CW-1 OU | Sampling Location: GP-5 <15' bgs | SAF No.: B99-078 | |
| Ice Chest No.: ERC96-064 / ERC96-063 | Field Logbook No.: EL-1511 | Method of Shipment: Federal Express | |
| Shipped To: TMA/RECRA 8-30-99 | Offsite Property No.: A990236 | Bill of Lading/Air Bill No.: 4235 7952 8852 (682-684) 8863 (685-688) | |
| | | COA: B20CW1 67/C | |

| POSSIBLE SAMPLE HAZARDS/REMARKS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Preservation | None | Cool 4C | None | Cool 4C | None | Cool 4C | None | | | |
| | Type of Container | aG | aG | aG | aG | aG | aG | aG | | | |
| | No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Special Handling and/or Storage | Volume | 60mL | 250mL | 250mL | 500mL | 500mL | 1000mL | 1000mL | | | |
| SAMPLE ANALYSIS | | Isotopic Uranium | VOA - 8260A (TCL), VOA - 8260A (Add-On) (1-Propanol, Ethanol) | pH (Soil) - 9045 | Semi-VOA - 8270A (TCL), TPH-Diesel Range - WTPH-D, PCBs - 8082 | See item (1) in Special Instructions | See item (2) in Special Instructions | See item (3) in Special Instructions | | | |

| | Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | B0W6B2 | Soil | 8-30-99 | 0745 | | X | X | X | X | X | | 3-4' | |
| 02 | BOW6B3 | Soil | 8-30-99 | 0800 | | X | X | X | X | X | | 5.5-6.5' | |
| 03 | BOW6B4 | Soil | 8-30-99 | 0812 | | X | X | X | X | X | | 8'-9' | |
| 04 | BOW6B5 | Soil | 8-30-99 | 0871 | | X | X | X | X | X | | 10.5'-11.5' | |
| 05 | BOW6B6 | Soil | 8-30-99 | 0848 | | X | X | X | X | X | | 14' | 15' |

| CHAIN OF POSSESSION | Sign/Print Names | Date/Time | | Date/Time |
|---|---|---|---|---|
| Relinquished By | Doug Bowers | 8-30-99/1130 | Received By | 8-30-99/1130 |
| Relinquished By | Ref JB | 8-30-99 1530 | Received By | 8/30/99 1530 |
| Relinquished By | | 8/31/99 1300 | Received By | FEDEX 8/31/99 1300 |
| Relinquished By | Fed Ex | 9-1-99/0930 | Received By | 9-1-99/0930 |

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

COLLECTOR UNAVAILABLE TO SIGN

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196

(2) NO2/NO3 - 353.1; IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

(3) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241

use Box 528 to Ship

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

| LABORATORY SECTION | Received By | Title | Date/Time |
|---|---|---|---|
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

4235 7952 8863 -4.3° 4235 7952 8852 -5.5°

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B99-078-94 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector<br>Bowers/Porter/Nielson | Company Contact<br>Chris Cearlock | Telephone No.<br>372-9574 | Project Coordinator<br>TRENT, SJ | Price Code 8N | Data Turnaround<br>45 Days |
| Project Designation<br>200 Area Source characterization - 200-CW-1 OU | Sampling Location<br>GP-5 >15' bgs | | SAF No.<br>B99-078 | | |
| Ice Chest No.<br>ERC 96-066 / ERC 96-063 | Field Logbook No.<br>EL-1511 | | Method of Shipment<br>Federal Express | | |
| Shipped To<br>TMA/RECRA D 78 8-30-99 | Offsite Property No.<br>A99 02316 | | Bill of Lading/Air Bill No.<br>4235 7952 8852 (6B2-6B4) 8863 (6B5-6B8) | | |
| | | | COA B20CW1 671C | | |

| POSSIBLE SAMPLE HAZARDS/REMARKS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Preservation | None | None | None | None | Cool 4C | None | Cool 4C | None | Cool 4C | None |
| | Type of Container | aG | aG | aG | aG | aG | aG | aG | aG | aG | aG |
| | No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Special Handling and/or Storage | Volume | 60mL | 60mL | 60mL | 120mL | 250mL | 250mL | 500mL | 500mL | 1000mL | 1000mL |
| SAMPLE ANALYSIS | | Isotopic Uranium | Nickel-63 | Technetium-99 | Tritium - H3 | VOA - 8260A (TCL); VOA - 8260A (Add-On) {1-Propanol, Ethanol} | pH (Soil) - 9045 | Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082 | See item (1) in Special Instructions | See item (2) in Special Instructions | See item (3) in Special Instructions |
| Sample No. | Matrix * / Sample Date / Sample Time | | | | | | | | | | |
| 06 B0W6B7 | Soil / 8/30/99 / 09:04 | | | | | X | X | X | X | X | 19'-19' |
| 07 B0W6B8 | Soil / 8/30/99 / 09:25 | | | | | X | X | X | X | X | 20-21' |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By | Doug Bowers Date/Time 8-30-99/1130 | Received By | REF 10 Date/Time 8-30-99/1130 |
| Relinquished By | REF 1B Date/Time 8/30/99 1300 | Received By | C Julie Date/Time 1300/8-30-99 |
| Relinquished By | Julie Date/Time 8/31/99 1400 | Received By | FEDEX Date/Time 8/31/99 1400 |
| Relinquished By | Fed Ex Date/Time 9-1-99/0930 | Received By | D Smith Date/Time 9-1-99/0930 |

**SPECIAL INSTRUCTIONS**

See chain of custody comments on SAF B99-078.

COLLECTOR UNAVAILABLE TO SIGN COC

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

(2) NO2/NO3 - 353.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

(3) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241}; Strontium-89,90 -- Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241

use BOWSLB to sip

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

| LABORATORY SECTION | Received By | Title | Date/Time |
|---|---|---|---|
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

RECRA
ENVIRONMENTAL
INC.

*Chemical and Environmental Measurement Information*

DEC 1999
RECEIVED
Data
Log In

**Recra LabNet Philadelphia**
**Analytical Report**

**Client:** TNU HANFORD B99-078
**RFW #:** 9909L951
**SDG/SAF#:** H0510/B99-078

**W.O. #: #:** 10985-001-001-9999-00
**Date Received:** 09-01-99

**GC SCAN**

The set of samples consisted of seven (7) soil samples collected on 08-30-99.

The samples and their associated QC samples were prepared on 09-02-99 and analyzed by methodology based on EPA Method 8015B for Ethanol and Butanol on 09-02,03-99.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. The samples were packaged and stored as specified in the method protocol; the cooler temperature upon receipt has been recorded on the chain-of-custody.

2. The required holding time for analysis was met.

3. All initial calibrations associated with this data set were within acceptance criteria.

4. All continuing calibration standards analyzed prior to the sample extracts were within acceptance criteria.

5. Surrogates were not used for this analysis.

6. The blank spike recovery was within advisory control limits of 50%-150%.

7. All matrix spike recoveries were within advisory control limits of 50%-150%.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

9-20-99
Date

r:\share\lc\gcscan\09-951.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 7 pages.



208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

# GLOSSARY OF OGCSC DATA

## DATA QUALIFIERS

**U** = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

**J** = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

**B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

**E** = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

**I** = Interference.

## ABBREVIATIONS

**BS** = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

**BSD** = Indicates blank spike duplicate.

**MS** = Indicates matrix spike.

**MSD** = Indicates matrix spike duplicate.

**DL** = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

**NA** = Not Applicable.

**DF** = Dilution Factor.

**NR** = Not Required.

**SP** = Indicates spiked compound.

**Recra LabNet - Lionville Laboratory**

GC SCAN

Report Date: 09/13/99 15:30

RFW Batch Number: **9909L951** Client: **TNU-HANFORD B99-078** Work Order: **10985-001-001-9999-00** Page: 1

003

| | Cust ID: | B0W6B2 | B0W6B2 | B0W6B2 | B0W6B3 | B0W6B4 | B0W6B5 |
|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 001 | 001 MS | 001 MSD | 002 | 003 | 004 |
| | Matrix: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | D.F.: | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | Units: | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| n-Propyl Alcohol | | 5.5 U | 76 % | 68 % | 3.7 U | 4.2 U | 5.0 U |
| Ethanol | | 5.5 U | 5.0 U | 5.0 U | 3.7 U | 4.2 U | 5.0 U |

| | Cust ID: | B0W6B6 | B0W6B7 | B0W6B8 | BLK | BLK BS |
|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 005 | 006 | 007 | 99LLC133-MB1 | 99LLC133-MB1 |
| | Matrix: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | D.F.: | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | Units: | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| n-Propyl Alcohol | | 4.8 U | 4.8 U | 4.6 U | 5.0 U | 95 % |
| Ethanol | | 4.8 U | 4.8 U | 4.6 U | 5.0 U | 5.0 U |

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of Advisory limits.

09/16/99

Recra LabNet - Lionville Laboratory
GCSC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/01/99 RFW LOT # :9909L951

| CLIENT ID | RFW # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| B0W6B2 | 001 | S | 99LLC133 | 08/30/99 | 09/02/99 | 09/03/99 |
| B0W6B2 | 001 MS | S | 99LLC133 | 08/30/99 | 09/02/99 | 09/03/99 |
| B0W6B2 | 001 MSD | S | 99LLC133 | 08/30/99 | 09/02/99 | 09/03/99 |
| B0W6B3 | 002 | S | 99LLC133 | 08/30/99 | 09/02/99 | 09/03/99 |
| B0W6B4 | 003 | S | 99LLC133 | 08/30/99 | 09/02/99 | 09/03/99 |
| B0W6B5 | 004 | S | 99LLC133 | 08/30/99 | 09/02/99 | 09/03/99 |
| B0W6B6 | 005 | S | 99LLC133 | 08/30/99 | 09/02/99 | 09/03/99 |
| B0W6B7 | 006 | S | 99LLC133 | 08/30/99 | 09/02/99 | 09/03/99 |
| B0W6B8 | 007 | S | 99LLC133 | 08/30/99 | 09/02/99 | 09/03/99 |
| LAB QC: | | | | | | |
| BLK | MB1 | S | 99LLC133 | N/A | 09/02/99 | 09/02/99 |
| BLK | MB1 BS | S | 99LLC133 | N/A | 09/02/99 | 09/03/99 |

9/13/99

RECRA LabNet Use Only

99091951

# Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

**ALL** FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS (8) perrone wet lab

Client: TNU-Hanford B99-078

Est. Final Proj. Sampling Date:

Project #: 10985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: spec Del: std TAT: 30 day

Date Rec'd: 9/1/99 Date Due: 10/1/99

Account #:

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | 1 | 6→1 | | | | | | 6 | | 6 | 6 | | | | 005 |
| #/Type Container | Liquid | | | | | | | | | | | | | | | |
| | Solid | 1g | 1g→1 | | | | | | 1g | | 1g | 1g | | | | |
| Volume | Liquid | | | | | | | | | | | | | | | |
| | Solid | 250 | 500→1 | | | | | | 500 | | 250 | 1Lt | | | | |
| Preservatives | | | | | | | | | | | | | | | | |
| ANALYSES REQUESTED | ORGANIC: VOA | | BNA | | Pest/PCB | | Herb | | INORG: Metal | | CN | | | | | |

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | 8024H OGCSC | 8025H ODRO | OPRB | Metal | | 1PH | Ang① |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | BOW6B32 | | | S | 8/30/99 | 0745 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |
| 002 | 43 | | | | | 0800 | | | | | | | |
| 003 | 54 | | | | | 0812 | | | | | | | |
| 004 | 65 | | | | | 0831 | | | | | | | |
| 005 | 6 | | | | | 0848 | | | | | | | |
| 006 | 7 | | | | | 0904 | | | | | | | |
| 007 | 8 | | | | | 0925 | | | | | | | |

Met① = As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, Ag, V, Zn, Hg, ICP6

Special Instructions:

Run matrix QC

Saf# B99-078

**COMPOSITE WASTE**

OGCSC = 1-propanol + ethanol

9/8/99 - 1N3N2 added to Inorg① list.

DATE/REVISIONS:

1. Sample 001 (1000 ml ag) was
2. received broken.
3. Run analyses from other
4. jars.
5. Ang① = ICCL, ICFL, ICNO2, ICNO3, ICPO4,
6. ICSO4, ISED, INH3N, KCNTU, IN3N2

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___

Airbill #*

2) Ambient or Chilled

3) Received in Good Condition Y or N

4) Labels Indicate Properly Preserved Y or N

5) Received Within Holding Times Y or N

COC Tape was: 1) Present on Outer Package Y or N; 2) Unbroken on Outer Package Y or N; 3) Present on Sample Y or N; 4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec'd Y or N

Cooler Temp. 5.5 °C

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES: *4235795288 63-4.3' 4235795288 52

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Fed Ex | [signature] | 9/1/99 | 0930 |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Original | Rewritten | | |
| | | | |

9909L951

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B99-078-89 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: Bowers/Porter/Nielson | Company Contact: Chris Cearlock — Telephone No.: 372-9574 | Project Coordinator: TRENT, SJ | Price Code: 8N — Data Turnaround: 45 Days |
| Project Designation: 200 Area Source characterization - 200-CW-1 OU | Sampling Location: GP-5 <15' bgs | SAF No.: B99-078 | |
| Ice Chest No.: ERC96-066 / ERC96-063 | Field Logbook No.: EL-1511 | Method of Shipment: Federal Express | |
| Shipped To: TMA/RECRA 8-30-99 | Offsite Property No.: A990236 | Bill of Lading/Air Bill No.: 4235 7952 8852 (6B2-6B4), 8863 (6B5-6B6) | |
| | | COA: B20CW1 67/C | |

| POSSIBLE SAMPLE HAZARDS/REMARKS | Preservation | None | Cool 4C | None | Cool 4C | None | Cool 4C | None | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type of Container | aG | aG | aG | aG | aG | aG | aG | | | |
| | No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Special Handling and/or Storage | Volume | 60mL | 250mL | 250mL | 500mL | 500mL | 1000mL | 1000mL | | | |
| SAMPLE ANALYSIS | | Isotopic Uranium | VOA - 8260A (TCL), VOA - 8260A (Add-On) (1-Propanol, Ethanol) | pH (Soil) - 9045 | Semi-VOA - 8270A (TCL), TPH-Diesel Range - WTPH-D, PCBs - 8082 | See item (1) in Special Instructions | See item (2) in Special Instructions | See item (3) in Special Instructions | | | |

| | Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | B0W6B2 | Soil | 8-30-99 | 0745 | | X | X | X | X | X | | 3-4' | |
| 002 | B0W6B3 | Soil | 8-30-99 | 0800 | | X | X | X | X | X | | 5.5-6.5' | |
| 003 | B0W6B4 | Soil | 8-30-99 | 0812 | | X | X | X | X | X | | 8'-9' | |
| 004 | B0W6B5 | Soil | 8-30-99 | 0831 | | X | X | X | X | X | | 10.5'-11.5' | |
| 005 | B0W6B6 | Soil | 8-30-99 | 0848 | | X | X | X | X | X | | 14' | 15' |

| CHAIN OF POSSESSION | Sign/Print Names | Date/Time | Received By | Date/Time |
|---|---|---|---|---|
| Relinquished By | Doug Bowers | 8-30-99/1130 | Received By: Ref JB | 8-30-99/1130 |
| Relinquished By: Ref JB | | 8-30-99 1530 | Received By: C Julie | 8/30/99 1530 |
| Relinquished By: C Julie | | 8/31/99 1300 | Received By: FEDEX | 8/31/99 1300 |
| Relinquished By: Fed Ex | | 9.1.99/0930 | Received By: D Smith | 9.1.99/0930 |

**SPECIAL INSTRUCTIONS**

See chain of custody comments on SAF B99-078.

COLLECTOR UNAVAILABLE TO SIGN

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196

(2) NO2/NO3 - 353.1; IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

(3) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241

use Box 528 to ship

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

| LABORATORY SECTION | Received By | Title | Date/Time |
|---|---|---|---|
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

4235 7952 8863 -4.3°

4235 7952 8852 -5.5°

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B99-078-94 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: Bowers/Porter/Nielson | Company Contact: Chris Cearlock | Telephone No.: 372-9574 | Project Coordinator: TRENT, SJ |
| Price Code: 8N | Data Turnaround: 45 Days | | |
| Project Designation: 200 Area Source characterization - 200-CW-1 OU | Sampling Location: GP-5 >15' bgs | SAF No.: B99-078 | |
| Ice Chest No.: ERC 96-066 / ERC 96-063 | Field Logbook No.: EL-1511 | Method of Shipment: Federal Express | |
| Shipped To: ~~TMA~~/RECRA DTB 8-20-99 | Offsite Property No.: A990236 | Bill of Lading/Air Bill No.: 4235 7952 8852 (6B2-6B4) 8863 (6B5-6B8) | |
| | | COA: B20CW1 671C | |

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | None | None | None | Cool 4C | None | Cool 4C | None | Cool 4C | None |
| Type of Container | aG | aG | aG | aG | aG | aG | aG | aG | aG | aG |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Volume | 60mL | 60mL | 60mL | 120mL | 250mL | 250mL | 500mL | 500mL | 1000mL | 1000mL |
| SAMPLE ANALYSIS | Isotopic Uranium | Nickel-63 | Technetium-99 | Tritium - H3 | VOA - 8260A (TCL); VOA - 8260A (Add-On) {1-Propanol, Ethanol} | pH (Soil) - 9045 | Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082 | See item (1) in Special Instructions | See item (2) in Special Instructions | See item (3) in Special Instructions |

| | Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 006 | B0W6B7 | Soil | 8/30/99 | 09:04 | | | | | X | X | X | X | X | 18'-19' |
| 007 | B0W6B8 | Soil | 8/30/99 | 09:25 | | | | | X | X | X | X | X | 20-21' |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By: Doug Bowers | Date/Time: 8-30-99/1130 | Received By: Ref 10 | Date/Time: 8-30-99/1130 |
| Relinquished By: REF 1B | Date/Time: 8/30/99 1300 | Received By: C Price | Date/Time: 1300/8-30-99 |
| Relinquished By: C Price | Date/Time: 8/31/99 1400 | Received By: GAEDEX | Date/Time: 8/31/99 1400 |
| Relinquished By: Geo Ex | Date/Time: 9.1.99/0930 | Received By: D Smith | Date/Time: 9.1.99/0930 |

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

COLLECTOR WAVAILABLE TO SKUCC

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

(2) NO2/NO3 - 353.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

(3) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241}; Strontium-89,90 -- Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241

use BOWSLB to ship

Matrix *

Soil
Water
Vapor
Other Solid
Other Liquid

| LABORATORY SECTION | Received By | Title | Date/Time |
|---|---|---|---|
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

RECRA
ENVIRONMENTAL
INC.

*Chemical and Environmental Measurement Information*

DEC 1999
RECEIVED
Data
Log In

**Recra LabNet Philadelphia**
**Analytical Report**

**Client :** TNU-HANFORD B99-078
**RFW# :** 9909L951
**SDG/SAF #:** H0510/B99-078

**W.O. #:** 10985-001-001-~~9999-00~~
**Date Received:** 09-01-99

**GC/MS VOLATILE** soil osr 10/14/99

Seven (7) water samples were collected on 08-30-99.

The samples and their associated QC samples were analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 09-13,18-99.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. The cooler temperatures upon receipt have been recorded on the chain-of-custody.

2. The required holding time for analysis was met with the exception of the matrix spike samples, which were analyzed outside of holding time. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

3. A non-target compound was detected in the method blank 99LVN296-MB1.

4. Three (3) of thirty-six (36) surrogate recoveries were outside EPA QC limits. The surrogate recoveries for both samples B0W6B2 and B0W6B4 were biased slightly high; however, there were no significant target compounds were detected in the samples. There were no significant impact on the data. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

5. All matrix spike recoveries were within EPA QC limits.

6. All blank spike recoveries were within EPA QC limits.

7. The method blanks contained the common laboratory contaminants Methylene Chloride and Acetone at levels less than 4x the CRQL. The method blank 99LVN296-MB1 also contained the target compound Trichlorofluoromethane at a level less than the CRQL.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

10-13-99
Date

som\group\data\ voa\tnu09951.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 20 pages.



208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

# GLOSSARY OF VOA DATA

## DATA QUALIFIERS

**U** = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.

**J** = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

**B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.

**E** = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

**D** = Identifies all compounds identified in an analysis at a secondary dilution factor.

**I** = Interference.

**NQ** = Result qualitatively confirmed but not able to quantify.

**N** = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

**X** = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).

**Y** = Additional qualifiers used as required are explained in the case narrative.

mmz\10-94\gloss.voa

# GLOSSARY OF VOA DATA

## ABBREVIATIONS

| | | |
|---|---|---|
| **BS** | = | Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported. |
| **BSD** | = | Indicates blank spike duplicate. |
| **MS** | = | Indicates matrix spike. |
| **MSD** | = | Indicates matrix spike duplicate. |
| **DL** | = | Suffix added to sample number to indicate that results are from a diluted analysis. |
| **NA** | = | Not Applicable. |
| **DF** | = | Dilution Factor. |
| **NR** | = | Not Required. |
| **SP, Z** | = | Indicates Spiked Compound. |

mmz\10-94\gloss.voa

**Recra** LabNet Philadelphia **Sample Discrepancy Report (SDR)** SDR #: 99VT140

Initiator: Michael Keppel RFW Batch: 99091L951 Parameter: 0624H VOA
Date: 9/14/99 Samples: 001; 003, MS & MSD Matrix: soil
Client: INV Hanford Method: SW846/MCAWW/CLP/ Prep Batch: _____

**1. Reason for SDR**

**a. COC Discrepancy** __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

**b. General Discrepancy**

__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

**c. QC Problem** (Include all relevant specific results; attach data if necessary)

① 001's 1st surrogate was slightly high. sample = 124% limit = 121%
② 003's 1st + 2nd surrogate were high. (1st) sample = 136 % limit = 121%; (2nd) sample = 128% limit = 117%
③ The MS + MSD will be run out of hold. Samples are clean

**2. Known or Probable Causes(s)**

**3. Discussion and Proposed Action**

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

Other Description:
①+② Report and narrate
③ Analyze out of hold; Report + Narrate

**4. Project Manager Instructions**...signature/date: Michael S. Johnson 9/14/99

✓ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
✓ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

**5. Final Action**...signature/date: Beth Quiroz 10/4/99 Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
X Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

**When Final Action has been recorded, forward original to QA Specialist for distribution and filing.**

| Route | Distribution of Completed SDR | Route | Distribution of Completed SDR |
|---|---|---|---|
| 2 | X Initiator | __ | __ Metals: Doughty |
| __ | X Lab Manager: M. Taylor | __ | __ Inorganic: Perrone |
| 1 | X Project Mgr: Stone/Carey/Schrenkel/Johnson | __ | __ GC/LC: Schnell |
| __ | X Section Mgr: Wesson/Daniels | __ | __ MS: LeMin/Taylor |
| __ | X QA (file): Racioppi | __ | __ Log-in: Toder |
| __ | __ Data Management: Feldman | __ | __ Admin: Soos |
| __ | __ Sample Prep: Schnell/Doughty/Kauffman | __ | __ Other: _____ |

L-WI-006/E-03/99

**Recra LabNet - Lionville Laboratory**

Volatiles by GC/MS, HSL List

Report Date: 10/06/99 09:27

RFW Batch Number: **9909L951** Client: **TNU-HANFORD B99-078** Work Order: 10985001001 Page: 1a

| | Cust ID: | B0W6B2 | | B0W6B3 | | B0W6B3 | | B0W6B3 | | B0W6B4 | | B0W6B5 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 001 | | 002 | | 002 MS | | 002 MSD | | 003 | | 004 | |
| | Matrix: | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | |
| | D.F.: | 1.00 | | 0.980 | | 0.980 | | 0.962 | | 1.02 | | 0.980 | |
| | Units: | UG/KG | | UG/KG | | UG/KG | | UG/KG | | UG/KG | | UG/KG | |
| Surrogate Recovery | Toluene-d8 | 117 | % | 108 | % | 109 | % | 100 | % | 128 * | % | 107 | % |
| | Bromofluorobenzene | 91 | % | 91 | % | 103 | % | 95 | % | 108 | % | 92 | % |
| | 1,2-Dichloroethane-d4 | 124 * | % | 111 | % | 112 | % | 103 | % | 136 * | % | 111 | % |
| | | | fl | | fl | | fl | | fl | | fl | | fl |
| Chloromethane | | 11 | U | 10 | U | 10 | U | 10 | U | 11 | U | 10 | U |
| Bromomethane | | 11 | U | 10 | U | 10 | U | 10 | U | 11 | U | 10 | U |
| Vinyl Chloride | | 11 | U | 10 | U | 10 | U | 10 | U | 11 | U | 10 | U |
| Chloroethane | | 11 | U | 10 | U | 10 | U | 10 | U | 11 | U | 10 | U |
| Methylene Chloride | | 20 | B | 17 | B | 12 | B | 11 | B | 20 | B | 16 | B |
| Acetone | | 3 | JB | 3 | BJ | 6 | JB | 4 | JB | 3 | JB | 3 | JB |
| Carbon Disulfide | | 6 | U | 5 | U | 5 | U | 5 | U | 6 | U | 5 | U |
| 1,1-Dichloroethene | | 6 | U | 5 | U | 101 | % | 97 | % | 6 | U | 5 | U |
| 1,1-Dichloroethane | | 6 | U | 5 | U | 5 | U | 5 | U | 6 | U | 5 | U |
| 1,2-Dichloroethene (total) | | 6 | U | 5 | U | 5 | U | 5 | U | 6 | U | 5 | U |
| Chloroform | | 6 | U | 5 | U | 5 | U | 5 | U | 6 | U | 5 | U |
| 1,2-Dichloroethane | | 6 | U | 5 | U | 5 | U | 5 | U | 6 | U | 5 | U |
| 2-Butanone | | 11 | U | 2 | J | 3 | JB | 2 | JB | 11 | U | 10 | U |
| 1,1,1-Trichloroethane | | 6 | U | 5 | U | 5 | U | 5 | U | 6 | U | 5 | U |
| Carbon Tetrachloride | | 6 | U | 5 | U | 5 | U | 5 | U | 6 | U | 5 | U |
| Bromodichloromethane | | 6 | U | 5 | U | 5 | U | 5 | U | 6 | U | 5 | U |
| 1,2-Dichloropropane | | 6 | U | 5 | U | 5 | U | 5 | U | 6 | U | 5 | U |
| cis-1,3-Dichloropropene | | 6 | U | 5 | U | 5 | U | 5 | U | 6 | U | 5 | U |
| Trichloroethene | | 6 | U | 5 | U | 103 | % | 99 | % | 6 | U | 5 | U |
| Dibromochloromethane | | 6 | U | 5 | U | 5 | U | 5 | U | 6 | U | 5 | U |
| 1,1,2-Trichloroethane | | 6 | U | 5 | U | 5 | U | 5 | U | 6 | U | 5 | U |
| Benzene | | 6 | U | 5 | U | 103 | % | 98 | % | 6 | U | 5 | U |
| Trans-1,3-Dichloropropene | | 6 | U | 5 | U | 5 | U | 5 | U | 6 | U | 5 | U |
| Bromoform | | 6 | U | 5 | U | 5 | U | 5 | U | 6 | U | 5 | U |
| 4-Methyl-2-pentanone | | 11 | U | 10 | U | 10 | U | 10 | U | 11 | U | 10 | U |
| 2-Hexanone | | 11 | U | 10 | U | 10 | U | 10 | U | 11 | U | 10 | U |
| Tetrachloroethene | | 6 | U | 5 | U | 5 | U | 5 | U | 6 | U | 5 | U |
| 1,1,2,2-Tetrachloroethane | | 6 | U | 5 | U | 5 | U | 5 | U | 6 | U | 5 | U |
| Toluene | | 6 | U | 5 | U | 102 | % | 97 | % | 6 | U | 5 | U |

*= Outside of EPA CLP QC limits.

RFW Batch Number: **9909L951** Client: **TNU-HANFORD B99-078** Work Order: 10985001001 Page: 1b

| Cust ID: | B0W6B2 | B0W6B3 | B0W6B3 | B0W6B3 | B0W6B4 | B0W6B5 |
|---|---|---|---|---|---|---|
| RFW#: | 001 | 002 | 002 MS | 002 MSD | 003 | 004 |
| Chlorobenzene | 6 U | 5 U | 101 % | 96 % | 6 U | 5 U |
| Ethylbenzene | 6 U | 5 U | 5 U | 5 U | 6 U | 5 U |
| Styrene | 6 U | 5 U | 5 U | 5 U | 6 U | 5 U |
| Xylene (total) | 6 U | 5 U | 5 U | 5 U | 6 U | 5 U |

*= Outside of EPA CLP QC limits.

**Recra LabNet - Lionville Laboratory**

Volatiles by GC/MS, HSL List

Report Date: 10/06/99 09:27

RFW Batch Number: **9909L951** Client: **TNU-HANFORD B99-078** Work Order: 10985001001 Page: 2a

| | Cust ID: | B0W6B6 | | B0W6B7 | | B0W6B8 | | VBLKRM | | VBLKPI | | VBLKPI BS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 005 | | 006 | | 007 | | 99LVN280-MB1 | | 99LVN296-MB1 | | 99LVN296-MB1 | |
| | Matrix: | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | |
| | D.F.: | 0.980 | | 0.980 | | 1.04 | | 1.00 | | 1.00 | | 1.00 | |
| | Units: | UG/KG | | UG/KG | | UG/KG | | UG/KG | | UG/KG | | UG/KG | |
| Surrogate Recovery | Toluene-d8 | 107 | % | 105 | % | 113 | % | 113 | % | 95 | % | 96 | % |
| | Bromofluorobenzene | 89 | % | 90 | % | 96 | % | 90 | % | 91 | % | 95 | % |
| | 1,2-Dichloroethane-d4 | 108 | % | 105 | % | 114 | % | 100 | % | 100 | % | 105 | % |
| | | | fl | | fl | | fl | | fl | | fl | | fl |
| Chloromethane | | 10 | U | 11 | U | 11 | U | 10 | U | 10 | U | 10 | U |
| Bromomethane | | 10 | U | 11 | U | 11 | U | 10 | U | 10 | U | 10 | U |
| Vinyl Chloride | | 10 | U | 11 | U | 11 | U | 10 | U | 10 | U | 10 | U |
| Chloroethane | | 10 | U | 11 | U | 11 | U | 10 | U | 10 | U | 10 | U |
| Methylene Chloride | | 18 | B | 19 | B | 20 | B | 15 | | 11 | | 10 | B |
| Acetone | | 3 | BJ | 2 | BJ | 4 | JB | 1 | J | 4 | J | 3 | JB |
| Carbon Disulfide | | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 5 | U |
| 1,1-Dichloroethene | | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 92 | % |
| 1,1-Dichloroethane | | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 5 | U |
| 1,2-Dichloroethene (total) | | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 5 | U |
| Chloroform | | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 5 | U |
| 1,2-Dichloroethane | | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 5 | U |
| 2-Butanone | | 10 | U | 11 | U | 11 | U | 10 | U | 2 | J | 2 | JB |
| 1,1,1-Trichloroethane | | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 5 | U |
| Carbon Tetrachloride | | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 5 | U |
| Bromodichloromethane | | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 5 | U |
| 1,2-Dichloropropane | | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 5 | U |
| cis-1,3-Dichloropropene | | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 5 | U |
| Trichloroethene | | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 101 | % |
| Dibromochloromethane | | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 5 | U |
| 1,1,2-Trichloroethane | | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 5 | U |
| Benzene | | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 100 | % |
| Trans-1,3-Dichloropropene | | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 5 | U |
| Bromoform | | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 5 | U |
| 4-Methyl-2-pentanone | | 10 | U | 11 | U | 11 | U | 10 | U | 10 | U | 10 | U |
| 2-Hexanone | | 10 | U | 11 | U | 11 | U | 10 | U | 10 | U | 10 | U |
| Tetrachloroethene | | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 5 | U |
| 1,1,2,2-Tetrachloroethane | | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 5 | U |
| Toluene | | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 97 | % |

*= Outside of EPA CLP QC limits.

RFW Batch Number: **9909L951** Client: **TNU-HANFORD B99-078** Work Order: 10985001001 Page: 2b

90

| Cust ID: | B0W6B6 | | B0W6B7 | | B0W6B8 | | VBLKRM | | VBLKPI | | VBLKPI BS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RFW#: | 005 | | 006 | | 007 | | 99LVN280-MB1 | | 99LVN296-MB1 | | 99LVN296-MB1 | |
| Chlorobenzene | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 99 | % |
| Ethylbenzene | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 5 | U |
| Styrene | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 5 | U |
| Xylene (total) | 5 | U | 6 | U | 6 | U | 5 | U | 5 | U | 5 | U |

*= Outside of EPA CLP QC limits.

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0W6B2

Lab Name: Recra.LabNet Contract: 10985001001

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 9909L951-001

Sample wt/vol: 5.00 (g/mL) G Lab File ID: n091314

Level: (low/med) LOW Date Received: 09/01/99

% Moisture: not dec. 7 Date Analyzed: 09/13/99

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | | | | |

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0W6B3

Lab Name: Recra.LabNet Contract: 10985001001

Lab Code: Recra Case No.: ____ SAS No.: ____ SDG No.: ____

Matrix: (soil/water) SOIL Lab Sample ID: 9909L951-002

Sample wt/vol: 5.10 (g/mL) G Lab File ID: n091315

Level: (low/med) LOW Date Received: 09/01/99

% Moisture: not dec. 3 Date Analyzed: 09/13/99

Column: (pack/cap) CAP Dilution Factor: 0.980

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | | | | |

FORM 1 VOA-TIC 1/87 Rev.

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0W6B4

Lab Name: Recra.LabNet Contract: 10985001001

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 9909L951-003

Sample wt/vol: 4.90 (g/mL) G Lab File ID: n091316

Level: (low/med) LOW Date Received: 09/01/99

% Moisture: not dec. 4 Date Analyzed: 09/13/99

Column: (pack/cap) CAP Dilution Factor: 1.02

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | | | | |

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0W6B5

Lab Name: Recra.LabNet Contract: 10985001001

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 9909L951-004

Sample wt/vol: 5.10 (g/mL) G Lab File ID: n091317

Level: (low/med) LOW Date Received: 09/01/99

% Moisture: not dec. 3 Date Analyzed: 09/13/99

Column: (pack/cap) CAP Dilution Factor: 0.980

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | | | | |

FORM 1 VOA-TIC 1/87 Rev.

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0W6B6

Lab Name: Recra.LabNet Contract: 10985001001

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 9909L951-005

Sample wt/vol: 5.10 (g/mL) G Lab File ID: n091318

Level: (low/med) LOW Date Received: 09/01/99

% Moisture: not dec. 6 Date Analyzed: 09/13/99

Column: (pack/cap) CAP Dilution Factor: 0.980

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | | | | |

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0W6B7

Lab Name: Recra.LabNet Contract: 10985001001

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 9909L951-006

Sample wt/vol: 5.10 (g/mL) G Lab File ID: n091319

Level: (low/med) LOW Date Received: 09/01/99

% Moisture: not dec. 7 Date Analyzed: 09/13/99

Column: (pack/cap) CAP Dilution Factor: 0.980

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | | | | |

FORM 1 VOA-TIC 1/87 Rev.

1E

VOLATILE ORGANICS ANALYSIS SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0W6B8

Lab Name: Recra.LabNet Contract: 10985001001

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 9909L951-007

Sample wt/vol: 4.80 (g/mL) G Lab File ID: n091320

Level: (low/med) LOW Date Received: 09/01/99

% Moisture: not dec. 4 Date Analyzed: 09/13/99

Column: (pack/cap) CAP Dilution Factor: 1.04

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | | | | |

1E

VOLATILE ORGANICS ANALYSIS SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKRM

Lab Name: Recra.LabNet Contract: 10985001001

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 99LVN280-MB1

Sample wt/vol: 5.00 (g/mL) G Lab File ID: n091304

Level: (low/med) LOW Date Received: 09/13/99

% Moisture: not dec. 0 Date Analyzed: 09/13/99

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | | | | |

FORM 1 VOA-TIC 1/87 Rev.

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKPI

Lab Name: Recra.LabNet Contract: 10985001001

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 99LVN296-MB1

Sample wt/vol: 5.00 (g/mL) G Lab File ID: n091805

Level: (low/med) LOW Date Received: 09/18/99

% Moisture: not dec. 0 Date Analyzed: 09/18/99

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | UNKNOWN | 16.588 | 6 | J |

Recra LabNet - Lionville Laboratory
VOA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/01/99 RFW LOT # :9909L951

| CLIENT ID | RFW # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| B0W6B2 | 001 | S | 99LVN280 | 08/30/99 | N/A | 09/13/99 |
| B0W6B3 | 002 | S | 99LVN280 | 08/30/99 | N/A | 09/13/99 |
| B0W6B3 | 002 MS | S | 99LVN296 | 08/30/99 | N/A | 09/18/99 |
| B0W6B3 | 002 MSD | S | 99LVN296 | 08/30/99 | N/A | 09/18/99 |
| B0W6B4 | 003 | S | 99LVN280 | 08/30/99 | N/A | 09/13/99 |
| B0W6B5 | 004 | S | 99LVN280 | 08/30/99 | N/A | 09/13/99 |
| B0W6B6 | 005 | S | 99LVN280 | 08/30/99 | N/A | 09/13/99 |
| B0W6B7 | 006 | S | 99LVN280 | 08/30/99 | N/A | 09/13/99 |
| B0W6B8 | 007 | S | 99LVN280 | 08/30/99 | N/A | 09/13/99 |

LAB QC:

| | | | | | | |
|---|---|---|---|---|---|---|
| VBLKRM | MB1 | S | 99LVN280 | N/A | N/A | 09/13/99 |
| VBLKPI | MB1 | S | 99LVN296 | N/A | N/A | 09/18/99 |
| VBLKPI | MB1 BS | S | 99LVN296 | N/A | N/A | 09/18/99 |

| RECRA LabNet Use Only |
|---|
| 99091951 |

# Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

**ALL** FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS (8) perrone wet lab

Client: TNU-Hanford B99-078
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: Spec Del: std TAT: 30 day
Date Rec'd: 9/1/99 Date Due: 10/1/99
Account #:

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | 1 | 6-1 | | | | | | 6 | | 6 | 6 | | | | |
| #/Type Container | Liquid | | | | | | | | | | | | | | | |
| | Solid | 1g | 1g-1 | | | | | | 1g | | 1g | 1g | | | | |
| Volume | Liquid | | | | | | | | | | | | | | | |
| | Solid | 250 | 500-1 | | | | | | 500 | | 250 | UT | | | | |
| Preservatives | | | | | | | | | | | | | | | | |
| ANALYSES REQUESTED → | | ORGANIC: VOA | BNA | Pest/PCB | Herb | | | | INORG: Metal | CN | | | | | | |
| RECRA LabNet Use Only | | 0024H OGCSC | 0025H ODRO | 8082 | | | | | Met① | | 1PH | Ang① | | | | |

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | VOA | BNA | Pest/PCB | Met① | 1PH | Ang① |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | BØW6B32 | | | S | 8/30/99 | 0745 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 002 | 43 | | | | | 0800 | | | | | | |
| 003 | 54 | | | | | 0812 | | | | | | |
| 004 | 65 | | | | | 0831 | | | | | | |
| 005 | 6 | | | | | 0848 | | | | | | |
| 006 | 7 | | | | | 0904 | | | | | | |
| 007 | 8 | | | | | 0925 | | | | | | |

Met① = As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, Ag, V, Zn, Hg, ICRC

Special Instructions:

Run matrix QC
Saf # B99-078

**COMPOSITE WASTE**

9/8/99 - 1N3N2 added to Inorg① list.

OGCSC = 1-propanol + ethanol

DATE/REVISIONS:

1. Sample #001 (1000ml ag) was
2. received broken.
3. Run analyses from other
4. jars.
5. Ang① = ICCL, ICFL, ICNO2, ICNO3, ICPO4,
6. ICSO4, ISFD, INH3N, ICNTU, IN3N2

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___
Airbill # *
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was: 1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N
Cooler Temp. 5.5 C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:
*4235795288 63-4.3' 4235795288 52

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Fed Ex | [signature] | 9/1/99 | 0930 |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Original | Rewritten | | |
| | | | |

9909L951

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B99-078-89 | Page 1 of 10 2 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: Bowers/Porter/Nielson | Company Contact: Chris Cearlock — Telephone No.: 372-9574 | Project Coordinator: TRENT, SJ | Price Code: 8N — Data Turnaround: 45 Days |
| Project Designation: 200 Area Source characterization - 200-CW-1 OU | Sampling Location: GP-5 <15' bgs | SAF No.: B99-078 | |
| Ice Chest No.: ERC96-066 / ERC96-063 | Field Logbook No.: EL-1511 | Method of Shipment: Federal Express | |
| Shipped To: ~~TMA/RECRA~~ 8-30-99 | Offsite Property No.: A990236 | Bill of Lading/Air Bill No.: 4235 7952 8852 (6B2-6B4) 8863 (6B5-6B6) | |
| | | COA: B20CW1 67/C | |

| POSSIBLE SAMPLE HAZARDS/REMARKS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Preservation | None | Cool 4C | None | Cool 4C | None | Cool 4C | None | | | |
| | Type of Container | aG | aG | aG | aG | aG | aG | aG | | | |
| | No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Special Handling and/or Storage | Volume | 60mL | 250mL | 250mL | 500mL | 500mL | 1000mL | 1000mL | | | |
| SAMPLE ANALYSIS | | Isotopic Uranium | VOA - 8260A (TCL), VOA - 8260A (Add-On) [1-Propanol, Ethanol] | pH (Soil) - 9045 | Semi-VOA - 8270A (TCL), TPH-Diesel Range - WTPH-D, PCBs - 8082 | See item (1) in Special Instructions | See item (2) in Special Instructions | See item (3) in Special Instructions | | | |
| Sample No. | Matrix* | Sample Date | Sample Time | | | | | | | | |
| 001 B0W6B2 | Soil | 8-30-99 | 0745 | | X | X | X | X | X | | 3-4' |
| 002 BOW6B3 | Soil | 8-30-99 | 0800 | | X | X | X | X | X | | 5.5-6.5' |
| 003 BOW6B4 | Soil | 8-30-99 | 0812 | | X | X | X | X | X | | 8'-9' |
| 004 BOW6B5 | Soil | 8-30-99 | 0831 | | X | X | X | X | X | | 10.5'-11.5' |
| 005 BOW6B6 | Soil | 8-30-99 | 0848 | | X | X | X | X | X | | 14' 15' |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By: Doug Bowers / Doug Bowers — Date/Time: 8-30-99/1130 | Received By: Ref 1B — Date/Time: 8-30-99/1130 | | |
| Relinquished By: Ref 1B — Date/Time: 8-30-99 1530 | Received By: C Nile — Date/Time: 8/30/99 1530 | | |
| Relinquished By: C Nile — Date/Time: 8/31/99 1300 | Received By: FEDEX — Date/Time: 8/31/99 1300 | | |
| Relinquished By: Fed Ex — Date/Time: 9.1.99/0930 | Received By: D Smith — Date/Time: 9.1.99/0930 | | |
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

COLLECTOR UNAVAILABLE TO SIGN

(1) ICP Metals - 6010A (Supertrace) [Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, Vanadium, Zinc]; Mercury - 7471 - (CV); Chromium Hex - 7196

(2) NO2/NO3 - 353.1; IC Anions - 300.0 [Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate]; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

(3) Gamma Spectroscopy [Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155]; Gamma Spec - Add-on [Americium-241]; Strontium-89,90 -- Total Sr; Total Uranium [Uranium]; Isotopic Plutonium; Isotopic Thorium [Thorium-232]; Americium-241

use Box 528 to Ship

Matrix*: Soil, Water, Vapor, Other Solid, Other Liquid

4235 7952 8863 -4.3°

4235 7952 8852 -5.5°

RECRA
ENVIRONMENTAL
INC.

*Chemical and Environmental Measurement Information*

DEC 1999
RECEIVED
Data
Log In

**Recra LabNet Philadelphia**
**Analytical Report**

**Client :** TNU-HANFORD B99-078
**RFW# :** 9909L951
**SDG/SAF# :** B99-078/H0510

**W.O.# :** 10985-001-001-9999-00
**Date Received:** 09-01-99

***REVISION***

## METALS CASE NARRATIVE

This package has been revised to include the addition of Antimony and Thallium.

1. This narrative covers the analyses of 7 soil samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.

3. All analyses were performed within the required holding times.

4. The cooler temperatures have been recorded on the Chain of Custody.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. The matrix spike (MS) recovery for 1 analyte was outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 020 pages.

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at the following concentration:

| Sample ID | Element | PDS Concentration (ppb) | PDS % Recovery |
|---|---|---|---|
| B0W6B2 | Antimony | 600 | 93.2 |

12. The duplicate analyses for 4 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

for Pat E

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-11-99
Date

mld/m09-951r

# METALS METHOD GLOSSARY

**The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#:** 9909L951

**Leaching Procedure:** __1310 __1311 __1312 __Other:_____

**CLP Metals __ Digestion and __ Analysis Methods:** __ILM03.0 __ILM04.0

**Metals Digestion Methods:** __3005A __3010A __3015 __3020A ✓3050A __3051 __200.7 __SS17
__Other: _____

## Metals Analysis Methods

| | SW846 | | EPA | | STD MTD | EPA OSWR | USATHAMA |
|---|---|---|---|---|---|---|---|
| Aluminum | __6010B | | __200.7 | | | | __99 |
| Antimony | ✓6010B | __7041 [5] | __200.7 | __204.2 | | | __99 |
| Arsenic | ✓6010B | __7060A [5] | __200.7 | __206.2 | __3113B | | __99 |
| Barium | ✓6010B | | __200.7 | | | | __99 |
| Beryllium | ✓6010B | | __200.7 | | | | __99 |
| Bismuth | __6010B [1] | | __200.7 [1] | | | __1620 | __99 |
| Boron | __6010B | | __200.7 | | | | __99 |
| Cadmium | ✓6010B | __7131A [5] | __200.7 | __213.2 | | | __99 |
| Calcium | __6010B | | __200.7 | | | | __99 |
| Chromium | ✓6010B | __7191 [5] | __200.7 | __218.2 | | | __SS17 |
| Cobalt | __6010B | | __200.7 | | | | __99 |
| Copper | ✓6010B | __7211 [5] | __200.7 | __220.2 | | | __99 |
| Iron | __6010B | | __200.7 | | | | __99 |
| Lead | ✓6010B | __7421 [5] | __200.7 | __239.2 | __3113B | | __99 |
| Lithium | __6010B | __7430 [4] | __200.7 | | | __1620 | __99 |
| Magnesium | __6010B | | __200.7 | | | | __99 |
| Manganese | __6010B | | __200.7 | | | | __99 |
| Mercury | __7470A [3] | ✓7471A [3] | __245.1 [2] | __245.5 [2] | | | __99 |
| Molybdenum | __6010B | | __200.7 | | | | __99 |
| Nickel | ✓6010B | | __200.7 | | | | __99 |
| Potassium | __6010B | __7610 [4] | __200.7 | __258.1 [4] | | | __99 |
| Rare Earths | __6010B [1] | | __200.7 [1] | | | __1620 | __99 |
| Selenium | ✓6010B | __7740 [5] | __200.7 | __270.2 | __3113B | | __99 |
| Silicon | __6010B [1] | | __200.7 | | | __1620 | __99 |
| Silica | __6010B | | __200.7 | | | __1620 | __99 |
| Silver | ✓6010B | __7761 [5] | __200.7 | __272.2 | | | __99 |
| Sodium | __6010B | __7770 [4] | __200.7 | __273.1 [4] | | | __99 |
| Strontium | __6010B | | __200.7 | | | | __99 |
| Thallium | ✓6010B | __7841 [5] | __200.7 | __279.2 | __200.9 | | __99 |
| Tin | __6010B | | __200.7 | | | | __99 |
| Titanium | __6010B | | __200.7 | | | | __99 |
| Uranium | __6010B [1] | | __200.7 [1] | | | __1620 | __99 |
| Vanadium | ✓6010B | | __200.7 | | | | __99 |
| Zinc | ✓6010B | | __200.7 | | | | __99 |
| Zirconium | __6010B [1] | | __200.7 [1] | | | __1620 | __99 |

**Other:**_____ **Method:**_____



L-WI-033/M-03/98

# METHOD REFERENCES AND DATA QUALIFIERS

## DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

## ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LCS = Laboratory Control Sample.
NC = Not calculated.

## ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).

4. Flame AA.

5. Graphite Furnace AA.

RFW 21-21L-033/N-10/96

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/09/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L951

WORK ORDER: 10985-001-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| -001 | B0W6B2 | Silver, Total | 0.1 u | MG/KG | 0.1 | 1.0 |
| | | Arsenic, Total | 3.3 | MG/KG | 0.32 | 1.0 |
| | | Barium, Total | 72.2 | MG/KG | 0.03 | 1.0 |
| | | Beryllium, Total | 0.23 | MG/KG | 0.01 | 1.0 |
| | | Cadmium, Total | 0.06 | MG/KG | 0.03 | 1.0 |
| | | Chromium, Total | 8.5 | MG/KG | 0.08 | 1.0 |
| | | Copper, Total | 16.8 | MG/KG | 0.12 | 1.0 |
| | | Mercury, Total | 0.02 u | MG/KG | 0.02 | 1.0 |
| | | Nickel, Total | 11.9 | MG/KG | 0.12 | 1.0 |
| | | Lead, Total | 5.6 | MG/KG | 0.21 | 1.0 |
| | | Antimony, Total | 0.24 u | MG/KG | 0.24 | 1.0 |
| | | Selenium, Total | 1.3 | MG/KG | 0.36 | 1.0 |
| | | Thallium, Total | 0.52 u | MG/KG | 0.52 | 1.0 |
| | | Vanadium, Total | 70.2 | MG/KG | 0.06 | 1.0 |
| | | Zinc, Total | 51.7 | MG/KG | 0.08 | 1.0 |
| -002 | B0W6B3 | Silver, Total | 0.07 u | MG/KG | 0.07 | 1.0 |
| | | Arsenic, Total | 2.4 | MG/KG | 0.23 | 1.0 |
| | | Barium, Total | 33.6 | MG/KG | 0.02 | 1.0 |
| | | Beryllium, Total | 0.11 | MG/KG | 0.007 | 1.0 |
| | | Cadmium, Total | 0.02 u | MG/KG | 0.02 | 1.0 |
| | | Chromium, Total | 2.9 | MG/KG | 0.06 | 1.0 |
| | | Copper, Total | 13.6 | MG/KG | 0.08 | 1.0 |
| | | Mercury, Total | 0.01 u | MG/KG | 0.01 | 1.0 |
| | | Nickel, Total | 7.2 | MG/KG | 0.08 | 1.0 |
| | | Lead, Total | 3.1 | MG/KG | 0.15 | 1.0 |
| | | Antimony, Total | 0.17 u | MG/KG | 0.17 | 1.0 |
| | | Selenium, Total | 1.3 | MG/KG | 0.26 | 1.0 |
| | | Thallium, Total | 0.96 | MG/KG | 0.37 | 1.0 |
| | | Vanadium, Total | 63.5 | MG/KG | 0.04 | 1.0 |
| | | Zinc, Total | 45.4 | MG/KG | 0.06 | 1.0 |

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/09/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L951

WORK ORDER: 10985-001-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| -003 | B0W6B4 | Silver, Total | 0.10 u | MG/KG | 0.10 | 1.0 |
| | | Arsenic, Total | 2.8 | MG/KG | 0.34 | 1.0 |
| | | Barium, Total | 42.9 | MG/KG | 0.03 | 1.0 |
| | | Beryllium, Total | 0.15 | MG/KG | 0.01 | 1.0 |
| | | Cadmium, Total | 0.04 | MG/KG | 0.03 | 1.0 |
| | | Chromium, Total | 4.1 | MG/KG | 0.08 | 1.0 |
| | | Copper, Total | 15.9 | MG/KG | 0.12 | 1.0 |
| | | Mercury, Total | 0.01 u | MG/KG | 0.01 | 1.0 |
| | | Nickel, Total | 8.3 | MG/KG | 0.12 | 1.0 |
| | | Lead, Total | 3.0 | MG/KG | 0.21 | 1.0 |
| | | Antimony, Total | 0.26 u | MG/KG | 0.26 | 1.0 |
| | | Selenium, Total | 0.83 | MG/KG | 0.38 | 1.0 |
| | | Thallium, Total | 0.54 u | MG/KG | 0.54 | 1.0 |
| | | Vanadium, Total | 66.8 | MG/KG | 0.06 | 1.0 |
| | | Zinc, Total | 48.7 | MG/KG | 0.08 | 1.0 |
| -004 | B0W6B5 | Silver, Total | 0.09 u | MG/KG | 0.09 | 1.0 |
| | | Arsenic, Total | 2.2 | MG/KG | 0.30 | 1.0 |
| | | Barium, Total | 31.5 | MG/KG | 0.03 | 1.0 |
| | | Beryllium, Total | 0.1 | MG/KG | 0.009 | 1.0 |
| | | Cadmium, Total | 0.06 | MG/KG | 0.03 | 1.0 |
| | | Chromium, Total | 3.5 | MG/KG | 0.07 | 1.0 |
| | | Copper, Total | 13.7 | MG/KG | 0.11 | 1.0 |
| | | Mercury, Total | 0.01 u | MG/KG | 0.01 | 1.0 |
| | | Nickel, Total | 8.3 | MG/KG | 0.11 | 1.0 |
| | | Lead, Total | 2.5 | MG/KG | 0.19 | 1.0 |
| | | Antimony, Total | 0.22 u | MG/KG | 0.22 | 1.0 |
| | | Selenium, Total | 0.96 | MG/KG | 0.33 | 1.0 |
| | | Thallium, Total | 0.51 | MG/KG | 0.47 | 1.0 |
| | | Vanadium, Total | 62.9 | MG/KG | 0.05 | 1.0 |
| | | Zinc, Total | 47.2 | MG/KG | 0.07 | 1.0 |

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/09/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L951

WORK ORDER: 10985-001-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| -005 | B0W6B6 | Silver, Total | 0.1 u | MG/KG | 0.1 | 1.0 |
| | | Arsenic, Total | 2.5 | MG/KG | 0.33 | 1.0 |
| | | Barium, Total | 34.3 | MG/KG | 0.03 | 1.0 |
| | | Beryllium, Total | 0.16 | MG/KG | 0.01 | 1.0 |
| | | Cadmium, Total | 0.03 u | MG/KG | 0.03 | 1.0 |
| | | Chromium, Total | 3.7 | MG/KG | 0.08 | 1.0 |
| | | Copper, Total | 12.0 | MG/KG | 0.12 | 1.0 |
| | | Mercury, Total | 0.02 u | MG/KG | 0.02 | 1.0 |
| | | Nickel, Total | 6.2 | MG/KG | 0.12 | 1.0 |
| | | Lead, Total | 3.4 | MG/KG | 0.21 | 1.0 |
| | | Antimony, Total | 0.25 u | MG/KG | 0.25 | 1.0 |
| | | Selenium, Total | 0.71 | MG/KG | 0.37 | 1.0 |
| | | Thallium, Total | 0.88 | MG/KG | 0.52 | 1.0 |
| | | Vanadium, Total | 51.1 | MG/KG | 0.06 | 1.0 |
| | | Zinc, Total | 41.2 | MG/KG | 0.08 | 1.0 |
| -006 | B0W6B7 | Silver, Total | 0.11 u | MG/KG | 0.11 | 1.0 |
| | | Arsenic, Total | 2.3 | MG/KG | 0.35 | 1.0 |
| | | Barium, Total | 33.7 | MG/KG | 0.03 | 1.0 |
| | | Beryllium, Total | 0.23 | MG/KG | 0.01 | 1.0 |
| | | Cadmium, Total | 0.03 u | MG/KG | 0.03 | 1.0 |
| | | Chromium, Total | 3.5 | MG/KG | 0.08 | 1.0 |
| | | Copper, Total | 14.0 | MG/KG | 0.13 | 1.0 |
| | | Mercury, Total | 0.02 u | MG/KG | 0.02 | 1.0 |
| | | Nickel, Total | 6.5 | MG/KG | 0.13 | 1.0 |
| | | Lead, Total | 3.9 | MG/KG | 0.22 | 1.0 |
| | | Antimony, Total | 0.26 u | MG/KG | 0.26 | 1.0 |
| | | Selenium, Total | 0.39 u | MG/KG | 0.39 | 1.0 |
| | | Thallium, Total | 0.56 u | MG/KG | 0.56 | 1.0 |
| | | Vanadium, Total | 41.5 | MG/KG | 0.06 | 1.0 |
| | | Zinc, Total | 37.0 | MG/KG | 0.08 | 1.0 |

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/09/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L951

WORK ORDER: 10985-001-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| -007 | B0W6B8 | Silver, Total | 0.08 u | MG/KG | 0.08 | 1.0 |
| | | Arsenic, Total | 2.3 | MG/KG | 0.26 | 1.0 |
| | | Barium, Total | 79.1 | MG/KG | 0.02 | 1.0 |
| | | Beryllium, Total | 0.16 | MG/KG | 0.008 | 1.0 |
| | | Cadmium, Total | 0.02 u | MG/KG | 0.02 | 1.0 |
| | | Chromium, Total | 4.1 | MG/KG | 0.06 | 1.0 |
| | | Copper, Total | 10.7 | MG/KG | 0.09 | 1.0 |
| | | Mercury, Total | 0.02 u | MG/KG | 0.02 | 1.0 |
| | | Nickel, Total | 5.6 | MG/KG | 0.09 | 1.0 |
| | | Lead, Total | 2.3 | MG/KG | 0.16 | 1.0 |
| | | Antimony, Total | 0.20 u | MG/KG | 0.20 | 1.0 |
| | | Selenium, Total | 0.29 u | MG/KG | 0.29 | 1.0 |
| | | Thallium, Total | 0.41 u | MG/KG | 0.41 | 1.0 |
| | | Vanadium, Total | 33.2 | MG/KG | 0.05 | 1.0 |
| | | Zinc, Total | 29.6 | MG/KG | 0.06 | 1.0 |

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/09/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L951

WORK ORDER: 10985-001-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| BLANK1 | 99L0643-MB1 | Silver, Total | 0.10 u | MG/KG | 0.10 | 1.0 |
| | | Arsenic, Total | 0.33 u | MG/KG | 0.33 | 1.0 |
| | | Barium, Total | 0.10 | MG/KG | 0.03 | 1.0 |
| | | Beryllium, Total | 0.01 u | MG/KG | 0.01 | 1.0 |
| | | Cadmium, Total | 0.03 u | MG/KG | 0.03 | 1.0 |
| | | Chromium, Total | 0.09 | MG/KG | 0.08 | 1.0 |
| | | Copper, Total | 0.12 u | MG/KG | 0.12 | 1.0 |
| | | Nickel, Total | 0.12 u | MG/KG | 0.12 | 1.0 |
| | | Lead, Total | 0.21 u | MG/KG | 0.21 | 1.0 |
| | | Antimony, Total | 0.25 u | MG/KG | 0.25 | 1.0 |
| | | Selenium, Total | 0.37 u | MG/KG | 0.37 | 1.0 |
| | | Thallium, Total | 0.53 u | MG/KG | 0.53 | 1.0 |
| | | Vanadium, Total | 0.06 u | MG/KG | 0.06 | 1.0 |
| | | Zinc, Total | 0.08 u | MG/KG | 0.08 | 1.0 |
| BLANK1 | 99C0269-MB1 | Mercury, Total | 0.02 u | MG/KG | 0.02 | 1.0 |

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 11/09/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L951

WORK ORDER: 10985-001-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | INITIAL RESULT | SPIKED AMOUNT | %RECOV | DILUTION FACTOR(SPK) |
|---|---|---|---|---|---|---|---|
| -001 | B0W6B2 | Silver, Total | 3.2 | 0.1 u | 3.6 | 88.9 | 1.0 |
| | | Arsenic, Total | 149 | 3.3 | 145 | 101.0 | 1.0 |
| | | Barium, Total | 195 | 72.2 | 145 | 84.9 | 1.0 |
| | | Beryllium, Total | 4.0 | 0.23 | 3.6 | 104.6 | 1.0 |
| | | Cadmium, Total | 3.7 | 0.06 | 3.6 | 101.0 | 1.0 |
| | | Chromium, Total | 22.8 | 8.5 | 14.5 | 98.6 | 1.0 |
| | | Copper, Total | 31.5 | 16.8 | 18.1 | 81.2 | 1.0 |
| | | Mercury, Total | 0.18 | 0.02u | 0.17 | 104.0 | 1.0 |
| | | Nickel, Total | 46.6 | 11.9 | 36.2 | 95.9 | 1.0 |
| | | Lead, Total | 41.8 | 5.6 | 36.2 | 100 | 1.0 |
| | | Antimony, Total | 19.9 | 0.24u | 36.2 | 55.0 | 1.0 |
| | | Selenium, Total | 141 | 1.3 | 145 | 96.9 | 1.0 |
| | | Thallium, Total | 141 | 0.52u | 145 | 97.6 | 1.0 |
| | | Vanadium, Total | 100 | 70.2 | 36.2 | 83.1 | 1.0 |
| | | Zinc, Total | 84.0 | 51.7 | 36.2 | 89.2 | 1.0 |

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 11/09/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L951

WORK ORDER: 10985-001-001-9999-00

| SAMPLE | SITE ID | ANALYTE | INITIAL RESULT | REPLICATE | RPD | DILUTION FACTOR(REP) |
|---|---|---|---|---|---|---|
| -001REP | B0W6B2 | Silver, Total | 0.1 u | 0.1 u | NC | 1.0 |
| | | Arsenic, Total | 3.3 | 3.2 | 3.1 | 1.0 |
| | | Barium, Total | 72.2 | 70.4 | 2.5 | 1.0 |
| | | Beryllium, Total | 0.23 | 0.39 | 49.0 | 1.0 |
| | | Cadmium, Total | 0.06 | 0.33 | 135.8 | 1.0 |
| | | Chromium, Total | 8.5 | 8.7 | 2.3 | 1.0 |
| | | Copper, Total | 16.8 | 16.0 | 4.9 | 1.0 |
| | | Mercury, Total | 0.02u | 0.02u | NC | 1.0 |
| | | Nickel, Total | 11.9 | 11.3 | 5.2 | 1.0 |
| | | Lead, Total | 5.6 | 6.7 | 17.9 | 1.0 |
| | | Antimony, Total | 0.24u | 0.25u | NC | 1.0 |
| | | Selenium, Total | 1.3 | 0.71 | 58.4 | 1.0 |
| | | Thallium, Total | 0.52u | 0.75 | ~~NC~~ 200 | 1.0 |
| | | Vanadium, Total | 70.2 | 68.8 | 2.0 | 1.0 |
| | | Zinc, Total | 51.7 | 50.8 | 1.8 | 1.0 |

Acm 11/11/99

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/09/99

CLIENT: TNU-HANFORD B99-07B

RECRA LOT #: 9909L951

WORK ORDER: 10985-001-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | SPIKED AMOUNT | UNITS | %RECOV |
|---|---|---|---|---|---|---|
| LCS1 | 99L0643-LC1 | Silver, LCS | 49.7 | 50.0 | MG/KG | 99.4 |
| | | Arsenic, LCS | 974 | 1000 | MG/KG | 97.4 |
| | | Barium, LCS | 497 | 500 | MG/KG | 99.4 |
| | | Beryllium, LCS | 24.4 | 25.0 | MG/KG | 97.6 |
| | | Cadmium, LCS | 24.6 | 25.0 | MG/KG | 98.4 |
| | | Chromium, LCS | 50.3 | 50.0 | MG/KG | 100.6 |
| | | Copper, LCS | 124 | 125 | MG/KG | 99.5 |
| | | Nickel, LCS | 197 | 200 | MG/KG | 98.4 |
| | | Lead, LCS | 246 | 250 | MG/KG | 98.6 |
| | | Antimony, LCS | 292 | 300 | MG/KG | 97.5 |
| | | Selenium, LCS | 945 | 1000 | MG/KG | 94.5 |
| | | Thallium, LCS | 1020 | 1000 | MG/KG | 101.6 |
| | | Vanadium, LCS | 256 | 250 | MG/KG | 102.5 |
| | | Zinc, LCS | 96.7 | 100 | MG/KG | 96.7 |
| LCS1 | 99C0269-LC1 | Mercury, LCS | 0.98 | 1.0 | MG/KG | 98.3 |

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/01/99 RFW LOT # :9909L951

| CLIENT ID /ANALYSIS | RFW # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| B0W6B2 | | | | | | |
| SILVER, TOTAL | 001 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| SILVER, TOTAL | 001 REP | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| SILVER, TOTAL | 001 MS | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| ARSENIC, TOTAL | 001 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| ARSENIC, TOTAL | 001 REP | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| ARSENIC, TOTAL | 001 MS | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| BARIUM, TOTAL | 001 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| BARIUM, TOTAL | 001 REP | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| BARIUM, TOTAL | 001 MS | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| BERYLLIUM, TOTAL | 001 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| BERYLLIUM, TOTAL | 001 REP | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| BERYLLIUM, TOTAL | 001 MS | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| CADMIUM, TOTAL | 001 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| CADMIUM, TOTAL | 001 REP | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| CADMIUM, TOTAL | 001 MS | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| CHROMIUM, TOTAL | 001 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| CHROMIUM, TOTAL | 001 REP | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| CHROMIUM, TOTAL | 001 MS | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| COPPER, TOTAL | 001 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| COPPER, TOTAL | 001 REP | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| COPPER, TOTAL | 001 MS | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| MERCURY, TOTAL | 001 | S | 99C0269 | 08/30/99 | 09/12/99 | 09/12/99 |
| MERCURY, TOTAL | 001 REP | S | 99C0269 | 08/30/99 | 09/12/99 | 09/12/99 |
| MERCURY, TOTAL | 001 MS | S | 99C0269 | 08/30/99 | 09/12/99 | 09/12/99 |
| NICKEL, TOTAL | 001 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| NICKEL, TOTAL | 001 REP | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| NICKEL, TOTAL | 001 MS | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| LEAD, TOTAL | 001 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| LEAD, TOTAL | 001 REP | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| LEAD, TOTAL | 001 MS | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| ANTIMONY, TOTAL | 001 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| ANTIMONY, TOTAL | 001 REP | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| ANTIMONY, TOTAL | 001 MS | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| SELENIUM, TOTAL | 001 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| SELENIUM, TOTAL | 001 REP | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/01/99 RFW LOT # :9909L951

| CLIENT ID /ANALYSIS | RFW # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| SELENIUM, TOTAL | 001 MS | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| THALLIUM, TOTAL | 001 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| THALLIUM, TOTAL | 001 REP | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| THALLIUM, TOTAL | 001 MS | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| VANADIUM, TOTAL | 001 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| VANADIUM, TOTAL | 001 REP | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| VANADIUM, TOTAL | 001 MS | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| ZINC, TOTAL | 001 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| ZINC, TOTAL | 001 REP | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| ZINC, TOTAL | 001 MS | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| B0W6B3 | | | | | | |
| SILVER, TOTAL | 002 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| ARSENIC, TOTAL | 002 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| BARIUM, TOTAL | 002 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| BERYLLIUM, TOTAL | 002 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| CADMIUM, TOTAL | 002 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| CHROMIUM, TOTAL | 002 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| COPPER, TOTAL | 002 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| MERCURY, TOTAL | 002 | S | 99C0269 | 08/30/99 | 09/12/99 | 09/12/99 |
| NICKEL, TOTAL | 002 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| LEAD, TOTAL | 002 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| ANTIMONY, TOTAL | 002 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| SELENIUM, TOTAL | 002 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| THALLIUM, TOTAL | 002 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| VANADIUM, TOTAL | 002 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| ZINC, TOTAL | 002 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| B0W6B4 | | | | | | |
| SILVER, TOTAL | 003 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| ARSENIC, TOTAL | 003 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| BARIUM, TOTAL | 003 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| BERYLLIUM, TOTAL | 003 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| CADMIUM, TOTAL | 003 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| CHROMIUM, TOTAL | 003 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| COPPER, TOTAL | 003 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/01/99 RFW LOT # :9909L951

| CLIENT ID /ANALYSIS | RFW # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| MERCURY, TOTAL | 003 | S | 99C0269 | 08/30/99 | 09/12/99 | 09/12/99 |
| NICKEL, TOTAL | 003 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| LEAD, TOTAL | 003 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| ANTIMONY, TOTAL | 003 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| SELENIUM, TOTAL | 003 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| THALLIUM, TOTAL | 003 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| VANADIUM, TOTAL | 003 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| ZINC, TOTAL | 003 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| B0W6B5 | | | | | | |
| SILVER, TOTAL | 004 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| ARSENIC, TOTAL | 004 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| BARIUM, TOTAL | 004 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| BERYLLIUM, TOTAL | 004 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| CADMIUM, TOTAL | 004 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| CHROMIUM, TOTAL | 004 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| COPPER, TOTAL | 004 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| MERCURY, TOTAL | 004 | S | 99C0269 | 08/30/99 | 09/12/99 | 09/12/99 |
| NICKEL, TOTAL | 004 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| LEAD, TOTAL | 004 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| ANTIMONY, TOTAL | 004 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| SELENIUM, TOTAL | 004 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| THALLIUM, TOTAL | 004 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| VANADIUM, TOTAL | 004 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| ZINC, TOTAL | 004 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| B0W6B6 | | | | | | |
| SILVER, TOTAL | 005 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| ARSENIC, TOTAL | 005 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| BARIUM, TOTAL | 005 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| BERYLLIUM, TOTAL | 005 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| CADMIUM, TOTAL | 005 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| CHROMIUM, TOTAL | 005 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| COPPER, TOTAL | 005 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| MERCURY, TOTAL | 005 | S | 99C0269 | 08/30/99 | 09/12/99 | 09/12/99 |
| NICKEL, TOTAL | 005 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/01/99 RFW LOT # :9909L951

| CLIENT ID /ANALYSIS | RFW # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| LEAD, TOTAL | 005 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| ANTIMONY, TOTAL | 005 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| SELENIUM, TOTAL | 005 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| THALLIUM, TOTAL | 005 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| VANADIUM, TOTAL | 005 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| ZINC, TOTAL | 005 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| B0W6B7 | | | | | | |
| SILVER, TOTAL | 006 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| ARSENIC, TOTAL | 006 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| BARIUM, TOTAL | 006 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| BERYLLIUM, TOTAL | 006 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| CADMIUM, TOTAL | 006 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| CHROMIUM, TOTAL | 006 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| COPPER, TOTAL | 006 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| MERCURY, TOTAL | 006 | S | 99C0269 | 08/30/99 | 09/12/99 | 09/12/99 |
| NICKEL, TOTAL | 006 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| LEAD, TOTAL | 006 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| ANTIMONY, TOTAL | 006 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| SELENIUM, TOTAL | 006 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| THALLIUM, TOTAL | 006 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| VANADIUM, TOTAL | 006 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| ZINC, TOTAL | 006 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| B0W6B8 | | | | | | |
| SILVER, TOTAL | 007 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| ARSENIC, TOTAL | 007 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| BARIUM, TOTAL | 007 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| BERYLLIUM, TOTAL | 007 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| CADMIUM, TOTAL | 007 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| CHROMIUM, TOTAL | 007 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| COPPER, TOTAL | 007 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| MERCURY, TOTAL | 007 | S | 99C0269 | 08/30/99 | 09/12/99 | 09/12/99 |
| NICKEL, TOTAL | 007 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| LEAD, TOTAL | 007 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| ANTIMONY, TOTAL | 007 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/01/99 RFW LOT # :9909L951

| CLIENT ID /ANALYSIS | RFW # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| SELENIUM, TOTAL | 007 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| THALLIUM, TOTAL | 007 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/28/99 |
| VANADIUM, TOTAL | 007 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |
| ZINC, TOTAL | 007 | S | 99L0643 | 08/30/99 | 09/22/99 | 09/27/99 |

LAB QC:

| | | | | | | |
|---|---|---|---|---|---|---|
| SILVER LABORATORY | LC1 BS | S | 99L0643 | N/A | 09/22/99 | 09/27/99 |
| SILVER, TOTAL | MB1 | S | 99L0643 | N/A | 09/22/99 | 09/27/99 |
| ARSENIC LABORATORY | LC1 BS | S | 99L0643 | N/A | 09/22/99 | 09/28/99 |
| ARSENIC, TOTAL | MB1 | S | 99L0643 | N/A | 09/22/99 | 09/28/99 |
| BARIUM LABORATORY | LC1 BS | S | 99L0643 | N/A | 09/22/99 | 09/27/99 |
| BARIUM, TOTAL | MB1 | S | 99L0643 | N/A | 09/22/99 | 09/27/99 |
| BERYLLIUM LABORATORY | LC1 BS | S | 99L0643 | N/A | 09/22/99 | 09/28/99 |
| BERYLLIUM, TOTAL | MB1 | S | 99L0643 | N/A | 09/22/99 | 09/28/99 |
| CADMIUM LABORATORY | LC1 BS | S | 99L0643 | N/A | 09/22/99 | 09/28/99 |
| CADMIUM, TOTAL | MB1 | S | 99L0643 | N/A | 09/22/99 | 09/28/99 |
| CHROMIUM LABORATORY | LC1 BS | S | 99L0643 | N/A | 09/22/99 | 09/28/99 |
| CHROMIUM, TOTAL | MB1 | S | 99L0643 | N/A | 09/22/99 | 09/28/99 |
| COPPER LABORATORY | LC1 BS | S | 99L0643 | N/A | 09/22/99 | 09/27/99 |
| COPPER, TOTAL | MB1 | S | 99L0643 | N/A | 09/22/99 | 09/27/99 |
| MERCURY LABORATORY | LC1 BS | S | 99C0269 | N/A | 09/12/99 | 09/12/99 |
| MERCURY, TOTAL | MB1 | S | 99C0269 | N/A | 09/12/99 | 09/12/99 |
| NICKEL LABORATORY | LC1 BS | S | 99L0643 | N/A | 09/22/99 | 09/28/99 |
| NICKEL, TOTAL | MB1 | S | 99L0643 | N/A | 09/22/99 | 09/28/99 |
| LEAD LABORATORY | LC1 BS | S | 99L0643 | N/A | 09/22/99 | 09/28/99 |
| LEAD, TOTAL | MB1 | S | 99L0643 | N/A | 09/22/99 | 09/28/99 |
| ANTIMONY LABORATORY | LC1 BS | S | 99L0643 | N/A | 09/22/99 | 09/28/99 |
| ANTIMONY, TOTAL | MB1 | S | 99L0643 | N/A | 09/22/99 | 09/28/99 |
| SELENIUM LABORATORY | LC1 BS | S | 99L0643 | N/A | 09/22/99 | 09/28/99 |
| SELENIUM, TOTAL | MB1 | S | 99L0643 | N/A | 09/22/99 | 09/28/99 |
| THALLIUM LABORATORY | LC1 BS | S | 99L0643 | N/A | 09/22/99 | 09/28/99 |
| THALLIUM, TOTAL | MB1 | S | 99L0643 | N/A | 09/22/99 | 09/28/99 |
| VANADIUM LABORATORY | LC1 BS | S | 99L0643 | N/A | 09/22/99 | 09/27/99 |
| VANADIUM, TOTAL | MB1 | S | 99L0643 | N/A | 09/22/99 | 09/27/99 |
| ZINC LABORATORY | LC1 BS | S | 99L0643 | N/A | 09/22/99 | 09/27/99 |
| ZINC, TOTAL | MB1 | S | 99L0643 | N/A | 09/22/99 | 09/27/99 |

| RECRA LabNet Use Only |
|---|
| 99091951 |

# Custody Transfer Record/Lab Work Request

Page 1 of 1

**ALL** FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS (8) perrone ~~wet lab~~ metals

RECRA LabNet

Client: TNU-Hanford B99-078
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: spec Del: std TAT: 30 day
Date Rec'd: 9/1/99 Date Due: 10/1/99
Account #:

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | 1 | 6-1 | | | | | | | 6 | | 6 | 6 | | | | |
| #/Type Container | Liquid | | | | | | | | | | | | | | | | |
| | Solid | 1g | 1g-1 | | | | | | | 1g | | 1g | 1g | | | | |
| Volume | Liquid | | | | | | | | | | | | | | | | |
| | Solid | 250 | 500-1 | | | | | | | 500 | | 250 | 1/4 | | | | |
| Preservatives | | | | | | | | | | | | | | | | | |
| ANALYSES REQUESTED → | | ORGANIC | | | | | | | | INORG | | | | | | | |
| | | VOA | BNA | Pest/PCB | Herb | | | | | Metal | CN | | | | | | |
| | | RECRA LabNet Use Only | | | | | | | | | | | | | | | |
| | | 0024H OGCSC | 0025H ODRO | 0013 | | | | | | Met① | | 1PH | Ang① | | | | |

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | 0024H OGCSC | 0025H ODRO | 0013 | Met① | 1PH | Ang① |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | BØW6BB2 | | | S | 8/30/99 | 0745 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 002 | ~~BW6B~~ 3 | | | | | 0800 | | | | | | |
| 003 | ~~BW6B~~ 4 | | | | | 0812 | | | | | | |
| 004 | ~~BW6B~~ 5 | | | | | 0831 | | | | | | |
| 005 | 6 | | | | | 0848 | | | | | | |
| 006 | 7 | | | | | 0904 | | | | | | |
| 007 | 8 | | | | | 0925 | | | | | | |

11/3/99 SB and TL added to all metals samples per client

Met① = As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, Ag, V, Zn, Hg, ICRG

Special Instructions:

Run matrix QC
Saf# B99-078

COMPOSITE WASTE

OGCSC = 1-propanol + ethanol

9/8/99 - 1N3N2 added to Inorg① list.

DATE/REVISIONS:

1. Sample #001 (1000ml ag) was
2. received broken.
3. Run analyses from other
4. jars.
5. Ang① = ICCL, ICFL, ICNO2, ICNO3, ICPO4,
6. ICSO4, ISFD, INH3N, ICNTU, IN3N2

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # *
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Cooler Temp. 5.5 °C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:
*4235795288 63-4.3' 4235795288 52

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Fed Ex | D. Smith | 9/1/99 | 0930 |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Original | Rewritten | | |
| | | | |

9904L451

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B99-078-89 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: Bowers/Porter/Nielson | Company Contact: Chris Cearlock — Telephone No.: 372-9574 | Project Coordinator: TRENT, SJ | Price Code: 8N — Data Turnaround: 45 Days |
| Project Designation: 200 Area Source characterization - 200-CW-1 OU | Sampling Location: GP-5 <15' bgs | SAF No.: B99-078 | |
| Ice Chest No.: ~~EQC~~ 96-066 / ~~EQC~~ 96-063 | Field Logbook No.: EL-1511 | Method of Shipment: Federal Express | |
| Shipped To: ~~TMA~~/RECRA 8-30-99 | Offsite Property No.: A990236 | Bill of Lading/Air Bill No.: 4235 7952 8852 (682-684) 8863 (685-688) | |
| | | COA: B20CW1 67/C | |

| POSSIBLE SAMPLE HAZARDS/REMARKS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Preservation | None | Cool 4C | None | Cool 4C | None | Cool 4C | None | | | |
| | Type of Container | aG | aG | aG | aG | aG | aG | aG | | | |
| | No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Special Handling and/or Storage | Volume | 60mL | 250mL | 250mL | 500mL | 500mL | 1000mL | 1000mL | | | |
| SAMPLE ANALYSIS | | Isotopic Uranium | VOA - 8260A (TCL), VOA - 8260A (Add-On) (1-Propanol, Ethanol) | pH (Soil) - 9045 | Semi-VOA - 8270A (TCL), TPH-Diesel Range - WTPH-D, PCBs - 8082 | See item (1) in Special Instructions | See item (2) in Special Instructions | See item (3) in Special Instructions | | | |

| | Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | B0W6B2 | Soil | 8-30-99 | 0745 | | X | X | X | X | X | | 3-4' | |
| 002 | B0W6B3 | Soil | 8-30-99 | 0800 | | X | X | X | X | X | | 5.5-6.5' | |
| 003 | B0W6B4 | Soil | 8-30-99 | 0812 | | X | X | X | X | X | | 8'-9' | |
| 004 | B0W6B5 | Soil | 8-30-99 | 0831 | | X | X | X | X | X | | 10.5'-11.5' | |
| 005 | B0W6B6 | Soil | 8-30-99 | 0848 | | X | X | X | X | X | | 14' | 15' |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By: Doug Bowers | Date/Time: 8-30-99/1130 | Received By: Ref 1B | Date/Time: 8-30-99/1130 |
| Relinquished By: Ref 1B | Date/Time: 8-30-99 1530 | Received By: C Allie | Date/Time: 8/30/99 1530 |
| Relinquished By: C Allie | Date/Time: 8/31/99 1300 | Received By: FEDEX | Date/Time: 8/31/99 1300 |
| Relinquished By: Fed Ex | Date/Time: 9.1.99/0930 | Received By: D. Smith | Date/Time: 9.1.99/0930 |

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

COLLECTOR UNAVAILABLE TO SIGN

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196

(2) NO2/NO3 - 353.1; IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

(3) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241

use Box 528 to Ship

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

| LABORATORY SECTION | Received By | Title | Date/Time |
|---|---|---|---|
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

4235 7952 8863 -4.3°

4235 7952 8852 -5.5°

019

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B99-078-94 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: Bowers/Porter/Nielson | Company Contact: Chris Cearlock | Telephone No.: 372-9574 | Project Coordinator: TRENT, SJ |
| Price Code: 8N | Data Turnaround: 45 Days | | |
| Project Designation: 200 Area Source characterization - 200-CW-1 OU | Sampling Location: GP-5 >15' bgs | | SAF No.: B99-078 |
| Ice Chest No.: ERC 96-066 / ERC 96-063 | Field Logbook No.: EL-1511 | | Method of Shipment: Federal Express |
| Shipped To: TMA/RECRA D 78 8-30-99 | Offsite Property No.: A99 02316 | | Bill of Lading/Air Bill No.: 4235 7952 8852 (6B2-6B4) 8863 (6B5-6B8) |
| | | | COA: B20CW1 671C |

| POSSIBLE SAMPLE HAZARDS/REMARKS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Preservation | None | None | None | None | Cool 4C | None | Cool 4C | None | Cool 4C | None |
| | Type of Container | aG | aG | aG | aG | aG | aG | aG | aG | aG | aG |
| | No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Special Handling and/or Storage | Volume | 60mL | 60mL | 60mL | 120mL | 250mL | 250mL | 500mL | 500mL | 1000mL | 1000mL |
| SAMPLE ANALYSIS | | Isotopic Uranium | Nickel-63 | Technetium-99 | Tritium - H3 | VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol) | pH (Soil) - 9045 | Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082 | See item (1) in Special Instructions | See item (2) in Special Instructions | See item (3) in Special Instructions |
| Sample No. | Matrix * / Sample Date / Sample Time | | | | | | | | | | |
| 006 B0W6B7 | Soil / 8/30/99 / 09:04 | | | | | X | X | X | X | X | 18'-19' |
| 007 B0W6B8 | Soil / 8/30/99 / 09:25 | | | | | X | X | X | X | X | 20-21' |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By: Doug Bowers / [signature] | Date/Time: 8-30-99/1130 | Received By: [signature] | Date/Time: 8-30-99/1130 |
| Relinquished By: REF 1B | Date/Time: 8/30/99 1300 | Received By: [signature] | Date/Time: 1300/8-30-99 |
| Relinquished By: [signature] | Date/Time: 8/31/99 1400 | Received By: FEDEX | Date/Time: 8/31/99 1400 |
| Relinquished By: Fed Ex | Date/Time: 9.1.99/0930 | Received By: [signature] | Date/Time: 9.1.99/0930 |
| LABORATORY SECTION: Received By | | Title | Date/Time |
| FINAL SAMPLE DISPOSITION: Disposal Method | | Disposed By | Date/Time |

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

COLLECTOR UNAVAILABLE TO SIGN COC

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196

(2) NO2/NO3 - 353.1; IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

(3) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241

use BOWSL8 to ship

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

020

0210

RECRA LabNet
a division of Recra Environmental, Inc.
Virtual Laboratories Everywhere

DEC 1999

**Recra LabNet Philadelphia**
**Analytical Report**

**Client :** TNU0HANFORD B99-078
**RFW# :** 9909L951
**SDG# :** H0510
**SAF# :** B99-078

**W.O. # :** 10985-001-001-9999-00
**Date Received:** 09-01-99

## INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 7 soil samples.

2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.

3. Sample holding times as required by the method and/or contract were met with the exception of matrix quality control analyses for Total Cyanide sample B0W6B2.

4. The cooler temperatures were recorded on the chain-of-custody.

5. The method blanks were within method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS were within the 20% Relative Percent Difference (RPD) control limit.

7. The matrix spike recoveries were within the 75-125% control limits. The matrix spike duplicates were within the 20% RPD control limit.

8. The replicate analyses were within the 20% RPD control limit.

9. Results for solid samples are reported on a dry weight basis.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

12-1-99
Date

njp&pef\i09-951

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 20 pages.

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

**Recra LabNet Philadelphia**

## WET CHEMISTRY
## METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

| | ASTM | SW846 | OTHER |
|---|---|---|---|
| % Ash | __ D2216-80 | | |
| % Moisture | __ D2216-80 | | __ ILMO4.0 (e) |
| % Solids | __ | | ✓ ILMO4.0 (e) |
| % Volatile Soilids | __ D2216-80 | | |
| ASTM Extraction in Water | __ D3987-81/85 | | |
| BTU | __ D240-87 | | |
| CEC | | __ 9081 | __ c |
| Chromium VI | | ✓ 3060A/7196A | |
| Corrosivity ___ by coupon ___ by pH | | __ 1110(mod) __ 9045C | |
| Cyanide, Total | | ✓ 9010B | __ ILMO4.0 (e) |
| Cyanide, Reactive | | __ Section 7.3 | |
| Halides, Extractable Organic | | __ 9020B | __ EPA 600/4/84-008 |
| Halides, Total | | __ 9020B | __ EPA 600/4/84-008 |
| EP Toxicity | | __ 1310A | |
| Flash Point | | __ 1010 | |
| Ignitability | | __ 1010 | |
| Oil & Grease | | __ 9071A | |
| Carbon, Total Organic | | __ 9060 | __ Lloyd Kahn (mod) |
| Oxygne Bomb Prep for Anions | __ D240-87(mod) | __ 5050 | |
| Petroleum Hydrocarbons, Total Recoverable | | __ 9071 | __ EPA 418.1 |
| pH, Soil | | ✓ 9045C | |
| Sulfide, Reactive | | __ Section 7.3 | |
| Sulfide | | ✓ 9030B(mod) | |
| Specific Gravity | __ D1429-76C/ | __ D5057-90 | |
| Sulfur, Total | | __ 9056 | |
| Synthetic Prpearation Leach | | __ 1312 | |
| Paint Filter | | 9095A | |

**Other:** Nitrate Nitrite **Method:** EPA 353.2

**Other:** Ammonia **Method** EPA 350.3

Chloride, Fluoride, Nitrite, Nitrate, Phosphate, Sulfate } EPA 300.0

## Recra LabNet Philadelphia
# METHOD REFERENCES AND DATA QUALIFIERS

## DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

## ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

## ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/22/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L951

WORK ORDER: 10985-001-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|---|
| -001 | B0W6B2 | % Solids | 92.8 | | % | 0.01 | 1.0 |
| | | Chloride by IC | 1.5 | | MG/KG | 1.3 | 1.0 |
| | | Fluoride by IC | 2.7 | u | MG/KG | 2.7 | 1.0 |
| | | Nitrite by IC | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | Nitrate by IC | 20 | | MG/KG | 1.3 | 1.0 |
| | | Cyanide, Total | 0.54 | u | MG/KG | 0.54 | 1.0 |
| | | Phosphate by IC | 2.2 | | MG/KG | 1.3 | 1.0 |
| | | Chromium VI | 0.43 | u | MG/KG | 0.43 | 1.0 |
| | | Sulfate by IC | 58.5 | | MG/KG | 5.2 | 4.0 |
| | | Nitrate Nitrite | 4.4 | | MG/KG | 0.21 | 1.0 |
| | | Ammonia, as N | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | pH | 8.7 | | SOIL PH | 0.0 | 1.0 |
| | | Sulfide | 1.1 | u | MG/KG | 1.1 | 1.0 |
| -002 | B0W6B3 | % Solids | 97.3 | | % | 0.01 | 1.0 |
| | | Chloride by IC | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | Fluoride by IC | 2.6 | u | MG/KG | 2.6 | 1.0 |
| | | Nitrite by IC | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | Nitrate by IC | 3.3 | | MG/KG | 1.3 | 1.0 |
| | | Cyanide, Total | 0.51 | u | MG/KG | 0.51 | 1.0 |
| | | Phosphate by IC | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | Chromium VI | 0.41 | u | MG/KG | 0.41 | 1.0 |
| | | Sulfate by IC | 35.2 | | MG/KG | 1.3 | 1.0 |
| | | Nitrate Nitrite | 0.70 | | MG/KG | 0.20 | 1.0 |
| | | Ammonia, as N | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | pH | 9.4 | | SOIL PH | 0.0 | 1.0 |
| | | Sulfide | 3.5 | | MG/KG | 1.0 | 1.0 |
| -003 | B0W6B4 | % Solids | 96.1 | | % | 0.01 | 1.0 |
| | | Chloride by IC | 1.4 | | MG/KG | 1.3 | 1.0 |
| | | Fluoride by IC | 2.6 | u | MG/KG | 2.6 | 1.0 |
| | | Nitrite by IC | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | Nitrate by IC | 15 | | MG/KG | 1.3 | 1.0 |
| | | Cyanide, Total | 0.52 | u | MG/KG | 0.52 | 1.0 |
| | | Phosphate by IC | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | Chromium VI | 0.42 | u | MG/KG | 0.42 | 1.0 |
| | | Sulfate by IC | 53.3 | | MG/KG | 2.6 | 2.0 |
| | | Nitrate Nitrite | 3.3 | | MG/KG | 0.21 | 1.0 |
| | | Ammonia, as N | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | pH | 9.4 | | SOIL PH | 0.0 | 1.0 |

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/22/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L951

WORK ORDER: 10985-001-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|---|
| -003 | B0W6B4 | Sulfide | 4.1 | | MG/KG | 1.0 | 1.0 |
| -004 | B0W6B5 | % Solids | 97.1 | | % | 0.01 | 1.0 |
| | | Chloride by IC | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | Fluoride by IC | 2.6 | u | MG/KG | 2.6 | 1.0 |
| | | Nitrite by IC | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | Nitrate by IC | 6.9 | | MG/KG | 1.3 | 1.0 |
| | | Cyanide, Total | 0.52 | u | MG/KG | 0.52 | 1.0 |
| | | Phosphate by IC | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | Chromium VI | 0.41 | u | MG/KG | 0.41 | 1.0 |
| | | Sulfate by IC | 21.3 | | MG/KG | 1.3 | 1.0 |
| | | Nitrate Nitrite | 1.6 | | MG/KG | 0.20 | 1.0 |
| | | Ammonia, as N | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | pH | 9.3 | | SOIL PH | 0.0 | 1.0 |
| | | Sulfide | 1.0 | u | MG/KG | 1.0 | 1.0 |
| -005 | B0W6B6 | % Solids | 94.4 | | % | 0.01 | 1.0 |
| | | Chloride by IC | 1.7 | | MG/KG | 1.3 | 1.0 |
| | | Fluoride by IC | 2.6 | u | MG/KG | 2.6 | 1.0 |
| | | Nitrite by IC | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | Nitrate by IC | 29 | | MG/KG | 1.3 | 1.0 |
| | | Cyanide, Total | 0.53 | u | MG/KG | 0.53 | 1.0 |
| | | Phosphate by IC | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | Chromium VI | 0.41 | u | MG/KG | 0.41 | 1.0 |
| | | Sulfate by IC | 59.0 | | MG/KG | 2.6 | 2.0 |
| | | Nitrate Nitrite | 5.8 | | MG/KG | 0.21 | 1.0 |
| | | Ammonia, as N | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | pH | 9.2 | | SOIL PH | 0.0 | 1.0 |
| | | Sulfide | 1.1 | u | MG/KG | 1.1 | 1.0 |
| -006 | B0W6B7 | % Solids | 93.4 | | % | 0.01 | 1.0 |
| | | Chloride by IC | 2.0 | | MG/KG | 1.3 | 1.0 |
| | | Fluoride by IC | 9.2 | | MG/KG | 2.7 | 1.0 |
| | | Nitrite by IC | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | Nitrate by IC | 41 | | MG/KG | 1.3 | 1.0 |
| | | Cyanide, Total | 0.54 | u | MG/KG | 0.54 | 1.0 |
| | | Phosphate by IC | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | Chromium VI | 0.43 | u | MG/KG | 0.43 | 1.0 |
| | | Sulfate by IC | 53.9 | | MG/KG | 2.7 | 2.0 |
| | | Nitrate Nitrite | 7.3 | | MG/KG | 0.21 | 1.0 |

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/22/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L951

WORK ORDER: 10985-001-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|---|
| -006 | B0W6B7 | Ammonia, as N | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | pH | 9.2 | | SOIL PH | 0.0 | 1.0 |
| | | Sulfide | 1.1 | u | MG/KG | 1.1 | 1.0 |
| -007 | B0W6B8 | % Solids | 96.4 | | % | 0.01 | 1.0 |
| | | Chloride by IC | 2.4 | | MG/KG | 1.3 | 1.0 |
| | | Fluoride by IC | 2.6 | u | MG/KG | 2.6 | 1.0 |
| | | Nitrite by IC | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | Nitrate by IC | 39 | | MG/KG | 1.3 | 1.0 |
| | | Cyanide, Total | 0.52 | u | MG/KG | 0.52 | 1.0 |
| | | Phosphate by IC | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | Chromium VI | 0.42 | u | MG/KG | 0.42 | 1.0 |
| | | Sulfate by IC | 51.6 | | MG/KG | 1.3 | 1.0 |
| | | Nitrate Nitrite | 8.6 | | MG/KG | 0.21 | 1.0 |
| | | Ammonia, as N | 1.3 | u | MG/KG | 1.3 | 1.0 |
| | | pH | 9.1 | | SOIL PH | 0.0 | 1.0 |
| | | Sulfide | 3.7 | | MG/KG | 1.0 | 1.0 |

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/22/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L951

WORK ORDER: 10985-001-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|---|
| BLANK10 | 99LIC080-MB1 | Chloride by IC | 1.2 | u | MG/KG | 1.2 | 1.0 |
| | | Fluoride by IC | 2.5 | u | MG/KG | 2.5 | 1.0 |
| | | Nitrite by IC | 1.2 | u | MG/KG | 1.2 | 1.0 |
| | | Nitrate by IC | 1.2 | u | MG/KG | 1.2 | 1.0 |
| | | Phosphate by IC | 1.2 | u | MG/KG | 1.2 | 1.0 |
| | | Sulfate by IC | 1.2 | u | MG/KG | 1.2 | 1.0 |
| BLANK1 | 99LC103-MB1 | Cyanide, Total | 0.50 | u | MG/KG | 0.50 | 1.0 |
| BLANK10 | 99LC114A-MB1 | Cyanide, Total | 0.50 | u | MG/KG | 0.50 | 1.0 |
| BLANK10 | 99LVI062-MB1 | Chromium VI | 0.40 | u | MG/KG | 0.40 | 1.0 |
| BLANK10 | 99LIC081-MB1 | Sulfate by IC | 1.2 | u | MG/KG | 1.2 | 1.0 |
| BLANK10 | 99LN3B45-MB1 | Nitrate Nitrite | 0.20 | u | MG/KG | 0.20 | 1.0 |
| BLANK10 | 99LANA55-MB1 | Nitrate Nitrite | 0.20 | u | MG/KG | 0.20 | 1.0 |
| BLANK10 | 99LAM035-MB1 | Ammonia, as N | 1.2 | u | MG/KG | 1.2 | 1.0 |
| BLANK10 | 99LSD043-MB1 | Sulfide | 1.0 | u | MG/KG | 1.0 | 1.0 |
| BLANK10 | 99LAM045-MB1 | Ammonia, as N | 1.2 | u | MG/KG | 1.2 | 1.0 |

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 11/22/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L951

WORK ORDER: 10985-001-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | INITIAL RESULT | SPIKED AMOUNT | %RECOV | DILUTION FACTOR(SPK) |
|---|---|---|---|---|---|---|---|
| -001 | B0W6B2 | Chloride by IC | 28.6 | 1.5 | 26.9 | 100.5 | 1.0 |
| | | Chloride by IC MSD | 28.8 | 1.5 | 26.9 | 101.3 | 1.0 |
| | | Fluoride by IC | 61.9 | 1.8 | 53.9 | 111.6 | 1.0 |
| | | Fluoride by IC MSD | 62.0 | 1.8 | 53.9 | 111.6 | 1.0 |
| | | Nitrite by IC | 29 | 1.3 u | 27 | 106.5 | 1.0 |
| | | Nitrite by IC MSD | 29 | 1.3 u | 27 | 107.3 | 1.0 |
| | | Nitrate by IC | 51 | 20 | 27 | 112.4 | 1.0 |
| | | Nitrate by IC MSD | 51 | 20 | 27 | 112.4 | 1.0 |
| | | Cyanide, Total | 4.5 | 0.54u | 5.4 | 83.2 | 1.0 |
| | | Cyanide, Total MSD | 4.8 | 0.54u | 5.4 | 88.5 | 1.0 |
| | | Phosphate by IC | 30.2 | 2.2 | 26.9 | 103.9 | 1.0 |
| | | Phosphate by IC MSD | 30.0 | 2.2 | 26.9 | 103.4 | 1.0 |
| | | Soluble Chromium VI | 4.4 | 0.43u | 4.3 | 104.2 | 1.0 |
| | | Insoluble Chromium VI | 1360 | 0.43u | 1180 | 115.4 | 100 |
| | | Sulfate by IC | 170 | 58.5 | 104 | 107.4 | 4.0 |
| | | Sulfate by IC MSD | 170 | 58.5 | 104 | 107.1 | 4.0 |
| | | Nitrate Nitrite | 10.6 | 4.4 | 5.1 | 123.9 | 5.0 |
| -002 | B0W6B3 | Ammonia, as N | 96.5 | 1.3 u | 99.7 | 96.8 | 1.0 |
| -007 | B0W6B8 | Sulfide | 322 | 3.7 | 350 | 90.9 | 1.0 |
| | | Sulfide MSD | 397 | 3.7 | 414 | 94.9 | 1.0 |
| BLANK10 | 99LIC080-MB1 | Chloride by IC | 24.3 | 1.2 u | 25.0 | 97.3 | 1.0 |
| | | Fluoride by IC | 53.3 | 2.5 u | 50.0 | 106.6 | 1.0 |
| | | Nitrite by IC | 24 | 1.2 u | 25 | 97.5 | 1.0 |
| | | Nitrate by IC | 24 | 1.2 u | 25 | 97.9 | 1.0 |
| | | Phosphate by IC | 25.8 | 1.2 u | 25.0 | 103.1 | 1.0 |
| | | Sulfate by IC | 24.0 | 1.2 u | 25.0 | 96.2 | 1.0 |
| BLANK10 | 99LVI062-MB1 | Soluble Chromium VI | 4.0 | 0.40u | 4.0 | 99.8 | 1.0 |
| | | Insoluble Chromium VI | 1100 | 0.40u | 1160 | 94.3 | 100 |
| BLANK10 | 99LIC081-MB1 | Sulfate by IC | 24.0 | 1.2 u | 25.0 | 95.9 | 1.0 |
| BLANK10 | 99LN3B45-MB1 | Nitrate Nitrite | 5.1 | 0.20u | 5.0 | 102.4 | 1.0 |
| | | Nitrate Nitrite MSD | 5.2 | 0.20u | 5.0 | 103.0 | 1.0 |
| BLANK10 | 99LANA55-MB1 | Nitrate Nitrite | 4.9 | 0.20u | 5.0 | 98.4 | 1.0 |
| | | Nitrate Nitrite MSD | 5.0 | 0.20u | 5.0 | 100.8 | 1.0 |
| BLANK10 | 99LAM035-MB1 | Ammonia, as N | 52.4 | 1.2 u | 50.0 | 104.8 | 1.0 |
| | | Ammonia, as N MSD | 52.6 | 1.2 u | 50.0 | 105.2 | 1.0 |
| BLANK10 | 99LSD043-MB1 | Sulfide | 9.1 | 1.0 u | 10.0 | 91.0 | 1.0 |
| | | Sulfide MSD | 9.4 | 1.0 u | 10.0 | 94.0 | 1.0 |

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 11/22/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L951

WORK ORDER: 10985-001-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | INITIAL RESULT | SPIKED AMOUNT | %RECOV | DILUTION FACTOR(SPK) |
|---|---|---|---|---|---|---|---|
| BLANK10 | 99LAM045-MB1 | Ammonia, as N | 51.4 | 1.2 u | 50.0 | 102.8 | 1.0 |
| | | Ammonia, as N MSD | 50.6 | 1.2 u | 50.0 | 101.2 | 1.0 |

Recra LabNet - Lionville

INORGANICS DUPLICATE SPIKE REPORT 11/22/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L951

WORK ORDER: 10985-001-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKE#1 %RECOV | SPIKE#2 %RECOV | %DIFF |
|---|---|---|---|---|---|
| -001 | B0W6B2 | Chloride by IC | 100.5 | 101.3 | 0.85 |
| | | Fluoride by IC | 111.6 | 111.6 | 0.027 |
| | | Nitrite by IC | 106.5 | 107.3 | 0.78 |
| | | Nitrate by IC | 112.4 | 112.4 | 0.016 |
| | | Cyanide, Total | 83.2 | 88.5 | 6.2 |
| | | Phosphate by IC | 103.9 | 103.4 | 0.46 |
| | | Sulfate by IC | 107.4 | 107.1 | 0.26 |
| -007 | B0W6B8 | Sulfide | 90.9 | 94.9 | 4.3 |
| BLANK10 | 99LN3B45-MB1 | Nitrate Nitrite | 102.4 | 103.0 | 0.58 |
| BLANK10 | 99LANA55-MB1 | Nitrate Nitrite | 98.4 | 100.8 | 2.4 |
| BLANK10 | 99LAM035-MB1 | Ammonia, as N | 104.8 | 105.2 | 0.48 |
| BLANK10 | 99LSD043-MB1 | Sulfide | 91.0 | 94.0 | 3.2 |
| BLANK10 | 99LAM045-MB1 | Ammonia, as N | 102.8 | 101.2 | 1.5 |

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 11/22/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L951

WORK ORDER: 10985-001-001-9999-00

| SAMPLE | SITE ID | ANALYTE | INITIAL RESULT | REPLICATE | RPD | DILUTION FACTOR(REP) |
|---|---|---|---|---|---|---|
| -001REP | B0W6B2 | Chloride by IC | 1.5 | 1.5 | 1.8 | 1.0 |
| | | Fluoride by IC | 2.7 u | 2.7 u | NC | 1.0 |
| | | Nitrite by IC | 1.3 u | 1.3 u | NC | 1.0 |
| | | Nitrate by IC | 20 | 20 | 0.31 | 1.0 |
| | | Cyanide, Total | 0.54u | 0.54u | NC | 1.0 |
| | | Phosphate by IC | 2.2 | 2.4 | 10.5 | 1.0 |
| | | Chromium VI | 0.43u | 0.43u | NC | 1.0 |
| | | Sulfate by IC | 58.5 | 58.7 | 0.36 | 4.0 |
| | | Nitrate Nitrite | 4.4 | 5.0 | 14.8 | 1.0 |
| -002REP | B0W6B3 | Ammonia, as N | 1.3 u | 1.3 u | NC | 1.0 |
| -004REP | B0W6B5 | % Solids | 97.1 | 97.0 | 0.11 | 1.0 |
| -007REP | B0W6B8 | pH | 9.1 | 9.1 | 0.0 | 1.0 |
| | | Sulfide | 3.7 | 3.7 | 0.71 | 1.0 |

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/22/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L951

WORK ORDER: 10985-001-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | SPIKED AMOUNT | UNITS | %RECOV |
|---|---|---|---|---|---|---|
| LCS1 | 99LC103-LC1 | Cyanide, Total LCS | 1.9 | 2.0 | MG/KG | 97.3 |
| LCS2 | 99LC103-LC2 | Cyanide, Total LCS | 9.8 | 10 | MG/KG | 97.7 |
| LCS10 | 99LC114A-LC1 | Cyanide, Total LCS | 2.0 | 2.0 | MG/KG | 100.2 |
| LCS20 | 99LC114A-LC2 | Cyanide, Total LCS | 9.8 | 10 | MG/KG | 98.0 |

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/01/99 RFW LOT # :9909L951

| CLIENT ID /ANALYSIS | RFW # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| B0W6B2 | | | | | | |
| % SOLIDS | 001 | S | 99L%S122 | 08/30/99 | 09/03/99 | 09/04/99 |
| CHLORIDE BY IC | 001 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| CHLORIDE BY IC | 001 REP | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| CHLORIDE BY IC | 001 MS | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| CHLORIDE BY IC | 001 MSD | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| FLUORIDE BY IC | 001 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| FLUORIDE BY IC | 001 REP | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| FLUORIDE BY IC | 001 MS | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| FLUORIDE BY IC | 001 MSD | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRITE BY IC | 001 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRITE BY IC | 001 REP | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRITE BY IC | 001 MS | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRITE BY IC | 001 MSD | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRATE BY IC | 001 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRATE BY IC | 001 REP | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRATE BY IC | 001 MS | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRATE BY IC | 001 MSD | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| TOTAL CYANIDE | 001 | S | 99LC103 | 08/30/99 | 09/10/99 | 09/10/99 |
| TOTAL CYANIDE | 001 REP | S | 99LC114A | 08/30/99 | 10/08/99 | 10/08/99 |
| TOTAL CYANIDE | 001 MS | S | 99LC114A | 08/30/99 | 10/08/99 | 10/08/99 |
| TOTAL CYANIDE | 001 MSD | S | 99LC114A | 08/30/99 | 10/08/99 | 10/08/99 |
| PHOSPHATE BY IC | 001 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| PHOSPHATE BY IC | 001 REP | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| PHOSPHATE BY IC | 001 MS | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| PHOSPHATE BY IC | 001 MSD | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| CHROMIUM VI | 001 | S | 99LVI062 | 08/30/99 | 09/08/99 | 09/08/99 |
| CHROMIUM VI | 001 REP | S | 99LVI062 | 08/30/99 | 09/08/99 | 09/08/99 |
| CHROMIUM VI | 001 MS | S | 99LVI062 | 08/30/99 | 09/08/99 | 09/08/99 |
| CHROMIUM VI | 001 MSD | S | 99LVI062 | 08/30/99 | 09/08/99 | 09/08/99 |
| SULFATE BY IC | 001 | S | 99LIC081 | 08/30/99 | 09/27/99 | 09/27/99 |
| SULFATE BY IC | 001 REP | S | 99LIC081 | 08/30/99 | 09/27/99 | 09/27/99 |
| SULFATE BY IC | 001 MS | S | 99LIC081 | 08/30/99 | 09/27/99 | 09/27/99 |
| SULFATE BY IC | 001 MSD | S | 99LIC081 | 08/30/99 | 09/27/99 | 09/27/99 |
| NITRATE NITRITE | 001 | S | 99LN3B45 | 08/30/99 | 09/16/99 | 09/17/99 |
| NITRATE NITRITE | 001 REP | S | 99LANA55 | 08/30/99 | 11/17/99 | 11/18/99 |

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/01/99 RFW LOT # :9909L951

| CLIENT ID /ANALYSIS | RFW # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| NITRATE NITRITE | 001 MS | S | 99LANA55 | 08/30/99 | 11/17/99 | 11/18/99 |
| AMMONIA | 001 | S | 99LAM035 | 08/30/99 | 09/15/99 | 09/15/99 |
| PH | 001 | S | 99LPH099 | 08/30/99 | 09/15/99 | 09/15/99 |
| SULFIDE | 001 | S | 99LSD043 | 08/30/99 | 09/03/99 | 09/04/99 |
| B0W6B3 | | | | | | |
| % SOLIDS | 002 | S | 99L%S122 | 08/30/99 | 09/03/99 | 09/04/99 |
| CHLORIDE BY IC | 002 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| FLUORIDE BY IC | 002 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRITE BY IC | 002 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRATE BY IC | 002 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| TOTAL CYANIDE | 002 | S | 99LC103 | 08/30/99 | 09/10/99 | 09/10/99 |
| PHOSPHATE BY IC | 002 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| CHROMIUM VI | 002 | S | 99LVI062 | 08/30/99 | 09/08/99 | 09/08/99 |
| SULFATE BY IC | 002 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRATE NITRITE | 002 | S | 99LN3B45 | 08/30/99 | 09/16/99 | 09/17/99 |
| AMMONIA | 002 | S | 99LAM035 | 08/30/99 | 09/15/99 | 09/15/99 |
| AMMONIA | 002 REP | S | 99LAM045 | 08/30/99 | 11/19/99 | 11/19/99 |
| AMMONIA | 002 MS | S | 99LAM045 | 08/30/99 | 11/19/99 | 11/19/99 |
| PH | 002 | S | 99LPH099 | 08/30/99 | 09/15/99 | 09/15/99 |
| SULFIDE | 002 | S | 99LSD043 | 08/30/99 | 09/03/99 | 09/04/99 |
| B0W6B4 | | | | | | |
| % SOLIDS | 003 | S | 99L%S122 | 08/30/99 | 09/03/99 | 09/04/99 |
| CHLORIDE BY IC | 003 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| FLUORIDE BY IC | 003 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRITE BY IC | 003 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRATE BY IC | 003 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| TOTAL CYANIDE | 003 | S | 99LC103 | 08/30/99 | 09/10/99 | 09/10/99 |
| PHOSPHATE BY IC | 003 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| CHROMIUM VI | 003 | S | 99LVI062 | 08/30/99 | 09/08/99 | 09/08/99 |
| SULFATE BY IC | 003 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRATE NITRITE | 003 | S | 99LN3B45 | 08/30/99 | 09/16/99 | 09/17/99 |
| AMMONIA | 003 | S | 99LAM035 | 08/30/99 | 09/15/99 | 09/15/99 |
| PH | 003 | S | 99LPH099 | 08/30/99 | 09/15/99 | 09/15/99 |
| SULFIDE | 003 | S | 99LSD043 | 08/30/99 | 09/03/99 | 09/04/99 |

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/01/99 RFW LOT # :9909L951

| CLIENT ID /ANALYSIS | RFW # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| B0W6B5 | | | | | | |
| % SOLIDS | 004 | S | 99L%S122 | 08/30/99 | 09/03/99 | 09/04/99 |
| % SOLIDS | 004 REP | S | 99L%S122 | 08/30/99 | 09/03/99 | 09/04/99 |
| CHLORIDE BY IC | 004 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| FLUORIDE BY IC | 004 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRITE BY IC | 004 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRATE BY IC | 004 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| TOTAL CYANIDE | 004 | S | 99LC103 | 08/30/99 | 09/10/99 | 09/10/99 |
| PHOSPHATE BY IC | 004 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| CHROMIUM VI | 004 | S | 99LVI062 | 08/30/99 | 09/08/99 | 09/08/99 |
| SULFATE BY IC | 004 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRATE NITRITE | 004 | S | 99LN3B45 | 08/30/99 | 09/16/99 | 09/17/99 |
| AMMONIA | 004 | S | 99LAM035 | 08/30/99 | 09/15/99 | 09/15/99 |
| PH | 004 | S | 99LPH099 | 08/30/99 | 09/15/99 | 09/15/99 |
| SULFIDE | 004 | S | 99LSD043 | 08/30/99 | 09/03/99 | 09/04/99 |
| B0W6B6 | | | | | | |
| % SOLIDS | 005 | S | 99L%S122 | 08/30/99 | 09/03/99 | 09/04/99 |
| CHLORIDE BY IC | 005 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| FLUORIDE BY IC | 005 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRITE BY IC | 005 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRATE BY IC | 005 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| TOTAL CYANIDE | 005 | S | 99LC103 | 08/30/99 | 09/10/99 | 09/10/99 |
| PHOSPHATE BY IC | 005 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| CHROMIUM VI | 005 | S | 99LVI062 | 08/30/99 | 09/08/99 | 09/08/99 |
| SULFATE BY IC | 005 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRATE NITRITE | 005 | S | 99LN3B45 | 08/30/99 | 09/16/99 | 09/17/99 |
| AMMONIA | 005 | S | 99LAM035 | 08/30/99 | 09/15/99 | 09/15/99 |
| PH | 005 | S | 99LPH099 | 08/30/99 | 09/15/99 | 09/15/99 |
| SULFIDE | 005 | S | 99LSD043 | 08/30/99 | 09/03/99 | 09/04/99 |
| B0W6B7 | | | | | | |
| % SOLIDS | 006 | S | 99L%S122 | 08/30/99 | 09/03/99 | 09/04/99 |
| CHLORIDE BY IC | 006 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/01/99 RFW LOT # :9909L951

| CLIENT ID /ANALYSIS | RFW # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| FLUORIDE BY IC | 006 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRITE BY IC | 006 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRATE BY IC | 006 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| TOTAL CYANIDE | 006 | S | 99LC103 | 08/30/99 | 09/10/99 | 09/10/99 |
| PHOSPHATE BY IC | 006 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| CHROMIUM VI | 006 | S | 99LVI062 | 08/30/99 | 09/08/99 | 09/08/99 |
| SULFATE BY IC | 006 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRATE NITRITE | 006 | S | 99LN3B45 | 08/30/99 | 09/16/99 | 09/17/99 |
| AMMONIA | 006 | S | 99LAM035 | 08/30/99 | 09/15/99 | 09/15/99 |
| PH | 006 | S | 99LPH099 | 08/30/99 | 09/15/99 | 09/15/99 |
| SULFIDE | 006 | S | 99LSD043 | 08/30/99 | 09/03/99 | 09/04/99 |
| B0W6B8 | | | | | | |
| % SOLIDS | 007 | S | 99L%S122 | 08/30/99 | 09/03/99 | 09/04/99 |
| CHLORIDE BY IC | 007 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| FLUORIDE BY IC | 007 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRITE BY IC | 007 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRATE BY IC | 007 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| TOTAL CYANIDE | 007 | S | 99LC103 | 08/30/99 | 09/10/99 | 09/10/99 |
| PHOSPHATE BY IC | 007 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| CHROMIUM VI | 007 | S | 99LVI062 | 08/30/99 | 09/08/99 | 09/08/99 |
| SULFATE BY IC | 007 | S | 99LIC080 | 08/30/99 | 09/25/99 | 09/25/99 |
| NITRATE NITRITE | 007 | S | 99LN3B45 | 08/30/99 | 09/16/99 | 09/17/99 |
| AMMONIA | 007 | S | 99LAM035 | 08/30/99 | 09/15/99 | 09/15/99 |
| PH | 007 | S | 99LPH099 | 08/30/99 | 09/15/99 | 09/15/99 |
| PH | 007 REP | S | 99LPH099 | 08/30/99 | 09/15/99 | 09/15/99 |
| SULFIDE | 007 | S | 99LSD043 | 08/30/99 | 09/03/99 | 09/04/99 |
| SULFIDE | 007 REP | S | 99LSD043 | 08/30/99 | 09/03/99 | 09/04/99 |
| SULFIDE | 007 MS | S | 99LSD043 | 08/30/99 | 09/03/99 | 09/04/99 |
| SULFIDE | 007 MSD | S | 99LSD043 | 08/30/99 | 09/03/99 | 09/04/99 |

LAB QC:

| | | | | | | |
|---|---|---|---|---|---|---|
| CHLORIDE BY IC | MB1 | S | 99LIC080 | N/A | 09/25/99 | 09/25/99 |
| CHLORIDE BY IC | MB1 BS | S | 99LIC080 | N/A | 09/25/99 | 09/25/99 |
| FLUORIDE BY IC | MB1 | S | 99LIC080 | N/A | 09/25/99 | 09/25/99 |
| FLUORIDE BY IC | MB1 BS | S | 99LIC080 | N/A | 09/25/99 | 09/25/99 |

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/01/99 RFW LOT # :9909L951

| CLIENT ID /ANALYSIS | RFW # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| NITRITE BY IC | MB1 | S | 99LIC080 | N/A | 09/25/99 | 09/25/99 |
| NITRITE BY IC | MB1 BS | S | 99LIC080 | N/A | 09/25/99 | 09/25/99 |
| NITRATE BY IC | MB1 | S | 99LIC080 | N/A | 09/25/99 | 09/25/99 |
| NITRATE BY IC | MB1 BS | S | 99LIC080 | N/A | 09/25/99 | 09/25/99 |
| TOTAL CYANIDE | LC1 L | S | 99LC103 | N/A | 09/10/99 | 09/10/99 |
| TOTAL CYANIDE | LC2 L | S | 99LC103 | N/A | 09/10/99 | 09/10/99 |
| TOTAL CYANIDE | MB1 | S | 99LC103 | N/A | 09/10/99 | 09/10/99 |
| TOTAL CYANIDE | LC1 L | S | 99LC114A | N/A | 10/08/99 | 10/08/99 |
| TOTAL CYANIDE | LC2 L | S | 99LC114A | N/A | 10/08/99 | 10/08/99 |
| TOTAL CYANIDE | MB1 | S | 99LC114A | N/A | 10/08/99 | 10/08/99 |
| PHOSPHATE BY IC | MB1 | S | 99LIC080 | N/A | 09/25/99 | 09/25/99 |
| PHOSPHATE BY IC | MB1 BS | S | 99LIC080 | N/A | 09/25/99 | 09/25/99 |
| CHROMIUM VI | MB1 | S | 99LVI062 | N/A | 09/08/99 | 09/08/99 |
| CHROMIUM VI | MB1 BS | S | 99LVI062 | N/A | 09/08/99 | 09/08/99 |
| CHROMIUM VI | MB1 BSD | S | 99LVI062 | N/A | 09/08/99 | 09/08/99 |
| SULFATE BY IC | MB1 | S | 99LIC081 | N/A | 09/27/99 | 09/27/99 |
| SULFATE BY IC | MB1 BS | S | 99LIC081 | N/A | 09/27/99 | 09/27/99 |
| NITRATE NITRITE | MB1 | S | 99LN3B45 | N/A | 09/17/99 | 09/17/99 |
| NITRATE NITRITE | MB1 BS | S | 99LN3B45 | N/A | 09/17/99 | 09/17/99 |
| NITRATE NITRITE | MB1 BSD | S | 99LN3B45 | N/A | 09/17/99 | 09/17/99 |
| NITRATE NITRITE | MB1 | S | 99LANA55 | N/A | 11/17/99 | 11/18/99 |
| NITRATE NITRITE | MB1 BS | S | 99LANA55 | N/A | 11/17/99 | 11/18/99 |
| NITRATE NITRITE | MB1 BSD | S | 99LANA55 | N/A | 11/17/99 | 11/18/99 |
| AMMONIA | MB1 | S | 99LAM035 | N/A | 09/15/99 | 09/15/99 |
| AMMONIA | MB1 BS | S | 99LAM035 | N/A | 09/15/99 | 09/15/99 |
| AMMONIA | MB1 BSD | S | 99LAM035 | N/A | 09/15/99 | 09/15/99 |
| SULFIDE | MB1 | S | 99LSD043 | N/A | 09/03/99 | 09/04/99 |
| SULFIDE | MB1 BS | S | 99LSD043 | N/A | 09/03/99 | 09/04/99 |
| SULFIDE | MB1 BSD | S | 99LSD043 | N/A | 09/03/99 | 09/04/99 |
| SULFATE BY IC | MB1 | S | 99LIC080 | N/A | 09/25/99 | 09/25/99 |
| SULFATE BY IC | MB1 BS | S | 99LIC080 | N/A | 09/25/99 | 09/25/99 |
| AMMONIA | MB1 | S | 99LAM045 | N/A | 11/19/99 | 11/19/99 |
| AMMONIA | MB1 BS | S | 99LAM045 | N/A | 11/19/99 | 11/19/99 |
| AMMONIA | MB1 BSD | S | 99LAM045 | N/A | 11/19/99 | 11/19/99 |

RECRA LabNet Use Only: 99091951

# Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

**ALL** FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS (8) perrone wet lab

Client: TNU-Hanford B99-078
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: spec Del: std TAT: 30 day
Date Rec'd: 9/1/99 Date Due: 10/1/99
Account #:

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | 1 | 6-1 | | | | | 6 | | 6 | 6 | | | | | |
| #/Type Container | Liquid | | | | | | | | | | | | | | | |
| | Solid | 1g | 1g-1 | | | | | 1g | | 1g | 1g | | | | | |
| Volume | Liquid | | | | | | | | | | | | | | | |
| | Solid | 250 | 500-1 | | | | | 500 | | 250 | UT | | | | | |
| Preservatives | | | | | | | | | | | | | | | | |
| ANALYSES REQUESTED → | ORGANIC: VOA | | | | | | | INORG: Metal | | | | | | | | |
| | BNA | | | | | | | | | | | | | | | |
| | Pest/PCB | | | | | | | | | | | | | | | |
| | Herb | | | | | | | CN | | | | | | | | |

RECRA LabNet Use Only

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | OG24H | OGCSC | OG25H | ODRO | OPCB | metⓘ | | IPH | Angⓘ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | BØW6B3 2 | | | S | 8/30/99 | 0745 | ✓ | ✓ | ✓ | | | ✓ | | ✓ | ✓ |
| 002 | 3 | | | | | 0800 | | | | | | | | | |
| 003 | 4 | | | | | 0812 | | | | | | | | | |
| 004 | 5 | | | | | 0831 | | | | | | | | | |
| 005 | 6 | | | | | 0848 | | | | | | | | | |
| 006 | 7 | | | | | 0904 | | | | | | | | | |
| 007 | 8 | | | | | 0925 | | | | | | | | | |

Metⓘ = As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, Ag, V, Zn, Hg, ICRG

Special Instructions:

Run matrix QC
Saf# B99-078

**COMPOSITE WASTE**

9/8/99 - 1N3N2 added to Inorgⓘ List.

OGCSC = 1-propanol + ethanol

DATE/REVISIONS:

1. Sample #001 (1000ml ag) was
2. received broken.
3. Run analyses from other
4. jars.
5. Angⓘ = ICCL, ICFL, ICNO2, ICNO3, ICPO4,
6. ICSO4, ISFD, INH3N, ICNTU, IN3N2

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___
Airbill # *
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was: 1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N
Cooler Temp. 5.5 °C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES: *4235795288 63 - 4.3°C 4235795288 52

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Fed Ex | [signature] | 9/1/99 | 0930 |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Original | Rewritten | | |
| | | | |

9904L451

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B99-078-89 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: Bowers/Porter/Nielson | Company Contact: Chris Cearlock | Telephone No.: 372-9574 | Project Coordinator: TRENT, SJ |
| Price Code: 8N | Data Turnaround: 45 Days | | |
| Project Designation: 200 Area Source characterization - 200-CW-1 OU | Sampling Location: GP-5 <15' bgs | | SAF No.: B99-078 |
| Ice Chest No.: ERC96-066 / ERC96-063 | Field Logbook No.: EL-1511 | | Method of Shipment: Federal Express |
| Shipped To: TMA/RECRA 8-30-99 | Offsite Property No.: A990236 | | Bill of Lading/Air Bill No.: 4235 7952 8852 (6B2-6B4) 8863 (6B5-6B8) |
| | | | COA: B20CW1 67/C |

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | Cool 4C | None | Cool 4C | None | Cool 4C | None | | | |
| Type of Container | aG | aG | aG | aG | aG | aG | aG | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Volume | 60mL | 250mL | 250mL | 500mL | 500mL | 1000mL | 1000mL | | | |
| SAMPLE ANALYSIS | Isotopic Uranium | VOA - 8260A (TCL), VOA - 8260A (Add-On) [1-Propanol, Ethanol] | pH (Soil) - 9045 | Semi-VOA - 8270A (TCL), TPH-Diesel Range - WTPH-D, PCBs - 8082 | See item (1) in Special Instructions | See item (2) in Special Instructions | See item (3) in Special Instructions | | | |

| | Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | B0W6B2 | Soil | 8-30-99 | 0745 | | X | X | X | X | X | | 3'-4' | |
| 002 | BOW6B3 | Soil | 8-30-99 | 0800 | | X | X | X | X | X | | 5.5'-6.5' | |
| 003 | BOW6B4 | Soil | 8-30-99 | 0812 | | X | X | X | X | X | | 8'-9' | |
| 004 | BOW6B5 | Soil | 8-30-99 | 0831 | | X | X | X | X | X | | 10.5'-11.5' | |
| 005 | BOW6B6 | Soil | 8-30-99 | 0848 | | X | X | X | X | X | | 14' | 15' |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By: Doug Bowers / Doug Bowers | Date/Time: 8-30-99/1130 | Received By: Ref IB | Date/Time: 8-30-99/1130 |
| Relinquished By: Ref IB | Date/Time: 8-30-99 1530 | Received By: C Hue | Date/Time: 8/30/99 1530 |
| Relinquished By: C Hue | Date/Time: 8/31/99 1300 | Received By: FEDEX | Date/Time: 8/31/99 1300 |
| Relinquished By: Fed Ex | Date/Time: 9-1-99/0930 | Received By: D. Smith | Date/Time: 9-1-99/0930 |

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

COLLECTOR UNAVAILABLE TO SIGN

(1) ICP Metals - 6010A (Supertrace) [Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, Vanadium, Zinc]; Mercury - 7471 - (CV); Chromium Hex - 7196

(2) NO2/NO3 - 353.1; IC Anions - 300.0 [Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate]; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

(3) Gamma Spectroscopy [Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155]; Gamma Spec - Add-on [Americium-241]; Strontium-89,90 – Total Sr; Total Uranium [Uranium]; Isotopic Plutonium; Isotopic Thorium [Thorium-232]; Americium-241

use Box 528 to Ship

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

| LABORATORY SECTION | Received By | Title | Date/Time |
|---|---|---|---|
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

4235 7952 8863 -4.3°

4235 7952 8852 -5.5°

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B99-078-94 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: Bowers/Porter/Nielson | Company Contact: Chris Cearlock | Telephone No.: 372-9574 | Project Coordinator: TRENT, SJ |
| Price Code: 8N | Data Turnaround: 45 Days | | |
| Project Designation: 200 Area Source characterization - 200-CW-1 OU | Sampling Location: GP-5 >15' bgs | SAF No.: B99-078 | |
| Ice Chest No.: ERC 96-066 / ERC 96-063 | Field Logbook No.: EL-1511 | Method of Shipment: Federal Express | |
| Shipped To: TMA/RECRA 8-30-99 | Offsite Property No.: A99 02316 | Bill of Lading/Air Bill No.: 4235 7952 8852 (682-684) 8863 (685-688) | |
| | | COA: B2CW1 67IC | |

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | None | None | None | Cool 4C | None | Cool 4C | None | Cool 4C | None |
| Type of Container | aG | aG | aG | aG | aG | aG | aG | aG | aG | aG |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Volume | 60mL | 60mL | 60mL | 120mL | 250mL | 250mL | 500mL | 500mL | 1000mL | 1000mL |
| SAMPLE ANALYSIS | Isotopic Uranium | Nickel-63 | Technetium-99 | Tritium - H3 | VOA - 8260A (TCL), VOA - 8260A (Add-On) (1-Propanol, Ethanol) | pH (Soil) - 9045 | Semi-VOA - 8270A (TCL), TPH-Diesel Range - WTPH-D; PCBs - 8082 | See item (1) in Special Instructions | See item (2) in Special Instructions | See item (3) in Special Instructions |

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 06 B0W6B7 | Soil | 8/30/99 | 09:04 | | | | | X | X | X | X | X | 19'-19' |
| 07 B0W6B8 | Soil | 8/30/99 | 09:25 | | | | | X | X | X | X | X | 20-21' |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By: Doug Bowers | Date/Time: 8-30-99/1130 | Received By: Rick 10 | Date/Time: 8-30-99/1130 |
| Relinquished By: REF IB | Date/Time: 8/30/99 1300 | Received By: C Price | Date/Time: 1300/8-30-99 |
| Relinquished By: C Price | Date/Time: 8/31/99 1400 | Received By: CAFEDEX | Date/Time: 8/31/99 1400 |
| Relinquished By: Geo Ex | Date/Time: 9.1.99/0930 | Received By: D Smith | Date/Time: 9.1.99/0930 |

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

COLLECTOR WAVAILABLE TO SIGN COC

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196

(2) NO2/NO3 - 353.1; IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

(3) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241

use BOWSL8 to ship

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

| LABORATORY SECTION | Received By | Title | Date/Time |
|---|---|---|---|
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |