START 9613475.0230 W0010-ITC-021 0045242

INTERNATIONAL TECHNOLOGY CORPORATION

JUN 1994 RECEIVED SDLA

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

Dear J.A. Lerch,

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

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

   Your Data Summary Packet contains the following items:

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

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

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

Please contact me with any questions or suggestions.

Sincerely,

Sheree' Schneider
Project Manager

SEP 1996 RECEIVED EDMC

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

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6-4-96 MC

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Westinghouse Hanford Company
P.O. Box 1970
Richland, WA 99352
Attn: J.A. Lerch

April 28, 1994

Job Number: 253

This is the Certificate of Analysis for the following samples:

SDG:	W0010
Client Project ID:	Westinghouse Hanford
Date Received by Lab:	March 24, 1994
Number of Samples:	Four (4)
Sample Type:	Soil - three (3), Water - one (1)

JUN 1994
RECEIVED
SDLA

I. Introduction

On March 24, 1994, three (3) soil samples and one (1) water sample arrived at ITAS-Richland, Washington and were transferred to ITAS-Knoxville for chemical analysis. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that the data are not blank corrected. Soil results are reported on a dry weight basis.

The samples were analyzed for Target Compound List (TCL) volatiles by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 3/90 Statement of Work.

Reviewed and Approved:

Sheree' A. Schneider
Project Manager

RECORD COPY

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

II. Analytical Results/Methodology (Continued)

The samples were analyzed for Target Compound List (TCL) semivolatiles by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 3/90 Statement of Work.

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

The samples were analyzed for total cyanide in accordance with the EPA CLP ILM03 Statement of Work.

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

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

III. Quality Control

The volatiles analyses were performed by purge and trap with a J & W DB-624 capillary column on a Hewlett-Packard 5970 GC/MS/DS and a Finnigan INCOS 500 GC/MS/DS. All QC results were within method specified limits.

The semivolatiles analyses were performed by direct injection of sample extract on a Restek XTI-5 capillary column on a Finnigan INCOS XL GC/MS/DS. All QC results were within method specified limits.

Data were reported with qualifiers as follows:

U - Compound analyzed for but not detected; value given is quantitation limit.
E - Compound exceeded calibration range.
D - Compound analyzed at a secondary dilution factor.
J - Compound detected but below quantitation limit; value estimated.
S - Spiked compound.
B - Compound found in method blank.
A - Suspected aldol condensation product.
Y - Indistinguishable isomer in tentatively identified compounds.
N - Presumptive evidence of compound presence.

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April 28, 1994

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KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

III. Quality Control (Continued)

The samples were digested on April 11, 1994 for ICP and GFAA. The CVAA analysis for mercury was performed on April 7, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from April 11 through April 14, 1994; the remaining metals were analyzed by ICP on April 13, 1994. All run QC was acceptable. A duplicate/spike pair was prepared using sample ~~0343001~~. BOBJ01 DEA 6/2/9 Spike recovery (accuracy) results were within acceptance limits for all parameters by ICP, GFAA and CVAA analyses except for arsenic by GFAA analysis. As the titanium concentration is greater than four times (4X) the spike added, spiking criteria do not apply for this analyte. Duplicate RPD (precision) results were within acceptance limits for all parameters by ICP, GFAA and CVAA analyses except for chromium by ICP analysis.

Data were reported with qualifiers as follows:

"C" Qualifiers

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

"O" Qualifiers

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

"M" Qualifiers

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

Miscellaneous

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

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April 28, 1994

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KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

III. Quality Control (Continued)

On April 15, 1994, the samples were analyzed for nitrate-nitrite by cadmium reduction followed by colorimetric determination using the LACHAT QuikChem automated flow injection analyzer (QuikChem Method No. 10-107-04-1-C).

The samples were analyzed for anions on April 20 and April 22, 1994. Matrix spike/matrix spike duplicate analyses were performed using sample ~~4-03-430-01B.~~ ~~AA4459~~ BOBJ01
SCG 5/30/94

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

III. Quality Control (Continued)

Table I is a cross reference between client IDs and abbreviated client IDs.

TABLE I

WHC ID	Richland ID	Knoxville ID	Matrix	Test
BOBJO1	4-03-430-01A	AA4455	SOIL	VOC
BOBJO1	4-03-430-01B	AA4456	SOIL	SVOC
BOBJO1	4-03-430-01C	AA4457	SOIL	METALS
BOBJO1	4-03-430-01D	AA4458	SOIL	CN
BOBJO1	4-03-430-01E	AA4459	SOIL	ANIONS
BOBJO1	4-03-430-01F	AA4460	SOIL	NO3NO2
BOBJO2	4-03-430-02A	AA4508	SOIL	VOC
BOBJO2	4-03-430-02B	AA4509	SOIL	SVOC
BOBJO2	4-03-430-02C	AA4510	SOIL	METALS
BOBJO2	4-03-430-02D	AA4511	SOIL	CN
BOBJO2	4-03-430-02E	AA4512	SOIL	ANIONS
BOBJO2	4-03-430-02F	AA4513	SOIL	NO3NO2
BOBJO4	4-03-430-03A	AA4514	SOIL	VOC
TRIP BLANK	4-03-430-04A	AA4515	WATER	VOC

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

IV. Certification

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

Reviewed and Approved:

Sheree' A. Schneider
Project Manager

INTERNATIONAL TECHNOLOGY CORPORATION

CUR 1350

Work Order No.: 253

Condition Upon Receipt Variance Report
ITAS - Knoxville Laboratory/Middlebrook Facility

Client: Westinghouse Hanford

Date: 3/24/93

Project No:

Initiated by: R. Charles

Analysis Requested: CN

RFA/COC Numbers: 340338

Client Sample Numbers Affected:

Condition/Variance (Check all that apply):

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

Notes:

Corrective Action:

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

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

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

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

Sample Control Supervisor Review: _____ Date: _____

Project Management Review: _____ Date: _____

WO# 253

SAMPLE RECEIPT VARIANCE REPORT
ITAS-RICHLAND LABORATORY

WORK ORDER NUMBER: _____ DATE INITIATED: 3/22/94

INITIATED BY: Heidelberg

DATE/TIME OF SAMPLE (AND/OR RFA & COC) RECEIPT: 3/22 1200

CLIENT SAMPLE NUMBER	RFA/COC NUMBERS	ANALYSIS REQUESTED
	na	

Samples were received with the following deficiencies:

- ☐ 1. Not enough sample received for proper analysis.
- ☐ 2. Sample received without proper preservative.
- ☐ 3. No sample received in container.
- ☐ 4. Sample received without a RFA/COC form.
- ☐ 5. No sample ID on container.
- ☐ 6. Sample received broken or leaking.
- ☐ 7. Holding time exceeded at receipt.
- ☐ 8. Custody tape broken.
- ☐ 9. COC not relinquished by client.
- ☒ 10. Sample information on container does not match sample information on the paper work (Explain below).
- ☐ 11. All shipping containers (coolers) on waybill not received with shipment.
  - ☐ RFA/COC received
  - ☐ RFA/COC not received
- ☐ 12. Other (Explain below).

NOTES: SAF #94-045 on paper work - Bottles have SAF #94-046. BOBJ01 COC - sample time 09:00 bottle - 08:45. BOBJ04 is 250 ml not 40 ml as on COC.

SUPERVISOR REVIEW: Jami Heidelberg

PROJECT MANAGER REVIEW: _____

TELEPHONED TO: _____ ON _____ BY _____

TELEFAXED TO: _____ ON _____ BY _____

SIGNED ORIGINAL MUST BE RETAINED IN WORK ORDER FILE

FORM NO. LS-023, 3/92, Rev. 0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJ01
~~40343001~~
SCG 5/30/94

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4455

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4455

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: not dec. 7 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	2	J
67-64-1	Acetone	11	
75-15-0	Carbon Disulfide	11	U
75-35-4	1,1-Dichloroethene	11	U
75-34-3	1,1-Dichloroethane	11	U
540-59-0	1,2-Dichloroethene (total)	11	U
67-66-3	Chloroform	2	J
107-06-2	1,2-Dichloroethane	11	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
75-27-4	Bromodichloromethane	11	U
78-87-5	1,2-Dichloropropane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
79-01-6	Trichloroethene	11	U
124-48-1	Dibromochloromethane	11	U
79-00-5	1,1,2-Trichloroethane	11	U
71-43-2	Benzene	11	U
10061-02-6	trans-1,3-Dichloropropene	11	U
75-25-2	Bromoform	11	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
108-88-3	Toluene	11	U
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
100-42-5	Styrene	11	U
1330-20-7	Xylenes (total)	11	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBJO1

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4455

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4455

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: not dec. 7 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	2.00	14	BJ

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJC2
~~40343002~~
SCG 5/20/94

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4508

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4508

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: not dec. 0 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	2	J
67-64-1	Acetone	2	J
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylenes (total)	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBJO2

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4508

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4508

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: not dec. 0 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	2.03	15	BJ
2.	UNKNOWN	16.23	7	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJ04
~~40343003A~~
SCG 5/20/94

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4514

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4514

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: not dec. 0 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	2	J
67-64-1	Acetone	5	J
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylenes (total)	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBJ04

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4514

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4514

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: not dec. 0 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	2.03	15	BJ
2.	UNKNOWN	16.20	6	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJ01
~~40343001AF~~
J.C. 5/20/94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4456

Sample wt/vol: 30.1 (g/mL) G Lab File ID: AA4456

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: 7 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/18/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)Ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-Di-n-Propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy)Methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-Methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	860	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	860	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
99-09-2	3-Nitroaniline	860	U
83-32-9	Acenaphthene	350	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJ01
~~4034500 1AF~~
J.C. 5/20/94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4456

Sample wt/vol: 30.1 (g/mL) G Lab File ID: AA4456

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: 7 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/18/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	860	U
100-02-7	4-Nitrophenol	860	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	860	U
534-52-1	4,6-Dinitro-2-Methylphenol	860	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	860	U
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-Butylphthalate	350	U
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U
56-55-3	Benzo(a)Anthracene	350	U
218-01-9	Chrysene	350	U
117-81-7	bis(2-Ethylhexyl)Phthalate	350	U
117-84-0	Di-n-Octyl Phthalate	350	U
205-99-2	Benzo(b)Fluoranthene	350	U
207-08-9	Benzo(k)Fluoranthene	350	U
50-32-8	Benzo(a)Pyrene	350	U
193-39-5	Indeno(1,2,3-cd)Pyrene	350	U
53-70-3	Dibenz(a,h)Anthracene	350	U
191-24-2	Benzo(g,h,i)Perylene	350	U

(1) - Cannot be separated from Diphenylamine

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJ02
~~40343002AF~~
J.C. 5/20/94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4509

Sample wt/vol: 30.0 (g/mL) G Lab File ID: AA4509

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/18/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.5

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)Ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-Propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)Methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	800	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
606-20-2	2,6-Dinitrotoluene	330	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	330	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJOZ
~~40343002AF~~
J.C. 5/20/94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4509

Sample wt/vol: 30.0 (g/mL) G Lab File ID: AA4509

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/18/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.5

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	800	U
100-02-7	4-Nitrophenol	800	U
132-64-9	Dibenzofuran	330	U
121-14-2	2,4-Dinitrotoluene	330	U
84-66-2	Diethylphthalate	330	U
7005-72-3	4-Chlorophenyl-phenylether	330	U
86-73-7	Fluorene	330	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-Methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	800	U
85-01-8	Phenanthrene	330	U
120-12-7	Anthracene	330	U
86-74-8	Carbazole	330	U
84-74-2	Di-n-Butylphthalate	330	U
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)Anthracene	330	U
218-01-9	Chrysene	330	U
117-81-7	bis(2-Ethylhexyl)Phthalate	41	J
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b)Fluoranthene	330	U
207-08-9	Benzo(k)Fluoranthene	330	U
50-32-8	Benzo(a)Pyrene	330	U
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U
53-70-3	Dibenz(a,h)Anthracene	330	U
191-24-2	Benzo(g,h,i)Perylene	330	U

(1) - Cannot be separated from Diphenylamine

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBJ01
~~0343001~~
J.C. 5/23/94

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: WO253 SAS No.: SDG No.: WO253
Matrix (soil/water): SOIL Lab Sample ID: AA4457
Level (low/med): LOW Date Received: 03/24/94
% Solids: 93.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4170			P
7440-36-0	Antimony	10.4	U		P
7440-38-2	Arsenic	0.43	B	N	F
7440-39-3	Barium	53.3			P
7440-41-7	Beryllium	0.30	B		P
7440-43-9	Cadmium	1.0	U		P
7440-70-2	Calcium	2280			P
7440-47-3	Chromium	12.8		*	P
7440-48-4	Cobalt	6.2	B		P
7440-50-8	Copper	10.4			P
7439-89-6	Iron	11700			P
7439-92-1	Lead	1.6			F
7439-95-4	Magnesium	2910			P
7439-96-5	Manganese	198			P
7439-97-6	Mercury	0.11	U		CV
7440-02-0	Nickel	11.7			P
7440-09-7	Potassium	871	B		P
7782-49-2	Selenium	0.41	U		F
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium	278	B		P
7440-28-0	Thallium	0.41	U		F
7440-62-2	Vanadium	22.2			P
7440-66-6	Zinc	32.7			P
	Titanium	690			P
5955-70-0	Cyanide				NR

Color Before: BEIGE Clarity Before: N/A Texture: MEDIUM
Color After: COLORLESS Clarity After: CLEAR Artifacts: YES

Comments:
ARTIFACTS INCLUDE ROCKS.

FORM I - IN

ILM02.1
8
4/25/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBJ01 ~~0343001~~ J.C. 5/23/94

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: WO253 SAS No.: SDG No.: WO253

Matrix (soil/water): SOIL Lab Sample ID: AA4458

Level (low/med): LOW Date Received: 03/24/94

% Solids: 93.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Titanium				NR
5955-70-0	Cyanide	1.1	U		AS

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

CYANIDE_ONLY.

FORM I - IN

ILM02.1

4/25/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBJOZ
~~0343002~~
J.C. 5/23/94

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: WO253 SAS No.: SDG No.: WO253
Matrix (soil/water): SOIL Lab Sample ID: AA4510
Level (low/med): LOW Date Received: 03/24/94
% Solids: 99.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	79.5			P
7440-36-0	Antimony	9.7	U		P
7440-38-2	Arsenic	0.38	U	N	F
7440-39-3	Barium	0.41	B		P
7440-41-7	Beryllium	0.19	U		P
7440-43-9	Cadmium	0.97	U		P
7440-70-2	Calcium	53.6	B		P
7440-47-3	Chromium	3.1		*	P
7440-48-4	Cobalt	1.9	U		P
7440-50-8	Copper	1.9	U		P
7439-89-6	Iron	141			P
7439-92-1	Lead	0.38	U		F
7439-95-4	Magnesium	10.9	B		P
7439-96-5	Manganese	0.57	B		P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	3.9	U		P
7440-09-7	Potassium	195	U		P
7782-49-2	Selenium	0.38	U		F
7440-22-4	Silver	0.97	U		P
7440-23-5	Sodium	46.6	B		P
7440-28-0	Thallium	0.38	U		F
7440-62-2	Vanadium	1.9	U		P
7440-66-6	Zinc	1.9	B		P
	Titanium	2.9			P
5955-70-0	Cyanide				NR

Color Before: WHITE Clarity Before: N/A Texture: COARSE
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

ILM02.1

8

4/25/94

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBJ02
~~0343002~~
J.C. 5/23/94

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: WO253 SAS No.: SDG No.: WO253
Matrix (soil/water): SOIL Lab Sample ID: AA4511
Level (low/med): LOW Date Received: 03/24/94
% Solids: 99.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Titanium				NR
5955-70-0	Cyanide	1.0	U		AS

Color Before: WHITE Clarity Before: N/A Texture: COARSE
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
CYANIDE ONLY.

FORM I - IN

ILM02.1

8
4/25/94

ANION ANALYSIS

Laboratory Name:	ITAS-KNOXVILLE	SDG Number:	W0010
Contract Name:	Westinghouse Hanford	Job Number:	253
Client Sample ID:	~~4-03-430-02E~~ BOBJ02 DFA	Analysis Date:	04/20/94 & 04/22/94
Lab Sample ID:	AA4512	Confirmation Date:	N/A
Sample Matrix:	SOIL	Concentration Units:	mg/kg (ppm)

Compound	Result	Qualifier
chloride	3.3	+
fluoride	0.44	+
sulfate	1.7	+

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

ANION ANALYSIS

Laboratory Name:	ITAS-KNOXVILLE	SDG Number:	W0010
Contract Name:	Westinghouse Hanford	Job Number:	253
Client Sample ID:	~~4-03-430-01E~~ BOBJ01 D&a	Analysis Date:	04/20/94 & 04/22/94
Lab Sample ID:	AA4459	Confirmation Date:	N/A
Sample Matrix:	SOIL	Concentration Units:	mg/kg (ppm)

Compound	Result	Qualifier
chloride	2.9	+
fluoride	0.4	U
sulfate	8.6	+

+ - Positive result.

NITRATE/NITRITE ANALYSIS

Laboratory Name:	ITAS-KNOXVILLE	SDG Number:	W0010
Contract Name:	Westinghouse Hanford	Job Number:	253
Sample Matrix:	Soil	Analysis Date:	04/15/94
Concentration Units:	mg/kg (ppm)		

Client Sample ID	Lab Sample ID	Result	Qualifier
Method Blank	P6096	2.5	U
~~4-03-430-02E~~ BOBJ02DEA	AA4513	2.5	U
~~4-03-430-01E~~ BOBJ01DEA	AA4460	2.5	U

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

9613475.0256

DON'T SAY IT --- Write It!

DATE May 19, 1994

To W0010, samples B0BJ01 and B0BJ02

FROM Jeff Lerch H4-23
Telephone 372-2596

cc: Doris Ayres
Briana Colley
Chris Koerner
Sandy Walls

SUBJECT Carbon-14 data not reported

Due to an insufficient presence of carbon in the samples (described on page 0010 of the radiochemistry laboratory case narrative), data for C-14 will not be reported for samples B0BJ01 and B0BJ02.

9613475.0257

HANFORD ANALYTICAL SERVICES MANAGEMENT

RECORD OF DISPOSITION

ROD-94-0065
Record of Disposition No.

DATE: March 28, 1994	LABORATORY: IT
PROJECT TITLE/NO.: 200-UP-1/SAF 94-046	NCR NO.: n/a

SAMPLE IDENTIFICATION NUMBERS: B0BJ01

DESCRIPTION OF EVENT:

Due to oversight by the sampler, collection times recorded on the chain of custody and sample labels do not match. The chain of custody form indicates that the sample was collected at 0900 hrs. The B0BJ01 sample label indicates that the sample was collected at 0845 hrs.

DISPOSITION OF SAMPLES:

The correct sample collection time is 0900 hrs. IT is directed to proceed with analysis and note the inconsistency in the Case Narrative for the associated delivery group.

APPROVAL SIGNATURES:

J. A. Lerch Jeff Lerch 3/28/94
CAS Project Coordinator (Print/Sign Name) Date

B. E. Innis Brian E. Innis 3/29/94
Technical Representative (Print/Sign Name) Date

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

9613475.0258

IT/WHC ISSUE RESOLUTION FORM

SAF No. 94-046 Project 200-UP-1 Soil Date 3/23/94

Sample No.(s) B0BJ01

Submitted By: Jim Harvey

Phone No. 615-690-3211 x5611

Fax No. 615-693-2348

Submitted To: Jeff Lerch

Phone No. 509-372-2596

Fax No. 509-372-2106

ISSUE	PROPOSED RESOLUTION
COC indicates time of collection was 0900 Bottle indicates time of collection was 0845 3/18/94	WHC to notify which collection time is correct. WV Setzer EFL-11/18

IT/WHC0001

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: ☐ Priority ☒ Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-049 646 WVS 3-23-94
Ice Chest No.: WHC 19	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0- 0369-31	Bill of Lading/Air Bill No.: NA

Possible Sample Hazards/Remarks: NONE OBSERVED

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

SDG W0010

4-03-430

Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4		
Type of Container	aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs		
No. of Container(s)	1	1	1	1	1	1	1	1					1		
Volume	120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml		
SAMPLE ANALYSIS	VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)		
	A	B	C	D	E	F									

	Sample No.	Matrix*	Date Sampled	Time Sampled	A	B	C	D	E	F									
01	BOBJ01	S	3-18-94	0900	X	X	X	X	X	X	X	X							
02	BOBJ02	S	3-18-94	0830	X	X	X	X	X	X	X	X							
03	BOBJ04	S	3-18-94	0700													X		

WO#253

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: W.V. Setzer	Date/Time: 3-22-94 1125	Received By: R. Boyd Jr	Date/Time: 3/22/94 12:02
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

(BOBJ01 4053101) (BOBJ02 - 40343102)

LOWEST HOLDING TIME = 7DAYS

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

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9613475.0259

0000020

9613475.0260

0000021

WO # 253

Contractor WESTINGHOUSE HANFORD COMPANY	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT) W94-0-0369-31

PART I – TO BE COMPLETED BY ORIGINATOR

Department ENVIRONMENTAL	Section ENV. FIELD SERVICES	Unit ENV. SAMPLING & CHARAC.

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

Routing ☒ Contractor ☐ Vendor

Shipped to	Off-site Custodian
IT 2800 GEORGE WASHINGTON Way Richland, Wa 99352	TAMMY HIRDELBERG
	Full Title: PROJECT COORDINATOR

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
1	WHC 19 Poly Cooler. Contains soil samples that are double-bagged and packed in wet ice & vermiculite. Samples are nonhazardous. SAMPLE #'s: BOBJ01, BOBJ02, BOBJ04	NA

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

Necessity for the Off-Site Use of this Property: To support drilling @ 200 up 1

RECEIVED
MAR 22 1994
PROPERTY RECORDS

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

RM Clearance for Public Release: Michael S. Jones	RM Survey No: 157458	Date: 3-22-94
Location of Property (Area & Bldg.)	Contact: W.V. SETZER	Phone: 376-2443
Date Ready for Shipment: 3-22-94	Cost Code to be Charged: 84300 PTIBD	Approximate Date This Property will be Returned: NA
Originated By: RELINQUISHED By:	Date	Authorized By: W.V. Setzer — Date: 3-22-94
Signature and Name of Property Control	Custodian Date	Property Management Approval: JP Hankel — Date: 3/22/94

PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient	Return Order No.	Date Issued	Purchase Order No.	Date Issued
L. Boyd IT Date: 3/22/94 12:00				

DISTRIBUTION

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

Recpt Lot 345

WO# 253

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST / CHAIN OF CUSTODY RECORD

COC NO. *0001350*

Reference Document No. 340338

Page 1 of 2

Project Name/No. 1 SAF 94-046

Sample Team Members 2

Profit Center No. 3 4632

Project Manager 4 YAN PETTEY

Purchase Order No. 6

Required Report Date 11

Samples Shipment Date 7 3-23-94

Lab Destination 8 Middlebrook

Lab Contact 9

Project Contact/Phone 12

Carrier/Waybill No. 13 Fed Ex 3771620842

Bill to: 5 IT Richland

Report to: 10 IT Richland

ONE CONTAINER PER LINE

Sample Number 14	Sample Description/Type 15	Date/Time Collected 16	Container Type 17	Sample Volume 18	Pre-servative 19	Requested Testing Program 20	Condition on Receipt 21	Disposal Record No. 22
4-03-430-01A	BOBJ01 / Soil	3/18 0900	glass	120ml	Cool 4°	VOA	2°C 3/24/94	
B				500ml		Semi VOA	BS	
C				↓		ICP, GFAA Metals, Hg		
D				250ml		CN	Plastic	
E				↓		EPA 300.0		
F				120ml		EPA 353.2		
4-03-430-02A	BOBJ02 / Soil	3/18 0830		↓		VOA		
B				500ml		Semi VOA		

FOR LAB USE ONLY

FOR LAB USE ONLY

Special Instructions: 23 As per WHC Contract

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

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

Turnaround Time Required: 26
Normal ☒ Rush ☐

QC Level: 27
I. ☐ II. ☐ III. ☐ Project Specific (specify): SDG W0010

1. Relinquished by 28 (Signature/Affiliation) Heidelberg	Date: 3-23-94 Time: 16:00	1. Received by 28 (Signature/Affiliation) R Charles ITAS KN	Date: 3/24/94 Time: 9:30
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: 29

MCA 3/16/8

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WO#253

INTERNATIONAL TECHNOLOGY CORPORATION

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

Reference Document No.[30] 340338

Page 2 of 2

Project Name SAF 94-046

Project No. 876-W0010

Samples Shipment Date 3-23-94

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
A-03-430-02C	BOBJ02 / Soil	3/18 0830	glass	500 ml	Cool 4°	ICP, GFAA Metals, Hg		
D				250 ml		CN	Plastic	FOR LAB USE ONLY
E						EPA 300.0		
F				120 ml		EPA 353.2		
A-03-430-03A	BOBJ04	3/18 0700				VOA	250 ml	FOR LAB USE ONLY
A-03-430-04A	Trip Blank	3/23/94		40 ml		VOA		
B						VOA		FOR LAB USE ONLY
								FOR LAB USE ONLY
								FOR LAB USE ONLY
		3/23/94						FOR LAB USE ONLY
								FOR LAB USE ONLY
								FOR LAB USE ONLY
								FOR LAB USE ONLY

White: To accompany samples Yellow: Field copy

*See back of form for special instructions.

MCA 3/15/91

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TENNELEC #1

SCREENING CALCULATION SPREADSHEET

Cust Code	Recieved Date	Time	Screening Prep Date	Time	Count Date	Mnts. Crtd	BACKGROUND Alpha	Beta	Mnts
WHC			32294		322	10	9	96	120

Customer ID	pH <2 Rcvd/Req	Pinchit Wght (mGrms)	Vol. Anal. mG mL	Sample Size Gm L	SMPLE CNT DATA Hldr Num.	Total Alpha	Counts Beta	Net Sample Counts/Minute Alpha	Beta	DPM / Aliquot Alpha	Beta	uCi per Sample Alpha	Beta	2 Sigma Error uCi per Sample Alpha	Beta	pCi/(Gm or L) Alpha	Beta	Catagory 1 Yes/No	Aliquot to Cat 1 Gm or Ltr Alpha	Beta
WHC/SOIL																				
B08J01		90.1	90	1000.0	35	0	20	-0.08	1.16	-8E-01	3.0E+00	-4E-03	1.7E-02	-1E-05	1.0E-05	-4E+00	1.7E+01	Yes	-2E+03	6.0E+03
B08J02		90.0	90	850.0	36	1	19	0.03	1.08	1.9E-01	2.7E+00	8.2E-04	1.1E-02	4.4E-06	9.8E-05	9.6E-01	1.3E+01	Yes	1.0E+04	7.5E+03
TOTAL	uCi							-0.08	-0.62	-3E-01	-2E+00	-4E-03	2.8E-02	ERR	ERR	ERR	ERR	Yes	ERR	ERR

J Mackell
3/22/94

WO# 253

9613475.0263

0000024

WO #253

SAMPLE STATUS REPORT FOR E 5522. E-BLANK B0BJ01 TIME: 3/21/94 8: 5
DISPATCHED: 3/ 8/94 10:36 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/18/94 11:24

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

END OF REPORT

WO #253

SAMPLE STATUS REPORT FOR E 5523. E-BLANK BOBJ02 TIME: 3/21/94 8: 5
DISPATCHED: 3/ 8/94 10:37 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/18/94 11:24

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

END OF REPORT

WO#253

4 WVS 3·22·94

SAMPLE STATUS REPORT FOR E 5524. E-BLANK B0BJ03 TIME: 3/21/94 8: 5
DISPATCHED: 3/ 8/94 10:37 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/18/94 11:24

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

END OF REPORT

9613475.0267

INTERNATIONAL TECHNOLOGY CORPORATION

RECORD COPY

Analytical Data Package Prepared For

Westinghouse Hanford

MAY 1994 RECEIVED SDLA

Radiochemical Analysis By

IT Analytical Services
Richland Laboratory

Sample Delivery Group Number: W0010

WHC IDENTIFICATION NUMBER	ITAS RICHLAND ID NUMBER
B0BJ01	403431-01A
B0BJ02	403431-02A

Regional Office
2800 George Washington Way • Richland, Washington 99352-1613 • 509-375-3131 • FAX: 509-375-5590

IT Corporation is a wholly owned subsidiary of International Technology Corporation

INTERNATIONAL TECHNOLOGY CORPORATION

CERTIFICATE OF ANALYSIS

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

May 16, 1994

Attention: J.A.Lerch

SAF Number	:	94-046
Date Received by Lab	:	March 22, 1994
Number of Samples	:	Two (2)
Sample Type	:	Soil
SDG Number	:	W0010
Data Deliverable	:	Stand Alone

I. Introduction

On March 22, 1994, two soil samples were received by ITAS-Richland for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the WHC specific IDs:

ITAS-Richland ID	WHC ID	Matrix	Date of Receipt
403431-01A	B0BJ01	Soil	3/22/94
403431-02A	B0BJ02	Soil	3/22/94

II. Analytical Results/Methodology

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

The requested analyses were:

Alpha Spectroscopy
Americium-241, Curium-244 by method ITAS-RD-3302
Neptunium-237 by method ITAS-RD-3208
Plutonium-238, 239/40 by method ITAS-RD-3209
Uranium-234, 235, 238 by method ITAS-RD-3234
Gamma Spectroscopy
Gamma Scan by method ITAS-RD-3219
Gas Proportional Counting
Gross Alpha by method ITAS-RD-3222
Gross Beta by method ITAS-RD-3222
Strontium-90 by method ITAS-RD-3204
Liquid Scintillation Counting
Carbon-14 by method ITAS-RD-3247
Technetium-99 by method ITAS-IT-RS-0001

III. Quality Control

The analytical results for each analysis performed under SDG W0010 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate.

Quality control sample results are reported in the same units as sample results except for gross alpha and gross beta quality control sample results which are reported in pCi/sample.

IV. Comments

The initial radioactivity screening of the samples classified them as Category I.

Alpha Spectroscopy

Americium-241, Curium-244 by method ITAS-RD-3302
The batch was reanalyzed due to low chemical yields (yields < 30%) although the calculated detection limits from the initial analysis met contract requirements. The reanalysis results are within 3 sigma of the original analysis results and have acceptable chemical yields, however, the LCS and blank are outside acceptable limits. It is the professional opinion of the analyst that the original results are acceptable even though the yields are below the contractual limit of 30%. The original analysis results are reported herein. The sample and sample duplicate results are within the 3 sigma control limit.

Neptunium-237 by method ITAS-RD-3208
Three matrix spikes were analyzed with the batch and their average yield was used for yield correction. The analyzed matrix spikes analyzed were samples: L034311M and L034312M (spiked Ottawa Sand) and W0343102 (matrix spike of sample B0BJ02). The LCS is biased low (57%) after yield correction. The batch blank result is acceptable. The sample and sample duplicate results are within the 3 sigma control limit.

Plutonium-238, 239/40 by method ITAS-RD-3209
The batch was reanalyzed due to low chemical yields (yields < 30%). The reanalysis results are acceptable. The LCS and batch blank results are acceptable. The sample and sample duplicate results are within the 3 sigma control limit.

Uranium-234, 235, 238 by method ITAS-RD-3234
The batch was reanalyzed due to sample and sample duplicate results outside of the 3 sigma control limit. The reanalysis results are acceptable. The LCS and the batch blank results are acceptable. The sample and sample duplicate results are within the 3 sigma control limit.

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219
The batch (with the exception of sample B0BJ02) was recounted for an extended counting time (1000 min.) in order to meet the detection limit for Fe-59. The recount data are accepted even though the MDA was not achieved for Fe-59 on the recount. Future WHC soil samples will be counted using a 450 ml Marinelli geometry (provided sufficient sample is available) to increase the counting efficiency and facilitate meeting the required MDAs. The LCS and batch blank results are acceptable. The sample and sample duplicate results are within the 3 sigma control limit.

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222
The LCS and batch blank results are acceptable. The sample and sample duplicate results are within the 3 sigma control limit.

Gross Beta by method ITAS-RD-3222
The LCS and batch blank results are acceptable. The sample and sample duplicate results are within the 3 sigma control limit.

Strontium-90 by method ITAS-RD-3204
The LCS recovery is biased high (167%). The high result is attributed to strontium-85 in the spike. Concurrently analyzed spikes without strontium-85 added were acceptable. Strontium-85 will not be used in the future for spikes used in the analysis of strontium-90 on WHC samples. The batch blank result is acceptable. The sample and sample duplicate results are within the 3 sigma control limit.

Liquid Scintillation Counting

Carbon-14 by method ITAS-RD-3247
Carbon-14 results are not reportable due to an insufficient presence of carbon in the samples to perform the analysis. The carbon-14 method requires that 2 grams of carbon be present in each sample. The samples were silicate in nature and produced zero measurable carbon dioxide during sample preparation. Both acid digestion and burning the samples were performed in attempts to produce sufficient carbon in the sample matrices. The samples are considered "lost" in analysis due to a matrix effect (lack of carbon in the matrix).

Technetium-99 by method ITAS-IT-RS-0001
The LCS and batch blank results are acceptable. Two matrix spikes were analyzed with the set and their average result was used for the batch yield correction. The sample and sample duplicate results are within the 3 sigma control limit.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

Suzanne Gaines

Suzanne Gaines
Project Manager

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

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG NO.:	W0010
LAB SAMPLE ID:	4-03-431-01	MATRIX:	SOIL
WHC ID:	BOBJ01	DATE RECEIVED:	3/22/94
REPORTING UNITS:	pCi/g		

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER
AM-241	4.19E-01	1.94E-01	2.30E-01	0.186	RD3302
CM-242	5.35E-02	7.57E-02	7.73E-02	0.186	RD3302
CM-244	0.00E+00	0.00E+00	6.71E-02	0.186	RD3302
NP-237	8.91E-03	1.26E-02	1.27E-02	0.934	RD3208
PU-238	-1.98E-03	3.95E-03	3.97E-03	0.421	RD3209
PU239/40	0.00E+00	0.00E+00	2.96E-02	0.421	RD3209
U-234	5.95E-01	1.13E-01	1.37E-01	0.777	RD3234
U-235	2.10E-02	2.14E-02	2.16E-02	0.777	RD3234
U-238DA	6.47E-01	1.18E-01	1.44E-01	0.777	RD3234
CO-60	8.81E-04	8.45E-03	8.45E-03	N/A	RD3219
FE-59	-2.11E-02	3.27E-02	3.27E-02	N/A	RD3219
EU-152	9.36E-02	3.78E-02	3.90E-02	N/A	RD3219
CO-58	-1.15E-04	1.18E-02	1.18E-02	N/A	RD3219
CS-137DA	4.71E-01	2.28E-02	5.23E-02	N/A	RD3219
EU-155	4.43E-02	2.44E-02	2.48E-02	N/A	RD3219
EU-154	1.01E-02	2.79E-02	2.79E-02	N/A	RD3219
ALPHA	4.43E+00	2.53E+00	2.58E+00	1	RD3222
BETA	2.14E+01	2.38E+00	2.77E+00	1	RD3222
TOTAL-SR	8.73E-02	5.88E-02	6.23E-02	0.704	RD3204
TC-99	1.19E+00	2.61E-01	1.20E+00	0.912	ITAS-IT-RS-0001

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND
SDG NO.: W0010
LAB SAMPLE ID: 4-03-431-02
MATRIX: SOIL
WHC ID: BOBJ02
DATE RECEIVED: 3/22/94
REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER
AM-241	6.95E-01	1.96E-01	2.56E-01	0.303	RD3302
CM-242	1.65E-02	3.30E-02	3.32E-02	0.303	RD3302
CM-244	0.00E+00	0.00E+00	4.14E-02	0.303	RD3302
NP-237	1.78E-02	1.78E-02	1.82E-02	0.934	RD3208
PU-238	0.00E+00	0.00E+00	2.73E-02	0.459	RD3209
PU239/40	0.00E+00	0.00E+00	2.73E-02	0.459	RD3209
U-234	8.24E-02	4.45E-02	4.58E-02	0.725	RD3234
U-235	1.45E-02	2.00E-02	2.01E-02	0.725	RD3234
U-238DA	3.12E-02	2.82E-02	2.85E-02	0.725	RD3234
CO-60	5.37E-03	6.87E-03	6.89E-03	N/A	RD3219
FE-59	1.30E-02	2.38E-02	2.38E-02	N/A	RD3219
EU-152	2.31E-02	4.36E-02	4.37E-02	N/A	RD3219
CO-58	5.01E-03	1.04E-02	1.04E-02	N/A	RD3219
CS-137DA	-6.00E-03	7.81E-03	7.84E-03	N/A	RD3219
EU-155	2.06E-04	1.93E-02	1.93E-02	N/A	RD3219
EU-154	2.01E-02	2.10E-02	2.11E-02	N/A	RD3219
ALPHA	6.79E-01	1.53E+00	1.53E+00	1	RD3222
BETA	3.04E+00	1.38E+00	1.39E+00	1	RD3222
TOTAL-SR	8.04E-02	4.80E-02	5.23E-02	0.969	RD3204
TC-99	1.16E-01	2.44E-01	1.12E+00	0.912	ITAS-IT-RS-0001

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0275

INTERNATIONAL TECHNOLOGY CORPORATION

LOG #: RD-94-_____ page 1 of 2

ITAS-Richland
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): WAC

NCM INITIATED BY (Name/Date): MMM 5-7-94

PARAMETER(S): Am

SAMPLE NUMBER(S) AFFECTED: L0343115, 15, L0343101 W0010

MATRIX: soil

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

NONCONFORMANCE [check appropriate item(s)]:

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

   Due to:
   - ☐ sample matrix ☐ insufficient sample
   - ☐ instrumentation ☐ other (see #10)
9. ☐ Other (specify): tr yd < 20%
10. ☐ Comments/Explanation:

NOTIFICATION [check appropriate item(s)]:

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

PROJECT MANAGER (signature & date): Suzy Davies 5/11/94

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2

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

CORRECTIVE ACTION

☐ **ROOT CAUSE:** INITIALS/DATE [illegible] 5-7-94

tr yds < 20%

☐ **CORRECTIVE ACTION:** INITIALS/DATE [illegible] 5-7-94

Blk + Spike within acceptable limits MDH met
Rerun - rerun samples were within 3S of original. rerun
CL was out of limits. Report original data!

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

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

FIRST LEVEL SUPERVISOR: M Killeen DATE: 5-7-94

RESPONSIBLE MANAGER: W MacKellar DATE: 5/11/94

QC REVIEW

☐ NONCONFORMANCE ☒ DEFICIENCY ☐ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO

QC COORDINATOR: Jodie Carr DATE: 5/12/94

CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: Jodie Carr DATE: 5/12/94

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

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0277

INTERNATIONAL TECHNOLOGY CORPORATION

LOG #: RD-94-_____ page 1 of 2

ITAS-Richland
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): WHC

NCM INITIATED BY (Name/Date): MMM 5-5-94

PARAMETER(S): Np

SAMPLE NUMBER(S) AFFECTED: L0343115 W0010

MATRIX: soil

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

NONCONFORMANCE [check appropriate item(s)]:

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

   Due to:
   - ☐ sample matrix ☐ insufficient sample
   - ☐ instrumentation ☐ other (see #10)
9. ☐ Other (specify): 32Pu recovery at 57%
10. ☐ Comments/Explanation:

NOTIFICATION [check appropriate item(s)]:

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

PROJECT MANAGER (signature & date): Guy Davies 5/11/94

FURTHER ACTION REQUIRED. SEE PAGE 2 OF 2

IT CORPORATION

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

CORRECTIVE ACTION

☐ ROOT CAUSE: INITIALS/DATE MMM 5-5-94

spike recovery is 57% – unknown why the reagent spike recovery is less than the matrix spike.

☐ CORRECTIVE ACTION: INITIALS/DATE MMM 5-5-94

The matrix spike recovery is 93.4% indicating the sample results are acceptable.

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☐ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE_____

FIRST LEVEL SUPERVISOR: M Kellogg DATE: 5-5-94

RESPONSIBLE MANAGER: W Mackelle DATE: 5/11/94

QC REVIEW

☐ NONCONFORMANCE ☒ DEFICIENCY ☐ RERUN

☐ FURTHER ACTION REQUIRED.

ASSIGNED TO

QC COORDINATOR: Jodie Carr DATE: 5/12/94

CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: Jodie Carr DATE: 5/12/94

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

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INTERNATIONAL TECHNOLOGY CORPORATION

LOG #: RD-94-_____ page 1 of 2

ITAS-Richland
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): WHC

NCM INITIATED BY (Name/Date): MMK 5-6-94

PARAMETER(S): Pu 150

SAMPLE NUMBER(S) AFFECTED: 4034310 1, F01, 02 W0010

MATRIX: soil

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

NONCONFORMANCE [check appropriate item(s)]:

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

   Due to:
   - ☐ sample matrix ☐ insufficient sample
   - ☐ instrumentation ☐ other (see #10)
9. ☐ Other (specify): low tr yds
10. ☐ Comments/Explanation:

NOTIFICATION [check appropriate item(s)]:

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

PROJECT MANAGER (signature & date): Sey Davies 5/11/94

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2

IT CORPORATION

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

CORRECTIVE ACTION

☐ ROOT CAUSE: INITIALS/DATE mmm 5-6-94

low tr yd; cause unknown

☐ CORRECTIVE ACTION: INITIALS/DATE mmm 5-6-94

Rerun

rerun acceptable 5-6-94 mmm

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☐ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE_____

FIRST LEVEL SUPERVISOR: M Kelly DATE: 5-6-94

RESPONSIBLE MANAGER: Li McKellar DATE: 5/11/94

QC REVIEW

☐ NONCONFORMANCE ☐ DEFICIENCY ☒ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO

QC COORDINATOR: Jodie Gr DATE: 5/12/94

CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason

REASON:

NCM CLOSURE

QC COORDINATOR: Jodie Gr DATE: 5/12/94

0025

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

9613475.0281

INTERNATIONAL TECHNOLOGY CORPORATION

0279

LOG #: RD-94-_____ page 1 of 2

(TAS-Richland)
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): WHC

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

PARAMETER(S): Gamma

SAMPLE NUMBER(S) AFFECTED: 4034310 1 F034310 1 W0010

MATRIX: Soil

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

NONCONFORMANCE [check appropriate item(s)]:

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

   Due to:
   - ☐ sample matrix ☐ insufficient sample
   - ☐ instrumentation ☐ other (see #10)
9. ☒ Other (specify): MDA for Fe 59 is 0.54 vs CL 0.5
10. ☐ Comments/Explanation:

NOTIFICATION [check appropriate item(s)]:

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

PROJECT MANAGER (signature & date): Sey Davies 5/11/94

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2

IT CORPORATION

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

CORRECTIVE ACTION

☒ ROOT CAUSE: INITIALS/DATE TK 5-5-94

Sample background and half life of isotope 44.5 days

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

Data accepted

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☐ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE

FIRST LEVEL SUPERVISOR: Joel Kemmann DATE: 5-5-94 TK 5-5-94

RESPONSIBLE MANAGER: W MacKelle DATE: 5/12/94

QC REVIEW

☐ NONCONFORMANCE ☒ DEFICIENCY ☐ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO:

QC COORDINATOR: Jodie Carr DATE: 5/12/94

CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: Jodie Carr DATE: 5/12/94

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

9613475.0283

0123

INTERNATIONAL TECHNOLOGY CORPORATION

LOG #: RD-94-_____ page 1 of 2

ITAS-Richland
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): WHC

NCM INITIATED BY (Name/Date): Joel T Kempema 5-4-94

PARAMETER(S): γ gamma

SAMPLE NUMBER(S) AFFECTED: L0343118 40343101 F0343101 WXDID

MATRIX: Soil

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

NONCONFORMANCE [check appropriate item(s)]:

1. ☐ Not enough sample received for proper analysis.
2. ☐ Holding time exceeded by _____ days due to:
   - 2.1. ☐ CATEGORY I: Out of Laboratory Control
     - ☐ Holding time expired at receipt.
   - 2.2 ☐ CATEGORY II: Laboratory Dependent
     - ☐ work backlog ☐ instrument failure
     - ☐ communication ☐ other (see #10)
   - 2.3. ☐ CATEGORY III: Laboratory Reruns
     - 2.3.1. ☐ QA/QC:
       - ☐ surrogates ☐ internal standards
       - ☐ spike recoveries ☐ blank contamination
     - 2.3.2. ☐ CONFIRMATION:
       - ☐ second column ☐ contamination check
       - ☐ other (see #10)
     - 2.3.3. ☐ DILUTION:
       - ☐ over calibration ☐ under calibration
       - ☐ other (see #10)
     - 2.3.4. ☒ OTHER: (see #10)
3. ☐ Sample lost during extraction/analysis; no re-prep or re-analysis possible.
4. ☐ QC data reported to client outside of:
   - ☐ method limits ☐ internal limits
   - ☐ QAPP limits ☐ contract limits
   - ☐ regulatory limits ☐ blank criteria
5. ☐ Incorrect procedure(s) used. (See #10)
6. ☐ Invalid instrument calibration. (See #10)
7. ☐ Incorrect/incomplete data reported to client. (See #10)
8. ☐ Reported detection limit(s) higher than:
   - ☐ method limits ☐ QAPP limits
   - ☐ contract limits ☐ other (see #10)
   - Due to:
     - ☐ sample matrix ☐ insufficient sample
     - ☐ instrumentation ☐ other (see #10)
9. ☒ Other (specify): Recount 1000 min Fe 59 MDA > Contract Limit
10. ☐ Comments/Explanation:

NOTIFICATION [check appropriate item(s)]:

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

PROJECT MANAGER (signature & date): Suzy Barnes 5/1/94

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2

0028

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

CORRECTIVE ACTION

☒ **ROOT CAUSE:** INITIALS/DATE TTK 5-24-94

uncertain – count time, single geometry,

☒ **CORRECTIVE ACTION:** INITIALS/DATE TTK 5-4-94

Recounted – Recount data accepted

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

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

FIRST LEVEL SUPERVISOR: Joel Kimyema DATE: 5-17-94

RESPONSIBLE MANAGER: Matt Reddy DATE: 5-17-94

QC REVIEW

☐ NONCONFORMANCE ☐ DEFICIENCY ☒ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO:

QC COORDINATOR: DATE: 5/17/94

CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: DATE: 5/17/94

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

9613475.0285

INTERNATIONAL TECHNOLOGY CORPORATION

LOG #: RD-94- 0140 page 1 of 2

ITAS-Richland
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): WHC

NCM INITIATED BY (Name/Date): SEL 5/2/94

PARAMETER(S): SVOT

SAMPLE NUMBER(S) AFFECTED: L0343115 W000

MATRIX: SOIL

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

NONCONFORMANCE [check appropriate item(s)]:

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

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

NOTIFICATION [check appropriate item(s)]:

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

PROJECT MANAGER (signature & date): Suzy Davies 5/12/94

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2

9613475.0286

IT CORPORATION

LOG #: RD-94- 0140 page 2 of 2

CORRECTIVE ACTION

☒ ROOT CAUSE: INITIALS/DATE GE 5/2/94

SvBS in spike (EQGI) This gives false high counts
Concurrently run spikes without SvBS e.g. L032691A WQ
OR Affects only spike alone. No SvBS added to sample

☐ CORRECTIVE ACTION: INITIALS/DATE SE 5/2/94

Report data.

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☐ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE SE 5/2/94

SvBS will not be added in future samples

FIRST LEVEL SUPERVISOR: [signature] DATE: SE 5/2/94

RESPONSIBLE MANAGER: [signature] DATE: 5-17-94

QC REVIEW

☒ NONCONFORMANCE ☐ DEFICIENCY ☐ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO:

QC COORDINATOR: [signature] DATE: 5/17/94

CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: [signature] DATE: 5/17/94

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

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9613475.0287

INTERNATIONAL TECHNOLOGY CORPORATION

LOG #: RD-94-_____ page 1 of 2

0278

ITAS-Richland
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): WHC.

NCM INITIATED BY (Name/Date): SE 5/4/94

PARAMETER(S): C14

SAMPLE NUMBER(S) AFFECTED: 403431 WOOD

MATRIX: Soil

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

NONCONFORMANCE [check appropriate item(s)]:

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

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

NOTIFICATION [check appropriate item(s)]:

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

PROJECT MANAGER (signature & date): Suzy Daines 5/11/94

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2

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

CORRECTIVE ACTION

☒ **ROOT CAUSE:** INITIALS/DATE GE 5/4/94

Insufficient Carbon in samples to perform analyses. Attempted both acid digestion and burning. Zero pressure observed.
To perform C14 significant Carbon must be present. (2 grams)

☒ **CORRECTIVE ACTION:** INITIALS/DATE GE 5/4/94

Report to client inability to perform samples
Note ~~pH~~ reporting units are pCi/gtC
if any measurable CO_2 is produced by either method we can perform analysis. None was produced in these cases

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

☒ **ACTIONS TO PREVENT RECURRENCE:** INITIALS/DATE GE 5/4/94

None required problem unique to samples with were essentially silicate sand with no CO_3 or organic material.

FIRST LEVEL SUPERVISOR: [signature] **DATE:** 5/4/94

RESPONSIBLE MANAGER: [signature] **DATE:** 5/11/94

QC REVIEW

☐ NONCONFORMANCE ☒ DEFICIENCY ☐ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO:

QC COORDINATOR: [signature] **DATE:** 5/12/94

CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: [signature] **DATE:** 5/12/94

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

9613475.0289

SAMPLE RECEIPT VARIANCE REPORT
ITAS-RICHLAND LABORATORY

WORK ORDER NUMBER: _____ DATE INITIATED: 3/22/94

INITIATED BY: Heidelberg

DATE/TIME OF SAMPLE (AND/OR RFA & COC) RECEIPT: 3/22 1200

CLIENT SAMPLE NUMBER	RFA/COC NUMBERS	ANALYSIS REQUESTED
	na	

Samples were received with the following deficiencies:

- ☐ 1. Not enough sample received for proper analysis.
- ☐ 2. Sample received without proper preservative.
- ☐ 3. No sample received in container.
- ☐ 4. Sample received without a RFA/COC form.
- ☐ 5. No sample ID on container.
- ☐ 6. Sample received broken or leaking.
- ☐ 7. Holding time exceeded at receipt.
- ☐ 8. Custody tape broken.
- ☐ 9. COC not relinquished by client.
- ☒ 10. Sample information on container does not match sample information on the paper work (Explain below).
- ☐ 11. All shipping containers (coolers) on waybill not received with shipment.
  - ☐ RFA/COC received
  - ☐ RFA/COC not received
- ☐ 12. Other (Explain below).

NOTES: SAF #94-045 on paper work - Bottles have SAF #94-046. BOBJ01 COC - sample time 09:00 bottle - 08:45. BOBJ04 is 250 ml not 40 ml as on COC.

SUPERVISOR REVIEW: Jami Heidelberg

PROJECT MANAGER REVIEW: _____

TELEPHONED TO: _____ ON _____ BY _____

TELEFAXED TO: _____ ON _____ BY _____

SIGNED ORIGINAL MUST BE RETAINED IN WORK ORDER FILE

FORM NO. LS-023, 3/92, Rev. 0

IT/WHC ISSUE RESOLUTION FORM

SAF No. 94-046 Project 200-UP-1 Soil Date 3/23/94

Sample No.(s) B0BJ01

Submitted By: Jim Harvey

Phone No. 615-690-3211 x5611

Fax No. 615-693-2348

Submitted To: Jeff Lerch

Phone No. 509-372-2596

Fax No. 509-372-2106

ISSUE	PROPOSED RESOLUTION
COC indicates time of collection was 0900 Bottle indicates time of collection was 0845	WHC to notify which collection time is correct.

IT/WHC0001

9613475.0291

*** AM/CMISO ***

due date 4/26

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

23-Mar-1994
Page 1

CUSTOMER: WHC SAF

SAMPLE DELIVERY GROUP W0010

MATRIX : SOIL 94-046

BATCH NUMBER 3-431

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0343113	ESJ10345			
	L0343115	IQ0005			
1)	40343101	ESJ10346	WHC	BOBJ01	
2)	40343102	ESJ10347	WHC	BOBJ02	
	F0343101	ESJ10348			

ACTIONS (Initial & Date)

1) INITIATED JH 3/23/94

2) PREP LAB RECEIVED 4/18/94 Bm

3) SAMPLE REMAINDER STORED N/A
RD3221 4/19/94 bm

4) SEPARATION LAB RECEIVED 4/20/94 JT
4-29-94 - Susan

5) COUNTING/MEASUREMENT LAB KC 4-30-94

6) DATA REVIEWED AND ANALYTICAL PREP STORED mmk 5-1-94
Lerem 5-2-94 mmk

ED 4.30.94

0045

9613475.0292

INTERNATIONAL TECHNOLOGY CORPORATION

DUE DATE 5/6/94

REANALYSIS / RECOUNT

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

ANALYSIS Pu/Am

NAME/DATE MMK / 5-2-94

CUSTOMER WHC

SAMPLE DELIVERY GROUP W0010

MATRIX soil

BATCH NUMBER

ITAS ID	CUSTOMER ID	COMMENTS
1) 40343101		
2) F0343101		
3) 40343102		
4)		
5)		
6)		
7)		
8)		
9)		
10)		

3386

REANALYSIS

REFERENCED QC

ESH 15974 ESJ 10409

ITAS ID - BLANK L034313B

~~IQHI~~ 047 HQ0010

ITAS ID - SPIKE L034313S

CLIENT CODE WHC

ACTIONS (Initial & Date)

PREP LAB RECEIVED 5/3/94 [illegible]

SAMPLE REMAINDER RETURNED TO SCG ✓ ☐ (CHECK ONE) [illegible]

NO SAMPLE REMAINING ☐

RD3221 5/3/94 [illegible]

SEPARATION LAB 5-4-94 Susie 5/5/94 [illegible]

COUNTING/MEASUREMENT Count 5-6-94 AR SK 5-6-94

DATA REVIEWED MMM 5-11-94

ANALYTICAL PREP STORED MMM 5-11-94

RECOUNT

ACTIONS (Initial & Date)

COUNTING/MEASUREMENT

DATA REVIEWED

ANALYTICAL PREP STORED

ADDITIONAL COMMENTS:

OK - Fe Susie

RC-048 12/92 REV 2

5/6/94

9613475.0293 *** NP-237 *** Due date 4/26

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

23-Mar-1994
Page 1

CUSTOMER: WHC SAF SAMPLE DELIVERY GROUP W0010

MATRIX : SOIL 94-046 BATCH NUMBER 3-431

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0343113		L034311m	EQR016	
	L034311S	EQR012	L034312m	EQR017	
1)	40343101		WHC	BOBJ01	
2)	40343102		WHC	BOBJ02	
	F0343101				
	W0343102	EQR018			

ACTIONS (Initial & Date)

1) INITIATED JH 3/23/94

2) PREP LAB RECEIVED 4/18/94 Bm

3) SAMPLE REMAINDER STORED N/A
RD 3221 4/19/94 Bm

4) SEPARATION LAB RECEIVED 4/21/94 JF

5) COUNTING/MEASUREMENT LAB AS 5-5-94

6) DATA REVIEWED AND ANALYTICAL PREP STORED mmm 5-5-94

EQR012 25.041 ± .3524

EQR016 25.087 ± .3567 ~~25.086 ± .3525~~ 5-6-94

EQR017 ~~25.048 ± .3522~~ 5-5-94
25.117 ± .35321

EQR018 25.003 ± .35160

Copy 5-5-94

0047 5/6

9613475.0294

*** PUISO *** Due 4/26

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

23-Mar-1994
Page 1

CUSTOMER: WHC SAF SAMPLE DELIVERY GROUP W0010

MATRIX : SOIL 94-046 BATCH NUMBER 3-431

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0343118	ESH15687			
	L0343119	FQHJ033			
1)	40343101	ESH15688	WHC	BOBJ01	
2)	40343102	ESH15689	WHC	BOBJ02	
	F0H3101	ESH15690			

ACTIONS (Initial & Date)

1) INITIATED JH 3/23/94

2) PREP LAB RECEIVED 4/18/94 Bm

3) SAMPLE REMAINDER STORED N/A
RD 3221 4/19/94 Bm

4) SEPARATION LAB RECEIVED 4/20/94 SF

5) COUNTING/MEASUREMENT LAB 4/29/94

6) DATA REVIEWED AND ANALYTICAL PREP STORED mm 5-6-94

rerun 5-2-94 mm

use rerun data 5-6-94 mm

4.29.94

0048

9613475.0295

INTERNATIONAL TECHNOLOGY CORPORATION

DUE DATE 5-6-94

REANALYSIS / RECOUNT

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

ANALYSIS Pu

NAME/DATE MMM / 5-6-94

CUSTOMER WHC

SAMPLE DELIVERY GROUP WCD10

MATRIX Soil

BATCH NUMBER

ITAS ID	CUSTOMER ID	COMMENTS
1) 40343101		
2) F 01		
3) 02		
4)		
5)		
6)		
7)		
8)		
9)		
10)		

REANALYSIS

REFERENCED QC

ESH 15974 ESS 10809

ITAS ID - BLANK LO 3431 3B

IQHF 047 IQO 010

ITAS ID - SPIKE 3S

CLIENT CODE WHC

ACTIONS (Initial & Date)

PREP LAB RECEIVED 5/3/94 Bm

SAMPLE REMAINDER RETURNED TO SCG ☐ Bm (CHECK ONE)

NO SAMPLE REMAINING ☐

RD3221 5/3/94 Bm

SEPARATION LAB 5-4-94 Susie

COUNTING/MEASUREMENT OD 05/5/94 OD

DATA REVIEWED MMM 5-6-94

ANALYTICAL PREP STORED MMM 5-6-94

RECOUNT

ACTIONS (Initial & Date)

COUNTING/MEASUREMENT ~~OD~~ 5/5/94 OD

DATA REVIEWED

ANALYTICAL PREP STORED

ADDITIONAL COMMENTS:

OX ~~Fe~~ Susie

FeOH JF

Pu column AB/JF

Ed AB-MK-5-5-94

RC-048 12/92 REV 2

RD May 9

9613475.0296

*** UISO ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

23-Mar-1994
Page 1

CUSTOMER: WHC SAF SAMPLE DELIVERY GROUP W0010

MATRIX : SOIL 94-046 BATCH NUMBER 3-431

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0343118	ESI14918			
	L0343115	EQIE031			
1)	40343101	ESI14919	WHC	BOBJ01	
2)	40343102	ESI14920	WHC	BOBJ02	
	F0343101	ESI14921			

ACTIONS (Initial & Date)

1) INITIATED JH 3/23/94

2) PREP LAB RECEIVED 4/18/94 Bm

3) SAMPLE REMAINDER STORED N/A
RD3221 4/19/94 Bm

4) SEPARATION LAB RECEIVED _____

5) COUNTING/MEASUREMENT LAB 4/27/94

6) DATA REVIEWED AND ANALYTICAL PREP STORED mmm 5-1-94

Reran dyr 5-1-94 mmm

Ext 4.25.94

Ext 4.26.94

ED 4.27.94

0050

9613475.0297

INTERNATIONAL TECHNOLOGY CORPORATION

DUE DATE 4-26

REANALYSIS / RECOUNT

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

ANALYSIS Uro

NAME/DATE mmm / 5-1-94

CUSTOMER WHC

SAMPLE DELIVERY GROUP W0010

MATRIX Soil

BATCH NUMBER 03-343

ITAS ID	CUSTOMER ID	COMMENTS
1) 40343101	ES715307	looked like 01 and
2) F 01	↓ 15308	02 are the dups
3) 02	↓ 15337	
4)		
5)		
6)		
7)		
8)		
9)		
10)		

REANALYSIS

REFERENCED QC

ITAS ID - BLANK ES715306 L0343123

ITAS ID - SPIKE ECFE035 L0343125

CLIENT CODE WHC

ACTIONS (Initial & Date)

PREP LAB RECEIVED 5/2/94 Bm

SAMPLE REMAINDER RETURNED TO SCG ☐ (CHECK ONE) Bm

NO SAMPLE REMAINING ☐

SEPARATION LAB RD 3221 5/3/94 Em

COUNTING/MEASUREMENT SK 5-4-94

DATA REVIEWED mmm 5-5-94

ANALYTICAL PREP STORED mmm 5-5-94

RECOUNT

ACTIONS (Initial & Date)

COUNTING/MEASUREMENT

DATA REVIEWED

ANALYTICAL PREP STORED

ADDITIONAL COMMENTS:

ether 5-3-94 Susan

ED 5-4-94 Bm

0051

RC-048 12/92 REV 2

9613475.0298

due 4/24/94 TF

*** GAMMA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

23-Mar-1
Page 1

CUSTOMER: WHC SAF

SAMPLE DELIVERY GROUP W0010

MATRIX : SOIL 94-046

BATCH NUMBER 3-431

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0343118 ✓				
	L0343115 ✓				
1)	40343101 ✓		WHC	BOBJ01	
	F0343101 ✓				
2)	40343102		WHC	BOBJ02	

ACTIONS (Initial & Date)

1) INITIATED JH 3/23/94

2) PREP LAB RECEIVED MM 3-25-94

3) SAMPLE REMAINDER STORED MM 3-29-94

4) SEPARATION LAB RECEIVED N/A

5) COUNTING/MEASUREMENT LAB AB 4-1

6) DATA REVIEWED AND ANALYTICAL PREP STORED TK 5-5

0052

9613475.0299

INTERNATIONAL TECHNOLOGY CORPORATION

DUE DATE 4/26/94

REANALYSIS / RECOUNT

CHAIN-OF-CUSTODY ~~BATCH ANALYSIS~~ RECORD

ANALYSIS gamma

CUSTOMER WHC

MATRIX Soil

NAME/DATE TK 1.54-94

SAMPLE DELIVERY GROUP W0010

BATCH NUMBER

ITAS ID	CUSTOMER ID	COMMENTS
1) 40343101 ✓		1000 min
2) F0343101		
3) L034311B		
4)		
5)		
6)		
7)		
8)		
9)		
10)		

TK 5-4-94

REANALYSIS

REFERENCED QC

ITAS ID - BLANK

ITAS ID - SPIKE

CLIENT CODE

ACTIONS (Initial & Date)

PREP LAB RECEIVED

SAMPLE REMAINDER RETURNED TO SCG ☐ (CHECK ONE)

NO SAMPLE REMAINING ☐

SEPARATION LAB

COUNTING/MEASUREMENT

DATA REVIEWED

ANALYTICAL PREP STORED

RECOUNT

ACTIONS (Initial & Date)

COUNTING/MEASUREMENT KCS-4-94

DATA REVIEWED TK 5-5-94

ANALYTICAL PREP STORED

ADDITIONAL COMMENTS:

Transfer Recount Results

0053

RC-048 12/92 REV 2

9613475.0300

4/26/94

*** ALPHA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

23-Mar-1994
Page 1

CUSTOMER: WHC SAF

SAMPLE DELIVERY GROUP W0010

MATRIX : SOIL 94-046

BATCH NUMBER 3-431

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0343118 L0343115		EQE4142	10.011 ± .096000	= 4.5094 ± .04324 pCi
1)	40343101 F0343101		WHC	BOBJ01	
2)	40343102		WHC	BOBJ02	

ACTIONS (Initial & Date)

1) INITIATED JH 3/23/94

2) PREP LAB RECEIVED MM 3-25-94

3) SAMPLE REMAINDER STORED MM 3-29-94

4) SEPARATION LAB RECEIVED N/A

5) COUNTING/MEASUREMENT LAB AS 4-14-94

6) DATA REVIEWED AND ANALYTICAL PREP STORED JK 4-21-94

9613475.0301

4/20/94

*** BETA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

23-Mar-1994
Page 1

CUSTOMER: WHC SAF

SAMPLE DELIVERY GROUP WO010

MATRIX : SOIL 94-046

BATCH NUMBER 3431

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0343118 L0343115		EQBA038	25.064 ± .35360	= 11.2901 ± 0.15928 pCi/g
1)	40343101 F0343101		WHC	B0BJ01	
2)	40343102		WHC	B0BJ02	

ACTIONS (Initial & Date)

1) INITIATED 3/23/94

2) PREP LAB RECEIVED 3-25-94

3) SAMPLE REMAINDER STORED 3-29-94

4) SEPARATION LAB RECEIVED N/A

5) COUNTING/MEASUREMENT LAB AS 4-14-94 ~~4-14-93~~

6) DATA REVIEWED AND ANALYTICAL PREP STORED 4-21-94

0055

9613475.0302

TOTAL SR

*** ~~SR=90~~ *** 4-20-94

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

23-Mar-1994
Page 1

CUSTOMER: WHC SAF

SAMPLE DELIVERY GROUP W0010

MATRIX : SOIL 94-046

BATCH NUMBER 3-431

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L034311B			5.2289 ± .06 PCI	
	L034311S	EQGI100		69.649 ± .19995 DPM	
1)	40343101		WHC	BOBJ01	
	E034310I				
2)	40343102		WHC	BOBJ02	

ACTIONS (Initial & Date)

1) INITIATED JH 3/23/94

2) PREP LAB RECEIVED MM 3-25-94

3) SAMPLE REMAINDER STORED MM 3-29-94

4) SEPARATION LAB RECEIVED 4-11-94 TK

5) COUNTING/MEASUREMENT LAB SK 4-28-94

6) DATA REVIEWED AND ANALYTICAL PREP STORED SK 5/2/94

9613475.0303

*** C-14 ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

23-Mar-1994
Page 1

CUSTOMER: WHC SAF SAMPLE DELIVERY GROUP W0010

MATRIX : SOIL 94-046 BATCH NUMBER 3-431

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40343101		WHC	BOBJ01	
2)	40343102		WHC	BOBJ02	

ACTIONS (Initial & Date)

1) INITIATED JH 3/23/94

2) PREP LAB RECEIVED N/A

3) SAMPLE REMAINDER STORED _____

4) SEPARATION LAB RECEIVED 3-23-94

5) COUNTING/MEASUREMENT LAB _____

6) DATA REVIEWED AND ANALYTICAL PREP STORED _____

9613475.0304

*** TC-99 ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

23-Mar-1994
Page 1

CUSTOMER: WHC SAF SAMPLE DELIVERY GROUP W0010

MATRIX : SOIL 94-046 BATCH NUMBER 3-431

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
			L034311X		
	L034311B		~~W0343111X~~	~~W0343213M~~	
	L034311M		~~W0343212M~~	W0343101	W0343102
1)	40343101		WHC	BOBJ01	
2)	40343102		WHC	BOBJ02	
	L034211N		instrument		
	L034312N		BIRE		

ACTIONS (Initial & Date)

1) INITIATED 3/23/94

2) PREP LAB RECEIVED 3-25-94

3) SAMPLE REMAINDER STORED 3-29-94

4) SEPARATION LAB RECEIVED 3/30/94

5) COUNTING/MEASUREMENT LAB 3 May 94 1910

6) DATA REVIEWED AND ANALYTICAL PREP STORED

0058

9613475.0305

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

DATE: January 13, 1995

TO: W0010-ITC-021

FROM: Pat Reich H4-14

Telephone: 372-2785

cc:

SUBJECT: SUMMARY VALIDATION REPORT

The Validation Summary Report for this data package 200-UP-1 Project, Round 1 Soil Sampling Task is filed in W0004-ITC-022.

Pat Reich
SDLA

54-3000-101 (12/92) GEF014

9613475.0306

DON'T SAY IT - - WRITE IT!

Date: 1-4-95

From: P. K. Reich H4-14, (509) 372-2785

Subject: Correction of Validation Date Received Stamp

The date stamped on this validation report is the date the final correction documents were received in the completion of the Validation Review Process.

The original front pages(s) are maintained as a documented record of the date the Validation Report was originally received from the Validators.

Thank You,

Pat Reich
Sample Management

9613475.0307

Golder Associates Inc.

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

Golder Associates

original Val Pkt received date 1-5-95 PKR

DEC 1994
RECEIVED
Validation
Log In

December 21, 1994

Our ref: 943-1610.048.0400
94-1610/O/119

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

ATTENTION: Ms. Jeanette Duncan

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

Dear Ms. Duncan:

This letter is to transmit the following data validation packages:

Data Package	Analyses
W0010-ITC-021	Volatiles, Semivolatiles, Inorganics, General Chemistry, Radiochemistry

Please call if you have any questions.

Sincerely,

GOLDER ASSOCIATES INC.

Christina I. Jensen
Task Manager

Kent M. Angelos
Project Manager

Enclosures

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

9613475.0308

RECORD COPY

MEMORANDUM

DEC 1994
RECEIVED
Validation
Log In

TO: 200-UP-1 Round 1 Soil Sampling Project QA Record December 14, 1994

FR: Sandra Schildt, Golder Associates Inc.

RE: VOLATILES DATA VALIDATION SUMMARY FOR DATA PACKAGE W0010-ITC-021 (943-1610.048,W0010voa.UP1)

INTRODUCTION

This memorandum presents the results of data validation on data package W0010-ITC-021 prepared by the International Technology Corporation. A list of the samples validated along with the analytes reported and the method of analysis is provided in the following table.

SAMPLE ID	MEDIA	ANALYSIS
B0BJ01*	SOIL	VOLATILES
B0BJ02	SOIL	
B0BJ04	SOIL	
TRIPBLANK (W0010TB)	SOIL	SEE ATTACHMENT 4

* - Indicates sample results which were 100% recalculated.

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

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

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

Detection Limits. Detection limit goals were met.

Completeness. The data package was complete for all requested analyses. Four samples (4) were validated in this data set with a total of 132 determinations reported, all of which were deemed valid. This results in a completeness of 100% which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

Minor deficiencies were identified during validation which required qualification of data.

Blanks

- Methylene chloride and acetone were detected in the laboratory blanks. Attachments 2 and 5 provide a summary of the samples and data qualification applied.

TENTATIVELY IDENTIFIED COMPOUNDS

Tentatively identified compounds (TICs) were evaluated during validation and qualified as follows:

- TICs were detected in the samples and laboratory blanks, resulting in qualification of the sample results as non-detects (U).
- TICs were detected in the samples and determined to be valid, resulting in qualification of the results as presumptive and valid (JN).

FIELD QUALITY CONTROL

- Sample B0BJ02 was identified as an equipment blank and sample TRIPBLANK was identified as a trip blank. Methylene chloride was detected in TRIPBLANK and tentatively identified compounds were detected in B0BJ02. No qualification was applied in accordance with the validation procedures.

REFERENCES

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994; Westinghouse Hanford Company, Richland, Washington.

9513175.0310

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

961975.0311

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.

NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.

UJN- Indicates a tentatively identified compound (TIC) that has been determined to be presumptive and valid (JN) in terms of identification and quantitation and has been qualified as undetected due to associated blank contamination.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B-7

PKG: W0010-ITC-021	REVIEWER: S. Schildt	DATE: 12/14/94	PAGE 1 OF 1
COMMENTS: VOLATILES			
PARAMETER	QUALIFIER	SAMPLES AFFECTED	REASON
Acetone Methylene chloride	U	B0BJ01, B0BJ02, BOBJ04	Compound detected in the laboratory blank
Acetone	U	TRIPBLANK	Compound detected in the laboratory blank

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0010-ITC-021

	Samp#	B0BJ01		B0BJ02		B0BJ04		W0010TB	
	Date	3-18-94		3-18-94		3-18-94		3-23-94	
	Location	299-W19-35		299-W19-35		299-W19-35		299-W19-35	
	Depth	245.00 - 247.00		---		---		---	
	Type	SOIL		SOIL		SOIL		WATER, UG/L	
	Comments			EQUIP. BLANK		TRIP BLANK		TRIP BLANK	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q
CHLOROMETHANE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
BROMOMETHANE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
VINYL CHLORIDE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
CHLOROETHANE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
METHYLENE CHLORIDE	UG/KG	11.000	U	10.000	U	10.000	U	1.000	J
ACETONE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
CARBON DISULFIDE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
1,1-DICHLOROETHENE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
1,1-DICHLOROETHANE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
1,2-DICHLOROETHENE (TOTAL)	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
CHLOROFORM	UG/KG	2.000	J	10.000	U	10.000	U	10.000	U
1,2-DICHLOROETHANE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
2-BUTANONE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
1,1,1-TRICHLOROETHANE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
CARBON TETRACHLORIDE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
BROMODICHLOROMETHANE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
1,2-DICHLOROPROPANE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
CIS-1,3-DICHLOROPROPENE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
TRICHLOROETHENE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
DIBROMOCHLOROMETHANE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
1,1,2-TRICHLOROETHANE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
BENZENE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
TRANS-1,3-DICHLOROPROPENE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
BROMOFORM	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
4-METHYL-2-PENTANONE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
2-HEXANONE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
TETRACHLOROETHENE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
1,1,2,2-TETRACHLOROETHANE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
TOLUENE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
CHLOROBENZENE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
ETHYLBENZENE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
STYRENE	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U
XYLENES (TOTAL)	UG/KG	11.000	U	10.000	U	10.000	U	10.000	U

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

9613475.0316

Validated 18/15/94

009

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BCB501
~~40343001~~
SCG 5/31/94

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4455

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4455

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: not dec. 7 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	11 ~~2~~ ~~J~~	U
67-64-1	Acetone	11 —	U
75-15-0	Carbon Disulfide	11	U
75-35-4	1,1-Dichloroethene	11	U
75-34-3	1,1-Dichloroethane	11	U
540-59-0	1,2-Dichloroethene (total)	11	U
67-66-3	Chloroform	2	J
107-06-2	1,2-Dichloroethane	11	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	11	U
56-23-5	Carbon Tetrachloride	11	U
75-27-4	Bromodichloromethane	11	U
78-87-5	1,2-Dichloropropane	11	U
10061-01-5	cis-1,3-Dichloropropene	11	U
79-01-6	Trichloroethene	11	U
124-48-1	Dibromochloromethane	11	U
79-00-5	1,1,2-Trichloroethane	11	U
71-43-2	Benzene	11	U
10061-02-6	trans-1,3-Dichloropropene	11	U
75-25-2	Bromoform	11	U
108-10-1	4-Methyl-2-Pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	11	U
79-34-5	1,1,2,2-Tetrachloroethane	11	U
108-88-3	Toluene	11	U
108-90-7	Chlorobenzene	11	U
100-41-4	Ethylbenzene	11	U
100-42-5	Styrene	11	U
1330-20-7	Xylenes (total)	11	U

FORM I VOA

3/90

12/13/94

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBJ01

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4455

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4455

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: not dec. 7 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	2.00	14	~~BJ~~ U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BCBSCA
~~40343002~~
SCL 5/BCKN
Equip Blk

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4508

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4508

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: not dec. 0 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10 ~~2~~ ~~J~~	U
67-64-1	Acetone	10 ~~2~~ ~~J~~	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylenes (total)	10	U

FORM I VOA

3/90

12/13/94

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBJO2

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4508

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4508

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: not dec. 0 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	UNKNOWN	2.03	15	~~BJ~~	U
2.	UNKNOWN	16.23	7	~~J~~	JN

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJC4
~~40343003A~~
SCG 5/31/94
Trip Blk

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4514

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4514

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: not dec. 0 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10 ~~2~~	~~J~~ U
67-64-1	Acetone	10 ~~5~~	~~J~~ U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylenes (total)	10	U

FORM I VOA

3/90

12/13/94

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBJ04

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4514

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4514

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: not dec. 0 Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	UNKNOWN	2.03	15	~~BJ~~	U
2.	UNKNOWN	16.20	6	~~J~~	JN

12/13/94

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TRIP BLANK
~~40243004A~~
SCG 5/2/94
W0010TB

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) WATER Lab Sample ID: AA4515

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AC910

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: not dec. ____ Date Analyzed: 03/29/94

GC Column: DB-624 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

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

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	1	J
67-64-1	Acetone	10 ~~6~~	~~BJ~~
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylenes (total)	10	U

FORM I VOA

3/90
12/13/94

9613475.0324

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Westinghouse Hanford Company
P.O. Box 1970
Richland, WA 99352
Attn: J.A. Lerch

April 28, 1994

Job Number: 253

This is the Certificate of Analysis for the following samples:

SDG:	W0010
Client Project ID:	Westinghouse Hanford
Date Received by Lab:	March 24, 1994
Number of Samples:	Four (4)
Sample Type:	Soil - three (3), Water - one (1)

JUN 1994 RECEIVED SDLA

I. Introduction

On March 24, 1994, three (3) soil samples and one (1) water sample arrived at ITAS-Richland, Washington and were transferred to ITAS-Knoxville for chemical analysis. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that the data are not blank corrected. Soil results are reported on a dry weight basis.

The samples were analyzed for Target Compound List (TCL) volatiles by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 3/90 Statement of Work.

Reviewed and Approved:

Sheree' A. Schneider
Project Manager

RECORD COPY

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

II. Analytical Results/Methodology (Continued)

The samples were analyzed for Target Compound List (TCL) semivolatiles by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 3/90 Statement of Work.

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

The samples were analyzed for total cyanide in accordance with the EPA CLP ILM03 Statement of Work.

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

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

III. Quality Control

The volatiles analyses were performed by purge and trap with a J & W DB-624 capillary column on a Hewlett-Packard 5970 GC/MS/DS and a Finnigan INCOS 500 GC/MS/DS. All QC results were within method specified limits.

The semivolatiles analyses were performed by direct injection of sample extract on a Restek XTI-5 capillary column on a Finnigan INCOS XL GC/MS/DS. All QC results were within method specified limits.

Data were reported with qualifiers as follows:

U - Compound analyzed for but not detected; value given is quantitation limit.
E - Compound exceeded calibration range.
D - Compound analyzed at a secondary dilution factor.
J - Compound detected but below quantitation limit; value estimated.
S - Spiked compound.
B - Compound found in method blank.
A - Suspected aldol condensation product.
Y - Indistinguishable isomer in tentatively identified compounds.
N - Presumptive evidence of compound presence.

12/15/94

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

III. Quality Control (Continued)

The samples were digested on April 11, 1994 for ICP and GFAA. The CVAA analysis for mercury was performed on April 7, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from April 11 through April 14, 1994; the remaining metals were analyzed by ICP on April 13, 1994. All run QC was acceptable. A duplicate/spike pair was prepared using sample ~~0343001~~. BOBJ01 DE 6/2 Spike recovery (accuracy) results were within acceptance limits for all parameters by ICP, GFAA and CVAA analyses except for arsenic by GFAA analysis. As the titanium concentration is greater than four times (4X) the spike added, spiking criteria do not apply for this analyte. Duplicate RPD (precision) results were within acceptance limits for all parameters by ICP, GFAA and CVAA analyses except for chromium by ICP analysis.

Data were reported with qualifiers as follows:

"C" Qualifiers

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

"Q" Qualifiers

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

"M" Qualifiers

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

Miscellaneous

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

12/13/94

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

III. Quality Control (Continued)

On April 15, 1994, the samples were analyzed for nitrate-nitrite by cadmium reduction followed by colorimetric determination using the LACHAT QuikChem automated flow injection analyzer (QuikChem Method No. 10-107-04-1-C).

The samples were analyzed for anions on April 20 and April 22, 1994. Matrix spike/matrix spike duplicate analyses were performed using sample ~~4-03-430-01E.~~ AA4459 BOB101
SCG 5/20/94

12/13/94

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

III. Quality Control (Continued)

Table I is a cross reference between client IDs and abbreviated client IDs.

TABLE I

WHC ID	Richland ID	Knoxville ID	Matrix	Test
BOBJO1	4-03-430-01A	AA4455	SOIL	VOC
BOBJO1	4-03-430-01B	AA4456	SOIL	SVOC
BOBJO1	4-03-430-01C	AA4457	SOIL	METALS
BOBJO1	4-03-430-01D	AA4458	SOIL	CN
BOBJO1	4-03-430-01E	AA4459	SOIL	ANIONS
BOBJO1	4-03-430-01F	AA4460	SOIL	NO3NO2
BOBJO2	4-03-430-02A	AA4508	SOIL	VOC
BOBJO2	4-03-430-02B	AA4509	SOIL	SVOC
BOBJO2	4-03-430-02C	AA4510	SOIL	METALS
BOBJO2	4-03-430-02D	AA4511	SOIL	CN
BOBJO2	4-03-430-02E	AA4512	SOIL	ANIONS
BOBJO2	4-03-430-02F	AA4513	SOIL	NO3NO2
BOBJO4	4-03-430-03A	AA4514	SOIL	VOC
TRIP BLANK	4-03-430-04A	AA4515	WATER	VOC

12/13/94

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

IV. Certification

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

Reviewed and Approved:

Sheree' A. Schneider
Project Manager

12/13/94

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priority [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-~~049~~ 646 WVS 3-23-94
Ice Chest No.: WHC 19	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0- 0369-31	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks: NONE OBSERVED	Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE	

SDG W0010

4-08-430

			Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4		
			Type of Container	aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs		
			No. of Container(s)	1	1	1	1	1	1	1	1					1		
			Volume	120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml		
			SAMPLE ANALYSIS	VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)		
				A	B	C	D	E	F									
Sample No.	Matrix*	Date Sampled	Time Sampled															
01 BOBJ01	S	3-18-94	0900	X	X	X	X	X	X	X	X							
02 BOBJ02	S	3-18-94	0830	X	X	X	X	X	X	X	X							
03 BOBJ04	S	3-18-94	0700													X		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
W.V. Setzer	3-22-94 1125	R. Boyd Jr	3/22/94 12:02

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

(BOBJ01~~4~~03101) (BOBJ02-40343102)

LOWEST HOLDING TIME = 7DAYS

Matrix*

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

LABORATORY SECTION — Received By: ____ Title: ____ Date/Time: ____

FINAL SAMPLE DISPOSITION — Disposal Method: ____ Disposed By: ____ Date/Time: ____

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

WO#253

12/13/94

024

9613475.0331

00000020

WO#253

INTERNATIONAL TECHNOLOGY CORPORATION

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

Reference Document No.[30] 340338

Page 2 of 2

Project Name SAF 94-046

Project No. SDG W0010

Samples Shipment Date 3-23-94

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
A-03-430-02C	BOBJ02 / Soil	3/18 0830	glass	500ml	Cool 4°	ICP, GFAA Metals, Hg		
D				250ml		CN	Plastic	FOR LAB USE ONLY
E						EPA 300.0		
F				120ml		EPA 353.2		
A-03-430-03A	BOBJ04	3/18 0700				VOA	250ml	FOR LAB USE ONLY
A-03-430-04A	Trip Blank	3/23/94		40ml		VOA		
B						VOA		FOR LAB USE ONLY
								FOR LAB USE ONLY
								FOR LAB USE ONLY
		3/23/94						FOR LAB USE ONLY
								FOR LAB USE ONLY
								FOR LAB USE ONLY
								FOR LAB USE ONLY

White: To accompany samples Yellow: Field copy

*See back of form for special instructions.

12/13/94

025

9613475.0332

0000023

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-1		DATA PACKAGE: W0010-ITC-021
VALIDATOR: L. Schild+	LAB: IT	DATE: 12/13/94
CASE:		SDG: W0010

ANALYSES PERFORMED

☑ CLP Volatiles	☐ SW-846 8240 (cap column)	☐ SW-846 8260 (packed column)	☐ CLP Semivolatiles	☐ SW-846 8270 (cap column)	☐ SW-846 (packed column)
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX BOBJ01, BOBJ02, BOBJ04, Trip blank (W0010TB) / soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

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

Are initial calibrations acceptable? . . . . . Yes No N/A

Are continuing calibrations acceptable? . . . . . Yes No N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: ~~Acetone~~ 12/13/94 Methylene chloride detected in Trip Blank (W0010TB). No qualification required. Methylene chloride and acetone detected in laboratory blank. Associated results qualified as undetected (U). See comment section 8.

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . . Yes No N/A

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

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

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? . . . . . Yes No N/A

Are field duplicate RPD values acceptable? . . . . . Yes No N/A

Are field split RPD values acceptable? . . . . . Yes No N/A

Comments:

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . Yes No N/A

Are internal standard areas acceptable? . . . . . Yes No N/A

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

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments: Lab conservatively identified acetone and methylene chloride in samples but not in lab blanks. RICs are similar and, therefore, are attributed to blank contamination in samples BOBJ01, 2, and 4. [illegible] 12/15

9. REPORTED RESULTS AND QUANTITATION LIMITS

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

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

Do results meet the CRQLs? . . . . . Yes No N/A

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

Comments:

HOLDING TIME SUMMARY

SDG: W0010-ITC-021	VALIDATOR: S. Galitsky	DATE: 12/13/94	PAGE 1 OF 1
COMMENTS: Volatiles			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B0BJ01	VOA	3/18/94	3/26/94	3/26/94	8	8	none
B0BJ02	↓	↓	↓	↓	↓	↓	↓
B0BJ04	↓	↓	↓	↓	↓	↓	↓
Trip blank	↓	3/23/94	3/29/94	3/29/94	6	6	↓

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKAA4735

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) WATER Lab Sample ID: AA4735

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AC909

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. ____ Date Analyzed: 03/29/94

GC Column: DB-624 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

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

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	2	J
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylenes (total)	10	U

FORM I VOA

3/90 12/13/94

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKAA4645W

Lab Name: ITAS-KNOXVILLE Contract: _____

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4645

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AA4645

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. ____ Date Analyzed: 03/26/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

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

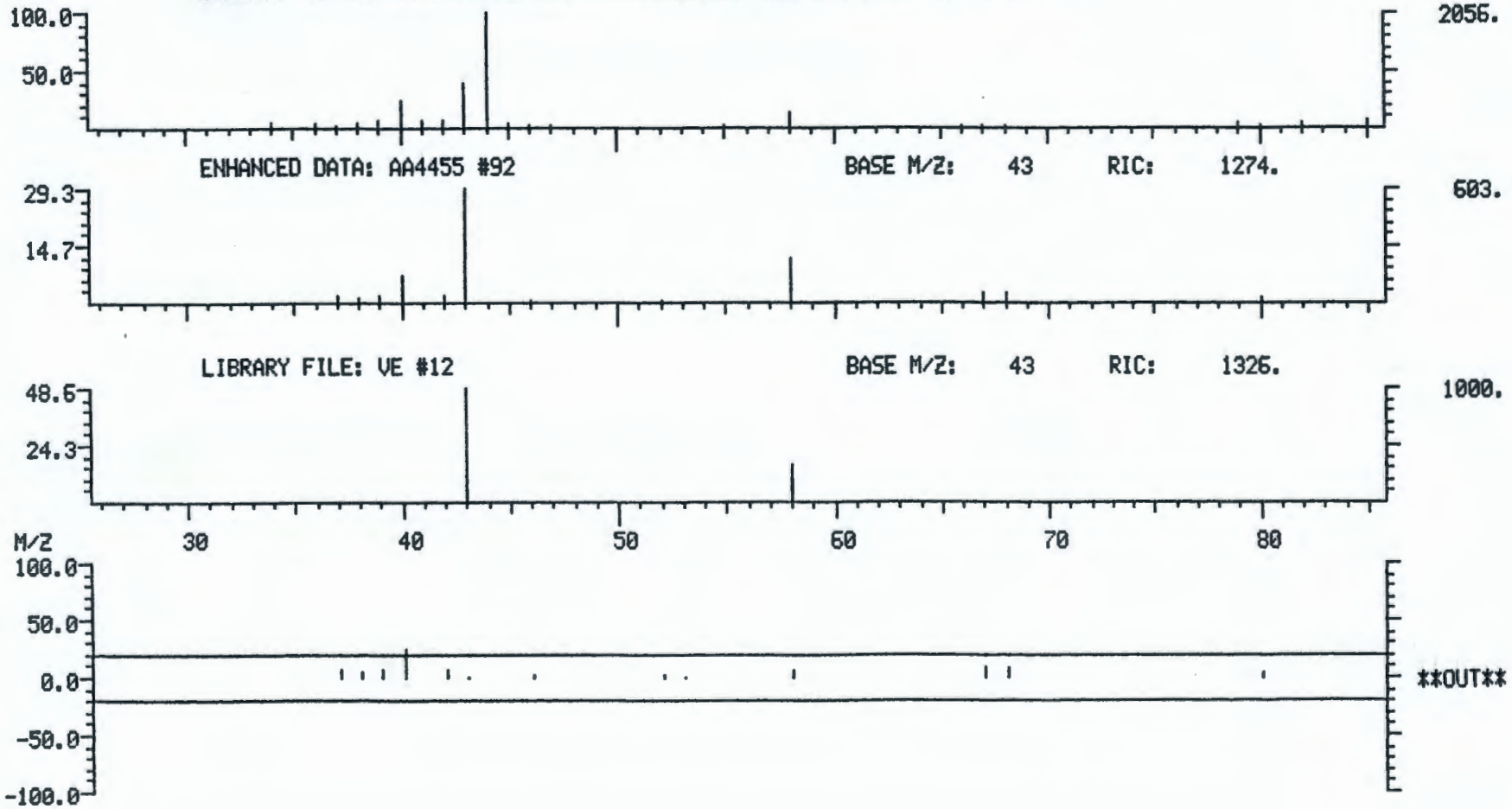
CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 0-00-0	UNKNOWN	2.03	15	J

BOB501

TARGET COMPOUND COMPARISON

COMPOUND: C035 ACETONE

RAW DATA: AA4455 #92 BASE M/Z: 44 RIC: 5864.
03/26/94 16:51
SAMPLE: CLP,253,W0010,40343001,LOW,SOIL,AA4455,VOA,EPA,
CONDS.: DB-624/0.53,WS0326,WBFB0326,AA4645R,AA4455MS,AA4455MD,UNDILUTED,



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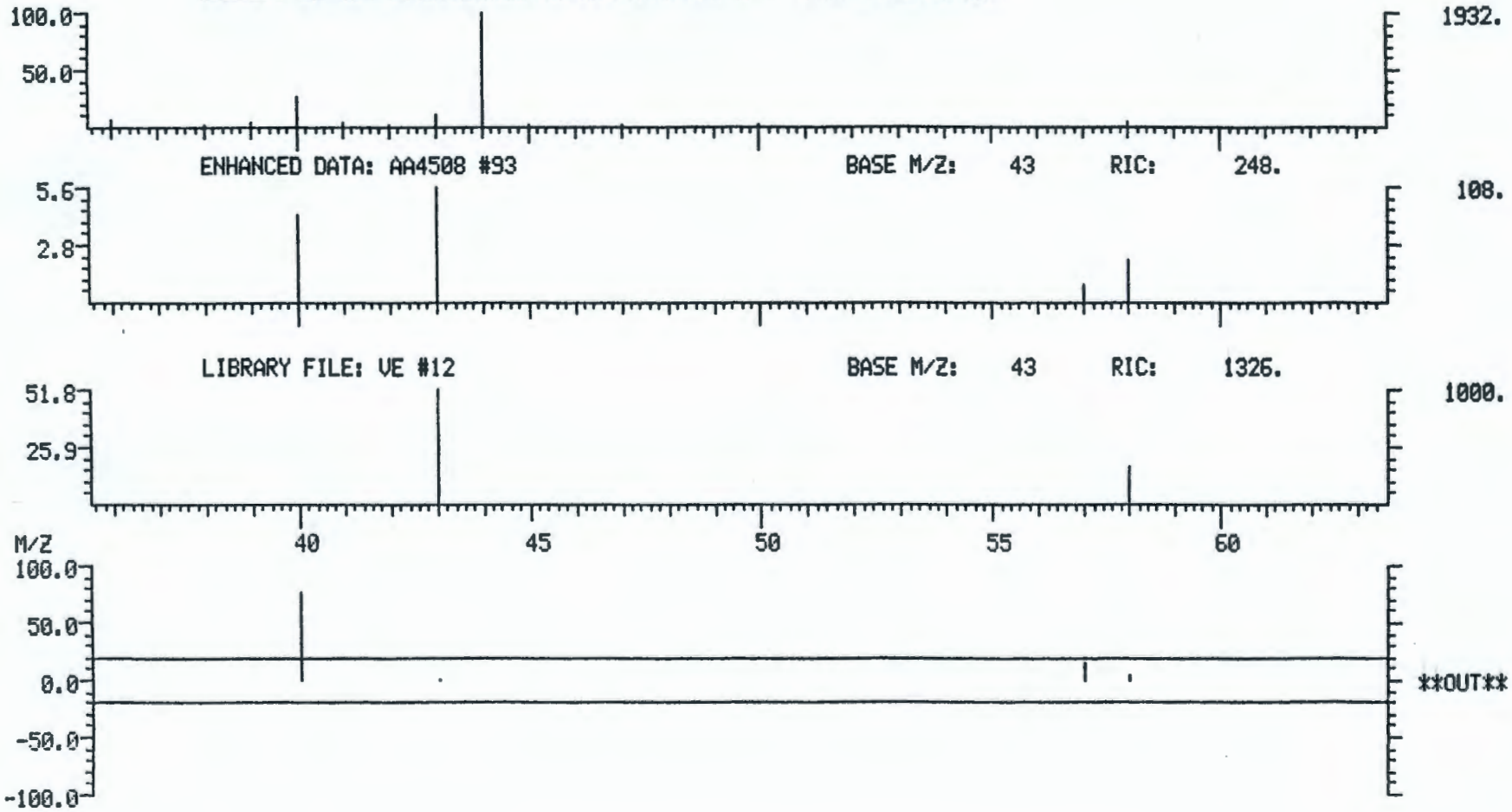
BCB502

TARGET COMPOUND COMPARISON

COMPOUND: C035 ACETONE

RAW DATA: AA4508 #93 BASE M/Z: 44 RIC: 4240.
03/26/94 18:39
SAMPLE: CLP,253,W0010,40343002,LOW,SOIL,AA4508,VOA,EPA,
CONDS.: DB-624/0.53,WS0326,WBFB0326,AA4645R, , ,UNDILUTED,I500A,



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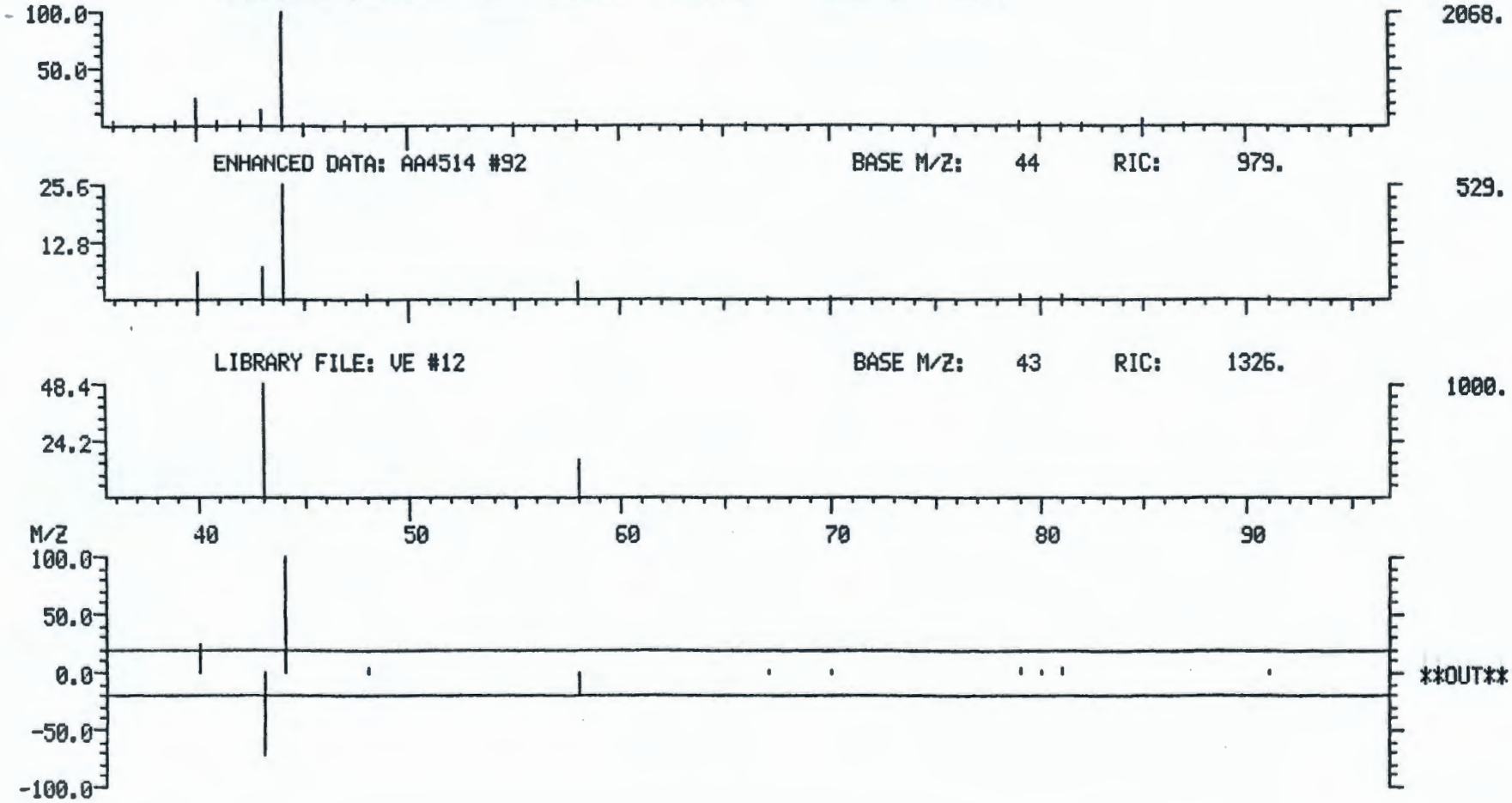
TARGET COMPOUND COMPARISON

COMPOUND: C035 ACETONE

RAW DATA: AA4514 #92 BASE M/Z: 44 RIC: 5128.
03/26/94 19:14
SAMPLE: CLP,253,W0010,40343003A,LOW,SOIL,AA4514,VOA,EPA,
CONDS.: DB-624/0.53,WS0326,WBFB0326,AA4645R, , ,UNDILUTED,I500A,



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VB/K

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
1	128	183	6:06	1	1.000	A BB	36489.	50.000 UG/L	16.17
2	114	229	7:38	2	1.000	A BB	141571.	50.000 UG/L	16.17
3	117	361	12:02	3	1.000	A BB	101401.	50.000 UG/L	16.17
4	65	208	6:56	1	1.137	A BB	50769.	46.962 UG/L	15.19
5	98	295	9:50	3	0.817	A BB	97440.	50.043 UG/L	16.18
6	95	417	13:54	3	1.155	A BB	81940.	48.549 UG/L	15.70
7	NOT	FOUND							
~~8~~	94	61	2:02	1	0.333	A BB	645.	0.579 UG/L	0.19
9	NOT	FOUND						methylene chloride	
~~10~~	64	63	2:06	1	0.344	A BB	7582.	8.611 UG/L	2.78
11	84	109	3:38	1	0.596	A BB	451.	0.455 UG/L	0.15 meth. Cl
~~12~~	43	92	3:04	1	0.503	A VB	742.	1.737 UG/L	0.56 Acetone
13	56	85	2:50	1	0.464	A BB	74.	0.396 UG/L	0.13
								acetone	
14	NOT	FOUND							
15	NOT	FOUND							
16	NOT	FOUND							
17	NOT	FOUND							
18	NOT	FOUND							
19	83	188	6:16	1	1.027	A BB	55.	0.029 UG/L	0.01
20	62	210	7:00	1	1.148	A BB	131.	0.116 UG/L	0.04
21	43	175	5:50	1	0.956	A*BV	467.	0.856 UG/L	0.28
22	NOT	FOUND							
23	NOT	FOUND							
24	NOT	FOUND							
25	NOT	FOUND							
26	NOT	FOUND							
27	NOT	FOUND							
28	130	240	8:00	2	1.048	A BB	86.	0.082 UG/L	0.03
29	NOT	FOUND							
30	97	317	10:34	2	1.384	A BB	66.	0.068 UG/L	0.02
31	78	210	7:00	2	0.917	A BB	121.	0.050 UG/L	0.02
32	NOT	FOUND							
33	NOT	FOUND							
34	173	390	13:00	2	1.703	A*BB	147.	0.142 UG/L	0.05
35	NOT	FOUND							
36	NOT	FOUND							
37	NOT	FOUND							
38	NOT	FOUND							
39	NOT	FOUND							
40	NOT	FOUND							
41	NOT	FOUND							
42	NOT	FOUND							
43	NOT	FOUND							
44	106	374	12:28	3	1.036	A BB	262.	0.294 UG/L	0.09
45	NOT	FOUND							
46	NOT	FOUND							
47	106	374	12:28	3	1.036	A BB	262.	0.294 UG/L	0.09

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
1	6:04	1.01	1.000	1.00	50.00	50.00	1.000	1.000	1.00
2	7:38	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
3	12:02	1.00	1.000	1.00	50.00	50.00	1.000	1.000	1.00
4	6:56	1.00	1.143	0.99	46.96	50.00	1.391	1.481	0.94
5	9:48	1.00	0.814	1.00	50.04	50.00	0.961	0.960	1.00
6	13:54	1.00	1.155	1.00	48.55	50.00	0.808	0.832	0.97
7	1:38		0.269						

12/13/94

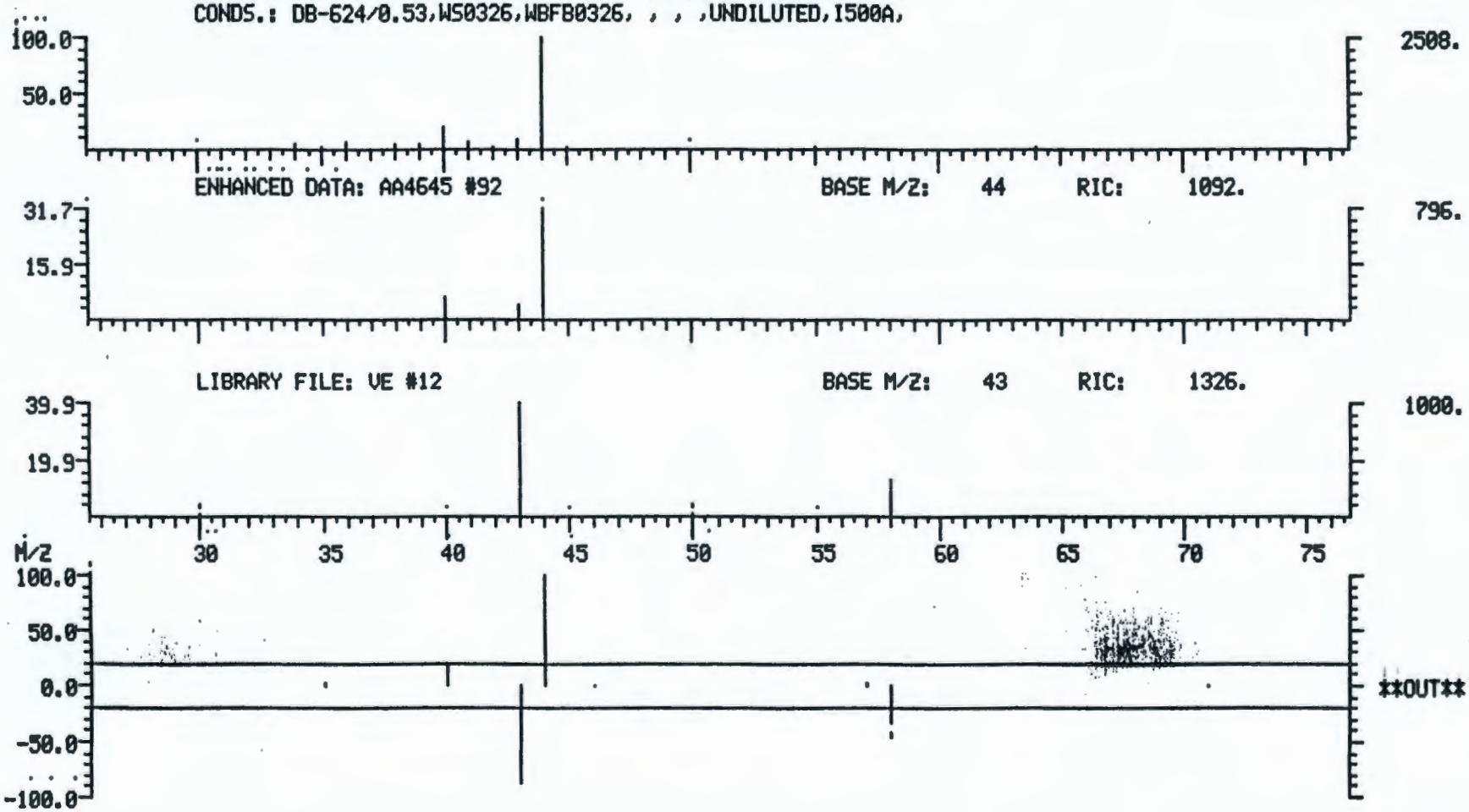
VBLK 3/26/94

TARGET COMPOUND COMPARISON

COMPOUND: C035 ACETONE

4/14/94

RAW DATA: AA4645 #92 BASE M/Z: 44 RIC: 4408.
03/26/94 13:56
SAMPLE: CLP, , ,VBLKAA4645W,LOW,SOIL,AA4645,VOA,BLANK,
CONDS.: DB-624/0.53,WS0326,WBFB0326, , , ,UNDILUTED,I500A,



Rad 12/13/94

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DEC 1994
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Validation
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MEMORANDUM

TO: 200-UP-1 Round 1 Soil Sampling Project QA Record December 21, 1994

FR: Sandra Schildt, Golder Associates Inc.

RE: SEMIVOLATILES DATA VALIDATION SUMMARY FOR DATA PACKAGE W0010-ITC-021 (943-1610.048,W0010sv.up1)

INTRODUCTION

This memorandum presents the results of data validation on data package W0010-ITC-021 prepared by International Technology Corporation. A list of the samples validated along with the analytes reported and the method of analysis is provided in the following table.

SAMPLE ID	MEDIA	ANALYSIS
B0BJ01*	SOIL	SEMIVOLATILES
B0BJ02	SOIL	SEE ATTACHMENT 4

* - Indicates sample results which were 100% recalculated.

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

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

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

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

Completeness. The data package was complete for all requested analyses. Two samples (2) were validated in this data set with a total of 128 determinations reported, all of which were deemed valid. This results in a completeness of 100% which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

The following minor deficiencies were identified during validation which required qualification of data.

Laboratory Blanks

- Bis(2-ethylhexyl)phthalate was detected but not reported in the laboratory blank because it was detected at less than 1 µg/ml in the extract. The raw quantitation sheets were compared and based on the 10x rule, the associated sample result was qualified as undetected. Attachments 2 and 5 provide a summary of the samples and data qualification applied.

TENTATIVELY IDENTIFIED COMPOUND EVALUATION

Tentatively identified compounds (TICs) were evaluated during validation and qualified as follows:

- TICs were detected in the samples and determined to be valid, resulting in qualification of the results as presumptive and valid (JN).
- TICs were detected in the samples and identified as common laboratory contaminant, resulting in qualification of the results as unusable (R) as shown in attachment 3.

FIELD QUALITY CONTROL

- Sample B0BJ02 was identified as an equipment blank. No target compounds were detected in B0BJ02 but tentatively identified compounds were detected in B0BJ02. No qualification was applied in accordance with the validation procedures.

REFERENCES

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994; Westinghouse Hanford Company, Richland, Washington.

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

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ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected in the associated laboratory blank. This qualifier is applied by the laboratory. During the process of data validation this qualifier may be replaced by other appropriate qualifiers as defined by the validation procedures. The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration reported may not accurately reflect the sample quantitation limit. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. This qualifier may be applied by the laboratory to indicate a concentration which is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). During data validation this qualifier may be applied to indicate a minor quality control deficiency. However in either case, the associated data should be considered usable for decision making purposes.

NJ - Indicates presumptive evidence of a constituent at an estimated value. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

N - Indicates presumptive evidence of a constituent. This qualifier is normally applied to GC analysis data (such as organochlorine pesticide and PCB data). The associated data should be considered usable for decision making purposes.

JN - Indicates a tentatively identified compound (TIC) whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for decision making purposes.

UJN- Indicates a tentatively identified compound (TIC) that has been determined to be presumptive and valid (JN) in terms of identification and quantitation and has been qualified as undetected due to associated blank contamination.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported has been qualified as unusable due to a major quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

WHC-SD-EN-SPP-002. Rev. 2

DATA QUALIFICATION SUMMARY - FORM B-7

PKG: W0010-ITC-021	REVIEWER: S. Schildt	DATE: 12/14/94	PAGE 1 OF 1
COMMENTS: Semivolatiles			
PARAMETER	QUALIFIER	SAMPLES AFFECTED	REASON
Bis(2-ethylhexyl)phthalate	U	B0BJ02	Compound detected in the laboratory blank

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ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0010-ITC-021

	Samp#	B0BJ01		B0BJ02	
	Date	3-18-94		3-18-94	
	Location	299-W19-35		299-W19-35	
	Depth	245.00 - 247.00		---	
	Type	SOIL		SOIL	
	Comments			EQUIP. BLANK	
Parameter	Units	Result	Q	Result	Q
PHENOL	UG/KG	350.000	U	330.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG	350.000	U	330.000	U
2-CHLOROPHENOL	UG/KG	350.000	U	330.000	U
1,3-DICHLOROBENZENE	UG/KG	350.000	U	330.000	U
1,4-DICHLOROBENZENE	UG/KG	350.000	U	330.000	U
1,2-DICHLOROBENZENE	UG/KG	350.000	U	330.000	U
2-METHYLPHENOL	UG/KG	350.000	U	330.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	350.000	U	330.000	U
4-METHYLPHENOL	UG/KG	350.000	U	330.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	350.000	U	330.000	U
HEXACHLOROETHANE	UG/KG	350.000	U	330.000	U
NITROBENZENE	UG/KG	350.000	U	330.000	U
ISOPHORONE	UG/KG	350.000	U	330.000	U
2-NITROPHENOL	UG/KG	350.000	U	330.000	U
2,4-DIMETHYLPHENOL	UG/KG	350.000	U	330.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	350.000	U	330.000	U
2,4-DICHLOROPHENOL	UG/KG	350.000	U	330.000	U
1,2,4-TRICHLOROBENZENE	UG/KG	350.000	U	330.000	U
NAPHTHALENE	UG/KG	350.000	U	330.000	U
4-CHLOROANILINE	UG/KG	350.000	U	330.000	U
HEXACHLOROBUTADIENE	UG/KG	350.000	U	330.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG	350.000	U	330.000	U
2-METHYLNAPHTHALENE	UG/KG	350.000	U	330.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	350.000	U	330.000	U
2,4,6-TRICHLOROPHENOL	UG/KG	350.000	U	330.000	U
2,4,5-TRICHLOROPHENOL	UG/KG	860.000	U	800.000	U
2-CHLORONAPHTHALENE	UG/KG	350.000	U	330.000	U
2-NITROANILINE	UG/KG	860.000	U	800.000	U
DIMETHYLPHTHALATE	UG/KG	350.000	U	330.000	U
ACENAPHTHYLENE	UG/KG	350.000	U	330.000	U
2,6-DINITROTOLUENE	UG/KG	350.000	U	330.000	U
3-NITROANILINE	UG/KG	860.000	U	800.000	U
ACENAPHTHENE	UG/KG	350.000	U	330.000	U
2,4-DINITROPHENOL	UG/KG	860.000	U	800.000	U
4-NITROPHENOL	UG/KG	860.000	U	800.000	U
DIBENZOFURAN	UG/KG	350.000	U	330.000	U
2,4-DINITROTOLUENE	UG/KG	350.000	U	330.000	U
DIETHYLPHTHALATE	UG/KG	350.000	U	330.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	350.000	U	330.000	U
FLUORENE	UG/KG	350.000	U	330.000	U
4-NITROANILINE	UG/KG	860.000	U	800.000	U

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

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Validated Data Summary, Data Package: W0010-ITC-021

	Samp#	B0BJ01		B0BJ02	
	Date	3-18-94		3-18-94	
	Location	299-W19-35		299-W19-35	
	Depth	245.00 - 247.00		0.00 - 0.00	
	Type	SOIL		SOIL	
	Comments			EQUIP. BLANK	
Parameter	Units	Result	Q	Result	Q
4,6-DINITRO-2-METHYLPHENOL	UG/KG	860.000	U	800.000	U
N-NITROSODIPHENYLAMINE	UG/KG	350.000	U	330.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	350.000	U	330.000	U
HEXACHLOROBENZENE	UG/KG	350.000	U	330.000	U
PENTACHLOROPHENOL	UG/KG	860.000	U	800.000	U
PHENANTHRENE	UG/KG	350.000	U	330.000	U
ANTHRACENE	UG/KG	350.000	U	330.000	U
CARBAZOLE	UG/KG	350.000	U	330.000	U
DI-N-BUTYLPHTHALATE	UG/KG	350.000	U	330.000	U
FLUORANTHENE	UG/KG	350.000	U	330.000	U
PYRENE	UG/KG	350.000	U	330.000	U
BUTYLBENZYLPHTHALATE	UG/KG	350.000	U	330.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	350.000	U	330.000	U
BENZO(A)ANTHRACENE	UG/KG	350.000	U	330.000	U
CHRYSENE	UG/KG	350.000	U	330.000	U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	350.000	U	330.000	U
DI-N-OCTYLPHTHALATE	UG/KG	350.000	U	330.000	U
BENZO(B)FLUORANTHENE	UG/KG	350.000	U	330.000	U
BENZO(K)FLUORANTHENE	UG/KG	350.000	U	330.000	U
BENZO(A)PYRENE	UG/KG	350.000	U	330.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	350.000	U	330.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	350.000	U	330.000	U
BENZO(G,H,I)PERYLENE	UG/KG	350.000	U	330.000	U

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

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Verified 19/15/94

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJ01
~~4034300IAP~~
J.C. 5/20/94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4456

Sample wt/vol: 30.1 (g/mL) G Lab File ID: AA4456

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: 7 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/18/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)Ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-Di-n-Propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy)Methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-Methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	860	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	860	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
99-09-2	3-Nitroaniline	860	U
83-32-9	Acenaphthene	350	U

12/13/94

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOB101
~~40343001AF~~
J.C. 5/20/94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4456

Sample wt/vol: 30.1 (g/mL) G Lab File ID: AA4456

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: 7 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/18/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	860	U
100-02-7	4-Nitrophenol	860	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	860	U
534-52-1	4,6-Dinitro-2-Methylphenol	860	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	860	U
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-Butylphthalate	350	U
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U
56-55-3	Benzo(a)Anthracene	350	U
218-01-9	Chrysene	350	U
117-81-7	bis(2-Ethylhexyl)Phthalate	350	U
117-84-0	Di-n-Octyl Phthalate	350	U
205-99-2	Benzo(b)Fluoranthene	350	U
207-08-9	Benzo(k)Fluoranthene	350	U
50-32-8	Benzo(a)Pyrene	350	U
193-39-5	Indeno(1,2,3-cd)Pyrene	350	U
53-70-3	Dibenz(a,h)Anthracene	350	U
191-24-2	Benzo(g,h,i)Perylene	350	U

(1) - Cannot be separated from Diphenylamine

12/13/94

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBJ01

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4456

Sample wt/vol: 30.1 (g/mL) G Lab File ID: AA4456

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: 7 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/18/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 9.0

Number TICs found: 6

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	UNKNOWN	4.55	130	~~AJ~~	JN
2. 123-42-2	2-PENTANONE, 4-HYDROXY-4-MET	4.82	6200	~~AJN~~	R
3.	UNKNOWN	16.20	150	~~J~~	JN
4.	UNKNOWN	18.95	170	~~J~~	JN
5.	UNKNOWN	20.25	130	~~J~~	JN
6.	UNKNOWN	22.55	93	~~J~~	JN

12/13/94

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBJ02
~~40343002AF~~
J.C. 5/20/94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4509

Sample wt/vol: 30.0 (g/mL) G Lab File ID: AA4509

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/18/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.5

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)Ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-Propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)Methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	800	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
606-20-2	2,6-Dinitrotoluene	330	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	330	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BJ02
~~40343002AF~~
J.C. 5/20/94

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4509

Sample wt/vol: 30.0 (g/mL) G Lab File ID: AA4509

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/18/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.5

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	800	U
100-02-7	4-Nitrophenol	800	U
132-64-9	Dibenzofuran	330	U
121-14-2	2,4-Dinitrotoluene	330	U
84-66-2	Diethylphthalate	330	U
7005-72-3	4-Chlorophenyl-phenylether	330	U
86-73-7	Fluorene	330	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-Methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	800	U
85-01-8	Phenanthrene	330	U
120-12-7	Anthracene	330	U
86-74-8	Carbazole	330	U
84-74-2	Di-n-Butylphthalate	330	U
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)Anthracene	330	U
218-01-9	Chrysene	330	U
117-81-7	bis(2-Ethylhexyl)Phthalate	~~330~~ 41	~~J~~ U
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b)Fluoranthene	330	U
207-08-9	Benzo(k)Fluoranthene	330	U
50-32-8	Benzo(a)Pyrene	330	U
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U
53-70-3	Dibenz(a,h)Anthracene	330	U
191-24-2	Benzo(g,h,i)Perylene	330	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOBJ02

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4509

Sample wt/vol: 30.0 (g/mL) G Lab File ID: AA4509

Level: (low/med) LOW Date Received: 03/24/94

% Moisture: 0 decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/18/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.5

Number TICs found: 5

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	UNKNOWN	4.57	120	~~AJ~~	JN
2. 123-42-2	2-PENTANONE, 4-HYDROXY-4-MET	4.82	5600	~~AJN~~	R
3.	UNKNOWN	18.93	330	~~J~~	JN
4.	UNKNOWN	20.25	260	~~J~~	JN
5.	UNKNOWN	20.87	100	~~J~~	JN

12/13/94

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Westinghouse Hanford Company
P.O. Box 1970
Richland, WA 99352
Attn: J.A. Lerch

April 28, 1994

Job Number: 253

This is the Certificate of Analysis for the following samples:

SDG:	W0010
Client Project ID:	Westinghouse Hanford
Date Received by Lab:	March 24, 1994
Number of Samples:	Four (4)
Sample Type:	Soil - three (3), Water - one (1)

JUN 1994 RECEIVED SDLA

I. Introduction

On March 24, 1994, three (3) soil samples and one (1) water sample arrived at ITAS-Richland, Washington and were transferred to ITAS-Knoxville for chemical analysis. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that the data are not blank corrected. Soil results are reported on a dry weight basis.

The samples were analyzed for Target Compound List (TCL) volatiles by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 3/90 Statement of Work.

Reviewed and Approved:

Sheree' A. Schneider
Project Manager

RECORD COPY

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

II. Analytical Results/Methodology (Continued)

The samples were analyzed for Target Compound List (TCL) semivolatiles by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 3/90 Statement of Work.

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

The samples were analyzed for total cyanide in accordance with the EPA CLP ILM03 Statement of Work.

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

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

III. Quality Control

The volatiles analyses were performed by purge and trap with a J & W DB-624 capillary column on a Hewlett-Packard 5970 GC/MS/DS and a Finnigan INCOS 500 GC/MS/DS. All QC results were within method specified limits.

The semivolatiles analyses were performed by direct injection of sample extract on a Restek XTI-5 capillary column on a Finnigan INCOS XL GC/MS/DS. All QC results were within method specified limits.

Data were reported with qualifiers as follows:

U - Compound analyzed for but not detected; value given is quantitation limit.
E - Compound exceeded calibration range.
D - Compound analyzed at a secondary dilution factor.
J - Compound detected but below quantitation limit; value estimated.
S - Spiked compound.
B - Compound found in method blank.
A - Suspected aldol condensation product.
Y - Indistinguishable isomer in tentatively identified compounds.
N - Presumptive evidence of compound presence.

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

III. Quality Control (Continued)

The samples were digested on April 11, 1994 for ICP and GFAA. The CVAA analysis for mercury was performed on April 7, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from April 11 through April 14, 1994; the remaining metals were analyzed by ICP on April 13, 1994. All run QC was acceptable. A duplicate/spike pair was prepared using sample ~~0343001~~. BOBJ01 P. 61. Spike recovery (accuracy) results were within acceptance limits for all parameters by ICP, GFAA and CVAA analyses except for arsenic by GFAA analysis. As the titanium concentration is greater than four times (4X) the spike added, spiking criteria do not apply for this analyte. Duplicate RPD (precision) results were within acceptance limits for all parameters by ICP, GFAA and CVAA analyses except for chromium by ICP analysis.

Data were reported with qualifiers as follows:

"C" Qualifiers

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

"O" Qualifiers

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

"M" Qualifiers

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

Miscellaneous

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

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

III. Quality Control (Continued)

On April 15, 1994, the samples were analyzed for nitrate-nitrite by cadmium reduction followed by colorimetric determination using the LACHAT QuikChem automated flow injection analyzer (QuikChem Method No. 10-107-04-1-C).

The samples were analyzed for anions on April 20 and April 22, 1994. Matrix spike/matrix spike duplicate analyses were performed using sample ~~4-03-430-01E~~ ~~AA445A~~ BOB501
SCG 5/30/94

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

III. Quality Control (Continued)

Table I is a cross reference between client IDs and abbreviated client IDs.

TABLE I

WHC ID	Richland ID	Knoxville ID	Matrix	Test
BOBJO1	4-03-430-01A	AA4455	SOIL	VOC
BOBJO1	4-03-430-01B	AA4456	SOIL	SVOC
BOBJO1	4-03-430-01C	AA4457	SOIL	METALS
BOBJO1	4-03-430-01D	AA4458	SOIL	CN
BOBJO1	4-03-430-01E	AA4459	SOIL	ANIONS
BOBJO1	4-03-430-01F	AA4460	SOIL	NO3NO2
BOBJO2	4-03-430-02A	AA4508	SOIL	VOC
BOBJO2	4-03-430-02B	AA4509	SOIL	SVOC
BOBJO2	4-03-430-02C	AA4510	SOIL	METALS
BOBJO2	4-03-430-02D	AA4511	SOIL	CN
BOBJO2	4-03-430-02E	AA4512	SOIL	ANIONS
BOBJO2	4-03-430-02F	AA4513	SOIL	NO3NO2
BOBJO4	4-03-430-03A	AA4514	SOIL	VOC
TRIP BLANK	4-03-430-04A	AA4515	WATER	VOC

12/13/94

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

IV. Certification

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

Reviewed and Approved:

Sheree' A. Schneider
Project Manager

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priority [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-~~049~~ 646 WVS 3-23-94
Ice Chest No.: WHC 19	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0- 0369-31	Bill of Lading/Air Bill No.: NA

Possible Sample Hazards/Remarks: NONE OBSERVED

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

SDG W0010

SAMPLE ANALYSIS: 4-08-430

			Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4		
			Type of Container	aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs		
			No. of Container(s)	1	1	1	1	1	1	1	1					1		
			Volume	120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml		
				VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)		
				A	B	C	D	E	F									
Sample No.	Matrix*	Date Sampled	Time Sampled															
01 BOBJ01	S	3-18-94	0900	X	X	X	X	X	X	X	X							
02 BOBJ02	S	3-18-94	0830	X	X	X	X	X	X	X	X							
03 BOBJ04	S	3-18-94	0700													X		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
W.V. Setzer	3-22-94 1125	R. Boyd Jr	3/22/94 12:02

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

(BOBJ01403101) (BOBJ02-40343102)

LOWEST HOLDING TIME = 7DAYS

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

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

WO#253

024

9613475.0368

0000020

WO#253

INTERNATIONAL TECHNOLOGY CORPORATION

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

Reference Document No.[30] 340338

Page 2 of 2

Project Name SAF 94-046

Project No. 826-W0010

Samples Shipment Date 3-23-94

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
A-03-430-02C	BOBJ02 / Soil	3/18 0830	glass	500ml	Cool 4°	ICP, GFAA Metals, Hg		
D				250ml		CN	Plastic	FOR LAB USE ONLY
E						EPA 300.0		
F				120ml		EPA 353.2		
A-03-430-03A	BOBJ64	3/18 0700				VOA	25	FOR LAB USE ONLY
A-03-430-04A	Trip Blank	3/23/94		40ml		VOA		
B						VOA		FOR LAB USE ONLY
								FOR LAB USE ONLY
								FOR LAB USE ONLY
		3/23/94						FOR LAB USE ONLY
								FOR LAB USE ONLY
								FOR LAB USE ONLY
								FOR LAB USE ONLY

White: To accompany samples

Yellow: Field copy

*See back of form for special instructions.

MCA 3/15/91

12/13/

025

9613475.0369

0000023

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-1		DATA PACKAGE: W0010-ITC-021
VALIDATOR: L Schulobt	LAB: IT	DATE: 12/13/94
CASE:		SDG: W0010

ANALYSES PERFORMED

☐ CLP Volatiles	☐ SW-846 8240 (cap column)	☐ SW-846 8260 (packed column)	☑ CLP Semivolatiles	☐ SW-846 8270 (cap column)	☐ SW-846 (packed column)
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX BOBJ01, 2 / soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

027

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

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

Are initial calibrations acceptable? . . . . . Yes No N/A

Are continuing calibrations acceptable? . . . . . Yes No N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No ~~N/A~~ 12/13/

Are field/trip blank results acceptable? . . . . . Yes No ~~N/A~~

Comments: BEHP was detected in the lab blank @ concentration < level considered for reporting purposes but within 10x the concentration detected in BOBJ02. Associated results qualified as non-detect (U). No Target compound detected in field blank

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . . Yes No N/A

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

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

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? . . . . . Yes No N/A

Are field duplicate RPD values acceptable? . . . . . Yes No N/A

Are field split RPD values acceptable? . . . . . Yes No N/A

Comments:

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . Yes No N/A

Are internal standard areas acceptable? . . . . . Yes No N/A

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

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

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

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

Do results meet the CRQLs? . . . . . Yes No N/A

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

Comments:

HOLDING TIME SUMMARY

SDG: W0010-ITC-021	VALIDATOR: L. Schilcht	DATE: 12/13/94	PAGE 1 OF 1
COMMENTS: Semivolatiles			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOBJ01,2	BNA	3/18/94	3/29/94	4/18/94	11	20	none

9613475.0374

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLKAA4733A

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4733

Sample wt/vol: 30.0 (g/mL) G Lab File ID: AA4733

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)Ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-Propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)Methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	800	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
606-20-2	2,6-Dinitrotoluene	330	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	330	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLKAA4733A

Lab Name: ITAS-KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: 253 SAS No.: _____ SDG No.: W0010

Matrix: (soil/water) SOIL Lab Sample ID: AA4733

Sample wt/vol: 30.0 (g/mL) G Lab File ID: AA4733

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 03/29/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/06/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	800	U
100-02-7	4-Nitrophenol	800	U
132-64-9	Dibenzofuran	330	U
121-14-2	2,4-Dinitrotoluene	330	U
84-66-2	Diethylphthalate	330	U
7005-72-3	4-Chlorophenyl-phenylether	330	U
86-73-7	Fluorene	330	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-Methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	800	U
85-01-8	Phenanthrene	330	U
120-12-7	Anthracene	330	U
86-74-8	Carbazole	330	U
84-74-2	Di-n-Butylphthalate	330	U
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	330	U
56-55-3	Benzo(a)Anthracene	330	U
218-01-9	Chrysene	330	U
117-81-7	bis(2-Ethylhexyl)Phthalate	330	U
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b)Fluoranthene	330	U
207-08-9	Benzo(k)Fluoranthene	330	U
50-32-8	Benzo(a)Pyrene	330	U
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U
53-70-3	Dibenz(a,h)Anthracene	330	U
191-24-2	Benzo(g,h,i)Perylene	330	U

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

3/90

12/13/94

BOB502

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount	%Tot
61	NOT FOUND								
62	NOT FOUND								
63	178	949	15:49	4	1.005	A BB	136.	0.035 UG/ML	0.01
64	NOT FOUND								
65	149	1033	17:13	4	1.094	A BB	720.	0.122 UG/ML	0.03
66	NOT FOUND								
67	202	1152	19:12	5	0.896	A BB	464.	0.116 UG/ML	0.03
68	149	1219	20:19	5	0.948	A BB	278.	0.100 UG/ML	0.02
69	NOT FOUND								
70	228	1286	21:26	5	1.000	A BB	72.	0.023 UG/ML	0.01
71	149	1278	21:18	5	0.994	A VB	4518.	1.239 UG/ML	0.30
72	NOT FOUND								
73	NOT FOUND								
74	NOT FOUND								
75	NOT FOUND								
76	NOT FOUND								
77	NOT FOUND								
78	NOT FOUND								
79	NOT FOUND								
80	NOT FOUND								
81	NOT FOUND								
82	NOT FOUND								
83	NOT FOUND								

BEHP

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
51	12:36		1.036						
52	12:40		1.041						
53	11:45		0.966						
54	13:10	1.00	1.082	1.00	0.02	25.00	0.001	1.379	0.00
55	13:22		1.099						
56	13:25		1.103						
57	13:35		1.116						
58	13:39		0.867						
59	13:40		0.868						
60	14:34		0.925						
61	14:59		0.951						
62	15:26		0.980						
63	15:49	1.00	1.004	1.00	0.04	25.00	0.002	1.099	0.00
64	15:56		1.012						
65	17:14	1.00	1.094	1.00	0.12	25.00	0.008	1.667	0.00
66	18:43		1.188						
67	19:11	1.00	0.894	1.00	0.12	25.00	0.007	1.519	0.00
68	20:20	1.00	0.948	1.00	0.10	25.00	0.004	1.064	0.00
69	21:21		0.995						
70	21:25	1.00	0.998	1.00	0.02	25.00	0.001	1.216	0.00
71	21:19	1.00	0.994	1.00	1.24	25.00	0.069	1.391	0.05
72	21:30		1.002						
73	22:31		0.903						
74	23:51		0.957						
75	23:54		0.959						
76	24:46		0.993						
77	28:49		1.156						
78	28:48		1.155						
79	29:59		1.203						
80	13:45		1.130						
81	5:07		0.734						

12/3/94

SRIK

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount		%Tot
61	NOT FOUND									
62	NOT FOUND									
63	NOT FOUND									
64	NOT FOUND									
65	NOT FOUND									
66	NOT FOUND									
67	NOT FOUND									
68	NOT FOUND									
69	NOT FOUND									
70	NOT FOUND									
71	149	1288	21:28	5	0.993	A BB	402.	0.191	UG/ML	0.04
72	NOT FOUND									
73	NOT FOUND									
74	NOT FOUND									
75	NOT FOUND									
76	NOT FOUND									
77	NOT FOUND									
78	NOT FOUND									
79	NOT FOUND									
80	NOT FOUND									
81	NOT FOUND									
82	NOT FOUND									
83	NOT FOUND									

BEHP

No	Ret(L)	Ratio	RRT(L)	Ratio	Amnt	Amnt(L)	R.Fac	R.Fac(L)	Ratio
51	12:50		1.034						
52	12:52		1.036						
53	11:58		0.964						
54	13:24		1.079						
55	13:36		1.095						
56	13:40		1.101						
57	13:46		1.109						
58	13:51		0.866						
59	13:54		0.869						
60	14:48		0.925						
61	15:13		0.951						
62	15:39		0.978						
63	16:04		1.004						
64	16:10		1.010						
65	17:28		1.092						
66	18:55		1.182						
67	19:23		0.896						
68	20:30		0.948						
69	21:31		0.995						
70	21:36		0.998						
71	21:29	1.00	0.993	1.00	0.19	25.00	0.009	1.116	0.01
72	21:42		1.003						
73	22:43		0.901						
74	24:06		0.956						
75	24:09		0.958						
76	25:03		0.993						
77	29:11		1.157						
78	29:11		1.157						
79	30:24		1.206						
80	14:00		1.128						
81	5:07		0.734						

12/13/94

9613475.0379

RECORD COPY

MEMORANDUM

JAN 1995

[redacted]

TO: 200-UP-1 Round 1 Soil Sampling Project QA Record December 29, 1994

FR: Sandra Schildt, Golder Associates Inc.

RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE W0010-ITC-021 (943-1610.048,W0010chm.up1)

INTRODUCTION

This memorandum presents the results of data validation on data package W0010-ITC-021 prepared by International Technology Corporation. A list of the samples validated along with the analytes reported and the method of analysis is provided in the following table.

SAMPLE ID	MEDIA	ANALYSIS
B0BJ01*	SOIL	GENERAL CHEMISTRY
B0BJ02	SOIL	SEE ATTACHMENT 4

* - Indicates sample results which were 100% recalculated.

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

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met with the exception of the minor deficiencies described below.

Accuracy. Goals for accuracy were met with the exceptiom of the minor deficiencies described below.

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

Detection Limits. Detection limit goals were met.

Replaced Page
12/30/94

Completeness. The data package was complete for all requested analyses with the exception of nitrate, nitrite, and phosphate. Two samples (2) were validated in this data set with a total of 8 determinations reported all of which were deemed valid. This results in a completeness of 100% which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

Laboratory Spike

- Spike recoveries for chloride and sulfate were less than the control limit. Attachments 2 and 5 provide a summary of samples affected, qualification applied and supporting documentation.

Laboratory Duplicate

- The relative percent difference (RPD) for chloride was greater than the control limit. Attachments 2 and 5 provide a summary of samples affected, qualification applied and supporting documentation.

FIELD QUALITY CONTROL

- Sample B0BJ02 was identified as an equipment blank. Chloride, fluoride, and sulfate were detected in the equipment blanks. No qualification was applied in accordance with the validation procedures.

REFERENCES

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994; Westinghouse Hanford Company, Richland, Washington.

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

Replaced PRP 12/20/94

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for sample aliquot size, dilution factors and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and was not detected. Due to a minor quality control deficiency identified during data validation, the concentration reported may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.

BJ - Indicates the constituent was analyzed for and detected at a concentration less than the CRDL but greater then the IDL. Due to a minor quality control deficiency identified during data validation, The associated data have been qualified as estimated, but should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B-7

PKG: W0010-ITC-021	REVIEWER: S. Schildt	DATE: 12/14/94	PAGE 1 OF 1
COMMENTS: General Chemistry			
PARAMETER	QUALIFIER	SAMPLES AFFECTED	REASON
Chloride Sulfate	J	B0BJ01, B0BJ02	Spike sample recovery <75%
Chloride	J	B0BJ01, B0BJ02	Duplicate RPD > 35%

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0010-ITC-021

	Samp#	BOBJ01		BOBJ02	
	Date	3-18-94		3-18-94	
	Location	299-W19-35		299-W19-35	
	Depth	245.00 - 247.00		---	
	Type	SOIL		SOIL	
	Comments			EQUIP. BLANK	
Parameter	Units	Result	Q	Result	Q
FLUORIDE	MG/KG	0.400	U	0.440	
CHLORIDE	MG/KG	2.900	J	3.300	J
SULFATE	MG/KG	8.600	J	1.700	J
NITRATE+NITRITE	MG/KG	2.500	U	2.500	U

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

Replaced Validated Page Date

9613475.0386

ANION ANALYSIS

Laboratory Name:	ITAS-KNOXVILLE	SDG Number:	W0010
Contract Name:	Westinghouse Hanford	Job Number:	253
Client Sample ID:	~~4-03-430-01E~~ BOBJ01	Analysis Date:	04/20/94 & 04/22/94
Lab Sample ID:	AA4459 D2a	Confirmation Date:	N/A
Sample Matrix:	SOIL	Concentration Units:	mg/kg (ppm)

Compound	Result	Qualifier
chloride	2.9	+ J
fluoride	0.4	U
sulfate	8.6	+ J

+ - Positive result.

12/15/94

ANION ANALYSIS

Laboratory Name:	ITAS-KNOXVILLE	SDG Number:	W0010
Contract Name:	Westinghouse Hanford	Job Number:	253
Client Sample ID:	~~4-03-430-02E~~ BOBJ02 DFA	Analysis Date:	04/20/94 & 04/22/94
Lab Sample ID:	AA4512	Confirmation Date:	N/A
Sample Matrix:	SOIL	Concentration Units:	mg/kg (ppm)

Compound	Result	Qualifier
chloride	3.3	~~+~~ J
fluoride	0.44	+
sulfate	1.7	~~+~~ J

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

12/15/94

NITRATE/NITRITE ANALYSIS

Laboratory Name:	ITAS-KNOXVILLE	SDG Number:	W0010
Contract Name:	Westinghouse Hanford	Job Number:	253
Sample Matrix:	Soil	Analysis Date:	04/15/94
Concentration Units:	mg/kg (ppm)		

Client Sample ID	Lab Sample ID	Result	Qualifier
Method Blank	P6096	2.5	U
~~4-03-430-02E~~ BOBJ02DEA	AA4513	2.5	U
~~4-03-430-01E~~ BOBJ01DEA	AA4460	2.5	U

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

ADL 12/15/94

9613475.0390

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Westinghouse Hanford Company
P.O. Box 1970
Richland, WA 99352
Attn: J.A. Lerch

April 28, 1994

Job Number: 253

This is the Certificate of Analysis for the following samples:

SDG:	W0010
Client Project ID:	Westinghouse Hanford
Date Received by Lab:	March 24, 1994
Number of Samples:	Four (4)
Sample Type:	Soil - three (3), Water - one (1)

JUN 1994
RECEIVED
SDLA

I. Introduction

On March 24, 1994, three (3) soil samples and one (1) water sample arrived at ITAS-Richland, Washington and were transferred to ITAS-Knoxville for chemical analysis. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that the data are not blank corrected. Soil results are reported on a dry weight basis.

The samples were analyzed for Target Compound List (TCL) volatiles by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 3/90 Statement of Work.

Reviewed and Approved:

Sheree Schneider

Sheree' A. Schneider
Project Manager

RECORD COPY

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

II. Analytical Results/Methodology (Continued)

The samples were analyzed for Target Compound List (TCL) semivolatiles by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 3/90 Statement of Work.

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

The samples were analyzed for total cyanide in accordance with the EPA CLP ILM03 Statement of Work.

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

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

III. Quality Control

The volatiles analyses were performed by purge and trap with a J & W DB-624 capillary column on a Hewlett-Packard 5970 GC/MS/DS and a Finnigan INCOS 500 GC/MS/DS. All QC results were within method specified limits.

The semivolatiles analyses were performed by direct injection of sample extract on a Restek XTI-5 capillary column on a Finnigan INCOS XL GC/MS/DS. All QC results were within method specified limits.

Data were reported with qualifiers as follows:

U - Compound analyzed for but not detected; value given is quantitation limit.
E - Compound exceeded calibration range.
D - Compound analyzed at a secondary dilution factor.
J - Compound detected but below quantitation limit; value estimated.
S - Spiked compound.
B - Compound found in method blank.
A - Suspected aldol condensation product.
Y - Indistinguishable isomer in tentatively identified compounds.
N - Presumptive evidence of compound presence.

10/15/94

682-1-88

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

III. Quality Control (Continued)

The samples were digested on April 11, 1994 for ICP and GFAA. The CVAA analysis for mercury was performed on April 7, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from April 11 through April 14, 1994; the remaining metals were analyzed by ICP on April 13, 1994. All run QC was acceptable. A duplicate/spike pair was prepared using sample ~~0343001~~. B0BJ01 P61 Spike recovery (accuracy) results were within acceptance limits for all parameters by ICP, GFAA and CVAA analyses except for arsenic by GFAA analysis. As the titanium concentration is greater than four times (4X) the spike added, spiking criteria do not apply for this analyte. Duplicate RPD (precision) results were within acceptance limits for all parameters by ICP, GFAA and CVAA analyses except for chromium by ICP analysis.

Data were reported with qualifiers as follows:

"C" Qualifiers

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

"Q" Qualifiers

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

"M" Qualifiers

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

Miscellaneous

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

AAS 12/15/94

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

III. Quality Control (Continued)

On April 15, 1994, the samples were analyzed for nitrate-nitrite by cadmium reduction followed by colorimetric determination using the LACHAT QuikChem automated flow injection analyzer (QuikChem Method No. 10-107-04-1-C).

The samples were analyzed for anions on April 20 and April 22, 1994. Matrix spike/matrix spike duplicate analyses were performed using sample ~~4-03-430-01B.~~ AA4459 BOB101
SCG 5/30/94

AAS 12/15/94

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

III. Quality Control (Continued)

Table I is a cross reference between client IDs and abbreviated client IDs.

TABLE I

WHC ID	Richland ID	Knoxville ID	Matrix	Test
BOBJO1	4-03-430-01A	AA4455	SOIL	VOC
BOBJO1	4-03-430-01B	AA4456	SOIL	SVOC
BOBJO1	4-03-430-01C	AA4457	SOIL	METALS
BOBJO1	4-03-430-01D	AA4458	SOIL	CN
BOBJO1	4-03-430-01E	AA4459	SOIL	ANIONS
BOBJO1	4-03-430-01F	AA4460	SOIL	NO3NO2
BOBJO2	4-03-430-02A	AA4508	SOIL	VOC
BOBJO2	4-03-430-02B	AA4509	SOIL	SVOC
BOBJO2	4-03-430-02C	AA4510	SOIL	METALS
BOBJO2	4-03-430-02D	AA4511	SOIL	CN
BOBJO2	4-03-430-02E	AA4512	SOIL	ANIONS
BOBJO2	4-03-430-02F	AA4513	SOIL	NO3NO2
BOBJO4	4-03-430-03A	AA4514	SOIL	VOC
TRIP BLANK	4-03-430-04A	AA4515	WATER	VOC

12/15/94

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

IV. Certification

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

Reviewed and Approved:

Sheree' A. Schneider
Project Manager

12/15/94

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priority [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-049 646 WVS 3-23-94
Ice Chest No.: WHC 19	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0- 0369-31	Bill of Lading/Air Bill No.: NA
Possible Sample Hazards/Remarks: NONE OBSERVED		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

SDG W0010

4-03-430

Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4		
Type of Container	aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs		
No. of Container(s)	1	1	1	1	1	1	1	1					1		
Volume	120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml		
SAMPLE ANALYSIS	VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Mg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)		
	A	B	C	D	E	F									

	Sample No.	Matrix*	Date Sampled	Time Sampled	A	B	C	D	E	F									
01	BOBJ01	S	3-18-94	0900	X	X	X	X	X	X	X	X							
02	BOBJ02	S	3-18-94	0830	X	X	X	X	X	X	X	X							
03	BOBJ04	S	3-18-94	0700													X		

WO #253

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: W.V. Setzer	Date/Time: 3-22-94 1125	Received By: R. Boyd Jr	Date/Time: 3/22/94 12:02
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

(BOBJ01 4033101) (BOBJ02- 40343102)

LOWEST HOLDING TIME = 7DAYS

Matrix*

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

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-928 (12/92)

019

4/15/94

9613475.0397

0000020

WO#253

INTERNATIONAL TECHNOLOGY CORPORATION

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

Reference Document No.[30] 340338

Page 2 of 2

Project Name SAF 94-046

Project No. 876 W0010

Samples Shipment Date 3-23-94

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
A03-430-02C	BOBJ02 / soil	3/18 0830	glass	500 ml	Cool 4°	ICP, GFAA Metals, Hg		
D				250 ml		CN	Plastic	FOR LAB USE ONLY
E						EPA 300.0		
F				120 ml		EPA 353.2		
4-03-430-03A	BOBJ04	3/18 0700				VOA	25	FOR LAB USE ONLY
4-03-430-04A	Trip Blank	3/23/94		40 ml		VOA		
B						VOA		FOR LAB USE ONLY
								FOR LAB USE ONLY
								FOR LAB USE ONLY
	JH	3/23/94						FOR LAB USE ONLY
								FOR LAB USE ONLY
								FOR LAB USE ONLY
								FOR LAB USE ONLY

White: To accompany samples

Yellow: Field copy

*See back of form for special instructions.

MCA 3/15/91

9613475.0398

0000023

020

12/15/94

9613475.0399

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-1		DATA PACKAGE: W0010-IYC-021
VALIDATOR: L. Schilabi	LAB: IT	DATE: 12/14/94
CASE:		SDG: W0010

ANALYSES PERFORMED

☑ Anions/IC	☐ TOC	☐ TOX	☐ TPH-418.1	Oil and Grease	Alkalinity
☐ Ammonia	☐ BOD/COD	☐ Chloride	☐ Chromium-VI	☐ pH	☑ NO_3/NO_2
☐ Sulfate	☐ TDS	☐ TKN	☐ Phosphate	☐	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX B0BJC1, 2 / soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No N/A

Is a case narrative present? . . . . . Yes No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . Yes No N/A

Comments:

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

Was initial calibration performed for all applicable analyses? (Yes) No N/A

Are initial calibration results acceptable? . . . . . (Yes) No N/A

Was a calibration check performed for all applicable analyses? (Yes) No N/A

Are calibration check results acceptable? . . . . . (Yes) No N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . (Yes) No N/A

Are laboratory blank results acceptable? . . . . . (Yes) No N/A

Were field/trip blanks analyzed? . . . . . (Yes) No N/A

Are field/trip blank results acceptable? . . . . . Yes (No) N/A

Comments: Cl, F, and SO_4 detected in field blank No qualification required.

5. ACCURACY

Were spike samples analyzed at the required frequency? . . . . (Yes) No N/A

Are spike recoveries acceptable? . . . . . Yes (No) N/A

Were LCS analyses performed at the required frequency? . . . . (Yes) No N/A

Are LCS recoveries acceptable? . . . . . (Yes) No N/A

Comments: % R of Cl, and SO_4 were less than 75% but greater than 30% in the spike Associated results qualified as estimated (J)

6. PRECISION

Were laboratory duplicate samples analyzed at the required frequency? . . . . . (Yes) No N/A

Are laboratory duplicate sample RPD values acceptable? . . . . Yes (No) N/A

Are field duplicate RPD values acceptable? . . . . . Yes No (N/A)

Are field split RPD values acceptable? . . . . . Yes No (N/A)

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments: The RPD for chloride is >35%. Associated results are qualified as estimated (J).

7. ANALYTE QUANTITATION

Was analyte quantitation performed properly? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A 12/14/94

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

Are results calculated properly? . . . . . Yes No N/A

Do results meet the CRDLs? . . . . . Yes No N/A

Comments: NO_3, NO_2, and PO_4 results not reported. See memorandum attached to checklist

HOLDING TIME SUMMARY

SDG: W0010-ITC-021 VALIDATOR: A. Schilde DATE: 12/14/94 PAGE 1 OF 1

COMMENTS: General Chemistry

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOBJ01	~~3/1~~ 12/14/94 F, Cl, SO4	3/18/94	4/22/94	4/22/94	35	35	none
BOBJ02	F, Cl, SO4	3/18/94	4/20/94	4/20/94	33	33	
BOBJ01,2	NO3/NO2	3/18/94	4/15/94	4/15/94	28	28	

9613475.0403

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

MATRIX SPIKE/MATRIX SPIKE DUPLICATE ANALYSIS

Laboratory Name:	ITAS-KNOXVILLE	SDG Number:	W0010
Contract Name:	Westinghouse Hanford	Job Number:	253
Client Sample ID:	~~4-03-430-01E~~ BOBJ01 DEA	Extraction Date:	N/A
Lab Sample ID:	AA4459 OS/MS/MSD	Analysis Date:	03/28/94
Sample Matrix:	SOIL	Concentration Units:	mg/kg (ppm)

Compound	Orig. Sample Result		Conc. Spike Added	Conc. MS	% Rec.	Conc. MSD	%Rec.	RPD
chloride	2.716	+	2	3.697	49	3.075	18	92
fluoride	0.4	U	2	2.168	108.4	1.95	97.5	10.6
sulfate	8.041	+	10	14.427	63.9	15.166	71.2	10.8

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

12/15/94

Quanterra

Memorandum

TO: Joan Kessner

FROM: Jodie Carnes

DATE: December 20, 1994

SUBJECT: W0010 anion data

The Knoxville laboratory did not report nitrite, nitrate and phosphate by method 300.0 due to a login oversight. Nitrite, nitrate and phosphate were not analyzed therefore the data cannot be regenerated. Please accept our apology for any inconvenience this may cause.

9613475.0406

RECORD COPY

MEMORANDUM

DEC 1994 RECEIVED Validation Log In

TO: 200-UP-1 Round 1 Soil Sampling Project QA Record December 15, 1994

FR: Sandra Schildt, Golder Associates Inc.

RE: METALS DATA VALIDATION SUMMARY FOR DATA PACKAGE W0010-ITC-021 (943-1610.048,w0010ino.up1)

INTRODUCTION

This memorandum presents the results of data validation on data package W0010-ITC-071 prepared by International Technology Corporation. A list of the samples validated along with the analytes reported and the method of analysis is provided in the following table.

SAMPLE ID	MEDIA	ANALYSIS
B0BJ01*	SOIL	INORGANICS
B0BJ02	SOIL	SEE ATTACHMENT 4

* - Indicates sample results which were 100% recalculated.

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

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met with the exception of the minor deficiencies described below.

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

Detection Limits. Detection limit goals were met.

Completeness. The data package was complete for all requested analyses. Two samples (2) were validated in this data set with a total of 50 determinations reported, all of which were deemed

valid. This results in a completeness of 100% which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

The following minor deficiencies were identified during validation which required qualification of data.

Laboratory Blanks

- Alluminum, calcium, magnesium, sodium, and zinc were detected in the preparation blank at positive values. Attachments 2 and 5 provide a summary of the samples and data qualification applied.

Spike Samples

- Spike sample recovery of arsenic was outside control limits. Attachments 2 and 5 provide a summary of the samples and data qualification applied.

FIELD QUALITY CONTROL

- Sample B0BJ02 was identified as an equipment blank. Barium, chromium, iron, manganese, and titanium were detected in the equipment blanks. No qualification was applied in accordance with the validation procedures.

REFERENCES

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994; Westinghouse Hanford Company, Richland, Washington.

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

5615475.0408

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for sample aliquot size, dilution factors and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and was not detected. Due to a minor quality control deficiency identified during data validation, the concentration reported may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.

BJ - Indicates the constituent was analyzed for and detected at a concentration less than the CRDL but greater then the IDL. Due to a minor quality control deficiency identified during data validation, The associated data have been qualified as estimated, but should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

WHC-SD-EN-SPP-002. Rev. 2

DATA QUALIFICATION SUMMARY - FORM B-7

PKG: W0010-ITC-021	REVIEWER: S. Schildt	DATE: 12/14/94	PAGE 1 OF 1
COMMENTS: Metals			
PARAMETER	QUALIFIER	SAMPLES AFFECTED	REASON
Aluminum Calcium Magnesium Sodium Zinc	U	B0BJ02	Analyte detected in the preparation blank
Arsenic	BJ UJ	B0BJ01 B0BJ02	Spike sample recovery <75%

9613475.0912

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0010-ITC-021

	Samp#	B0BJ01		B0BJ02	
	Date	3-18-94		3-18-94	
	Location	299-W19-35		299-W19-35	
	Depth	245.00 - 247.00		---	
	Type	SOIL		SOIL	
	Comments			EQUIP. BLANK	
Parameter	Units	Result	Q	Result	Q
ALUMINUM	MG/KG	4170.000		79.500	U
ANTIMONY	MG/KG	10.400	U	9.700	U
ARSENIC	MG/KG	0.430	BJ	0.380	UJ
BARIUM	MG/KG	53.300		0.410	B
BERYLLIUM	MG/KG	0.300	B	0.190	U
CADMIUM	MG/KG	1.000	U	0.970	U
CALCIUM	MG/KG	2280.000		53.600	U
CHROMIUM	MG/KG	12.800		3.100	
COBALT	MG/KG	6.200	B	1.900	U
COPPER	MG/KG	10.400		1.900	U
IRON	MG/KG	11700.000		141.000	
LEAD	MG/KG	1.600		0.380	U
MAGNESIUM	MG/KG	2910.000		10.900	U
MANGANESE	MG/KG	198.000		0.570	B
MERCURY	MG/KG	0.110	U	0.100	U
NICKEL	MG/KG	11.700		3.900	U
POTASSIUM	MG/KG	871.000	B	195.000	U
SELENIUM	MG/KG	0.410	U	0.380	U
SILVER	MG/KG	1.000	U	0.970	U
SODIUM	MG/KG	278.000	B	46.600	U
THALLIUM	MG/KG	0.410	U	0.380	U
VANADIUM	MG/KG	22.200		1.900	U
ZINC	MG/KG	32.700		1.900	U
TITANIUM	MG/KG	690.000		2.900	
CYANIDE	MG/KG	1.100	U	1.000	U

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

Verified 1/15/94

9613475.0413

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBJ01
~~0343001~~
J.C. 5/23/94

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: WO253 SAS No.: SDG No.: WO253
Matrix (soil/water): SOIL Lab Sample ID: AA4457
Level (low/med): LOW Date Received: 03/24/94
% Solids: 93.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4170			P
7440-36-0	Antimony	10.4	U		P
7440-38-2	Arsenic	0.43	B	N	F 13J
7440-39-3	Barium	53.3			P
7440-41-7	Beryllium	0.30	B		P
7440-43-9	Cadmium	1.0	U		P
7440-70-2	Calcium	2280			P
7440-47-3	Chromium	12.8		*	P
7440-48-4	Cobalt	6.2	B		P
7440-50-8	Copper	10.4			P
7439-89-6	Iron	11700			P
7439-92-1	Lead	1.6			F
7439-95-4	Magnesium	2910			P
7439-96-5	Manganese	198			P
7439-97-6	Mercury	0.11	U		CV
7440-02-0	Nickel	11.7			P
7440-09-7	Potassium	871	B		P
7782-49-2	Selenium	0.41	U		F
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium	278	B		P
7440-28-0	Thallium	0.41	U		F
7440-62-2	Vanadium	22.2			P
7440-66-6	Zinc	32.7			P
	Titanium	690			P
5955-70-0	Cyanide				NR

Color Before: BEIGE Clarity Before: N/A Texture: MEDIUM
Color After: COLORLESS Clarity After: CLEAR Artifacts: YES

Comments:
ARTIFACTS INCLUDE ROCKS.

FORM I - IN

ILM02.1
8
4/25/94

12/14/94

12/15/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBJ01 ~~0343001~~ J.C 5/23/94

Lab Name: ITAS KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: WO253 SAS No.: SDG No.: WO253

Matrix (soil/water): SOIL Lab Sample ID: AA4458

Level (low/med): LOW Date Received: 03/24/94

% Solids: 93.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Titanium				NR
5955-70-0	Cyanide	1.1	U		AS

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

CYANIDE_ONLY.

FORM I - IN

ILM02.1

S 4/25/94

AAS 10/15/94

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBJOZ
~~0343002~~
J.C. 5/23/94

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: WO253 SAS No.: SDG No.: WO253
Matrix (soil/water): SOIL Lab Sample ID: AA4510
Level (low/med): LOW Date Received: 03/24/94
% Solids: 99.8

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	79.5			P	u
7440-36-0	Antimony	9.7	U		P	
7440-38-2	Arsenic	0.38	U	N	F	UJ
7440-39-3	Barium	0.41	B		P	
7440-41-7	Beryllium	0.19	U		P	
7440-43-9	Cadmium	0.97	U		P	
7440-70-2	Calcium	53.6	B		P	u
7440-47-3	Chromium	3.1		*	P	
7440-48-4	Cobalt	1.9	U		P	
7440-50-8	Copper	1.9	U		P	
7439-89-6	Iron	141			P	
7439-92-1	Lead	0.38	U		F	
7439-95-4	Magnesium	10.9	B		P	u
7439-96-5	Manganese	0.57	B		P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	3.9	U		P	
7440-09-7	Potassium	195	U		P	
7782-49-2	Selenium	0.38	U		F	
7440-22-4	Silver	0.97	U		P	
7440-23-5	Sodium	46.6	B		P	u
7440-28-0	Thallium	0.38	U		F	
7440-62-2	Vanadium	1.9	U		P	
7440-66-6	Zinc	1.9	B		P	u
	Titanium	2.9			P	12/14/94
5955-70-0	Cyanide				NR	

Color Before: WHITE Clarity Before: N/A Texture: COARSE
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

ILM02.1
8
4/25/94

12/15/94

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBJ02
~~0343002~~
J.C 5/23/94

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: WO253 SAS No.: SDG No.: WO253
Matrix (soil/water): SOIL Lab Sample ID: AA4511
Level (low/med): LOW Date Received: 03/24/94
% Solids: 99.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Titanium				NR
5955-70-0	Cyanide	1.0	U		AS

Color Before: WHITE Clarity Before: N/A Texture: COARSE
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
CYANIDE ONLY.

FORM I - IN

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12/15/94

9613475.0418

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Westinghouse Hanford Company
P.O. Box 1970
Richland, WA 99352
Attn: J.A. Lerch

April 28, 1994

Job Number: 253

This is the Certificate of Analysis for the following samples:

SDG:	W0010
Client Project ID:	Westinghouse Hanford
Date Received by Lab:	March 24, 1994
Number of Samples:	Four (4)
Sample Type:	Soil - three (3), Water - one (1)

JUN 1994 RECEIVED SDLA

I. Introduction

On March 24, 1994, three (3) soil samples and one (1) water sample arrived at ITAS-Richland, Washington and were transferred to ITAS-Knoxville for chemical analysis. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that the data are not blank corrected. Soil results are reported on a dry weight basis.

The samples were analyzed for Target Compound List (TCL) volatiles by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 3/90 Statement of Work.

Reviewed and Approved:

Sheree' A. Schneider
Project Manager

RECORD COPY

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

II. Analytical Results/Methodology (Continued)

The samples were analyzed for Target Compound List (TCL) semivolatiles by gas chromatography/mass spectroscopy (GC/MS) in accordance with the EPA CLP 3/90 Statement of Work.

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

The samples were analyzed for total cyanide in accordance with the EPA CLP ILM03 Statement of Work.

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

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

III. Quality Control

The volatiles analyses were performed by purge and trap with a J & W DB-624 capillary column on a Hewlett-Packard 5970 GC/MS/DS and a Finnigan INCOS 500 GC/MS/DS. All QC results were within method specified limits.

The semivolatiles analyses were performed by direct injection of sample extract on a Restek XTI-5 capillary column on a Finnigan INCOS XL GC/MS/DS. All QC results were within method specified limits.

Data were reported with qualifiers as follows:

U - Compound analyzed for but not detected; value given is quantitation limit.
E - Compound exceeded calibration range.
D - Compound analyzed at a secondary dilution factor.
J - Compound detected but below quantitation limit; value estimated.
S - Spiked compound.
B - Compound found in method blank.
A - Suspected aldol condensation product.
Y - Indistinguishable isomer in tentatively identified compounds.
N - Presumptive evidence of compound presence.

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

III. Quality Control (Continued)

The samples were digested on April 11, 1994 for ICP and GFAA. The CVAA analysis for mercury was performed on April 7, 1994; the GFAA analyses for arsenic, lead, selenium and thallium were performed from April 11 through April 14, 1994; the remaining metals were analyzed by ICP on April 13, 1994. All run QC was acceptable. A duplicate/spike pair was prepared using sample ~~0343001~~. BOBJ01 Spike recovery (accuracy) results were within acceptance limits for all parameters by ICP, GFAA and CVAA analyses except for arsenic by GFAA analysis. As the titanium concentration is greater than four times (4X) the spike added, spiking criteria do not apply for this analyte. Duplicate RPD (precision) results were within acceptance limits for all parameters by ICP, GFAA and CVAA analyses except for chromium by ICP analysis.

Data were reported with qualifiers as follows:

"C" Qualifiers

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

"Q" Qualifiers

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

"M" Qualifiers

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

Miscellaneous

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

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

III. Quality Control (Continued)

On April 15, 1994, the samples were analyzed for nitrate-nitrite by cadmium reduction followed by colorimetric determination using the LACHAT QuikChem automated flow injection analyzer (QuikChem Method No. 10-107-04-1-C).

The samples were analyzed for anions on April 20 and April 22, 1994. Matrix spike/matrix spike duplicate analyses were performed using sample ~~4-03-430-01B.~~ AA4459 BCB501
SCG 5/30/94

017 12/15/94

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

III. Quality Control (Continued)

Table I is a cross reference between client IDs and abbreviated client IDs.

TABLE I

WHC ID	Richland ID	Knoxville ID	Matrix	Test
BOBJO1	4-03-430-01A	AA4455	SOIL	VOC
BOBJO1	4-03-430-01B	AA4456	SOIL	SVOC
BOBJO1	4-03-430-01C	AA4457	SOIL	METALS
BOBJO1	4-03-430-01D	AA4458	SOIL	CN
BOBJO1	4-03-430-01E	AA4459	SOIL	ANIONS
BOBJO1	4-03-430-01F	AA4460	SOIL	NO3NO2
BOBJO2	4-03-430-02A	AA4508	SOIL	VOC
BOBJO2	4-03-430-02B	AA4509	SOIL	SVOC
BOBJO2	4-03-430-02C	AA4510	SOIL	METALS
BOBJO2	4-03-430-02D	AA4511	SOIL	CN
BOBJO2	4-03-430-02E	AA4512	SOIL	ANIONS
BOBJO2	4-03-430-02F	AA4513	SOIL	NO3NO2
BOBJO4	4-03-430-03A	AA4514	SOIL	VOC
TRIP BLANK	4-03-430-04A	AA4515	WATER	VOC

12/15/94

IT Corporation
April 28, 1994

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Westinghouse Hanford

Job Number: 253

IV. Certification

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

Reviewed and Approved:

Sheree Schneider

Sheree' A. Schneider
Project Manager

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priority [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-045 646 WVS 3-23-94
Ice Chest No.: WHC 19	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0- 0369-31	Bill of Lading/Air Bill No.: NA
Possible Sample Hazards/Remarks: NONE OBSERVED		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

SDG W0010

4-08-430

			Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4		
			Type of Container	aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs		
			No. of Container(s)	1	1	1	1	1	1	1	1					1		
			Volume	120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml		
			SAMPLE ANALYSIS	VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)		
				A	B	C	D	E	F									
Sample No.	Matrix*	Date Sampled	Time Sampled															
01 BOBJ01	S	3-18-94	0900	X	X	X	X	X	X	X	X							
02 BOBJ02	S	3-18-94	0830	X	X	X	X	X	X	X	X							
03 BOBJ04	S	3-18-94	0700													X		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: W.V. Setzer	Date/Time: 3-22-94 1125	Received By: R. Boyd Jr	Date/Time: 3/22/94 12:02
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

(BOBJ01 40343101) (BOBJ02 - 40343102)

LOWEST HOLDING TIME = 7DAYS

Matrix*

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

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-928 (12/92)

WO#253

020

12/15/94

9613475.0425

0000020

WO#253

INTERNATIONAL TECHNOLOGY CORPORATION

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

Reference Document No.[30] 340338

Page 2 of 2

Project Name SAF 94-046

Project No. 5D6-W0010

Samples Shipment Date 3-23-94

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
A-03-430-02C	BOBJ02 / Soil	3/18 0830	glass	500ml	Cool 4°	ICP, GFAA Metals, Hg		
D				250ml		CN	Pl 06/16	FOR LAB USE ONLY
E						EPA 300.0		
F				120ml		EPA 353.2		
A-03-430-03A	BOBJ04	3/18 0700				VOA	25 [illegible]	FOR LAB USE ONLY
A-03-430-04A	Trip Blank	3/23/94		40ml		VOA		
B						VOA		FOR LAB USE ONLY
								FOR LAB USE ONLY
								FOR LAB USE ONLY
		3/23/94						FOR LAB USE ONLY
								FOR LAB USE ONLY
								FOR LAB USE ONLY

White: To accompany samples Yellow: Field copy

*See back of form for special instructions.

021

12/5/94

9613475.0426

0000023

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-UP-1			DATA PACKAGE: W0010-ITC-021		
VALIDATOR: L. Schildt		LAB: IT		DATE: 12/13/94	
CASE:			SDG: W0010		
ANALYSES PERFORMED					
☑ CLP/ICP	☑ CLP/GFAA	☑ CLP/Hg	☑ CLP/Cyanide	☐	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐
SAMPLES/MATRIX B0BJ01, B0BJ02 / soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments? . . . . Yes No N/A

Are initial calibrations acceptable? . . . . . Yes No N/A

Are ICP interference checks acceptable? . . . . . Yes No N/A

Were ICV and CCV checks performed on all instruments? . . . . Yes No N/A

Are ICV and CCV checks acceptable? . . . . . Yes No N/A

Comments:

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A

Are ICB and CCB results acceptable? . . . . . Yes ~~No~~ N/A 12/13/94

Were preparation blanks analyzed? . . . . . Yes No N/A

Are preparation blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: Al, Ca, Mg, Na, Zn detected in prep. blank. Associated results <5x blank concentration are qualified as undetected (U).
Cr, Fe, Mn, Ti, Ba detected in field blank. No qualification required.

5. ACCURACY

Were spike samples analyzed? . . . . . Yes No N/A

Are spike sample recoveries acceptable? . . . . . Yes No N/A

Were laboratory control samples (LCS) analyzed? . . . . . Yes No N/A

Are LCS recoveries acceptable? . . . . . Yes No N/A

Comments: Os, ~~Fe~~ 12/14/94 recoveries outside control limits. Associated results qualified estimated (BJ or UJ)

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed? . . . . . Yes No N/A

Are laboratory duplicate samples RPD values acceptable? . . . Yes No N/A

Were ICP serial dilution samples analyzed? . . . . . Yes No N/A

Are ICP serial dilution %D values acceptable? . . . . . Yes No N/A

Are field duplicate RPD values acceptable? . . . . . Yes No N/A

Are field split RPD values acceptable? . . . . . Yes No N/A

Comments: Lab. flagged Cr results for RPD exceedance but soil samples control limit is 35% and RPD is 27%.

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required? . . . . . Yes No N/A

Are duplicate injection %RSD values acceptable? . . . . . Yes No N/A

Were analytical spikes performed as required? . . . . . Yes No N/A

Are analytical spike recoveries acceptable? . . . . . Yes No N/A

Was MSA performed as required? . . . . . Yes No N/A

Are MSA results acceptable? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

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

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

Are results calculated properly? . . . . . Yes No N/A

Do results meet the CRDLs? . . . . . Yes No N/A

Comments:

HOLDING TIME SUMMARY

SDG: W0010-ITC-071 VALIDATOR: [illegible] DATE: 12/13/94 PAGE 1 OF 1

COMMENTS: Metals

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B0BJ01,2	ICP	3/18/94	4/11/94	4/13/94	24	26	none
B0BJ02,1	GFAA-As		4/11/94	4/14/94		27	
	GFAA-Pb			4/12/94		25	
	GFAA-Tl			4/14/94		27	
	GFAA-Se			4/14/94		27	
	CV		4/7/94	4/7/94	20	20	
	CN		3/31/94	3/31/94	13	13	

9613475.0431

U.S. EPA - CLP

3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___

Lab Code: ITSTU_ Case No.: WO253 SAS No.: _____ SDG No.: WO253_

Preparation Blank Matrix (soil/water): SOIL_

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum	40.0	U	40.0	U	40.0	U	40.0	U	37.422	B	P
Antimony	50.0	U	50.0	U	50.0	U	50.0	U	10.000	U	P
Arsenic	2.0	U	2.0	U	2.0	U	2.0	U	0.400	U	F
Barium	2.0	U	2.0	U	2.0	U	2.0	U	0.400	U	P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	0.200	U	P
Cadmium	5.0	U	5.0	U	5.0	U	5.0	U	1.000	U	P
Calcium	20.0	U	20.0	U	20.0	U	20.0	U	29.196	B	P
Chromium	10.0	U	10.0	U	10.0	U	10.0	U	2.000	U	P
Cobalt	10.0	U	10.0	U	10.0	U	10.0	U	2.000	U	P
Copper	10.0	U	10.0	U	10.0	U	10.0	U	2.000	U	P
Iron	10.0	U	10.0	U	10.0	U	10.0	U	18.828	B	P
Lead	2.0	U	2.0	U	2.0	U	2.0	U	0.400	U	F
Magnesium	30.0	U	30.0	U	30.0	U	30.0	U	7.026	B	P
Manganese	2.0	U	2.0	U	2.0	U	2.0	U	0.400	U	P
Mercury	0.2	U	0.2	U	0.2	U	0.2	U	0.100	U	CV
Nickel	20.0	U	20.0	U	20.0	U	20.0	U	4.000	U	P
Potassium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	200.000	U	P
Selenium	2.0	U	2.0	U	2.0	U	2.0	U	0.400	U	F
Silver	5.0	U	5.0	U	5.0	U	5.0	U	1.000	U	P
Sodium	100.0	U	100.0	U	100.0	U	100.0	U	30.898	B	P
Thallium	2.0	U	2.0	U	2.0	U	2.0	U	0.400	U	F
Vanadium	10.0	U	10.0	U	10.0	U	10.0	U	2.000	U	P
Zinc	5.0	U	5.0	U	5.0	U	5.0	U	2.388	B	P
Titanium	3.0	U	3.0	U	3.0	U	3.0	U	0.600	U	P
Cyanide	10.0	U	10.0	U					1.000	U	AS

PBS0331(CV)
PBS0411A(AA6028)
CPBS0411B(AA5605)
APBS0411A(AA6037)

FORM III - IN

ILM02.1
8
4/25/94

AAS 12/15/94

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

BOBJOIS ~~03430013~~ J.C. 5/23/94

Lab Name: ITAS_KNOXVILLE_____ Contract:HANFORD___

Lab Code: ITSTU_ Case No.: WO253 SAS No.: _____ SDG No.: WO253_

Matrix: __SOIL_____ Level (low/med): _LOW____

% Solids for Sample: _93.0

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

Analyte	Control Limit %R	Spiked Sample Result (SSR) AA4457S	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony	75-125	93.2331		10.4395	U	104.40	89.3		P
Arsenic	75-125	5.9140		0.4321	B	8.12	67.5	N	F
Barium	75-125	460.9479		53.2540		417.58	97.6		P
Beryllium	75-125	10.9469		0.2965	B	10.44	102.0		P
Cadmium	75-125	10.4165		1.0440	U	10.44	99.8		P
Calcium									NR
Chromium	75-125	57.4131		12.7884		41.76	106.9		P
Cobalt	75-125	112.5712		6.1906	B	104.40	101.9		P
Copper	75-125	59.1273		10.4040		52.20	93.3		P
Iron									NR
Lead	75-125	5.8105		1.6454		4.06	102.6		F
Magnesium									NR
Manganese	75-125	323.8355		197.5947		104.40	120.9		P
Mercury	75-125	0.6086		0.1075	U	0.54	112.7		CV
Nickel	75-125	113.2456		11.6860		104.40	97.3		P
Potassium									NR
Selenium	75-125	1.6636		0.4058	U	2.03	82.0		F
Silver	75-125	10.5648		1.0440	U	10.44	101.2		P
Sodium									NR
Thallium	75-125	8.9714		0.4058	U	10.14	88.5		F
Vanadium	75-125	133.0723		22.2069		104.40	106.2		P
Zinc	75-125	133.3918		32.6923		104.40	96.5		P
Titanium		994.4483		690.3873		104.40	291.2		P
Cyanide									NR

Comments:
ARTIFACTS_INCLUDE_ROCKS.

FORM V (Part 1) - IN ILM02.1

4/25/94

10/15/94

9613475.0434

RECORD COPY

MEMORANDUM

JAN 1995

TO: 200-UP-1 Round 1 Soil Project QA Record [redacted] December 30, 1994

FR: Thomas Stapp, Golder Associates Inc.

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE W0010-ITC-021 (943-1610.048 021RAD.UP1)

INTRODUCTION

This memo presents the results of data validation on data package W0010-ITC-021 prepared by International Technology Laboratory. Sample information is provided in the following table.

SAMPLE ID	COMMENTS	MEDIA	ANALYSIS
B0BJ01 B0BJ02*		SOIL SOIL	RADIOCHEMISTRY SEE ATTACHMENT 4
* Indicates the sample results which were 100% recalculated.			

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

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met with the exception of minor deficiencies identified below.

Accuracy. Goals for accuracy were met with the exception of minor deficiencies identified below.

Sample Result Verification. All sample results were supported in the raw data with the exception of carbon-14 which was not reported due to a deficiency of carbon in the samples.

Detection Limits. Detection limit goals were met for all results with the exception of Iron-59 in sample B0BJ01.

Replaced Page 12/30/94

Completeness. The data package was complete for all requested analyses. A total of two samples were validated in this data package with a total of 46 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90 percent.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

The following minor deficiencies were identified during data validation which required qualification of data.

Laboratory Blanks

- Americium-241, europium-152 and technetium-99 were detected in the method blank. Attachments 2 and 5 provide a summary of the samples affected, qualification applied, and supporting documentation.

Laboratory Control Sample

- The laboratory control sample recovery for americium-241 and neptunium-237 were unacceptable. Attachments 2 and 5 provide a summary of the samples affected, qualification applied, and supporting documentation.

Tracer Recovery

- The chemical tracer recovery for americium-241 and curium-242/244 analyses was unacceptable. Attachments 2 and 5 provide a summary of the samples affected, qualification applied, and supporting documentation.

Laboratory Duplicates

- The +/- two times the RDL criteria for cesium-137 was unacceptable. Attachments 2 and 5 provide a summary of the samples affected, qualification applied, and supporting documentation.

DATA REPORTING

- The minimum detectable activities could not be verified by recalculation for neptunium-237, total strontium, and technetium-99 therefore, nondetect results have been qualified as estimated.

FIELD QUALITY CONTROL

- Sample B0BJ02 was identified as an equipment blank. Americium-241, neptunium-237, uranium-234, uranium-238, and gross beta were detected in the equipment blank. No qualification was applied in accordance with the validation procedures.

Replaced Page MWS 12/30/94

REFERENCES

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

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994, Westinghouse Hanford Company, Richland, Washington.

9613475.0437

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

ATTACHMENT 1

GLOSSARY OF RADIOCHEMISTRY DATA REPORTING QUALIFIERS

U - Indicates the constituent was analyzed for, but was not detected at a concentration above the minimum detectable activity (MDA). The concentration reported is the MDA corrected for sample aliquot size, dilution factors and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and was not detected at a concentration above the MDA. Due to a quality control deficiency identified during data validation, the concentration reported may not accurately reflect the sample MDA. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as estimated due to a quality control deficiency identified during data validation. The associated data should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

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ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

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

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: W0010-ITC-021	REVIEWER: T. STAPP	DATE: 12-14-94	PAGE 1 OF 1
COMMENTS: RADIOCHEMISTRY			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
NEPTUNIUM-237	J/UJ	ALL	LABORATORY CONTROL SAMPLE RECOVERY <70% BUT >30%
AMERICIUM-241	J	ALL	DETECTED IN BLANK
TECHNETIUM-99	J	B0BJ01	DETECTED IN BLANK
EUROPIUM-152	J	B0BJ01	DETECTED IN BLANK
AMERICIUM-241, CURIUM-242/244	J/UJ	B0BJ01	TRACER RECOVERY <20% BUT >5%
AMERICIUM-241	J	ALL	LABORATORY CONTROL SAMPLE RECOVERY >130%
CESIUM-137	J/UJ	ALL	PLUS/MINUS 2X RDL CRITERIA EXCEEDED
NEPTUNIUM-237	UJ	B0BJ01	MDAs CANNOT BE VERIFIED
TOTAL STRONTIUM	UJ	ALL	MDAs CANNOT BE VERIFIED
TECHNETIUM-99	UJ	B0BJ02	MDAs CANNOT BE VERIFIED

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12/20/94

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ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0010-ITC-021

	Samp#	B0BJ01		B0BJ02	
	Date	3-18-94		3-18-94	
	Location	299-W19-35		299-W19-35	
	Depth	245.00 - 247.00		---	
	Type	SOIL		SOIL	
	Comments			EQUIP. BLANK	
Parameter	Units	Result	Q	Result	Q
AMERICIUM-241	PCI/G	0.419	J	0.695	J
CURIUM-242	PCI/G	0.072	UJ	0.045	U
CURIUM-244	PCI/G	0.061	UJ	0.037	U
NEPTUNIUM-237	PCI/G	0.011	UJ	0.018	J
PLUTONIUM-238	PCI/G	0.025	U	0.025	U
PLUTONIUM-239/240	PCI/G	0.027	U	0.025	U
URANIUM-234	PCI/G	0.595		0.082	
URANIUM-235	PCI/G	0.021		0.029	U
URANIUM-238	PCI/G	0.647		0.031	
COBALT-60	PCI/G	0.014	U	0.013	U
IRON-59	PCI/G	0.054	U	0.041	U
EUROPIUM-152	PCI/G	0.094	J	0.078	U
COBALT-58	PCI/G	0.020	U	0.018	U
CESIUM-137	PCI/G	0.471	J	0.012	UJ
EUROPIUM-155	PCI/G	0.044		0.032	U
EUROPIUM-154	PCI/G	0.047	U	0.041	U
GROSS ALPHA	PCI/G	4.430		2.770	U
GROSS BETA	PCI/G	21.400		3.040	
STRONTIUM	PCI/G	0.120	UJ	0.097	UJ
TECHNETIUM-99	PCI/G	1.190	J	0.186	UJ

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

Verified 12/16/94

009

9613475.0442

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

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG NO.:	W0010
LAB SAMPLE ID:	4-03-431-01	MATRIX:	SOIL
WHC ID:	BOBJ01	DATE RECEIVED:	3/22/94
REPORTING UNITS:	pCi/g		

ISOTOPE	RESULT Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA YIELD	METHOD NUMBER
AM-241	4.19E-01 J	1.94E-01	2.30E-01	.0962 0.186	RD3302
CM-242	5.35E-02 UJ	7.57E-02	7.73E-02	.0725 0.186	RD3302
CM-244	0.00E+00 UJ	0.00E+00	6.71E-02	.0606 0.186	RD3302
NP-237	8.91E-03 UJ	1.26E-02	1.27E-02	.0113 0.934	RD3208
PU-238	-1.98E-03 U	3.95E-03	3.97E-03	.0247 0.421	RD3209
PU239/40	0.00E+00 U	0.00E+00	2.96E-02	.0267 0.421	RD3209
U-234	5.95E-01	1.13E-01	1.37E-01	.0324 0.777	RD3234
U-235	2.10E-02	2.14E-02	2.16E-02	.0197 0.777	RD3234
U-238DA	6.47E-01	1.18E-01	1.44E-01	.0235 0.777	RD3234
CO-60	8.81E-04 U	8.45E-03	8.45E-03	.01445 N/A	RD3219
FE-59	-2.11E-02 U	3.27E-02	3.27E-02	.05412 N/A	RD3219
EU-152	9.36E-02 J	3.78E-02	3.90E-02	.07338 N/A	RD3219
CO-58	-1.15E-04 U	1.18E-02	1.18E-02	.01996 N/A	RD3219
CS-137DA	4.71E-01 J	2.28E-02	5.23E-02	N/A	RD3219
EU-155	4.43E-02	2.44E-02	2.48E-02	.04157 N/A	RD3219
EU-154	1.01E-02 U	2.79E-02	2.79E-02	.04704 N/A	RD3219
ALPHA	4.43E+00	2.53E+00	2.58E+00	3.16 1	RD3222
BETA	2.14E+01	2.38E+00	2.77E+00	1.95 1	RD3222
TOTAL-SR	8.73E-02 UJ	5.88E-02	6.23E-02	.12 0.704	RD3204
TC-99	1.19E+00 J	2.61E-01	1.20E+00	.186 0.912	ITAS-IT-RS-0001

Verified 12-13-94

9613475.0444

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

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG NO.:	W0010
LAB SAMPLE ID:	4-03-431-02	MATRIX:	SOIL
WHC ID:	BOBJ02	DATE RECEIVED:	3/22/94
REPORTING UNITS:	pCi/g		

ISOTOPE	RESULT Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA / YIELD	METHOD NUMBER
AM-241	6.95E-01 J	1.96E-01	2.56E-01	.0685 0.303	RD3302
CM-242	1.65E-02 U	3.30E-02	3.32E-02	.04470.303	RD3302
CM-244	0.00E+00 U	0.00E+00	4.14E-02	.0374 0.303	RD3302
NP-237	1.78E-02 J	1.78E-02	1.82E-02	.0112 0.934	RD3208
PU-238	0.00E+00 U	0.00E+00	2.73E-02	.0246 0.459	RD3209
PU239/40	0.00E+00 U	0.00E+00	2.73E-02	.0246 0.459	RD3209
U-234	8.24E-02	4.45E-02	4.58E-02	.0312 0.725	RD3234
U-235	1.45E-02 U	2.00E-02	2.01E-02	.0291 0.725	RD3234
U-238DA	3.12E-02	2.82E-02	2.85E-02	.0302 0.725	RD3234
CO-60	5.37E-03 U	6.87E-03	6.89E-03	.01339 N/A	RD3219
FE-59	1.30E-02 U	2.38E-02	2.38E-02	.04119 N/A	RD3219
EU-152	2.31E-02 U	4.36E-02	4.37E-02	.07834 N/A	RD3219
CO-58	5.01E-03 U	1.04E-02	1.04E-02	.0175 N/A	RD3219
CS-137DA	-6.00E-03UJ	7.81E-03	7.84E-03	.01235 N/A	RD3219
EU-155	2.06E-04 U	1.93E-02	1.93E-02	.03248 N/A	RD3219
EU-154	2.01E-02 U	2.10E-02	2.11E-02	.04064 N/A	RD3219
ALPHA	6.79E-01 U	1.53E+00	1.53E+00	2.77 1	RD3222
BETA	3.04E+00	1.38E+00	1.39E+00	1.99 1	RD3222
TOTAL-SR	8.04E-02 UJ	4.80E-02	5.23E-02	.0966 0.969	RD3204
TC-99	1.16E-01 UJ	2.44E-01	1.12E+00	.186 0.912	ITAS-IT-RS-0001

Verified 12-13-94

9613475.0145

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

INTERNATIONAL TECHNOLOGY CORPORATION

CERTIFICATE OF ANALYSIS

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

May 16, 1994

Attention: J.A.Lerch

SAF Number	:	94-046
Date Received by Lab	:	March 22, 1994
Number of Samples	:	Two (2)
Sample Type	:	Soil
SDG Number	:	W0010
Data Deliverable	:	Stand Alone

I. Introduction

On March 22, 1994, two soil samples were received by ITAS-Richland for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the WHC specific IDs:

ITAS-Richland ID	WHC ID	Matrix	Date of Receipt
403431-01A	B0BJ01	Soil	3/22/94
403431-02A	B0BJ02	Soil	3/22/94

II. Analytical Results/Methodology

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

12-13-94 013

Regional Office
2800 George Washington Way • Richland, Washington 99352-1613 • 509-375-3131 • FAX: 509-375-5590

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The requested analyses were:

Alpha Spectroscopy
Americium-241, Curium-244 by method ITAS-RD-3302
Neptunium-237 by method ITAS-RD-3208
Plutonium-238, 239/40 by method ITAS-RD-3209
Uranium-234, 235, 238 by method ITAS-RD-3234
Gamma Spectroscopy
Gamma Scan by method ITAS-RD-3219
Gas Proportional Counting
Gross Alpha by method ITAS-RD-3222
Gross Beta by method ITAS-RD-3222
Strontium-90 by method ITAS-RD-3204
Liquid Scintillation Counting
Carbon-14 by method ITAS-RD-3247
Technetium-99 by method ITAS-IT-RS-0001

III. Quality Control

The analytical results for each analysis performed under SDG W0010 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate.

Quality control sample results are reported in the same units as sample results except for gross alpha and gross beta quality control sample results which are reported in pCi/sample.

IV. Comments

The initial radioactivity screening of the samples classified them as Category I.

12-13-94

Alpha Spectroscopy

Americium-241, Curium-244 by method ITAS-RD-3302
The batch was reanalyzed due to low chemical yields (yields < 30%) although the calculated detection limits from the initial analysis met contract requirements. The reanalysis results are within 3 sigma of the original analysis results and have acceptable chemical yields, however, the LCS and blank are outside acceptable limits. It is the professional opinion of the analyst that the original results are acceptable even though the yields are below the contractual limit of 30%. The original analysis results are reported herein. The sample and sample duplicate results are within the 3 sigma control limit.

Neptunium-237 by method ITAS-RD-3208
Three matrix spikes were analyzed with the batch and their average yield was used for yield correction. The analyzed matrix spikes analyzed were samples: L034311M and L034312M (spiked Ottawa Sand) and W0343102 (matrix spike of sample B0BJ02). The LCS is biased low (57%) after yield correction. The batch blank result is acceptable. The sample and sample duplicate results are within the 3 sigma control limit.

Plutonium-238, 239/40 by method ITAS-RD-3209
The batch was reanalyzed due to low chemical yields (yields < 30%). The reanalysis results are acceptable. The LCS and batch blank results are acceptable. The sample and sample duplicate results are within the 3 sigma control limit.

Uranium-234, 235, 238 by method ITAS-RD-3234
The batch was reanalyzed due to sample and sample duplicate results outside of the 3 sigma control limit. The reanalysis results are acceptable. The LCS and the batch blank results are acceptable. The sample and sample duplicate results are within the 3 sigma control limit.

12-13-94

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219
The batch (with the exception of sample B0BJ02) was recounted for an extended counting time (1000 min.) in order to meet the detection limit for Fe-59. The recount data are accepted even though the MDA was not achieved for Fe-59 on the recount. Future WHC soil samples will be counted using a 450 ml Marinelli geometry (provided sufficient sample is available) to increase the counting efficiency and facilitate meeting the required MDAs. The LCS and batch blank results are acceptable. The sample and sample duplicate results are within the 3 sigma control limit.

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222
The LCS and batch blank results are acceptable. The sample and sample duplicate results are within the 3 sigma control limit.

Gross Beta by method ITAS-RD-3222
The LCS and batch blank results are acceptable. The sample and sample duplicate results are within the 3 sigma control limit.

Strontium-90 by method ITAS-RD-3204
The LCS recovery is biased high (167%). The high result is attributed to strontium-85 in the spike. Concurrently analyzed spikes without strontium-85 added were acceptable. Strontium-85 will not be used in the future for spikes used in the analysis of strontium-90 on WHC samples. The batch blank result is acceptable. The sample and sample duplicate results are within the 3 sigma control limit.

12-13-94

Liquid Scintillation Counting

Carbon-14 by method ITAS-RD-3247
Carbon-14 results are not reportable due to an insufficient presence of carbon in the samples to perform the analysis. The carbon-14 method requires that 2 grams of carbon be present in each sample. The samples were silicate in nature and produced zero measurable carbon dioxide during sample preparation. Both acid digestion and burning the samples were performed in attempts to produce sufficient carbon in the sample matrices. The samples are considered "lost" in analysis due to a matrix effect (lack of carbon in the matrix).

Technetium-99 by method ITAS-IT-RS-0001
The LCS and batch blank results are acceptable. Two matrix spikes were analyzed with the set and their average result was used for the batch yield correction. The sample and sample duplicate results are within the 3 sigma control limit.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

Suzanne Gaines

Suzanne Gaines
Project Manager

12-13-94

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: W. V. SETZER	Company Contact: W. V. SETZER	Telephone No.: (509) 376-2413
Project Designation: 200 UP-1	Sampling Location: 299-W19-35	SAF No.: 94-~~045~~ 646 WVS 3-23-94
Ice Chest No.: WHC 19	Field Logbook No.: EFL-1118	Method of Shipment: BY DOE VEHICLE
Shipped To: INTERNATIONAL TECHNOLOGIES	Offsite Property No.: W94-0- 0369-31	Bill of Lading/Air Bill No.: NA

Possible Sample Hazards/Remarks: NONE OBSERVED

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

SDX- W0010

SAMPLE ANALYSIS

4 03-430

Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4					COOL 4		
Type of Container	aGs	aG	G	P/G	G	P/G	P/G	P/G					aGs		
No. of Container(s)	1	1	1	1	1	1	1	1					1		
Volume	120ml	500ml	500ml	250ml	250ml	120ml	1000ml	500ml					40ml		
	VOA (CLP)	SEMIVOA (CLP)	ICP MTL GFAA METALS Hg (CLP)	Cn (CLP)	ANIONS IC-F,CL SO4,NO2 NO3,PO4	NO2,NO3 EPA(353.2)	*1	*1					VOA TRIP (CLP)		
	A	B	C	D	E	F									

	Sample No.	Matrix*	Date Sampled	Time Sampled	A	B	C	D	E	F									
C1	BOBJ01	S	3-18-94	0900	X	X	X	X	X	X	X	X							
C2	BOBJ02	S	3-18-94	0830	X	X	X	X	X	X	X	X							
C3	BOBJ04	S	3-18-94	0700													X		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: W.V. Setzer	Date/Time: 3-22-94 1125	Received By: R. Boyd	Date/Time: 3/22/94 12:00
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

*1- GROSS ALPHA,BETA(ITAS-RD-3222) Am-241,Cm 243/244 (ITAS-RD-3302) Np-237 (ITAS-RD-3208) Pu-238,239/240 (ITAS-RD-3209) U-234,235,238 (ITAS-RD-3234) GAMMA SPEC TO INCLUDE; Co-58,60,Cs-137,Eu-152,154,155 AND Fe-59 (ITAS-RD-3219) Sr-90 (ITAS-RD-3204) C-14 (ITAS-RD-3247) Tc-99 (ITAS-IT-RS-0001)

(BOBJ01 4033101) (BOBJ02 - 4034310 2)

LOWEST HOLDING TIME = 7DAYS

Matrix*

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

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

DISTRIBUTION: Original - Sample Yellow - Sampler

BC-6000-828 (12/92)

9413175.0151

0118

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ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-1 ROUND 1 SOIL		DATA PACKAGE: W0010-ITC-021
VALIDATOR: T. Stapp	LAB: ITAS-Richland	DATE: 12-12-94
CASE:	SDG:	

ANALYSES PERFORMED

[X] Gross Alpha/Beta	[X] Strontium-90	[X] Technetium-99	[X] Alpha Spectroscopy	[X] Gamma Spectroscopy	
☐ Total Uranium	☐ Radium-22	☐ Tritium	[X] C-14		

SAMPLES/MATRIX

BOBJ01 / SOIL
BOBJ02 / SOIL

1. Completeness . . . . . ☐ N/A

Technical verification forms present? . . . . . (Yes) No N/A

Comments:

2. Initial Calibration . . . . . ☐ N/A

Instruments/detectors calibrated within one year of sample analysis? . . . . NOTE (1) . . . . Yes (No) N/A

Initial calibration acceptable? . . . . . (Yes) No N/A

Standards NIST traceable? . . . . . (Yes) No N/A

Standards Expired? . . . . . Yes (No) N/A

Comments: (1) Detectors for all requested analyses with the exception of Tc-99 were not calibrated within one year of sample analysis however continuing calibration data is acceptable and no qualification will be required.

3. Continuing Calibration . . . . . ☐ N/A

Calibration checked within one week of sample analysis? . . . Yes No N/A
Calibration check acceptable? . . . . . Yes No N/A
Calibration check standards NIST traceable? . . . . . Yes No N/A
Calibration check standards expired? . . . . . Yes No N/A

Comments:

4. Blanks . . . . . ☐ N/A

Method blank analyzed? . . . . . Yes No N/A
Method blank results acceptable? . . . . . Yes No N/A
Analytes detected in method blank? . . NOTE ① . . . . . Yes No N/A
Field blank(s) analyzed? . . . . . NOTE ② . . . . . Yes No ~~N/A~~ 12/16/94
Field blank results acceptable? . . . . . Yes No ~~N/A~~
Analytes detected in field blank(s)? . . . . . Yes No ~~N/A~~
Transcription/Calculation Errors? . . . . . Yes No N/A

TS 12-14-94

Comments: ① See ~~field~~ method blank summary pages.
~~② Field QC was not identified with this sample set but it has been requested. Field blanks will be evaluated in the final data summary.~~ Am-241, Np-237, U-234, U-238 and gross beta were detected in the equipment blank, sample BOBJ02. No qualification required. 12/16/94

5. Matrix Spikes . . . . . ☐ N/A

Matrix spike analyzed? . . . . . Yes No N/A
Spike recoveries acceptable? . . . . . Yes No N/A
Spike source traceable? . . . . . Yes No N/A
Spike source expired? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments:

021

6. Laboratory Control Samples . . . . . ☐ N/A

LCS analyzed? . . . . . (Yes) No N/A
LCS recoveries acceptable? . . . NOTE ① . . . . . Yes (No) N/A
LCS traceable? . . . . . (Yes) No N/A
Transcription/Calculation Errors? . . . . . Yes (No) N/A

Comments: ① See Laboratory Control Sample Summary page.

7. Chemical Recovery . . . . . ☐ N/A

Chemical carrier added? . . . . . (Yes) No N/A
Chemical recovery acceptable? . . NOTE ① . . . . . Yes (No) N/A
Chemical carrier traceable? . . . . . (Yes) No N/A
Chemical carrier expired? . . . . . Yes (No) N/A
Transcription/Calculation errors? . . . . . Yes (No) N/A

Comments: ① Tracer recoveries associated with Am-241, Cm-242 and Cm-244 for sample BOBJ01 were below 20% but above 5% and qualify results as estimated (J/UJ).

8. Duplicates . . . . . ☐ N/A

Duplicates Analyzed? . . . . . (Yes) No N/A
RPD Values Acceptable? . . . . . NOTE ① . . . . . Yes (No) N/A
Transcription/Calculation Errors? . . . . . Yes (No) N/A

Comments: ① See duplicate RPD calculation Summary page.

022

9. Field QC Samples . . . . . ☐ N/A

Field duplicate sample(s) analyzed? . . . . Note ① . . . . Yes (No) N/A
Field duplicate RPD values acceptable? . . . . . Yes No (N/A)
Field split sample(s) analyzed? . . . . . Yes No (N/A)
Field split RPD values acceptable? . . . . . Yes No (N/A)
Performance audit sample(s) analyzed? . . . . . Yes No (N/A)
Performance audit sample results acceptable? . . . . . Yes No (N/A)

Comments: ① Field QC was not identified with this Sample Set but it has been requested. Field duplicates will be evaluated in the final data Summary.

10. Holding Times

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

(Collected)	Am/Cm	Np	Pu	U-234	Gamma	Grs α	β	Sr	C14	Tc99
BOBJ01 (3-18-94)	4-30	5/05	5/05	5/04	5/04	4/14	4/14	4/29	NA	5/02
BOBJ02 (3-18-94)	4-30	5/05	5/05	5/04	4/20	4/14	4/14	4/29	NA	5/02
	≤180 → DAYS									

NA-Not Analyzed.

11. Results and Detection Limits (Levels D & E) . . . . . ☐ N/A

Results reported for all required sample analyses? NOTE ① . . . . Yes (No) N/A
Results supported in raw data? . . . . . (Yes) No N/A
Results Acceptable? . . . . . (Yes) No N/A
Transcription/Calculation errors? . . . . . Yes (No) N/A
MDA's meet required detection limits? . . . . . ~~(Yes)~~ (No) N/A MWT 12/29/94
Transcription/calculation errors? . . NOTE ② . . . . . (Yes) No N/A

Comments: ① Results for C-14 not reported since insufficient amount of Carbon present in Sample, as discussed in laboratory narrative. No qualification will be applied.
② MDAs cannot be confirmed for Np-237, Strontium (Total), and Tc-99. Associated non-detects are qualified (UJ).

Revised page 12/29/94 MWT

023

9613475.0457

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

BLANK RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0010

LAB SAMPLE ID: L-03-431-1B

REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA / YIELD	METHOD NUMBER
AM-241	4.52E-01	1.97E-01	2.36E-01	.0582 0.194	RD3302
CM-242	0.00E+00	0.00E+00	6.92E-02	.0625 0.194	RD3302
CM-244	0.00E+00	0.00E+00	6.46E-02	.0583 0.194	RD3302
NP-237	0.00E+00	0.00E+00	0.00E+00	.0113 0.934	RD3208
CO-60	2.26E-03	8.94E-03	8.94E-03	.01569 N/A	RD3219
FE-59	1.03E-02	2.13E-02	2.13E-02	.03795 N/A	RD3219
EU-152	1.19E-01	4.18E-02	4.35E-02	.0869 N/A	RD3219
CO-58	-1.43E-02	1.11E-02	1.12E-02	.01731 N/A	RD3219
CS-137DA	2.11E-03	9.53E-03	9.53E-03	.01626 N/A	RD3219
EU-155	2.32E-02	1.89E-02	1.90E-02	.03247 N/A	RD3219
EU-154	-2.30E-02	2.81E-02	2.82E-02	.04495 N/A	RD3219
ALPHA	9.01E-03	3.45E-02	3.45E-02	.0658 1	RD3222
BETA	2.57E-01	2.50E-01	2.50E-01	.401 1	RD3222
TOTAL-SR	6.95E-02	4.57E-02	4.91E-02	.0925 0.969	RD3204
TC-99	1.01E-01	2.41E-01	1.12E+00	.186 0.912	ITAS-IT-RS-0001

Sample results associated with the circled isotope results above, that are less than 5 times the blank value but above the MDA are qualified as estimated (J).

024

12-13-94

~~0015~~

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

BLANK RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0010

LAB SAMPLE ID: L-03-431-2B

REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA / YIELD	METHOD NUMBER
U-234	9.86E-03 ✓	1.67E-02	1.68E-02	.0232 0.71	RD3234
U-235	4.46E-03 ✓	1.19E-02	1.19E-02	.0257 0.71	RD3234
U-238DA	1.08E-02 ✓	1.67E-02	1.67E-02	.0239 0.71	RD3234

LAB SAMPLE ID: L-03-431-3B

REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA / YIELD	METHOD NUMBER
PU-238	-2.74E-03 ✓	3.87E-03	3.90E-03	.0342 0.609	RD3209
PU239/40	-1.37E-03 ✓	2.74E-03	2.75E-03	.0246 0.609	RD3209

LAB SAMPLE ID: L-03-431-1X

REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA / YIELD	METHOD NUMBER
TC-99	3.21E-01 ✓	2.45E-01	1.13E+00	.186 0.912	ITAS-IT-RS-0001

Sample result for Tc-99 less than 5 times the blank result and above the MDA is qualified as estimated (J). 12-13-94

~~0016~~

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

LABORATORY CONTROL SAMPLES

LAB NAME: ITAS-RICHLAND SDG NO.: W0010

LAB SAMPLE ID: L-03-431-1S

REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	EXPECTED	% RECOVERY
AM-241	6.00E+00	8.79E-01	2.27E+00	0.13	4.59E+00	131
NP-237	3.23E+00	2.40E-01	7.37E-01	0.934	5.64E+00	57
CS-137DA	3.86E-01	2.79E-02	4.76E-02	N/A	3.58E-01	108
ALPHA	4.39E+00	2.98E-01	7.97E-01	1	4.51E+00	97
BETA	1.12E+01	7.38E-01	1.08E+00	1	1.13E+01	99
TOTAL-SR	8.72E+00	3.09E-01	2.22E+00	0.92	5.23E+00	167

Total Sr results are non-detect and qualification does not apply. 12-13-94

LAB SAMPLE ID: L-03-431-2S

REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	EXPECTED	% RECOVERY
U-234	1.64E+00	1.81E-01	2.74E-01	0.83	1.62E+00	101
U-235	6.91E-02	3.76E-02	3.86E-02	0.83	6.10E-02	113
U-238DA	1.68E+00	1.84E-01	2.80E-01	0.83	1.70E+00	99

Percent recoveries circled above are not acceptable, and qualify associated results as estimated; (J) for results above the MDA associated with Am-241 ~~and Total Strontium~~, (J/UJ) for Np-237 results. 12-13-94

12-13-94

~~0018~~

682A-6-R3

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

RPD CALCULATIONS

LAB NAME: ITAS-RICHLAND SDG NO.: W0010

LAB SAMPLE ID: 4-03-431-01

WHC ID: BOBJ01

REPORTING UNITS: pCi/g

ISOTOPE	SAMPLE RESULT	DUPLICATE RESULT	RPD	
AM-241	4.19E-01	8.67E-01	69.67	±2xRDL ✓
CM-242	5.35E-02	1.63E-02	106.59	±2xRDL ✓
CM-244	0.00E+00	0.00E+00	N/A	
NP-237	8.91E-03	4.45E-03	66.77	±2xRDL ✓
PU-238	-1.98E-03	-1.54E-03	25.00	NC ✓
PU239/40	0.00E+00	-6.17E-03	200.00	NC ✓
U-234	5.95E-01	6.86E-01	14.21	±2xRDL ✓
U-235	2.10E-02	5.26E-02	85.87	±2xRDL ✓
U-238DA	6.47E-01	5.36E-01	18.77	±2xRDL ✓
CO-60	8.81E-04	-1.00E-02	238.64	NC
FE-59	-2.11E-02	-1.93E-02	8.91	NC
EU-152	9.36E-02	7.50E-02	22.06	±2xRDL ✓
CO-58	-1.15E-04	-9.21E-03	195.07	NC
CS-137DA	4.71E-01	2.46E-01	62.76	
EU-155	4.43E-02	2.36E-02	60.97	±2xRDL ✓
EU-154	1.01E-02	2.36E-02	80.12	±2xRDL ✓
ALPHA	4.43E+00	5.93E+00	28.96	±2xRDL ✓
BETA	2.14E+01	2.11E+01	1.41	±2xRDL ✓
TOTAL-SR	8.73E-02	3.71E-02	80.71	±2xRDL ✓
TC-99	1.19E+00	7.29E-01	48.05	±2xRDL

The result circled above qualifies associated results as estimated (J/UJ), since it exceeds ±2x the RDL.

12-13-94

~~0014~~

W0010-ITC-021

Americium/Curium	
HEIS No.:	B0BJ02
Lab ID:	40343102
Aliquot:	2.01E+00
Am241 net cpm:	0.0940
Am241 bkg cpm:	0.0010
Spl count time:	200
Bkg count time:	1000
Eff d/c:	3.7
Decay:	1
Yield:	0.186
Am241 calc:	4.19E-01
Am241 rptd:	4.19E-01
Am241 MDA calc:	9.64E-02
Am241 MDA rptd:	9.62E-02
Cm244 net cpm:	0.0000
Cm244 bkg cpm:	0.0000
Cm244 decay:	1.005
Cm244 calc:	0.00E+00
Cm244 rptd:	0.00E+00
Cm244 MDA calc:	6.08E-02
Cm244 MDA rptd:	6.06E-02
Cm242 net cpm:	0.0100
Cm242 bkg cpm:	0.0000
Cm242 decay:	1.201
Cm242 calc.:	5.36E-02
Cm242 rptd:	5.35E-02
Cm242 MDA calc:	7.26E-02
Cm242 MDA rptd:	7.25E-02

Neptunium	
HEIS No.:	B0BJ02
Lab ID:	40343102
Aliquot:	2.00E+00
Np237 net cpm:	0.01
Np237 bkg cpm:	0
Spl count time:	200
Bkg count time:	2500
Eff d/c:	3.7
Decay:	1
Yield:	0.934
Np237 calc:	8.91E-03
Np237 rptd:	8.91E-03
Np237 MDA calc:	1.21E-02
Np237 MDA rptd:	1.13E-02

W0010-ITC-021

Plutonium	
HEIS No.:	B0BJ02
Lab ID:	40343102
Aliquot:	2.00E+00
Pu238 net cpm:	0
Pu238 bkg cpm:	0
Spl count time:	200
Bkg count time:	1000
Pu238 Eff d/c:	3.703
Decay:	1.001
Yield:	0.459
Pu238 calc:	0.00E+00
Pu238 rptd:	0.00E+00
Pu238 MDA calc:	2.46E-02
Pu238 MDA rptd:	2.46E-02
Pu239 net cpm:	0
Pu239 bkg cpm:	0
Pu239 d/c:	3.7
Pu239 decay:	1
Pu239 calc:	0.00E+00
Pu239 rptd:	0.00E+00
Pu239 MDA calc:	2.46E-02
Pu239 MDA rptd:	2.46E-02

Uranium	
HEIS No.:	B0BJ02
Lab ID:	40343102
Aliquot:	2.00E+00
U-234 net cpm:	0.0718
U-234 bkg cpm:	0.0032
Spl count time:	200
Bkg count time:	2500
Eff d/c:	3.7
Decay:	1
Yield:	0.725
U-234 calc:	8.24E-02
U-234 rptd:	8.24E-02
U-234 MDA calc:	3.12E-02
U-234 MDA rptd:	3.12E-02
U-235 net cpm:	0.0126
U-235 bkg cpm:	0.0024
U-235 decay:	1
U-235 calc:	1.45E-02
U-235 rptd:	1.45E-02
U-235 MDA calc:	2.91E-02
U-235 MDA rptd:	2.91E-02
U-238 net cpm:	0.0272
U-238 bkg cpm:	0.0028
U-238 decay:	1
U-238 calc.:	3.12E-02
U-238 rptd:	3.12E-02
U-238 MDA calc:	3.02E-02
U-238 MDA rptd:	3.02E-02

W0010-ITC-021

Gross Alpha	
HEIS No.:	B0BJ02
Lab ID:	40343102
Aliquot:	4.99E-02
Net counts:	0.015
Bkg counts:	0.03
Spl count time:	200
Bkg count time:	500
d/c:	5.016
Calc.:	6.79E-01
Rptd:	6.79E-01
MDA calc:	2.78E+00
MDA rptd:	2.77E+00

Gross Beta	
HEIS No.:	B0BJ02
Lab ID:	40343102
Aliquot:	2.50E-01
Net counts:	0.582
Bkg counts:	0.968
Spl count time:	100
Bkg count time:	500
d/c:	2.898
Calc.:	3.04E+00
Rptd:	3.04E+00
MDA calc:	1.99E+00
MDA rptd:	1.99E+00

W0010-ITC-021

Total Strontium	
HEIS No.:	B0BJ02
Sample:	40343102
Sep date:	4/27/94
Sep time:	20:00
Count date:	4/29/94
Count time:	08:26
Hours:	36.433333
Sample amt:	6.21E+00
Net, cpm:	0.64
Count time:	50
Bkg, cpm:	1.08
Count time:	500
D/C 1:	2.3
D/C 2:	1.881
D/C 3:	2.02
Yield:	0.969
Calc:	8.04E-02
Rptd:	8.04E-02
MDA, Calc:	1.39E-01
MDA, rptd:	9.66E-02

Technetium-99	
HEIS No.:	B0BJ02
Sample:	40343102
Bkg cpm:	27.24
Spl, amt:	2.00E+00
Spl cpm:	25.86
Count time:	125
Spl dpm:	28.05
d/c:	1.085
Yield:	0.912
Blk, dpm:	3.02E+01
Blk, d/c:	1.067
Calc:	1.16E-01
Rptd:	1.16E-01
MDA, calc:	4.33E-03
MDA, rptd:	1.86E-01