START 9713508.2238

W0025-ITC-027

0045984

MAY 1994 RECEIVED SDLA

INTERNATIONAL TECHNOLOGY CORPORATION

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

RECORD COPY

Dear Mr. 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,

Wade H. Price
Project Manager

DEC 1996 RECEIVED DMC

Regional Office
13715 N. Rider Trail • Earth City, Missouri 63045-1205 • 314-298-8566 • FAX: 314-298-8757

IT Corporation is a wholly owned subsidiary of International Technology Corporation

9713508.2239

Analytical Data Package Prepared For

Westinghouse Hanford

Chemical Analysis By

IT Analytical Services
St. Louis Laboratory

Sample Delivery Group Number: W0025

MAY 1994
RECEIVED
SDLA

WHC IDENTIFICATION NUMBER
BOBKM2

ITAS-ST. LOUIS ID NUMBER
4873-001

RECORD COPY

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006449

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. N/A
Offsite Property No.
Method of Shipment Government truck
Field Logbook No.
Shipped to IT
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
404183 01 A BOBKM2	S	3-29-94	0900	(1) 250ml aG	Semi-VOA	CLP	
B BOBKM2	S			(1) 250ml Poly	Metals -CLP TAL Titanium Mercury	CPL	
C BOBKM2	S			(1) 125ml G	Anions F, Cl, SO_4	EPA 300.0	
D BOBKM2	S			(1) 125ml G	NO_2 NO_3	EPA 353.2	
E BOBKM2	S			(1) 125ml G	Cyanide	CPL	
F BOBKM2	S			(1) 125ml Gs	TPH Diesel Range	8015m	
G BOBKM2	S			(1) 125ml aGs	TOC	9060	
404184 01 BOBKM2	S			(1) 1000ml Poly	Gross Alpha/Beta ITAS-RD-3322 Gamma Spec. Cs-134,137, I-129, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 ITAS-RD-3219; Total Uranium ITAS-RD-4200 OR 4201 U-235/234/238 ITAS-RD-3234 Np-237 ITAS-RD-3208; Pu-238/239/240 ITAS-RD-3209; Sr-90 ITAS-RD-3204; Tc-99 ITAS-RD-RS-0001; Am-241, Cm-244 ITAS-RD-3302; Se-79 ITAS-RD-3253		

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. SICKLE	4/11/94	0800	D.L. Edwards
D.L. Edwards	4/11/94	1140	J.T. Hogan JG Hogan
J.T. Hogan JG Hogan	4/11/94	1418	ITAS Tom Gilmore

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

0000014

EMERGENCY CONTACT (509) 373-3800 ERG #61 Attached

9715508.2291

OFFSITE RADIOACTIVE SHIPMENT RECORD

– EXTERIOR INSPECTION PERMITTED –

19742

SHIPPING INST.

SHIP TO:
Company: IT Analytical
Address: 2800 George Washington Way
City, State, Zip: Richland, WA 99352
Attention: TAMI HEIDELBERG

Contractor: ☐ PNL ☐ KEH ☒ WHC
Site Carrier: JG HOGAN
PR No. 57783 Veh. No. 6883630

Ship: ☐ Prepaid ☐ Collect Via:
☐ Motor-Rail ☐ Air Psgr.
☐ Excl. Use ☐ Air Cargo
☐ DOE Veh. ☐ Mail
☐ UPS Sur. ☒ Government Vehicle

SHIPMENT DESCRIPTION AND CERTIFICATION

Proper Shipping Name — UN Number

Radioactive Material, Excepted Package
1. Empty Packages ☐ UN 2908
2. Low Specific Activity, n.o.s ☐ UN 2912
3. Limited quantity, n.o.s. ☐ UN 2910
4. N.O.S. ☐ UN 2982
5. Fissile n.o.s. ☐ UN 2918
6. Special Form, n.o.s. ☐ UN 2974
7. Instruments & Articles ☐ UN 2911
8. Limited Quantity of Material, ☒ UN2910

Material Form: ☐ Special (A1) ☒ Normal (A2)

Labels Applied: ☐ Empty ☐ Radioactive LSA ☐ White I ☐ Yellow II ☐ Yellow III ☒ None ☐ Danger (Air Cargo) ☐ Secondary

Material Category: ☐ Empty ☐ Low Specific Act. (LSA) ☒ Limited Quantity ☐ Type A Quantity ☐ Type B Quantity ☐ Highway Route Controlled Quantity

For Normal Form Identify:
Physical Form: ☒ Solid ☐ Liquid ☐ Gas
Chemical Form: ☐ Metal ☐ Oxide ☒ Elemental ☐ Nitrate
Other

TYPE PACKAGE: ☒ Strong Tight ☐ Type A ☐ Type B ☐ Type B (U) ☐ Type B (M)

CONSTRUCTION: ☐ Box, FB ☐ Wood ☐ Steel ☐ Drum ☐ Cask ☒ Other Poly Cooler

FISSILE CLASS: ☒ Non Fissile ☐ Fissile Exempt ☐ Fissile I ☐ Fissile II ☐ Fissile III
Grams Fissile

SRM: ☒ No ☐ Yes ☐ < 1 gr ☐ Category I ☐ Category II ☐ Category III

ACCOUNTABILITY/SECURITY CONTROL: ☐ Classified ☒ Unclassified
Consignee authorized to receive this qty ☒
Sig. Security Svc. Req. ☐ NA ☒
Pu, EU > 1 g ☐ N/A NU, DU > 1 Kg ☐ N/A
Security Escorts Req. ☐ Not. Req. ☒
External Cask Temperature N/A ☒
(Max. 122°F LTL, 180°F Ex. Use) °F

Packaging conforms to appropriate packaging procedure ☐ N/A ☒ Yes
Complies with D.O.T. packaging marking and labeling requirements ☐ N/A ☒ Yes
Container acceptability documented (incl. 7A cert.) ☒ N/A ☐ Yes

Container examined: No evidence of deterioration or damage ☒ Yes
QA Inspection Current ☐ Yes ☒ N/A Seals required ☒ No ☐ Yes
Shipping Doc. 49CFR173.421 Authorization No. N/A

No. Pkgs.	Model Package	COC/Spec. No.	Serial No.	Seal No.	Isotopes	Curies/Pkg	T.I.	Gr. Wt.
1	Poly Cooler	N/A	B1-100	Tape Applied	Cs-137, Sr-90	277.9 mci	N/A	50 LBS
	(Strong Tight)							
	# Ltd. Qty	Statement in	cooler #					
	SAF: 94-065	COC #'s:	006449,	006257	Cooler contains:			
	(4) 250 mL bottles,	(9) 250 mL bottles		(2) 1000 mL	Poly			
(Shipper may describe package in detail on one of unused lines above)					TOTAL	277.9 mci	N/A	50 LBS

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation, according to the applicable federal, state, local and international regulations for the transportation of hazardous materials.

Certifier's Signature: JG Hogan Date: 4-11-94 Organization: FIELD ANALYTICAL SERVICES Complete Cost Code (inc. end function): 12900

AREA MONITOR

Surface Dose Rate of Package: ☒ ≤0.5 or ___ mrem/hr (N + βγ)
Dose Rate at 1 Meter from Surface of Package: ☒ ≤0.5 or ___ mrem/hr (N + βγ)
Smears of Outer Container: ☒ ≤22 dpm βγ/cm² ☒ ≤2.2 dpm α/cm²

TRUCK LOAD OR EXCLUSIVE USE
Surface: ☒ ≤ 200 mrem/hr (N + βγ)
@ 6 feet: ☒ ≤ 10 mrem/hr (N + βγ)
@ Cab or Sleeper: ☒ ≤ 2.0 mrem/hr (N + βγ)

Additional Data and Instructions (inc. Readings on Internal Packaging)

Signature - Radiation Monitor: [signature] Bldg. 200-S Survey No. 51676B9 Date 4/11/94

0000015

APPROVAL

AUTHORIZATION FOR SHIPMENT

AIR TRANSPORT CERTIFICATION: Cargo Only: ☐ Danger Labels Applied
Passenger: ☐ 1. Ltd. Qty. ☐ 2. ≤3 T.I ☐ 3. Research or Medical Diagnosis ☐ 4. Human Medical Research
Pkg. Dimensions: N/A

Traffic has inspected and verified preshipment compliance to DOT regulations.

Authorized Signature: [signature] Printed Name: M.A. SAMS Date: 4-11-94

APPROVED FOR OFFSITE SHIPMENT

TRAFFIC

B.L. No. RMW-8581 Date Shipped 4-11-94 E.T.A. 4-11-94 Routing WHC VEHICLE ☐ N/A Placards ☐ Yes ☒ No
Surveyed By ___ Date ___ Approved for Shipment Westinghouse Hanford Company [signature] Date 4-11-94 Route Plan ☐ Yes ☒ No

*U.S. GPO: 1992-791-064/80001 S4-6000-088 (10/88)

Received [signature] ITAS 4/11/94 1418

9213508.2242

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
1330 George Washington Way
Richland, Washington 99352

SAMPLE CHECK-IN LIST

(Per Shipping Container)

Date/Time Received 4/11/94 14:15 Client Name WHC

Project/Client # 94-005 Batch or Case # N/A

Cooler ID (if noted on the outside of cooler) BT-100

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

Sample temperature 6°C

11. The following paperwork should be accounted for (N/A if not applicable):

Chain of Custody #'(s) 006257, 006449

Request for analysis #(s) N/A

Airbill # N/A Carrier N/A

12. Have any anomalies been identified above? Yes ☐ No ☒
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature Tom Gilmore [signature] Date/Time 4/11/94 1418

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

0000016

9713508.2243

SAMPLE STATUS REPORT FOR E 5869. E-BLANK BOBKM2 TIME: 4/ 5/94 10:24
DISPATCHED: 3/28/94 14:21 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 3/30/94 8: 2

EXT.	DETER.	RESULTS OR STATUS		OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********		***	***	******
1210	TB MISC	5.16000E 02 pCi/G		N	Y	VOGEL
1211	AT MISC	4.94000E 00 pCi/G		N	Y	VOGEL
2183	GEA-MISC	6.22000E 04 pCi/G	Cs-137	N	Y	VOGEL
4271	TOT-ACT	1.19000E 02 pCi/G		N	Y	VOGEL

END OF REPORT

2125 ml x 1.6 = 3400 Grams total

Sr-90

516 pCi/g x 3400g = 1754400 pCi

$A_2 = .4$ $A_2/1000 = .0004$ Ci = 400000000 pCi

$\frac{1754400}{400000000} = .0044$

Alpha

4.94 pCi/g x 3400g = 16796 pCi

$A_2 = .002$ Ci Ltd. Qty = $A_2/1000 = .000002$ Ci = 2000000 pCi

$\frac{16796}{2000000} = .0084$

Cs-137

62200 pCi/g x 3400g = 211480000 pCi

$A_2 = 10$ $A_2/1000 = .01$ Ci = 10000000000 pCi

$\frac{211480000}{10000000000} = .0211$

Unity = .0044 + .0084 + .0211 = .0339 Meets Ltd. Qty. !

0000017

CUR

temp. 6°

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. 340366
Page 1 of 1

Project Name/No. 1 94-005
Sample Team Members 2
Profit Center No. 3 4632
Project Manager 4 [illegible]
Purchase Order No. 6
Required Report Date 11

Samples Shipment Date 7 4/11/94
Lab Destination 8 St. Louis
Lab Contact 9
Project Contact/Phone 12
Carrier/Waybill No. 13

Bill to: 5 ITAS Richland

Report to: 10 ITAS Richland

ONE CONTAINER PER LINE

Sample Number 14	Sample Description/Type 15	Date/Time Collected 16	Container Type 17	Sample Volume 18	Pre-servative 19	Requested Testing Program 20	Condition on Receipt 21	Disposal Record No. 22
W4048301 A	BOBKM2 / SOIL	3/29/94 0900	Amber Glass	250 ml	4°C	SemiVOa	100 % Intact	
B			Poly			Metals TAl + Ag, Ti		
C			Amber Glass	125 ml		300.0		
D						353.2		
E						CN		
F						TPH 8015		
G						TOC		
4/11/94								

FOR LAB USE ONLY

FOR LAB USE ONLY

Special Instructions: 23

Possible Hazard Identification: 24 CAT III
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): SDGW 0025

1. Relinquished by 28 (Signature/Affiliation) [signature] ITAS	Date: 4/11/94 Time: 1600	1. Received by 28 (Signature/Affiliation) Sue Wilson	Date: 04-12-94 Time: 0900
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

0000018

White: To accompany samples Yellow: Field copy

*See back of form for special instructions.

9713570.1241

INTERNATIONAL TECHNOLOGY CORPORATION

C.U.R. and C.O.C.

COPIED TO: W. Price

DATE: 04-12-94

TIME: 1115

BY: SV

Work Order No.: 4873

Condition Upon Receipt Variance Report
ITAS - St. Louis Laboratory

Client: _____

Date: 04-12-94 0900

Project No: 519.04

Initiated by: Sue Arbor

Analysis Requested: Refer to RFA/COC

RFA/COC Numbers: 340366

Client Sample Numbers Affected: Entire Login

Condition/Variance (Check all that apply): Circle Number to Denote that Item was Evaluated. "NA" = "Not Applicable".

1. NA 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: 6° Temp. trial 4.
   - ☐ 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. NA Sample splits performed by lab.
10. NA 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): Shipping containers not rad surveyed.

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: (or designate) NA Date: NA

Project Management Review: W. Price Date: 4/13/94

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

000019

ITAS - St. Louis April 24, 1994 08:57 am
Account: 10722 Project: 519.04 ITAS - Richland SAS No. 480 Rev. 0
Master Sample Login: 4873

Project Manager: M. Price

Draft: Final: Entered and Reviewed by: Bob Cowart PM Review:

Sample Header Template:

Sample No. / #	Client ID / Container Type	C-Matrix / Analysis	Date: Collected / Class	Received / Preservative	Due / Anal. Due Date	Shipper / Hold Date	Site	Rad Category / (Container Numbers:% Filled)	Rad Sample No.
4873-001	B08KM2	Soil	29-MAR-94 09:00	12-APR-94 09:00	17-MAY-94	FED-EX	2		R2145-002
NOTE: CONTAINER #01A=SEMI-VOA,01B=METALS-CLP-TAL-TI-HG,01C=EPA (300.0),01D=NO2-NO3 (353.2),01E=CN,01F=TPH Kerosene,01G=TOC, RICHLAND ID W404183									
1	AN - Amber Glass-250ML	BNA/CLP90/Q4	S	COLD	10-MAY-94	12-APR-94	R1D	(73917:100)	
1	AN - Amber Glass-120ML	CL/300.0/Q4	S	COLD	10-MAY-94	26-APR-94	R1D	(73919:100)	
1		CN/CLP/Q4	S	COLD	10-MAY-94	12-APR-94	R1D	(73921:98)	
1		FL/300.0/Q4	S	COLD	10-MAY-94	26-APR-94	R1D	(73919:100)	
1		NO3/353.1/Q4	S	COLD	10-MAY-94	26-APR-94	R1D	(73920:99)	
1		SO4/300.0/Q4	S	COLD	10-MAY-94	26-APR-94	R1D	(73919:100)	
1		TOC/9060/Q4	S	COLD	10-MAY-94	26-APR-94	R1D	(73923:96)	
1		TPH/8015/Q4	S	COLD	10-MAY-94	12-APR-94	R1D	(73922:97)	
1	PN - Plastic-250ml	AS/CLP90/Q4	S	COLD	10-MAY-94	09-OCT-94	R1D	(73918:100)	
1		HG/CLP90/Q4	S	COLD	10-MAY-94	08-MAY-94	R1D	(73918:100)	
1		ICAP/CLP90/Q4	S	COLD	10-MAY-94	09-OCT-94	R1D	(73918:100)	
1		PB/CLP90/Q4	S	COLD	10-MAY-94	09-OCT-94	R1D	(73918:100)	
1		PH/CLP/Q4	S	COLD	10-MAY-94	26-APR-94	R1D	(73918:100)	
1		PM/IT/Q4	S	COLD	10-MAY-94	25-SEP-94	R1D	(73918:100)	
1		SE/CLP90/Q4	S	COLD	10-MAY-94	09-OCT-94	R1D	(73918:100)	
1		TL/CLP90/Q4	S	COLD	10-MAY-94	09-OCT-94	R1D	(73918:100)	
4873-001DUP	B08KM2	Soil	29-MAR-94 09:00	12-APR-94 09:00	17-MAY-94	FED-EX	2		R2145-002
NOTE: CONTAINER #01A=SEMI-VOA,01B=METALS-CLP-TAL-TI-HG,01C=EPA (300.0),01D=NO2-NO3 (353.2),01E=CN,01F=TPH Kerosene,01G=TOC, RICHLAND ID W404183									
1	AN - Amber Glass-120ML	CL/300.0/Q4	S	COLD	10-MAY-94	26-APR-94	R1D	(73919:100)	
1		CN/CLP/Q4	S	COLD	10-MAY-94	12-APR-94	R1D	(73921:98)	
1		FL/300.0/Q4	S	COLD	10-MAY-94	26-APR-94	R1D	(73919:100)	
1		NO3/353.1/Q4	S	COLD	10-MAY-94	26-APR-94	R1D	(73920:99)	
1		SO4/300.0/Q4	S	COLD	10-MAY-94	26-APR-94	R1D	(73919:100)	
1		TOC/9060/Q4	S	COLD	10-MAY-94	26-APR-94	R1D	(73923:96)	
1	PN - Plastic-250ml	AS/CLP90/Q4	S	COLD	10-MAY-94	09-OCT-94	R1D	(73918:100)	
1		HG/CLP90/Q4	S	COLD	10-MAY-94	08-MAY-94	R1D	(73918:100)	
1		ICAP/CLP90/Q4	S	COLD	10-MAY-94	09-OCT-94	R1D	(73918:100)	
1		PB/CLP90/Q4	S	COLD	10-MAY-94	09-OCT-94	R1D	(73918:100)	
1		PH/CLP/Q4	S	COLD	10-MAY-94	26-APR-94	R1D	(73918:100)	
1		SE/CLP90/Q4	S	COLD	10-MAY-94	09-OCT-94	R1D	(73918:100)	
1		TL/CLP90/Q4	S	COLD	10-MAY-94	09-OCT-94	R1D	(73918:100)	
4873-001MS	B08KM2	Soil	29-MAR-94 09:00	12-APR-94 09:00	17-MAY-94	FED-EX	2		R2145-002
NOTE: CONTAINER #01A=SEMI-VOA,01B=METALS-CLP-TAL-TI-HG,01C=EPA (300.0),01D=NO2-NO3 (353.2),01E=CN,01F=TPH Kerosene,01G=TOC, RICHLAND ID W404183									
1	AN - Amber Glass-250ML	BNA/CLP90/Q4	S	COLD	10-MAY-94	12-APR-94	R1D	(73917:100)	
1	AN - Amber Glass-120ML	CL/300.0/Q4	S	COLD	10-MAY-94	26-APR-94	R1D	(73919:100)	
1		CN/CLP/Q4	S	COLD	10-MAY-94	12-APR-94	R1D	(73921:98)	

3*=Sample has not been rad screened.

0000020

9413508.2246

ITAS - St. Louis April 24, 1994 08:57 am
Account: 10722 Project: 519.04 ITAS - Richland QAS No. 480 Rev. 0
Master Sample Login: 4873

Project Manager: W. Price

Draft: Final: Entered and Reviewed by:_____ PM Review:_____

Sample Header Template: _____

Sample No.	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
Comments								

#	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
Data:								
1		FL/300.0/Q4	S	COLD	10-MAY-94	26-APR-94	R1D	(73919:100)
1		NO3/353.1/Q4	S	COLD	10-MAY-94	26-APR-94	R1D	(73920:99)
1		SO4/300.0/Q4	S	COLD	10-MAY-94	26-APR-94	R1D	(73919:100)
1		TOC/9060/Q4	S	COLD	10-MAY-94	26-APR-94	R1D	(73923:96)
1		TPH/8015/Q4	S	COLD	10-MAY-94	12-APR-94	R1D	(73922:97)
1	PN - Plastic-250ml	AS/CLP90/Q4	S	COLD	10-MAY-94	09-OCT-94	R1D	(73918:100)
1		HG/CLP90/Q4	S	COLD	10-MAY-94	08-MAY-94	R1D	(73918:100)
1		ICAP/CLP90/Q4	S	COLD	10-MAY-94	09-OCT-94	R1D	(73918:100)
1		PB/CLP90/Q4	S	COLD	10-MAY-94	09-OCT-94	R1D	(73918:100)
1		PH/CLP/Q4	S	COLD	10-MAY-94	26-APR-94	R1D	(73918:100)
1		SE/CLP90/Q4	S	COLD	10-MAY-94	09-OCT-94	R1D	(73918:100)
1		TL/CLP90/Q4	S	COLD	10-MAY-94	09-OCT-94	R1D	(73918:100)

4873-001MSD B0BKM2 Soil 29-MAR-94 09:00 12-APR-94 09:00 17-MAY-94 FED-EX 2 R2145-002
NOTE: CONTAINER #01A=SEMI-VOA,01B=METALS-CLP-TAL-TI-HG,01C=EPA (300.0),01D=NO2-NO3 (353.2),01E=CN,01F=TPH Kerosene,01G=TOC, RICHLAND ID W404183

1	AN - Amber Glass-250ML	BNA/CLP90/Q4	S	COLD	10-MAY-94	12-APR-94	R1D	(73917:100)
1	AN - Amber Glass-120ML	TPH/8015/Q4	S	COLD	10-MAY-94	12-APR-94	R1D	(73922:97)

9713508.2247

3*=Sample has not been rad screened.

TENNELEC #1

SCREENING CALCULATION SPREADSHEET

BOBKM2 is Category III.
BOBNP9 is Cat. II.
JRN 11 April 1994

Customer Code	Recieved Date	Time	Screening Prep Date	Time	Count Date	Mnts. Cntd	BACKGROUND Alpha	Beta	Mnts
WHC			41194		411	10	23	236	240

Customer ID WHC/SOIL	pH <2 Rcvd/Reiq	RESIDUE Wght (mGrms)	Vol. Anal. mG mL	Sample Size Gm L	SMPLE CNT DATA Hldr Num.	Total Counts Alpha	Beta	Net Sample Counts/Minute Alpha	Beta	DPM / Aliqout Alpha	Beta	uCi per Sample Alpha	Beta	2 Sigma Error uCi per Sample Alpha	Beta	pCi/(Gm or L) Alpha	Beta	Catagory 1 Yes/No	Aliquot to Cat 1 Gm or Ltr Alpha	Beta
B0BKM2		84.6	85	1250.0	49	23	612	2.20	60.22	1.8E+01	1.5E+02	1.2E-01	9.8E-01	7.2E-05	1.1E-04	9.6E+01	7.8E+02	No	1.0E+02	1.3E+02
B0BNP9		81.1	81	1350.0	50	3	109	0.20	9.92	1.4E+00	2.4E+01	1.0E-02	1.8E-01	2.1E-05	4.2E-05	7.8E+00	1.3E+02	No	1.3E+03	7.4E+02
TOTAL	uCi							-0.10	-0.98	-3E-01	-2E+00	1.3E-01	1.2E+00	ERR	ERR	ERR	ERR	No	ERR	ERR

9427.8095 2248

9713508.2249

5/16/94

*** AM/CMISO ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

12-Apr-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0025

MATRIX : SOIL

BATCH NUMBER 4-184

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	V40418410	ES J10471			
	L0418415	~~ESO~~ 016			
1)	40418401	ES J10472	WHC	BOBKM2	
	F0418401	ES J10473			

ACTIONS (Initial & Date)

1) INITIATED 4/12/94

2) PREP LAB RECEIVED 5/11/94

3) SAMPLE REMAINDER STORED
RD3221 5/12/94

4) SEPARATION LAB RECEIVED 5/16/94

5) COUNTING/MEASUREMENT LAB 5/19/94

6) DATA REVIEWED AND ANALYTICAL PREP STORED 5/23/94

5.19.94

0051

5/16/94

9713508.2250

*** NP-237 ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

12-Apr-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0025

MATRIX : SOIL

BATCH NUMBER 4-184

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0418418		W0418401	EQR051	
	L0418415	EQR050	W0418415	EQR052	
1)	40418401		WHC	BOBKM2	
	F0418401				

ACTIONS (Initial & Date)

1) INITIATED 4/12/94

2) PREP LAB RECEIVED 5/11/94

3) SAMPLE REMAINDER STORED
RD 3221 5/13/94

4) SEPARATION LAB RECEIVED 5/17/94 DRM

5) COUNTING/MEASUREMENT LAB 5-19-94

6) DATA REVIEWED AND ANALYTICAL PREP STORED 5-23-94

Rerun 5-23-94

copy 5.18.94

0052

9713508.2251

5/16/94

*** PUISO ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

12-Apr-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0025

MATRIX : SOIL

BATCH NUMBER 4-184

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0418418 ESH1609S				
	L0418415 IQHE053				
1)	40418401 ESH1609G		WHC	BOBKM2	
	F0418401 ESH1609T				

ACTIONS (Initial & Date)

1) INITIATED 4/12/94

2) PREP LAB RECEIVED 5/11/94

3) SAMPLE REMAINDER STORED
RD3221 5/12/94

4) SEPARATION LAB RECEIVED 5/16/94

5) COUNTING/MEASUREMENT LAB 18 May 94

6) DATA REVIEWED AND ANALYTICAL PREP STORED 5/19/94

5.18.94

EP

0053

9713508.2252

5/16/94

*** UISO ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

12-Apr-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0035

MATRIX : SOIL

BATCH NUMBER 4-184

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0418410 ESZ15626				
	L0418415 EQIE050				
1)	40418401 ESZ15627		WHC	B0BKM2	
	F0418401 ESZ15628				

ACTIONS (Initial & Date)

1) INITIATED 4/12/94

2) PREP LAB RECEIVED 5/11/94

3) SAMPLE REMAINDER STORED _____
RD3221 5/12/94

4) SEPARATION LAB RECEIVED 5/13/94

5) COUNTING/MEASUREMENT LAB 18 May 94

6) DATA REVIEWED AND ANALYTICAL PREP STORED 5-20-94

Ext 5.17.94

0054

9713508.2253

5/16/94

*** GAMMA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

12-Apr-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0025

MATRIX : SOIL

BATCH NUMBER 4-184

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0418415 CAL 491				
1)	40418401		WHC	BOBKM2	
	F0418401	DUP			

ACTIONS (Initial & Date)

1) INITIATED 4/12/94

2) PREP LAB RECEIVED JN 4-27-94

3) SAMPLE REMAINDER STORED JN 5-4-94

4) SEPARATION LAB RECEIVED N/A

5) COUNTING/MEASUREMENT LAB 5/4/94

6) DATA REVIEWED AND ANALYTICAL PREP STORED 5-23-94

0055

9713508.2254

INTERNATIONAL TECHNOLOGY CORPORATION

DUE DATE 5/20/94

REANALYSIS / RECOUNT

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

ANALYSIS Gamma

CUSTOMER WHC

MATRIX Soil

NAME/DATE TK / 5-24-94

SAMPLE DELIVERY GROUP W0025

BATCH NUMBER

ITAS ID	CUSTOMER ID	COMMENTS
1) L04184IX		Cal OSBK 1000m
2)		
3)		
4)		
5)		
6)		
7)		
8)		
9)		
10)		

TK 5-24-94

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 TK 5-25-94

DATA REVIEWED TK 5-27-94

ANALYTICAL PREP STORED

ADDITIONAL COMMENTS:

200ml Fine ottawa Sand blank

RC-048 12/92 REV 2

0056

9713508.2255

*** I-129LP ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

18-Apr-1994
Page 1

CUSTOMER: WHC SAF 94-065

SAMPLE DELIVERY GROUP W0025

MATRIX : SOIL

BATCH NUMBER 4-184

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0418918				
	L0419415		EQ2K009	1002.5 ± 11.899	
1)	40418401 ✓		WHC	BOBKM2	

ACTIONS (Initial & Date)

1) INITIATED JH 4/18/94

2) PREP LAB RECEIVED JN 4-27-94

3) SAMPLE REMAINDER STORED JN 5-4-94

4) SEPARATION LAB RECEIVED NA

5) COUNTING/MEASUREMENT LAB OD 5/4/94

6) DATA REVIEWED AND ANALYTICAL PREP STORED JK 5-10-94 JK 5-10-94

9713508.2256

5/16/94

*** ALPHA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

12-Apr-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0025

MATRIX : SOIL

BATCH NUMBER 4-184

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0418415				
	L0418415		EQEG 200	10.018 ± .096069	
1)	40418401		WHC	BOBKM2	
	F0418401	DUP			

ACTIONS (Initial & Date)

1) INITIATED 4/12/94

2) PREP LAB RECEIVED JN 4-27-94

3) SAMPLE REMAINDER STORED JN 5-7-94

4) SEPARATION LAB RECEIVED NA

5) COUNTING/MEASUREMENT LAB RM 5/8/94

6) DATA REVIEWED AND ANALYTICAL PREP STORED TK 5-10-94

0058

9713508.2257

5/16/94

*** BETA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

12-Apr-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0025

MATRIX : SOIL

BATCH NUMBER 4-184

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L0418418				
	L0418415		EGAM 2135	10.080 ± .14221	
1)	40418401		WHC	BOBKM2	
	F0418401	DUP			

ACTIONS (Initial & Date)

1) INITIATED 4/12/94

2) PREP LAB RECEIVED JN 4-27-94

3) SAMPLE REMAINDER STORED JN 5-7-94

4) SEPARATION LAB RECEIVED NA

5) COUNTING/MEASUREMENT LAB 5/8/94

6) DATA REVIEWED AND ANALYTICAL PREP STORED JTK 5-10-94

9413508.2258

5/16/94

*** TOTAL-SR ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

12-Apr-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0025

MATRIX : SOIL

BATCH NUMBER 4-184

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	L041841 B ✓				
	L041841 S ✓		EQCF 003	81.658 ± 1.1736	
1)	40418401		WHC	BOBKM2	
	F0418401: QP				

ACTIONS (Initial & Date)

1) INITIATED 4/12/94

2) PREP LAB RECEIVED 5/2/94 [illegible]

3) SAMPLE REMAINDER STORED 5/2/94 [illegible]

4) SEPARATION LAB RECEIVED 5-2-94 [illegible]

5) COUNTING/MEASUREMENT LAB GK for KC 5-23-94 RWJ 5-26-94

6) DATA REVIEWED AND ANALYTICAL PREP STORED [illegible] 5/27/94

BATCH SUMMARY/CHAIN OF CUSTODY

ANALYSIS Sep MATRIX Soil DUE DATE

WORK ORDER	SEQUENCE #	CLIENT	COMMENTS
L 03492113	-1B	WHC	QC BATCH REAGENT BLANK
L	-1X		QC BATCH MATRIX BLANK
L 0349213	-1M or 1S (circle)		QC BATCH MATRIX/REAGENT SPIKE 5/12/94 EQBS
L	-2M or 2S (circle)		QC BATCH MATRIX/REAGENT SPIKE
F 04091 03	-		Duplicate of Sample # 40409103
W 0401901	-		40401901
W0401 91D	-		Dup Spk 40401901
	-		
40349201	-		
40354601	-		
40401901	- 03		
	-		
	-		
	-		
	-		
	-		
	-		

Batched and QC updated by [illegible] on 5/12/94 Rec'd in C.R. by [illegible] on 5/18/94

Rec'd in Prep Lab by [illegible] on 5/10/94 Data Reviewed and anal. Prep stored [illegible] on 5/23/94

RD 32.21 5/11/94 [illegible]

Rec'd in Sep Lab by [illegible] on 5-17-94

Rec'd in Sep lab by N/A on N/A Samples Disposed by _____ on _____

Original batch sheet and complete calculation file to be filed with the FIRST listed work order number.

FORM NO.: RC-52, 1/94, Rev. 4

9713508.2260

5/16/94

*** SE-79 ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

12-Apr-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0025

MATRIX : SOIL

BATCH NUMBER 4-184

ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
L041841B		W041840N	EQBS034	ottawa sand
L041841S	EQBS025	W041841D	EQBS035	ottawa sand EQBS025
1) 40418401		WHC	BOBKM2	100.26 ± 4.5288
F041840I				

ACTIONS (Initial & Date)

1) INITIATED 4/12/94

2) PREP LAB RECEIVED 5/11/94 BM

3) SAMPLE REMAINDER STORED _____
RD3221 5/13/94 BM

4) SEPARATION LAB RECEIVED 5-17-94 Swain

5) COUNTING/MEASUREMENT LAB 5-19-94

6) DATA REVIEWED AND ANALYTICAL PREP STORED 5/23/94

0062

9713508.2261

BATCH SUMMARY/CHAIN OF CUSTODY

ANALYSIS Tc-99 MATRIX Soil DUE DATE 4/29/94

W0014 & W0025

WORK ORDER	SEQUENCE #	CLIENT	COMMENTS
L 04091 L 040912	-1B 2B	WHC	QC BATCH REAGENT BLANK
L	-1X		QC BATCH MATRIX BLANK
L 04091 L 040912 L 040913 jm 5/19/94	-1M or 1S 2M (circle) 3M	EQnI 195	QC BATCH MATRIX/REAGENT SPIKE 67.6081 ± .8354 PCIG 300 1S ± 3.7092
L 04091	-2M or 2S (circle)	EQnJ 142	QC BATCH MATRIX/REAGENT SPIKE 22.52 ± .2783 PCIG 99.99 ± 1.2355
W0014 F 0409101 F 0401901	-		Duplicate of Sample #
W0025 F 0418401	- 22.5946 ± .2792	PCIG	L 040911 N 2N
W0409102 = EQnJ141 W0401901 = EQnJ 143	100.32 ± 1.2397 22.5338 ± .2784 100.05 ± 1.2363	PCIG	3N 4N
L 040913m = EQnI 194	300.27 ± 3.7104 67.6284 ± .8357 100.05 ± 1.2363 jm 5/19/94	PCIG	
SDG W0014 4040910 1	- 03		
4034920 1	- 01		
4035460 1	- 01		
4040190 1	- 01		
SDG W0025 4041840 1	- 01		
	-		
	-		
	-		
	-		

Batched and QC updated by MM on 5/16/94 Rec'd in C.R. by [illegible] on 5/16/94

Rec'd in Prep Lab by MM on 5/06/94 Data Reviewed and anal. Prep stored [illegible] on 5/19/94

Rec'd in Sep Lab by MM on 5/06/94

Rec'd in Sep lab by NA on NA Samples Disposed by _____ on _____

Original batch sheet and complete calculation file to be filed with the FIRST listed work order number.

FORM NO.: RC-52, 1/94, Rev. 4

9713508.2262

5/16/94

*** TC-99 ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

12-Apr-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0035

MATRIX : SOIL

BATCH NUMBER 4-184

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	40418401		WHC	BOBKM2	

ACTIONS (Initial & Date)

1) INITIATED 4/12/94

2) PREP LAB RECEIVED 4-27-94

3) SAMPLE REMAINDER STORED 5-5-94

4) SEPARATION LAB RECEIVED _____

5) COUNTING/MEASUREMENT LAB _____

6) DATA REVIEWED AND ANALYTICAL PREP STORED _____

9713508.2263

*** URANIUM ***

5/16/94

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

12-Apr-1994
Page 1

CUSTOMER: WHC

SAMPLE DELIVERY GROUP W0025

MATRIX : SOIL

BATCH NUMBER 4-184

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
				L041841M EQIK088	
	L041841B		L041841X	~~L041841A~~ 5/13/94 Bm	
	L041841S	EQIK087	L041842X	L041842M EQIK089	
1)	40418401		WHC	BOBKM2	

ACTIONS (Initial & Date)

1) INITIATED 4/12/94

2) PREP LAB RECEIVED 5/11/94 Bm

3) SAMPLE REMAINDER STORED NA
RD 3221 5/12/94 Bm

4) SEPARATION LAB RECEIVED NA

5) COUNTING/MEASUREMENT LAB PH 5/19/94 UA 5/19/94 PK 5/19/94

6) DATA REVIEWED AND ANALYTICAL PREP STORED PK 5/19/94

9713508.2264

INTERNATIONAL TECHNOLOGY CORPORATION

CERTIFICATE OF ANALYSIS

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

May 13, 1994

Attention: J. A. Lerch

Project number	:	519.04
Date Received by Lab	:	April 12, 1994
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W0025

I. Introduction

On April 12, 1994, one (1) soil sample was received by ITAS-Richland and transferred to ITAS-St. Louis for chemical analysis. Upon receipt, the sample was given the following laboratory ID number to correspond with the specific client ID:

St. Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
4873-001	BOBKM2	W40418301	Soil	04/12/94

II. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results, and the appropriate detection limits.

Regional Office
13715 N. Rider Trail • Earth City, Missouri 63045-1205 • 314-298-8566 • FAX: 314-298-8757

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Analyses requested: BNA and Metals including Cyanide using CLP/90 protocol. Chloride, Sulfate and Fluoride by EPA method 300.0. Nitrate by EPA method 353.1. Total Petroleum Hydrocarbons (Kerosene) by method 8015.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike/Matrix Spike Duplicate or Duplicates analyses were performed for all analyses.

IV. Comments

Analysis for cyanide exceeded hold time by one day. See accompanying non-conformance memo SL-94-0244 for details. Samples were received on the last day of the holding time for Cyanide analysis. Analysis was performed as soon as possible but after the holding time had expired.

Kerosene results are noted as High Boiling Hydrocarbons on the TPH forms. They are quantitated against a Fuel Oil #2 (diesel) standard curve which is proved to have the same response factors as that of Kerosene (Fuel Oil #1) within minimal error. The response factor correlation is demonstrated by the running of a single, mid-level calibration standard at the beginning of the analytical batch. This calibration verification data is contained in the data package. This procedure is outlined in ITAS-St. Louis SOP SL4055.

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

Reviewed and approved:

Wade H. Price
Project Manager
z:\annelars\hanw0025.nar

9713508.2267

LOG #: SL-94-0044 page 1 of 2

ITAS-St. Louis
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): 519.04
NCM INITIATED BY (Name/Date): WHP 05-12-94
PARAMETER(S): CN-
SAMPLE NUMBER(S) AFFECTED: 4873-001 W0025

AREA:

☐ SHIP/REC	☐ GC	☑ GEN CHEM	☐ BIOASSAY	☐ IH
☐ ORG EXT	☐ HPLC	☐ METALS	☐ RADIOCHEM	☐ DATA VERIFICATION
☐ INORG PREP	☐ GCMS	☐ GEO	☐ COUNTING	☐ REPORTING
☐ OTHER:	☐	☐	☐	☐

NONCONFORMANCE [check appropriate item(s)]:

1. ☐ Not enough sample received for proper analysis.
2. ☐ Holding time exceeded by 1 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): ~~Holding~~ Sample received on last day of holding time
10. ☐ Comments/Explanation:

NOTIFICATION [check appropriate item(s)]:

1. ☑ Client notified by (name and date): 5/12/94 ~~V. Pottey~~ WHP
   - ☐ in writing ☐ by FAX
   - ☑ by phone ☐ Other (explain)
2. ☑ Client's name V. Pottey and response
   - ☑ process ~~as-is~~ ASAP ☐ resample
   - ☐ on hold til ____ ☐ Other (explain)

PROJECT MANAGER (signature & date): [signature] 5/12/94

FURTHER ACTION REQUIRED. SEE PAGE 2 OF 2

9713508.2268

IT CORPORATION

LOG #: SL-94- 0244 page 2 of 2

CORRECTIVE ACTION

☑ ROOT CAUSE: INITIALS/DATE

Sample held by sampling team for 13 days

☑ CORRECTIVE ACTION: INITIALS/DATE

~~Inform + educate client~~; client notified, and analysis after HT expiration OK'd. Analyze ASAP

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☑ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE

Inform + educate client

FIRST LEVEL SUPERVISOR: DATE:

RESPONSIBLE MANAGER: JAPrice DATE: 5/12/94

QC REVIEW

☐ NONCONFORMANCE ☑ DEFICIENCY ☐ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO:

QC COORDINATOR: JM Clayton DATE: 05-13-94

CORRECTIVE ACTION VERIFICATION

☐ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: JM Clayton DATE: 05-13-94

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

9713508.2269

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BKM2

Lab Name: ITAS-ST.LOUIS Contract: 519-04

Lab Code: ITSL Case No.: S87301 SAS No.: SDG No.: W0025

Matrix: (soil/water) SOIL Lab Sample ID: 4873-001

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A4639

Level: (low/med) LOW Date Received: 04/12/94

% Moisture: 5 decanted: (Y/N) N Date Extracted: 04/12/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/28/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.2

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	840	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethyl Phthalate	350	U
208-96-8	Acenaphthylene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
99-09-2	3-Nitroaniline	840	U
83-32-9	Acenaphthene	350	U

0000044

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IC

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BKM2

Lab Name: ITAS-ST.LOUIS Contract: 519-04

Lab Code: ITSL Case No.: S87301 SAS No.: SDG No.: W0025

Matrix: (soil/water) SOIL Lab Sample ID: 4873-001

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A4639

Level: (low/med) LOW Date Received: 04/12/94

% Moisture: 5 decanted: (Y/N) N Date Extracted: 04/12/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/28/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.2

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	840	U
100-02-7	4-Nitrophenol	840	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	840	U
534-52-1	4,6-Dinitro-2-Methylphenol	840	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	840	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	120	BJ
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	36	BJ
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

0000045

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IF

EPA SAMPLE NO.

B0BKM2

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: ITAS-ST.LOUIS Contract: 519-04

Lab Code: ITSL Case No.: S87301 SAS No.: SDG No.: W0025

Matrix: (soil/water) SOIL Lab Sample ID: 4873-001

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A4639

Level: (low/med) LOW Date Received: 04/12/94

% Moisture: 5 decanted: (Y/N) N Date Extracted: 04/12/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/28/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.2

Number TICs found: 4

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111900	Ethanol, 2-(2-ethoxyethoxy)-	5.91	240	BJN
2.	UNKNOWN	26.07	170	J
3.	UNKNOWN	28.32	82	J
4.	UNKNOWN	30.37	190	J

0000046

9713508.2272

INTERNATIONAL TECHNOLOGY CORPORATION

CERTIFICATE OF ANALYSIS

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

May 13, 1994

Attention: J. A. Lerch

Project number	:	519.04
Date Received by Lab	:	April 12, 1994
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W0025

I. Introduction

On April 12, 1994, one (1) soil sample was received by ITAS-Richland and transferred to ITAS-St. Louis for chemical analysis. Upon receipt, the sample was given the following laboratory ID number to correspond with the specific client ID:

St. Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
4873-001	BOBKM2	W40418301	Soil	04/12/94

II. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results, and the appropriate detection limits.

Regional Office
13715 N. Rider Trail • Earth City, Missouri 63045-1205 • 314-298-8566 • FAX: 314-298-8757

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---

Analyses requested: BNA and Metals including Cyanide using CLP/90 protocol. Chloride, Sulfate and Fluoride by EPA method 300.0. Nitrate by EPA method 353.1. Total Petroleum Hydrocarbons (Kerosene) by method 8015.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike/Matrix Spike Duplicate or Duplicates analyses were performed for all analyses.

IV. Comments

Analysis for cyanide exceeded hold time by one day. See accompanying non-conformance memo SL-94-0244 for details. Samples were received on the last day of the holding time for Cyanide analysis. Analysis was performed as soon as possible but after the holding time had expired.

Kerosene results are noted as High Boiling Hydrocarbons on the TPH forms. They are quantitated against a Fuel Oil #2 (diesel) standard curve which is proved to have the same response factors as that of Kerosene (Fuel Oil #1) within minimal error. The response factor correlation is demonstrated by the running of a single, mid-level calibration standard at the beginning of the analytical batch. This calibration verification data is contained in the data package. This procedure is outlined in ITAS-St. Louis SOP SL4055.

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

Reviewed and approved:

Wade H. Price
Project Manager
z:\annelars\hanw0025.nar

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LOG #: SL-94- 0244 page 1 of 2

ITAS-St. Louis
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): 519.04
NCM INITIATED BY (Name/Date): WHP /05-12-94
PARAMETER(S): CN-
SAMPLE NUMBER(S) AFFECTED: 4873-001 W0025

AREA:
- [ ] SHIP/REC
- [ ] ORG EXT
- [ ] INORG PREP
- [ ] OTHER:
- [ ] GC
- [ ] HPLC
- [ ] GCMS
- [ ] GEN CHEM
- [ ] METALS
- [ ] GEO
- [ ] BIOASSAY
- [ ] RADIOCHEM
- [ ] COUNTING
- [ ] IH
- [ ] DATA VERIFICATION
- [ ] REPORTING

NONCONFORMANCE [check appropriate item(s)]:

1. [ ] Not enough sample received for proper analysis.
2. [ ] Holding time exceeded by 1 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
     - [x] 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): ~~Holding~~ Sample received on last day of holding time
10. [ ] Comments/Explanation:

NOTIFICATION [check appropriate item(s)]:

1. [x] Client notified by (name and date): 4/12/94 ~~V. Pettey~~ WHP
   - [ ] in writing
   - [ ] by FAX
   - [x] by phone
   - [ ] Other (explain)
2. [x] Client's name V. Pettey and response
   - [x] process ~~"as is"~~ ASAP
   - [ ] resample
   - [ ] on hold til
   - [ ] Other (explain)

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

FURTHER ACTION REQUIRED. SEE PAGE 2 OF 2

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IT CORPORATION

LOG #: SL-94-0244 page 2 of 2

CORRECTIVE ACTION

☑ ROOT CAUSE: INITIALS/DATE

Sample held by sampling team for 13 days

☑ CORRECTIVE ACTION: INITIALS/DATE

~~Inform + educate client~~; client notified and analysis after HT expiration OK'd. Analyze ASAP

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☑ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE

Inform + educate client

FIRST LEVEL SUPERVISOR: DATE:

RESPONSIBLE MANAGER: JAPrice DATE: 5/12/94

QC REVIEW

☐ NONCONFORMANCE ☑ DEFICIENCY ☐ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO:

QC COORDINATOR: JM Clayton DATE: 05-13-94

CORRECTIVE ACTION VERIFICATION

☐ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: JM Clayton DATE: 05-13-94

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

0000155

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: ITAS_ST._LOUIS_____ Contract: 519.04____

Lab Code: ITMO__ Case No.: _____ SAS No.: _____ SDG No.: W0025_____

SOW No.: ILM03

EPA Sample No.	Lab Sample ID
B0BKM2	4873-001
B0BKM2D	4873-001D
B0BKM2S	4873-001S

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES

If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:

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 and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Wade H. Price Name: WADE H. PRICE

Date: 5/13/94 Title: Project Manager

0000157

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U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0BKM2

Lab Name: ITAS_ST._LOUIS Contract: 519.04

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0025

Matrix (soil/water): SOIL Lab Sample ID: 4873-001

Level (low/med): LOW Date Received: 04/12/94

% Solids: 94.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6590			P
7440-36-0	Antimony	5.2	U	N	P
7440-38-2	Arsenic	4.5			F
7440-39-3	Barium	73.4			P
7440-41-7	Beryllium	0.59	B		P
7440-43-9	Cadmium	0.71	B		P
7440-70-2	Calcium	7940			P
7440-47-3	Chromium	6.0			P
7440-48-4	Cobalt	11.4			P
7440-50-8	Copper	15.1			P
7439-89-6	Iron	26400			P
7439-92-1	Lead	5.8			F
7439-95-4	Magnesium	4950			P
7439-96-5	Manganese	367			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	10.8			P
7440-09-7	Potassium	1100			P
7782-49-2	Selenium	0.40	B	N	F
7440-22-4	Silver	0.78	U		P
7440-23-5	Sodium	196	B		P
7440-28-0	Thallium	0.15	U		F
7440-62-2	Vanadium	53.2			P
7440-66-6	Zinc	50.6			P
	Cyanide	0.15	U		AS
7440-32-6	Titanium	2040			P

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: COLORLESS Clarity After: Artifacts:

Comments:

FORM I - IN

ILM03.0

0000158

9713508.2279

INTERNATIONAL TECHNOLOGY CORPORATION

CERTIFICATE OF ANALYSIS

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

May 13, 1994

Attention: J. A. Lerch

Project number	:	519.04
Date Received by Lab	:	April 12, 1994
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W0025

I. Introduction

On April 12, 1994, one (1) soil sample was received by ITAS-Richland and transferred to ITAS-St. Louis for chemical analysis. Upon receipt, the sample was given the following laboratory ID number to correspond with the specific client ID:

St. Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
4873-001	BOBKM2	W40418301	Soil	04/12/94

II. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results, and the appropriate detection limits.

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Analyses requested: BNA and Metals including Cyanide using CLP/90 protocol. Chloride, Sulfate and Fluoride by EPA method 300.0. Nitrate by EPA method 353.1. Total Petroleum Hydrocarbons (Kerosene) by method 8015.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike/Matrix Spike Duplicate or Duplicates analyses were performed for all analyses.

IV. Comments

Analysis for cyanide exceeded hold time by one day. See accompanying non-conformance memo SL-94-0244 for details. Samples were received on the last day of the holding time for Cyanide analysis. Analysis was performed as soon as possible but after the holding time had expired.

Kerosene results are noted as High Boiling Hydrocarbons on the TPH forms. They are quantitated against a Fuel Oil #2 (diesel) standard curve which is proved to have the same response factors as that of Kerosene (Fuel Oil #1) within minimal error. The response factor correlation is demonstrated by the running of a single, mid-level calibration standard at the beginning of the analytical batch. This calibration verification data is contained in the data package. This procedure is outlined in ITAS-St. Louis SOP SL4055.

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

Reviewed and approved:

Wade H. Price
Project Manager
z:\annelars\hanw0025.nar

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9713508.2232

LOG #: SL-94- 0244 page 1 of 2

ITAS-St. Louis
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): 519.04
NCM INITIATED BY (Name/Date): WHP 05-12-94
PARAMETER(S): CN-
SAMPLE NUMBER(S) AFFECTED: 4873-001 W0025

AREA:

☐ SHIP/REC	☐ GC	☑ GEN CHEM	☐ BIOASSAY	☐ IH
☐ ORG EXT	☐ HPLC	☐ METALS	☐ RADIOCHEM	☐ DATA VERIFICATION
☐ INORG PREP	☐ GCMS	☐ GEO	☐ COUNTING	☐ REPORTING
☐ OTHER:	☐	☐	☐	☐

NONCONFORMANCE [check appropriate item(s)]:

1. ☐ Not enough sample received for proper analysis.
2. ☐ Holding time exceeded by 1 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):** Holding. Sample received on last day of holding time
10. ☐ **Comments/Explanation:**

NOTIFICATION [check appropriate item(s)]:

1. ☑ Client notified by (name and date): 5/12/94 ~~V. Pettey~~ WHP
   - ☐ in writing ☐ by FAX
   - ☑ by phone ☐ Other (explain)
2. ☑ Client's name V. Pettey and response
   - ☑ process ~~as is~~ ASAP ☐ resample
   - ☐ on hold til ☐ Other (explain)

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

FURTHER ACTION REQUIRED. SEE PAGE 2 OF 2

000027

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IT CORPORATION

LOG #: SL-94-0244 page 2 of 2

CORRECTIVE ACTION

☑ ROOT CAUSE: INITIALS/DATE

Sample held by sampling team for 13 days

☑ CORRECTIVE ACTION: INITIALS/DATE

~~Inform + educate client~~; client notified and analysis after HT expiration OK'd. Analyze ASAP

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☑ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE

Inform + educate client

FIRST LEVEL SUPERVISOR: DATE:

RESPONSIBLE MANAGER: JAPrice DATE: 5/12/94

QC REVIEW

☐ NONCONFORMANCE ☑ DEFICIENCY ☐ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO:

QC COORDINATOR: JM Clemis DATE: 05-13-94

CORRECTIVE ACTION VERIFICATION

☐ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: JM Clemis DATE: 05-13-94

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

000030

ITAS ST. LOUIS

ANIONS BY I.C.

(ug/g) ug/L mg/L
(circle one)

Project # 519.04
Analyst J. Carro
Reviewed by R. Patterson/05-02-94
Reviewed by R. Patterson/05-02-94
Page 1 of 1

Prep Date 04-18-94
Analysis Date 04-18-94
Loop Used 50ml
Batch # 36290
Method # 300.0

Standard Value	Sample ID	Std ID	Solid Fract.	Dil.	Fl	Cl	SO_4	Fl Dry Wt	Cl Dry Wt	SO_4 Dry Wt	% Rec	RPD
	QCBLK36290				<0.986	<2.46	<9.86					
Fl 9.88 SO4 39.5	QCLCS36290	AL1588-94			9.27	9.09	36.8				Fl 94 SO4 93	
	4769-001		0.8289					<1.20	9.71	16.0		
	001DUP							<1.20	9.72	15.8		Fl <1 SO4 1
F 23.9	001MS	AL1589-94						28.7			F 120	
	4796-001		0.8979					<1.11	<2.78	16.0		
	4873-001		0.9491					<1.05	9.59	62.2		
	001DUP							<1.05	9.59 RPOS-05-02-94	62.2 RPOS-05-02-94		Fl <1 SO4 <1
F 20.9	001MS	AL1590-94						25.8			F 123	
	4817-001		0.9862					<1.01	7.76	11.9		
	4846-001		0.9770					<1.02	6.60	10.6		
	002		0.9778					<1.01	6.33	<10.1		
	003		0.9681					<1.03	9.97	12.3		
Cl 239 SO4 239	4769-001MS	AL1589-94	0.8289	X10					252	257	Cl 101 SO4 101	
Cl 209 SO4 209	4873-001MS	AL1590-94	0.9491	X10					218	281	Cl 100 SO4 105	

* CANT CALCULATE RPD DUE TO VALUES BELOW DETECTION LIMIT

0000435

SI-92-INORG-0165

ITAS-ST. LOUIS

NITRATE/NITRITE-N REPORT

Pg. 1 of 1

Analyst: J. CARRO
Project No.: 519.04
Reviewed by: R. Patterson

Batch No.: 35922

PREP DATE: 04-18-94
Analysis Date: 04-19-94
Method No.: 353.1
Date: 04-29-94

TRUE VALUE	LAB ID	STANDARD ID	RAW VALUE x	DILUTION ÷	SAMPLE VOLUME (L or g) =	NITRATE/ NITRITE x	EXTRACT VOLUME (L) ÷	FRACTION SOLID =	FINAL CONCENTRATION (ug/L)-N (ug/g)-N	% RECOVERY	RPD
	QCBK35922-1		-9.318		5.071		0.05	AD 04-29-94	* <0.493		
5.60	QCLCS35922-1	AUSB3-94	599.0		5.043				5.94	106	
	4769-001		394.2		5.015			0.8289	* 4.74		
	001DUP		395.3		5.032				4.74		<1
6.71	001MS	AUSB4-94	210.6	X5	5.072				12.5	116	
	4776-001		195.7	X10	5.003			0.8979	21.8		
	4873-001		276.1	X10	5.016			0.9491	29.0		
	001DUP		270.0	X10	5.023				28.3		2
5.50	001MS	AUSB5-94	351.2	X10	5.041				36.7	131 **	
	4817-001		204.8	X5	5.011			0.9862	10.4		
	4846-001		599.2		5.023			0.9770	6.10		
	002		618.0		5.063			0.9778	6.24		
	003		665.3		5.023			0.9681	6.84		

* CORRECTED FOR % MOISTURE
** [illegible] SPIKE AMT

0000490

SL-91-INORG-0039

ITAS - ST. LOUIS

TOC ANALYSIS

PREP DATE: 04-20-94
DATE OF ANALYSIS: 04-20-94
ANALYST: J. Flandreau
BATCH #: 36063

PAGE 1 OF 1

REVIEWED BY: R. Patterson/05-09-94
REVIEWED BY: R. Patterson/05-09-94
METHOD #: 9060
PROJECT #: 519.04

ANALYSIS TIME	LAB ID	STANDARD CONC.	VOLUME/ WEIGHT g USED	DILUTION	FRACTION SOLID	INSTRUMENT PRINTOUT PPM C	CONC (MG/L OR UG/G)	SAMPLE AVERAGE & ~~RPD~~ Range
	QCBLK36063-1		80.4	0.995		9.811	<24.9	RD 05-09-94
	AL1671-94 QCLCS36063-1	605 ug/g	79.4	1.01		554.5	554	
	4873-001		51.1	1.57	0.9491	1486	1570	
	001		30.3	2.64		1185	1250	$\bar{x}$=1260
	001		31.7	2.52		1127	1190	range=1040→1570
	001		31.6	2.53		985.4	1040	
	001 DUP		35.6	2.25		1027	1080	
	001 DUP		38.4	2.08		1019	1070	$\bar{x}$=1250
	001 DUP		39.3	2.04		1582	1670	range=1070→1670
	001 DUP		32.0	2.50		1117	1180	
	AL1672-94 001 MS	2050	30.8	2.60		2985	3150	
	AL1673-94 001 MS	2110	30.0	2.67		3310	3490	$\bar{x}$=3390
	AL1674-94 001 MS	2090	30.2	2.65		3202	3370	range=3150→3550
	AL1675-94 001 MS	2100	30.1	2.66		3369	3550	
						J. Flandreau	05-05-94	

0000515

LCS True Value = 605 ug/g
Percent Recovery = 92
SL-91-INORG-0013-WESTON

MS True Value = 2090 ug/g
Percent Recovery = 102

MSD True Value = N/A
Percent Recovery = ↓
RPD = <1

mg/L TOC (water) = Instr. Printout (PPMC) x Dil. Factor
ug/g TOC (soil) = Instr. Printout (PPMC) / Fraction Solid

97 13508 2236

9713508.2287

INTERNATIONAL TECHNOLOGY CORPORATION

CERTIFICATE OF ANALYSIS

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

May 13, 1994

Attention: J. A. Lerch

Project number	:	519.04
Date Received by Lab	:	April 12, 1994
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W0025

I. Introduction

On April 12, 1994, one (1) soil sample was received by ITAS-Richland and transferred to ITAS-St. Louis for chemical analysis. Upon receipt, the sample was given the following laboratory ID number to correspond with the specific client ID:

St. Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
4873-001	BOBKM2	W40418301	Soil	04/12/94

II. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results, and the appropriate detection limits.

Analyses requested: BNA and Metals including Cyanide using CLP/90 protocol. Chloride, Sulfate and Fluoride by EPA method 300.0. Nitrate by EPA method 353.1. Total Petroleum Hydrocarbons (Kerosene) by method 8015.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike/Matrix Spike Duplicate or Duplicates analyses were performed for all analyses.

IV. Comments

Analysis for cyanide exceeded hold time by one day. See accompanying non-conformance memo SL-94-0244 for details. Samples were received on the last day of the holding time for Cyanide analysis. Analysis was performed as soon as possible but after the holding time had expired.

Kerosene results are noted as High Boiling Hydrocarbons on the TPH forms. They are quantitated against a Fuel Oil #2 (diesel) standard curve which is proved to have the same response factors as that of Kerosene (Fuel Oil #1) within minimal error. The response factor correlation is demonstrated by the running of a single, mid-level calibration standard at the beginning of the analytical batch. This calibration verification data is contained in the data package. This procedure is outlined in ITAS-St. Louis SOP SL4055.

000537

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

Reviewed and approved:

Wade H. Price
Project Manager
z:\annelars\hanw0025.nar

0000539

9713508.2290

LOG #: SL-94-0244 page 1 of 2

ITAS-St. Louis
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): 519.04
NCM INITIATED BY (Name/Date): WHP 05-12-94
PARAMETER(S): CN-
SAMPLE NUMBER(S) AFFECTED: 4873-001 W0025

AREA:
- [ ] SHIP/REC
- [ ] ORG EXT
- [ ] INORG PREP
- [ ] OTHER:
- [ ] GC
- [ ] HPLC
- [ ] GCMS
- [ ] _____
- [x] GEN CHEM
- [ ] METALS
- [ ] GEO
- [ ] _____
- [ ] BIOASSAY
- [ ] RADIOCHEM
- [ ] COUNTING
- [ ] _____
- [ ] IH
- [ ] DATA VERIFICATION
- [ ] REPORTING
- [ ] _____

NONCONFORMANCE [check appropriate item(s)]:

1. [ ] Not enough sample received for proper analysis.
2. [ ] Holding time exceeded by 1 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
     - [x] 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): ~~Holding~~ Sample received on last day of holding time
10. [ ] Comments/Explanation:

NOTIFICATION [check appropriate item(s)]:

1. [x] Client notified by (name and date): 4/12/94 ~~V. Pettey~~ WHP
   - [ ] in writing
   - [ ] by FAX
   - [x] by phone
   - [ ] Other (explain)
2. [x] Client's name V. Pettey and response
   - [x] process ~~"as-is"~~ ASAP
   - [ ] resample
   - [ ] on hold til
   - [ ] Other (explain)

PROJECT MANAGER (signature & date): [signature] 5/12/94

FURTHER ACTION REQUIRED. SEE PAGE 2 OF 2

CORRECTIVE ACTION

☒ ROOT CAUSE: INITIALS/DATE

Sample held by sampling team for 13 days

☒ CORRECTIVE ACTION: INITIALS/DATE

~~Inform + educate client~~. client notified and analysis after HT expiration OK'd. Analyze ASAP

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☒ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE

Inform + educate client

FIRST LEVEL SUPERVISOR: DATE:

RESPONSIBLE MANAGER: JR Price DATE: 5/12/94

QC REVIEW

☐ NONCONFORMANCE ☒ DEFICIENCY ☐ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO:

QC COORDINATOR: JM Clayton DATE: 05-13-94

CORRECTIVE ACTION VERIFICATION

☐ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: JM Clayton DATE: 05-13-94

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

9713508.2292

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.
B0BKM2

Lab Name: ITAS-St. Louis
Contract: 519.04

Lab Code: ITSL Case No.: _____ SAS No.: _____ SDG No.: W0025

Matrix : (soil/water) SOIL
Lab Sample ID: 4873-001

Sample wt/vol: 20.2 (g/ml) g
Lab File ID: _____

Level: (low/med) LOW
Date Sampled: 03-29-94

% Moisture: not dec. 5 dec. _____
Date Extracted: 04-12-94

Extraction: (SepF/Cont/Sonc/Shak) SHAK
Date Analyzed: 04-21-94

GPC Cleanup: (Y/N) N pH: _____
Dilution Factor: 1

CAS NO.	Compound	CONCENTRATION UNITS: (mg/L or mg/Kg) mg/Kg	Q
	HBH (1)	26	U

U: Concentration of analyte is less than the value given.

(1): High Boiling Hydrocarbon (HBH) is quantitated as if it is Fuel Oil #2.

0005049

FORM I HBH

9713508.2293

INTERNATIONAL TECHNOLOGY CORPORATION

RECORD COPY

JUN 1994
RECEIVED
SDLA

Analytical Data Package Prepared For

Westinghouse Hanford

Radiochemical Analysis By

IT Analytical Services
Richland Laboratory

Sample Delivery Group Number: W0025

WHC IDENTIFICATION NUMBER	ITAS RICHLAND ID NUMBER
BOBKM2	404184-01

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

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0001

INTERNATIONAL TECHNOLOGY CORPORATION

CERTIFICATE OF ANALYSIS

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

June 1, 1994

Attention: J.A.Lerch

SAF Number	:	94-065
Date SDG Closed	:	April 25, 1994
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W0025
Data Deliverable	:	Stand Alone

I. Introduction

On April 11, 1994, one soil sample was received by ITAS-Richland for radiochemical analysis. Upon receipt, the sample was assigned the following laboratory ID number to correspond with the WHC specific ID:

ITAS-Richland ID	WHC ID	Matrix	Date of Receipt
404184-01A	B0BKM2	Soil	4/11/94

II. Analytical Results/Methodology

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

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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
Iodine-129 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
Selenium-79 by method ITAS-RD-3253
Technetium-99 by method ITAS-IT-RS-0001
Total Uranium
Total Uranium by method ITAS-RD-4200

III. Quality Control

The analytical results for each analysis performed under SDG W0025 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 sample classified it as Category III.

Alpha Spectroscopy

Americium-241, Curium-244 by method ITAS-RD-3302
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BKM2) results are within contractual requirements. The batch blank indicates Am-241 contamination at a level below the contractual detection limit. The sample result is below the contractual detection limit and is not significantly affected by the low-level contamination. Blank tests performed since the analysis of this batch indicate that the contamination has effectively been eliminated by clean-up steps taken since the discovery of the contamination.

Neptunium-237 by method ITAS-RD-3208
Two matrix spikes were analyzed with the batch. Both matrix spike recoveries are greater than 30% and less than 60%. A reanalysis of the batch was performed, however, the reanalysis matrix spike recoveries were less than those on the initial analysis. The initial analysis is accepted with matrix spike recoveries between 30% and 60% due to a matrix effect. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BKM2) results meet contractual requirements and are reported.

Plutonium-238, -239/40 by method ITAS-RD-3209
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BKM2) results meet contractual requirements.

Uranium-234, -235, -238 by method ITAS-RD-3234
The LCS, batch blank, and sample results meet contractual requirements. The duplicate of sample B0BKM2 did not meet the tracer yield lower limit of 30%. The isotopic uranium results for the duplicate of B0BKM2 are within 3 sigma of the sample results and are accepted based on the acceptable LCS and batch blank results.

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219
The detection limit was not met for Eu-155 in the analysis of sample B0BKM2 and the duplicate of B0BKM2 due to high background counts interfering with the Eu-155 energy region of interest. An Ottawa sand blank counted for the same length of time did meet the MDA for Eu-155, therefore, the data are accepted with the elevated Eu-155 detection limit. The interference is attributed to a matrix effect. The LCS and batch blank results are within contractual requirements.

Iodine-129 by method ITAS-RD-3219
The detection limit was not met for sample B0BKM2 and the duplicate of B0BKM2 due to Cs-137 interference. The duplicate of B0BKM2 was not initially submitted with the batch for counting due to an error at the time of the preparation of the batch. When the omission was discovered the duplicate was submitted for the I-129 gamma count. The duplicate data verifies the matrix effect caused by high levels of Cs-137 in the sample without necessitating a reanalysis of the sample batch. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BKM2) results are accepted and reported.

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BKM2) results meet contractual requirements.

Gross Beta by method ITAS-RD-3222
The LCS vial used for this batch was the spike intended for an analysis of gross beta in water and has a different spike level than the spike level required for the analysis of soil. The responsible technician was reminded to use care in selecting the proper spike vial for the analysis and matrix. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BKM2) results are accepted and reported.

Strontium-90 by method ITAS-RD-3204
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BKM2) results meet contractual requirements.

Liquid Scintillation Counting

Selenium-79 by method ITAS-RD-3253
The reported result for sample B0BKM2 is believed to be a FALSE POSITIVE result. The raw LSC data indicates that the activity attributed to Se-79 is likely caused by a nuclide other than Se-79. Two matrix spikes were analyzed and their average chemical yield is used for the batch yield corrections. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BKM2) results are within contractual requirements.

Technetium-99 by method ITAS-IT-RS-0001
Due to a batching error, SDG W0014 and W0025 were batched and analyzed together. Both SDGs share a single blank and both matrix spikes analyzed were assigned to SDG W0014. The data is reported using the blank and matrix spike data in both data packages for the Tc-99 analysis. The team leaders have been reinstructed as to batching requirements for the WHC contract. The average matrix spike yield is used for batch yield corrections. The result for the duplicate of sample B0BKM2 is not within the 3 sigma control limit. The other two sets of duplicate samples analyzed in the same batch are acceptable, therefore the duplicate difference is attributed to non-homogeneity of the soil matrix and the results are accepted. The LCS, batch blank, sample and sample duplicate results are within contractual requirements.

Total Uranium

Total Uranium by method ITAS-RD-4200
Two matrix spikes were analyzed with the batch and their average chemical yield is used for batch yield corrections. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BKM2) results meet contractual requirements and are reported.

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

9713508.2299

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND
SDG NO.: W0025
LAB SAMPLE ID: 40418401
MATRIX: SOIL
WHC ID: B0BKM2
DATE RECEIVED 4/11/94
REPORTING UNITS pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER
AM-241	7.28E-01	1.23E-01	1.68E-01	0.704	RD3302
CM-242	0.00E+00	0.00E+00	1.93E-02	0.704	RD3302
CM-244	4.78E-03	1.04E-02	1.04E-02	0.704	RD3302
NP-237	7.99E-03	1.18E-02	1.19E-02	1	RD3208
PU239/40	2.47E-01	8.35E-02	9.20E-02	0.591	RD3209
PU-238	1.27E-02	2.02E-02	2.03E-02	0.591	RD3209
U-234	9.63E+00	5.17E-01	1.43E+00	0.601	RD3234
U-235	3.86E-01	1.04E-01	1.17E-01	0.601	RD3234
U-238DA	8.51E+00	4.86E-01	1.28E+00	0.601	RD3234
K-40	1.27E+01	3.87E-01	1.33E+00	N/A	RD3219
CO-60	5.81E-03	9.00E-03	9.02E-03	N/A	RD3219
EU-152	6.13E-02	3.99E-02	4.04E-02	N/A	RD3219
CS-137DA	5.25E+02	5.25E+01	5.25E+01	N/A	RD3219
CS-134	-3.52E-02	5.23E-02	5.25E-02	N/A	RD3219
RU-106DA	5.66E-02	5.46E-01	5.46E-01	N/A	RD3219
NA-22	-9.86E-05	1.02E-02	1.02E-02	N/A	RD3219
EU-155	4.51E-02	1.72E-01	1.72E-01	N/A	RD3219
EU-154	-2.70E-04	2.78E-02	2.78E-02	N/A	RD3219
I-129LP	-2.91E+01	3.51E+00	4.56E+00	N/A	RD3219
ALPHA	3.55E+01	8.24E+00	9.09E+00	1	RD3222
BETA	7.41E+02	1.77E+01	5.20E+01	1	RD3222
TOTAL-SR	4.12E+01	7.56E-01	9.93E+00	0.779	RD3204
SE-79	9.47E+00	8.03E-01	2.79E+00	0.723	RD3253
TC-99	2.52E+01	6.17E-01	3.95E+00	0.691	ITAS-IT-RD-0001
URANIUM	3.04E+01	N/A	4.56E+00	0.87	RD4200

001D
~~0001~~
~~1000~~

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ITAS - ST. LOUIS

SOIL PH

ANALYST M. Hurst
BATCH NO. 35728
PREP AND ANALYSIS DATE 04-15-94

REVIEWED BY R. Patterson/04-18-94
REVIEWED BY
PROJECT NO. 500.01, 262.01, 519.04.31
METHOD NO. CLP

	LAB ID	SAMPLE WEIGHT, g	VOLUME OF WATER, ml	TEMP °C	pH
	Cal buffer 4.0 IP0140-94	–	–	23	3.98
	Cal buffer 10.0 IP0001-94	–	–	↓	10.00
	Check buffer 7.0 IP0002-94	–	–	↓	7.00
1	QCBlk 35728-1	–	50	↓	5.75
2	4807-002	50.066	↓	21	8.90
3	4852-004	50.113	↓	↓	8.83
4	005	50.359	↓	↓	8.37
5	006	50.186	↓	↓	8.92
6	006DUP	50.012	↓	↓	8.90
7	4863-001	50.234	↓	↓	7.26
8	002	50.031	↓	↓	7.05
9	003	50.115	↓	↓	7.31
10	004	50.295	↓	↓	6.97
11	005	50.667	↓	↓	7.72
12	006	50.734	↓	↓	7.81
	007	50.095	↓	↓	8.01
	4846-001	50.545	↓	↓	8.41
	002	50.726	↓	↓	8.38
	003	50.227	↓	↓	8.69
	4873-001	50.514	↓	↓	8.19
	001DUP	50.622	↓	↓	8.17
	4884-001	50.431	↓	↓	9.72
	002	50.462	↓	↓	8.96

M. Hurst 04-15-94

ITAS - St. Louis
April 15, 1994 10:33 am
Non-Decanted % Solids and % Moisture

nalyst: N.HURT NNH
Date: 15-APR-94
Project: 262.01,340.06,383.01,5K 500.01

ak'd By: R. Patterson
Date: 04-15-94
In Date: 14-APR-94
Out Date: 15-APR-94

ethod: SL 4005
Oven Temp: 105 C.

atch No.: 35684
Units = grams

Sample No.	Pan Weight	Wet Soil+Pan	Dry 1 Soil+Pan	Dry 2 Soil+Pan	Differ	Dry 3 Soil+Pan	Differ	% Solids	% Moist	RPD
4768-001	1.5477	11.9029	4.4991					28.50	71.50	2.056
4768-001DUP1	1.5742	12.0537	4.5002					27.92	72.08	
4768-002	1.5988	12.2120	4.8885					31.00	69.00	
4807-002	1.5581	12.3354	9.6071					74.68	25.32	
4873-001	1.5840	13.0060	12.4249					94.91	5.09	
4846-001	1.6052	12.7668	12.5105					97.70	2.30	
4846-002	1.5669	12.1153	11.8806					97.78	2.22	
4846-003	1.5730	12.6757	12.3219					96.81	3.19	
4852-001	1.6073	12.2902	11.6445					93.96	6.04	
4852-002	1.5848	13.0434	12.1368					92.09	7.91	
4852-003	1.5914	12.1564	11.3406					92.28	7.72	
4852-004	1.5509	12.1386	11.6675					95.55	4.45	
4852-005	1.5842	11.9418	10.9711					90.63	9.37	
4852-006	1.5950	12.8752	12.4107					95.88	4.12	
4863-001	1.5717	12.8378	10.2748					77.25	22.75	
4863-002	1.6061	12.9990	10.4886					77.97	22.03	
4863-003	1.5910	12.8779	11.1701					84.87	15.13	
4863-004	1.5483	12.7648	10.1712					76.88	23.12	

alculation: $\frac{\text{Dry-Pan Weight}}{\text{Wet-Pan Weight}} * 100 = \%\ \text{Solids}$

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97134008.2301

ITAS - St. Louis
April 15, 1994 10:33 am
Non-Decanted % Solids and % Moisture

Analyst: N.HURT NNH
Date: 15-APR-94
Project: 262.01,340.06,383.01,5
500 c

Chk'd By: R. Patterson
Date: 04-15-94
In Date: 14-APR-94
Out Date: 15-APR-94

Method: SL 4005
Oven Temp: 105 C.

Batch No.: 35684
Units = grams

Sample No.	Pan Weight	Wet Soil+Pan	Dry 1 Soil+Pan	Dry 2 Soil+Pan	Differ	Dry 3 Soil+Pan	Differ	% Solids	% Moist	RPD
4863-005	1.6006	14.8112	10.2657					65.59	34.41	
4863-006	1.6057	12.1524	8.9247					69.40	30.60	
4863-007	1.5555	12.4579	11.1515					88.02	11.98	
4871-001	1.6095	12.8895	2.4288					7.26	92.74	
4871-002	1.5260	12.4336	3.6373					19.36	80.64	
4871-003	1.5880	12.2511	4.8462					30.56	69.44	3.694
4871-003DUP1	1.5340	12.4274	4.9886					31.71	68.29	

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0000485

Calculation: $\frac{\text{Dry-Pan Weight}}{\text{Wet-Pan Weight}} * 100 = \%\ \text{Solids}$

9713508.2303

VALIDATION SUMMARY

9713508.2304

MEMORANDUM

TO: 200-UP-2 Project QA Record

June 16, 1994

FR: Susan Winter, Golder Associates Inc.

RE: GENERAL GC DATA VALIDATION SUMMARY FOR DATA PACKAGE: W0025-ITC-027 (923-E418, Filename W0025G.UP2)

INTRODUCTION

This memo presents the results of data validation on data package W0025-ITC-027 prepared by the International Technology Corporation (ITC) laboratory. Information concerning the sample validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B0BKM2	03/29/94	SOIL	SEE NOTE 1

Note 1. Sample B0BKM2 was analyzed for high boiling hydrocarbons using Method 8015 modified.

Data validation was conducted in accordance with the WHC statement of work (WHC 1993a) and validation procedures (WHC 1993b). 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

RECEIVED
JUN 17 1994
VALIDATION DOCUMENTATIO
SDLA

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 as specified in the reference analytical method.

Completeness. The data package was complete for all requested analyses. A total of one sample was validated in this data package with a total of 1 determination reported, of which

001

was deemed valid. This results in a completeness of 100 percent, 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

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

REFERENCES

WHC 1993a, Validation of 200-UP-2 Data, Statement of Work, Analytical Laboratory Data Validation, Task Order S-94-18, December 14, 1993, Purchase Order M073750. 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 (U) due to associated blank contamination.

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

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

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ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: W0025-ITC-027	VALIDATOR:	DATE: June 14, 1994	PAGE 1 OF 1
COMMENTS: GENERAL GC			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
NO QUALIFICATION IS REQUIRED			

9713508.2310

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0025-ITC-027

	Samp#	BOBKM2	
	Date	3-29-94	
	Location	216-U-8	
	Depth	---	
	Type	SOIL	
	Comments	---	
Parameter	Units	Result	Q
HIGH BOILING HYDROCARBONS	MG/KG	26.000	U

Verified
[illegible] 6/16/94

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1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.
B0BKM2

Lab Name: ITAS-St. Louis
Contract: 519.04

Lab Code: ITSL Case No.: _____ SAS No.: _____ SDG No.: W0025

Matrix : (soil/water) SOIL
Lab Sample ID: 4873-001

Sample wt/vol: 20.2 (g/ml) g
Lab File ID: _____

Level: (low/med) LOW
Date Sampled: 03-29-94

% Moisture: not dec. 5 dec. _____
Date Extracted: 04-12-94

Extraction: (SepF/Cont/Sonc/Shak) SHAK
Date Analyzed: 04-21-94

GPC Cleanup: (Y/N) N pH: _____
Dilution Factor: 1

CAS NO.	Compound	CONCENTRATION UNITS: (mg/L or mg/Kg) mg/Kg	Q
	HBH (1)	26	U

U: Concentration of analyte is less than the value given.

(1): High Boiling Hydrocarbon (HBH) is quantitated as if it is Fuel Oil #2.

C450000

Verified
6/14/94

FORM I HBH

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ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

9713508.2314

INTERNATIONAL TECHNOLOGY CORPORATION

CERTIFICATE OF ANALYSIS

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

May 13, 1994

Attention: J. A. Lerch

Project number	:	519.04
Date Received by Lab	:	April 12, 1994
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W0025

I. Introduction

On April 12, 1994, one (1) soil sample was received by ITAS-Richland and transferred to ITAS-St. Louis for chemical analysis. Upon receipt, the sample was given the following laboratory ID number to correspond with the specific client ID:

St. Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
4873-001	BOBKM2	W40418301	Soil	04/12/94

II. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results, and the appropriate detection limits.

011

Regional Office
13715 N. Rider Trail • Earth City, Missouri 63045-1205 • 314-298-8566 • FAX: 314-298-8757

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Analyses requested: BNA and Metals including Cyanide using CLP/90 protocol. Chloride, Sulfate and Fluoride by EPA method 300.0. Nitrate by EPA method 353.1. Total Petroleum Hydrocarbons (Kerosene) by method 8015.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike/Matrix Spike Duplicate or Duplicates analyses were performed for all analyses.

IV. Comments

Analysis for cyanide exceeded hold time by one day. See accompanying non-conformance memo SL-94-0244 for details. Samples were received on the last day of the holding time for Cyanide analysis. Analysis was performed as soon as possible but after the holding time had expired.

Kerosene results are noted as High Boiling Hydrocarbons on the TPH forms. They are quantitated against a Fuel Oil #2 (diesel) standard curve which is proved to have the same response factors as that of Kerosene (Fuel Oil #1) within minimal error. The response factor correlation is demonstrated by the running of a single, mid-level calibration standard at the beginning of the analytical batch. This calibration verification data is contained in the data package. This procedure is outlined in ITAS-St. Louis SOP SL4055.

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

Reviewed and approved:

Wade H. Price
Project Manager
z:\annelars\hanw0025.nar

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006449

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. N/A
Offsite Property No.
Method of Shipment Government truck
Field Logbook No.
Shipped to IT
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

SPECIAL INSTRUCTIONS

9713508.2317

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBKM2	S	3-29-94	0900	(1) 250ml aG	Semi-VOA	CLP	
BOBKM2	S			(1) 250ml Poly	Metals -CLP TAL Titanium Mercury	CPL	
BOBKM2	S			(1) 125ml G	Anions F, Cl, SO_4	EPA 300.0	
BOBKM2	S			(1) 125ml G	NO_2 NO_3	EPA 353.2	
BOBKM2	S			(1) 125ml G	Cyanide	CPL	
BOBKM2	S			(1) 125ml Gs	TPH Diesel Range	8015m	
BOBKM2	S			(1) 125ml aGs	TOC	9060	
BOBKM2	S			(1) 1000ml Poly	Gross Alpha/Beta ITAS-RD-3322 Gamma Spec. Cs-134,137, I-129, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 ITAS-RD-3219; Total Uranium ITAS-RD-4200 OR 4201 U-235/234/238 ITAS-RD-3234 Np-237 ITAS-RD-3208; Pu-238/239/240 ITAS-RD-3209; Sr-90 ITAS-RD-3204; Tc-99 ITAS-RD-RS-0001; Am-241, Cm-244 ITAS-RD-3302; Se-79 ITAS-RD-3253		

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Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. SICKLE	4/11/94	0800	
	4/11/94	1140	JG HOGAN
JG HOGAN	4/11/94	1418	ITAS Tom Gilmore

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

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ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL GC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: WC025-ITC-027
VALIDATOR: [illegible]	LAB: ITC	DATE: 06/08/94
CASE:		SDG: WC025-ITC-027

ANALYSES PERFORMED

☐ 8010	☒ 8015	☐ 8020	☐ 8021	8140	8141
☐ 8150	☐ 8151	☐ WTPH-HCID	☐ WTPH-G	☐ WTPH-D	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX: Soil

B=BKM2

The sample was analyzed for kerosene by Method 8015 modified and was reported as High Boiling Hydrocarbons (HBH).

[illegible] 6/14/94

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:

016

GENERAL GC DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

3.1 INITIAL CALIBRATION

Was an initial calibration performed? . . . . . Yes No N/A

Are %RSD values for calibration or response factors acceptable? . . . . . Yes No N/A

Comments:

3.2 CONTINUING CALIBRATION

Was a continuing calibration check performed? . . . . . Yes No N/A

Are %D values for calibration or response factors 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: Sample locations are not currently available. Field QC will be evaluated in the final summary report.

5. ACCURACY

Were surrogates analyzed? . . . . . Yes No N/A

Are surrogate recoveries acceptable? . . . . . Yes No N/A

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

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

Were LCS samples analyzed? . . . . . Yes No N/A

Are LCS recoveries acceptable? . . . . . Yes No N/A

017

GENERAL GC DATA VALIDATION CHECKLIST

Comments:

6. PRECISION

Are MS/MSD 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

Comments:

7. COMPOUND IDENTIFICATION AND QUANTITATION

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

Is compound quantitation 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

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

Comments:

GENERAL GC DATA VALIDATION CHECKLIST

Comments:

The LCS %R is 68% which is within the DV control limits of 50% - 150%. No qualification is required.

The MS/MSD %R are 65% and 69%, respectively. Lab control limits for the MS/MSD %R are not provided, however, in general, limits of 50% to 150% is acceptable for GC parameters. No qualification is required.

The sample surrogate recovery is 100% which is acceptable. No qualification is required.

6/14/94

019

HOLDING TIME SUMMARY

W0025-ITC-027

SDG:	VALIDATOR: [illegible]	DATE: 6/08/94	PAGE 1 OF 1
COMMENTS: General GC			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B08KM2	GC TPH (HSH)	03/29/94	4/12/94	4/21/94	14	9	None

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MEMORANDUM

JUN 1994 RECEIVED TQO

TO: 200-UP-2 Project QA Record June 16, 1994

FR: Susan Winter, Golder Associates Inc.

RE: SEMIVOLATILE ORGANICS DATA VALIDATION SUMMARY FOR DATA PACKAGE: W0025-ITC-027 (923-E418, Filename W0025B.UP2)

INTRODUCTION

This memo presents the results of data validation on data package W0025-ITC-027 prepared by the International Technology Corporation (ITC) laboratory. Information concerning the sample validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B0BKM2	03/29/94	SOIL	SEE NOTE 1

Note 1. Sample B0BKM2 was analyzed for CLP TCL semivolatile organics.

Data validation was conducted in accordance with the WHC statement of work (WHC 1993a) and validation procedures (WHC 1993b). 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

RECEIVED
JUN 17 1994
VALIDATION DOCUMENTATION
SDLA

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 as specified in the reference analytical method.

Completeness. The data package was complete for all requested analyses. A total of one sample was validated in this data package with a total of 64 determinations reported, all of

which were deemed valid. This results in a completeness of 100 percent, 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 data validation which required qualification of data as estimated.

Laboratory Blanks

- Di-n-butylphthalate and bis(2-ethylhexyl)phthalate were detected in the associated laboratory blank. Attachments 2 and 5 provide a summary of the sample results affected, data qualifications applied and supporting documentation.

TENTATIVELY IDENTIFIED COMPOUND EVALUATION

Tentatively identified compounds (TICs) reported by the laboratory were evaluated during validation and qualified as follows:

- TICs were detected in the samples and associated laboratory blank and have been qualified due to associated blank contamination and have been determined to be presumptive and valid (UJN).

- TICs were detected in the samples and determined to be valid, resulting in qualification of the results as presumptive and valid (JN).

REFERENCES

WHC 1993a, Validation of 200-UP-2 Data, Statement of Work, Analytical Laboratory Data Validation, Task Order S-94-18, December 14, 1993, Purchase Order M073750. 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.

9713508.2326

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 (U) due to associated blank contamination.

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

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

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ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: W0025-ITC-027	VALIDATOR:	DATE: June 7, 1994	PAGE 1 OF 1
COMMENTS: SEMIVOLATILE ORGANICS			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
DI-N-BUTYLPHTHALATE	U	B0BKM2	PRESENT IN BLANK
BIS(2-ETHYLHEXYL)PHTHALATE	U	B0BKM2	PRESENT IN BLANK

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ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0025-ITC-027

	Samp#	B0BKM2	
	Date	3-29-94	
	Location	216-U-8	
	Depth	---	
	Type	SOIL	
	Comments	---	
Parameter	Units	Result	Q
PHENOL	UG/KG	350.000	U
BIS(2-CHLOROETHYL)ETHER	UG/KG	350.000	U
2-CHLOROPHENOL	UG/KG	350.000	U
1,3-DICHLOROBENZENE	UG/KG	350.000	U
1,4-DICHLOROBENZENE	UG/KG	350.000	U
1,2-DICHLOROBENZENE	UG/KG	350.000	U
2-METHYLPHENOL	UG/KG	350.000	U
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/KG	350.000	U
4-METHYLPHENOL	UG/KG	350.000	U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	350.000	U
HEXACHLOROETHANE	UG/KG	350.000	U
NITROBENZENE	UG/KG	350.000	U
ISOPHORONE	UG/KG	350.000	U
2-NITROPHENOL	UG/KG	350.000	U
2,4-DIMETHYLPHENOL	UG/KG	350.000	U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	350.000	U
2,4-DICHLOROPHENOL	UG/KG	350.000	U
1,2,4-TRICHLOROBENZENE	UG/KG	350.000	U
NAPHTHALENE	UG/KG	350.000	U
4-CHLOROANILINE	UG/KG	350.000	U
HEXACHLOROBUTADIENE	UG/KG	350.000	U
4-CHLORO-3-METHYLPHENOL	UG/KG	350.000	U
2-METHYLNAPHTHALENE	UG/KG	350.000	U
HEXACHLOROCYCLOPENTADIENE	UG/KG	350.000	U
2,4,6-TRICHLOROPHENOL	UG/KG	350.000	U
2,4,5-TRICHLOROPHENOL	UG/KG	840.000	U
2-CHLORONAPHTHALENE	UG/KG	350.000	U
2-NITROANILINE	UG/KG	840.000	U
DIMETHYLPHTHALATE	UG/KG	350.000	U
ACENAPHTHYLENE	UG/KG	350.000	U
2,6-DINITROTOLUENE	UG/KG	350.000	U
3-NITROANILINE	UG/KG	840.000	U

Verified
[illegible] 6/09/94

9713508.2331

008

Validated Data Summary, Data Package: W0025-ITC-027

	Samp#	B0BKM2	
	Date	3-29-94	
	Location	216-U-8	
	Depth	---	
	Type	SOIL	
	Comments	---	
Parameter	Units	Result	Q
ACENAPHTHENE	UG/KG	350.000	U
2,4-DINITROPHENOL	UG/KG	840.000	U
4-NITROPHENOL	UG/KG	840.000	U
DIBENZOFURAN	UG/KG	350.000	U
2,4-DINITROTOLUENE	UG/KG	350.000	U
DIETHYLPHTHALATE	UG/KG	350.000	U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	350.000	U
FLUORENE	UG/KG	350.000	U
4-NITROANILINE	UG/KG	840.000	U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	840.000	U
N-NITROSODIPHENYLAMINE	UG/KG	350.000	U
4-BROMOPHENYL-PHENYLETHER	UG/KG	350.000	U
HEXACHLOROBENZENE	UG/KG	350.000	U
PENTACHLOROPHENOL	UG/KG	840.000	U
PHENANTHRENE	UG/KG	350.000	U
ANTHRACENE	UG/KG	350.000	U
CARBAZOLE	UG/KG	350.000	U
DI-N-BUTYLPHTHALATE	UG/KG	350.000	U
FLUORANTHENE	UG/KG	350.000	U
PYRENE	UG/KG	350.000	U
BUTYLBENZYLPHTHALATE	UG/KG	350.000	U
3,3'-DICHLOROBENZIDINE	UG/KG	350.000	U
BENZO(A)ANTHRACENE	UG/KG	350.000	U
CHRYSENE	UG/KG	350.000	U
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	350.000	U
DI-N-OCTYLPHTHALATE	UG/KG	350.000	U
BENZO(B)FLUORANTHENE	UG/KG	350.000	U
BENZO(K)FLUORANTHENE	UG/KG	350.000	U
BENZO(A)PYRENE	UG/KG	350.000	U
INDENO(1,2,3-CD)PYRENE	UG/KG	350.000	U
DIBENZ(A,H)ANTHRACENE	UG/KG	350.000	U
BENZO(G,H,I)PERYLENE	UG/KG	350.000	U

Verified

6/09/94

9713508.2332

9713508.2333

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOBKM2

Lab Name: ITAS-ST.LOUIS Contract: 519-04

Lab Code: ITSL Case No.: S87301 SAS No.: SDG No.: W0025

Matrix: (soil/water) SOIL Lab Sample ID: 4873-001

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A4639

Level: (low/med) LOW Date Received: 04/12/94

% Moisture: 5 decanted: (Y/N) N Date Extracted: 04/12/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/28/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.2

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	840	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethyl Phthalate	350	U
208-96-8	Acenaphthylene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
99-09-2	3-Nitroaniline	840	U
83-32-9	Acenaphthene	350	U

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6/07/94

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1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0BKM2

Lab Name: ITAS-ST.LOUIS Contract: 519-04

Lab Code: ITSL Case No.: S87301 SAS No.: SDG No.: W0025

Matrix: (soil/water) SOIL Lab Sample ID: 4873-001

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A4639

Level: (low/med) LOW Date Received: 04/12/94

% Moisture: 5 decanted: (Y/N) N Date Extracted: 04/12/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/28/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.2

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	840	U
100-02-7	4-Nitrophenol	840	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	840	U
534-52-1	4,6-Dinitro-2-Methylphenol	840	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	840	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 ~~120~~	~~BJ~~
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 ~~36~~	~~BJ~~
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

FORM I SV-2 3/90

6/07/94

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0BKM2

Lab Name: ITAS-ST.LOUIS Contract: 519-04

Lab Code: ITSL Case No.: S87301 SAS No.: SDG No.: W0025

Matrix: (soil/water) SOIL Lab Sample ID: 4873-001

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A4639

Level: (low/med) LOW Date Received: 04/12/94

% Moisture: 5 decanted: (Y/N) N Date Extracted: 04/12/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/28/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.2

Number TICs found: 4

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111900	Ethanol, 2-(2-ethoxyethoxy)-	5.91	240	~~BJN~~
2.	UNKNOWN	26.07	170	~~J~~
3.	UNKNOWN	28.32	82	~~J~~
4.	UNKNOWN	30.37	190	~~J~~

Q
NJB
NJB
NJB
NJB

~~0000046~~

6/07/94

012

9715508.2556

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

9713508.2337

INTERNATIONAL TECHNOLOGY CORPORATION

CERTIFICATE OF ANALYSIS

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

May 13, 1994

Attention: J. A. Lerch

Project number	:	519.04
Date Received by Lab	:	April 12, 1994
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W0025

I. Introduction

On April 12, 1994, one (1) soil sample was received by ITAS-Richland and transferred to ITAS-St. Louis for chemical analysis. Upon receipt, the sample was given the following laboratory ID number to correspond with the specific client ID:

St. Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
4873-001	BOBKM2	W40418301	Soil	04/12/94

II. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results, and the appropriate detection limits.

Regional Office
13715 N. Rider Trail • Earth City, Missouri 63045-1205 • 314-298-8566 • FAX: 314-298-8757

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Analyses requested: BNA and Metals including Cyanide using CLP/90 protocol. Chloride, Sulfate and Fluoride by EPA method 300.0. Nitrate by EPA method 353.1. Total Petroleum Hydrocarbons (Kerosene) by method 8015.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike/Matrix Spike Duplicate or Duplicates analyses were performed for all analyses.

IV. Comments

Analysis for cyanide exceeded hold time by one day. See accompanying non-conformance memo SL-94-0244 for details. Samples were received on the last day of the holding time for Cyanide analysis. Analysis was performed as soon as possible but after the holding time had expired.

Kerosene results are noted as High Boiling Hydrocarbons on the TPH forms. They are quantitated against a Fuel Oil #2 (diesel) standard curve which is proved to have the same response factors as that of Kerosene (Fuel Oil #1) within minimal error. The response factor correlation is demonstrated by the running of a single, mid-level calibration standard at the beginning of the analytical batch. This calibration verification data is contained in the data package. This procedure is outlined in ITAS-St. Louis SOP SL4055.

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

Reviewed and approved:

Wade H. Price
Project Manager
z:\annelars\hanw0025.nar

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006449

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. N/A
Offsite Property No.
Method of Shipment Government truck
Field Logbook No.
Shipped to IT
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required	Preservative
BOBKM2	S	3-29-94	0900	(1) 250ml aG	Semi-VOA CLP	
BOBKM2	S			(1) 250ml Poly	Metals -CLP TAL Titanium Mercury CPL	
BOBKM2	S			(1) 125ml G	Anions F, Cl, SO_4 EPA 300.0	
BOBKM2	S			(1) 125ml G	NO_2 NO_3 EPA 353.2	
BOBKM2	S			(1) 125ml G	Cyanide CPL	
BOBKM2	S			(1) 125ml Gs	TPH Diesel Range 8015m	
BOBKM2	S			(1) 125ml aGs	TOC 9060	
BOBKM2	S			(1) 1000ml Poly	Gross Alpha/Beta ITAS-RD-3322 Gamma Spec. Cs-134,137, I-129, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 ITAS-RD-3219; Total Uranium ITAS-RD-4200 OR 4201 U-235/234/238 ITAS-RD-3234 Np-237 ITAS-RD-3208; Pu-238/239/240 ITAS-RD-3209; Sr-90 ITAS-RD-3204; Tc-99 ITAS-RD-RS-0001; Am-241, Cm-244 ITAS-RD-3302; Se-79 ITAS-RD-3253	

01A B C D E F G 404183
404184 01

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. SICKLE	4/11/94	0800	D.L. Edwards
D.L. Edwards	4/11/94	1140	J.G. Hogan JG Hogan
J.G. Hogan JG Hogan	4/11/94	1418	ITAS Tom Gilmore

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

017

0000014

97135082.2440

9713508.2341

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: W0025-ITC-027
VALIDATOR: [illegible]	LAB: ITC	DATE: 06/07/94
CASE:		SDG: W0025-ITC-027

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 Soil

BOBKM2

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:

019

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: Di-n-butylphthalate and bis(2-ethylhexyl) phthalate were detected in the lab blank. The assoc. sample results have been qualified as undetected (u).

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: Sample locations are currently not available. Field QC will be evaluated in the final summary report.

7. SYSTEM PERFORMANCE

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

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

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

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

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

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

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

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

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

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

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

Comments:

HOLDING TIME SUMMARY

W0025-ITC-027

SDG:	VALIDATOR: [illegible]	DATE: 06/7/94	PAGE 1 OF 1
COMMENTS: Semivolatile Organics			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B0BKM2	SVOA	03/29/94	04/12/94	04/28/94	14	16	None

9713508.2346

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK01

Lab Name: ITAS-ST.LOUIS Contract: 519-04

Lab Code: ITSL Case No.: S87301 SAS No.: SDG No.: W0025

Matrix: (soil/water) SOIL Lab Sample ID: QCBLK35518

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A4638

Level: (low/med) LOW Date Received:

% Moisture: decanted: (Y/N) N Date Extracted: 04/12/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/28/94

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	100	J
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	95	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

RLO=1000

RLO=950

6600000

(1) - Cannot be separated from Diphenylamine

FORM I SV-2 6/07/94 3/90

9713508.2347

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SBLK01

Lab Name: ITAS-ST.LOUIS Contract: 519-04

Lab Code: ITSL Case No.: S87301 SAS No.: SDG No.: W0025

Matrix: (soil/water) SOIL Lab Sample ID: QCBLK35518

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A4638

Level: (low/med) LOW Date Received:

% Moisture: decanted: (Y/N) N Date Extracted: 04/12/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 04/28/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH:

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111900	Ethanol, 2-(2-ethoxyethoxy)-	5.92	300	~~JN~~

Q JN

0000100

6/07/94

FORM I SV-TIC 3/90

9713508.2348

MEMORANDUM

TO: 200-UP-2 Project QA Record

June 16, 1994

FR: Susan Winter, Golder Associates Inc.

RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE: W0025-ITC-027 (923-E418, Filename W0025W.UP2)

INTRODUCTION

This memo presents the results of data validation on data package W0025-ITC-027 prepared by the International Technology Corporation (ITC) laboratory. Information concerning the sample validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B0BKM2	03/29/94	SOIL	SEE NOTE 1

Note 1. Sample B0BKM2 was analyzed for anions (chloride, fluoride, and sulfate), nitrate+nitrite-N and total organic carbon (TOC).

Data validation was conducted in accordance with the WHC statement of work (WHC 1993a) and validation procedures (WHC 1993b). 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

RECEIVED JUN 17 1994 VALIDATION DOCUMENTATION SDLA

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 deficiencies identified below.

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

Detection Limits. Detection limit goals were met for all sample results as specified in the reference analytical method.

001

Completeness. The data package was complete for all requested analyses. A total of one sample was validated in this data package with a total of 5 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, 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 data validation which required qualification of data as estimated.

Matrix Spikes

- Matrix spike percent recovery for chloride was unacceptable. Attachments 2 and 5 provide a summary of the sample results affected, data qualification applied and supporting documentation.

REFERENCES

WHC 1993a, Validation of 200-UP-2 Data, Statement of Work, Analytical Laboratory Data Validation, Task Order S-94-18, December 14, 1993, Purchase Order M073750. 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.

9713508.2350

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

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

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

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

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

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

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

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

9713508.2352

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: W0025-ITC-027	VALIDATOR: DATE: June 8, 1994		PAGE 1 OF 1
COMMENTS: GENERAL CHEMISTRY			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
CHLORIDE	J	B0BKM2	MS %R > 125%

9713508.2354

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0025-ITC-027

	Samp#	B0BKM2	
	Date	3-29-94	
	Location	216-U-8	
	Depth	---	
	Type	SOIL	
	Comments	---	
Parameter	Units	Result	Q
FLUORIDE	MG/KG	1.050	U
CHLORIDE	MG/KG	9.590	J
SULFATE	MG/KG	62.200	
NITRATE+NITRITE	MG-N/KG	29.000	
TOTAL ORGANIC CARBON	MG/KG	1260.000	

Verified
6/09/94

9413208.2254

ITAS ST. LOUIS

ANIONS BY I.C.

ug/g ug/L mg/L (circle one) → mg/kg

Project # 519.04
Analyst [illegible]
Reviewed by R. Patterson/05-02-94
Reviewed by R. Patterson/05-02-94
Page 1 of 1

Prep Date 04-18-94
Analysis Date 04-18-94
Loop Used 50 ml
Batch # 36290
Method # 300.0

Standard Value	Sample ID	Std ID	Solid Fract.	Dil.	Fl	Cl	SO_4	Fl Dry Wt	Cl Dry Wt	SO_4 Dry Wt	% Rec	RPD
	QCBLK36290				<0.986	<2.46	<9.86	(mg/kg)	(mg/kg)	(mg/kg)		
Fl 9.85 Cl 9.86 SO4 39.5	QCLCS36290	AL1588-94			9.27	9.09	36.8				Fl 94 Cl 92 SO4 93	
	4769-001		0.8289					<1.20	9.71	16.0		
	001DUP							<1.20	9.72	15.8		Fl <1 Cl <1 SO4 1
F 23.9	001MS	AL1589-94						28.7			F 120	
	4796-001		0.8979					<1.11	<2.78	16.0		
	4873-001	8-8-94 m2	0.9491					<1.05	9.59	62.2		
	001DUP							<1.05	9.59	62.2		Fl <1 SO4 <1
F 20.9	001MS	AL1590-94						25.8			F 123	
	4817-001		0.9862					<1.01	7.76	11.9		
	4846-001		0.9770					<1.02	6.60	10.6		
	002		0.9778					<1.01	6.33	<10.1		
	003		0.9681					<1.03	9.97	12.3		
Cl 239 SO4 239	4769-001MS	AL1589-94	0.8289	X10					252	257	Cl 101 SO4 101	
Cl 209 SO4 209	4873-001MS	AL1590-94	0.9491	X10					218	281	Cl 100 SO4 105	

* DON'T CALCULATE RPD DUE TO VALUES BELOW DETECTION LIMIT

~~0000435~~

6/08/94

SL-92-INORG-0055

009

ITAS-ST. LOUIS

NITRATE/NITRITE-N REPORT

Pg. 1 of 1

Analyst: J. CARRIO
Project No.: 519.04
Reviewed by: R. Patterson

Batch No.: 35922

PREP DATE: 04-18-94
Analysis Date: 04-19-94
Method No.: 353.1
Date: 04-29-94

mg/g N = mg/kg-N 6/8/94

PREV VALUE	LAB ID	STANDARD ID	RAW VALUE x	DILUTION ÷	SAMPLE VOLUME (L or g) =	NITRATE/ NITRITE x	EXTRACT VOLUME (L) ÷	FRACTION SOLID =	FINAL CONCENTRATION (ug/L)-N (ug/g)-N	% RECOVERY	RPD
	QCB35922-1		-9.318		5.071		0.05	04-19-94	* <0.493		
5.60	QCLCS35922-1	AUSB3-94	599.0		5.043				5.94	106	
	4769-001		394.2		5.015			0.8289	* 4.74		
	001DUP		395.3		5.032				4.74		<1
6.71	001MS	AUSB4-94	210.6	X5	5.072				12.5	116	
	4746-001		195.7	X10	5.003			0.8979	21.8		
	4873-001	BORE-MA	276.1	X10	5.016			0.9491	29.0		
	001DUP		270.0	X10	5.023				28.3		2
5.90	001MS	AUSB5-94	351.2	X10	5.041				36.7	131 **	
	4817-001		204.8	X5	5.011			0.9862	10.4		
	4846-001		599.2		5.023			0.9770	6.10		
	002		618.0		5.063			0.9778	6.24		
	003		665.3		5.023			0.9681	6.84		

* CORRECTED FOR % MOISTURE
** SAMPLE CONC. 4X > SPIKE AMT

0000490

010

6/8/94

SL-91-INORG-0039

ITAS - ST. LOUIS

TOC ANALYSIS

PREP DATE: 04-20-94
DATE OF ANALYSIS: 04-20-94
ANALYST: J. Flandreau
BATCH #: 36063

PAGE 1 OF 1

REVIEWED BY: R. Patterson/05-09-94
REVIEWED BY: R. Patterson/05-09-94
METHOD #: 9060
PROJECT #: 519.04

6/8/94

~~ANALYSIS TIME~~ Heis ID	LAB ID	STANDARD CONC.	VOLUME/ WEIGHT g USED	DILUTION	FRACTION SOLID	INSTRUMENT PRINTOUT PPM C	CONC (MG/L OR UG/G)	SAMPLE AVERAGE & ~~RPD~~ Range
	QCBLK36063-1		80.4	0.995		9.811	<24.9	RPD 05-09-94
	AL1671-94 QCLCS36063-1	605 ug/g.	79.4	1.01		554.5	554	
6/8/94 BOSKM2	4873-001		51.1	1.57	0.9491	1486	1570	
	001		30.3	2.64		1185	1250	$\bar{x}$ = 1260
	001		31.7	2.52		1127	1190	range = 1040 → 1570
	001		31.6	2.53		985.4	1040	
6/8/94 BOSKM2 Dup	001 DUP		35.6	2.25		1027	1080	
	001 DUP		38.4	2.08		1019	1070	$\bar{x}$ = 1250
	001 DUP		39.3	2.04		1582	1670	range = 1070 → 1670
	001 DUP		32.0	2.50		1117	1180	
BOSKM2 MS	AL1672-94 001 MS	2050	30.8	2.60		2985	3150	
	AL1673-94 001 MS	2110	30.0	2.67		3310	3490	$\bar{x}$ = 3390
	AL1674-94 001 MS	2090	30.2	2.65		3202	3370	range = 3150 → 3550
	AL1675-94 001 MS	2100	30.1	2.66		3369	3550	

~~0000515~~

J. Flandreau 05-05-94

LCS True Value = 605 ug/g
Percent Recovery = 92
SL-91-INORG-0013-WESTON

MS True Value = 2090 ug/g
Percent Recovery = 102

MSD True Value = N/A
Percent Recovery = ↓
RPD = <1

mg/L TOC (water) = Instr. Printout (PPMC) x Dil. Factor
ug/g TOC (soil) = Instr. Printout (PPMC) / Fraction Solid

6/08/94

011

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ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

9713508.2360

INTERNATIONAL TECHNOLOGY CORPORATION

CERTIFICATE OF ANALYSIS

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

May 13, 1994

Attention: J. A. Lerch

Project number	:	519.04
Date Received by Lab	:	April 12, 1994
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W0025

I. Introduction

On April 12, 1994, one (1) soil sample was received by ITAS-Richland and transferred to ITAS-St. Louis for chemical analysis. Upon receipt, the sample was given the following laboratory ID number to correspond with the specific client ID:

St. Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
4873-001	BOBKM2	W40418301	Soil	04/12/94

II. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results, and the appropriate detection limits.

013

Regional Office
13715 N. Rider Trail • Earth City, Missouri 63045-1205 • 314-298-8566 • FAX: 314-298-8757

IT Corporation is a wholly owned subsidiary of International Technology Corporation

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Analyses requested: BNA and Metals including Cyanide using CLP/90 protocol. Chloride, Sulfate and Fluoride by EPA method 300.0. Nitrate by EPA method 353.1. Total Petroleum Hydrocarbons (Kerosene) by method 8015.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike/Matrix Spike Duplicate or Duplicates analyses were performed for all analyses.

IV. Comments

Analysis for cyanide exceeded hold time by one day. See accompanying non-conformance memo SL-94-0244 for details. Samples were received on the last day of the holding time for Cyanide analysis. Analysis was performed as soon as possible but after the holding time had expired.

Kerosene results are noted as High Boiling Hydrocarbons on the TPH forms. They are quantitated against a Fuel Oil #2 (diesel) standard curve which is proved to have the same response factors as that of Kerosene (Fuel Oil #1) within minimal error. The response factor correlation is demonstrated by the running of a single, mid-level calibration standard at the beginning of the analytical batch. This calibration verification data is contained in the data package. This procedure is outlined in ITAS-St. Louis SOP SL4055.

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

Reviewed and approved:

Wade H. Price
Project Manager
z:\annelars\hanw0025.nar

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		006449

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. N/A
Offsite Property No.
Method of Shipment Government truck
Field Logbook No.
Shipped to IT
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBKM2	S	3-29-94	0900	(1) 250ml aG	Semi-VOA	CLP	
BOBKM2	S			(1) 250ml Poly	Metals -CLP TAL Titanium Mercury	CPL	
BOBKM2	S			(1) 125ml G	Anions F, Cl, SO_4	EPA 300.0	
BOBKM2	S			(1) 125ml G	NO_2 NO_3	EPA 353.2	
BOBKM2	S			(1) 125ml G	Cyanide	CPL	
BOBKM2	S			(1) 125ml Gs	TPH Diesel Range	8015m	
BOBKM2	S			(1) 125ml aGs	TOC	9060	
BOBKM2	S			(1) 1000ml Poly	Gross Alpha/Beta ITAS-RD-3322 Gamma Spec. Cs-134,137, I-129, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 ITAS-RD-3219; Total Uranium ITAS-RD-4200 OR 4201 U-235/234/238 ITAS-RD-3234 Np-237 ITAS-RD-3208; Pu-238/239/240 ITAS-RD-3209; Sr-90 ITAS-RD-3204; Tc-99 ITAS-RD-RS-0001; Am-241, Cm-244 ITAS-RD-3302; Se-79 ITAS-RD-3253		

01A B C D E F G

~~404183~~ 404184 01

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. SICKLE	4/11/94	0800	D.L. Edwards
D.L. Edwards	4/11/94	1140	J.M. Hogan JG Hogan
J.M. Hogan JG Hogan	4/11/94	1418	ITAS Tom Gilmore

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

016

~~0000014~~

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ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-UP-2		DATA PACKAGE: W0025-ITC-027
VALIDATOR: [illegible]	LAB: ITC	DATE: 06/08/94
CASE:		SDG: W0025-ITC-027

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 Soil

B0BKM2

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:

018

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:

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: The MS %R for chloride is 13.2. The assoc. result has been 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)

019

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments:

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

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:

HOLDING TIME SUMMARY

W0025-ITC-027

SDG:	VALIDATOR: [illegible]	DATE: 6/8/94	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
B0BKM2	Fluoride	3/29/94	4/18/94	4/18/94	20	0	None
	Chloride				20	0	
	Sulfate				20	0	
	NO_2+NO_3-N	3/29/94	4/18/94	4/19/94	20	1	
	TOC	3/29/94	4/20/94	4/20/94	22	0	

CALCULATION SUMMARY

WC025-ITC-027

SDG:	REVIEWER: [illegible]	DATE: 6/08/94	PAGE 1 OF 1

COMMENTS:

Spike Recoveries

Analyte	Spiked Amount (mg/L)	Sample Conc. (mg/L)	Spiked Sample Conc. (mg/L)	% R
Fluoride	2	0.089	2.472	124%
Chloride	20	0.913	27.027	131%
Sulfate	20	5.920	29.447	118%

The ~~values~~ concentrations ~~that~~ 6/8/94 above are obtained from the raw data and are in mg/L units.

Qualify the chloride result as estimated (J) since the MS %R is >125%.

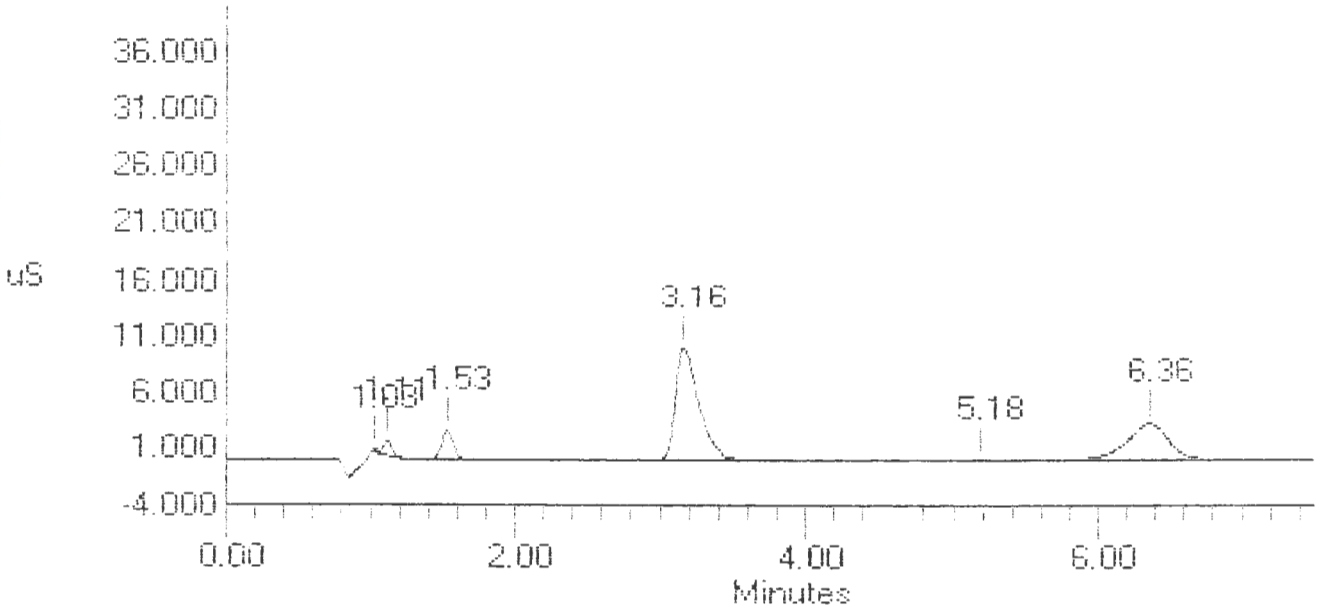
971508.2370

Sample Name: 4873-001			Date: Mon Apr 18 16:34:23 1994
Data File : C:\DX\DATA\041894a1.D15			
Method : C:\DX\METHOD\anions.met			
ACI Address: 1	System : 1	Inject#: 15	Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1	2255	5Hz	0.00	7.52	100

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.03	Fluoride	0.089	343	898	2	0.00
2	1.11		5297.594	1303	5298	2	
3	1.53	Chloride	0.913	2661	15016	1	-1.95
4	3.16	Nitrate-N	3.184	9955	111230	1	-4.96
5	5.18	O-Po4	0.460	62	859	1	0.25
6	6.36	Sulfate	5.920	3227	66630	1	-1.12

File: C:\DX\DATA\041894a1.D15 Sample: 4873-001



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6/08/94

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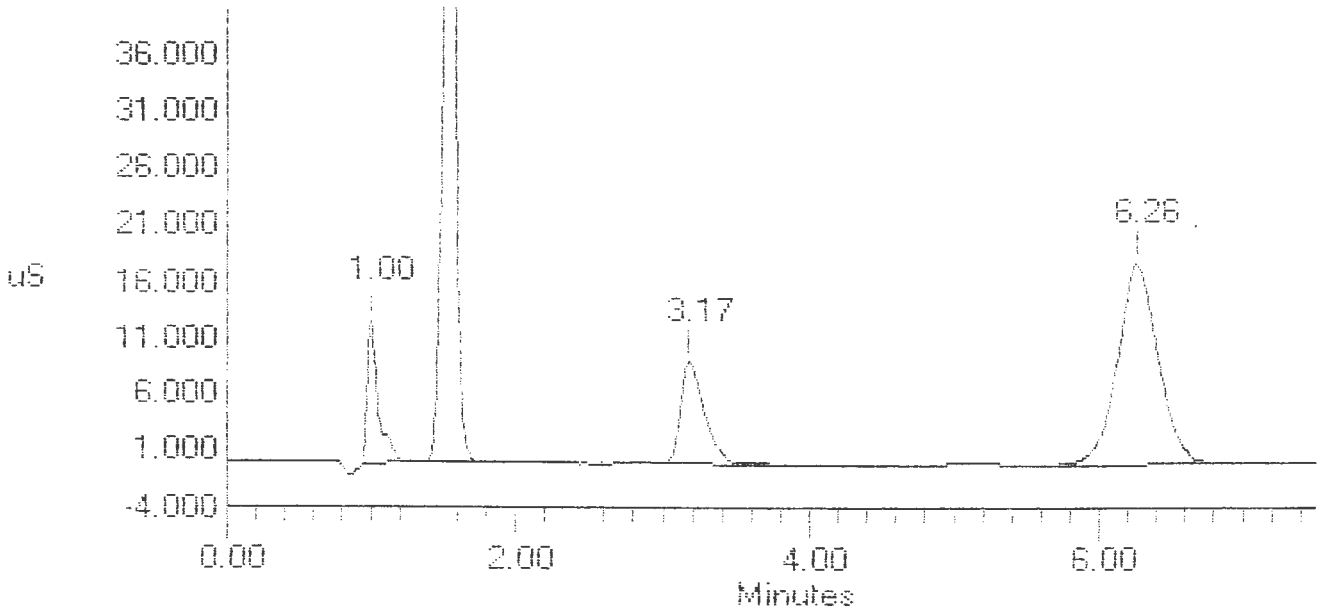
Sample Name: 4873-001MS Date: Mon Apr 18 22:30:30 1994
Data File : C:\DX\DATA\041894B1.D17
Method : C:\DX\METHOD\anions.met
ACI Address: 1 System : 1 Inject#: 17 Detector: CDM-1

REPORT	VOLUME	DILUTION	POINTS	RATE	START	STOP	AREA REJ
External	1	1	2255	5Hz	0.00	7.52	100

Pk. Num	Ret Time	Component Name	Concentration	Height	Area	Bl. Code	%Delta
1	1.00	Fluoride	2.472	12768	67516	1	0.00
2	1.55	Chloride	27.027	84003	460031	1	1.98
3	3.17	Nitrate-N	2.902	9037	101359	1	-2.01
4	6.26	Sulfate	29.447	17721	348903	1	-0.08

File: C:\DX\DATA\041894B1.D17 Sample: 4873-001MS



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ce.44 94

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil. Vol.	Final Conc	Solvent	Analyst Init.	Expiration Date	Comments/ Recommendations

NOTE A:

CALIBRATION STD	ID #	CONCENTRATION
FLUORIDE	AL3490-93	1000 mg/L
CHLORIDE	AL3543-92	1000 mg/L
BROMIDE	AL1437-93	1000 mg/L
NITRITE	AL1005-94	1000 mg/L N
NITRATE	AL3806-93	1000 mg/L N
PHOSPHATE	AL3133-92	1000 mg/L
SULFATE	AL3132-92	1000 mg/L

LCS, SPIKE, ICVS, STD	ID #	CONCENTRATION
FLUORIDE	AL1430-93	1000 mg/L
CHLORIDE	AL1431-93	1000 mg/L
BROMIDE	AL1432-93	1000 mg/L
NITRITE	AL1433-93	1000 mg/L
NITRATE	AL1434-93	1000 mg/L
PHOSPHATE	AL1435-93	1000 mg/L
SULFATE	AL1436-93	1000 mg/L

NOTE B:

	CALIBRATION		LCS, ICVS
	IC STD HIGH	IC STD LOW	IC STD HIGH
FLUORIDE	1.0 ml	0.4 ml	1.0 ml
CHLORIDE	1.0 ml	1.0 ml	1.0 ml
BROMIDE	1.0 ml	1.0 ml	1.0 ml
NITRITE	0.08 ml	0.08 ml	0.263 ml
NITRATE	0.08 ml	0.08 ml	0.354 ml
PHOSPHATE	4.0 ml	4.0 ml	4.0 ml
SULFATE	4.0 ml	4.0 ml	4.0 ml

MS
F 100 ml
Cl 1000
SO4 1000

NOTE C:

	FLUORIDE	CHLORIDE	BROMIDE	NITRITE	NITRATE	PHOSPHATE	SULFATE
IC STD HIGH	5 mg/L	5 mg/L	5 mg/L	0.4 mg/L N	0.4 mg/L N	20 mg/L	20 mg/L
IC STD LOW	2 mg/L	5 mg/L	5 mg/L	0.4 mg/L N	0.4 mg/L N	20 mg/L	20 mg/L
AUTO CAL 6R	5 mg/L	5 mg/L	5 mg/L	0.4 mg/L N	0.4 mg/L N	20 mg/L	20 mg/L
AUTO CAL 2R	0.1 mg/L	0.25 mg/L	0.25 mg/L	0.02 mg/L N	0.02 mg/L N	1 mg/L	1 mg/L
AUTO CAL 3R	0.5 mg/L	0.5 mg/L	0.5 mg/L	0.04 mg/L N	0.04 mg/L N	2 mg/L	2 mg/L
AUTO CAL 4R	1 mg/L	1 mg/L	1 mg/L	0.08 mg/L N	0.08 mg/L N	4 mg/L	4 mg/L
AUTO CAL 5R	2.5 mg/L	2.5 mg/L	2.5 mg/L	0.2 mg/L N	0.2 mg/L N	10 mg/L	10 mg/L
CCVS	2 mg/L	2 mg/L	2 mg/L	0.16 mg/L N	0.16 mg/L N	8 mg/L	8 mg/L
ICVS	2 mg/L	2 mg/L	2 mg/L	0.16 mg/L N	0.16 mg/L N	8 mg/L	8 mg/L
MS	2 mg/L	20 mg/L	2 mg/L	0.452 mg/L N	0.609 mg/L N	2 mg/L	20 mg/L
LCS	1 mg/L	1 mg/L	1 mg/L	0.08 mg/L N	0.08 mg/L N	4 mg/L	4 mg/L

LCS soil
F 9.88 ug/g
Cl 9.88
SO4 39.5

4769-001 MS
F 19.8 ug/g wet weight
Cl 198
SO4 198

4873-001 MS
F 19.0 ug/g wet weight
Cl 198
SO4 198

025

~~0000478~~

9/15/08 2:07

9713508.2373

MEMORANDUM

JUN 1994 RECEIVED TQO

TO: 200-UP-2 Project QA Record June 14, 1994

FR: Susan Winter, Golder Associates Inc.

RE: METALS DATA VALIDATION SUMMARY FOR DATA PACKAGE: W0025-ITC-027 (923-E418, Filename W0025M.UP2)

INTRODUCTION

This memo presents the results of data validation on data package W0025-ITC-027 prepared by the International Technology Corporation (ITC) laboratory. Information concerning the sample validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B0BKM2	03/29/94	SOIL	SEE NOTE 1

Note 1. Sample B0BKM2 was analyzed for CLP TAL metals, cyanide and titanium.

Data validation was conducted in accordance with the WHC statement of work (WHC 1993a) and validation procedures (WHC 1993b). 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

RECEIVED JUN 17 1994 VALIDATION DOCUMENTATION SDLA

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 deficiencies identified below.

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

Detection Limits. Detection limit goals were met for all sample results as specified in the reference analytical method.

Completeness. The data package was complete for all requested analyses. A total of one sample was validated in this data package with a total of 25 determinations reported, all of

which were deemed valid. This results in a completeness of 100 percent, 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 data validation which required qualification of data as estimated.

Holding Times

- Mercury and cyanide analyses were performed out of the required holding times. Therefore, the associated sample results have been qualified as estimated (UJ).

Laboratory Blanks

- **Positive Blanks.** Beryllium and selenium were detected at positive concentrations in the associated calibration and/or preparation blank. Attachments 2 and 5 provide a summary of the sample results affected, data qualifications applied and supporting documentation.

- **Negative Blanks.** Thallium was detected at a negative concentration in the associated preparation blank. Attachments 2 and 5 provide a summary of the sample result affected, data qualification applied and supporting documentation.

Matrix Spike

- Matrix spike percent recoveries for antimony and selenium were unacceptable. Attachments 2 and 5 provide a summary of the sample results affected, data qualifications applied and supporting documentation.

REFERENCES

WHC 1993a, Validation of 200-UP-2 Data, Statement of Work, Analytical Laboratory Data Validation, Task Order S-94-18, December 14, 1993, Purchase Order M073750. 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.

9713508.2375

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

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

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

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

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

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

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

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

9713508.2377

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: W0025-ITC-027	VALIDATOR:	DATE: June 8, 1994	PAGE 1 OF 1
COMMENTS: METALS			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
MERCURY	UJ	B0BKM2	ANALYZED OUT OF HOLDING TIME
CYANIDE	UJ	B0BKM2	ANALYZED OUT OF HOLDING TIME
BERYLLIUM	U	B0BKM2	PRESENT IN ICB, CCB, AND PREP. BLANK AT POSITIVE CONCENTRATIONS
THALLIUM	UJ	B0BKM2	PRESENT IN PREP. BLANK AT A NEGATIVE CONCENTRATION
SELENIUM	U	B0BKM2	PRESENT IN CCB AT A POSITIVE CONCENTRATION
ANTIMONY	UJ	B0BKM2	MS %R < 75% BUT > 30%
SELENIUM	UJ	B0BKM2	MS %R < 75% BUT > 30%

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ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0025-ITC-027

	Samp#	B0BKM2	
	Date	3-29-94	
	Location	216-U-8	
	Depth	---	
	Type	SOIL	
	Comments	---	
Parameter	Units	Result	Q
ALUMINUM	MG/KG	6590.000	
ANTIMONY	MG/KG	5.200	UJ
ARSENIC	MG/KG	4.500	
BARIUM	MG/KG	73.400	
BERYLLIUM	MG/KG	0.590	U
CADMIUM	MG/KG	0.710	B
CALCIUM	MG/KG	7940.000	
CHROMIUM	MG/KG	6.000	
COBALT	MG/KG	11.400	
COPPER	MG/KG	15.100	
IRON	MG/KG	26400.000	
LEAD	MG/KG	5.800	
MAGNESIUM	MG/KG	4950.000	
MANGANESE	MG/KG	367.000	
MERCURY	MG/KG	0.050	UJ
NICKEL	MG/KG	10.800	
POTASSIUM	MG/KG	1100.000	
SELENIUM	MG/KG	0.400	UJ
SILVER	MG/KG	0.780	U
SODIUM	MG/KG	196.000	B
THALLIUM	MG/KG	0.150	UJ
VANADIUM	MG/KG	53.200	
ZINC	MG/KG	50.600	
CYANIDE	MG/KG	0.150	UJ
TITANIUM	MG/KG	2040.000	

Verified

6/09/94

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U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0BKM2

Lab Name: ITAS_ST._LOUIS Contract: 519.04

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0025

Matrix (soil/water): SOIL Lab Sample ID: 4873-001

Level (low/med): LOW Date Received: 04/12/94

% Solids: 94.9

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	6590			P	
7440-36-0	Antimony	5.2	~~U~~	N	P	
7440-38-2	Arsenic	4.5			F	
7440-39-3	Barium	73.4			P	
7440-41-7	Beryllium	0.59	~~B~~		P	
7440-43-9	Cadmium	0.71	B		P	
7440-70-2	Calcium	7940			P	
7440-47-3	Chromium	6.0			P	
7440-48-4	Cobalt	11.4			P	
7440-50-8	Copper	15.1			P	
7439-89-6	Iron	26400			P	
7439-92-1	Lead	5.8			F	
7439-95-4	Magnesium	4950			P	
7439-96-5	Manganese	367			P	
7439-97-6	Mercury	0.05	~~U~~		CV	
7440-02-0	Nickel	10.8			P	
7440-09-7	Potassium	1100			P	
7782-49-2	Selenium	0.40	~~B~~	N	F	~~BS~~
7440-22-4	Silver	0.78	U		P	
7440-23-5	Sodium	196	B		P	
7440-28-0	Thallium	0.15	~~U~~		F	
7440-62-2	Vanadium	53.2			P	
7440-66-6	Zinc	50.6			P	
	Cyanide	0.15	~~U~~		AS	
7440-32-6	Titanium	2040			P	

6/8/94

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Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: COLORLESS Clarity After: Artifacts:

Comments:

Verified

6/08/94

FORM I - IN

ILM03.0

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ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

9715508.2333

INTERNATIONAL TECHNOLOGY CORPORATION

CERTIFICATE OF ANALYSIS

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

May 13, 1994

Attention: J. A. Lerch

Project number	:	519.04
Date Received by Lab	:	April 12, 1994
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W0025

I. Introduction

On April 12, 1994, one (1) soil sample was received by ITAS-Richland and transferred to ITAS-St. Louis for chemical analysis. Upon receipt, the sample was given the following laboratory ID number to correspond with the specific client ID:

St. Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
4873-001	BOBKM2	W40418301	Soil	04/12/94

II. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results, and the appropriate detection limits.

Regional Office
13715 N. Rider Trail • Earth City, Missouri 63045-1205 • 314-298-8566 • FAX: 314-298-8757

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Analyses requested: BNA and Metals including Cyanide using CLP/90 protocol. Chloride, Sulfate and Fluoride by EPA method 300.0. Nitrate by EPA method 353.1. Total Petroleum Hydrocarbons (Kerosene) by method 8015.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike/Matrix Spike Duplicate or Duplicates analyses were performed for all analyses.

IV. Comments

Analysis for cyanide exceeded hold time by one day. See accompanying non-conformance memo SL-94-0244 for details. Samples were received on the last day of the holding time for Cyanide analysis. Analysis was performed as soon as possible but after the holding time had expired.

Kerosene results are noted as High Boiling Hydrocarbons on the TPH forms. They are quantitated against a Fuel Oil #2 (diesel) standard curve which is proved to have the same response factors as that of Kerosene (Fuel Oil #1) within minimal error. The response factor correlation is demonstrated by the running of a single, mid-level calibration standard at the beginning of the analytical batch. This calibration verification data is contained in the data package. This procedure is outlined in ITAS-St. Louis SOP SL4055.

Westinghouse Hanford Company
May 13, 1994
Project Number: 519.04
Page 3

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

Reviewed and approved:

Wade H. Price
Project Manager
z:\annelars\hanw0025.nar

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1 006449

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. N/A
Offsite Property No.
Method of Shipment Government truck
Field Logbook No.
Shipped to IT
SPECIAL INSTRUCTIONS
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

	Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
01A	BOBKM2	S	3-29-94	0900	(1) 250ml aG	Semi-VOA	CLP	
B	BOBKM2	S			(1) 250ml Poly	Metals -CLP TAL Titanium Mercury	CPL	
C	BOBKM2	S			(1) 125ml G	Anions F, Cl, SO_4	EPA 300.0	
D	BOBKM2	S			(1) 125ml G	NO_2 NO_3	EPA 353.2	
E	BOBKM2	S			(1) 125ml G	Cyanide	CPL	
F	BOBKM2	S			(1) 125ml Gs	TPH Diesel Range	8015m	
G	BOBKM2	S			(1) 125ml aGs	TOC	9060	
404184 01	BOBKM2	S			(1) 1000ml Poly	Gross Alpha/Beta ITAS-RD-3322 Gamma Spec. Cs-134,137, I-129, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 ITAS-RD-3219; Total Uranium ITAS-RD-4200 OR 4201 U-235/234/238 ITAS-RD-3234 Np-237 ITAS-RD-3208; Pu-238/239/240 ITAS-RD-3209; Sr-90 ITAS-RD-3204; Tc-99 ITAS-RD-RS-0001; Am-241, Cm-244 ITAS-RD-3302; Se-79 ITAS-RD-3253		

404183

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. SICKLE	4/11/94	0800	D.L. Edwards
D.L. Edwards	4/11/94	1140	J.G. Hogan JG Hogan
J.G. Hogan JG Hogan	4/11/94	1418	ITAS Tom Gilmore

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

014

0000011

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ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

W0025-ITC-02
Metals

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

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-UP-2			DATA PACKAGE: W0025-ITC-027		
VALIDATOR: [illegible]		LAB: ITC		DATE: 06/08/94	
CASE:			SDG: W0025-ITC-027		
ANALYSES PERFORMED					
☑ CLP/ICP	☑ CLP/GFAA	☑ CLP/Hg	☑ CLP/Cyanide	☐	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐
SAMPLES/MATRIX BOBKM2/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: Hg and CN were analyzed out of the required holding times. The assoc. results have been qualified as ~~[illegible]~~ estimated (UJ)

Revised [illegible] 6/24/94

016

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 6/8/94

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 6/8/94

6/8/94 Comments: Be is present in the ICB and CCB at a pos. conc.. The assoc. sample result has been qualified as undetected (U). Tl is present in the prep blank at a neg. concentration. The assoc. result has been qualified as estimated (UJ). Se is present in the ICB at a pos. conc. Result has been qual. as undetected (U).

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: The MS % R for Sb and Se are 66.9% and 71.7%, respectively. The assoc. sample results have been qualified as estimated (UJ/BJ).

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: Sample locations are currently not available. Field QC will be evaluated in the final summary report.

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required? . . . . . Yes No N/A
Are duplicate injection %RSD values acceptable? . . . . . Yes No N/A
Were analytical spikes performed as required? . . . . . Yes No N/A
Are analytical spike recoveries acceptable? . . . . . Yes No N/A
Was MSA performed as required? . . . . . Yes No N/A
Are MSA results acceptable? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A
Are all results supported in the raw data? . . . . . Yes No N/A
Are results calculated properly? . . . . . Yes No N/A
Do results meet the CRDLs? . . . . . Yes No N/A

Comments:

018

HOLDING TIME SUMMARY

W0025-ITC-027

SDG:	VALIDATOR:	DATE: 6/07/94	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
B0BKM2	ICP	03/29/94		5/04/94		36	None
	As			5/09/94		41	
	Se			5/04/94		36	
	Pb			5/09/94		41	
	Tl			5/09/94		41	
	Hg			05/06/94		38	UJ
	CN			04/13/94		15	UJ

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3
BLANKS

Lab Name: ITAS_ST._LOUIS_____ Contract: 519.04____

Lab Code: ITMO__ Case No.: _____ SAS No.: _____ SDG No.: W0025_____

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	Prepa-ration Blank	C	M
Aluminum	51.2	U	52.2	B	51.2	U	60.2	B	10.240	U	P
Antimony	24.8	U	24.8	U	24.8	U	24.8	U	4.960	U	P
Arsenic	0.7	U	0.7	U	0.7	U	0.7	U	0.140	U	F
Barium	2.2	U	2.2	U	2.2	U	2.2	U	0.440	U	P
Beryllium	2.5 0.5	B	4.5 0.9	B	4.5 0.9	B	0.9	B	0.31 0.062	B	P
Cadmium	1.6	U	1.6	U	1.6	U	1.6	U	0.320	U	P
Calcium	26.6	U	61.0	B	29.4	B	87.7	B	14.752	B	P
Chromium	4.2	U	4.2	U	4.2	U	4.2	U	0.840	U	P
Cobalt	4.2	U	4.2	U	4.2	U	4.2	U	0.840	U	P
Copper	4.9	U	4.9	U	4.9	U	4.9	U	0.980	U	P
Iron	7.2	U	23.0	B	38.1	B	29.0	B	4.928	B	P
Lead	0.4	U	0.4	U	0.4	U	0.4	U	0.080	U	F
Magnesium	32.3	U	32.4	B	32.3	U	62.8	B	6.460	U	P
Manganese	2.7	U	2.7	U	2.7	U	2.7	U	0.540	U	P
Mercury	0.1	B	0.1	U	0.1	U			0.050	U	CV
Nickel	18.6	U	18.6	U	18.6	U	18.6	U	3.720	U	P
Potassium	263.4	U	263.4	U	263.4	U	263.4	U	70.998	B	P
Selenium	1.8	U	1.8	U	1.8	U	3.0	B	0.360	U	F
Silver	3.7	U	3.7	U	3.7	U	-4.6	B	0.740	U	P
Sodium	46.7	U	49.7	B	48.2	B	56.4	B	22.968	B	P
Thallium	0.7	U	0.7	U	0.7	U	1.7	B	-0.188	B	F
Vanadium	12.2	U	12.2	U	12.2	U	-16.7	B	2.440	U	P
Zinc	1.5	U	3.8	B	3.3	B	4.7	B	1.012	B	P
Cyanide	2.9	U	2.9	U	2.9	U			0.144	U	AS
Titanium	3.0	U	3.0	U	3.6	B	3.0	U	0.788	B	P

FORM III - IN

ILM03.0

Qualify Be result as undetected (U).

Qualify Tl result as estimated (UJ).

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6/07/94

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3
BLANKS

00000166

Lab Name: ITAS_ST._LOUIS_____ Contract: 519.04____

Lab Code: ITMO__ Case No.: _____ SAS No.: _____ SDG No.: W0025_____

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): _____

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony	24.8	U	24.8	U	24.8	U					P
Arsenic											NR
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead											NR
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium			12 2.4	B	1.8	U					F
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Cyanide											NR
Titanium	3.0	U	3.0	U	3.0	U					P

Qualify Se result as undetected (U).

FORM III - IN

ILM03.0

6/08/94

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U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

B0BKM2S

Lab Name: ITAS_ST._LOUIS Contract: 519.04

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0025

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 94.9

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony	75-125	70.5205		5.2266	U	105.37	66.9	N	P
Arsenic	75-125	11.8040		4.4889		8.43	86.8		F
Barium	75-125	491.0601		73.4247		421.50	99.1		P
Beryllium	75-125	11.6839		0.5901	B	10.54	105.3		P
Cadmium	75-125	11.6986		0.7081	B	10.54	104.3		P
Calcium									NR
Chromium	75-125	51.3741		5.9579		42.15	107.7		P
Cobalt	75-125	117.3952		11.3614		105.37	100.6		P
Copper	75-125	68.9083		15.1317		52.69	102.1		P
Iron									NR
Lead	75-125	9.6839		5.8061		4.21	92.1		F
Magnesium									NR
Manganese	75-125	462.5353		366.6533		105.37	91.0		P
Mercury	75-125	0.5796		0.0527	U	0.53	109.4		CV
Nickel	75-125	121.3762		10.7629		105.37	105.0		P
Potassium									NR
Selenium	75-125	1.9115		0.3983	B	2.11	71.7	N	F
Silver	75-125	10.2740		0.7798	U	10.54	97.5		P
Sodium									NR
Thallium	75-125	9.1085		0.1475	U	10.54	86.4		F
Vanadium	75-125	166.1876		53.1507		105.37	107.3		P
Zinc	75-125	162.2677		50.5964		105.37	106.0		P
Cyanide	75-125	24.8230		0.1522	U	26.08	95.2		AS
Titanium		2242.7566		2041.3340		210.75	95.6		P

Comments: Qualify Sb and Se results as estimated (UJ/BJ).

FORM V (Part 1) - IN ILM03.0

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MEMORANDUM

JUN 1994
RECEIVED
TQO

TO: 200-UP-2 Project QA Record June 20, 1994

FR: Kent Angelos, Golder Associates Inc.

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE: W0025-ITC-027, (923-E418, Filename W0025R.UP2)

INTRODUCTION

This memo presents the results of data validation on data package W0025-ITC-027 prepared by IT Analytical Services of Richland, Washington. The sample validated along with the analyses reported and the method of analysis is listed in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B0BKM2	3/29/94	SOIL	SEE NOTE 1

Note 1. The sample was analyzed for americium-241, neptunium-237, plutonium-238, 239/240 and uranium-234, 235 and 238 by alpha spectroscopy; iodine-129 and selected radionuclides by gamma spectroscopy; gross alpha, gross beta and strontium-90 by gas proportional counting; selenium-79 and technetium-99 by liquid scintillation counting and total uranium by kinetic phosphorimetry.

Data validation was conducted in accordance with the WHC statement of work (WHC 1993a) and validation procedures (WHC 1993b). 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

RECEIVED
JUN 24 1994
VALIDATION DOCUMENTATION
SDLA

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 deficiencies identified under "Minor Deficiencies".

Accuracy. Goals for accuracy were met with the exception of the deficiencies identified under "Minor Deficiencies".

Sample Result Verification. All sample results were supported in the raw data. Minimum detectable activities (MDA) could not be verified by recalculation for uranium-234/235/238 and selenium-79. No qualification was necessary since the sample activity was above the MDA.

001

Detection Limits. Detection limit goals were met for all analytes except europium-155, technetium-99 and iodine-129. The europium-155 and iodine-129 detection limits were elevated due to cesium-137 interference. No explanation was provided for the technetium-99 detection limit, however the sample activity was well above the MDA.

Completeness. The data package was complete for all requested analyses. One sample was validated in this data package with a total of 25 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

No major deficiencies were identified which resulted in qualification of sample results as unusable.

MINOR DEFICIENCIES

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

Method Blanks

- Americium-241 was detected in the method blank and sample. Attachments 2 and 5 provide a summary of the results and qualifications applied.

Laboratory Duplicates

- Duplicate sample relative percent differences were unacceptable for technetium-99. Attachments 2 and 5 provide a summary of the sample results affected and qualifications applied.

Spike Sample Recovery

- Spike sample recovery for neptunium-237 was unacceptable. Attachments 2 and 5 provide a summary of the sample results affected and qualifications applied.

DATA REPORTING

- Results reported at a concentration of less than the minimum detectable activity (MDA) have been qualified as undetected (U) and the MDA is reported in the validated data summary in Attachment 3.

- In the case narrative the laboratory indicated they believe the selenium-79 result to be a false positive. However, since all associated quality control data was acceptable, no qualification was applied to the result.

REFERENCES

WHC 1993a, Validation of 200-UP-2 Data, Statement of Work, Analytical Laboratory Data Validation, Task Order S-94-18, December 14, 1993, Purchase Order M073750. Westinghouse Hanford Company, Richland, Washington.

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

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.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

SDG: W0025-ITC-027	VALIDATOR: KA	DATE: June 20, 1994	PAGE 1 OF 1
COMMENTS: RADIOCHEMISTRY			
ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
NEPTUNIUM-237	UJ	B0BKM2 and B0BKM2 DUPLICATE	MATRIX SPIKE RECOVERY <60% BUT GREATER THAN 10%
AMERICIUM-241	J	B0BKM2 AND B0BKM2 DUPLICATE	RESULT LESS THAN 5X THE ASSOCIATED BLANK
TECHNETIUM-99	J	B0BKM2	DUPLICATE SAMPLE RPD >35%

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0025-ITC-027

	Samp#	B0BKM2	
	Date	3-29-94	
	Location	216-U-8	
	Depth	---	
	Type	SOIL	
	Comments	---	
Parameter	Units	Result	Q
AMERICIUM-241	PCI/G	0.728	J
CURIUM-242	PCI/G	0.017	U
CURIUM-244	PCI/G	0.021	U
NEPTUNIUM-237	PCI/G	0.017	UJ
PLUTONIUM-239/240	PCI/G	0.247	
PLUTONIUM-238	PCI/G	0.034	U
URANIUM-234	PCI/G	9.630	
URANIUM-235	PCI/G	0.386	
URANIUM-238	PCI/G	8.510	
POTASSIUM-40	PCI/G	12.700	
COBALT-60	PCI/G	0.016	U
EUROPIUM-152	PCI/G	0.071	U
CESIUM-137	PCI/G	525.000	
CESIUM-134	PCI/G	0.082	U
RUTHENIUM-106	PCI/G	0.865	U
SODIUM-22	PCI/G	0.017	U
EUROPIUM-155	PCI/G	0.281	U
EUROPIUM-154	PCI/G	0.047	U
IODINE-129	PCI/G	5.360	U
ALPHA	PCI/G	35.500	
BETA	PCI/G	741.000	
TOTAL STRONTIUM	PCI/G	41.200	
SELENIUM-79	PCI/G	9.470	
TECHNETIUM-99	PCI/G	25.200	J
URANIUM	UG/G	30.400	

Verified
6/19/94

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(509) 375-3131

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND
SDG NO.: W0025
LAB SAMPLE ID: 40418401
MATRIX: SOIL
WHC ID: B0BKM2
DATE RECEIVED: 4/11/94
REPORTING UNITS: pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
AM-241	7.28E-01 J	1.23E-01	1.68E-01	1.40E-02	0.704	RD3302
CM-242	0.00E+00 U	0.00E+00	1.93E-02	1.74E-02	U 0.704	RD3302
CM-244	4.78E-03 U	1.04E-02	1.04E-02	2.09E-02	U 0.704	RD3302
NP-237	7.99E-03 UJ	1.18E-02	1.19E-02	1.67E-02	UJ 1	RD3208
PU239/40	2.47E-01	8.35E-02	9.20E-02	1.91E-02	0.591	RD3209
PU-238	1.27E-02 U	2.02E-02	2.03E-02	3.38E-02	U 0.591	RD3209
U-234	9.63E+00	5.17E-01	1.43E+00	3.45E-02	0.601	RD3234
U-235	3.86E-01	1.04E-01	1.17E-01	3.70E-02	0.601	RD3234
U-238DA	8.51E+00	4.86E-01	1.28E+00	3.91E-02	0.601	RD3234
K-40	1.27E+01	3.87E-01	1.33E+00	N/A	N/A	RD3219
CO-60	5.81E-03 U	9.00E-03	9.02E-03	1.57E-02	U N/A	RD3219
EU-152	6.13E-02 U	3.99E-02	4.04E-02	7.12E-02	U N/A	RD3219
CS-137DA	5.25E+02	5.25E+01	5.25E+01	N/A	N/A	RD3219
CS-134	-3.52E-02 U	5.23E-02	5.25E-02	8.22E-02	U N/A	RD3219
RU-106DA	5.66E-02 U	5.46E-01	5.46E-01	8.65E-01	U N/A	RD3219
NA-22	-9.86E-05 U	1.02E-02	1.02E-02	1.71E-02	U N/A	RD3219
EU-155	4.51E-02 U	1.72E-01	1.72E-01	2.81E-01	U N/A	RD3219
EU-154	-2.70E-04 U	2.78E-02	2.78E-02	4.69E-02	U N/A	RD3219
I-129LP	-2.91E+01 U	3.51E+00	4.56E+00	5.36E+00	U N/A	RD3219
ALPHA	3.55E+01	8.24E+00	9.09E+00	4.32E+00	1	RD3222
BETA	7.41E+02	1.77E+01	5.20E+01	2.83E+00	1	RD3222
TOTAL-SR	4.12E+01	7.56E-01	9.93E+00	1.57E-01	0.779	RD3204
SE-79	9.47E+00	8.03E-01	2.79E+00	1.32E+00	0.723	RD3253
TC-99	2.52E+01 J	6.17E-01	3.95E+00	7.30E-01	0.691	ITAS-IT-RD-0001
URANIUM	3.04E+01	N/A	4.56E+00	1.36E-03	0.87	RD4200

Verified MAS 6/19/94

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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

June 1, 1994

Attention: J.A.Lerch

SAF Number	:	94-065
Date SDG Closed	:	April 25, 1994
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W0025
Data Deliverable	:	Stand Alone

I. Introduction

On April 11, 1994, one soil sample was received by ITAS-Richland for radiochemical analysis. Upon receipt, the sample was assigned the following laboratory ID number to correspond with the WHC specific ID:

ITAS-Richland ID	WHC ID	Matrix	Date of Receipt
404184-01A	B0BKM2	Soil	4/11/94

II. Analytical Results/Methodology

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

The requested analyses were:

Alpha Spectroscopy
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
Iodine-129 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
Selenium-79 by method ITAS-RD-3253
Technetium-99 by method ITAS-IT-RS-0001
Total Uranium
Total Uranium by method ITAS-RD-4200

III. Quality Control

The analytical results for each analysis performed under SDG W0025 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 sample classified it as Category III.

Alpha Spectroscopy

Americium-241, Curium-244 by method ITAS-RD-3302
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BKM2) results are within contractual requirements. The batch blank indicates Am-241 contamination at a level below the contractual detection limit. The sample result is below the contractual detection limit and is not significantly affected by the low-level contamination. Blank tests performed since the analysis of this batch indicate that the contamination has effectively been eliminated by clean-up steps taken since the discovery of the contamination.

Neptunium-237 by method ITAS-RD-3208
Two matrix spikes were analyzed with the batch. Both matrix spike recoveries are greater than 30% and less than 60%. A reanalysis of the batch was performed, however, the reanalysis matrix spike recoveries were less than those on the initial analysis. The initial analysis is accepted with matrix spike recoveries between 30% and 60% due to a matrix effect. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BKM2) results meet contractual requirements and are reported.

Plutonium-238, -239/40 by method ITAS-RD-3209
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BKM2) results meet contractual requirements.

Uranium-234, -235, -238 by method ITAS-RD-3234
The LCS, batch blank, and sample results meet contractual requirements. The duplicate of sample B0BKM2 did not meet the tracer yield lower limit of 30%. The isotopic uranium results for the duplicate of B0BKM2 are within 3 sigma of the sample results and are accepted based on the acceptable LCS and batch blank results.

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219
The detection limit was not met for Eu-155 in the analysis of sample B0BKM2 and the duplicate of B0BKM2 due to high background counts interfering with the Eu-155 energy region of interest. An Ottawa sand blank counted for the same length of time did meet the MDA for Eu-155, therefore, the data are accepted with the elevated Eu-155 detection limit. The interference is attributed to a matrix effect. The LCS and batch blank results are within contractual requirements.

Iodine-129 by method ITAS-RD-3219
The detection limit was not met for sample B0BKM2 and the duplicate of B0BKM2 due to Cs-137 interference. The duplicate of B0BKM2 was not initially submitted with the batch for counting due to an error at the time of the preparation of the batch. When the omission was discovered the duplicate was submitted for the I-129 gamma count. The duplicate data verifies the matrix effect caused by high levels of Cs-137 in the sample without necessitating a reanalysis of the sample batch. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BKM2) results are accepted and reported.

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BKM2) results meet contractual requirements.

Gross Beta by method ITAS-RD-3222
The LCS vial used for this batch was the spike intended for an analysis of gross beta in water and has a different spike level than the spike level required for the analysis of soil. The responsible technician was reminded to use care in selecting the proper spike vial for the analysis and matrix. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BKM2) results are accepted and reported.

Strontium-90 by method ITAS-RD-3204
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BKM2) results meet contractual requirements.

Liquid Scintillation Counting

Selenium-79 by method ITAS-RD-3253
The reported result for sample B0BKM2 is believed to be a FALSE POSITIVE result. The raw LSC data indicates that the activity attributed to Se-79 is likely caused by a nuclide other than Se-79. Two matrix spikes were analyzed and their average chemical yield is used for the batch yield corrections. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BKM2) results are within contractual requirements.

Technetium-99 by method ITAS-IT-RS-0001
Due to a batching error, SDG W0014 and W0025 were batched and analyzed together. Both SDGs share a single blank and both matrix spikes analyzed were assigned to SDG W0014. The data is reported using the blank and matrix spike data in both data packages for the Tc-99 analysis. The team leaders have been reinstructed as to batching requirements for the WHC contract. The average matrix spike yield is used for batch yield corrections. The result for the duplicate of sample B0BKM2 is not within the 3 sigma control limit. The other two sets of duplicate samples analyzed in the same batch are acceptable, therefore the duplicate difference is attributed to non-homogeneity of the soil matrix and the results are accepted. The LCS, batch blank, sample and sample duplicate results are within contractual requirements.

Total Uranium

Total Uranium by method ITAS-RD-4200
Two matrix spikes were analyzed with the batch and their average chemical yield is used for batch yield corrections. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0BKM2) results meet contractual requirements and are reported.

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

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

006449

Collector R.T. Sickle
Company Contact C.A. Rowley
Telephone 372-3293
SAF No. 94-065
Project Designation 216-U-8 Vitrified Clay Pipeline
Sampling Locations 216-U-8 Crib
Ice Chest No.
Bill of Lading/Airbill No. N/A
Offsite Property No.
Method of Shipment Government truck
Field Logbook No.
Shipped to IT
Possible Sample Hazards/Remarks None Detected
Special Handling and/or Storage Keep cool

SPECIAL INSTRUCTIONS

Sample Number	*	Date Collected	Time	Number and Type of Containers	Analysis Required		Preservative
BOBKM2	S	3-29-94	0900	(1) 250ml aG	Semi-VOA	CLP	
BOBKM2	S			(1) 250ml Poly	Metals -CLP TAL Titanium Mercury	CPL	
BOBKM2	S			(1) 125ml G	Anions F, Cl, SO_4	EPA 300.0	
BOBKM2	S			(1) 125ml G	NO_2 NO_3	EPA 353.2	
BOBKM2	S			(1) 125ml G	Cyanide	CPL	
BOBKM2	S			(1) 125ml Gs	TPH Diesel Range	8015m	
BOBKM2	S			(1) 125ml aGs	TOC	9060	
BOBKM2	S			(1) 1000ml Poly	Gross Alpha/Beta ITAS-RD-3322 Gamma Spec. Cs-134,137, I-129, Co-60, K-40, Eu-152/154/155, Ru-106, Na-22 ITAS-RD-3219; Total Uranium ITAS-RD-4200 OR 4201 U-235/234/238 ITAS-RD-3234 Np-237 ITAS-RD-3208; Pu-238/239/240 ITAS-RD-3209; Sr-90 ITAS-RD-3204; Tc-99 ITAS-RD-RS-0001; Am-241, Cm-244 ITAS-RD-3302; Se-79 ITAS-RD-3253		

01A B C D E F G

4184 01

Chain of Possession Relinquished By (Sign and Print Names)	Date	Time	Received By
R.T. Sickle	4/11/94	0800	
	4/11/94	1140	JG Hogan
JG Hogan	4/11/94	1418	ITAS Tom Gilmore

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

LABORATORY SECTION	Received By	Title	Date/Time
Final Sample Disposition	Disposal Method:	Disposed by:	Date/Time:

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0046 015

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	(D)	E
PROJECT: 200 UP 2			DATA PACKAGE: W0025-ITC-027		
VALIDATOR: KA.		LAB: IT		DATE: 6/19/94	
CASE: —			SDG: —		

ANALYSES PERFORMED					
☑ Gross Alpha/Beta	☑ Strontium-90	☑ Technetium-99	☑ Alpha Spectroscopy	☑ Gamma Spectroscopy	
☑ Total Uranium	☐ Radium-22	☐ Tritium	☒ I-129		

SAMPLES/MATRIX B0BKM2 / SOIL

1. Completeness . . . . . ☐ N/A

Technical verification forms present? . . . . . (Yes) No N/A

Comments:

2. Initial Calibration . . . . . ☐ N/A

Instruments/detectors calibrated within one year of sample analysis? . . . . . Yes (No) N/A

Initial calibration acceptable? . . . . . (Yes) No N/A

Standards NIST traceable? . . . . . (Yes) No N/A

Standards Expired? . . . . . Yes (No) N/A

Comments:

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? . . . . . (Yes) No N/A
Field blank(s) analyzed? . . . . . Yes No (N/A)
Field blank results acceptable? . . . . . Yes No (N/A)
Analytes detected in field blank(s)? . . . . . Yes No (N/A)
Transcription/Calculation Errors? . . . . . Yes (No) N/A

Comments: Am 241 detected in method blank. Sample result for B0BKM2 qualified J

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: Np 237 %R >10 but <60, results qualified UJ

6. Laboratory Control Samples . . . . . ☐ N/A

LCS analyzed? . . . . . Yes No N/A
LCS recoveries acceptable? . . . . . Yes No N/A
LCS traceable? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments: LCS recovery for I-129 >130% but no qualification applied since sample results are ND

7. Chemical Recovery . . . . . ☐ N/A

Chemical carrier added? . . . . . Yes No N/A
Chemical recovery acceptable? . . . . . Yes No N/A
Chemical carrier traceable? . . . . . Yes No N/A
Chemical carrier expired? . . . . . Yes No N/A
Transcription/Calculation errors? . . . . . Yes No N/A

Comments: Tracer recovery acceptable

8. Duplicates . . . . . ☐ N/A

Duplicates Analyzed? . . . . . Yes No N/A
RPD Values Acceptable? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments: Tc99 RPD >35%, results qualified J/UJ

9. Field QC Samples . . . . . ☒ N/A

Field duplicate sample(s) analyzed? . . . . . Yes No N/A
Field duplicate RPD values acceptable? . . . . . Yes No N/A
Field split sample(s) analyzed? . . . . . Yes No N/A
Field split RPD values acceptable? . . . . . Yes No N/A
Performance audit sample(s) analyzed? . . . . . Yes No N/A
Performance audit sample results acceptable? . . . . . Yes No N/A

Comments: Field QC not evaluated

10. Holding Times

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

Comments: Sample collected 3/29/94, all analysis completed by 5/27/94 which is < 180 days.

11. Results and Detection Limits (Levels D & E) . . . . . ☐ N/A

Results reported for all required sample analyses? . . . . (Yes) No N/A
Results supported in raw data? . . . . . (Yes) No N/A
Results Acceptable? . . . . . (Yes) No N/A
Transcription/Calculation errors? . . . . . Yes (No) N/A
MDA's meet required detection limits? . . . . . Yes (No) N/A
Transcription/calculation errors? . . . . . (Yes) No N/A

Comments: MDA's can't be verified by recalculation for Se 79 and Tc 99. Nondetects qualified as UJ.
also U234, U235, U238

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

DUPLICATE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0025

LAB SAMPLE ID: F0418401

WHC ID: B0BKM2

REPORTING UNITS: pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
AM-241	8.45E-01 J	1.36E-01	1.93E-01	2.92E-02	0.664	RD3302
CM-242	-5.45E-04 U	1.09E-03	1.09E-03	2.74E-02	0.664	RD3302
CM-244	5.05E-03 U	1.10E-02	1.11E-02	2.21E-02	0.664	RD3302
NP-237	7.65E-03 UJ	1.18E-02	1.19E-02	1.90E-02	1	RD3208
PU239/40	2.42E-01	8.04E-02	8.85E-02	4.47E-02	0.639	RD3209
PU-238	3.91E-03 U	1.35E-02	1.36E-02	3.68E-02	0.639	RD3209
U-234	1.09E+01	9.09E-01	2.41E+00	1.22E-01	0.22	RD3234
U-235	3.76E-01	1.70E-01	1.86E-01	8.65E-02	0.22	RD3234
U-238DA	9.34E+00	8.41E-01	2.09E+00	5.13E-02	0.22	RD3234
K-40	1.27E+01	3.69E-01	1.32E+00	N/A	N/A	RD3219
CO-60	-4.11E-03 U	8.87E-03	8.88E-03	1.48E-02	N/A	RD3219
EU-152	7.54E-02	4.07E-02	4.14E-02	7.25E-02	N/A	RD3219
CS-137DA	5.43E+02	5.43E+01	5.43E+01	N/A	N/A	RD3219
CS-134	1.84E-02 U	4.99E-02	4.99E-02	8.09E-02	N/A	RD3219
RU-106DA	-5.48E-01 U	5.25E-01	5.27E-01	8.49E-01	N/A	RD3219
NA-22	6.90E-03 U	1.01E-02	1.01E-02	1.74E-02	N/A	RD3219
EU-155	7.09E-03 U	1.48E-01	1.48E-01	2.43E-01	N/A	RD3219
EU-154	1.89E-02 U	2.75E-02	2.76E-02	4.73E-02	N/A	RD3219
I-129LP	-3.64E+01 U	3.51E+00	5.06E+00	5.24E+00	N/A	RD3219
ALPHA	2.53E+01	6.99E+00	7.50E+00	4.05E+00	1	RD3222
BETA	7.26E+02	1.75E+01	5.10E+01	2.97E+00	1	RD3222
TOTAL-SR	4.17E+01	7.90E-01	9.81E+00	1.66E-01	0.678	RD3204
SE-79	9.25E+00	8.34E-01	2.86E+00	1.39E+00	0.723	RD3253
TC-99	1.66E+00	3.42E-01	1.57E+00	7.30E-01	0.691	ITAS-IT-RD-0001
URANIUM	2.93E+01	N/A	4.39E+00	1.36E-03	0.87	RD4200

Verified [illegible] 6/14/94

682A-6-93

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

RPD CALCULATIONS

LAB NAME: ITAS-RICHLAND SDG NO.: W0025

LAB SAMPLE ID: 40418401

WHC ID: BOBKM2

REPORTING UNITS: pCi/g & ug/g

ISOTOPE	SAMPLE RESULT	DUPLICATE RESULT	RPD
AM-241	7.28E-01	8.45E-01	14.88
CM-242	0.00E+00	-5.45E-04	200.00
CM-244	4.78E-03	5.05E-03	5.49
NP-237	7.99E-03	7.65E-03	4.35
PU239/40	2.47E-01	2.42E-01	2.04
PU-238	1.27E-02	3.91E-03	105.84
U-234	9.63E+00	1.09E+01	12.37
U-235	3.86E-01	3.76E-01	2.62
U-238DA	8.51E+00	9.34E+00	9.30
K-40	1.27E+01	1.27E+01	0.00
CO-60	5.81E-03	-4.11E-03	1167.06
EU-152	6.13E-02	7.54E-02	20.63
CS-137DA	5.25E+02	5.43E+02	3.37
CS-134	-3.52E-02	1.84E-02	638.10
RU-106DA	5.66E-02	-5.48E-01	246.07
NA-22	-9.86E-05	6.90E-03	205.80
EU-155	4.51E-02	7.09E-03	145.66
EU-154	-2.70E-04	1.89E-02	205.80
I-129LP	-2.91E+01	-3.64E+01	22.29
ALPHA	3.55E+01	2.53E+01	33.55
BETA	7.41E+02	7.26E+02	2.04
TOTAL-SR	4.12E+01	4.17E+01	1.21
SE-79	9.47E+00	9.25E+00	2.35
TC-99	2.52E+01	1.66E+00	175.28
URANIUM	3.04E+01	2.93E+01	3.69

J/UJ

Verified MMT 6/19/94

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682A-6-93

9713508.2417

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

BLANK RESULTS

LAB NAME: ITAS- RICHLAND SDG NO.: W0025

LAB SAMPLE ID: L041841B

REPORTING UNITS: pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
AM-241	5.95E-01	1.03E-01	1.36E-01	1.21E-02	0.812	RD3302
CM-242	0.00E+00	0.00E+00	1.44E-02	1.30E-02	0.812	RD3302
CM-244	0.00E+00	0.00E+00	1.34E-02	1.21E-02	0.812	RD3302
NP-237	0.00E+00	0.00E+00	0.00E+00	1.13E-02	1	RD3208
PU239/40	4.35E-02	3.39E-02	3.46E-02	3.06E-02	0.652	RD3209
PU-238	-2.56E-03	3.62E-03	3.64E-03	3.62E-02	0.652	RD3209
U-234	3.23E-03	1.09E-02	1.09E-02	3.04E-02	0.775	RD3234
U-235	-1.72E-03	1.72E-03	1.73E-03	2.87E-02	0.775	RD3234
U-238DA	3.66E-03	1.09E-02	1.09E-02	2.87E-02	0.775	RD3234
K-40	1.35E+00	1.80E-01	2.25E-01	3.93E-01	N/A	RD3219
CO-60	-2.41E-03	9.31E-03	9.32E-03	1.60E-02	N/A	RD3219
EU-152	-1.62E-02	4.62E-02	4.62E-02	7.63E-02	N/A	RD3219
CS-137DA	-1.89E-03	9.22E-03	9.22E-03	1.53E-02	N/A	RD3219
CS-134	1.57E-03	8.82E-03	8.82E-03	1.48E-02	N/A	RD3219
RU-106DA	-8.80E-03	8.06E-02	8.06E-02	1.34E-01	N/A	RD3219
NA-22	-4.30E-03	1.02E-02	1.02E-02	1.72E-02	N/A	RD3219
EU-155	-6.67E-05	2.12E-02	2.12E-02	3.38E-02	N/A	RD3219
EU-154	-1.20E-02	2.85E-02	2.85E-02	4.74E-02	N/A	RD3219
I-129LP	3.13E-01	2.48E-01	2.50E-01	5.17E-01	N/A	RD3219
ALPHA	-7.98E-03	3.87E-02	3.87E-02	9.71E-02	1	RD3222
BETA	2.50E-01	3.57E-01	3.57E-01	5.93E-01	1	RD3222
TOTAL-SR	3.01E-02	5.42E-02	5.47E-02	1.48E-01	0.812	RD3204
SE-79	3.46E-01	6.45E-01	1.86E+00	1.32E+00	0.723	RD3253
URANIUM	1.95E-03	N/A	2.92E-04	1.36E-03	1	RD4200

Verified MAS 6/19/94

9713508.2418

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

BLANK RESULTS

LAB NAME: ITAS- RICHLAND **SDG NO.:** W0025

LAB SAMPLE ID: L041841X

REPORTING UNITS: pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
K-40	1.89E-02	1.45E-01	1.45E-01	N/A	N/A	RD3219
CO-60	2.56E-03	5.22E-03	5.22E-03	9.10E-03	N/A	RD3219
EU-152	3.59E-04	2.67E-02	2.67E-02	4.53E-02	N/A	RD3219
CS-137DA	-5.45E-03	4.98E-03	5.01E-03	8.01E-03	N/A	RD3219
CS-134	4.85E-04	4.22E-03	4.22E-03	7.23E-03	N/A	RD3219
RU-106DA	1.66E-02	4.41E-02	4.42E-02	7.68E-02	N/A	RD3219
NA-22	5.14E-04	4.79E-03	4.79E-03	8.48E-03	N/A	RD3219
EU-155	-8.51E-03	1.10E-02	1.11E-02	1.69E-02	N/A	RD3219
EU-154	1.45E-03	1.35E-02	1.35E-02	2.37E-02	N/A	RD3219
URANIUM	3.89E-01	N/A	5.83E-02	1.36E-03	0.87	RD4200

Verified [illegible] 6/19/94

9713508.2419

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

BLANK RESULTS

LAB NAME: ITAS- RICHLAND SDG NO.: W0025

LAB SAMPLE ID: L040911B

REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
TC-99	1.11E-01	3.14E-01	1.44E+00	7.30E-01	0.691	ITAS-IT-RD-0001

LAB SAMPLE ID: L040912B

REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
TC-99	3.49E-01	3.19E-01	1.46E+00	7.30E-01	0.691	ITAS-IT-RD-0001

LAB SAMPLE ID: L041842X

REPORTING UNITS: ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
URANIUM	4.94E-01	N/A	7.41E-02	1.36E-03	0.87	RD4200

Verified
6/19/94

9713508.2420

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

LABORATORY CONTROL SAMPLES

LAB NAME: ITAS-RICHLAND **SDG NO.:** W00025

LAB SAMPLE ID: L041841S

REPORTING UNITS: pCi/g & ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	EXPECTED	% RECOVERY
AM-241	5.41E+00	3.11E-01	8.68E-01	2.05E-02	0.811	4.51E+00	119.96
NP-237	5.70E+00	3.08E-01	1.27E+00	1.68E-02	1	5.65E+00	100.88
PU239/40	3.24E+00	3.25E-01	5.73E-01	2.21E-02	0.511	3.38E+00	95.86
U-234	1.52E+00	2.11E-01	3.01E-01	3.64E-02	0.571	1.62E+00	93.83
U-235	7.85E-02	4.84E-02	4.97E-02	3.64E-02	0.571	7.38E-02	106.37
U-238DA	1.68E+00	2.21E-01	3.24E-01	1.97E-02	0.571	1.69E+00	99.41
K-40	1.93E+01	6.42E-01	2.03E+00	N/A	N/A	1.95E+01	98.97
CS-137DA	4.02E-01	3.71E-02	5.47E-02	N/A	N/A	3.58E-01	112.29
RA-226DA	1.03E+00	7.19E-02	1.26E-01	N/A	N/A	1.16E+00	88.79
I-129LP	1.27E+01	1.04E+00	1.64E+00	N/A	N/A	9.03E+00	140.64
ALPHA	4.32E+00	4.18E-01	8.40E-01	9.16E-02	1	4.51E+00	95.79
BETA	5.01E+00	7.34E-01	8.15E-01	5.80E-01	1	4.54E+00	110.35
TOTAL-SR	5.81E+00	2.72E-01	1.47E+00	1.38E-01	0.886	6.13E+00	94.78
SE-79	3.80E+01	1.05E+01	1.05E+01	N/A	0	4.52E+01	84.07
URANIUM	9.32E+00	N/A	1.40E+00	1.36E-03	1	1.00E+01	93.20

I-129 detects qualified J

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

LABORATORY CONTROL SAMPLES

LAB NAME: ITAS-RICHLAND **SDG NO.:** W0025

LAB SAMPLE ID: L040911M

REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	EXPECTED	% RECOVERY
TC-99	6.18E+01	8.87E-01	7.95E+00	7.30E-01	0.691	6.76E+01	91.42

LAB SAMPLE ID: L040912M

REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	EXPECTED	% RECOVERY
TC-99	2.54E+01	6.17E-01	3.96E+00	7.30E-01	0.691	2.25E+01	112.89

LAB SAMPLE ID: L040913M

REPORTING UNITS: pCi/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	EXPECTED	% RECOVERY
TC-99	6.45E+01	9.01E-01	8.25E+00	7.30E-01	0.691	6.76E+01	95.41

LAB SAMPLE ID: L041841M

REPORTING UNITS: ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	EXPECTED	% RECOVERY
URANIUM	1.07E+01	N/A	1.60E+00	1.36E-03	0.87	1.00E+01	107.00

LAB SAMPLE ID: L041842M

REPORTING UNITS: ug/g

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	EXPECTED	% RECOVERY
URANIUM	9.81E+00	N/A	1.48E+00	1.63E-03	0.87	1.00E+01	98.10

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682A-6-93

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

MATRIX SPIKE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0025

LAB SAMPLE ID: W0418401

REPORTING UNITS: pCi/g

ISOTOPE	SPIKE RESULT*	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	SAMPLE RESULT	EXPECTED	% RECOVERY
NP-237	2.12E+00	1.88E-01	4.94E-01	1.67E-02	7.99E-03	5.64E+00	37.59
SE-79	3.42E+01	5.77E+00	6.70E+00	N/A	N/A	4.50E+01	76.00

Np 237 qualified J/UJ

LAB SAMPLE ID: W041841D

REPORTING UNITS: pCi/g

ISOTOPE	SPIKE RESULT*	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	SAMPLE RESULT	EXPECTED	% RECOVERY
NP-237	3.20E+00	2.31E-01	7.26E-01	1.13E-02	7.99E-03	5.65E+00	56.64
SE-79	3.07E+01	4.59E+00	5.52E+00	N/A	N/A	4.48E+01	~~68.53~~

Np 237 qualified J/UJ

LAB SAMPLE ID: W0401901

REPORTING UNITS: pCi/g

ISOTOPE	SPIKE RESULT*	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	SAMPLE RESULT	EXPECTED	% RECOVERY
TC-99	2.26E+01	5.92E-01	3.67E+00	7.30E-01	-2.30E-01	2.55E+01	88.63

LAB SAMPLE ID: W0409102

REPORTING UNITS: pCi/g

ISOTOPE	SPIKE RESULT*	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	SAMPLE RESULT	EXPECTED	% RECOVERY
TC-99	2.25E+01	5.92E-01	3.65E+00	7.30E-01	4.79E-01	2.66E+01	84.59

*SPIKE RESULT CORRECTED FOR SAMPLE RESULT

Verified [illegible] 6/19/94

9713508.2423

Golder Associates	SUBJECT W0025-ITC-027		
	Job No. 923-E418 Ref.	Made by Checked Reviewed	Date 6/19/94 Sheet of

Blanks

Analyte	Result pCi/g	5X Result	Sample Result pCi/g	Qualifier
Am 241	0.595	2.975	0.728	J
PU239/40	0.0435	0.218	0.247	none
U234	0.00323	0.016	0.63	none
U238	0.00366	0.018	8.51	none
K40	1.35	6.75	12.7	none
CS134	0.00157	0.008	0.822U	none
I129	0.313	1.565	5.36U	none
Beta	0.250	1.25	741	none
Total SR	0.0301	0.151	41.2	none
Se 79	0.346	1.73	9.47	none
Uranium (ug/g)	0.00195	0.010	30.4	none

Golder Associates	SUBJECT W0025-ITC-027		
	Job No. 923-8418 Ref.	Made by Checked Reviewed	Date 6/19/94 Sheet of

Blanks, Cont'd.

Analyte	Result pCi/g	5X Result	Sample Result pCi/g	Qualifier
K40	0.0189	0.095	127	none
Co60	0.00256	0.013	0.0157 U	none
Eu152	0.000359	0.002	0.0172 U	none
Cs134	0.000485	0.002	0.0822 U	none
Ru106	0.0166	0.083	0.865 U	none
Na22	0.00514	0.003	0.0171 U	none
Eu154	0.00145	0.007	0.0469 U	none
Uranium (ug/g)	0.389	1.945	30.4	none
TC99	0.111	0.555	25.2	none
TC99	0.349	1.745	25.2	none
Uranium (ug/g)	0.494	2.47	30.4	none

9713508.2425

Golder Associates

SUBJECT		
Job No. 923-E418 Ref.	Made by Checked Reviewed	Date 6/19/94 Sheet of

Duplicates

Analyte	A	B	RPD	2x RDL	Qual.
Cm 242	0.0174	0.0274	45	0.1	none
Pu 238	0.0338	0.0368	8	0.1	ok
Co 60	0.0157	0.0148	6	0.1	ok
Cs 134	0.0822	0.0809	2	NO RDL	ok
Ru 106	0.865	0.849	2	NO RDL	ok
Na 22	0.0171	0.0174	2	NO RDL	ok
Eu 155	0.281	0.243	15	0.2	ok
Eu 154	0.0469	0.0473	1	0.2	ok
Tc 99	25.2	1.66	175	1	J/UJ

RPD's recalculated with MDA's because sample results are < MDA.

Golder Associates	SUBJECT W0025-ITC-027		
	Job No. Ref. 903-E418	Made by Checked MA Reviewed	Date 6/19/94 Sheet of

Results vs RDL's

Analyte	Result (MDA)	RDL	Comments
Eu155	0.281	0.1	RDL not met *
Tc99	(0.73)	0.5	RDL not met
I-129	(5.36)	2	RDL Not Met

* No qual. necessary for Tc99 since result is well above MDA

W0025-ITC-027

Americium/Curium		
HEIS No.:	B0BKM2	
Lab ID:	40418401	
Aliquot:	2.00E+00	
Am241 net cpm:	0.7050	
Am241 bkg cpm:	0.0000	
Spl count time:	200	
Bkg count time:	2500	
Eff d/c:	3.225	
Decay:	1	
Yield:	0.704	
Am241 calc:	7.27E-01	OKAY
Am241 rptd:	7.28E-01	
Am241 MDA calc:	1.40E-02	OKAY
Am241 MDA rptd:	1.40E-02	
Cm244 net cpm:	0.0046	
Cm244 bkg cpm:	0.0004	
Cm244 decay:	1.005	
Cm244 calc:	4.77E-03	OKAY
Cm244 rptd:	4.78E-03	
Cm244 MDA calc:	2.09E-02	OKAY
Cm244 MDA rptd:	2.09E-02	
Cm242 net cpm:	0.0000	
Cm242 bkg cpm:	0.0000	
Cm242 decay:	1.248	
Cm242 calc.:	0.00E+00	OKAY
Cm242 rptd:	0.00E+00	
Cm242 MDA calc:	1.74E-02	OKAY
Cm242 MDA rptd:	1.74E-02	
Neptunium		
HEIS No.:	B0BKM2	
Lab ID:	40418401	
Aliquot:	2.00E+00	
Np237 net cpm:	0.0096	
Np237 bkg cpm:	0.0004	
Spl count time:	200	
Bkg count time:	2500	
Eff d/c:	3.7	
Decay:	1	
Yield:	1	
Np237 calc:	7.99E-03	OKAY
Np237 rptd:	7.99E-03	
Np237 MDA calc:	1.67E-02	OKAY
Np237 MDA rptd:	1.67E-02	

W0025-ITC-027

Plutonium		
HEIS No.:	B0BKM2	
Lab ID:	40418401	
Aliquot:	2.00E+00	
Pu238 net cpm:	0.009	
Pu238 bkg cpm:	0.001	
Spl count time:	200	
Bkg count time:	1000	
Pu238 Eff d/c:	3.703	
Decay:	1	
Yield:	0.591	
Pu238 calc:	1.27E-02	OKAY
Pu238 rptd:	1.27E-02	
Pu238 MDA calc:	3.38E-02	OKAY
Pu238 MDA rptd:	3.38E-02	
Pu239 net cpm:	0.175	
Pu239 bkg cpm:	0	
Pu239 d/c:	3.7	
Pu239 decay:	1	
Pu239 calc:	2.47E-01	OKAY
Pu239 rptd:	2.47E-01	
Pu239 MDA calc:	1.91E-02	OKAY
Pu239 MDA rptd:	1.91E-02	
Uranium		
HEIS No.:	B0BKM2	
Lab ID:	40418401	
Aliquot:	2.00E+00	
U-234 net cpm:	6.9488	
U-234 bkg cpm:	0.0012	
Spl count time:	200	
Bkg count time:	2500	
Eff d/c:	3.7	
Decay:	1	
Yield:	0.601	
U-234 calc:	9.62E+00	OKAY
U-234 rptd:	9.63E+00	
U-234 MDA calc:	3.04E-02	UJ
U-234 MDA rptd:	3.45E-02	
U-235 net cpm:	0.2784	
U-235 bkg cpm:	0.0016	
U-235 decay:	1	
U-235 calc:	3.85E-01	OKAY
U-235 rptd:	3.86E-01	
U-235 MDA calc:	3.21E-02	UJ
U-235 MDA rptd:	3.70E-02	
U-238 net cpm:	6.143	
U-238 bkg cpm:	0.002	
U-238 decay:	1	
U-238 calc.:	8.50E+00	OKAY
U-238 rptd:	8.51E+00	
U-238 MDA calc:	3.37E-02	UJ
U-238 MDA rptd:	3.91E-02	

W0025-ITC-027

Gross Alpha		
HEIS No.:	B0BKM2	
Lab ID:	40418401	
Aliquot:	4.99E-02	
Net counts:	0.784	
Bkg counts:	0.036	
Spl count time:	100	
Bkg count time:	500	
d/c:	5.016	
Calc.:	3.55E+01	OKAY
Rptd:	3.55E+01	
MDA calc:	4.34E+00	OKAY
MDA rptd:	4.32E+00	
Gross Beta		
HEIS No.:	B0BKM2	
Lab ID:	40418401	
Aliquot:	2.50E-01	
Net counts:	141.88	
Bkg counts:	1	
Spl count time:	50	
Bkg count time:	500	
d/c:	2.897	
Calc.:	7.41E+02	OKAY
Rptd:	7.41E+02	
MDA calc:	2.83E+00	OKAY
MDA rptd:	2.83E+00	
Strontium 90		
HEIS No.:	B0BKM2	
Sample:	40418401	
Sep date:	5/25/94	
Sep time:	15:30	
Count date:	5/26/94	
Count time:	12:35	
Hours:	21.083333	
Sample amt:	5.94E+00	
Net, cpm:	238.528	
Count time:	50	
Bkg, cpm:	1.092	
Count time:	500	
D/C 1:	2.173	
D/C 2:	1.832	
D/C 3:	1.961	
Yield:	0.779	
Calc:	4.11E+01	OKAY
Rptd:	4.12E+01	
MDA, Calc:	1.57E-01	OKAY
MDA, rptd:	1.57E-01	

W0025-ITC-027

Selenium 79		
HEIS No.:	B0BKM2	
Sample:	40418401	
Bkg cpm:	21	
Spl, amt:	1.00E+00	
Spl cpm:	33.56	
Count time:	100	
Spl dpm:	37.37	
d/c:	1.114	
Yield:	0.723	
Blk, dpm:	3.06E+01	
Calc:	9.48E+00	OKAY
Rptd:	9.47E+00	
MDA, calc:	1.50E+00	UJ
MDA, rptd:	1.32E+00	
Technetium-99		
HEIS No.:	B0BKM2	
Sample:	40418401	
Bkg cpm:	25.71	
Spl, amt:	2.00E+00	
Spl cpm:	97.3	
Count time:	125	
Spl dpm:	104.47	
d/c:	1.074	
Yield:	0.691	
Blk, dpm:	3.91E+01	
Calc:	2.52E+01	OKAY
Rptd:	2.52E+01	
MDA, calc:	7.46E-01	OKAY
MDA, rptd:	7.30E-01	
Total Uranium		
HEIS No.:	B0BKM2	
Lab ID:	40418401	
ng, raw:	2.65E+04	
g, sample:	1.00E+00	
Dil. vol:	1	
Yield, corr:	0.87	
Calc.:	3.04E+01	
Rptd:	3.04E+01	

W0025-ITC-027

SAMP_NUM	PARAM	RESULT	Q	MDA	RDL	COMMENTS
BOBKM2	AM-241	0.728	J	0.014	0.05	OKAY
	CM-242	0.0174	U	0.0174	NO RDL	NO RDL
	CM-244	0.0209	U	0.0209	0.05	OKAY
	NP-237	0.0167	UJ	0.0167	0.2	OKAY
	PU3940	0.247		0.0191	0.05	OKAY
	PU-238	0.0338	U	0.0338	0.05	OKAY
	U-234	9.63		0.0345	0.3	OKAY
	U-235	0.386		0.037	0.3	OKAY
	U-238	8.51		0.0391	0.3	OKAY
	K-40	12.7		0	NO RDL	NO RDL
	CO-60	0.0157	U	0.0157	0.05	OKAY
	EU-152	0.0712	U	0.0712	0.1	OKAY
	CS-137	525		0	0.05	OKAY
	CS-134	0.0822	U	0.0822	NO RDL	NO RDL
	RU-106	0.865	U	0.865	NO RDL	NO RDL
	NA-22	0.0171	U	0.0171	NO RDL	NO RDL
	EU-155	0.281	U	0.281	0.1	MDA>RDL!
	EU-154	0.0469	U	0.0469	0.1	OKAY
	I-129	5.36	U	5.36	2	MDA>RDL!
	ALPHA	35.5		4.32	10	OKAY
	BETA	741		2.83	10	OKAY
	TOTAL-SR	41.2		0.157	1	OKAY
	SE-79	9.47		1.32	10	OKAY
	TC-99	25.2	J	0.73	0.5	OKAY
	URANIUM	30.4		0	0.1	OKAY