BOBP28-TMA-752

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

GENERAL CHEMISTRY
Case No. 04-082
(TMA/ARLI W.O. No. A4-04-082)

METALS
Case No. N4-04-112
(TMA/SS W.O. Nos. S4-05-023 & S4-05-024)

June 14, 1994

TMA Master Work Order N4-04-112

PAGE 1 TMA/Norcal CHAIN OF CUSTODY ORD # N4-04-112
RCVD: 04/29/94 DUE: 06/03/94 04/29/94 14:57:10 KEEP: 09/01/94 DISP: S

DASH	SAMPLE IDENTIFICATION		STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY		
01A-W	B0BP28	UNFILTERED	ARLI	WH043	WH121	WH122
01C-W	B0BP28 MS	UNFILTERED	ARLI	WH043		
01D-W	B0BP28 DUP	UNFILTERED	ARLI	WH043	WH121	WH122

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
tyamamoto	4/29/94	ARLI	4/29/94	Phil McGrath	4/30/94

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: ☐ Priority ☒ Normal

Collector: K. Trapp	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 100-BC-5	Sampling Location: 100 B	SAF No.: 94-129
Ice Chest No.: SMC 144	Field Logbook No.: EFL-1036	Method of Shipment: EMERY
Shipped To: TMA	Offsite Property No.	Bill of Lading/Air Bill No.

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE 3B 12/1005 AJS 4/24/94 1612

SAMPLE ANALYSIS.

Possible Sample Hazards/Remarks																	
	Preservative	HNO3<2	COOL 4	HNO3<2	HCL pH<2	COOL 4		HNO3<2									
	Type of Container	G/P	P	G/P	G/P	Gs		G/P									
	No. of Container(s)	1	1	1 4 KH 4/26/94	1	2		1									
	Volume	1000ml	1000ml	4L ~~1000ml~~ KH 4/26/94	1000ml	1000ml		1000ml									
		ICP METALS AA METALS Hg CLP	ANIONS F, SO4 COND pH	GROSS ALPHA/ BETA Sr-90	Tc-99	TRITIUM C-14		ICP METALS, AA METALS, Hg FILTERD CLP									

Sample No.	Matrix*	Date Sampled	Time Sampled														
60BP28	W	4/26/94	1034	X	X	X	X	X									
60BP29	W	↓	↓							X							

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
K. Trapp/K. Trapp	4/26/94 1610	AJ Simpson AJSIMPSON	4/27/94 1612
AJ Simpson AJ SIMPSON	4/28/94 0952	Kermit Blum K. Blum	4-29-94/1340

SPECIAL INSTRUCTIONS: DATA DELIVERABLE-STANDALONE

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

LABORATORY SECTION — Received By | Title | Date/Time

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

0090 1050 96

0000024

9613501.0681

000003

SAMPLE LOG-IN SHEET

LAB NAME : TMA/ARL

PAGE : 1 OF 1

RECEIVED BY (PRINT NAME): Nigel McElrath

RECEIVED BY (SIGNATURE): Nigel McElrath

LOG-IN-DATE : 4/30/94

ICE CHEST NO. EML144

		CORRESPONDING		
	EPA SAMPLE #	SAMPLE TAG #	ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC
REMARKS:		BOBP28	A404082	GOOD
1. Custody Seal(s) (Present / Absent* Intact / Broken)		BOBRM5	A4 04081	↓
		BOBRM7	↓	
2. Custody Seal Nos: N/A				
3. Chain of Custody Records (Present / Absent*)				
4. Traffic Reports or Packing List (Present / Absent*)				
5. Airbill (Airbill / Sticker Present / Absent*)				
6. Airbill No.: 8826001306				
7. Sample Tags (Present / Absent*)				
8. Sample Tag Numbers (Listed / Not Listed on Chain of Custody)				
9. Sample Condition: (Intact / Broken* / Leaking)				
10. Does information on custody records, traffic reports, and sample tags agree? (Yes / No*)				
11. Date Recieved at Lab: 4/30/94				
12. Temp of ice chest @ 1 °C				
13. Time Recieved: 1000				

SAMPLE TRANSFER

Fraction: N/A

Area #: N/A

By: N/A

On: N/A

(PM) 5-2-94

* Contact SMO and attach record of resolution

Reviewed By: _____ Logbook No.: N/A

Date: _____ Logbook Page No.: N/A

FORM DC-1

Samples received 4/30/94 - log-in on Monday 5/2/94, MHP 4/29/94

000004

FEDERAL EXPRESS

USE THIS AIRBILL FOR SHIPMENTS WITHIN THE CONTINENTAL U.S.A., ALASKA AND HAWAII
USE THE INTERNATIONAL AIR WAYBILL FOR SHIPMENTS TO PUERTO RICO AND ALL NON U.S. LOCATIONS
QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 8826001306

3356M 8826001306

1 SENDER'S FEDERAL EXPRESS ACCOUNT NUMBER: 0941-5760-9

Date: 4-29-94

From (Your Name) Please Print: Sample Control

Your Phone Number (Very Important): 510-235-2633

Company: T M A /NORCAL

Department/Floor No.:

Street Address: 2030 WRIGHT AVE

City: RICHMOND State: CA ZIP Required: 94804

2 To (Recipient's Name) Please Print: Carole Harris

Recipient's Phone Number (Very Important): (818) 357-3247

Company: TMA / Arli

Department/Floor No.:

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 160 Taylor St.

City: Monrovia State: CA ZIP Required: 91016

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.): 2340-6406

H IF HOLD AT FEDEX LOCATION, Print FEDEX Address Here
Street Address:
City State ZIP Required

3 PAYMENT
1 [X] Bill Sender Acct. No. Req'd. 2 [ ] Bill Recipient's FedEx Acct. No. Fill in Account Number below 3 [ ] Bill 3rd Party FedEx Acct. No. Fill in Account Number below (req'd.) 4 [ ] Bill Credit Card Fill in Credit Card No. below (req'd.)
5 [ ] Cash/Check Acct./Credit Card No. Exp. Date

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning)
11 [X] OTHER PACKAGING
16 [ ] FEDEX LETTER*
12 [ ] FEDEX PAK*
13 [ ] FEDEX BOX
14 [ ] FEDEX TUBE

Standard Overnight (Delivery by next business afternoon. No Saturday delivery)
51 [ ] OTHER PACKAGING
56 [ ] FEDEX LETTER*
52 [ ] FEDEX PAK*
53 [ ] FEDEX BOX
54 [ ] FEDEX TUBE

Economy Two-Day (Delivery by second business day.)
30 [ ] ECONOMY**
* Economy Letter Rate not available. Minimum charge: One pound Economy rate

Government Overnight (Restricted to authorized users only)
46 [ ] GOVT LETTER
41 [ ] GOVT PACKAGE

Freight Service (for packages over 150 lbs.)
70 [ ] OVERNIGHT FREIGHT** (Confirmed reservation required)
80 [ ] TWO-DAY FREIGHT**
† Delivery commitment may be later in some areas
*Declared Value Limit $500
**Call for delivery schedule

5 DELIVERY AND SPECIAL HANDLING (Check services required)

Weekday Service
1 [ ] HOLD AT FEDEX LOCATION WEEKDAY (Fill in Section H)
2 [ ] DELIVER WEEKDAY

Saturday Service
31 [ ] HOLD AT FEDEX LOCATION SATURDAY (Fill in Section H)
3 [X] DELIVER SATURDAY (Not available in all locations)
9 [ ] SATURDAY PICK-UP (Extra charge)

Special Handling
4 [ ] DANGEROUS GOODS (Extra charge)
6 [ ] DRY ICE (Dangerous Goods Shipper's Declaration not required)
Dry Ice 9 UN 1845 X kg 904 III
[ ] DESCRIPTION
12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

6 PACKAGES / WEIGHT (In Pounds Only)
Total 1 Total 42

DIM SHIPMENT (Chargeable Weight)
[ ] lbs
L x ?? x ??

Received At
[X] Regular Stop 2 [ ] On-Call Stop 3 [ ] Drop Box 4 [ ] B.S.C. 5 [ ] Station

7 Release Signature:

Emp. No Date
[ ] Cash Received
[ ] Return Shipment
[ ] Third Party [ ] Chg. To Del [ ] Chg. To Hold
Street Address
City State Zip
Received By: X
Date/Time Received FedEx Employee Number

Federal Express Use
Base Charges
Declared Value Charge
Other 1
Other 2
Total Charges

REVISION DATE 12/92
PART #137204 FXEM 11/93
FORMAT #158
158
© 1992-93 FEDEX
PRINTED IN U.S.A.

DESTINATION COPY

2890-1050196

TMA/ARLI
Thermo Analytical Inc.

RADIATION DOSE RATE SURVEY FORM

Date 5/2/94 COMPANY NORCAL/WHC OTHER ORD # 8826001306

Surveyor's Name Michael D. Williams

Model No. HP-210 / ESP-1 Model No. AC-3-7 / ESP-1

Serial Nos. 710289 / 02619 Serial Nos. 407726 / 02628

Calibration Date 11/17/93 Calibration Date 3/15/94

Instrument Calibration Factor Instrument Calibration Factor

Sample	Location	HP-210 CPM	HP-210 Factor	HP-210 DPM	AC-3-7 CPM	AC-3-7 Factor	AC-3-7 DPM	Spillage or Breakage?	Activity, nCi/mL or nCi/g
Background		40.0			1.0				
Consistency		7290	0.281		4980	0.183			
Smears:									
Smd 144		34.0			1.0				
Rad	Activities	Sheet	from		WHC				
all	sample			<	5.00 E 01		pCi/g.		

All OK V Approved mm

Not OK Date 5/2/94

Comments: Victoreen screen: background level only (~15 μR/h).

GENERAL CHEMISTRY RESULTS

CASE NO. 04-082

Sample #:

B0BP28

CASE NARRATIVE

The holding time was exceeded for the analysis of pH. Careful review of the QC analysis indicates that the data is reliable.

No other problems were encountered during sample analysis. All QC results were acceptable.

Maureen Parrish 6/13/94

Maureen Parrish

TMA Inc. REPORT Work Order # A4-04-082

Received: 04/29/94 Results by Sample

SAMPLE ID B0BP28 FRACTION 01A TEST CODE WCCLPL NAME Anions & Wet Chem.

Date & Time Collected 04/26/94 Category

ANIONS AND WET CHEMISTRY - LIQUIDS				
ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300.0	0.2	mg/L	0.1
pH	9040	7.9	pH	0.1
Sulfate	300.0	29	mg/L	1
Elect. Conductivity	120.1	307	umho/cm	6

FORM I

9613501.0686

TMA
Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

RECORD COPY

May 31, 1994

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Quality Control Narrative

Scope
One (1) water sample was submitted to TMA/Skinner & Sherman Laboratories, Inc. on May 3, 1994 from TMA/Norcal. The sample was analyzed for the USEPA CLP metals. The analysis was performed under TMA/Skinner and Sherman work order S405023.

Methodology
The sample was prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program ILM02.

Discussion
All quality control requirements were met for the samples with no exceptions.

Please feel free to call if there are any questions concerning the data package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal
Steven R. Provencal
Lead Chemist

8/9/96 KdB

SAMPLE NUMBER: B0BP28

INORGANIC ANALYSIS DATA SHEET

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-04-112SAS No.: SDG No.: B0BP28

Matrix (soil/water): WATER Lab Sample ID: 05023-01S

Level (low/med): LOW Date Received: 05/03/94

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	20.9	U		P
7440-36-0	Antimony	14.7	U		P
7440-38-2	Arsenic	2.8	B		P
7440-39-3	Barium	14.4	B		P
7440-41-7	Beryllium	0.40	U		P
7440-43-9	Cadmium	1.1	U		P
7440-70-2	Calcium	35000			P
7440-47-3	Chromium	2.8	B		P
7440-48-4	Cobalt	2.1	U		P
7440-50-8	Copper	3.6	U		P
7439-89-6	Iron	120			P
7439-92-1	Lead	2.0	B		P
7439-95-4	Magnesium	12700			P
7439-96-5	Manganese	3.3	B		P
7439-97-6	Mercury	0.20	U		AV
7440-02-0	Nickel	6.5	U		P
7440-09-7	Potassium	4360	B		P
7782-49-2	Selenium	2.1	U		P
7440-22-4	Silver	3.6	U		P
7440-23-5	Sodium	11200			P
7440-28-0	Thallium	2.2	U		P
7440-62-2	Vanadium	23.6	B		P
7440-66-6	Zinc	7.1	U		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

002

9613501.0688

TMA/Skinner & Sherman Laboratories
Sample Login Sheet

Workorder 94-05022 Client Hanford WCH Number/Type of Samples (water)
Protocol CLP Turnaround 33 Days Cooler Temp: 3.0 °C, or N/A Cooler (Yes)/No
Custodian: D. Monreau Shipper & # Fedex SDG/Batch# NA
Custody Seal: Present/Absent/(Intact)/Not Client Case# NA-04-112
Purchase Order/Contract# NA-04-112 Client Contact D Sanders
Tag#: Present/Absent/NA/(See COC) Chain of Custody (Present)/Absent/NA,#

Sample Containers - (Intact)/Broken Comment:
Client Comment? Yes/(No)
Sample labels agree with Chain of Custody Information? (Yes)/No (Comment)
Client paperwork agrees with samples and Chain of Custody? (Yes)/No (Comment)
Shipment Dates: 5/3/94
List any date with paperwork/shipment problems & specify the problem:

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1	BKBP28	water	5/3/94	1.90	CLP metals + Hg (D,S) (unfilt)	
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

Complete
DRM 5/3/94

These samples are from a site known to have Radioactive Contamination: Yes ✓ No
These samples have detectable amounts of Radioactive Material: Yes No ✓

Subcontract: Yes/No, To: Date:

Reviewed Date

* EPA/CLP required

961350L.0689

TMA
Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

RECORD COPY

May 31, 1994

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Quality Control Narrative

Scope
One (1) water sample was submitted to TMA/Skinner & Sherman Laboratories, Inc. on May 3, 1994 from TMA/Norcal. The sample was analyzed for the USEPA CLP metals. The analysis was performed under TMA/Skinner and Sherman work order S405024.

Methodology
The sample was prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program ILM02.

Discussion
All quality control requirements were met for the samples with the following exceptions:

The ICP serial dilution for potassium exceeded the control limit requirement.

Please feel free to call if there are any questions concerning the data package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal
Steven R. Provencal
Lead Chemist

; 8/9/96 KDB

WESTINGHOUSE/HANFORD
1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B0BP29

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-04-112SAS No.: SDG No.: B0BP29

Matrix (soil/water): WATER Lab Sample ID: 05024-01S

Level (low/med): LOW Date Received: 05/03/94

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	20.9	U		P
7440-36-0	Antimony	14.7	U		P
7440-38-2	Arsenic	2.6	B		P
7440-39-3	Barium	15.0	B		P
7440-41-7	Beryllium	0.40	U		P
7440-43-9	Cadmium	1.1	U		P
7440-70-2	Calcium	36000			P
7440-47-3	Chromium	2.5	U		P
7440-48-4	Cobalt	2.1	U		P
7440-50-8	Copper	3.6	U		P
7439-89-6	Iron	9.9	U		P
7439-92-1	Lead	1.6	B		P
7439-95-4	Magnesium	13200			P
7439-96-5	Manganese	0.90	U		P
7439-97-6	Mercury	0.20	U		AV
7440-02-0	Nickel	6.5	U		P
7440-09-7	Potassium	4520	B	E	P
7782-49-2	Selenium	2.1	U		P
7440-22-4	Silver	3.6	U		P
7440-23-5	Sodium	11700			P
7440-28-0	Thallium	2.2	U		P
7440-62-2	Vanadium	23.9	B		P
7440-66-6	Zinc	7.1	U		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

002

9613501.0691

TMA/Skinner & Sherman Laboratories
Sample Login Sheet

Workorder 54-05-024 Client Hanford WA Number/Type of Samples 1 water

Protocol CLP Turnaround 33 Days Cooler Temp: 3 °C or N/A Cooler Yes/No

Custodian: D. Martinez Shipper &# ____ SDG/Batch# --

Custody Seal: Present/Absent/Intact/Not Client Case# WU-04-112

Purchase Order/Contract# WU-04-112 Client Contact D. Sanchez

Tag#: Present/Absent/NA/(See COC) Chain of Custody: Present/Absent/NA,# ____

Sample Containers - Intact/Broken Comment:

Client Comment? Yes/No

Sample labels agree with Chain of Custody Information? Yes/No (Comment)

Client paperwork agrees with samples and Chain of Custody? Yes/No (Comment)

Shipment Dates: 5/13/94

List any date with paperwork/shipment problems & specify the problem:

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1	BABP29	water	5/13/94	1.86	CLP metals + Hg (D,S)	(Filtr.)
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

complete
DRM 5/13/94

These samples are from a site known to have Radioactive Contamination: Yes ✓ No ____

These samples have detectable amounts of Radioactive Material: Yes ____ No ✓

Subcontract: Yes/No, To: ____ Date: ____

Reviewed ____ Date ____

181

* EPA/CLP required

Rev 1.7

TMA
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
P. O. Box 4040
Richmond, CA 94804-0040
(510) 235-2633 Fax No. (510) 235-0438

June 24, 1994

Ref: TMA/Norcal N4-04-144-7371

Ms. Briana Colley
Westinghouse Hanford Company
345 Hills Street
Richland, WA 99352

Dear Ms. Colley:

Enclosed is the data report for one water samples designated as SAF# 94-129, received April 29, 1994. Results are given for gross alpha, gross beta, tritium, carbon-14, strontium-90, and technetium-99.

The data package is paginated 1 through 221.

Please call if you have any questions concerning this data.

Sincerely,

N. Joseph Verville

N. Joseph Verville
Nuclear Program Manager
TMA/Norcal

NJV/ss

Enclosure: Data Package

TMA/NORCAL

Report N4-04-114-7371
Sample Delivery Group 7371

Westinghouse Hanford Company
P.O. MBH-SVV-069262

Case Narrative

June 24, 1994

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7371 is comprised of a single water sample designated as SAF 94-129. There were no unique ID's on the Chain-of-Custody document, however, the project designation on the document was 100-BC-5.

Four 1000 mL poly bottles of sample were received for analyses.

2.0 ANALYSIS NOTES

2.1 Gross Alpha Analyses
No problems were encountered by the laboratory with the analyses.

2.2 Gross Beta Analyses
No problems were encountered by the laboratory with the analyses.

2.3 Tritium Analyses
No problems were encountered by the laboratory with the analyses.

2.4 Carbon-14 Analyses
The recovery for laboratory control sample 7371-002 was 124%, which is outside the 3σ protocol limits of 79-121%. The sample and duplicate analyses were in agreement, and the blank analysis was satisfactory therefor the samples were not reanalyzed.

2.5 Strontium-90 Analyses
No problems were encountered by the laboratory with the analyses.

2.6 Technetium-99 Analyses
The MDA's for sample B0BP28 and laboratory control sample 7371-002 were greater than the RDL due to low chemical yields. The LCS contained activity at a level seven times the MDA, therefore the higher MDA has no impact on data validity. There was not enough of sample BOBP28 to perform a reanalysis, however, the MDA of the duplicate analysis was less than the RDL. Activity greater than the MDA was not detected in either sample B0BP28 or the duplicate.

TMA NORCAL

SAMPLE DELIVERY GROUP 7371

DATA SHEET

N404114-01

BOBP28

SDG 7371 Client Westinghouse Hanford
Contact N. Joseph Verville Contract MBH-SVV-069262

Lab sample id N404114-01 Client sample id BOBP28
Dept sample id 7371-001 Location/Matrix 100-BC-5 LIQUID
Received 04/29/94 Collected 04/26/94
Chain of custody id EFL-1036

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	Alpha	0.77	1.2	2	3	U	80A
Gross Beta	Beta	4.0	1.3	2	4		80B
Tritium	10028-17-8	4.3	160	300	400	U	H
Carbon 14	14762-75-5	-15	33	60	100	U	C
Strontium 90	10098-97-2	0.18	0.31	0.8	2	U	Y
Technetium 99	14133-76-7	1.1	1.9	7	5	U	TC

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 06/24/94

DATA SHEETS
Page 1
SUMMARY DATA SECTION
Page 12

Environ. Restor. Division

Signature Security Service

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT)
WHC		W94-C-C515-22

PART I – TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
Env. Eng. & Tech.	Geosciences	Geochem. & Hydrochem.

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

Routing Emery ☑ Contractor ☐ Vendor

Shipped to	Off-site Custodian
TMA/NORCAL 2030 Wright Ave. Richmond, CA 94804	Full Title

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
1 ~1 lbs.	Sample #: BOBV08, BOBV29 Cooler ID: SNOW44 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 lbs.	Sample #: NA Cooler ID: Polycooler with groundwater samples packed in wet ice and vermiculite	N/A

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

Necessity for the Off-Site Use of this Property:

Sampling supports RI/FS work in the 100 AREA

Bill of lading # 14621376 1K

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

RM Clearance for Public Release	RM Survey No. 15794	Date 4-25-94
Location of Property (Area & Bldg.) 100 BC-5	Contact PH Butcher	Phone (509) 376-5045
Date Ready for Shipment 4-25-94	Cost Code to be Charged WB1232 / PBSNA	Approximate Date This Property will be Returned NA
Originated By PH Butcher	Date 4/25/94	Authorized By	Date
Signature and Name of Property Control	Custodian Date	Property Management Approval	Date 4/25/94

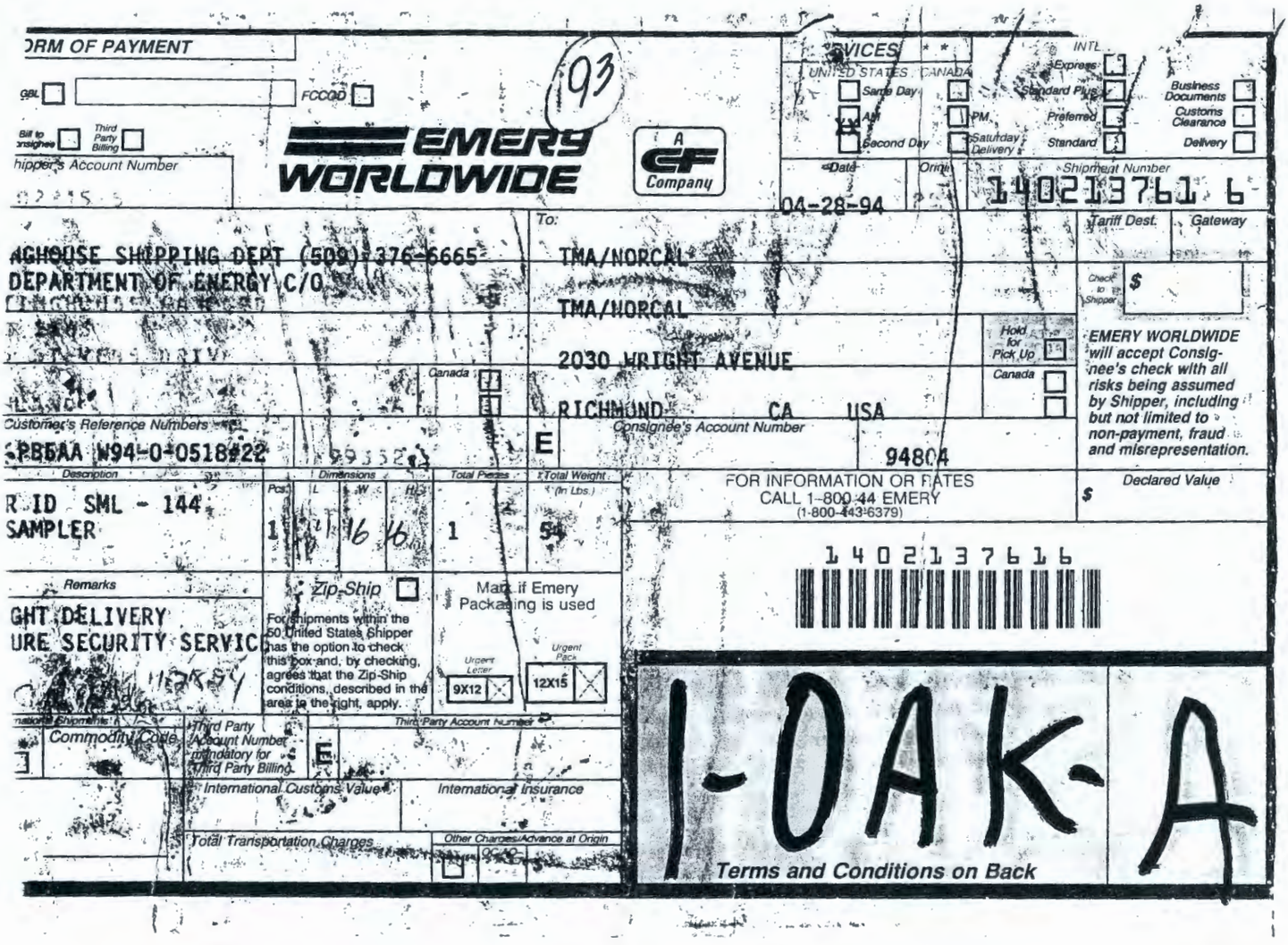
PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient	Return Order No:	Date Issued	Purchase Order No.	Date Issued
CR Wilson	42			
Date 4-28-94				

DISTRIBUTION

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

54-3000-479 (09/89)



ORM OF PAYMENT

GBL ☐ FCCOD ☐

Bill to Consignee ☐ Third Party Billing ☐

Shipper's Account Number

EMERY WORLDWIDE

A CF Company

SERVICES

	UNITED STATES	CANADA	INTL
Same Day	☐	☐	Express ☐
AM	☐	☐	Standard Plus ☐
Second Day	☐	PM ☐	Preferred ☐
	☐	Saturday Delivery ☐	Standard ☐

Business Documents ☐ Customs Clearance ☐ Delivery ☐

Date: 04-28-94 Origin: Shipment Number: 140213761 6

To:

AGHOUSE SHIPPING DEPT (509)-376-6665
DEPARTMENT OF ENERGY C/O

TMA/NORCAL

TMA/NORCAL

2030 WRIGHT AVENUE

RICHMOND CA USA

Consignee's Account Number: 94804

Tariff Dest. | Gateway

Check to Shipper $

Hold for Pick Up ☐

Canada ☐

EMERY WORLDWIDE will accept Consignee's check with all risks being assumed by Shipper, including but not limited to non-payment, fraud and misrepresentation.

Canada ☐

Customer's Reference Numbers

PBBAA W94-0-0518#22

Description	Pcs	Dimensions L	W	H	Total Pieces	Total Weight (In Lbs.)
R ID SML - 144 SAMPLER	1	21	16	16	1	54

FOR INFORMATION OR RATES CALL 1-800-44 EMERY (1-800-443-6379)

Declared Value $

140213761 6

Remarks

GHT DELIVERY
URE SECURITY SERVIC

Zip-Ship ☐

For shipments within the 50 United States Shipper has the option to check this box and, by checking, agrees that the Zip-Ship conditions, described in the area to the right, apply.

Mark if Emery Packaging is used

Urgent Letter 9X12 ☐ Urgent Pack 12X15 ☐

Commodity Code

Third Party Account Number mandatory for Third Party Billing

Third Party Account Number

International Customs Value

International Insurance

Total Transportation Charges

Other Charges/Advance at Origin

1-OAK-A

Terms and Conditions on Back

VALIDATION SUMMARY

DATA VALIDATION REPORT FOR THE 100-BC-5 OPERABLE UNIT SECOND QUARTER 1994 GROUNDWATER SAMPLING DATA

Submitted To:

Westinghouse Hanford Company
P.O. Box 1970
2355 Stevens Drive
Richland, WA 99352

Submitted By:

A.T. Kearney, Inc.
2952 George Washington Way
Richland, WA 99352

In Response To:

Purchase Order VSR-94-002
Task Order No. SAF-94-129

Document Control Number
BHI-00102, Rev. 00

Validation Start Date: July 8, 1994
Validation Completion Date: September 15, 1994

September 1994

DISCLAIMER

This report is designated as Revision 0. The report covers a specific site for a specific sampling time frame. The report addresses only those samples that have been provided for data validation review.

All related quality assurance samples, including all field quality control samples, were reviewed and validated to verify that reported sample results were of sufficient quality to meet quality control objectives.

ACRONYMS

%D	percent difference
AA	Atomic absorption
APHA	American Public Health Association
BFB	bromofluorobenzene
BNA	base/neutral and acid
CCV	continuing calibration verification
CLP	Contract Laboratory Program
CRDL	Contract Required Detection Limit
CRQL	Contract Required Quantitation Limit
d	day
DBC	dibutylchlorendate
DFTPP	decafluorotriphenylphosphine
ECD	electron capture detector
EICP	extracted ion current profile
EPA	U.S. Environmental Protection Agency
GC/MS	gas chromatography/mass spectrometry
GC	gas chromatography
GFAA	graphite furnace atomic absorption
GPC	gel permeation chromatography
HEIS	Hanford Environmental Information System
h	hour
HRMS	high resolution mass spectrometry
ICP	Inductively coupled plasma emission spectrometry
ICS	ICP interference check sample
ICV	Initial calibration verification
IDL	Instrument detection limit
mo	month
MSA	Method of standard addition
MS/MSD	Matrix Spike/Matrix Spike Duplicate
n	normality
NIST	National Institute of Standards and Technology
PCB	polychlorinated biphenyl
PCDD	polychlorinated dibenzo-p-dioxin
PCDF	polychlorinated dibenzofuran
PCDPE	polychlorinated diphenyl ether
PEM	performance evaluation mixture
PFK	perfluorokerosene
PTFE	polytetrafluoroethylene

QA	quality assurance
QAPjP	quality assurance project plan
QC	quality control
RF	response factor
RIC	reconstructed ion chromatogram
RPD	relative percent difference
RRF	relative response factor
RSD	relative standard deviation
RT	retention time
RRT	relative retention time
SDG	sample delivery group
SIM	selected ion monitoring
SOW	statement of work
TAL	target analyte list
TCL	target compound list
TIC	tentatively identified compounds
TOC	Total Organic Carbon
TOX	Total Organic Halogen
tph-d	total petroleum hydrocarbons-diesel
tph-g	total petroleum hydrocarbons-gasoline
TWP	technical work plan
UV	ultraviolet
VOC	volatile organic compound
V/V	volume per volume
WHC	Westinghouse Hanford Company
yr	year

CONTENTS

1.0 INTRODUCTION

The chemical analyses data from the 100-BC-5 Operable Unit Second Quarter 1994 Groundwater Sampling Investigation and their related quality assurance samples were reviewed and validated to verify that reported sample results were of sufficient quality to support decisions regarding remedial actions performed at this site. The samples were analyzed by Thermo-Analytic Laboratories (TMA) and International Technology Laboratories (IT) using Westinghouse-Hanford CLP protocols.

Sample analyses included:

- Inorganics
- General chemical parameters.

The table below lists the Sample Delivery Groups (SDGs) that were validated for this sampling event.

SDG No.	Matrix	No. of Samples Analyzed	Level of Validation	Parameters
B0BP28	W	2	D	Inorganics
B0BP28	W	1	D	Wet Chem
W0031	W	22	D	Inorganics
W0031	W	11	D	Wet Chem
W0040	W	20	D	Inorganics
W0040	W	10	D	Wet Chem
W0043	W	18	D	Inorganics
W0043	W	9	D	Wet Chem

Thirty-one samples were analyzed for radiochemical parameters by TMA and IT Laboratories. Analytical protocols specified in the *Westinghouse Hanford Company Statement of Work for Nonradioactive Inorganic/Organic and*

Radiochemical Analytical Services were used. Sample analyses included the following:

- Gross alpha and gross beta determination
- Strontium-90
- Technetium-99
- Carbon-14
- Tritium.

The table below lists the Sample Delivery Groups (SDGs) that were validated for this sampling event.

SDG No.	Matrix	No. of Samples Analyzed	Level of Validation	Parameters
B0BP28	W	1	D	Radiochemistry
W0031	W	10	D	Radiochemistry
W0040	W	10	D	Radiochemistry
W0043	W	10	D	Radiochemistry

Data quality was reviewed and analytical results validated using Westinghouse-Hanford procedures and guidelines. Data were qualified based upon their quality and the guidance provided by these sources.

Two sets of split samples were submitted to the IT laboratory as shown below:

Set 1:

Sample No.	Split Sample No.	Well Location
B0BNY4	B0BP26	1-B4-4
B0BNY5	B0BP27	1-B4-4

Set 2:

Sample No.	Split Sample No.	Well Location
B0BP06	B0BP28	6-63-90
B0BP07	B0BP29	6-63-90

000007

The sample and split samples for both well locations were included in the validated data. The results were compared using the sample guidelines for determining the RPD between a sample and its duplicate. All results fell within the required control limit. All results for both well locations appear in the summary tables within this report.

Two sets of field duplicate samples were submitted to IT laboratory as shown below.

Set 1:

Sample No.	Duplicate Sample No.	Well Location
B0BNZ4	B0BP22	1-B5-1
B0BNZ5	B0BP23	1-B5-1

Set 2:

Sample No.	Duplicate Sample No.	Well Location
B0BP18	B0BP24	6-72-73
B0BP19	B0BP25	6-72-73

The duplicate sample results for both well locations were included in the validated data. The results were compared using the sample guidelines for determining the RPD between a sample and its duplicate. Field duplicate pair results in four samples fell outside the QC limits. All other results fell within the required control limit. All results for both well locations appear in the summary tables within this report.

Two sets of equipment blanks were submitted to IT laboratory as shown in the table below.

Set 1: Sample Number	Set 2: Sample Number
B0BP30	B0BP42
B0BP31	B0BP43

Equipment blanks are water samples used to indicate whether or not decontamination procedures were adequate or that contamination was not inherent in the equipment used. The equipment blank information provided was inadequate to determine what contamination, if any, was a result of the equipment used.

Equipment blanks require well number locations and associated sample numbers in order to make such a determination. No analytes were detected in equipment blanks.

The report is broken down into sections for each chemical analysis and radiochemical analysis type. Each section addresses the data package completeness, holding time adherence, instrument calibration and tuning acceptability, blank results, accuracy, precision, system performance, as well as the compound identification and quantitation. In addition, each section has an overall assessment and summary for the data packages reviewed for the particular chemical/radiochemical analyses. Detailed backup information is provided to the reader by SDG No. and sample number. For each data package, a matrix of chemical analyses per sample number is presented, as well as data qualification summaries.

Laboratory and data validation personnel added qualifiers to the reported data based on specified data quality objectives. The data reporting qualifiers are summarized as follows:

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

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

J - Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

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

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

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

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

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

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

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

It should be noted that, frequently, results will bear two qualifiers - one given by the laboratory and one given during the validation process. For example, a "U" qualifier is given by the laboratory when the compound has not been detected during the analysis, and a "J" qualifier may be added during the validation to qualify the result due to minor quality problems. Therefore, the resulting qualification is "UJ", where the "U" qualifier has been given by the laboratory and the "J" qualifier given by the validator.

1.1 OBJECTIVES AND SCOPE

The objectives of this data validation project is to provide Westinghouse Hanford with reliable environmental data. Validation is performed in order to determine the usability of analytical results to support programmatic decisions regarding the selection of cleanup remedies and investigative approach.

The validation process includes routinely spot checking data packages for completeness, evaluating data for scientific validity and quality control acceptance, and determining correctness of qualitative identifications and quantitative results. The result of data validation will be accomplished by the completion of narrative reports, checklists, and summary forms. The completed narrative reports, checklists and summary forms will be used to determine whether the analytical data are acceptable for their intended use.

1.2 SAMPLES AND ANALYSES

SAMPLES AND ANALYSES					
Data Package No.	Sample Number	Sample Location	Sample Date	Sample Type[1]	Analyses[2]
B0BP28-TMA-752	B0BP28	6-63-90	04/26/94	GW,SPLIT	1,2,3
B0BP28-TMA-752	B0BP29	6-63-90	04/26/94	GW,SPLIT	1
W0040-ITC-046	B0BP10	6-65-83	04/21/94	GW	1,2,3
W0040-ITC-046	B0BP11	6-65-83	04/21/94	GW	1
W0040-ITC-046	B0BP00	1-B9-1	04/21/94	GW	1,2,3
W0040-ITC-046	B0BP01	1-B9-1	04/21/94	GW	1
W0040-ITC-046	B0BNY4	1-B4-1	04/21/94	GW	1,2,3
W0040-ITC-046	B0BNY5	1-B4-1	04/21/94	GW	1
W0040-ITC-046	B0BP02	1-B9-2	04/21/94	GW	1,2,3
W0040-ITC-046	B0BP03	1-B9-2	04/21/94	GW	1
W0040-ITC-046	B0BP26	1-B4-4	04/21/94	GW,SPLIT	1,2,3
W0040-ITC-046	B0BP27	1-B4-4	04/21/94	GW,SPLIT	1
W0040-ITC-046	B0BP04	1-B9-3	04/22/94	GW	1,2,3
W0040-ITC-046	B0BP05	1-B9-3	04/22/94	GW	1
W0040-ITC-046	B0BNZ6	1-B5-2	04/22/94	GW	1,2,3
W0040-ITC-046	B0BNZ7	1-B5-2	04/22/94	GW	1
W0040-ITC-046	B0BNZ8	1-B8-6	04/22/94	GW	1,2,3
W0040-ITC-046	B0BNZ9	1-B8-6	04/22/94	GW	1
W0040-ITC-046	B0BNZ0	1-B4-8	04/22/94	GW	1,2,3
W0040-ITC-046	B0BNZ1	1-B4-8	04/22/94	GW	1
W0040-ITC-046	B0BNY8	1-B4-7	04/25/94	GW	1,2,3
W0040-ITC-046	B0BNY9	1-B4-7	04/22/94	GW	1
W0031-ITC-041	B0BNX2	1-B2-12	04/12/94	GW	1,2,3
W0031-ITC-041	B0BNX3	1-B2-12	04/12/94	GW	1
W0031-ITC-041	B0BNX6	1-B3-1	04/13/94	GW	1,2,3
W0031-ITC-041	B0BNX7	1-B3-1	04/13/94	GW	1

SAMPLES AND ANALYSES					
Data Package No.	Sample Number	Sample Location	Sample Date	Sample Type[1]	Analyses[2]
W0031-ITC-041	B0BNY0	1-B3-47	04/13/94	GW	1,2,3
W0031-ITC-041	B0BNY1	1-B3-47	04/13/94	GW	1
W0031-ITC-041	B0BNZ2	1-B4-9	04/15/94	GW	1,2,3
W0031-ITC-041	B0BNZ3	1-B4-9	04/15/94	GW	1
W0031-ITC-041	B0BNZ4	1-B5-1	04/15/94	GW	1,2,3
W0031-ITC-041	B0BNZ5	1-B5-1	04/15/94	GW	1
W0031-ITC-041	B0BP14	6-67-86	04/19/94	GW	1,2,3
W0031-ITC-041	B0BP15	6-67-86	04/19/94	GW	1
W0031-ITC-041	B0BP16	6-71-77	04/19/94	GW	1,2,3
W0031-ITC-041	B0BP17	6-71-77	04/19/94	GW	1
W0031-ITC-041	B0BP18	6-72-73	04/19/94	GW	1,2,3
W0031-ITC-041	B0BP19	6-72-73	04/19/94	GW	1
W0031-ITC-041	B0BP22	1-B5-1	04/15/94	GW,DUP	1,2,3
W0031-ITC-041	B0BP23	1-B5-1	04/15/94	GW,DUP	1
W0031-ITC-041	B0BP24	6-72-73	04/19/94	GW,DUP	1,2,3
W0031-ITC-041	B0BP25	6-72-73	04/19/94	GW,DUP	1
W0031-ITC-041	B0BNX4	1-B2-13	04/18/94	GW	1,2,3
W0031-ITC-041	B0BNX5	1-B2-13	04/18/94	GW	1
W0031-ITC-041	B0BNX8	1-B3-46	04/13/94	GW	1,2,3
W0031-ITC-041	B0BNX9	1-B3-46	04/13/94	GW	1
W0031-ITC-041	B0BNY2	1-B4-1	04/21/94	GW	1,2,3
W0031-ITC-041	B0BNY3	1-B4-1	04/21/94	GW	1
W0031-ITC-041	B0BNY6	1-B4-5	04/25/94	GW	1,2,3
W0031-ITC-041	B0BNY7	1-B4-5	04/25/94	GW	1
W0031-ITC-041	B0BP06	6-63-90	04/26/94	GW	1,2,3
W0031-ITC-041	B0BP07	6-63-90	04/26/94	GW	1
W0031-ITC-041	B0BP08	6-65-72	04/27/94	GW	1,2,3
W0031-ITC-041	B0BP09	6-65-72	04/27/94	GW	1

SAMPLES AND ANALYSES					
Data Package No.	Sample Number	Sample Location	Sample Date	Sample Type[1]	Analyses[2]
W0031-ITC-041	B0BP12	6-66-64	04/25/94	GW	1,2,3
W0031-ITC-041	B0BP13	6-66-64	04/25/94	GW	1
W0031-ITC-041	B0BP20	6-72-92	04/26/94	GW	1,2,3
W0031-ITC-041	B0BP21	6-72-92	04/26/94	GW	1
W0031-ITC-041	B0BP30	@ 6-72-92	04/26/94	GW,EB	1,2,3
W0031-ITC-041	B0BP31	@ 6-72-92	04/26/94	GW,EB	1
W0031-ITC-041	B0BP42	@ 6-72-92	04/26/64	GW,EB	1,2,3
W0031-ITC-041	B0BP43	@ 6-72-92	04/26/94	GW,EB	1

[1] GW = Groundwater, DUP = Duplicate, EB = Equipment Blank
[2] 1 = Inorganics, 2 = Wet Chemistry, 3 = Radiochemistry

2.0 METALS DATA VALIDATION SUMMARY

2.1 SUMMARY

Positive and negative blank contamination were present in several samples. Minor matrix spike and analytical spike problems were noted for several samples. Minor laboratory duplicate precision and ICP serial dilution problems were encountered in several samples. The MSA result for one sample was outside the QC limits. All associated sample results were flagged accordingly.

2.2 HOLDING TIMES

Analytical holding times for ICP metals, GFAA metals and CVAA mercury analyses were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: samples must be analyzed within 28 days for mercury, and within six months for all other metals.

All holding time requirements for all analytes in all data packages reviewed were met.

2.3 CALIBRATIONS

Performance of specific instrument quality assurance and quality control procedures, including deficiencies noted during the quality assurance review, are outlined below.

Three calibration standards and a blank were analyzed for arsenic, lead, selenium and thallium by GFAA. The correlation coefficient of a least squares linear regression met the requirements for calibration in all cases.

Up to five calibration standards and a blank were analyzed for mercury by CVAA. The correlation coefficient of a least squares linear regression met the requirements for calibration.

At least one standard and a blank were analyzed by ICP for all other elements.

The above calibrations were each immediately verified with an ICV standard and a calibration blank. The ICV was prepared from a source independent of the calibration standards, at a mid-calibration range concentration. The ICV percent recovery must fall within the control limits of 90 to 110 percent for metals analyzed by ICP and GFAA, and 80 to 120 percent for mercury. Calibration linearity near the detection limit was verified with a standard prepared at a concentration near the CRDL.

The ICVs met the recommended control limits in all cases.

The calibrations were subsequently verified at regular intervals using a CCV standard. The control windows for percent recovery of CCV standards are the same as the ICV windows described above.

The CCVs met the recommended control limits in all cases.

2.3.1 ICP Calibration

An ICS was analyzed at the beginning and end of each ICP sample run to verify the laboratory interelement and background correction factors. Results for the ICS solution must fall within the control limit of ±20 percent of the true value. Arsenic, lead, selenium and thallium were analyzed using a Thermo-Jarrell Ash ICP61E. Under USEPA CLP protocol, this is acceptable provided the ICP is able to meet the required detection limits and the analytical run follows the USEPA CLP protocol for ICP analysis. Under the ICP method, an ICS is required for lead at a concentration of 1.0 mg/L. Refer to Table 2, page E-14, of the USEPA CLP ILM01.0.

A five-fold serial dilution is required for all elements analyzed by ICP. The subsequent concentrations of the reanalysis are compared with the original analysis. If the analyte concentration is sufficiently high (a minimum factor of 50 above the IDL) then the serial dilution must agree within 10% of the original determination after correction for dilution.

The ICS has been analyzed at the proper frequency and all ICSAB solution percent recovery values fell within the control limit.

2.3.2 Atomic Absorption Calibrations

Duplicate injections are required for all GFAA analyses. The duplicate injections establish the precision of the individual analytical determinations. For sample concentrations greater than the CRDL, duplicate injections must agree within ±20 percent RSD or CV. The AA calibration results are discussed further in Section 2.6.4 of this report.

2.4 BLANKS

2.4.1 Calibration Blanks

A calibration blank must be analyzed immediately after every initial and continuing calibration verification. The blank must be analyzed at the beginning of the run and after the last analytical sample. In the case of positive blank results, samples with digestate concentrations (in ug/L) of less than five times (<5x) the highest amount found in any of the associated blanks have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times (>5x) the highest blank value do not require qualification.

In the case of negative blank results, if the absolute value of any calibration blank exceeds the Instrument Detection Limit (IDL), all non-detects are qualified as estimates and flagged "UJ", and all positive results within two times the absolute value of the blank result are qualified as estimates and flagged "J".

Due to the presence of laboratory blank contamination, the following samples were flagged "U" for aluminum:

- Sample numbers B0BNX2, B0BNX3, B0BNZ7, B0BNY0, B0BNY1, B0BNZ4, B0BNZ5, B0BP22 and B0BP23 in SDG No. W0031.
- Sample numbers B0BNY4 and B0BP02 in SDG No. W0040.
- Sample number B0BNX4 in SDG No. W0043.

Due to the presence of negative laboratory blank contamination, the following sample was flagged "UJ" for arsenic:

- Sample number B0BP10 in SDG No. W0040.

Due to the presence of laboratory blank contamination, the following sample was flagged "U" for chromium:

- Sample number B0BP28 in SDG No. B0BP28.

Due to the presence of laboratory blank contamination, the following samples were flagged "U" for iron:

- Sample numbers B0BNZ4, B0BNZ5 and B0BP22 in SDG No. W0031.

Due to the presence of negative laboratory blank contamination, the following sample was flagged "BJ" for iron:

- Sample number B0BP26 in SDG No. W0040.

Due to the presence of laboratory blank contamination, the following samples were flagged "U" for manganese:

- Sample numbers B0BNZ4 and B0BP22 in SDG No. W0031.

Due to the presence of laboratory blank contamination, the following samples were flagged "U" for potassium:

- Sample numbers B0BP16, B0BP17 and B0BP25 in SDG No. W0031.
- Sample numbers B0BNZ0, B0BNZ1, B0BNZ6, B0BNZ7, B0BNZ8, B0BNZ9, B0BP04 and B0BP05 in SDG No. W0040.
- Sample numbers B0BNY2 and B0BNY3 in SDG No. W0043.

Due to the presence of negative laboratory blank contamination, the following sample was flagged "UJ" for selenium:

- Sample number B0BP29 in SDG No. B0BP28.

Due to the presence of negative laboratory blank contamination, the following sample was flagged "UJ" for silver:

- Sample number B0BNZ3 in SDG No. W0031.

Due to the presence of laboratory blank contamination, the following sample was flagged "U" for zinc:

- Sample number B0BNZ3 in SDG No. W0031.

All other laboratory blank results were acceptable.

2.4.2 Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations (in ug/L) of less than five times (<5x) the preparation blank value have had their associated values qualified

as non-detected and flagged "U". Samples with concentrations of greater than five times (>5x) the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the Contract Required Detection Limit (CRDL), all non-detects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the IDL and less than or equal to the CRDL all non-detects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J".

Due to the presence of preparation blank contamination, the following samples were flagged "U" for aluminum:

- Sample numbers B0BNX2, B0BNX3, B0BNZ7, B0BNY0, B0BNY1, B0BNZ2, B0BNZ3, B0BNZ4, B0BNZ5, B0BP22 and B0BP23 in SDG No. W0031.

- Sample numbers B0BNY4 and B0BP02 in SDG No. W0040.

- Sample number B0BP08 in SDG No. W0043.

Due to the presence of negative preparation blank contamination, the following samples were flagged "J" for arsenic:

- Sample numbers B0BP18, B0BP19 and B0BP24 in SDG No. W0031.

Due to the presence of negative preparation blank contamination, the following samples were flagged "UJ" for arsenic:

- Sample numbers B0BP17, B0BNZ3 and B0BP25 in SDG No. W0031.

- Sample number B0BNY2 in SDG No. W0043.

Due to the presence of negative preparation blank contamination, the following samples were flagged "BJ" for arsenic:

- Sample numbers B0BP14, B0BP15, B0BP16 and B0BP18 in SDG No. W0031.

- Sample number B0BNY3 in SDG No. W0043.

Due to the presence of preparation blank contamination, the following samples were flagged "U" for calcium:

- Sample numbers B0BP30, B0BP31, B0BP42 and B0BP43 in SDG No. W0043.

Due to the presence of preparation blank contamination, the following samples were flagged "U" for iron:

- Sample numbers B0BNY4, B0BNZ0, B0BNZ6, B0BNZ8, B0BNZ9, B0BP00, B0BP01, B0BP02, B0BP03, B0BP04 and B0BP11 in SDG No. W0040.

- Sample numbers B0BNY7, B0BP07, B0BP12, B0BP13, B0BP20, B0BP21, B0BP30, B0BP31 and B0BP42 in SDG No. W0043.

Due to the presence of preparation blank contamination, the following samples were flagged "U" for lead:

- Sample numbers B0BNZ4 and B0BP23 in SDG No. W0031.

- Sample number B0BNX5 in SDG No. W0043.

Due to the presence of preparation blank contamination, the following samples were flagged "U" for sodium:

- Sample numbers B0BP30, B0BP31, B0BP42 and B0BP43 in SDG No. W0043.

Due to the presence of preparation blank contamination, the following samples were flagged "U" for zinc:

- Sample numbers B0BNZ0, B0BNZ7, B0BNZ9, B0BP04 and B0BP05 in SDG No. W0040.

All other preparation blank results were acceptable.

2.5 ACCURACY

2.5.1 Matrix Spike Samples

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must generally fall within the range

of 75 to 125 percent. Samples with a spike recovery of less than 30% and a sample value below the IDL were rejected and flagged "UR". All other samples with a spike recovery outside the QC limits are qualified as estimates and flagged "J".

The matrix spike recovery fell outside the QC limits and the associated results were flagged "J" for lead in the following samples:

- Samples numbers B0BNX8 and B0BP14 in SDG No. W0031.
- Sample numbers B0BNY2 and B0BP30 in SDG No. W0043.

The matrix spike recovery fell outside the QC limits and the associated results were flagged "UJ" for lead in the following samples:

- Samples numbers B0BNX2, B0BNX3, B0BNX6, B0BNX7, B0BNY0, B0BNY1, B0BNZ2, B0BNZ4, B0BP16, B0BP18, B0BP22 and B0BP24 in SDG No. W0031.
- Sample numbers B0BNX4, B0BNY6, B0BP06, B0BP08, B0BP12 and B0BP42 in SDG No. W0043.

The matrix spike recovery fell outside the QC limits and the associated result was flagged "BJ" for lead in the following sample:

- Sample number B0BP20 in SDG No. W0043.

All other matrix spike recovery results were acceptable.

2.5.2 Laboratory Control Samples

The LCS monitors the overall performance of the analysis, including the sample preparation. An LCS should be digested or distilled and analyzed with every group of samples which have been prepared together. The performance criteria for solid LCS samples are established through interlaboratory studies coordinated by a certifying agency (e.g., EPA or an independent commercial supplier).

One liquid LCS was digested and analyzed for each of the cases in this report that contained water samples. The results were compared against the control limit of 80-120% as required by the EPA CLP SOW 3/90 protocol and found to be acceptable.

All LCS results were acceptable.

000020

2.5.3 GFAA Analytical Spikes

The post-digestion analytical spike is analyzed to determine the extent of interference in the digestate matrix. When the results of the analytical spike analyses exceeds the control window of 85 to 115 percent recovery and the absorbance of the sample is greater than fifty percent of the analytical spike absorbance, then the sample must be reanalyzed using the MSA. The analytical spike recoveries establish the accuracy of the individual GFAA determinations.

For all samples whose analytical spike results are outside the 85 to 115 percent control limit, but whose absorbances are less than 50 percent of the analytical spike absorbance, the samples were flagged as estimates "J". In cases where the analytical spike recovery was <10 percent, the positive results were flagged "J" and the non-detects were rejected and flagged "UR".

The analytical spike recovery fell outside the established QC limits and the associated results flagged "UJ" for arsenic in the following sample:

- Sample number B0BP17 in SDG No. W0031.

The analytical spike recovery fell outside the established QC limits and the associated results flagged "BJ" for arsenic in the following samples:

- Sample numbers B0BNY9, B0BP02 and B0BP03 in SDG No. W0040.
- Sample numbers B0BNY6, B0BNY7 and B0BP12 in SDG No. W0043.

The analytical spike recovery fell outside the established QC limits and the associated results flagged "UJ" for lead in the following samples:

- Sample numbers B0BNX6, B0BNX7, B0BNY0, B0BNZ2, B0BNZ3, B0BNZ4, B0BNZ5 and B0BP23 in SDG No. W0031.
- Sample numbers B0BNY4, B0BNY8, B0BNY9, B0BP00, B0BP02 and B0BP10 in SDG No. W0040.
- Sample numbers B0BNX4, B0BNX5, B0BNY6, B0BNY7, B0BP06, B0BP07, B0BP09, B0BP12, B0BP13, B0BP21 and B0BP31 in SDG No. W0043.

The analytical spike recovery fell outside the established QC limits and the associated results flagged "BJ" for lead in the following sample:

- Sample number B0BP20 in SDG No. W0043.

000021

The analytical spike recovery fell outside the established QC limits and the associated results flagged "J" for selenium in the following sample:

- Sample number B0BP06 in SDG No. W0043.

The analytical spike recovery fell outside the established QC limits and the associated results flagged "UJ" for selenium in the following samples:

- Sample numbers B0BNZ8, B0BP01, B0BP05, B0BP10 and B0BP11 in SDG No. W0040.

- Sample numbers B0BP30 and B0BP42 in SDG No. W0043.

The analytical spike recovery fell outside the established QC limits and the associated results flagged "BJ" for selenium in the following samples:

- Sample numbers B0BNY8, B0BNY9, B0BNZ0, B0BNZ1 and B0BNZ7 in SDG No. W0040.

- Sample numbers B0BNY6 and B0BP06 in SDG No. W0043.

The analytical spike recovery fell outside the established QC limits and the associated results flagged "UJ" for thallium in the following sample:

- Sample number B0BNX5 in SDG No. W0043.

All other analytical spike recovery results were acceptable.

2.5.4 Method of Standard Addition (MSA) Results

For all samples whose analytical spike results are outside the 85 to 115 percent control limit and whose absorbances are greater than 50 percent of the analytical spike absorbance an MSA is required. In cases where the MSA correlation coefficient was less than 0.995 the MSA analysis was repeated once. If the correlation coefficient was still less than 0.995, samples were flagged as estimates "J".

The MSA correlation coefficient was less than 0.995 for selenium in sample number B0BNZ6 in SDG No. W0040. All associated sample results were qualified as estimates and flagged "J".

All other MSA results were acceptable.

2.6 ANALYTICAL PRECISION

2.6.1 Laboratory Duplicate Samples

The laboratory duplicate results measures the precision of the method by measuring a second aliquot of the sample that is treated the same way as the original. Samples whose precision fell outside the quality control requirements were flagged as estimates "J".

The laboratory duplicate results fell outside the QC limits and the associated results were flagged "J" for calcium in the following samples:

- Sample numbers B0BNX9, B0BNZ3, B0BNZ5, B0BP15, B0BP17, B0BP19, B0BP23 and B0BP25 in SDG No. W0031.

All other laboratory duplicate recovery results were acceptable.

2.6.2 ICP Serial Dilution

The ICP serial dilution is used to determine whether significant physical or chemical interferences exist due to sample matrix. If sample concentration is $\geq$50 times the IDL for an analyte and the %D is outside the control limits the associated data must be qualified as estimates "J".

The ICP serial dilution result fell outside the QC limits and the associated result was flagged "BJ" for potassium in sample number B0BP29 in SDG No. B0BP28.

All other ICP serial dilution results were acceptable.

2.6.3 Field Duplicates

Field duplicate results were compared using the same guidelines for determining the RPD between a sample and its duplicate. Data qualification is not required for field duplicates, however, the results of field duplicate samples are discussed in the introduction.

2.6.4 GFAA Duplicate Injections

Each furnace analysis requires a minimum of two injections (burns), except for full Method of Standard Addition (MSA). For concentrations greater than CRDL, the duplicate injection readings must agree within 20% relative standard deviation (RSD) or coefficient of variation (CV). If these requirements are not met, the analytical sample must be rerun once (i.e., two additional burns). If the

readings are then still outside the QC limits, the result is qualified as an estimate and flagged "J".

All duplicate injection quality control requirements were met.

2.7 SAMPLE RESULT QUANTITATION, VERIFICATION AND REPORTED DETECTION LIMITS

Twenty percent of sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors.

The reviewer verified that the results and detection limits fell within the linear range of the instrument. All sample results and reported detection limits were acceptable.

2.8 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

A review of instrument continuing calibration information and QC data indicates that instrument performance was adequate. Positive and negative blank contamination was noted in several samples. Associated sample results were flagged accordingly. Contamination, however, was not significantly high enough to affect the usability of the data. Minor matrix spike accuracy problems, analytical spike problems, lab duplicate precision and ICP serial dilution problems were noted for several samples. The MSA result for one sample was outside the QC limits. All results were flagged accordingly. Data flagged "J" are usable for limited purposes only. Except as noted in the preceding sections, all other validated data are usable for all purposes.

3.0 GENERAL CHEMISTRY DATA VALIDATION SUMMARY

3.1 SUMMARY

Holding times were exceeded for pH in all samples in all data packages. All associated results were qualified as estimates and flagged "J".

3.2 HOLDING TIMES

Analytical holding times for fluoride, pH, sulfate, and specific conductance were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: 28 days for fluoride, specific conductance and sulfate; and 24 hours for pH.

The 24-hour holding time for pH was exceeded. The associated results were qualified as estimates and flagged "J" in the following samples:

- Sample number B0BP28 in SDG No. B0BP28.
- Sample numbers B0BNX2, B0BNX6, B0BNY0, B0BNY2, B0BNZ2, B0BNZ4, B0BP14, B0BP16, B0BP18, B0BP22 and B0BP24 in SDG No. W0031.
- Sample numbers B0BNY4, B0BNY8, B0BNZ0, B0BNZ6, B0BNZ8, B0BP00, B0BP02, B0BP04, B0BP10 and B0BP26 in SDG No. W0040.
- Sample numbers B0BNX4, B0BNX8, B0BNY6, B0BP06, B0BP08, B0BP12, B0BP20, B0BP30 and B0BP42 in SDG No. W0043.

Holding times for all other analytes reviewed met QC requirements.

3.3 CALIBRATIONS

3.3.1 Initial Calibration

The following calibration procedures must be conducted:

- At least a blank and three standards were used to establish the ion chromatography, ion selective electrode, and spectrophotometer calibrations prior to sample analysis and the correlation was $\geq$0.995.

All initial calibration results were acceptable.

3.3.2 Continuing Calibration Verification

All CCV standards must be analyzed within the required frequency or every 20 samples. The percent recoveries must fall within the 90-110% acceptance windows.

All continuing calibration results were acceptable.

3.4 BLANKS

3.4.1 Laboratory Blanks

One laboratory preparation blank is analyzed at a frequency of one every 20 samples. All blank results must fall below the CRQL and if not, all associated data <5 times the amount found in the blank are qualified as non-detected "U".

All laboratory blank results were acceptable.

3.5 ANALYTICAL ACCURACY

3.5.1 Spike Samples

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations.

All matrix spike results were acceptable.

3.5.2 Laboratory Control Sample Recovery

The LCS monitors the overall performance of the analysis, including the sample preparation. An LCS should be prepared (e.g., digested or distilled) and analyzed with every group of samples which have been prepared together. The performance criteria for aqueous LCS percent recovery is 80 to 120 percent. The performance criteria for solid LCS samples are established through interlaboratory studies coordinated by a certifying agency (e.g., EPA or an independent commercial supplier).

ICV results obtained from the raw data were used to calculate LCS results. All LCS results were found to be acceptable.

3.6 ANALYTICAL PRECISION

3.6.1 Laboratory Duplicates

The laboratory duplicate results measures the precision of the method by measuring a second aliquot of the sample that is treated the same way as the original. Samples whose precision fell outside the quality control requirements were flagged as estimates "J".

All laboratory duplicate results were acceptable.

3.6.2 Field Duplicates

Field duplicate results were compared using the same guidelines for determining the precision between a sample and its duplicate. Data qualification is not required for field duplicates, however, the results of field duplicate samples are discussed in the introduction.

3.7 SAMPLE RESULT QUANTITATION, VERIFICATION AND REPORTED DETECTION LIMITS

Twenty percent of sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors.

The reviewer verified that the results and detection limits fell within the linear range of the instrument. All sample results and reported detection limits were acceptable.

3.8 OVERALL ASSESSMENT AND SUMMARY

A review of instrument continuing calibration information and QC data indicate that instrument performance was adequate for most analyses. Holding times were exceeded for pH in all samples. All associated results were flagged accordingly. Estimated results are usable for limited purposes. All other validated results are considered accurate within the standard error associated with the methods.

4.0 RADIOCHEMISTRY DATA VALIDATION SUMMARY

4.1 SUMMARY

All tritium results in SDG Nos. W0031 and W0043 were rejected and flagged "UR/R" due to samples not being analyzed within seven days of distillation. Due to a low chemical recovery, the technetium-99 result for one sample was qualified as an estimate and flagged "J".

4.2 HOLDING TIMES AND SAMPLE PREPARATION

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analyses is six months. Tritium sample preparation requires distillation. Tritium samples must be analyzed within seven days of distillation.

All holding times were acceptable.

Due to samples not being analyzed within seven days of distillation, all associated tritium results in SDG Nos. W0031 and W0043 were rejected and flagged "UR/R".

All other sample preparation measures were acceptable.

4.3 CALIBRATIONS

Instrument calibration is performed to establish that the counters used to determine radionuclide activities are capable of producing acceptable and reliable analytical data. Each counting system must be factory calibrated at installation and after any maintenance or repair. Calibration consists of an instrument efficiency determination for each applicable radionuclide. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible.

All calibration results, including efficiency checks and background counts, were acceptable.

4.4 LABORATORY BLANK

Laboratory blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above both the MDA and the statistical uncertainty associated with that MDA, the following qualifiers were applied: All positive sample results less than five times the highest blank concentration were qualified as estimated; sample results below the MDA were elevated to the MDA and qualified as undetected; sample results above the MDA and greater than five times the highest blank concentration were not qualified.

All laboratory blank results were acceptable.

4.5 ANALYTICAL ACCURACY

4.5.1 Chemical Recoveries

A chemical tracer is used to determine the efficiency of the analytical method, with tracer yield limits of 30 to 105 percent. Sample results above the MDA with chemical yields outside the above stated limits were qualified as estimated or rejected.

Due to a low chemical yield (25%), the technetium-99 result for sample number B0BP28 in SDG No. B0BP28 was qualified as estimated and flagged "J".

All other radiochemical yields were acceptable.

4.5.2 Laboratory Control Samples

Accuracy was evaluated by analyzing soil or distilled water samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample recovery range is 70 to 130 percent, while that for a matrix spike is 60 to 140 percent. Spike sample results outside the above ranges resulted in associated sample results being qualified as estimated, rejected, or not qualified, depending on the activity of the individual sample.

All laboratory control sample results were acceptable.

4.6 ANALYTICAL PRECISION

4.6.1 Laboratory Duplicates

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the RDL and the RPD is less than 35 percent for soil samples and 20 percent for water samples, the results are acceptable. If either activities are <5xRDL, a control limit of ≤ 2xRDL is used for soil samples and $\leq$RDL for water samples. If either the original or replicate value is below the RDL, the applicable control limits are $\leq$RDL for water samples and ≤ 2xRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

4.6.2 Field Duplicates

Field duplicate results were compared using the same guidelines for determining the RPD between a sample and its duplicate. Data qualification is not required for field duplicate RPDs, however, the results of field duplicate samples are discussed in the introduction.

4.7 SAMPLE RESULTS QUANTITATION, VERIFICATION AND REPORTED DETECTION LIMITS

Twenty percent of sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors.

The RDL for technetium-99 in sample B0BP28 in SDG No. B0BP28 was above the calculate MDA value.

All other sample results and reported detection limits were acceptable.

4.8 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

A review of instrument continuing calibration information and QC data indicates that instrument performance was adequate for these analyses. Due to a low chemical recovery, the technetium-99 result in sample number B0BP28 in SDG No. B0BP28 was qualified as an estimate and flagged "J". Due to samples not

being analyzed within seven days of distillation, all tritium results in SDG Nos. W0031 and W0043 were rejected and flagged "U/UR". Rejected data are unusable for all purposes and should not be reported. Data qualified as estimates are valid and usable for limited purposes only. All other QC data are valid and usable for all purposes.

5.0 REFERENCES

EPA, 1987, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, Environmental Protection Agency, Washington, D.C.

EPA, 1988a, *EPA Contract Laboratory Program Statement of Work for Organics Analyses, Multi-Media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1988b, *Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses*, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1988c, *EPA Contract Laboratory Program Statement of Work for Inorganics Analyses, Multi-Media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1988d, *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses*, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1990, *EPA Contract Laboratory Program Statement of Work for Inorganic Analyses, Multi-media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1991, *EPA Contract Laboratory Program Statement of Work for Organics Analyses, Multi-Media, Multi-Concentration*, Environmental Protection Agency, Washington, D.C.

WHC, 1992a, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

WHC, 1992b, *Data Validation Procedure for Radiological Analyses*, WHC-SD-EN-SPP-001, Rev. 2, Westinghouse Hanford Company, 1993.

ATK, Letter from J.W. Goode to K.N. Pool, re: Revision to Radiochemical Data Validation Procedures, March 17, 1994.

000033

APPENDICES

APPENDIX A

METALS DATA SUMMARY TABLES

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B0BP28																				
Sample Number		B0BP29																			
Location		6-63-90																			
Remarks		SPLIT,FIL																			
Sample Date		04/26/94																			
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	20.9	U																		
Antimony	60	14.7	U																		
Arsenic	10	2.6	B																		
Barium	200	15.0	B																		
Beryllium	5	0.40	U																		
Cadmium	5	1.1	U																		
Calcium	5000	36000																			
Chromium	10	2.5	U																		
Cobalt	50	2.1	U																		
Copper	25	3.6	U																		
Iron	100	9.9	U																		
Lead	3	1.6	B																		
Magnesium	5000	13200																			
Manganese	15	0.90	U																		
Mercury	0.2	0.20	U																		
Nickel	40	6.5	U																		
Potassium	5000	4520	BJ																		
Selenium	5	2.1	UJ																		
Silver	10	3.6	U																		
Sodium	5000	11700																			
Thallium	10	2.2	U																		
Vanadium	50	23.9	B																		
Zinc	20	7.1	U																		
Cyanide	10	N/A																			

N/A = Not Applicable, FIL = Filtered

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE–HANFORD																					
Laboratory: TMA																					
Case	SDG: B0BP28																				
Sample Number		B0BP28																			
Location		6–63–90																			
Remarks		SPLIT																			
Sample Date		04/26/94																			
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	20.9	U																		
Antimony	60	14.7	U																		
Arsenic	10	2.8	B																		
Barium	200	14.4	B																		
Beryllium	5	0.40	U																		
Cadmium	5	1.1	U																		
Calcium	5000	35000																			
Chromium	10	2.8	U																		
Cobalt	50	2.1	U																		
Copper	25	3.6	U																		
Iron	100	120																			
Lead	3	2.0	B																		
Magnesium	5000	12700																			
Manganese	15	3.3	B																		
Mercury	0.2	0.20	U																		
Nickel	40	6.5	U																		
Potassium	5000	4360	B																		
Selenium	5	2.1	U																		
Silver	10	3.6	U																		
Sodium	5000	11200																			
Thallium	10	2.2	U																		
Vanadium	50	23.6	B																		
Zinc	20	7.1	U																		
Cyanide	10	NA																			

NA = Not Analyzed

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: IT																					
Case	SDG: W0031																				
Sample Number		B0BNX2		B0BNX3		B0BNX6		B0BNX7		B0BNX8		B0BNX9		B0BNY0		B0BNY1		B0BNZ2		B0BNZ3	
Location		1-B2-12		1-B2-12		1-B3-1		1-B3-1		1-B3-46		1-B3-46		1-B3-47		1-B3-47		1-B4-9		1-B4-9	
Remarks				FIL				FIL				FIL				FIL				FIL	
Sample Date		04/12/94		04/12/94		04/13/94		04/13/94		04/13/94		04/13/94		04/13/94		04/13/94		04/15/94		04/15/94	
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	67.3	U	52.5	U	518		139	U	40.0	U	40.0	U	86.7	U	214	U	140	U	80.8	U
Antimony	60	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Arsenic	10	2.4	B	2.1	B	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	B	2.5	B
Barium	200	53.1	B	62.7	B	32.3	B	38.6	B	38.6	B	29.3	B	31.8	B	27.0	B	79.0	B	31.6	B
Beryllium	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	2.0	B	1.0	U
Cadmium	5	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Calcium	5000	24900		27300		54000		64100		53600		39200	J	55800		47200		49100		52300	J
Chromium	10	10.9		10.0	U	358		64.8		11.1		10.0	U	46.6		40.6		27.4		15.1	
Cobalt	50	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	16.6	B	10.0	U
Copper	25	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U
Iron	100	42.8	B	17.3	B	1130		174		59.3	B	11.0	B	61.2	B	38.2	B	79.4	B	20.7	B
Lead	3	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ	4.0	J	2.0	U	5.1	UJ	2.0	UJ	2.0	UJ	2.0	UJ
Magnesium	5000	8460		9730		8710		10500		7290		5260		8320		7050		7640		8080	
Manganese	15	14.2		19.4		26.1		4.3	B	2.0	U	2.0	U	2.2	B	2.0	B	13.4	B	2.0	U
Mercury	0.2	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
Nickel	40	20.0	U	20.0	U	122		20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	22.0	B	20.0	U
Potassium	5000	4780	B	5360		1920	B	2330	B	2590	B	1860	B	1250	B	1650	B	4570	B	4870	B
Selenium	5	2.0	U	2.0	U	2.9	B	2.0	U	2.0	U	2.2	B	2.0	U	2.0	U	2.2	B	2.6	B
Silver	10	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Sodium	5000	12100		13400		11000		13200		15200		11300		10800		9060		10800		11900	UJ
Thallium	10	2.0	U	2.0	B	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Vanadium	50	30.3	B	36.3	B	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	18.5	B	10.0	U
Zinc	20	11.8	B	9.1	B	12.9	B	10.1	B	6.9	B	5.0	U	10.5	B	13.3	B	23.8		10.6	U
Cyanide	10	NA		N/A		NA		N/A		NA		N/A		NA		N/A		NA		N/A	

FIL = Filtered, NA = Not Analyzed, N/A = Not Applicable, DUP = Duplicate

Project: WESTINGHOUSE-HANFORD																					
Laboratory: IT																					
Case	SDG: WOO31																				
Sample Number		B0BNZ4		B0BNZ5		B0BP14		B0BP15		B0BP16		B0BP17		B0BP18		B0BP19		B0BP22		B0BP23	
Location		1-B5-1		1-B5-1		6-67-86		6-67-86		6-71-77		6-71-77		6-72-73		6-72-73		1-B5-1		1-B5-1	
Remarks				FIL				FIL				FIL				FIL		DUP		DUP, FIL	
Sample Date		04/15/94		04/15/94		04/19/94		04/19/94		04/19/94		04/19/94		04/19/94		04/19/94		04/15/94		04/15/94	
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	84.3	U	82.9	U	40.0	U	40.0	U	40.0	U	40.0	U	40.0	U	40.0	U	73.8	U	80.0	U
Antimony	60	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Arsenic	10	2.1	B	2.0	U	2.0	BJ	2.1	BJ	2.1	BJ	2.0	UJ	4.0	BJ	2.4	BJ	2.0	U	2.5	B
Barium	200	29.7	B	21.5	B	11.0	B	15.0	B	59.0	B	55.6	B	21.2	B	17.7	B	23.8	B	19.4	B
Beryllium	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	B
Cadmium	5	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Calcium	5000	36700		34100	J	27100		34600	J	31300		29500	J	34600		29900	J	36600		29400	J
Chromium	10	18.4		13.6		13.8		17.1		10.0	U	10.0	U	10.0	U	10.0	U	14.1		11.8	
Cobalt	50	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U
Copper	25	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U
Iron	100	46.6	U	23.9	U	76.4	B	10.1	B	21.6	B	10.0	U	71.1	B	56.7	B	33.1	U	27.3	B
Lead	3	5.6	UJ	2.0	UJ	3.0	J	3.6		2.0	UJ	2.3	B	2.0	UJ	2.0	U	2.0	UJ	2.3	UJ
Magnesium	5000	6770		6260		7530		9630		9710		9280		9170		7950		6740		5440	
Manganese	15	2.4	U	2.0	U	2.5	B	2.2	B	2.0	U	2.0	U	2.8	B	2.3	B	2.0	U	2.1	B
Mercury	0.2	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
Nickel	40	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U
Potassium	5000	4180	B	4500	B	5390		6150		6020		5140	U	5760		5320		4390	B	3670	B
Selenium	5	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Silver	10	5.0	U	5.0	U	5.0	U	5.0	U	5.1	B	5.0	U	5.3	B	5.0	U	5.0	U	5.0	U
Sodium	5000	9660		8990		11900		15400		14900		14000		13700		11900		9460		8110	
Thallium	10	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	B
Vanadium	50	10.0	U	10.0	U	17.2	B	19.7	B	25.2	B	21.6	B	16.1	B	13.0	B	10.0	U	10.0	U
Zinc	20	15.6	B	75.3		22.8		35.1		52.1		5.0	U	6.9	B	20.9		14.7	B	13.6	B
Cyanide	10	NA		N/A		NA		N/A		NA		N/A		NA		N/A		NA		N/A	

FIL = Filtered, NA = Not Analyzed, N/A = Not Applicable, DUP = Duplicate

RADIOCHEMISTRY ANALYSIS, WATER MATRIX, (pCi/L+-2 standard deviations)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: W0040																				
Sample Number	B0BNY4		B0BNY8		B0BNZ0		B0BNZ6		B0BNZ8		B0BP00		B0BP02		B0BP04		B0BP10		B0BP26		
Location	1-B4-4		1-B4-7		1-B4-8		1-B5-2		1-B8-6		1-B9-1		1-B9-2		1-B9-3		6-65-83		1-B4-4		
Remarks																					
Sample Date	04/21/94		04/25/94		04/22/94		04/22/94		04/22/94		04/21/94		04/21/94		04/22/94		04/21/94		04/21/94		
Radiochemistry Analysis	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
Gross Alpha	0.716	U	1.49		0.810	U	0.894	U	0.657	U	0.727	U	0.295	U	1.68		0.650	U	1.11		
Gross Beta	78.8		32.5		25.2		55.2		13.0		15.7		16.4		20.1		11.2		78.1		
Tritium	2910		2470		3300		6440		1520		1760		2580		2400		927.0		2950		
Carbon-14	0.0450	U	1.96	U	1.28	U	0.0450	U	0.878	U	1.01	U	0.721	U	-0.0225	U	-1.26	U	0.766	U	
Strontium-90	26.6		5.31		1.30		14.6		-0.0374	U	0.862	U	-0.0431	U	0.343	U	-0.0986	U	28.2		
Technetium-99	60.3		57.7		69.4		66.9		32.1		35.4		45.9		52.9		7.79		60.4		

RADIOCHEMISTRY ANALYSIS, WATER MATRIX, (pCi/L+−2 standard deviations)

Project: WESTINGHOUSE−HANFORD																				
Laboratory: TMA																				
Case	SDG: W0040																			
Sample Number	B0BNY4		B0BNY8		B0BNZ0		B0BNZ6		B0BNZ8		B0BP00		B0BP02		B0BP04		B0BP10		B0BP26	
Location	1−B4−4		1−B4−7		1−B4−8		1−B5−2		1−B8−6		1−B9−1		1−B9−2		1−B9−3		6−65−83		1−B4−4	
Remarks																				
Sample Date	04/21/94		04/25/94		04/22/94		04/22/94		04/22/94		04/21/94		04/21/94		04/22/94		04/21/94		04/21/94	
Radiochemistry Analysis	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha	0.716	U	1.49		0.810	U	0.894	U	0.657	U	0.727	U	0.295	U	1.68		0.650	U	1.11	
Gross Beta	78.8		32.5		25.2		55.2		13.0		15.7		16.4		20.1		11.2		78.1	
Tritium	2910		2470		3300		6440		1520		1760		2580		2400		927.0		2950	
Carbon−14	0.0450	U	1.96	U	1.28	U	0.0450	U	0.878	U	1.01	U	0.721	U	−0.0225	U	−1.26	U	0.766	U
Strontium−90	26.6		5.31		1.30		14.6		−0.0374	U	0.862	U	−0.0431	U	0.343	U	−0.0986	U	28.2	
Technetium−99	60.3		57.7		69.4		66.9		32.1		35.4		45.9		52.9		7.79		60.4	

Project: WESTINGHOUSE-HANFORD																					
Laboratory: IT																					
Case	SDG: W0040																				
Sample Number		B0BNZ0		B0BNZ1		B0BNZ6		B0BNZ7		B0BNZ8		B0BNZ9		B0BP04		B0BP05					
Location		1-B4-8		1-B4-8		1-B5-2		1-B5-2		1-B8-6		1-B8-6		1-B9-3		1-B9-3					
Remarks				FIL				FIL				FIL				FIL					
Sample Date		04/22/94		04/22/94		04/22/94		04/22/94		04/22/94		04/22/94		04/22/94		04/22/94					
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	45.0	B	40.0	U	40.0	U	40.0	U	40.0	U	40.0	U	40.0	U	40.0	U				
Antimony	60	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U				
Arsenic	10	2.8	B	2.6	B	5.1	B	2.7	B	2.9	B	2.6	B	3.3	B	3.1	B				
Barium	200	22.7	B	24.3	B	32.1	B	28.2	B	13.1	B	13.7	B	12.0	B	12.6	B				
Beryllium	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
Cadmium	5	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U				
Calcium	5000	47500		50300		52700		47600		30500		33300		37700		42900					
Chromium	10	13.8		10.0	U	14.9		10.9		18.8		16.0		16.0		15.3					
Cobalt	50	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U				
Copper	25	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.2	B	10.0	U	10.0	U				
Iron	100	35.4	U	10.0	U	22.8	U	10.0	U	25.4	U	14.1	U	27.5	U	63.2	B				
Lead	3	2.0	U	2.0	U	2.0	U	4.0		2.0	U	2.0	U	2.0	U	2.0	U				
Magnesium	5000	7680		8180		6730		6120		7850		8590		8790		10100					
Manganese	15	2.4	B	2.0	U	2.2	B	2.0	U	2.0	U	2.0	U	2.0	U	2.4	B				
Mercury	0.2	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U				
Nickel	40	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U				
Potassium	5000	5950	U	5530	U	5710	U	4850	U	5840	U	5930	U	5600	U	6210	U				
Selenium	5	3.0	BJ	2.6	BJ	3.7	BJ	3.2	BJ	2.0	UJ	2.6	B	2.8	B	2.0	UJ				
Silver	10	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.9	B				
Sodium	5000	10400		11000		11000		9960		8510		9390		9610		11000					
Thallium	10	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U				
Vanadium	50	10.0	U	10.0	U	10.0	U	10.0	U	12.5	B	10.9	B	10.1	B	13.1	B				
Zinc	20	14.6	U	5.0	U	5.0	U	5.5	U	5.0	U	6.0	U	5.7	U	8.4	U				
Cyanide	10	NA		N/A		NA		N/A		NA		N/A		NA		N/A					

FIL = Filtered, NA = Not Analyzed, N/A = Not Applicable

9613501.0739

000042

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: IT																					
Case	SDG: W0040																				
Sample Number		B0BNY8		B0BNY9																	
Location		1-B4-7		1-B4-7																	
Remarks				FIL																	
Sample Date		04/25/94		04/25/94																	
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	65.5	B	46.9	B																
Antimony	60	50.0	U	50.0	U																
Arsenic	10	2.4	B	2.8	BJ																
Barium	200	20.0	B	17.7	B																
Beryllium	5	1.0	U	1.0	U																
Cadmium	5	5.0	U	5.0	U																
Calcium	5000	51900		44100																	
Chromium	10	19.8		13.1																	
Cobalt	50	10.0	U	10.0	U																
Copper	25	10.0	U	10.0	U																
Iron	100	49.6	B	46.6	B																
Lead	3	2.0	UJ	2.0	UJ																
Magnesium	5000	8170		6970																	
Manganese	15	2.0	U	2.0	U																
Mercury	0.2	0.20	U	0.20	U																
Nickel	40	20.0	U	20.0	U																
Potassium	5000	5090		4060	B																
Selenium	5	2.4	BJ	2.8	BJ																
Silver	10	5.0	U	5.0	U																
Sodium	5000	12000		10400																	
Thallium	10	2.0	U	2.0	U																
Vanadium	50	10.0	U	10.0	U																
Zinc	20	5.0	U	6.6	B																
Cyanide	10	NA		N/A																	

FIL = Filtered, NA = Not Analyzed, N/A = Not Applicable

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: IT																					
Case	SDG: W0043																				
Sample Number		B0BNX4		B0BNX5		B0BNY2		B0BNY3		B0BNY6		B0BNY7		B0BP06		B0BP07		B0BP08		B0BP09	
Location		1-B2-13		1-B2-13		1-B4-1		1-B4-1		1-B4-5		1-B4-5		6-63-90		6-63-90		6-65-72		6-65-72	
Remarks				FIL				FIL				FIL				FIL				FIL	
Sample Date		04/18/94		04/18/94		04/21/94		04/21/94		04/25/94		04/25/94		04/26/94		04/26/94		04/27/94		04/27/94	
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	63.8	U	40.0	U	40.0	U	40.0	U	40.0	U	52.0	B	44.6	B	40.0	U	49.7	U	40.0	U
Antimony	60	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Arsenic	10	2.0	U	2.0	U	2.0	UJ	2.3	BJ	2.3	BJ	2.4	BJ	2.0	U	2.0	UJ	3.5	B	4.1	B
Barium	200	35.4	B	36.3	B	29.7	B	27.1	B	15.3	B	15.1	B	13.7	B	11.6	B	18.7	B	15.0	B
Beryllium	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Cadmium	5	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Calcium	5000	42600		42600		48900		44700		43100		43200		35500		30000		34100		27700	
Chromium	10	25.2		18.6		16.1		14.8		18.3		14.7		10.0	U	10.0	U	12.4		10.0	U
Cobalt	50	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U
Copper	25	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	65.4		10.0	U
Iron	100	67.2	B	16.5	B	39.2	B	10.0	U	78.5	B	12.3	U	201		14.7	U	47.7	B	16.6	B
Lead	3	2.0	UJ	3.4	UJ	2.3	BJ	2.0	U	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ
Magnesium	5000	9940		9960		6720		6150		7820		7790		12400		10400		10100		8200	
Manganese	15	2.0	U	2.0	U	2.2	B	2.0	U	2.0	U	2.0	U	4.0	B	2.0	U	2.0	U	2.0	U
Mercury	0.2	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
Nickel	40	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U
Potassium	5000	3100	B	2920	B	5330	U	4510	U	4720	B	4730	B	3660	B	3250	B	5850		4100	B
Selenium	5	2.0	U	2.0	U	2.0	U	2.1	B	2.7	BJ	2.0	U	2.4	BJ	2.0	U	2.0	U	2.0	U
Silver	10	5.0	U	5.0	U	5.1	B	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Sodium	5000	10200		10100		10200		9360		10500		10400		11300		9530		20900		17000	
Thallium	10	2.0	U	2.0	UJ	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Vanadium	50	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	20.8	B	16.1	B	17.5	B	12.6	B
Zinc	20	76.1		7.5	B	16.6	B	12.7	B	28.7		5.0	U	7.2	B	5.0	U	14.8	B	5.0	U
Cyanide	10	NA		N/A		NA		N/A		NA		N/A		NA		N/A		NA		N/A	

FIL = Filtered, NA = Not Analyzed, N/A = Not Applicable, EB = Equipment Blank

Project: WESTINGHOUSE-HANFORD																			
Laboratory: IT																			
Case	SDG: W0043																		
Sample Number		B0BP12		B0BP13		B0BP20		B0BP21		B0BP30		B0BP31		B0BP42		B0BP43			
Location		6-66-64		6-66-64		6-72-92		6-72-92		6-72-92		6-72-92		6-72-92		6-72-92			
Remarks				FIL				FIL		EB		EB,FIL		EB		EB			
Sample Date		04/25/94		04/25/94		04/26/94		04/26/94		04/26/94		04/26/94		04/26/94		04/26/94			
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	40.0	U	50.3	B	40.0	U	40.0	U	41.4	B	46.3	B	40.0	U	40.0	U				
Antimony	60	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U				
Arsenic	10	3.6	BJ	2.9	B	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U				
Barium	200	10.9	B	10.8	B	22.9	B	24.4	B	2.0	U	2.0	U	2.0	U	2.0	U				
Beryllium	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
Cadmium	5	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U				
Calcium	5000	30300		31700		40200		37600		99.3	U	62.8	U	115	U	78.2	U				
Chromium	10	10.0	U	10.0	U	10.4		10.0	U	10.0	U	10.0	U	10.0	U	10.0	U				
Cobalt	50	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U				
Copper	25	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U				
Iron	100	59.9	U	11.8	U	24.0	U	10.0	U	25.3	U	16.5	U	10.5	U	10.0	U				
Lead	3	2.0	UJ	2.0	UJ	2.8	BJ	2.0	UJ	3.6	J	2.0	UJ	2.0	UJ	2.0	U				
Magnesium	5000	8790		9190		9860		9220		30.0	U	30.0	U	30.0	U	30.0	U				
Manganese	15	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U				
Mercury	0.2	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U				
Nickel	40	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U				
Potassium	5000	4030	B	4700	B	3140	B	3170	B	1000	U	1000	U	1000	U	1000	U				
Selenium	5	2.0	U	2.0	U	2.0	U	2.0	U	2.0	UJ	2.0	U	2.0	UJ	2.0	U				
Silver	10	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U				
Sodium	5000	17400		18100		7870		7240		155	U	242	U	182	U	140	U				
Thallium	10	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U				
Vanadium	50	10.0	U	12.3	B	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U				
Zinc	20	48.2		5.0	U	5.0	U	5.0	U	5.0	U	6.1	B	5.0	U	5.0	U				
Cyanide	10	NA		N/A		NA		N/A		NA		N/A		NA		N/A					

FIL = Filtered, NA = Not Analyzed, N/A = Not Applicable, EB = Equipment Blank

APPENDIX B

METALS VALIDATED LABORATORY REPORT FORMS

SAMPLE NUMBER: B0BP28

INORGANIC ANALYSIS DATA SHEET

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-04-112SAS No.: SDG No.: B0BP28

Matrix (soil/water): WATER Lab Sample ID: 05023-01S

Level (low/med): LOW Date Received: 05/03/94

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	20.9	U		P
7440-36-0	Antimony	14.7	U		P
7440-38-2	Arsenic	2.8	B		P
7440-39-3	Barium	14.4	B		P
7440-41-7	Beryllium	0.40	U		P
7440-43-9	Cadmium	1.1	U		P
7440-70-2	Calcium	35000			P
7440-47-3	Chromium	2.8	B		P
7440-48-4	Cobalt	2.1	U		P
7440-50-8	Copper	3.6	U		P
7439-89-6	Iron	120			P
7439-92-1	Lead	2.0	B		P
7439-95-4	Magnesium	12700			P
7439-96-5	Manganese	3.3	B		P
7439-97-6	Mercury	0.20	U		AV
7440-02-0	Nickel	6.5	U		P
7440-09-7	Potassium	4360	B		P
7782-49-2	Selenium	2.1	U		P
7440-22-4	Silver	3.6	U		P
7440-23-5	Sodium	11200			P
7440-28-0	Thallium	2.2	U		P
7440-62-2	Vanadium	23.6	B		P
7440-66-6	Zinc	7.1	U		P
	Cyanide				NR

U - cal. blank

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

RJS 7.11.9

Comments:

002

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER: B0BP29

INORGANIC ANALYSIS DATA SHEET

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-04-112SAS No.: SDG No.: B0BP29

Matrix (soil/water): WATER Lab Sample ID: 05024-01S

Level (low/med): LOW Date Received: 05/03/94

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	20.9	U		P	
7440-36-0	Antimony	14.7	U		P	
7440-38-2	Arsenic	2.6	B		P	
7440-39-3	Barium	15.0	B		P	
7440-41-7	Beryllium	0.40	U		P	
7440-43-9	Cadmium	1.1	U		P	
7440-70-2	Calcium	36000			P	
7440-47-3	Chromium	2.5	U		P	
7440-48-4	Cobalt	2.1	U		P	
7440-50-8	Copper	3.6	U		P	
7439-89-6	Iron	9.9	U		P	
7439-92-1	Lead	1.6	B		P	
7439-95-4	Magnesium	13200			P	
7439-96-5	Manganese	0.90	U		P	
7439-97-6	Mercury	0.20	U		AV	
7440-02-0	Nickel	6.5	U		P	
7440-09-7	Potassium	4520	~~B~~	E	P	BJ
7782-49-2	Selenium	2.1	~~U~~		P	UJ
7440-22-4	Silver	3.6	U		P	
7440-23-5	Sodium	11700			P	
7440-28-0	Thallium	2.2	U		P	
7440-62-2	Vanadium	23.9	B		P	
7440-66-6	Zinc	7.1	U		P	
_____	Cyanide				NR	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: RJS 9.12.94

002

000048

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNX2

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD/WE

Lab Code: ITSTU_ Case No.: WO363 SAS No.: _____ SDG No.: W0031_

Matrix (soil/water): WATER Lab Sample ID: AA6516

Level (low/med): LOW Date Received: 04/15/94

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	67.3	B		P	U
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.4	B		F	
7440-39-3	Barium	53.1	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	24900			P	
7440-47-3	Chromium	10.9			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	42.8	B		P	
7439-92-1	Lead	2.0	U	W	F	UJ
7439-95-4	Magnesium	8460			P	
7439-96-5	Manganese	14.2	B		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	4780	B		P	
7782-49-2	Selenium	2.0	U		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	12100			P	
7440-28-0	Thallium	2.0	U	W	F	UJ
7440-62-2	Vanadium	30.3	B		P	
7440-66-6	Zinc	11.8	B		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture: N/A

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

RJS 9/14/94

FORM I - IN

ILM02.1 6/2/94

61-0000 RBC

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNX3

Lab Name: ITAS_KNOXVILLE Contract: HANFORD/WE
Lab Code: ITSTU Case No.: WO363 SAS No.: SDG No.: W0031
Matrix (soil/water): WATER Lab Sample ID: AA6518
Level (low/med): LOW Date Received: 04/15/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	52.5	B		P	U
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.1	B		F	
7440-39-3	Barium	62.7	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	27300			P	
7440-47-3	Chromium	10.0	U		P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	17.3	B		P	
7439-92-1	Lead	2.0	B	WN	F	UJ
7439-95-4	Magnesium	9730			P	
7439-96-5	Manganese	19.4			P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	5360			P	
7782-49-2	Selenium	2.0	U		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	13400			P	
7440-28-0	Thallium	2.0	B		F	
7440-62-2	Vanadium	36.3	B		P	
7440-66-6	Zinc	9.1	B		P	

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

Comments:

RJJ 9/14/94

FORM I - IN

ILM02.1
8 6/2/94

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

BOBNX6

Lab Name: ITAS_KNOXVILLE Contract: HANFORD/WE
Lab Code: ITSTU Case No.: WO363 SAS No.: SDG No.: W0031
Matrix (soil/water): WATER Lab Sample ID: AA6510
Level (low/med): LOW Date Received: 04/15/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	518			P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	U		F	
7440-39-3	Barium	32.3	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	54000			P	
7440-47-3	Chromium	358			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	1130			P	
7439-92-1	Lead	2.0	~~U~~	~~WR~~	F	UJ
7439-95-4	Magnesium	8710			P	
7439-96-5	Manganese	26.1			P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	122			P	
7440-09-7	Potassium	1920	B		P	
7782-49-2	Selenium	2.9	B		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	11000			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	12.9	B		P	

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

Comments:

RJS 9/14/94

FORM I - IN

ILM02.1 6/2/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNX7

Lab Name: ITAS_KNOXVILLE Contract: HANFORD/WE
Lab Code: ITSTU Case No.: WO363 SAS No.: SDG No.: W0031
Matrix (soil/water): WATER Lab Sample ID: AA6512
Level (low/med): LOW Date Received: 04/15/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	139	~~B~~		P	U
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	U		F	
7440-39-3	Barium	38.6	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	64100			P	
7440-47-3	Chromium	64.8			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	174			P	
7439-92-1	Lead	2.0	~~B~~	~~WN~~	F	UJ
7439-95-4	Magnesium	10500			P	
7439-96-5	Manganese	4.3	B		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	2330	B		P	
7782-49-2	Selenium	2.0	U	W	F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	13200			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	10.1	B		P	

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

Comments:

RJS
9/14/94

FORM I - IN

ILM02.1
8 6/2/94

9613501.0750

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNX8

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD/WE _____ SDG No.: W0031_
Lab Code: ITSTU_ Case No.: WO383 SAS No.: _____ Lab Sample ID: AA6808
Matrix (soil/water): WATER Date Received: 04/16/94
Level (low/med): LOW__
% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	U		F	
7440-39-3	Barium	38.6	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	53600			P	
7440-47-3	Chromium	11.1			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	59.3	B		P	
7439-92-1	Lead	4.0		W	F	J
7439-95-4	Magnesium	7290			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	2590	B		P	
7782-49-2	Selenium	2.0	U	W	F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	15200			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	6.9	B		P	

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: N/A___
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

RS 6/14/94

FORM I - IN

ILM02.1

8/1/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNX9

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD/WE

Lab Code: ITSTU_ Case No.: WO383 SAS No.: _____ SDG No.: W0031_

Matrix (soil/water): WATER Lab Sample ID: AA6810

Level (low/med): LOW__ Date Received: 04/16/94

% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	U		F	
7440-39-3	Barium	29.3	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	39200	/	J	P	J
7440-47-3	Chromium	10.0	U		P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	11.0	B		P	
7439-92-1	Lead	2.0	U		F	
7439-95-4	Magnesium	5260			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	1860	B		P	
7782-49-2	Selenium	2.2	B		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	11300			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	5.0	U		P	

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: N/A___

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

DISSOLVED.

RJS 9/14/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNY1

Lab Name: ITAS KNOXVILLE Contract: HANFORD/WE
Lab Code: ITSTU Case No.: WO363 SAS No.: SDG No.: W0031
Matrix (soil/water): WATER Lab Sample ID: AA6515
Level (low/med): LOW Date Received: 04/15/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	214	/		P	J
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	U		F	
7440-39-3	Barium	27.0	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	47200			P	
7440-47-3	Chromium	40.6			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	38.2	B		P	
7439-92-1	Lead	2.0	~~U~~	~~W~~N	F	UJ
7439-95-4	Magnesium	7050			P	
7439-96-5	Manganese	2.0	B		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	1650	B		P	
7782-49-2	Selenium	2.0	U	W	F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	9060			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	13.3	B		P	

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

Comments:

RJS 9/14/94

FORM I - IN

ILM02.1

6/2/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNYO

Lab Name: ITAS KNOXVILLE Contract: HANFORD/WE
Lab Code: ITSTU Case No.: WO363 SAS No.: SDG No.: W0031
Matrix (soil/water): WATER Lab Sample ID: AA6513
Level (low/med): LOW Date Received: 04/15/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	86.7	B		P	J
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	U		F	
7440-39-3	Barium	31.8	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	55800			P	
7440-47-3	Chromium	46.6			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	61.2	B		P	
7439-92-1	Lead	5.1		WN	F	UJ
7439-95-4	Magnesium	8320			P	
7439-96-5	Manganese	2.2	B		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	1250	B		P	
7782-49-2	Selenium	2.0	U	N	F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	10800			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	10.5	B		P	

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

Comments:

RJS 9/14/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP14

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD/WE

Lab Code: ITSTU_ Case No.: WO420 SAS No.: _____ SDG No.: W0031_

Matrix (soil/water): WATER Lab Sample ID: AA7324

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

% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	B		F	BJ
7440-39-3	Barium	11.0	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	27100			P	
7440-47-3	Chromium	13.8			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	76.4	B		P	
7439-92-1	Lead	3.0		N	F	J
7439-95-4	Magnesium	7530			P	
7439-96-5	Manganese	2.5	B		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	5390			P	
7782-49-2	Selenium	2.0	U	W	F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	11900			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	17.2	B		P	
7440-66-6	Zinc	22.8			P	

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: N/A___

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

RJS 9/14/94

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

BOBP15

Lab Name: ITAS KNOXVILLE Contract: HANFORD/WE
Lab Code: ITSTU Case No.: WO420 SAS No.: SDG No.: W0031
Matrix (soil/water): WATER Lab Sample ID: AA7326
Level (low/med): LOW Date Received: 04/22/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.1	B		F	BJ
7440-39-3	Barium	15.0	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	34600		*	P	J
7440-47-3	Chromium	17.1			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	10.1	B		P	
7439-92-1	Lead	3.6			F	
7439-95-4	Magnesium	9630			P	
7439-96-5	Manganese	2.2	B		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	6150			P	
7782-49-2	Selenium	2.0	U		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	15400			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	19.7	B		P	
7440-66-6	Zinc	35.1			P	

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

Comments:
DISSOLVED

RJS 9/14/94

8 6/2/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP16

Lab Name: ITAS_KNOXVILLE Contract: HANFORD/WE

Lab Code: ITSTU Case No.: WO420 SAS No.: SDG No.: W0031

Matrix (soil/water): WATER Lab Sample ID: AA7330

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

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.1	~~P~~		F	BJ
7440-39-3	Barium	59.0	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	31300			P	
7440-47-3	Chromium	10.0	U		P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	21.6	B		P	
7439-92-1	Lead	2.0	~~P~~	~~N~~	F	UJ
7439-95-4	Magnesium	9710			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	6020	/		P	J
7782-49-2	Selenium	2.0	U		F	
7440-22-4	Silver	5.1	B		P	
7440-23-5	Sodium	14900			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	25.2	B		P	
7440-66-6	Zinc	52.1			P	

Color Before: COLORLESS Clarity Before: CLEAR Texture: N/A

Color After: COLOLRESS Clarity After: CLEAR Artifacts:

Comments:

RJS 9/14/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP17

Lab Name: ITAS_KNOXVILLE Contract: HANFORD/WE

Lab Code: ITSTU Case No.: WO420 SAS No.: SDG No.: W0031

Matrix (soil/water): WATER Lab Sample ID: AA7332

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

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	U	W	F	UJ
7440-39-3	Barium	55.6	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	29500			P	J
7440-47-3	Chromium	10.0	U		P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	10.0	U		P	
7439-92-1	Lead	2.3	B		F	
7439-95-4	Magnesium	9280			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	5140			P	J
7782-49-2	Selenium	2.0	U		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	14000			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	21.6	B		P	
7440-66-6	Zinc	5.0	U		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture: N/A

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

DISSOLVED

RJS 9/14/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNZ2

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD/WE

Lab Code: ITSTU_ Case No.: WO386 SAS No.: _____ SDG No.: W0031_

Matrix (soil/water): WATER Lab Sample ID: AA6879

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

% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	140	B		P	U
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	B		F	
7440-39-3	Barium	79.0	B		P	
7440-41-7	Beryllium	2.0	B		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	49100			P	
7440-47-3	Chromium	27.4			P	
7440-48-4	Cobalt	16.6	B		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	79.4	B		P	
7439-92-1	Lead	2.0		WN	F	UJ
7439-95-4	Magnesium	7640			P	
7439-96-5	Manganese	13.4	B		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	22.0	B		P	
7440-09-7	Potassium	4570	B		P	
7782-49-2	Selenium	2.2	B		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	10800			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	18.5	B		P	
7440-66-6	Zinc	23.8			P	

Color Before: COLORLESS Clarity Before: CLEAR Texture: N/A

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

000061

FORM I - IN

ILM02.1

6/2/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNZ3

Lab Name: ITAS_KNOXVILLE Contract: HANFORD/WE

Lab Code: ITSTU Case No.: WO386 SAS No.: _____ SDG No.: W0031

Matrix (soil/water): WATER Lab Sample ID: AA7103

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

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	80.8	B		P	U
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.5	B		F	
7440-39-3	Barium	31.6	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	52300			P	J
7440-47-3	Chromium	15.1			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	20.7	B		P	
7439-92-1	Lead	2.0		W	F	UJ
7439-95-4	Magnesium	8080			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	4870	B		P	
7782-49-2	Selenium	2.6	B		F	
7440-22-4	Silver	5.0			P	UJ
7440-23-5	Sodium	11900			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	10.6	B		P	U

Color Before: COLORLESS Clarity Before: CLEAR Texture: N/A

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

DISSOLVED

9/14/94

FORM I - IN

ILM02.1

8 6/2/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO: BOBP25

Lab Name: ITAS KNOXVILLE Contract: HANFORD/WE
Lab Code: ITSTU Case No.: WO420 SAS No.: _____ SDG No.: W003
Matrix (soil/water): WATER Lab Sample ID: AA7329
Level (low/med): LOW Date Received: 04/22/94
% Solids: 0.0

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

Filtered

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	U		F	UJ
7440-39-3	Barium	17.9	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	26500		*	P	J
7440-47-3	Chromium	10.0	U		P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	13.2	B		P	
7439-92-1	Lead	2.0	U		F	
7439-95-4	Magnesium	7030			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	4830	B		P	U
7782-49-2	Selenium	2.0	U		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	10600			P	
7440-28-0	Thallium	2.0	U	W	F	
7440-62-2	Vanadium	11.8	B		P	
7440-66-6	Zinc	18.1	B		P	

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

Comments:
DISSOLVED

RLS 7.28

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNZ5

Lab Name: ITAS KNOXVILLE Contract: HANFORD/WE
Lab Code: ITSTU Case No.: WO386 SAS No.: SDG No.: W0031
Matrix (soil/water): WATER Lab Sample ID: AA7105
Level (low/med): LOW Date Received: 04/19/94
% Solids: 0.0

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

Filtered

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	82.9	B		P	U
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	U		F	
7440-39-3	Barium	21.5	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	34100		*	P	J
7440-47-3	Chromium	13.6			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	23.9	B		P	U
7439-92-1	Lead	2.0	U	W	F	UJ
7439-95-4	Magnesium	6260			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	4500	B		P	
7782-49-2	Selenium	2.0	U	W	F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	8990			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	75.3			P	

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

Comments:
DISSOLVED

RTS 7.27.94

FORM I - IN

ILM02.1

000064

8 6/2/94

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

~~BOBNF23~~ BO
er 9

Lab Name: ITAS KNOXVILLE Contract: HANFORD/WE
Lab Code: ITSTU Case No.: WO386 SAS No.: SDG No.: W0031
Matrix (soil/water): WATER Lab Sample ID: AA7106
Level (low/med): LOW Date Received: 04/19/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	80.0	~~B~~		P	U
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.5	B		F	
7440-39-3	Barium	19.4	B		P	
7440-41-7	Beryllium	1.0	B		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	29400	~~B~~	~~J~~	P	J
7440-47-3	Chromium	11.8			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	27.3	B		P	
7439-92-1	Lead	2.3	~~B~~	W	F	UJ
7439-95-4	Magnesium	5440			P	
7439-96-5	Manganese	2.1	B		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	3670	B		P	
7782-49-2	Selenium	2.0	U	W	F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	8110			P	
7440-28-0	Thallium	2.0	B		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	13.6	B		P	

Filtered

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

Comments:
DISSOLVED

FORM I GS-IN

ILM02.1
6/2/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

~~BOBNP22~~ BOBP22

Lab Name: ITAS KNOXVILLE Contract: HANFORD/WE

Lab Code: ITSTU Case No.: WO386 SAS No.: SDG No.: W0031

Matrix (soil/water): WATER Lab Sample ID: AA7101

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

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	73.8	B		P	U
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	U		F	
7440-39-3	Barium	23.8	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	36600			P	
7440-47-3	Chromium	14.1			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	33.1	B		P	U
7439-92-1	Lead	2.0	B	WN	F	UJ
7439-95-4	Magnesium	6740			P	
7439-96-5	Manganese	2.0	B		P	U
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	4390	B		P	
7782-49-2	Selenium	2.0	U	W	F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	9460			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	14.7	B		P	

Total

Color Before: COLORLESS Clarity Before: CLEAR Texture: N/A

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

RJS 7.27.94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO

BOBP19

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD/WE

Lab Code: ITSTU_ Case No.: WO420 SAS No.: _____ SDG No.: W003

Matrix (soil/water): WATER Lab Sample ID: AA7316

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

% Solids: __0.0

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

Filtered

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	40.0	U		P
7440-36-0	Antimony	50.0	U		P
7440-38-2	Arsenic	2.4	B		F
7440-39-3	Barium	17.7	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	29900			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	56.7	B		P
7439-92-1	Lead	2.0	U		F
7439-95-4	Magnesium	7950			P
7439-96-5	Manganese	2.3	B		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	20.0	U		P
7440-09-7	Potassium	5320			P
7782-49-2	Selenium	2.0	U		F
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	11900			P
7440-28-0	Thallium	2.0	U		F
7440-62-2	Vanadium	13.0	B		P
7440-66-6	Zinc	20.9			P

BJ 9/5/1

J

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: N/A_

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: ____

Comments:

DISSOLVED

RS 7.28.94

FORM I - IN

ILM02.1

8 6/2/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE N

BOBP24

Lab Name: ITAS KNOXVILLE Contract: HANFORD/WE
Lab Code: ITSTU Case No.: WO420 SAS No.: SDG No.: WOC
Matrix (soil/water): WATER Lab Sample ID: AA7327
Level (low/med): LOW Date Received: 04/22/9
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	40.0	U		P
7440-36-0	Antimony	50.0	U		P
7440-38-2	Arsenic	2.5	B		F
7440-39-3	Barium	16.1	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	27000			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	42.0	B		P
7439-92-1	Lead	2.0	B	N	F
7439-95-4	Magnesium	7140			P
7439-96-5	Manganese	2.0	U		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	20.0	U		P
7440-09-7	Potassium	4380	B		P
7782-49-2	Selenium	2.0	U		F
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	10700			P
7440-28-0	Thallium	2.0	U		F
7440-62-2	Vanadium	10.6	B		P
7440-66-6	Zinc	20.4			P

Total

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

Comments:

RJS 128.44

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP18

Lab Name: ITAS KNOXVILLE Contract: HANFORD/WE

Lab Code: ITSTU Case No.: WO420 SAS No.: _____ SDG No.: W0031

Matrix (soil/water): WATER Lab Sample ID: AA7311

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

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	40.0	U		P
7440-36-0	Antimony	50.0	U		P
7440-38-2	Arsenic	4.0	~~U~~		F J
7440-39-3	Barium	21.2	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	34600			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	71.1	B		P
7439-92-1	Lead	2.0	~~U~~	~~N~~	F WJ
7439-95-4	Magnesium	9170			P
7439-96-5	Manganese	2.8	B		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	20.0	U		P
7440-09-7	Potassium	5760			P
7782-49-2	Selenium	2.0	U		F
7440-22-4	Silver	5.3	B		P
7440-23-5	Sodium	13700			P
7440-28-0	Thallium	2.0	U		F
7440-62-2	Vanadium	16.1	B		P
7440-66-6	Zinc	6.9	B		P

Total

Color Before: COLORLESS Clarity Before: CLEAR Texture: N/A

Color After: COLORLESS Clarity After: CLEAR Artifacts: ____

Comments:

RLS 7.28.94

FORM I - IN

ILM02.

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNZ4

Lab Name: ITAS KNOXVILLE Contract: HANFORD/WE

Lab Code: ITSTU Case No.: WO386 SAS No.: _____ SDG No.: W0031

Matrix (soil/water): WATER Lab Sample ID: AA7099

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

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	84.3	B		P	U
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.1	B		F	
7440-39-3	Barium	29.7	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	36700			P	
7440-47-3	Chromium	18.4			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	46.6	B		P	U
7439-92-1	Lead	5.6		W	F	UJ
7439-95-4	Magnesium	6770			P	
7439-96-5	Manganese	2.4	B		P	U
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	4180	B		P	
7782-49-2	Selenium	2.0	U	W	F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	9660			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	15.6	B		P	

Total

Color Before: COLORLESS Clarity Before: CLEAR Texture: N/A

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

FORM I - IN

RB 7-27-94

ILM02.1

6/2/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNZ0

Lab Name: ITAS_KNOXVILLE Contract: HANFORD/WE
Lab Code: ITSTU Case No.: WO437 SAS No.: SDG No.: W0040
Matrix (soil/water): WATER Lab Sample ID: AA7557
Level (low/med): LOW Date Received: 04/27/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	45.0	B		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.8	B		F	
7440-39-3	Barium	22.7	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	47500			P	
7440-47-3	Chromium	13.8			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	35.4	B		P	u
7439-92-1	Lead	2.0	U		F	
7439-95-4	Magnesium	7680			P	
7439-96-5	Manganese	2.4	B		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	5950			P	u as BJ
7782-49-2	Selenium	3.0	B	W	F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	10400			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	14.6	B		P	u

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

Comments:

[redacted]- IN

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNZ1

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD/WE

Lab Code: ITSTU_ Case No.: WO437 SAS No.: _____ SDG No.: W0040_

Matrix (soil/water): WATER Lab Sample ID: AA7567

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

% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	40.0	U		P
7440-36-0	Antimony	50.0	U		P
7440-38-2	Arsenic	2.6	B		F
7440-39-3	Barium	24.3	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	50300			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	10.0	U		P
7439-92-1	Lead	2.0	U		F
7439-95-4	Magnesium	8180			P
7439-96-5	Manganese	2.0	U		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	20.0	U		P
7440-09-7	Potassium	5530			P
7782-49-2	Selenium	2.6	B	W	F
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	11000			P
7440-28-0	Thallium	2.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	5.0	U		P

U BJ RS 9/13/

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: N/A__

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

DISSOLVED._____

FORM I - IN

RS 7.19.94

ILM02.1

S 6/9/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNZ6

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD/WE

Lab Code: ITSTU_ Case No.: WO437 SAS No.: _____ SDG No.: W0040

Matrix (soil/water): WATER Lab Sample ID: AA7553

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

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	5.1	B		F	
7440-39-3	Barium	32.1	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	52700			P	
7440-47-3	Chromium	14.9			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	22.8	~~B~~		P	U
7439-92-1	Lead	2.0	U		F	
7439-95-4	Magnesium	6730			P	
7439-96-5	Manganese	2.2	B		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	5710	~~B~~		P	U
7782-49-2	Selenium	3.7	~~B~~	+	F	~~B~~ BJ as 9/15/94
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	11000			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	5.0	U		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture: N/A

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNZ7

Lab Name: ITAS KNOXVILLE Contract: HANFORD/WE

Lab Code: ITSTU Case No.: WO437 SAS No.: SDG No.: W0040

Matrix (soil/water): WATER Lab Sample ID: AA7563

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

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	40.0	U		P
7440-36-0	Antimony	50.0	U		P
7440-38-2	Arsenic	2.7	B		F
7440-39-3	Barium	28.2	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	47600			P
7440-47-3	Chromium	10.9			P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	10.0	U		P
7439-92-1	Lead	4.0			F
7439-95-4	Magnesium	6120			P
7439-96-5	Manganese	2.0	U		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	20.0	U		P
7440-09-7	Potassium	4850	B		P U
7782-49-2	Selenium	3.2	B	W	F J BJ ATS 9/15/94
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	9960			P
7440-28-0	Thallium	2.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	5.5	B		P U

Color Before: COLORLESS Clarity Before: CLEAR Texture: N/A

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

DISSOLVED.

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNZ8

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD/WE

Lab Code: ITSTU_ Case No.: WO437 SAS No.: _____ SDG No.: W0040_

Matrix (soil/water): WATER Lab Sample ID: AA7555

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

% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.9	B		F	
7440-39-3	Barium	13.1	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	30500			P	
7440-47-3	Chromium	18.8			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	25.4	~~B~~ U		P	u
7439-92-1	Lead	2.0	U		F	
7439-95-4	Magnesium	7850			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	5840			P	u
7782-49-2	Selenium	2.0	~~U~~	W	F	UJ
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	8510			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	12.5	B		P	
7440-66-6	Zinc	5.0	U		P	

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: N/A___

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

_____

_____

_____

_____

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNZ9

Lab Name: ITAS KNOXVILLE Contract: HANFORD/WE
Lab Code: ITSTU Case No.: WO437 SAS No.: SDG No.: W0040
Matrix (soil/water): WATER Lab Sample ID: AA7565
Level (low/med): LOW Date Received: 04/27/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.6	B		F	
7440-39-3	Barium	13.7	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	33300			P	
7440-47-3	Chromium	16.0			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.2	B		P	
7439-89-6	Iron	14.1	B		P	u
7439-92-1	Lead	2.0	U		F	
7439-95-4	Magnesium	8590			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	5930			P	u
7782-49-2	Selenium	2.6	B		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	9390			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.9	B		P	
7440-66-6	Zinc	6.0	B		P	u

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

Comments:
DISSOLVED.

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP04

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD/WE

Lab Code: ITSTU_ Case No.: WO437 SAS No.: _____ SDG No.: W0040_

Matrix (soil/water): WATER Lab Sample ID: AA7551

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

% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	3.3	B		F	
7440-39-3	Barium	12.0	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	37700			P	
7440-47-3	Chromium	16.0			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	27.5	B		P	u
7439-92-1	Lead	2.0	U		F	
7439-95-4	Magnesium	8790			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	5600			P	u
7782-49-2	Selenium	2.8	B		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	9610			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.1	B		P	
7440-66-6	Zinc	5.7	B		P	u

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: N/A___

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

RSS 7-19-94

FORM I - IN

000077

ILM02.1

8/8/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP05

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD/WE

Lab Code: ITSTU_ Case No.: WO437 SAS No.: _____ SDG No.: W0040_

Matrix (soil/water): WATER Lab Sample ID: AA7559

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

% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	3.1	B		F	
7440-39-3	Barium	12.6	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	42900			P	
7440-47-3	Chromium	15.3			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	63.2	B		P	
7439-92-1	Lead	2.0	U		F	
7439-95-4	Magnesium	10100			P	
7439-96-5	Manganese	2.4	B		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	6210	/		P	U
7782-49-2	Selenium	2.0	U		F	UJ
7440-22-4	Silver	5.9	B		P	
7440-23-5	Sodium	11000			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	13.1	B		P	
7440-66-6	Zinc	8.4	U		P	U

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: N/A___

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

DISSOLVED._____

FORM I - IN

RJS 7.19.94

ILM02.1

F4/8/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNY8

Lab Name: ITAS_KNOXVILLE Contract: HANFORD

Lab Code: ITSTU Case No.: WO453 SAS No.: SDG No.: WO040

Matrix (soil/water): WATER Lab Sample ID: AA7725

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

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	65.5	B		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.4	B		F	
7440-39-3	Barium	20.0	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	51900			P	
7440-47-3	Chromium	19.8			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	49.6	B		P	
7439-92-1	Lead	2.0	~~B~~	W	F	UJ
7439-95-4	Magnesium	8170			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	5090			P	
7782-49-2	Selenium	2.4	~~B~~	N	F	~~J~~ BJ RTS 9
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	12000			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	5.0	U		P	
5955-70-0	Cyanide				NR	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

TOTAL

FORM I - IN

000075 RTS 7.19.94

ILM02.1

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNY9

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO453 SAS No.: _____ SDG No.: WO040_
Matrix (soil/water): WATER Lab Sample ID: AA7746
Level (low/med): LOW__ Date Received: 04/29/94
% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	46.9	B		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.8	B	W	F	J BJ (as 9/15/94)
7440-39-3	Barium	17.7	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	44100			P	
7440-47-3	Chromium	13.1			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	46.6	B		P	
7439-92-1	Lead	2.0	~~B~~	W	F	UJ
7439-95-4	Magnesium	6970			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	4060	B		P	
7782-49-2	Selenium	2.8	~~B~~	W	F	~~J~~ BJ (as 9/15/94)
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	10400			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	6.6	B		P	
5955-70-0	Cyanide				NR	

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

Comments:
DISSOLVED_____

7.19.94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNY4

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO427 SAS No.: _____ SDG No.: WO040_
Matrix (soil/water): WATER Lab Sample ID: AA7378
Level (low/med): LOW__ Date Received: 04/25/94
% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	43.9	~~B~~		P	U
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.1	B		F	
7440-39-3	Barium	23.5	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	50600			P	
7440-47-3	Chromium	14.3			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	11.6	~~B~~		P	U
7439-92-1	Lead	2.0	~~B~~	W	F	UJ
7439-95-4	Magnesium	7710			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	4130	B		P	
7782-49-2	Selenium	2.1	B		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	10800			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	5.0	U		P	
5955-70-0	Cyanide				NR	

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

Comments:
TOTAL_____

FORM I - IN

ILM02.1

000081

TJS 7.14.94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNY5

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: WO427 SAS No.: SDG No.: WOO40
Matrix (soil/water): WATER Lab Sample ID: AA7386
Level (low/med): LOW Date Received: 04/25/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	40.0	U		P
7440-36-0	Antimony	50.0	U		P
7440-38-2	Arsenic	2.0	U		F
7440-39-3	Barium	27.8	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	60500			P
7440-47-3	Chromium	13.2			P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	10.0	U		P
7439-92-1	Lead	2.0	U		F
7439-95-4	Magnesium	9250			P
7439-96-5	Manganese	2.0	U		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	20.0	U		P
7440-09-7	Potassium	5190			P
7782-49-2	Selenium	2.6	B		F
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	13200			P
7440-28-0	Thallium	2.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	17.0	B		P
5955-70-0	Cyanide				NR

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

Comments:
DISSOLVED

000082

RJS 7.15.94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP00

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO427 SAS No.: _____ SDG No.: WO040_
Matrix (soil/water): WATER Lab Sample ID: AA7376
Level (low/med): LOW__ Date Received: 04/25/94
% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	4.0	B		F	
7440-39-3	Barium	10.7	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	41300			P	
7440-47-3	Chromium	19.8			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	51.8	~~B~~		P	U
7439-92-1	Lead	2.0	~~B~~	W	F	UJ
7439-95-4	Magnesium	8940			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	5290			P	
7782-49-2	Selenium	2.6	B		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	11300			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	5.0	U		P	
5955-70-0	Cyanide				NR	

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

Comments:
TOTAL_____

FORM I - IN

ILM02.1

RJS
7.15.94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP01

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO427 SAS No.: _____ SDG No.: WO040_
Matrix (soil/water): WATER Lab Sample ID: AA7385
Level (low/med): LOW__ Date Received: 04/25/94
% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.4	B		F	
7440-39-3	Barium	11.0	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	44300			P	
7440-47-3	Chromium	16.5			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	14.1	~~B~~		P	U
7439-92-1	Lead	2.0	U		F	
7439-95-4	Magnesium	9630			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	5580			P	
7782-49-2	Selenium	2.0	~~U~~	~~W~~	F	W
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	12400			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.3	B		P	
7440-66-6	Zinc	5.5	B		P	
5955-70-0	Cyanide				NR	

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

Comments:
DISSOLVED_____

FORM I - IN

ILM02.1

RJS
7.15.94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP02

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO427 SAS No.: _____ SDG No.: WO040_
Matrix (soil/water): WATER Lab Sample ID: AA7380
Level (low/med): LOW__ Date Received: 04/25/94
% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	48.0	~~B~~		P	U
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	3.7	~~B~~	~~W~~	F	~~J~~ BJ
7440-39-3	Barium	16.1	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	54000			P	
7440-47-3	Chromium	25.0			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	41.2	~~B~~		P	U
7439-92-1	Lead	2.0	~~B~~	~~W~~	F	UJ
7439-95-4	Magnesium	12300			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	5890			P	
7782-49-2	Selenium	2.5	B		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	12100			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	5.0	U		P	
5955-70-0	Cyanide				NR	

12 J 9/15/94

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

Comments:
TOTAL_____

RJS 7.15.94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP03

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO427 SAS No.: _____ SDG No.: WO040_
Matrix (soil/water): WATER Lab Sample ID: AA7387
Level (low/med): LOW__ Date Received: 04/25/94
% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum_	40.0	U		P_	
7440-36-0	Antimony_	50.0	U		P_	
7440-38-2	Arsenic__	2.7	~~B~~	~~W~~	F_	J BJ R5 7/8/
7440-39-3	Barium___	17.9	B		P_	
7440-41-7	Beryllium	1.0	U		P_	
7440-43-9	Cadmium__	5.0	U		P_	
7440-70-2	Calcium__	58000			P_	
7440-47-3	Chromium_	19.0			P_	
7440-48-4	Cobalt___	10.0	U		P_	
7440-50-8	Copper___	10.0	U		P_	
7439-89-6	Iron____	12.9	~~B~~		P_	U
7439-92-1	Lead____	2.0	U		F_	
7439-95-4	Magnesium	13100			P_	
7439-96-5	Manganese	2.0	U		P_	
7439-97-6	Mercury__	0.20	U		CV	
7440-02-0	Nickel___	20.0	U		P_	
7440-09-7	Potassium	6010			P_	
7782-49-2	Selenium_	2.6	B		F_	
7440-22-4	Silver___	5.0	U		P_	
7440-23-5	Sodium___	12900			P_	
7440-28-0	Thallium_	2.0	U		F_	
7440-62-2	Vanadium_	10.0	U		P_	
7440-66-6	Zinc____	5.0	U		P_	
5955-70-0	Cyanide__				NR	

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

Comments:
DISSOLVED_____

RJS 7-15-94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP10

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: WO427 SAS No.: SDG No.: WO040
Matrix (soil/water): WATER Lab Sample ID: AA7374
Level (low/med): LOW Date Received: 04/25/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	~~U~~		F	UJ
7440-39-3	Barium	7.6	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	28200			P	
7440-47-3	Chromium	21.5			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	114			P	
7439-92-1	Lead	2.0	~~U~~	W	F	UJ
7439-95-4	Magnesium	8400			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	5330			P	UJ
7782-49-2	Selenium	2.0	~~U~~	W	F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	12600			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	20.5	B		P	
7440-66-6	Zinc	7.6	B		P	
5955-70-0	Cyanide				NR	

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

Comments:
TOTAL

OUTGOST - IN

ILM02.1

RJ 7.15.94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP11

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: WO427 SAS No.: SDG No.: WO040
Matrix (soil/water): WATER Lab Sample ID: AA7384
Level (low/med): LOW Date Received: 04/25/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	U		F	
7440-39-3	Barium	10.1	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	35500			P	
7440-47-3	Chromium	25.6			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	12.1	~~B~~ U		P	u
7439-92-1	Lead	2.0	U		F	
7439-95-4	Magnesium	10700			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	6940			P	
7782-49-2	Selenium	2.0	~~U~~ W		F	UJ
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	16100			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	25.6	B		P	
7440-66-6	Zinc	5.3	B		P	
5955-70-0	Cyanide				NR	

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

Comments:
DISSOLVED

RSS 7.15.94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP26

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO427 SAS No.: _____ SDG No.: WO040
Matrix (soil/water): WATER Lab Sample ID: AA7382
Level (low/med): LOW__ Date Received: 04/25/94
% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	40.0	U		P
7440-36-0	Antimony	50.0	U		P
7440-38-2	Arsenic	2.0	U		F
7440-39-3	Barium	23.9	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	51200			P
7440-47-3	Chromium	12.1			P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	20.4	B		P
7439-92-1	Lead	2.0	U		F
7439-95-4	Magnesium	8310			P
7439-96-5	Manganese	2.0	U		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	20.0	U		P
7440-09-7	Potassium	4850	B		P
7782-49-2	Selenium	2.5	B		F
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	11700			P
7440-28-0	Thallium	2.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	5.0	U		P
5955-70-0	Cyanide				NR

BJ RS 9/15/

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

Comments:
TOTAL_____

FORM I - IN

ILM02.1

RS 7.15.94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP27

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD___
Lab Code: ITSTU_ Case No.: WO427 SAS No.: _____ SDG No.: WO040_
Matrix (soil/water): WATER Lab Sample ID: AA7388
Level (low/med): LOW__ Date Received: 04/25/94
% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	40.0	U		P
7440-36-0	Antimony_	50.0	U		P
7440-38-2	Arsenic__	4.1	B		F
7440-39-3	Barium___	22.8	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium__	5.0	U		P
7440-70-2	Calcium__	49700			P
7440-47-3	Chromium_	10.6			P
7440-48-4	Cobalt___	10.0	U		P
7440-50-8	Copper___	22.0	B		P
7439-89-6	Iron_____	10.0	U		P
7439-92-1	Lead_____	2.0	U		F
7439-95-4	Magnesium	7550			P
7439-96-5	Manganese	2.0	U		P
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	20.0	U		P
7440-09-7	Potassium	4070	B		P
7782-49-2	Selenium_	2.4	B		F
7440-22-4	Silver___	5.0	U		P
7440-23-5	Sodium___	10700			P
7440-28-0	Thallium_	2.0	U		F
7440-62-2	Vanadium_	10.0	U		P
7440-66-6	Zinc_____	8.1	B		P
5955-70-0	Cyanide__				NR

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

Comments:
DISSOLVED_____

RJS
7-15-94

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

BOBNX4

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD/WE
Lab Code: ITSTU_ Case No.: WO417 SAS No.: _____ SDG No.: W0043_
Matrix (soil/water): WATER Lab Sample ID: AA7284
Level (low/med): LOW__ Date Received: 04/20/94
% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	63.8	~~B~~		P	U
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	U		F	
7440-39-3	Barium	35.4	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	42600			P	
7440-47-3	Chromium	25.2			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	67.2	B		P	
7439-92-1	Lead	2.0	~~B~~	~~WN~~	F	UJ
7439-95-4	Magnesium	9940			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U	~~N~~	CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	3100	B		P	
7782-49-2	Selenium	2.0	U		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	10200			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	76.1			P	

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: N/A___
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

RJS
4/15/94

FORM I - IN

ILM02.1
8 4/1/94

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

BOBNX5

Lab Name: ITAS KNOXVILLE Contract: HANFORD/WE
Lab Code: ITSTU Case No.: WO417 SAS No.: SDG No.: W0043
Matrix (soil/water): WATER Lab Sample ID: AA7286
Level (low/med): LOW Date Received: 04/20/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	U		F	
7440-39-3	Barium	36.3	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	42600			P	
7440-47-3	Chromium	18.6			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	16.5	B		P	
7439-92-1	Lead	3.4	U	W	F	UJ
7439-95-4	Magnesium	9960			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	2920	B		P	
7782-49-2	Selenium	2.0	U		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	10100			P	
7440-28-0	Thallium	2.0	U	W	F	UJ
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	7.5	B		P	
5955-70-0	Cyanide				NR	

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

Comments:
DISSOLVED.

RJS
9/15/94

9/5/94

9613501.0790

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

BOBNY2

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD/WE
Lab Code: ITSTU_ Case No.: WO426 SAS No.: _____ SDG No.: W0043_
Matrix (soil/water): WATER Lab Sample ID: AA7371
Level (low/med): LOW__ Date Received: 04/25/94
% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	~~U~~		F	UJ
7440-39-3	Barium	29.7	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	48900			P	
7440-47-3	Chromium	16.1			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	39.2	B		P	
7439-92-1	Lead	2.3	~~B~~	N	F	~~J~~ BJ
7439-95-4	Magnesium	6720			P	
7439-96-5	Manganese	2.2	B		P	
7439-97-6	Mercury	0.20	U	N	CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	5330	✓		P	U
7782-49-2	Selenium	2.0	U	N	F	
7440-22-4	Silver	5.1	B		P	
7440-23-5	Sodium	10200			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	16.6	B		P	

Total

RS 9/15/94

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: N/A___
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

7.26.94 ILM02.1 & 9/6/94

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

BOBNY3

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD/WE

Lab Code: ITSTU_ Case No.: WO426 SAS No.: _____ SDG No.: W0043_

Matrix (soil/water): WATER Lab Sample ID: AA7373

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

% Solids: __0.0

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

Filtered

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	40.0	U		P
7440-36-0	Antimony	50.0	U		P
7440-38-2	Arsenic	2.3	~~U~~		F → BJ as 9/16/94
7440-39-3	Barium	27.1	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	44700			P
7440-47-3	Chromium	14.8			P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	10.0	U		P
7439-92-1	Lead	2.0	U		F
7439-95-4	Magnesium	6150			P
7439-96-5	Manganese	2.0	U		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	20.0	U		P
7440-09-7	Potassium	4510	~~B~~		P → U
7782-49-2	Selenium	2.1	B		F
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	9360			P
7440-28-0	Thallium	2.0	U		F
7440-62-2	Vanadium	10.0	U		P
7440-66-6	Zinc	12.7	B		P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: N/A___

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

DISSOLVED_____

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSES DATA SHEET

BOBNY6

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD/WE

Lab Code: ITSTU_ Case No.: WO454 SAS No.: _____ SDG No.: W0043_

Matrix (soil/water): WATER Lab Sample ID: AA7801

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

% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.3	~~B~~	W	F	BJ
7440-39-3	Barium	15.3	B		P	[redacted] 4/5/94
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	43100			P	
7440-47-3	Chromium	18.3			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	78.5	B		P	
7439-92-1	Lead	2.0	~~B~~	~~W~~N	F	UJ
7439-95-4	Magnesium	7820			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U	X	CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	4720	B		P	
7782-49-2	Selenium	2.7	~~B~~	X	F	BJ
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	10500			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	28.7			P	

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: N/A___

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

RJS 9/15/94

FORM I - IN

ILM02.1

S 6/6/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBNY7

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD/WE

Lab Code: ITSTU_ Case No.: WO454 SAS No.: _____ SDG No.: W0043_

Matrix (soil/water): WATER Lab Sample ID: AA7809

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

% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	52.0	B		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.4	~~B~~	~~W~~	F	BJ
7440-39-3	Barium	15.1	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	43200			P	
7440-47-3	Chromium	14.7			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	12.3	~~B~~		P	U
7439-92-1	Lead	2.0	~~W~~	~~W~~	F	UJ
7439-95-4	Magnesium	7790			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	4730	B		P	
7782-49-2	Selenium	2.0	U		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	10400			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	5.0	U		P	

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: N/A___

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

DISSOLVED._____

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP06

Lab Name: ITAS KNOXVILLE Contract: HANFORD/WE
Lab Code: ITSTU Case No.: WO454 SAS No.: SDG No.: W0043
Matrix (soil/water): WATER Lab Sample ID: AA7797
Level (low/med): LOW Date Received: 04/29/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	44.6	B		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	U		F	
7440-39-3	Barium	13.7	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	35500			P	
7440-47-3	Chromium	10.0	U		P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	201			P	
7439-92-1	Lead	2.0	~~J~~	~~W~~N	F	UJ
7439-95-4	Magnesium	12400			P	
7439-96-5	Manganese	4.0	B		P	
7439-97-6	Mercury	0.20	U	~~W~~	CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	3660	B		P	
7782-49-2	Selenium	2.4	~~J~~	~~W~~	F	~~J~~ BJ as 9/15/94
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	11300			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	20.8	B		P	
7440-66-6	Zinc	7.2	B		P	

Total

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

Comments:

8 6/6/94

RJS 7.26.94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP07

Lab Name: ITAS KNOXVILLE Contract: HANFORD/WE
Lab Code: ITSTU Case No.: WO454 SAS No.: SDG No.: W0043
Matrix (soil/water): WATER Lab Sample ID: AA7807
Level (low/med): LOW Date Received: 04/29/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	40.0	U		P
7440-36-0	Antimony	50.0	U		P
7440-38-2	Arsenic	2.0	U		P
7440-39-3	Barium	11.6	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	30000			P
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt	10.0	U		P
7440-50-8	Copper	10.0	U		P
7439-89-6	Iron	14.7	B		P
7439-92-1	Lead	2.0	U	W	F
7439-95-4	Magnesium	10400			P
7439-96-5	Manganese	2.0	U		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	20.0	U		P
7440-09-7	Potassium	3250	B		P
7782-49-2	Selenium	2.0	U		F
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	9530			P
7440-28-0	Thallium	2.0	U		F
7440-62-2	Vanadium	16.1	B		P
7440-66-6	Zinc	5.0	U		P

Filtered

UJ SC 8/1/94

U UJ

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

Comments:
DISSOLVED.

ILM02.1

RAJ 6/6/94 726 44

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP08

Lab Name: ITAS KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: WO463 SAS No.: SDG No.: W0043
Matrix (soil/water): WATER Lab Sample ID: AA7893
Level (low/med): LOW Date Received: 04/30/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	49.7	B		P	U
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	3.5	B		F	
7440-39-3	Barium	18.7	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	34100			P	
7440-47-3	Chromium	12.4			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	65.4			P	
7439-89-6	Iron	47.7	B		P	
7439-92-1	Lead	2.0		N	F	UJ
7439-95-4	Magnesium	10100			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U	N	CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	5850			P	
7782-49-2	Selenium	2.0	U		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	20900			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	17.5	B		P	
7440-66-6	Zinc	14.8	B		P	

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

Comments:
TOTAL

RJS
9/15/94

FORM I - IN

ILM02.1

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP09

Lab Name: ITAS_KNOXVILLE Contract: HANFORD
Lab Code: ITSTU Case No.: WO463 SAS No.: SDG No.: W0043
Matrix (soil/water): WATER Lab Sample ID: AA7895
Level (low/med): LOW Date Received: 04/30/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	4.1	B		F	
7440-39-3	Barium	15.0	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	27700			P	
7440-47-3	Chromium	10.0	U		P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	16.6	B		P	
7439-92-1	Lead	2.0	~~B~~	W	F	UJ
7439-95-4	Magnesium	8200			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	4100	B		P	
7782-49-2	Selenium	2.0	U		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	17000			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	12.6	B		P	
7440-66-6	Zinc	5.0	U		P	

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

Comments:
DISSOLVED

RJS 9/16/94

FORM I - IN

ILM02.1

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP12

Lab Name: ITAS KNOXVILLE Contract: HANFORD/WE
Lab Code: ITSTU Case No.: WO454 SAS No.: SDG No.: W0043
Matrix (soil/water): WATER Lab Sample ID: AA7803
Level (low/med): LOW Date Received: 04/29/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	3.6	B	W	F	BJ
7440-39-3	Barium	10.9	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	30300			P	
7440-47-3	Chromium	10.0	U		P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	59.9	B		P	U
7439-92-1	Lead	2.0	U	W	F	UJ
7439-95-4	Magnesium	8790			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U	W	CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	4030	B		P	
7782-49-2	Selenium	2.0	U		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	17400			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	48.2			P	

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

Comments:

RJS 6/15/94

FORM I - IN

ILM02.1

6/6/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP13

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD/WE

Lab Code: ITSTU_ Case No.: WO454 SAS No.: _____ SDG No.: W0043_

Matrix (soil/water): WATER Lab Sample ID: AA7810

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

% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	50.3	B		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.9	B		F	
7440-39-3	Barium	10.8	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	31700			P	
7440-47-3	Chromium	10.0	U		P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	11.8	~~B~~		P	U
7439-92-1	Lead	2.0	~~B~~	W	F	UJ
7439-95-4	Magnesium	9190			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	4700	B		P	
7782-49-2	Selenium	2.0	U		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	18100			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	12.3	B		P	
7440-66-6	Zinc	5.0	U		P	

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: N/A___

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

DISSOLVED.

RJS 9/15/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP20

Lab Name: ITAS KNOXVILLE Contract: HANFORD/WE
Lab Code: ITSTU Case No.: WO454 SAS No.: SDG No.: W0043
Matrix (soil/water): WATER Lab Sample ID: AA7785
Level (low/med): LOW Date Received: 04/29/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	U		F	
7440-39-3	Barium	22.9	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	40200			P	
7440-47-3	Chromium	10.4			P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	24.0	~~U~~		P	U
7439-92-1	Lead	2.8	~~U~~	~~W~~N	F	BJ
7439-95-4	Magnesium	9860			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U	M	CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	3140	B		P	
7782-49-2	Selenium	2.0	U		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	7870			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	5.0	U		P	

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

Comments:

RJS
9/15/94

FORM I - IN

ILM02.1

000103

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP21

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD/WE

Lab Code: ITSTU_ Case No.: WO454 SAS No.: _____ SDG No.: W0043_

Matrix (soil/water): WATER Lab Sample ID: AA7805

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

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	U		F	
7440-39-3	Barium	24.4	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	37600			P	
7440-47-3	Chromium	10.0	U		P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	10.0	U		P	
7439-92-1	Lead	2.0	~~U~~	J	F	UJ
7439-95-4	Magnesium	9220			P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	3170	B		P	
7782-49-2	Selenium	2.0	U		F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	7240			P	
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	5.0	U		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture: N/A

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

DISSOLVED.

RS 9/15/94

FORM I - IN

ILM02.1

& 6/6/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP30

Lab Name: ITAS KNOXVILLE Contract: HANFORD/WE

Lab Code: ITSTU Case No.: WO454 SAS No.: SDG No.: W0043

Matrix (soil/water): WATER Lab Sample ID: AA7799

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

% Solids: 0.0

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

Total

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	41.4	B		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	U		F	
7440-39-3	Barium	2.0	U		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	99.3	~~B~~		P	U
7440-47-3	Chromium	10.0	U		P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	25.3	~~B~~		P	UJ
7439-92-1	Lead	3.6	/	*	F	
7439-95-4	Magnesium	30.0	U		P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U	*	CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	1000	U		P	
7782-49-2	Selenium	2.0	~~B~~	*	F	UJ
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	155	~~B~~		P	U
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	5.0	U		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture: N/A

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

000105

RJS 7-26-94

ILM02.1 8/6/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP31

Lab Name: ITAS_KNOXVILLE_____ Contract: HANFORD/WE

Lab Code: ITSTU_ Case No.: WO454 SAS No.: _____ SDG No.: W0043_

Matrix (soil/water): WATER Lab Sample ID: AA7808

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

% Solids: __0.0

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

Filtered

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	46.3	B		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	U		F	
7440-39-3	Barium	2.0	U		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	62.8	~~B~~		P	U
7440-47-3	Chromium	10.0	U		P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	16.5	~~B~~		P	U
7439-92-1	Lead	2.0	~~U~~	W	F	UJ
7439-95-4	Magnesium	30.0	U		P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	1000	U		P	
7782-49-2	Selenium	2.0	U	W	F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	242	~~B~~		P	U
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	6.1	B		P	

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: N/A___

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

DISSOLVED._____

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP42

Lab Name: ITAS KNOXVILLE Contract: HANFORD/WE

Lab Code: ITSTU Case No.: WO454 SAS No.: SDG No.: W0043

Matrix (soil/water): WATER Lab Sample ID: AA7795

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

% Solids: 0.0

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

Total

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	U		F	
7440-39-3	Barium	2.0	U		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	115	B		P	U
7440-47-3	Chromium	10.0	U		P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	10.5	B		P	U
7439-92-1	Lead	2.0	B	W	F	UJ
7439-95-4	Magnesium	30.0	U		P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U	W	CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	1000	U		P	
7782-49-2	Selenium	2.0	B		F	UJ
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	182	B		P	U
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	5.0	U		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture: N/A

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

ILM02.1

000107

RJS 7.26.94 & 6/6/94

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOBP43

Lab Name: ITAS KNOXVILLE Contract: HANFORD/WE

Lab Code: ITSTU Case No.: WO454 SAS No.: SDG No.: W0043

Matrix (soil/water): WATER Lab Sample ID: AA7806

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

% Solids: 0.0

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

Filtered

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.0	U		P	
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	2.0	U		F	
7440-39-3	Barium	2.0	U		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	5.0	U		P	
7440-70-2	Calcium	78.2	B		P	4
7440-47-3	Chromium	10.0	U		P	
7440-48-4	Cobalt	10.0	U		P	
7440-50-8	Copper	10.0	U		P	
7439-89-6	Iron	10.0	U		P	
7439-92-1	Lead	2.0	U		F	
7439-95-4	Magnesium	30.0	U		P	
7439-96-5	Manganese	2.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	20.0	U		P	
7440-09-7	Potassium	1000	U		P	
7782-49-2	Selenium	2.0	U	W	F	
7440-22-4	Silver	5.0	U		P	
7440-23-5	Sodium	140	B		P	4
7440-28-0	Thallium	2.0	U		F	
7440-62-2	Vanadium	10.0	U		P	
7440-66-6	Zinc	5.0	U		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture: N/A

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

DISSOLVED.

RJS 7-26-94

APPENDIX C

GENERAL CHEMISTRY SUMMARY TABLES

WET CHEMISTRY/ANIONS ANALYSIS, WATER MATRIX, (mg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B0BP28																				
Sample Number		B0BP28																			
Location		6-63-90																			
Remarks		SPLIT																			
Sample Date		04/26/94																			
Wet Chemistry Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Fluoride	300.0	0.20																			
pH (pH units)	9040	7.9	J																		
Sulfate	300.0	29.0																			
Specific Conductivity (umho/cm)	120.1	307																			

0061122

0061122

WET CHEMISTRY/ANIONS ANALYSIS, WATER MATRIX, (mg/L)

Project: WESTINGHOUSE-HANFORD
Laboratory: IT
Case | SDG: W0031

Sample Number		B0BNX2		B0BNX6		B0BNY0		B0BNY2		B0BNZ2		B0BNZ4		B0BP14		B0BP16		B0BP18		B0BP22	
Location		1-B2-12		1-B3-1		1-B3-47		1-B4-1		1-B4-9		1-B5-1		6-67-86		6-71-77		6-72-73		1-B5-1	
Remarks																				DUP	
Sample Date		04/12/94		04/13/94		04/13/94		04/21/94		04/15/94		04/15/94		04/19/94		04/19/94		04/19/94		04/15/94	
Wet Chemistry Analytes	**Method**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
Fluoride	300.0	0.50		0.40	U	0.40	U	0.40	U	0.40	U	0.40	U	0.40	U	0.40	U	0.40	U	0.40	U
Sulfate	300.0	10.80		52		50.20		47		49		25		33		30		23		25	
pH	9040	7.87	J	7.61	J	8.16	J	7.91	J	7.9		7.4	J	7.82	J	7.84	J	7.78	J	7.4	J
Specific Conductivity (umhos/cm)	120.1	270		430		388		371		436		304		357		378		350		307	

DUP = Duplicate

9613501.0808

00011

WET CHEMISTRY/ANIONS ANALYSIS, WATER MATRIX, (mg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: IT																					
Case	SDG: W0031																				
Sample Number		B0BP24																			
Location		6-72-73																			
Remarks		DUP																			
Sample Date		04/19/94																			
Wet Chemistry Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Fluoride	300.0	0.40	U																		
Sulfate	300.0	23																			
pH	9040	7.81	J																		
Specific Conductivity (umhos/cm)	120.1	350																			

00112

DUP = Duplicate

WET CHEMISTRY/ANIONS ANALYSIS, WATER MATRIX, (mg/L)

Project: WESTINGHOUSE–HANFORD
Laboratory: IT
Case | SDG: W0040

Sample Number		B0BNY4		B0BNY8		B0BNZ0		B0BNZ6		B0BNZ8	
Location		1–B4–4		1–B4–7		1–B4–8		1–B5–2		1–B8–6	
Remarks											
Sample Date		04/21/94		04/25/94		04/22/94		04/22/94		04/22/94	
Wet Chemistry Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
pH	9040	7.92	J	7.99	J	8.32	J	8.18	J	7.91	J
Specific Conductance	120.1	442		435		457		442		323	
Fluoride	300.0	0.40	U	0.40	U	0.40	U	0.40	U	0.40	U
Sulfate	300.0	53		51		50		50		27	

Sample Number		B0BP00		B0BP02		B0BP04		B0BP10		B0BP26	
Location		1–B9–1		1–B9–2		1–B9–3		6–65–83		1–B4–4	
Remarks										SPLIT	
Sample Date		04/21/94		04/21/94		04/22/94		04/21/94		04/21/94	
Wet Chemistry Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
pH	9040	7.97	J	7.78	J	8.01	J	7.98	J	7.98	J
Specific Conductance	120.1	437		545		4.00		378		444	
Fluoride	300.0	0.40	U	0.40	U	0.40	U	0.40	U	0.40	U
Sulfate	300.0	45		82		45		33		52	

WET CHEMISTRY/ANIONS ANALYSIS, WATER MATRIX, (mg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: IT																					
Case	SDG: W0043																				
Sample Number		B0BNX4		B0BNX8		B0BNY6		B0BP06		B0BP08		B0BP12		B0BP20		B0BP30		B0BP42			
Location		1-B2-13		1-B3-46		1-B4-5		6-63-90		6-65-72		6-66-64		6-72-92		6-72-92		6-72-92			
Remarks																EB		EB			
Sample Date		04/18/94		04/13/94		04/25/94		04/26/94		04/27/94		04/25/94		04/26/94		04/26/94		04/26/94			
Wet Chemistry Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Fluoride	300.0	0.40	U	0.46		0.40	U	0.40	U	0.70		0.50		0.40	U	0.40	U	0.40	U		
Sulfate	300.0	41		45		46		27		34		39		38		1.5	U	1.5	U		
pH	9040	7.65	J	8.0	J	8.02	J	8.02	J	7.71	J	8.09	J	8.08	J	6.53	J	6.16	J		
Specific Conductivity (umhos/cm)	120.1	405.0		1.0	U	427		2.0		405		427		394		2.0		350			

00114

EB = Equipment Blank

APPENDIX D

GENERAL CHEMISTRY VALIDATED LABORATORY REPORT FORMS

9613501.0813

TMA Inc. REPORT Work Order # A4-04-082

Received: 04/29/94 Results by Sample

SAMPLE ID B0BP28 FRACTION 01A TEST CODE WCCLPL NAME Anions & Wet Chem.

Date & Time Collected 04/26/94 Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300.0	0.2	mg/L	0.1
pH	9040 J	7.9	pH	0.1
Sulfate	300.0	29	mg/L	1
~~Specific~~ ~~Elect~~. Conductivity	120.1	307	umho/cm	6

8/1/94 SC

FORM I

8/1/94 SC

SPECIFIC CONDUCTANCE ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0031
Contract Name:	Westinghouse Hanford	Job Number:	386
Sample Matrix:	Water	Extraction Date:	N/A
Concentration Units:	umhos/cm	Analysis Date:	04/27/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	P6154	1	U
BOBNZ4	AA7100	304	+
BOBNP22	AA7102	307	+
BOBNZ2	AA6880	436	+

RJS 9/15/94

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

SPECIFIC CONDUCTANCE ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0031
Contract Name:	Westinghouse Hanford	Job Number:	420
Sample Matrix:	Water	Extraction Date:	N/A
Concentration Units:	umhos/cm	Analysis Date:	04/27/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	P6154	1	U
BOBP16	AA7331	378	+
BOBP18	AA7312	350	+
BOBP24	AA7328	350	+
BOBP14	AA7325	357	+

RFS 4/15/94

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

SPECIFIC CONDUCTANCE ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0031
Contract Name:	Westinghouse Hanford	Job Number:	426
Sample Matrix:	Water	Extraction Date:	N/A
Concentration Units:	umhos/cm	Analysis Date:	04/27/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	P6155	1	U
BOBNY2	AA7372	371	+

RJS 9/15/94

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

SPECIFIC CONDUCTANCE ANALYSIS

DEA 7-7-94

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0031
Contract Name:	Westinghouse Hanford	Job Number:	363
Sample Matrix:	Water	Extraction Date:	N/A
Concentration Units:	umhos/cm	Analysis Date:	06/22/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	P6336	1	U
BOBNX6	AA6511	430	+

RFS 9/15/94

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

SPECIFIC CONDUCTANCE ANALYSIS

7/20/94

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0031
Contract Name:	Westinghouse Hanford	Job Number:	363
Sample Matrix:	Water	Extraction Date:	N/A
Concentration Units:	umhos/cm	Analysis Date:	07/19/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	P6385	1	U
BOBNY0	AA6514	388	+
BOBNX2	AA6517	270	+

9/15/94

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

pH ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0031
Contract Name:	Westinghouse Hanford	Job Number:	386
Sample Matrix:	Water	Extraction Date:	N/A
Concentration Units:	standard units	Analysis Date:	04/26/94

Client Sample ID	Lab Sample ID	Result
Method Blank	*	*
BOBNZ4	AA7100	7.4 J
BOBNP22	AA7102	7.4 J
BOBNZ2	AA6880	7.9 J

9/15/94 RFS

* - A method blank is not applicable for this analysis.

pH ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0031
Contract Name:	Westinghouse Hanford	Job Number:	420
Sample Matrix:	Water	Extraction Date:	N/A
Concentration Units:	standard units	Analysis Date:	04/26/94

Client Sample ID	Lab Sample ID	Result
Method Blank	*	*
BOBP16	AA7331	7.84 J
BOBP18	AA7312	7.78 J
BOBP24	AA7328	7.81 J
BOBP14	AA7325	7.82 J

9/15/94
RSS

* - A method blank is not applicable for this analysis.

pH ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0031
Contract Name:	Westinghouse Hanford	Job Number:	426
Sample Matrix:	Water	Extraction Date:	N/A
Concentration Units:	standard units	Analysis Date:	04/26/94

Client Sample ID	Lab Sample ID	Result
Method Blank	*	*
BOBNY2	AA7372	7.91 J

9/15/94 RJS

* - A method blank is not applicable for this analysis.

0002660A
Dea 7 7

9613501.0822

pH ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0031
Contract Name:	Westinghouse Hanford	Job Number:	363
Sample Matrix:	Water	Extraction Date:	N/A
Concentration Units:	standard units	Analysis Date:	06/22/94

Client Sample ID	Lab Sample ID	Result
Method Blank	*	*
BOBNX6	AA6511	7.61 J

RJJ 9/15/94

000125

* - A method blank is not applicable for this analysis.

pH ANALYSIS

DSa 7-20-94

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0031
Contract Name:	Westinghouse Hanford	Job Number:	363
Sample Matrix:	Water	Extraction Date:	N/A
Concentration Units:	standard units	Analysis Date:	07/19/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	*	-	-
BOBNY0	AA6514	8.16 J	-
BOBNX2	AA6517	7.87 J	-

RFS 9/10/94

* - A method blank is not applicable for this analysis.

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0031
Contract Name:	Westinghouse Hanford	Job Number:	420
Client Sample ID:	BOBP16	Preparation Date:	05/16/94
Lab Sample ID:	AA7331	Analysis Date:	05/16/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.4	U	0.4
sulfate	30	+	1.5

RTS 9/16/94

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

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0031
Contract Name:	Westinghouse Hanford	Job Number:	386
Client Sample ID:	BOBNZ2	Preparation Date:	05/13/94
Lab Sample ID:	AA6880	Analysis Date:	05/13/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.4	U	0.4
sulfate	49	+	7.5

RJS 9/16/94

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

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0031
Contract Name:	Westinghouse Hanford	Job Number:	386
Client Sample ID:	BOBNZ4	Preparation Date:	05/13/94
Lab Sample ID:	AA7100	Analysis Date:	05/13/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.4	U	0.4
sulfate	25	+	1.5

RJS 9/16/94

+ - Positive result.

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

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0031
Contract Name:	Westinghouse Hanford	Job Number:	386
Client Sample ID:	BOBP22	Preparation Date:	05/13/94
Lab Sample ID:	AA7102	Analysis Date:	05/13/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.4	U	0.4
sulfate	25	+	1.5

RS 9/16/94

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

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0031
Contract Name:	Westinghouse Hanford	Job Number:	426
Client Sample ID:	BOBNY2	Preparation Date:	05/17/94
Lab Sample ID:	AA7372	Analysis Date:	05/17/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.4	U	0.4
sulfate	47	+	7.5

RTS 9/16/94

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

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0031
Contract Name:	Westinghouse Hanford	Job Number:	420
Client Sample ID:	BOBP24	Preparation Date:	05/16/94
Lab Sample ID:	AA7328	Analysis Date:	05/16/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.4	U	0.4
sulfate	23	+	1.5

RJS 9/16/94

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

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0031
Contract Name:	Westinghouse Hanford	Job Number:	420
Client Sample ID:	BOBP14	Preparation Date:	05/16/94
Lab Sample ID:	AA7325	Analysis Date:	05/16/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.4	U	0.4
sulfate	33	+	3.0

RJS 9/10/94

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

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0031
Contract Name:	Westinghouse Hanford	Job Number:	420
Client Sample ID:	BOBP18	Preparation Date:	05/16/94
Lab Sample ID:	AA7312	Analysis Date:	05/16/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.4	+	0.4
sulfate	23	+	1.5

RDS 6/10/94

+ - Positive result.

ANION ANALYSIS

DRA 7-7-94

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0031
Contract Name:	Westinghouse Hanford	Job Number:	363
Client Sample ID:	BOBNY0	Preparation Date:	05/11/94
Lab Sample ID:	AA6514	Analysis Date:	05/11/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.4	U	0.4
sulfate	50.2	+	1.5

RJS 9/15/94

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

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0031
Contract Name:	Westinghouse Hanford	Job Number:	363
Client Sample ID:	BOBNX6	Preparation Date:	05/11/94
Lab Sample ID:	AA6511	Analysis Date:	05/11/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.4	U	0.4
sulfate	52	+	3.0

RFS 9/15/94

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

Pages
137-148
Not included

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0040
Contract Name:	Westinghouse Hanford	Job Number:	437
Client Sample ID:	BOBP04	Preparation Date:	05/18/94
Lab Sample ID:	AA7552	Analysis Date:	05/18/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.40	U	0.40
sulfate	45	+	7.5

RJS
9/15/94

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

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0040
Contract Name:	Westinghouse Hanford	Job Number:	437
Client Sample ID:	BOBNZ6	Preparation Date:	05/18/94
Lab Sample ID:	AA7554	Analysis Date:	05/18/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.40	U	0.40
sulfate	50	+	7.5

RJS
9/15/94

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

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0040
Contract Name:	Westinghouse Hanford	Job Number:	437
Client Sample ID:	BOBNZ8	Preparation Date:	05/18/94
Lab Sample ID:	AA7556	Analysis Date:	05/18/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.40	U	0.40
sulfate	27	+	3.0

9/15/94

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

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0040
Contract Name:	Westinghouse Hanford	Job Number:	437
Client Sample ID:	BOBNZ0	Preparation Date:	05/18/94
Lab Sample ID:	AA7558	Analysis Date:	05/18/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.40	U	0.40
sulfate	50	+	7.5

RJS
9/15/94

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

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0040
Contract Name:	Westinghouse Hanford	Job Number:	453
Client Sample ID:	BOBNY8	Preparation Date:	05/18/94
Lab Sample ID:	AA7726	Analysis Date:	05/18/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.40	U	0.40
sulfate	51	+	7.5

RJS
9/15/94

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

pH ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0043
Contract Name:	Westinghouse Hanford	Job Number:	383
Sample Matrix:	Water	Extraction Date:	N/A
Concentration Units:	standard units	Analysis Date:	05/10/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	*	-	-
BOBNX8	AA6809	8.0 J	-

9/15/94 RJS

* - A method blank is not applicable for this analysis.

pH ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0043
Contract Name:	Westinghouse Hanford	Job Number:	417
Sample Matrix:	Water	Extraction Date:	N/A
Concentration Units:	standard units	Analysis Date:	04/26/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	*	-	-
BOBNX4	AA7285	7.65 J	-

9/15/94
RJC

* - A method blank is not applicable for this analysis.

pH ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0043
Contract Name:	Westinghouse Hanford	Job Number:	454
Sample Matrix:	Water	Extraction Date:	N/A
Concentration Units:	standard units	Analysis Date:	05/03/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	*	-	-
BOBNY6	AA7802	8.02 J	-
BOBP12	AA7804	8.09 J	-
BOBP06	AA7798	8.02 J	-
BOBP20	AA7786	8.08 J	-
BOBP30	AA7800	6.53 J	-
BOBP42	AA7796	6.16 J	-

RJS 9/15/94

* - A method blank is not applicable for this analysis.

pH ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0043
Contract Name:	Westinghouse Hanford	Job Number:	463
Sample Matrix:	Water	Extraction Date:	N/A
Concentration Units:	standard units	Analysis Date:	05/06/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	*	-	-
BOBP08	AA7894	7.71 J	-

RJS 9/15/94

* - A method blank is not applicable for this analysis.

SPECIFIC CONDUCTANCE ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0043
Contract Name:	Westinghouse Hanford	Job Number:	383
Sample Matrix:	Water	Extraction Date:	N/A
Concentration Units:	umhos/cm	Analysis Date:	05/10/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	P6190	1	U
BOBNX8	AA6809	1	U

9/15/94
RJS

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

SPECIFIC CONDUCTANCE ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0043
Contract Name:	Westinghouse Hanford	Job Number:	417
Sample Matrix:	Water	Extraction Date:	N/A
Concentration Units:	umhos/cm	Analysis Date:	04/27/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	P6154	1	U
BOBNX4	AA7285	405	+

9/15/94
RJS

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

SPECIFIC CONDUCTANCE ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0043
Contract Name:	Westinghouse Hanford	Job Number:	454
Sample Matrix:	Water	Extraction Date:	N/A
Concentration Units:	umhos/cm	Analysis Date:	05/02/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	P6133	1	U
BOBNY6	AA7802	427	+
BOBP12	AA7804	427	+
BOBP20	AA7786	394	+
BOBP06	AA7798	2	+
BOBP30	AA7800	2	+
BOBP42	AA7796	350	+

RJS 9/15/94

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

SPECIFIC CONDUCTANCE ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0043
Contract Name:	Westinghouse Hanford	Job Number:	463
Sample Matrix:	Water	Extraction Date:	N/A
Concentration Units:	umhos/cm	Analysis Date:	05/04/94

Client Sample ID	Lab Sample ID	Result	Qualifiers
Method Blank	P6151	1	U
BOBP08	AA7894	405	+

RJS 9/15/94

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

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0043
Contract Name:	Westinghouse Hanford	Job Number:	463
Client Sample ID:	BOBP08	Preparation Date:	05/19/94
Lab Sample ID:	AA7894	Analysis Date:	05/19/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.70	+	0.40
sulfate	34	+	3.0

RJS
9/15/94

+ - Positive result.

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0043
Contract Name:	Westinghouse Hanford	Job Number:	454
Client Sample ID:	BOBP20	Preparation Date:	05/19/94
Lab Sample ID:	AA7786	Analysis Date:	05/19/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.40	U	0.40
sulfate	38	+	7.5

RJS
9/15/94

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

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0043
Contract Name:	Westinghouse Hanford	Job Number:	454
Client Sample ID:	BOBP12	Preparation Date:	05/18/94
Lab Sample ID:	AA7804	Analysis Date:	05/18/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.5	+	0.40
sulfate	39	+	7.5

RJS
9/15/94

+ - Positive result.

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0043
Contract Name:	Westinghouse Hanford	Job Number:	454
Client Sample ID:	BOBNY6	Preparation Date:	05/18/94
Lab Sample ID:	AA7802	Analysis Date:	05/18/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.40	U	0.40
sulfate	46	+	7.5

RJS
9/15/94

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

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0043
Contract Name:	Westinghouse Hanford	Job Number:	454
Client Sample ID:	BOBP30	Preparation Date:	05/18/94
Lab Sample ID:	AA7800	Analysis Date:	05/18/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.40	U	0.40
sulfate	1.5	U	1.5

RJS
7/15/94

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

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0043
Contract Name:	Westinghouse Hanford	Job Number:	454
Client Sample ID:	BOBP06	Preparation Date:	05/18/94
Lab Sample ID:	AA7798	Analysis Date:	05/18/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.40	U	0.40
sulfate	27	+	1.5

RJS
9/15/94

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

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0043
Contract Name:	Westinghouse Hanford	Job Number:	454
Client Sample ID:	BOBP42	Preparation Date:	05/18/94
Lab Sample ID:	AA7796	Analysis Date:	05/18/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.40	U	0.40
sulfate	1.5	U	1.5

RJS
9/15/94

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

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0043
Contract Name:	Westinghouse Hanford	Job Number:	417
Client Sample ID:	BOBNX4	Preparation Date:	05/16/94
Lab Sample ID:	AA7285	Analysis Date:	05/16/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.40	U	0.40
sulfate	41	+	7.5

R=5
9/16/94

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

ANION ANALYSIS

Laboratory Name:	ITAS-Knoxville	SDG Number:	W0043
Contract Name:	Westinghouse Hanford	Job Number:	383
Client Sample ID:	BOBNX8	Preparation Date:	05/11/94
Lab Sample ID:	AA6809	Analysis Date:	05/11/94
Sample Matrix:	Water	Concentration Units:	mg/l

Compound	Result	Qualifier	Detection Limit
fluoride	0.46	+	0.40
sulfate	45	+	3.0

RJS
9/16/94

+ - Positive result.

APPENDIX E

RADIOCHEMISTRY SUMMARY TABLES

RADIOCHEMISTRY ANALYSIS, WATER MATRIX, (pCi/L + - 2 standard deviations)

Project: WESTINGHOUSE-HANFORD																				
Laboratory: TMA																				
Case / SDG: B0BP28																				
Sample Number	B0BP28																			
Location	6-63-90																			
Remarks	Split																			
Sample Date	04/26/94																			
Radiochemistry Analysis	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha	0.77	U																		
Gross Beta	4.0																			
Tritium	4.3	U																		
Carbon-14	-15	U																		
Strontium-90	0.18	U																		
Technetium-99	1.1	UJ																		

RADIOCHEMISTRY ANALYSIS, WATER MATRIX, (pCi/L+ −2 standard deviations)

Project: WESTINGHOUSE−HANFORD
Laboratory: TMA
Case | SDG: W0031

Sample Number	B0BNX2		B0BNX6		B0BNY0		B0BNZ2		B0BNZ4		B0BP14		B0BP16		B0BP18		B0BP22		B0BP24	
Location	1−B2−12		1−B3−1		1−B3−47		1−B4−9		1−B5−1		6−67−86		6−71−77		6−72−73		1−B5−1		6−72−73	
Remarks																	DUP		DUP	
Sample Date	04/12/94		04/13/94		04/13/94		04/15/94		04/15/94		04/19/94		04/19/94		04/19/94		04/15/94		04/19/94	
Radiochemistry Analysis	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha	1.89		1.94		2.72		1.51	U	−0.0335	U	0.776	U	0.686	U	1.84		1.24	U	1.70	
Gross Beta	9.29		126		65.7		73.7		12.4		7.29		19.9		27.7		15.4		27.6	
Tritium	−17.4	UR	3550	R	6130	R	3370	R	1240	R	337	R	2330	R	2350	R	1080	R	2570	R
Carbon−14	−1.22	U	0.0225	U	2.66	U	4.32		1.31	U	−0.721	U	−0.563	U	−2.68	U	5.59		1.35	U
Strontium−90	−0.170	U	38.8		19.2		19.8		0.481	U	−0.131	U	−0.0224	U	−0.00955	U	0.936	U	−0.152	U
Technetium−99	−0.701	U	84.4		52.7		53.2		30.4		1.91	U	31.0		70.7		28.5		92.9	

000173

9413501.0859

DUP = Duplicate

RADIOCHEMISTRY ANALYSIS, WATER MATRIX, (pCi/L + −2 standard deviations)

Project: WESTINGHOUSE−HANFORD																				
Laboratory: TMA																				
Case	SDG: W0040																			
Sample Number	B0BNY4		B0BNY8		B0BNZ0		B0BNZ6		B0BNZ8		B0BP00		B0BP02		B0BP04		B0BP10		B0BP26	
Location	1−B4−4		1−B4−7		1−B4−8		1−B5−2		1−B8−6		1−B9−1		1−B9−2		1−B9−3		6−65−83		1−B4−4	
Remarks																				
Sample Date	04/21/94		04/25/94		04/22/94		04/22/94		04/22/94		04/21/94		04/21/94		04/22/94		04/21/94		04/21/94	
Radiochemistry Analysis	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha	0.716	U	1.49		0.810	U	0.894	U	0.657	U	0.727	U	0.295	U	1.68		0.650	U	1.11	
Gross Beta	78.8		32.5		25.2		55.2		13.0		15.7		16.4		20.1		11.2		78.1	
Tritium	2910		2470		3300		6440		1520		1760		2580		2400		927.0		2950	
Carbon−14	0.0450	U	1.96	U	1.28	U	0.0450	U	0.878	U	1.01	U	0.721	U	−0.0225	U	−1.26	U	0.766	U
Strontium−90	26.6		5.31		1.30		14.6		−0.0374	U	0.862	U	−0.0431	U	0.343	U	−0.0986	U	28.2	
Technetium−99	60.3		57.7		69.4		66.9		32.1		35.4		45.9		52.9		7.79		60.4	

RADIOCHEMISTRY ANALYSIS, WATER MATRIX, (pCi/L+-2 standard deviations)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: W0043																				
Sample Number	B0BNX4		B0BNX8		B0BNY2		B0BNY6		B0BP06		B0BP08		B0BP12		B0BP20		B0BP30		B0BP42		
Location	1-B2-13		1-B3-46		1-B4-1		1-B4-5		6-63-90		6-65-72		6-66-64		6-72-92		6-72-92		6-72-92		
Remarks																	EB		EB		
Sample Date	04/18/94		04/13/94		04/21/94		04/25/94		04/24/94		04/27/94		04/25/94		04/26/94		04/26/94		04/26/94		
Radiochemistry Analysis	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
Gross Alpha	0.742	U	1.26	U	1.43		0.746	U	1.84		2.56		1.54		0.533	U	0.0608	U	0.168	U	
Gross Beta	7.13		143		59.6		33.7		5.46		10.2		50.5		1.88	U	0.657	U	1.71	U	
Tritium	13600	R	4750	R	2860	R	2430	R	83.9	UR	26200	R	5510	R	1010	R	80.0	UR	9.64	UR	
Carbon-14	1.80	U	1.55	U	-1.82	U	0.338	U	-1.91	U	-1.19	U	0.0451	U	1.89	U	-1.44	U	-0.608	U	
Strontium-90	-0.118	U	56.7		17.1		4.85		-0.201	U	-0.200	U	0.0459	U	0.287	U	-0.0872	U	0.323	U	
Technetium-99	12.5		98.9		66.2		60.9		1.81	U	23.8		182		2.05	U	2.09	U	2.66		

EB = Equipment Blank

APPENDIX F

RADIOCHEMISTRY VALIDATED LABORATORY REPORT FORMS

N404114-01

TMA NORCAL

SAMPLE DELIVERY GROUP 7371

DATA SHEET

BOBP28

SDG 7371 Client Westinghouse Hanford

Contact N. Joseph Verville Contract MBH-SVV-069262

Lab sample id N404114-01 Client sample id BOBP28

Dept sample id 7371-001 Location/Matrix 100-BC-5 LIQUID

Received 04/29/94 Collected 04/26/94

Chain of custody id EFL-1036

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	Alpha	0.77	1.2	2	3	U	80A
Gross Beta	Beta	4.0	1.3	2	4		80B
Tritium	10028-17-8	4.3	160	300	400	U	H
Carbon 14	14762-75-5	-15	33	60	100	U	C
Strontium 90	10098-97-2	0.18	0.31	0.8	2	U	Y
Technetium 99	14133-76-7	1.1	1.9	7	5	UJ [1]	TC

1. Low Chemical Yield (24.9%)

RJS 7.11.94

000177

DATA SHEETS
Page 1
SUMMARY DATA SECTION
Page 12

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.30
Report date 06/24/94

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND
SDG NO.: W0031
LAB SAMPLE ID: 40426001
MATRIX: WATER
WHC ID: B0BNX6
DATE RECEIVED: 4/14/94
REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER
ALPHA	1.94E+00	1.30E+00	1.32E+00	1	RD3222
BETA	1.26E+02	7.90E+00	1.19E+01	1	RD3222
TOTAL-SR	3.88E+01	1.59E+00	9.01E+00	0.555	RD3204
C-14	2.25E-02	1.57E+00	3.35E+00	1	RD3263
TC-99	8.44E+01	1.90E+00	1.24E+01	0.951	ITAS-IT-RD-0001
TRITIUM	3.55E+03	1.97E+02	4.41E+02	0.94	RD3205

LAB SAMPLE ID: 40426002
MATRIX: WATER
WHC ID: B0BNY0
DATE RECEIVED: 4/14/94
REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER
ALPHA	2.72E+00	1.47E+00	1.52E+00	1	RD3222
BETA	6.57E+01	5.81E+00	7.43E+00	1	RD3222
TOTAL-SR	1.92E+01	1.10E+00	4.58E+00	0.604	RD3204
C-14	2.66E+00	1.62E+00	3.42E+00	1	RD3263
TC-99	5.27E+01	1.60E+00	9.07E+00	0.951	ITAS-IT-RD-0001
TRITIUM	6.13E+03	2.41E+02	6.19E+02	0.94	RD3205

1. Samples not analyzed within 7 days of distillation, (R, UR)

RTS
9/15/94

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0031

LAB SAMPLE ID: 40426003 MATRIX: WATER

WHC ID: B0BNX2 DATE RECEIVED: 4/14/94

REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER	
ALPHA	1.89E+00	1.27E+00	1.29E+00	1	RD3222	
BETA	9.29E+00	2.75E+00	2.82E+00	1	RD3222	
TOTAL-SR	-1.70E-01	4.74E-01	4.76E-01	0.394	RD3204	U
C-14	-1.22E+00	1.56E+00	3.32E+00	1	RD3263	U
TC-99	-7.01E-01	9.12E-01	4.10E+00	0.951	ITAS-IT-RD-0001	U
TRITIUM	-1.74E+01	1.11E+02	2.21E+02	0.94	RD3205	U

LAB SAMPLE ID: 40432301 MATRIX: WATER

WHC ID: B0BNZ2 DATE RECEIVED: 4/18/94

REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER	
ALPHA	1.51E+00	1.21E+00	1.22E+00	1	RD3222	U
BETA	7.37E+01	6.16E+00	8.07E+00	1	RD3222	
TOTAL-SR	1.98E+01	1.23E+00	4.63E+00	0.498	RD3204	
C-14	4.32E+00	1.64E+00	3.47E+00	1	RD3263	
TC-99	5.32E+01	1.59E+00	9.12E+00	0.951	ITAS-IT-RD-0001	
TRITIUM	3.37E+03	1.94E+02	4.29E+02	0.94	RD3205	F

1. Samples not analyzed within 7 days of distillation (R, UR)

000179

RJS
9/15/94

0003

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND
SDG NO.: W0031
LAB SAMPLE ID: 40432302
MATRIX: WATER
WHC ID: B0BNZ4
DATE RECEIVED: 4/18/94
REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER	
ALPHA	-3.35E-02	4.99E-01	4.99E-01	1	RD3222	U
BETA	1.24E+01	3.01E+00	3.13E+00	1	RD3222	
TOTAL-SR	4.81E-01	4.36E-01	4.49E-01	0.5	RD3204	U
C-14	1.31E+00	1.59E+00	3.38E+00	1	RD3263	U
TC-99	3.04E+01	1.36E+00	6.84E+00	0.951	ITAS-IT-RD-0001	
TRITIUM	1.24E+03	1.47E+02	2.91E+02	0.94	RD3205	R[1]

LAB SAMPLE ID: 40432303
MATRIX: WATER
WHC ID: B0BP22
DATE RECEIVED: 4/18/94
REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER	
ALPHA	1.24E+00	1.00E+00	1.01E+00	1	RD3222	U
BETA	1.54E+01	3.16E+00	3.34E+00	1	RD3222	
TOTAL-SR	9.36E-01	5.33E-01	5.71E-01	0.39	RD3204	U
C-14	5.59E+00	1.66E+00	3.50E+00	1	RD3263	
TC-99	2.85E+01	1.33E+00	6.66E+00	0.951	ITAS-IT-RD-0001	
TRITIUM	1.08E+03	1.43E+02	2.81E+02	0.94	RD3205	R[1]

1. Samples not analyzed within 7 days of distillation (R, UR)

RTS
9/15/94

9613501.0867

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0031

LAB SAMPLE ID: 40440501 MATRIX: WATER

WHC ID: B0BP18 DATE RECEIVED: 4/21/94

REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER	
ALPHA	1.84E+00	1.23E+00	1.25E+00	1	RD3222	
BETA	2.77E+01	3.98E+00	4.43E+00	1	RD3222	
TOTAL-SR	-9.55E-03	2.20E-01	2.20E-01	0.984	RD3204	U
C-14	-2.68E+00	1.53E+00	3.28E+00	1	RD3263	U
TC-99	7.07E+01	1.79E+00	1.09E+01	0.951	ITAS-IT-RD-0001	
TRITIUM	2.35E+03	1.74E+02	3.61E+02	0.94	RD3205	R

LAB SAMPLE ID: 40440502 MATRIX: WATER

WHC ID: B0BP14 DATE RECEIVED: 4/21/94

REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER	
ALPHA	7.76E-01	8.96E-01	9.02E-01	1	RD3222	U
BETA	7.29E+00	2.55E+00	2.60E+00	1	RD3222	
TOTAL-SR	-1.31E-01	2.06E-01	2.09E-01	1	RD3204	U
C-14	-7.21E-01	1.56E+00	3.33E+00	1	RD3263	U
TC-99	1.91E+00	9.56E-01	4.30E+00	0.951	ITAS-IT-RD-0001	U
TRITIUM	3.37E+02	1.22E+02	2.39E+02	0.94	RD3205	R

1. Samples not ~~00181~~ within 7 days of distillation, (R, UR

RJS 9/15/9
00:00

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND
SDG NO.: W0040
LAB SAMPLE ID: 40443201
MATRIX: WATER
WHC ID: B0BP10
DATE RECEIVED: 4/22/94
REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
ALPHA	6.50E-01	6.78E-01	6.83E-01	1.23E+00	1	RD3222 U
BETA	1.12E+01	2.05E+00	2.19E+00	2.81E+00	1	RD3222
TOTAL-SR	-9.86E-02	2.39E-01	2.41E-01	7.48E-01	1	RD3204 U
C-14	-1.26E+00	1.52E+00	3.22E+00	3.62E+00	1	RD3263 U
TC-99	7.79E+00	1.05E+00	4.75E+00	2.15E+00	0.951	ITAS-IT-RS-0001
TRITIUM	9.27E+02	1.34E+02	2.57E+02	2.49E+02	0.94	RD3205

LAB SAMPLE ID: 40443202
MATRIX: WATER
WHC ID: B0BP00
DATE RECEIVED: 4/22/94
REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
ALPHA	7.27E-01	6.73E-01	6.79E-01	1.13E+00	1	RD3222 U
BETA	1.57E+01	2.35E+00	2.60E+00	3.03E+00	1	RD3222
TOTAL-SR	8.62E-01	3.82E-01	4.38E-01	8.29E-01	0.88	RD3204
C-14	1.01E+00	1.56E+00	3.28E+00	3.62E+00	1	RD3263 U
TC-99	3.54E+01	1.46E+00	7.33E+00	2.15E+00	0.951	ITAS-IT-RS-0001
TRITIUM	1.76E+03	1.55E+02	3.08E+02	2.49E+02	0.94	RD3205

RJS 7/20/94

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0031

LAB SAMPLE ID: 40432302 MATRIX: WATER

WHC ID: B0BNZ4 DATE RECEIVED: 4/18/94

REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER	
ALPHA	-3.35E-02	4.99E-01	4.99E-01	1	RD3222	U
BETA	1.24E+01	3.01E+00	3.13E+00	1	RD3222	
TOTAL-SR	4.81E-01	4.36E-01	4.49E-01	0.5	RD3204	U
C-14	1.31E+00	1.59E+00	3.38E+00	1	RD3263	U
TC-99	3.04E+01	1.36E+00	6.84E+00	0.951	ITAS-IT-RD-0001	
TRITIUM	1.24E+03	1.47E+02	2.91E+02	0.94	RD3205	

LAB SAMPLE ID: 40432303 MATRIX: WATER

WHC ID: B0BP22 DATE RECEIVED: 4/18/94

REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	YIELD	METHOD NUMBER	
ALPHA	1.24E+00	1.00E+00	1.01E+00	1	RD3222	
BETA	1.54E+01	3.16E+00	3.34E+00	1	RD3222	
TOTAL-SR	9.36E-01	5.33E-01	5.71E-01	0.39	RD3204	
C-14	5.59E+00	1.66E+00	3.50E+00	1	RD3263	
TC-99	2.85E+01	1.33E+00	6.66E+00	0.951	ITAS-IT-RD-0001	
TRITIUM	1.08E+03	1.43E+02	2.81E+02	0.94	RD3205	

1. Samples not analyzed within 7 days of distillation (R, UR)

[redacted]
000183

RJS
9/15/94

0003
682A-6-9

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG NO.: W0040

LAB SAMPLE ID: 40443203 MATRIX: WATER

WHC ID: B0BNY4 DATE RECEIVED: 4/22/94

REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
ALPHA	7.16E-01	6.82E-01	6.88E-01	1.17E+00	1	RD3222 U
BETA	7.88E+01	4.49E+00	7.15E+00	2.89E+00	1	RD3222
TOTAL-SR	2.66E+01	1.58E+00	6.51E+00	9.75E-01	0.703	RD3204
C-14	4.50E-02	1.54E+00	3.25E+00	3.62E+00	1	RD3263 U
TC-99	6.03E+01	1.68E+00	9.85E+00	2.15E+00	0.951	ITAS-IT-RS-0001
TRITIUM	2.91E+03	1.81E+02	3.84E+02	2.49E+02	0.94	RD3205

LAB SAMPLE ID: 40443204 MATRIX: WATER

WHC ID: B0BP02 DATE RECEIVED: 4/22/94

REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
ALPHA	2.95E-01	7.28E-01	7.29E-01	1.64E+00	1	RD3222 U
BETA	1.64E+01	2.42E+00	2.69E+00	3.14E+00	1	RD3222
TOTAL-SR	-4.31E-02	3.24E-01	3.24E-01	9.60E-01	0.74	RD3204 U
C-14	7.21E-01	1.55E+00	3.27E+00	3.62E+00	1	RD3263
TC-99	4.59E+01	1.54E+00	8.38E+00	2.15E+00	0.951	ITAS-IT-RS-0001
TRITIUM	2.58E+03	1.73E+02	3.62E+02	2.49E+02	0.94	RD3205

RJS 7/8/94

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND
SDG NO.: W0040
LAB SAMPLE ID: 40443205
MATRIX: WATER
WHC ID: B0BP26
DATE RECEIVED: 4/22/94
REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
ALPHA	1.11E+00	7.26E-01	7.38E-01	9.45E-01	1	RD3222
BETA	7.81E+01	4.46E+00	7.09E+00	2.78E+00	1	RD3222
TOTAL-SR	2.82E+01	1.62E+00	6.87E+00	9.66E-01	0.703	RD3204
C-14	7.66E-01	1.55E+00	3.27E+00	3.62E+00	1	RD3263 U
TC-99	6.04E+01	1.67E+00	9.86E+00	2.15E+00	0.951	ITAS-IT-RS-0001
TRITIUM	2.95E+03	1.81E+02	3.87E+02	2.49E+02	0.94	RD3205

LAB SAMPLE ID: 40445701
MATRIX: WATER
WHC ID: B0BP04
DATE RECEIVED: 4/25/94
REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
ALPHA	1.68E+00	8.91E-01	9.15E-01	1.08E+00	1	RD3222
BETA	2.01E+01	2.53E+00	2.90E+00	2.89E+00	1	RD3222
TOTAL-SR	3.43E-01	4.20E-01	4.27E-01	1.11E+00	0.627	RD3204 U
C-14	-2.25E-02	1.54E+00	3.25E+00	3.62E+00	1	RD3263 U
TC-99	5.29E+01	1.61E+00	9.09E+00	2.15E+00	0.951	ITAS-IT-RS-0001
TRITIUM	2.40E+03	1.70E+02	3.50E+02	2.49E+02	0.94	RD3205

RTS 7/20/94

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND
SDG NO.: W0040
LAB SAMPLE ID: 40445702
MATRIX: WATER
WHC ID: B0BNZ6
DATE RECEIVED: 4/25/94
REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
ALPHA	8.94E-01	7.18E-01	7.27E-01	1.16E+00	1	RD3222 U
BETA	5.52E+01	3.81E+00	5.45E+00	2.82E+00	1	RD3222
TOTAL-SR	1.46E+01	1.04E+00	3.91E+00	7.51E-01	0.972	RD3204
C-14	4.50E-02	1.54E+00	3.25E+00	3.62E+00	1	RD3263 U
TC-99	6.69E+01	1.75E+00	1.05E+01	2.15E+00	0.951	ITAS-IT-RS-0001
TRITIUM	6.44E+03	2.42E+02	6.29E+02	2.49E+02	0.94	RD3205

LAB SAMPLE ID: 40445703
MATRIX: WATER
WHC ID: B0BNZ8
DATE RECEIVED: 4/25/94
REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
ALPHA	6.57E-01	6.76E-01	6.82E-01	1.25E+00	1	RD3222 U
BETA	1.30E+01	2.19E+00	2.38E+00	2.99E+00	1	RD3222
TOTAL-SR	-3.74E-02	2.65E-01	2.65E-01	7.94E-01	0.935	RD3204 U
C-14	8.78E-01	1.56E+00	3.28E+00	3.62E+00	1	RD3263 U
TC-99	3.21E+01	1.37E+00	7.00E+00	2.15E+00	0.951	ITAS-IT-RS-0001
TRITIUM	1.52E+03	1.49E+02	2.93E+02	2.49E+02	0.94	RD3205

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND
SDG NO.: W0040
LAB SAMPLE ID: 40445704
MATRIX: WATER
WHC ID: B0BNZ0
DATE RECEIVED: 4/25/94
REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
ALPHA	8.10E-01	6.88E-01	6.95E-01	1.11E+00	1	RD3222 V
BETA	2.52E+01	2.76E+00	3.28E+00	2.90E+00	1	RD3222
TOTAL-SR	1.30E+00	3.92E-01	5.20E-01	7.52E-01	0.989	RD3204
C-14	1.28E+00	1.56E+00	3.29E+00	3.62E+00	1	RD3263 V
TC-99	6.94E+01	1.76E+00	1.08E+01	2.15E+00	0.951	ITAS-IT-RS-0001
TRITIUM	3.30E+03	1.88E+02	4.10E+02	2.49E+02	0.94	RD3205

LAB SAMPLE ID: 40450001
MATRIX: WATER
WHC ID: B0BNY8
DATE RECEIVED: 4/27/94
REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
ALPHA	1.49E+00	8.45E-01	8.65E-01	1.08E+00	1	RD3222
BETA	3.25E+01	3.05E+00	3.82E+00	2.90E+00	1	RD3222
TOTAL-SR	5.31E+00	6.61E-01	1.53E+00	7.79E-01	0.976	RD3204
C-14	1.96E+00	1.57E+00	3.30E+00	3.62E+00	1	RD3263 V
TC-99	5.77E+01	1.66E+00	9.58E+00	2.15E+00	0.951	ITAS-IT-RS-0001
TRITIUM	2.47E+03	1.71E+02	3.54E+02	2.49E+02	0.94	RD3205

000187

RJS 7/20

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND
SDG NO.: W0043
LAB SAMPLE ID: 40428901
MATRIX: WATER
WHC ID: B0BNX8
DATE RECEIVED: 4/15/94
REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
ALPHA	1.26E+00	8.05E-01	8.20E-01	1.16E+00	1	RD3222
BETA	1.43E+02	5.93E+00	1.17E+01	2.89E+00	1	RD3222
TOTAL-SR	5.67E+01	1.98E+00	1.49E+01	8.11E-01	0.987	RD3204
C-14	1.55E+00	1.60E+00	3.39E+00	3.69E+00	1	RD3263 U
TC-99	9.89E+01	2.01E+00	1.39E+01	2.13E+00	0.951	ITAS-IT-RS-0001
TRITIUM	4.75E+03	2.15E+02	5.11E+02	2.50E+02	0.94	RD3205 R

LAB SAMPLE ID: 40435101
MATRIX: WATER
WHC ID: B0BNX4
DATE RECEIVED: 4/19/94
REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
ALPHA	7.42E-01	6.64E-01	6.70E-01	1.11E+00	1	RD3222 U
BETA	7.13E+00	1.86E+00	1.92E+00	2.99E+00	1	RD3222
TOTAL-SR	-1.18E-01	2.54E-01	2.56E-01	8.04E-01	0.9	RD3204 U
C-14	1.80E+00	1.60E+00	3.40E+00	3.69E+00	1	RD3263 U
TC-99	1.25E+01	1.12E+00	5.09E+00	2.13E+00	0.951	ITAS-IT-RS-0001
TRITIUM	1.36E+04	3.35E+02	1.15E+03	2.50E+02	0.94	RD3205 R

1. Samples not analyzed within 7 days of distillation (R, UR)

000188

RJS
9/15/94

000

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND
SDG NO.: W0043
LAB SAMPLE ID: 40443001
MATRIX: WATER
WHC ID: B0BNY2
DATE RECEIVED: 4/22/94
REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
ALPHA	1.43E+00	7.83E-01	8.03E-01	8.41E-01	1	RD3222
BETA	5.96E+01	3.95E+00	5.77E+00	2.83E+00	1	RD3222
TOTAL-SR	1.71E+01	1.22E+00	4.28E+00	8.67E-01	0.761	RD3204
C-14	-1.82E+00	1.52E+00	3.21E+00	3.62E+00	1	RD3263 U
TC-99	6.62E+01	1.72E+00	1.04E+01	2.13E+00	0.951	ITAS-IT-RS-0001
TRITIUM	2.86E+03	1.79E+02	3.82E+02	2.50E+02	0.94	RD3205 R

LAB SAMPLE ID: 40450201
MATRIX: WATER
WHC ID: B0BP20
DATE RECEIVED: 4/27/94
REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
ALPHA	5.33E-01	6.16E-01	6.20E-01	1.17E+00	1	RD3222
BETA	1.88E+00	1.51E+00	1.51E+00	3.04E+00	1	RD3222
TOTAL-SR	2.87E-01	2.99E-01	3.08E-01	7.86E-01	0.889	RD3204
C-14	1.89E+00	1.56E+00	3.25E+00	3.58E+00	1	RD3263
TC-99	2.05E+00	9.46E-01	4.23E+00	2.13E+00	0.951	ITAS-IT-RS-0001
TRITIUM	1.01E+03	1.37E+02	2.63E+02	2.50E+02	0.94	RD3205

1. Samples not analyzed within 7 days of distillation (UR, R

RJS 9/15/94
0009

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND
SDG NO.: W0043
LAB SAMPLE ID: 40450202
MATRIX: WATER
VHC ID: B0BP42
DATE RECEIVED: 4/27/94
REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER	
ALPHA	1.68E-01	2.53E-01	2.54E-01	5.05E-01	1	RD3222	U
BETA	1.71E+00	1.29E+00	1.29E+00	2.55E+00	1	RD3222	U
TOTAL-SR	3.23E-01	3.38E-01	3.47E-01	8.93E-01	0.858	RD3204	U
C-14	-6.08E-01	1.52E+00	3.19E+00	3.58E+00	1	RD3263	U
TC-99	2.66E+00	9.59E-01	4.28E+00	2.13E+00	0.951	ITAS-IT-RS-0001	
TRITIUM	9.64E+00	1.06E+02	2.08E+02	2.50E+02	0.94	RD3205	UR

LAB SAMPLE ID: 40450203
MATRIX: WATER
VHC ID: B0BP06
DATE RECEIVED: 4/27/94
EPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER	
ALPHA	1.84E+00	9.09E-01	9.40E-01	1.11E+00	1	RD3222	
BETA	5.46E+00	1.74E+00	1.78E+00	2.97E+00	1	RD3222	
TOTAL-SR	-2.01E-01	2.57E-01	2.61E-01	8.52E-01	0.833	RD3204	U
C-14	-1.91E+00	1.50E+00	3.16E+00	3.58E+00	1	RD3263	U
TC-99	1.81E+00	9.49E-01	4.21E+00	2.13E+00	0.951	ITAS-IT-RS-0001	U
TRITIUM	8.39E+01	1.09E+02	2.11E+02	2.50E+02	0.94	RD3205	UR

1. Samples not analyzed within 7 days of distillation (R, UR)

RJS 9/16/94

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

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG NO.:	W0043
LAB SAMPLE ID:	40450204	MATRIX:	WATER
VHC ID:	B0BP30	DATE RECEIVED:	4/27/94
REPORTING UNITS:	pCi/L		

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER	
ALPHA	6.08E-02	1.86E-01	1.86E-01	4.53E-01	1	RD3222	U
BETA	6.57E-01	1.24E+00	1.24E+00	2.66E+00	1	RD3222	U
TOTAL-SR	-8.72E-02	2.48E-01	2.48E-01	7.82E-01	0.865	RD3204	U
C-14	-1.44E+00	1.51E+00	3.17E+00	3.58E+00	1	RD3263	U
TC-99	2.09E+00	9.53E-01	4.23E+00	2.13E+00	0.951	ITAS-IT-RS-0001	U
TRITIUM	8.00E+01	1.09E+02	2.11E+02	2.50E+02	0.94	RD3205	UR

LAB SAMPLE ID:	40450205	MATRIX:	WATER
VHC ID:	B0BNY6	DATE RECEIVED:	4/27/94
REPORTING UNITS:	pCi/L		

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER	
ALPHA	7.46E-01	6.67E-01	6.73E-01	1.12E+00	1	RD3222	U
BETA	3.37E+01	3.08E+00	3.89E+00	2.83E+00	1	RD3222	
TOTAL-SR	4.85E+00	6.33E-01	1.39E+00	7.60E-01	0.933	RD3204	
C-14	3.38E-01	1.53E+00	3.21E+00	3.58E+00	1	RD3263	U
TC-99	6.09E+01	1.71E+00	9.86E+00	2.13E+00	0.951	ITAS-IT-RS-0001	
TRITIUM	2.43E+03	1.71E+02	3.53E+02	2.50E+02	0.94	RD3205	R

1. Sample not analyzed within 7 days of distillation (UR)

000131

RJS 9/15/94

0011

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

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND
SDG NO.: W0043
LAB SAMPLE ID: 40450206
MATRIX: WATER
WHC ID: B0BP12
DATE RECEIVED: 4/27/94
REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
ALPHA	1.54E+00	8.16E-01	8.38E-01	8.52E-01	1	RD3222
BETA	5.05E+01	3.71E+00	5.14E+00	3.06E+00	1	RD3222
TOTAL-SR	4.59E-02	2.69E-01	2.69E-01	7.93E-01	0.916	RD3204 U
C-14	4.51E-02	1.53E+00	3.20E+00	3.58E+00	1	RD3263 U
TC-99	1.82E+02	2.59E+00	2.28E+01	2.13E+00	0.951	ITAS-IT-RS-0001
TRITIUM	5.51E+03	2.28E+02	5.64E+02	2.50E+02	0.94	RD3205 R

LAB SAMPLE ID: 40456701
MATRIX: WATER
WHC ID: B0BP08
DATE RECEIVED: 4/29/94
REPORTING UNITS: pCi/L

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	YIELD	METHOD NUMBER
ALPHA	2.56E+00	1.07E+00	1.12E+00	1.14E+00	1	RD3222
BETA	1.02E+01	2.06E+00	2.18E+00	3.04E+00	1	RD3222
TOTAL-SR	-2.00E-01	2.74E-01	2.78E-01	8.98E-01	0.851	RD3204 U
C-14	-1.19E+00	1.51E+00	3.17E+00	3.58E+00	1	RD3263 U
TC-99	2.38E+01	1.27E+00	6.13E+00	2.13E+00	0.951	ITAS-IT-RS-0001
TRITIUM	2.62E+04	4.52E+02	2.06E+03	2.50E+02	0.94	RD3205 R

1. Samples not analyzed within 7 days of distillation (UR,

000192

RIS 9/15/94

0012

682A-6-9

Date: September 19, 1994
To: Westinghouse Hanford Company (technical representative)
From: A.T. Kearney, Inc.
Subject: Inorganics - Data Package No. B0BP28-TMA-752 (SDG No. B0BP28)

INTRODUCTION

This memo presents the results of data validation on Data Package No. B0BP28-TMA-752 prepared by Thermo-Analytic Laboratories. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analysis
B0BP28	04/26/94	Water	D	See Note 1
B0BP29	04/26/94	Water (Filtered)	D	See Note 2

Note 1. Requested Method: CLP-ICP Metals/AA Metals: Hg (unfiltered)
Note 2. Requested Method: CLP-ICP Metals/AA Metals: Hg (filtered)

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

  Analytical holding times for ICP metals and CVAA mercury analyses were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: samples must be analyzed within 28 days for mercury, and within six months for all other metals.

  All holding time requirements for all analytes in the data package were met.

- **Blanks**

  Positive Blanks

  In the case of positive blank results, samples with digestate concentrations (in ug/L) of less than five times (<5x) the highest amount found in any of the associated blanks have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times (>5x) the highest amount found in any of the associated blanks do not require qualification.

  Due to the presence of laboratory blank contamination, sample number B0BP28 in SDG No. B0BP28 was flagged "U" for chromium.

  Negative Blanks

  In the case of negative blank results, if the absolute value of any calibration blank exceeds the Instrument Detection Limit (IDL), all non-detects are qualified as estimates and flagged "UJ", and all positive results within two times the absolute value of the blank result are qualified as estimates and flagged "J". In the case of preparation blanks, if the absolute value exceeds the Contract Required Detection Limit (CRDL), all non-detects are rejected and flagged "R" and all detected that are less than ten times the absolute value of the preparation blank result are qualified as estimates and flagged "J".

  Due to the presence of negative laboratory contamination, sample number B0BP29 in SDG No. B0BP28 was flagged "UJ" for selenium:

  All other laboratory blank results were acceptable.

- **Accuracy**

  Matrix Spike

  Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must generally fall within the range of 75 to 125 percent. Samples with a spike recovery of less than 30% and a sample value below the IDL were rejected and flagged "R". All other samples with a spike recovery outside the QC limits are qualified as estimates and flagged "J".

  All matrix spike recovery results were acceptable.

Laboratory Control Sample Recovery

The LCS monitors the overall performance of the analysis, including the sample preparation. An LCS should be digested or distilled and analyzed with every group of samples which have been prepared together. The performance criteria for solid LCS samples are established through interlaboratory studies coordinated by a certifying agency (e.g., EPA or an independent commercial supplier).

One liquid LCS was digested and analyzed for each of the cases in this report that contained water samples. The results were compared against the control limit of 80-120% as required by the EPA CLP SOW 3/90 protocol and found to be acceptable.

All LCS results were found to be acceptable.

- **Precision**

Laboratory Duplicate Samples

The laboratory duplicate results measures the precision of the method by measuring a second aliquot of the sample that is treated the same way as the original. Samples whose precision fell outside the quality control requirements were flagged as estimates "J".

All laboratory duplicate recovery results were acceptable.

ICP Serial Dilution

The ICP serial dilution is used to determine whether significant physical or chemical interferences exist due to sample matrix. If sample concentration is $\geq$50 times the IDL for an analyte and the %D is outside the control limits the associated data must be qualified as estimates "J".

The ICP serial dilution results for sample number B0BP29 in SDG No. B0BP28 fell outside the QC limits and the associated results were flagged "BJ" for potassium.

Field Split Samples

Two sets of field split samples were submitted to TMA as shown below.

Sample No.	Duplicate Sample No.	Well Location
B0BP06	B0BP28	6-63-90
B0BP07	B0BP29	6-63-90

The split sample results were compared using the sample guidelines for determining the RPD between a sample and its duplicate. All results fell within the required control limit. All results for both well locations appear in the summary tables within this report.

- **Total and Dissolved Sample Analysis**

Inorganics parameters included the analysis of the total as well as dissolved samples. Total samples include particulate and dissolved fractions while dissolved samples are filtered prior to preparation. The purpose of the analysis is to determine what metals are inherent in the particulate matter found in the aqueous sample.

Since Westinghouse Validation Guidelines do not address this issue, the total and dissolved samples are presented in the report, but no judgement on the data was made.

Below is a table of the total and filtered samples which were validated.

Total	Filtered
B0BP28	B0BP29

- **Sample Result Verification and Detection Limits**

Sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors.

The reviewer verified that the results and detection limits fell within the linear range of the instrument. All sample results and reported detection limits were acceptable.

- **Completeness**

  Data Package No. B0BP28-TMA-752 (SDG No. B0BP28) was submitted for validation and verified for completeness.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Positive and negative blank contamination were noted in two samples. Associated sample results were flagged accordingly. Contamination, however, was not sufficiently high to affect the usability of the data. A minor ICP serial dilution problem was noted for one sample and the result was flagged accordingly. Data flagged "J" are usable for limited purposes only. Except as noted in the preceding sections, all other validated data are usable for all purposes.

REFERENCES

EPA, 1987, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, Environmental Protection Agency, Washington, D.C.

EPA, 1988c, *EPA Contract Laboratory Program Statement of Work for Inorganics Analyses, Multi-Media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1988d, *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses*, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1990, *EPA Contract Laboratory Program Statement of Work for Inorganic Analyses, Multi-media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

WHC, 1992a, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

J - Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: B0BP28	REVIEWER: RJS	DATE: 7/8/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Chromium	U	B0BP28	Lab Blank Contamination
Potassium	BJ	B0BP29	ICP Serial Dilution
Selenium	UJ	B0BP29	Negative Lab Blank Contamination

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE--HANFORD																					
Laboratory: TMA																					
Case	SDG: B0BP28																				
Sample Number		B0BP28																			
Location		6-63-90																			
Remarks		SPLIT																			
Sample Date		04/26/94																			
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	20.9	U																		
Antimony	60	14.7	U																		
Arsenic	10	2.8	B																		
Barium	200	14.4	B																		
Beryllium	5	0.40	U																		
Cadmium	5	1.1	U																		
Calcium	5000	35000																			
Chromium	10	2.8	U																		
Cobalt	50	2.1	U																		
Copper	25	3.6	U																		
Iron	100	120																			
Lead	3	2.0	B																		
Magnesium	5000	12700																			
Manganese	15	3.3	B																		
Mercury	0.2	0.20	U																		
Nickel	40	6.5	U																		
Potassium	5000	4360	B																		
Selenium	5	2.1	U																		
Silver	10	3.6	U																		
Sodium	5000	11200																			
Thallium	10	2.2	U																		
Vanadium	50	23.6	B																		
Zinc	20	7.1	U																		
Cyanide	10	NA																			

NA = Not Analyzed

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B0BP28																				
Sample Number		B0BP29																			
Location		6-63-90																			
Remarks		SPLIT,FIL																			
Sample Date		04/26/94																			
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	20.9	U																		
Antimony	60	14.7	U																		
Arsenic	10	2.6	B																		
Barium	200	15.0	B																		
Beryllium	5	0.40	U																		
Cadmium	5	1.1	U																		
Calcium	5000	36000																			
Chromium	10	2.5	U																		
Cobalt	50	2.1	U																		
Copper	25	3.6	U																		
Iron	100	9.9	U																		
Lead	3	1.6	B																		
Magnesium	5000	13200																			
Manganese	15	0.90	U																		
Mercury	0.2	0.20	U																		
Nickel	40	6.5	U																		
Potassium	5000	4520	BJ																		
Selenium	5	2.1	UJ																		
Silver	10	3.6	U																		
Sodium	5000	11700																			
Thallium	10	2.2	U																		
Vanadium	50	23.9	B																		
Zinc	20	7.1	U																		
Cyanide	10	N/A																			

N/A = Not Applicable, FIL = Filtered

SAMPLE NUMBER: B0BP28

INORGANIC ANALYSIS DATA SHEET

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-04-112SAS No.: SDG No.: B0BP28

Matrix (soil/water): WATER Lab Sample ID: 05023-01S

Level (low/med): LOW Date Received: 05/03/94

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	20.9	U		P
7440-36-0	Antimony	14.7	U		P
7440-38-2	Arsenic	2.8	B		P
7440-39-3	Barium	14.4	B		P
7440-41-7	Beryllium	0.40	U		P
7440-43-9	Cadmium	1.1	U		P
7440-70-2	Calcium	35000			P
7440-47-3	Chromium	2.8	B		P
7440-48-4	Cobalt	2.1	U		P
7440-50-8	Copper	3.6	U		P
7439-89-6	Iron	120			P
7439-92-1	Lead	2.0	B		P
7439-95-4	Magnesium	12700			P
7439-96-5	Manganese	3.3	B		P
7439-97-6	Mercury	0.20	U		AV
7440-02-0	Nickel	6.5	U		P
7440-09-7	Potassium	4360	B		P
7782-49-2	Selenium	2.1	U		P
7440-22-4	Silver	3.6	U		P
7440-23-5	Sodium	11200			P
7440-28-0	Thallium	2.2	U		P
7440-62-2	Vanadium	23.6	B		P
7440-66-6	Zinc	7.1	U		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

RJS 7.11.0

Comments:

002

SAMPLE NUMBER: B0BP29

INORGANIC ANALYSIS DATA SHEET

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-04-112SAS No.: SDG No.: B0BP29

Matrix (soil/water): WATER Lab Sample ID: 05024-01S

Level (low/med): LOW Date Received: 05/03/94

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	20.9	U		P	
7440-36-0	Antimony	14.7	U		P	
7440-38-2	Arsenic	2.6	B		P	
7440-39-3	Barium	15.0	B		P	
7440-41-7	Beryllium	0.40	U		P	
7440-43-9	Cadmium	1.1	U		P	
7440-70-2	Calcium	36000			P	
7440-47-3	Chromium	2.5	U		P	
7440-48-4	Cobalt	2.1	U		P	
7440-50-8	Copper	3.6	U		P	
7439-89-6	Iron	9.9	U		P	
7439-92-1	Lead	1.6	B		P	
7439-95-4	Magnesium	13200			P	
7439-96-5	Manganese	0.90	U		P	
7439-97-6	Mercury	0.20	U		AV	
7440-02-0	Nickel	6.5	U		P	
7440-09-7	Potassium	4520	~~B~~	~~E~~	P	BJ
7782-49-2	Selenium	2.1	U		P	UJ
7440-22-4	Silver	3.6	U		P	
7440-23-5	Sodium	11700			P	
7440-28-0	Thallium	2.2	U		P	
7440-62-2	Vanadium	23.9	B		P	
7440-66-6	Zinc	7.1	U		P	
_____	Cyanide				NR	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

RJS 9.12.94

002

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

PAGE 1 TMA/Norcal CHAIN OF CUSTODY ORD # N4-04-112
RCVD: 04/29/94 DUE: 06/03/94 04/29/94 14:57:10 KEEP: 09/01/94 DISP: S

DASH	SAMPLE IDENTIFICATION		STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY		
01A-W	BOBP28	UNFILTERED	ARLI	WH043	WH121	WH122
01C-W	BOBP28 MS	UNFILTERED	ARLI	WH043		
01D-W	BOBP28 DUP	UNFILTERED	ARLI	WH043	WH121	WH122

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
tyamamoto	4/29/94	ARLI	4/29/94	[signature]	4/30/94

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: ☐ Priority ☒ Normal

Collector: K. Trapp	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 100-BC-5	Sampling Location: 100 B	SAF No.: 94-129
Ice Chest No.: SMC 144	Field Logbook No.: EFL-1036	Method of Shipment: EMERY
Shipped To: THA	Offsite Property No.:	Bill of Lading/Air Bill No.:
Possible Sample Hazards/Remarks:		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE 3B ~~NMS~~ AJS 4/24/94 1612		

SAMPLE ANALYSIS.

Sample No.	Matrix*	Date Sampled	Time Sampled	Preservative	HNO3<2	COOL 4	HNO3<2	HCL pH<2	COOL 4		HNO3<2								
				Type of Container	G/P	P	G/P	G/P	Gs		G/P								
				No. of Container(s)	1	1	1 4 L kmw/cmm	1	2		1								
				Volume	1000ml	1000ml	~~1000ml~~ 4L kmw/cmm	1000ml	1000ml		1000ml								
					ICP METALS AA METALS Hg CLP	ANIONS F,SO4 COND pH	GROSS ALPHA/ BETA Sr-90	Tc-99	TRITIUM C-14		ICP METALS, AA METALS, Hg FILTERD CLP								
60BP28	W	4/26/94	1034		X	X	X	X	X										
60BP29	W	↓	↓								X								

00001

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By	Date/Time	Received By: AJ SIMPSON	Date/Time
K. Trapp/K. Trapp	4/26/94 1610	AJ Simpson	4/27/94 1612
Relinquished By: AJ SIMPSON	Date/Time	Received By: K. Blum	Date/Time
AJ Simpson	4/28/94 0952	Kermit Blum	4-29-94/1340
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
DATA DELIVERABLE-STANDALONE

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

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

DISTRIBUTION: Original- Sample Yellow - Sampler

SAMPLE LOG-IN SHEET

LAB NAME : TMA/ARU PAGE : 1 OF 1

RECEIVED BY (PRINT NAME): Nigel McElrath LOG-IN-DATE : 4/30/94

RECEIVED BY (SIGNATURE): Nigel McElrath

ICE CHEST NO. SML144

		CORRESPONDING		
	EPA SAMPLE #	SAMPLE TAG #	ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC
REMARKS:		BOBP28	A4040X2	GOOD
1. Custody Seal(s) (Present / Absent* Intact / Broken)		BOBRM5	A4040X1	↓
2. Custody Seal Nos: N/A		BOBRM7	N/	↓
3. Chain of Custody Records (Present / Absent*)				
4. Traffic Reports or Packing List (Present / Absent*)				
5. Airbill (Airbill / Sticker Present / Absent*)				
6. Airbill No.: 882600130 6				
7. Sample Tags (Present / Absent*)				
8. Sample Tag Numbers (Listed / Not Listed on Chain of Custody)				
9. Sample Condition: (Intact / Broken* / Leaking)				
10. Does information on custody records, traffic reports, and sample tags agree? (Yes / No*)				
11. Date Recieved at Lab: 4/30/94				
12. Temp of Ice chest 1 °C				
13. Time Recieved: 1000				
SAMPLE TRANSFER				
Fraction: N/A				
Area #: N/A				
By: N/A				
On: N/A				

5.2.94

* Contact SMO and attach record of resolution

Reviewed By: _____ Logbook No.: N/A

Date: _____ Logbook Page No.: N/A

FORM OC-1

Samples received 4/30/94 - log-in on Monday 5/2/94, MHP 4/3/94

TMA
Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

9413501.0897

RECORD COPY

JUN 1994
RECEIVED
SDLA

May 31, 1994

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Quality Control Narrative

Scope
One (1) water sample was submitted to TMA/Skinner & Sherman Laboratories, Inc. on May 3, 1994 from TMA/Norcal. The sample was analyzed for the USEPA CLP metals. The analysis was performed under TMA/Skinner and Sherman work order S405023.

Methodology
The sample was prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program ILM02.

Discussion
All quality control requirements were met for the samples with no exceptions.

Please feel free to call if there are any questions concerning the data package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven R. Provencal
Lead Chemist

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-04-112 SAS No.: SDG No.: B0BP28

SOW No.: ILM02.1

SAMPLE NUMBER:	Lab Sample ID.
B0BP28	05023-01S
B0BP28D	05023-01S2
B0BP28S	05023-01DS

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: Steven Provencal Name: Steven R. Provencal

Date: 5/31/94 Title: Lead Chemist

001

TMA/Skinner & Sherman Laboratories
Sample Login Sheet

Workorder 94-05022 Client Hanford WCS Number/Type of Samples (waters)
Protocol CLP Turnaround 33 Days Cooler Temp: 3.0 °C, or N/A Cooler (Yes)/No
Custodian: D. Monroe Shipper & # Fedex SDG/Batch# NA
Custody Seal: Present/Absent/Intact/Not Client Case# NW-04-112
Purchase Order/Contract# NW-04-112 Client Contact D. Sanders
Tag#: Present/Absent/NA/(See COC) Chain of Custody Present/Absent/NA,#

Sample Containers - Intact/Broken Comment:
Client Comment? Yes/No
Sample labels agree with Chain of Custody Information? (Yes)/No (Comment)
Client paperwork agrees with samples and Chain of Custody? (Yes)/No (Comment)
Shipment Dates: 5/3/94
List any date with paperwork/shipment problems & specify the problem:

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1	BKBP28	water	5/3/94	1.9	CLP metals + Hg (D.S.)	Comp
2						
3						
4						
5						
6						
7						
8					Complete	
9						
10						
11						
12					DRM 5/3/94	
13						
14						
15						
16						
17						
18						
19						
20						

These samples are from a site known to have Radioactive Contamination: Yes ✓ No
These samples have detectable amounts of Radioactive Material: Yes No

Subcontract: Yes/No, To: Date:

Reviewed Date

* EPA/CLP required

Rev 1.7

PAGE 1 TMA/Norcal CHAIN OF CUSTODY ORD # NA-04-112
RCVD: 04/29/94 DUE: 06/03/94 9613501 ORIG 04/29/94 14:57:13 KEEP: 09/01/94 DISP: S

DASH	SAMPLE IDENTIFICATION		STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY		
01B-W	BOBP28	UNFILTERED	S&S	WH007	WH008	WH010
01E-W	BOBP28	MS UNFILTERED	S&S	WH007	WH008	WH010
01F-W	BOBP28	DUP UNFILTERED	S&S	WH007	WH008	WH010
01G-W	L C S		S&S	WH007	WH008	WH010
02A-W	BOBP29	FILTERED	S&S	WH007	WH008	WH010
02B-W	BOBP29	MS FILTERED	S&S	WH007	WH008	WH010
02C-W	BOBP29	DUP FILTERED	S&S	WH007	WH008	WH010
02D-W	L C S		S&S	WH007	WH008	WH010

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
Yamamoto	5/2/94	Skinner	5/2/94	D Martinez	5/3/94

182

TMA
Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

9413501.0901

RECORD COPY

May 31, 1994

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Quality Control Narrative

Scope
One (1) water sample was submitted to TMA/Skinner & Sherman Laboratories, Inc. on May 3, 1994 from TMA/Norcal. The sample was analyzed for the USEPA CLP metals. The analysis was performed under TMA/Skinner and Sherman work order S405024.

Methodology
The sample was prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program ILM02.

Discussion
All quality control requirements were met for the samples with the following exceptions:

The ICP serial dilution for potassium exceeded the control limit requirement.

Please feel free to call if there are any questions concerning the data package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal
Steven R. Provencal
Lead Chemist

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-04-112 SAS No.: SDG No.: B0BP29

SOW No.: ILM02.1

SAMPLE NUMBER:	Lab Sample ID.
B0BP29	05024-01S
B0BP29D	05024-01S2
B0BP29S	05024-01DS

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: Steven Provencal Name: Steven R. Provencal

Date: 5/31/94 Title: Lead Chemist

001

TMA/Skinner & Sherman Laboratories
Sample Login Sheet

Workorder SH-05-024 Client Hanford WCH Number/Type of Samples 1 water
Protocol CLP Turnaround 30 day Cooler Temp: 3 °C or N/A Cooler Yes/No
Custodian: D Martinez Shipper &# SDG/Batch#
Custody Seal: Present/Absent/Intact/Not Client Case# WCH-04-112
Purchase Order/Contract# WCH-04-112 Client Contact D. Sanchez
Tag#: Present/Absent/NA (See COC) Chain of Custody: Present/Absent/NA, #

Sample Containers - Intact/Broken Comment:
Client Comment? Yes/No
Sample labels agree with Chain of Custody Information? Yes/No (Comment)
Client paperwork agrees with samples and Chain of Custody? Yes/No (Comment)
Shipment Dates: 5/3/94
List any date with paperwork/shipment problems & specify the problem:

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1	BBBP29	water	5/3/94	1.82	CLP metals + Hg (D,S)	(F
2						
3						
4						
5						
6						
7						
8					Complete	
9						
10						
11					DRM 5/4/94	
12						
13						
14						
15						
16						
17						
18						
19						
20						

These samples are from a site known to have Radioactive Contamination: Yes ✓ No
These samples have detectable amounts of Radioactive Material: Yes No ✓

Subcontract: Yes/No, To: Date:

Reviewed Date

181

* EPA/CLP required

Rev 1.7

Page: 99

PAGE 1 TMA/Norcal 9619504.0904 CHAIN OF CUSTODY ORD # NA-04-112
RCVD: 04/29/94 DUE: 06/03/94 04/29/94 14:57:13 KEEP: 09/01/94 DISP: S

DASH	SAMPLE IDENTIFICATION		STORED		TESTS for FRACTIONS with work in DEPT: SU and CATEGORY		
01B-W	BOBP28		UNFILTERED	S&S	WH007	WH008	WH010
01E-W	BOBP28	MS	UNFILTERED	S&S	WH007	WH008	WH010
01F-W	BOBP28	DUP	UNFILTERED	S&S	WH007	WH008	WH010
01G-W	L C S			S&S	WH007	WH008	WH010
02A-W	BOBP29		FILTERED	S&S	WH007	WH008	WH010
02B-W	BOBP29	MS	FILTERED	S&S	WH007	WH008	WH010
02C-W	BOBP29	DUP	FILTERED	S&S	WH007	WH008	WH010
02D-W	L C S			S&S	WH007	WH008	WH010

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
Yamamoto	5/2/94	Skinner	5/2/94	D. Martinez	5/3/94

182

Appendix 5

Data Validation Supporting Documentation

9413501.0900

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:			DATA PACKAGE: T00553		
VALIDATOR: RJS		LAB: TMA		DATE: 7.11.94	
CASE: 100-BC-5			SDG: B0BP28		

ANALYSES PERFORMED					
☒ CLP/ICP	☐ CLP/GFAA	☒ CLP/Hg	☐ CLP/Cyanide	☐	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX B0BP28 (WATER)

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

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

Comments:

2. HOLDING TIMES

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

Comments: ICP ✓

Hg ✓ < 28 days

9413501.0902

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: same ICV's and CCV's used for both SDG's B0BP28 + B0BA29

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? (Yes) No N/A

Are ICB and CCB results acceptable? . . . . ~~Yes~~ RS 9/6/94 (No) N/A

Were preparation blanks analyzed? . . . . (Yes) No N/A

Are preparation blank results acceptable? . . . . (Yes) No N/A

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

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

Comments: Chromium 5N ~~CCV~~ 3 7/12/94 CCB3 (U) Qualifier

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:

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~~

SN 7/12/9

Comments:

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:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:			DATA PACKAGE: T00553		
VALIDATOR: RJS		LAB: TMA		DATE: 7/8/94	
CASE: 100-BC-5			SDG: B0BP29		

ANALYSES PERFORMED					
☒ CLP/ICP	☐ CLP/GFAA	☒ CLP/Hg	☐ CLP/Cyanide	☐	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX B0BP29 (WATER)

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

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

Comments:

2. HOLDING TIMES

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

Comments: < 180 days ICP

Hg — Sampled 4/26-94 — Analyzed 5/17-94 < 28 days ✓

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? RS→ 9/6/94	~~Yes~~	No	N/A
Were preparation blanks analyzed?	Yes	No	N/A
Are preparation blank results acceptable?	Yes	~~No~~ RS→	N/A
Were field/trip blanks analyzed?	Yes	No	N/A
Are field/trip blank results acceptable?	Yes	No	N/A

Comments:

Se – neg cal blank -3.7 (UJ)

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: ✓

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?	RS 9/6/94 ~~Yes~~	(No)	N/A
Are field duplicate RPD values acceptable?	Yes	No	(N/A)
Are field split RPD values acceptable?	(Yes)	No	~~N/A~~ SC 7/12/94

Comments: Potassium — 11.2%. sample > 50 X IDL (J)

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: ICP Instrument ID number not provided on Form 1 but provided in Raw Data and on Form X's OK 8/1/94 SC

Cover Page Questions left unanswered all OK 8/1/94 SC

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):

BLANK AND SAMPLE DATA SUMMARY

SDG: B0BP28	REVIEWER: RJS	DATE: 7/11/94	PAGE 1 OF 1
COMMENTS:			

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB3	Chromium	2.8			ug/L	14.0	28.0	B0BP28	U

000036

BLANK AND SAMPLE DATA SUMMARY

SDG: B0BP28	REVIEWER: RJS				DATE: 7/8/94			PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	2X RESULT	10X RESULT	SAMPLES AFFECTED	`QUALIFIER
CCB4	Selenium	-3.8			ug/L	7.6	38.0	B0BP29	UJ

000037

PRECISION DATA SUMMARY

SDG: B0BP28	REVIEWER: RJS	DATE: 7/8/94	PAGE 1 OF 1		
COMMENTS:					
COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Potassium	B0BP29	B0BP29L	11.2	B0BP29	BJ

000038

Date: September 19, 1994
To: Westinghouse Hanford Company (technical representative)
From: A.T. Kearney, Inc.
Subject: Wet Chemistry - Data Package No. B0BP28-TMA-752
(SDG No. B0BP28)

INTRODUCTION

This memo presents the results of data validation on Data Package No. B0BP28-TMA-752 prepared by Thermo-Analytic Laboratories. A list of the sample validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analysis
B0BP28	04/26/94	Water	D	See Note 1

Note 1. Requested Method: Anions: F, S04, Cond., pH

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

  Analytical holding times for fluoride, pH, sulfate, and specific conductance were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: 28 days for fluoride, specific conductance and sulfate; and 24 hours for pH.

  The 24-hour holding time for pH was exceeded for sample number B0BP28 in SDG No. B0BP28 and the associated result was flagged "J".

  Holding times for all other analytes reviewed met QC requirements.

- **Blanks**

  One laboratory preparation blank is analyzed at a frequency of one every 20 samples. All blank results must fall below the CRQL and if not, all associated data <5 times the amount found in the blank are qualified as non-detected "U".

  All laboratory blank results were acceptable.

- **Accuracy**

  Matrix Spike

  Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations.

  All matrix spike results were acceptable.

  Laboratory Control Sample Recovery

  The LCS monitors the overall performance of the analysis, including the sample preparation. An LCS should be prepared (e.g., digested or distilled) and analyzed with every group of samples which have been prepared together. The performance criteria for aqueous LCS percent recovery is 80 to 120 percent. The performance criteria for solid LCS samples are established through interlaboratory studies coordinated by a certifying agency (e.g., EPA or an independent commercial supplier).

  All LCS results were found to be acceptable.

- **Precision**

  Analytical duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Field duplicate analyses are used to measure both the laboratory and the field sampling procedure precision.

  All duplicate analyses results were acceptable for this data.

- **Sample Result Verification and Detection Limits**

  Sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors.

  The reviewer verified that the results and detection limits fell within the linear range of the instrument. All sample results and reported detection limits were acceptable.

- **Completeness**

  Data Package No. B0BP28-TMA-752 (SDG No. B0BP28) was submitted for validation and verified for completeness.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

A review of instrument continuing calibration information and QC data indicate that instrument performance was adequate for all analyses. Holding times were exceeded for pH in one sample and the associated result was qualified as an estimate and flagged "J". Estimated results are usable for limited purposes only. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

EPA, 1987, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, Environmental Protection Agency, Washington, D.C.

EPA, 1988c, *EPA Contract Laboratory Program Statement of Work for Inorganics Analyses, Multi-Media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1988d, *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses*, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1990, *EPA Contract Laboratory Program Statement of Work for Inorganic Analyses, Multi-media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

WHC, 1992a, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: B0BP28	REVIEWER: SC	DATE: 8/1/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
pH	J	B0BP28	Holding Time Exceeded

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

WET CHEMISTRY/ANIONS ANALYSIS, WATER MATRIX, (mg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B0BP28																				
Sample Number		B0BP28																			
Location		6-63-90																			
Remarks		SPLIT																			
Sample Date		04/26/94																			
Wet Chemistry Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Fluoride	300.0	0.20																			
pH (pH units)	9040	7.9	J																		
Sulfate	300.0	29.0																			
Specific Conductivity (umho/cm)	120.1	307																			

9613501.0927

TMA Inc. REPORT Work Order # A4-04-082

Received: 04/29/94 Results by Sample

SAMPLE ID B0BP28 FRACTION 01A TEST CODE WCCLPL NAME Anions & Wet Chem.

Date & Time Collected 04/26/94 Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300.0	0.2	mg/L	0.1
pH	9040 J	7.9	pH	0.1
Sulfate	300.0	29	mg/L	1
~~Specific Elect.~~ Conductivity	120.1	307	umho/cm	6

8/1/94 SC

FORM I

8/1/94 SC

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

GENERAL CHEMISTRY
CASE NO. 04-082
(TMA/ARLI Work Order # A4-04-082

General Chemistry results are presented for the following WHC LIQUID samples:

B0BP28

Norcal Work Order # N4-04-112

Thermo Analytical Inc.
160 Taylor Street
Monrovia, CA 91016
(818) 357-3247

Date submitted:

6/13/94

PAGE 1 TMA/Norcal CHAIN OF CUSTODY ORD # N4-04-112
RCVD: 04/29/94 DUE: 06/03/94 04/29/94 14:57:10 KEEP: 09/01/94 DISP: S

DASH	SAMPLE IDENTIFICATION		STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY		
01A-W	BOBP28	UNFILTERED	ARLI	WH043	WH121	WH122
01C-W	BOBP28 MS	UNFILTERED	ARLI	WH043		
01D-W	BOBP28 DUP	UNFILTERED	ARLI	WH043	WH121	WH122

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
tyamamoto	4/29/94	ARLI	4/29/94	Phil M Uratta	4/30/94

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		Data Turnaround: ☐ Priorty ☒ Normal

Collector: K. Trapp	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 100-BC-5	Sampling Location: 100 B	SAF No.: 94-129
Ice Chest No.: SMC 144	Field Logbook No.: EFL-1036	Method of Shipment: EMERY
Shipped To: TMA	Offsite Property No.	Bill of Lading/Air Bill No.
Possible Sample Hazards/Remarks		

Preservative	HNO3<2	COOL 4	HNO3<2	HCLpH<2	COOL 4		HNO3<2											
Type of Container	G/P	P	G/P	G/P	Gs		G/P											
No. of Container(s)	1	1	1 ~~4~~	1	2		1											
Volume	1000ml	1000ml	~~4L~~ ~~1000ml~~	1000ml	1000ml		1000ml											
SAMPLE ANALYSIS.	ICP METALS AA METALS Hg CLP	ANIONS F,SO4 COND pH	GROSS ALPHA/ BETA Sr-90	Tc-99	TRITIUM C-14		ICP METALS, AA METALS, Hg FILTERD CLP											

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE 3B 4/25/94 AJS 4/24/94 1612

Sample No.	Matrix*	Date Sampled	Time Sampled															
600P28	W	4/26/94	1034	X	X	X	X	X										
600P29	W	↓	↓							X								

0000145

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By / Date/Time	K. Trapp 4/26/94 1610	Received By: AJ SIMPSON / Date/Time: AJ Simpson 4/27/94 1612
Relinquished By: AJ SIMPSON / Date/Time	AJ Simpson 4/28/94 0952	Received By: K. Blum / Date/Time: Kermit Blum 4-29-94/1340
Relinquished By / Date/Time		Received By / Date/Time
Relinquished By / Date/Time		Received By / Date/Time

SPECIAL INSTRUCTIONS
DATA DELIVERABLE-STANDALONE

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

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

DISTRIBUTION: Original - Sample Yellow - Sampler

BC 6000 B30 (12/93)

SAMPLE LOG-IN SHEET

LAB NAME : TMA/ARU PAGE : 1 OF 1

RECEIVED BY (PRINT NAME): Nigel McClarty LOG-IN-DATE : 4/30/94

RECEIVED BY (SIGNATURE): Nigel McClarty

ICE CHEST NO. SML144

REMARKS:

		EPA SAMPLE #	CORRESPONDING SAMPLE TAG #	CORRESPONDING ASSIGNED LAB #	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC
			BOBP28	A4040Y2	GOOD
1. Custody Seal(s)	(Present) / Absent* Intact / Broken		BOBRM5	A4040X1	↓
			BOBRM7	N/	
2. Custody Seal Nos:	N/A				
3. Chain of Custody Records	(Present) / Absent*				
4. Traffic Reports or Packing List	(Present) / Absent*				
5. Airbill	(Airbill / Sticker Present) / Absent*				
6. Airbill No.:	882600130 6				
7. Sample Tags	(Present) / Absent*				
8. Sample Tag Numbers	(Listed) / Not Listed on Chain of Custody				
9. Sample Condition:	(Intact) / Broken* / Leaking				
10. Does information on custody records, traffic reports, and sample tags agree?	(Yes) / No*				
11. Date Recieved at Lab:	4/30/94				
12. Temp of ice chest	1 °C				
13. Time Recieved:	1000				

SAMPLE TRANSFER

Fraction:	N/A	
Area #:	N/A	
By:	N/A	
On:	N/A	

* Contact SMO and attach record of resolution

Reviewed By: _____ Logbook No.: N/A

Date: _____ Logbook Page No.: N/A

FORM DC-1

Samples received 4/30/94 - log-in on Monday 5/2/94, MHP 4/30/94

GENERAL CHEMISTRY RESULTS

CASE NO. 04-082

Sample #:

B0BP28

CASE NARRATIVE

The holding time was exceeded for the analysis of pH. Careful review of the QC analysis indicates that the data is reliable.

No other problems were encountered during sample analysis. All QC results were acceptable.

Maureen Parrish 6/13/94

Maureen Parrish

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	(D)	E
PROJECT: Westinghouse-Hanford			DATA PACKAGE: T00553		
VALIDATOR: SC		LAB: IT		DATE: 8/1/94	
CASE:			SDG: BOBP28		

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	~~☐~~ Spec. Conduct	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX BOBP28 - water

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

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

Comments:

2. HOLDING TIMES

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

Comments: pH: out by 6 days qualify "J".

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:_____

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

RS 9/20/94 RS 9/20/94 SC 6/1/95

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

SDG: B0BP28	REVIEWER: SC			DATE: 8/1/94		PAGE 1 OF 1	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOBP28	pH	4/26/94		5/02/94		24 hours	J

9/02/94

Data Validation Check List

for Project 100-BC-5

HEIS Samp Number	Client Sample Number	Master DP File Number	DP Sequence Number	Laboratory	Y/N	VOA	Y/N	SEMI VOA	Y/N	PEST/PCB	Y/N	WETCHEM	Y/N	METALS	COMMENTS	Y/N	RADCHEM	Date OSM Rcvd DP
B0BP28		B0BP28	752	TMA/NORCAL	N		N		N		Y	6/15/94	Y	6/15/94	04/29/94 - SAF-94-129	Y	6/27/94	6/27/94
B0BP29		B0BP28	752	TMA/NORCAL	N		N		N		N		Y	6/15/94	04/29/94 - SAF-94-129	N		6/15/94

Data Entry Complete: DP SKW

DATATRAC

9/6 0501 0939

Validation Rcvd 9/2/94

Date: September 19, 1994
To: Westinghouse Hanford Company (technical representative)
From: A.T. Kearney, Inc.
Subject: Radiochemistry - Data Package No. B0BP28-TMA-752 (SDG No. B0BP28)

INTRODUCTION

This memo presents the results of data validation on Data Package No. B0BP28-TMA-752 prepared by Thermo-Analytic Laboratories. A list of the sample validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analysis
B0BP28	04/26/94	Water	D	See Note 1

Note 1. Requested Method: Gross Alpha/Beta, Sr-90, Tc-99, Tritium/C-14, Total Activity

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

  Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analyses is six months.

  All holding times were acceptable.

- **Instrument Calibration and Performance**

  Instrument calibration is performed to establish that the counters used to determine radionuclide activities are capable of producing acceptable and reliable analytical data. Each counting system must be factory calibrated at installation and after any maintenance or repair. Calibration consists of an instrument efficiency determination for each applicable radionuclide. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible.

  All calibration results, including efficiency checks and background counts, were acceptable.

- **Blanks**

  Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above both the MDA and the statistical uncertainty associated with that MDA, the following qualifiers were applied: All positive sample results less than five times the highest blank concentration were qualified as estimated; sample results below the MDA were elevated to the MDA and qualified as undetected; sample results above the MDA and greater than five times the highest blank concentration were not qualified.

  All blank results were acceptable.

- **Accuracy**

  Accuracy was evaluated by analyzing soil or distilled water samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample recovery range is 70 to 130 percent, while that for a matrix spike is 60 to 140 percent. Spike sample results outside the above ranges resulted in associated sample results being qualified as estimated, rejected, or not qualified, depending on the activity of the individual sample. A chemical tracer is used to determine the efficiency of the analytical method, with tracer yield limits of 30 to 105 percent. Sample results above the MDA with chemical yields outside the above stated limits were qualified as estimated or rejected.

  Due to a low chemical yield (25%), the technetium-99 result for sample number B0BP28 in SDG No. B0BP28 was qualified as estimated and flagged "J".

  All other accuracy results were acceptable.

- **Precision**

  Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the RDL and the RPD is less than 35 percent for soil samples and 20 percent for water samples, the results are acceptable. If either activities are $<$5xRDL, a control limit of $\leq$2xRDL is used for soil samples and $\leq$RDL for water samples. If either the original or replicate value is below the RDL, the applicable control limits are $\leq$RDL for water samples and $\leq$2xRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

  All precision results were acceptable.

- **Sample Result Verification and Detection Limits**

  Sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors.

  The RDL for technetium-99 in sample number B0BP28 in SDG No. B0BP28 was above the calculated MDA value.

  All other sample results and reported detection limits were acceptable.

- **Completeness**

  Data Package No. B0BP28-TMA-752 (SDG No. B0BP28) was submitted for validation and verified for completeness.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

A review of instrument continuing calibration information and QC data indicate that instrument performance was adequate for all analyses. The chemical recovery for technetium-99 in sample number B0BP28 was below QC limits. Associated sample results were qualified as estimates. Estimated results are usable for limited

purposes only. Except as noted in the preceding sections, all other validated data are usable for all purposes.

REFERENCES

WHC, 1992a, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

WHC, 1992b, *Data Validation Procedures for Radiochemical Analyses*, WHC-SD-EN-001, Rev. 2, Westinghouse Hanford Company, 1993.

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

J - Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: B0BP28	REVIEWER: RJS	DATE: 9/15/94	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Technetium-99	UJ	B0BP28	Low chemical recovery

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

RADIOCHEMISTRY ANALYSIS, WATER MATRIX, (pCi/L+-2 standard deviations)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B0BP28																				
Sample Number	B0BP28																				
Location	6-63-90																				
Remarks	Split																				
Sample Date	04/26/94																				
Radiochemistry Analysis	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
Gross Alpha	0.77	U																			
Gross Beta	4.0																				
Tritium	4.3	U																			
Carbon-14	-15	U																			
Strontium-90	0.18	U																			
Technetium-99	1.1	UJ																			

N404114-01

TMA/NORCAL
SAMPLE DELIVERY GROUP 7371

DATA SHEET

BOBP28

SDG	7371	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N404114-01	Client sample id	BOBP28
Dept sample id	7371-001	Location/Matrix	100-BC-5 LIQUID
Received	04/29/94	Collected	04/26/94
		Chain of custody id	EFL-1036

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALIFIERS	TEST
Gross Alpha	Alpha	0.77	1.2	2	3	U	80A
Gross Beta	Beta	4.0	1.3	2	4		80B
Tritium	10028-17-8	4.3	160	300	400	U	H
Carbon 14	14762-75-5	-15	33	60	100	U	C
Strontium 90	10098-97-2	0.18	0.31	0.8	2	U	Y
Technetium 99	14133-76-7	1.1	1.9	7	5	UJ [1]	TC

T00553

SDG: 7371

1. Low Chemical Yield (24.9%)

RJS 7-11-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.30
Report date	06/24/94

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

TMA/NORCAL

Report N4-04-114-7371
Sample Delivery Group 7371

Westinghouse Hanford Company
P.O. MBH-SVV-069262

Case Narrative

June 24, 1994

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7371 is comprised of a single water sample designated as SAF 94-129. There were no unique ID's on the Chain-of-Custody document, however, the project designation on the document was 100-BC-5.

Four 1000 mL poly bottles of sample were received for analyses.

2.0 ANALYSIS NOTES

2.1 Gross Alpha Analyses
No problems were encountered by the laboratory with the analyses.

2.2 Gross Beta Analyses
No problems were encountered by the laboratory with the analyses.

2.3 Tritium Analyses
No problems were encountered by the laboratory with the analyses.

2.4 Carbon-14 Analyses
The recovery for laboratory control sample 7371-002 was 124%, which is outside the 3σ protocol limits of 79-121%. The sample and duplicate analyses were in agreement, and the blank analysis was satisfactory therefor the samples were not reanalyzed.

2.5 Strontium-90 Analyses
No problems were encountered by the laboratory with the analyses.

2.6 Technetium-99 Analyses
The MDA's for sample B0BP28 and laboratory control sample 7371-002 were greater than the RDL due to low chemical yields. The LCS contained activity at a level seven times the MDA, therefore the higher MDA has no impact on data validity. There was not enough of sample BOBP28 to perform a reanalysis, however, the MDA of the duplicate analysis was less than the RDL. Activity greater than the MDA was not detected in either sample B0BP28 or the duplicate.

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: ☐ Priority ☒ Normal

Collector: K. Trapp	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 100-BC-5	Sampling Location: 100 B	SAF No.: 94-129
Ice Chest No.: SMC 144	Field Logbook No.: EFL-103C	Method of Shipment: EMERY
Shipped To: TMA	Offsite Property No.:	Bill of Lading/Air Bill No.:
Possible Sample Hazards/Remarks:		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE 3B deliver AJS 4/24/94 1612		

SAMPLE ANALYSIS

41

Preservative	HNO3<2	COOL 4	HNO3<2	HCL pH<2	COOL 4		HNO3<2								
Type of Container	G/P	P	G/P	G/P	Gs		G/P								
No. of Container(s)	1	1	1 4 L hr 4/26/94	1	2		1								
Volume	1000ml	1000ml	~~1000ml~~ 4L hr 4/26/94	1000ml	1000ml		1000ml								
	ICP METALS AA METALS Hg CLP	ANIONS F,SO4 COND pH	GROSS ALPHA/ BETA Sr-90	Tc-99	TRITIUM C-14		ICP METALS, AA METALS, Hg FILTERD CLP								

Sample No.	Matrix*	Date Sampled	Time Sampled														
100P28	W	4/26/94	1034	X	X	X	X	X									
100P29	W	↓	↓							X							

000014

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
K. Trapp/K. Trapp	4/26/94 1610	AJ Simpson	4/27/94 1612
AJ Simpson	4/28/94 0952	K. Blum / Kermit Blum	4-29-94/1340

SPECIAL INSTRUCTIONS
DATA DELIVERABLE-STANDALONE

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

LABORATORY SECTION: Received By | Title | Date/Time

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

Signature Security Service

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT)
WHC		W94-C-ESH-32

PART I – TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
Env. Eng. & Tech.	Geosciences	Geochem. & Hydrochem.

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

Routing Emery ☒ Contractor ☐ Vendor

Shipped to
TMA/NORCAL
2030 Wright Ave.
Richmond, CA 94804

Off-site Custodian

Full Title

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
1 ~1 lbs.	Sample #: BOBAB, BUBDS Cooler ID: SMC144 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 lbs.	Sample #: NA Cooler ID: Polycooler with groundwater samples packed in wet ice and vermiculite	N/A

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

Necessity for the Off-Site Use of this Property

Sampling supports RI/FS work in the 100 AREA

Bill of lading # 14621376 1C

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

RM Clearance for Public Release	RM Survey No.	Date
	15794	11-25-94

Location of Property (Area & Bldg.)	Contact	Phone
100 BE-5	PH Butcher	(509) 376-5045

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
11-25-94	WB1222 / P85NA	N/A

Originated By	Date	Authorized By	Date
PH Butcher	11/25/94		11/28/94

Signature and Name of Property Control	Custodian Date	Property Management Approval	Date
			11/28/94

PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient	Return Order No.	Date Issued	Purchase Order No.	Date Issued
CR Nelson	42			
Date 11-28-94				

DISTRIBUTION

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

54-3000-479 (09/89)

193

ORM OF PAYMENT

GBL ☐ FCCOD ☐

Bill to Consignee ☐ Third Party Billing ☐

Shipper's Account Number

EMERY WORLDWIDE

A CF Company

SERVICES

	UNITED STATES	CANADA	INTL
	Same Day ☐		Express ☐
	AM ☐	PM ☐	Preferred ☐
	Second Day ☐	Saturday Delivery ☐	Standard ☐

Standard Plus ☐ Business Documents ☐ Customs Clearance ☐ Delivery ☐

Date: 04-28-94 Origin: Shipment Number: 140213761 6

From:

NGHOUSE SHIPPING DEPT (509) 376-6665
DEPARTMENT OF ENERGY C/O

To:

TMA/NORCAL
TMA/NORCAL
2030 WRIGHT AVENUE
RICHMOND CA USA

Tariff Dest. | Gateway

Check to Shipper $

Hold for Pick Up ☐ Canada ☐

Canada ☐

EMERY WORLDWIDE will accept Consignee's check with all risks being assumed by Shipper, including but not limited to non-payment, fraud and misrepresentation.

Customer's Reference Numbers
PBBAA W94-0+0518#22

Consignee's Account Number
E 94804

FOR INFORMATION OR RATES CALL 1-800-44 EMERY (1-800-443-6379)

Declared Value $

Description	Dimensions (Pcs / L / W / H)	Total Pieces	Total Weight (lbs.)
ID SML - 144 AMPLER	1 / 16 / 16	1	54

Remarks
HT DELIVERY
RE SECURITY SERVIC

Zip-Ship ☐
For shipments within the 50 United States, Shipper has the option to check this box and, by checking, agrees that the Zip-Ship conditions described in the area to the right, apply.

Mark if Emery Packaging is used
Urgent Letter 9X12 ☒ Urgent Pack 12X15 ☒

140213761 6

1-OAK-A

Commodity Code | Third Party Account Number (mandatory for Third Party Billing) E | Third Party Account Number

International Customs Value | International Insurance

Total Transportation Charges | Other Charges/Advance at Origin | COD

Terms and Conditions on Back

TMA/NORCAL
ANALYTICAL METHODS FOR LIQUID SAMPLES

1. **Gross Alpha and Gross Beta:** Approximately a 0.200 L of water is uniformly deposited on a stainless steel planchet and counted on a low background proportional counter.

2. **Tritium:** A 0.05 L sample is distilled and 10 mL distillate is used for tritium determination by liquid scintillation counting. The efficiency is determined by an internal spike of the sample.

3. **Carbon-14:** Carbon-14 is determined by equilibrating the dissolved aliquot with carrier. CO_2 liberated from the sample is converted to $BaCO_3$. The $BaCO_3$ is added to a scintillation cocktail and counted on the LSC.

4. **Nickel-63:** Nickel-63 is determined by equilibrating the dissolved aliquot with carrier and purifying the nickel with selected precipitation. The purified nickel is counted by LSC counter.

5. **Strontium-89:** Strontium-89 is determined on a 1 L aliquot. Strontium carrier is equilibrated with the aliquot, purified by selective precipitations, and counted as $SrCo_3$ on a low background beta counter.

6. **Strontium-90:** Strontium-90 is determined on a 1 L aliquot. Yttrium is extracted by HDEHP extraction, converted to yttrium oxide, and beta counted.

7. **Technetium-99:** Approximately 100 mL aliquot is taken and enough sulfuric acid is added to make the solution 6N H_2SO_4. Appropriate technetium-99^m tracer and approximately 10 gram $K_2S_2O_8$ are added. The solution is boiled for 30 minutes, extracted with TBP, and purified by co-precipitation and anion exchange procedure.

   The purified technetium extract is electrodeposited on a stainless steel disc and counted on a gamma detector to determine yield. After decay of technetium-99^m, the disc is counted on a low background beta counter.

8. **Iodine-129:** A water aliquot is equilibrated with iodine carrier. The extracted iodine is purified, precipitated as CuI, and mounted on a nylon planchet for X-ray counting.

9. **Cesium-137:** Cesium-137 is determined by equilibrating a dissolved aliquot with carrier and purifying the cesium with selected precipitations. The purified cesium is mounted as Cs_2PtCl_6 and counted on a low background counter.

10. **Radium-226:** Radium-226 is determined by placing an aliquot of dissolved sample in a de-emanation bubbler tube and outgassing the sample with helium. The bubbler is sealed and stored for 10 to 14 days. After the ingrowth period, the radon-222 daughter is outgassed with helium into a Lucas Cell and alpha counted. The dpm alpha counts are converted to dpm by computer.

ANALYTICAL METHODS FOR LIQUID SAMPLES (cont'd, page two)

11. **Total Radium:** Total radium is determined by equlibrating an aliquot of water with barium and lead carriers. $BaSo_4$ is precipitated, filtered, and redissolved in the presence of EDTA. Finally, $BaSo_4$ is precipitated at pH 4.5, mounted on a filter paper, and counted on a gross alpha counter.

12. **Isotopic Thorium:** Thorium is determined on a 1 L aliquot. Appropriate thorium tracer is added and the solution equilibrated by HF-HNO_3-HCl treatment. Thorium is purified by selective ion exchange procedures and the purified extract is electroplated on a stainless steel disc for alpha pulse analysis.

13. **Isotopic Plutonium, Curium, and Americium:** Isotopic plutonium, americium, and curium are determined by adding appropriate tracers to the sample and purified by selective ion exchange columns. Americium and Curium are further purified. The purified extract is electrodeposited on a stainless steel disk for alpha pulse height analysis. The plutonium plate is striped with acid, converted to nitrate, and counted on an LSC counter for plutonium-241.

14. **Isotopic Uranium:** Uranium is determined on a 1 L aliquot. Appropriate uranium tracer is added and the solution equilibrated by HF-HNO_3-HCl treatment. Uranium is purified by selective ion exchange procedures and the purified extract is electroplated on a stainless steel disc for alpha pulse analysis.

15. **Total Uranium:** A 0.25 g aliquot of sample is dissolved in nitric acid and then evaporated to dryness. The residue is then ashed at 450°C and brought to a final dissolution volume of 20 mL in 1N HNO_3. One mL of the dissolution volume was taken for laser phosphorometric determination of uranium.

16. **Neptunium-237:** Calcium nitrate is added to a 200 mL aliquot and the mixture equilibrated with americium-234/neptunium-239 tracer. Calcium phosphate is precipitated, dissolved in aluminum nitrate-2N HNO_3 solution, and passed through a EI chrome column. Neptunium is eluted with 0.1M ammonium oxalate solution and converted to 1N HCl. Iron scavenge is added and iron hydroxide precipitated by the addition of NH_40H and Na_2C_3. The iron precipitate is dissolved in 8N HNO_3 and passed through a Dowex 1 x-4 column. Neptunium is eluted with 1N HCl and the purified extract is electrodeposited on a stainless steel disk for alpha pulse height analysis and beta counting.

17. **Gamma-Scan:** Approximately 0.5 L of water is placed in an appropriate geometry and counted on a Ge(Li) detector.

Appendix 5

Data Validation Supporting Documentation

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	(D)	~~E~~

RS 9/6/94

PROJECT:	DATA PACKAGE: T00553	
VALIDATOR: RJS	LAB: TMA	DATE: 7-11-94
CASE: 100-BC-5	SDG: 7371	

ANALYSES PERFORMED

☒ Gross Alpha/Beta	☒ Strontium-90	☒ Technetium-99	☐ Alpha Spectroscopy	☐ Gamma Spectroscopy	
☐ Total Uranium	☐ Radium-22	☒ Tritium	☒ C^{14}		

SAMPLES/MATRIX B0BP28 (WATER)

1. Completeness . . . . . ☐ N/A

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

Comments: ... Missing Radiological Data Package Verification Cover Sheet and ↳ ... Missing Radiological Analysis Data Verification

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: Gross α,β ✓
Tc^{99} ✓ Sr^{90} ✓
3H ✓
C^{14} ✓

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: Gross α & β ✓
3H ✓
C14 ✓
~~Btc~~ 99 ✓
SR 90 ✓

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: ✓

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: 3H 101% Recovery (✓)

9613501.0961

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

LCS analyzed? . . . . . (Yes) No N/A

LCS recoveries acceptable? . . . . . (Yes) No N/A 9/5/96

LCS traceable? . . . . . Yes No (N/A)

Transcription/Calculation Errors? . . . . . Yes No (N/A)

Comments: C^{14} Rec 124 % (✓) (70-130 %)

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: C^{14} LCS 114 %.

Sr^{90} ✓

* Tc BOBP28 - 24.9 %. (J or UJ)

TC Dup - 29.3 %.

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: Gross Beta 38% Recovery < 1 RDL (range) ✓

9613501.0962

9. Field QC Samples . . . . . X 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:

10. Holding Times

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

Comments: Samples collected 4/26/94 < 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? . . . . . RS 9/6/94 ~~Yes~~ (No) N/A
Transcription/calculation errors? . . . . . Yes (No) N/A

Comments: calculations ✓

Tc^{99} MDA > RDL
(7) (5)

9/06/94

Data Validation Check List

for Project 100-BC-5

HEIS Samp Number	Client Sample Number	Master DP File Number	DP Sequence Number	Laboratory	Y/N	VOA	Y/N	SEMI VOA	Y/N	PEST/PCB	Y/N	WETCHEM	Y/N	METALS	COMMENTS	Y/N	RADCHEM	Date OSM Rcvd DP
B0BP28	Split	B0BP28	752	TMA/NORCAL	N		N		N		Y	6/15/94	Y	6/15/94	04/29/94 - SAF-94-129	Y	6/27/94	6/27/94
B0BP29	Split, filtered	B0BP28	752	TMA/NORCAL	N		N		N		N		Y	6/15/94	04/29/94 - SAF-94-129	N		6/15/94
B0BNX2		W0031	041	ITC	N		N		N		Y	7/20/94	Y	6/08/94	04/14/94 - SAF-94-129	Y	6/06/94	~~7/20/94~~ 6/08/94
B0BNX3	filtered	W0031	041	ITC	N		N		N		N		Y	6/08/94	04/14/94 - SAF-94-129	N		6/08/94
B0BNX4		W0031	041	ITC	N		N		N		Y	6/15/94	Y	~~6/15/94~~ NV	04/19/94 - SAF-94-129 - CHANGED FROM SDG W0043	Y	~~6/06/94~~ NV	6/16/94
B0BNX5	filtered	W0031	041	ITC	N		N		N		N		Y	6/15/94	04/19/94 - SAF-94-129 - CHANGED FROM SDG W0043	N		6/15/94
B0BNX6		W0031	041	ITC	N		N		N		Y	6/24/94	Y	6/08/94	04/14/94 - SAF-94-129	Y	6/06/94	6/24/94
B0BNX7	filtered	W0031	041	ITC	N		N		N		N		Y	6/08/94	04/14/94 - SAF-94-129	N		6/08/94

Final Report

Validation Rcvd 9/6/94

9/06/94

Data Validation Check List

for Project 100-BC-5

HEIS Samp Number	Client Sample Number	Master DP File Number	DP Sequence Number	Laboratory	Y/N	VOA	Y/N	SEMI VOA	Y/N	PEST/PCB	Y/N	WETCHEM	Y/N	METALS	COMMENTS	Y/N	RADCHEM	Date OSM Rcvd DP
B0BNX8		W0031	041	ITC	N		N		N		Y	6/15/94	Y	6/08/94	04/15/94 - SAF-94-129 - CHANGED FROM SDG W0043	Y	6/16/94	6/16/94
B0BNX9	filtered	W0031	041	ITC	N		N		N		N		Y	6/08/94	04/15/94 - SAF-94-129	N		6/08/94
B0BNY0		W0031	041	ITC	N		N		N		Y	7/20/94	Y	6/08/94	04/14/94 - SAF-94-129	Y	6/06/94	7/20/94
B0BNY1	filtered	W0031	041	ITC	N		N		N		N		Y	6/08/94	04/14/94 - SAF-94-129	N		6/08/94
B0BNY2		W0031	041	ITC	N		N		N		Y	6/08/94	Y	6/15/94	04/22/94 - SAF-94-129 - CHANGED FROM SDG W0043	Y	6/16/94	6/16/94
B0BNY3	filtered	W0031	041	ITC	N		N		N		N		Y	6/15/94	04/22/94 - SAF-94-129 - CHANGED FROM SDG W0043	N		6/15/94
B0BNY6		W0031	041	ITC	N		N		N		Y	6/15/94	Y	6/15/94	04/27/94 - SAF-94-129 - CHANGED FROM SDG W0043	Y	6/16/94	6/16/94
B0BNY7	filtered	W0031	041	ITC	N		N		N		N		Y	6/15/94	04/27/94 - SAF-94-129 - CHANGED FROM SDG W0043	N		6/15/94

Validation Rcvd 9/6/94

9/06/94

Data Validation Check List

for Project 100-BC-5

HEIS Samp Number	Client Sample Number	Master DP File Number	DP Sequence Number	Laboratory	Y/N	VOA	Y/N	SEMI VOA	Y/N	PEST/PCB	Y/N	WETCHEM	Y/N	METALS	COMMENTS	Y/N	RADCHEM	Date OSM Rcvd DP
B0BNZ2		W0031	041	ITC	N		N		N		Y	6/08/94	Y	6/08/94	04/18/94 - SAF-94-129	Y	6/06/94	6/08/94
B0BNZ3	filtered	W0031	041	ITC	N		N		N		N		Y	6/08/94	04/18/94 - SAF-94-129	N		6/08/94
B0BNZ4		W0031	041	ITC	N		N		N		Y	6/08/94	Y	6/08/94	04/18/94 - SAF-94-129	Y	6/06/94	6/08/94
B0BNZ5	filtered	W0031	041	ITC	N		N		N		N		Y	6/08/94	04/18/94 - SAF-94-129	N		6/08/94
B0BP06		W0031	041	ITC	N		N		N		Y	6/15/94	Y	6/15/94	04/27/94 - SAF-94-129 - CHANGED FROM SDG W0043	Y	6/16/94	6/16/94
B0BP07	filtered	W0031	041	ITC	N		N		N		N		Y	6/15/94	04/27/94 - SAF-94-129 - CHANGED FROM SDG W0043	N		6/15/94
B0BP08		W0031	041	ITC	N		N		N		Y	6/15/94	Y	6/15/94	04/29/94 - SAF-94-129 - CHANGED FROM SDG W0043	Y	6/16/94	6/16/94
B0BP09	filtered	W0031	041	ITC	N		N		N		N		Y	6/15/94	04/29/94 - SAF-94-129 - CHANGED FROM SDG W0043	N		6/15/94

Validation Rcvd 9/6/94

9/06/94

Data Validation Check List

for Project 100-BC-5

HEIS Samp Number	Client Sample Number	Master DP File Number	DP Sequence Number	Laboratory	Y N	VOA	Y N	SEMI VOA	Y N	PEST/PCB	Y N	WETCHEM	Y N	METALS	COMMENTS	Y N	RADCHEM	Date OSM Rcvd DP
B0BP12		W0031	041	ITC	N		N		N		Y	6/15/94	Y	6/15/94 NV	04/27/94 - SAF-94-129 - CHANGED FROM SDG W0043	Y	6/16/94	6/16/94
B0BP13	filtered	W0031	041	ITC	N		N		N		N		Y	6/15/94	04/27/94 - SAF-94-129 - CHANGED FROM SDG W0043	N		6/15/94
B0BP14		W0031	041	ITC	N		N		N		Y	6/08/94	Y	6/08/94	04/21/94 - SAF-94-129	Y	6/06/94	6/08/94
B0BP15	filtered	W0031	041	ITC	N		N		N		N		Y	6/08/94	04/21/94 - SAF-94-129	N		6/08/94
B0BP16		W0031	041	ITC	N		N		N		Y	6/08/94	Y	6/08/94	04/21/94 - SAF-94-129	Y	6/06/94	6/08/94
B0BP17	filtered	W0031	041	ITC	N		N		N		N		Y	6/08/94	04/21/94 - SAF-94-129	N		6/08/94
B0BP18		W0031	041	ITC	N		N		N		Y	6/08/94	Y	6/08/94	04/21/94 - SAF-94-129	Y	6/06/94	6/08/94
B0BP19	filtered	W0031	041	ITC	N		N		N		N		Y	6/08/94	04/21/94 - SAF-94-129	N		6/08/94
B0BP20		W0031	041	ITC	N		N		N		Y	6/15/94	Y	6/15/94	04/27/94 - SAF-94-129 - CHANGED FROM SDG W0043	Y	6/16/94	6/16/94

Validation Rcvd 9/6/94

9/06/94

Data Validation Check List

for Project 100-BC-5

HEIS Samp Number	Client Sample Number	Master DP File Number	DP Sequence Number	Laboratory	Y/N	VOA	Y/N	SEMI VOA	Y/N	PEST/PCB	Y/N	WETCHEM	Y/N	METALS	COMMENTS	Y/N	RADCHEM	Date OSM Rcvd DP
B0BP21	filtered	W0031	041	ITC	N		N		N		N		Y	6/15/94	04/27/94 - SAF-94-129 - CHANGED FROM SDG W0043	N		6/15/94
B0BP22		W0031	041	ITC	N		N		N		Y	6/08/94	Y	6/08/94	04/18/94 - SAF-94-129	Y	6/06/94	6/08/94
B0BP23	filtered	W0031	041	ITC	N		N		N		N		Y	6/08/94	04/18/94 - SAF-94-129	N		6/08/94
B0BP24	duplicate filtered	W0031	041	ITC	N		N		N		Y	6/08/94	Y	6/08/94	04/21/94 - SAF-94-129	Y	6/06/94	6/08/94
B0BP25	duplicate filtered	W0031	041	ITC	N		N		N		N		Y	6/08/94	04/21/94 - SAF-94-129	N		6/08/94
B0BP30	equipment blank	W0031	041	ITC	N		N		N		Y	6/15/94	Y	6/15/94	04/27/94 - SAF-94-129 - CHANGED FROM SDG W0043	Y	6/16/94	6/16/94
B0BP31	equipment blank/filtered	W0031	041	ITC	N		N		N		N		Y	6/15/94	04/27/94 - SAF-94-129 - CHANGED FROM SDG W0043	N		6/15/94
B0BP42	equipment blank	W0031	041	ITC	N		N		N		Y	6/15/94	Y	6/15/94	04/27/94 - SAF-94-129 - CHANGED FROM SDG W0043	Y	6/16/94	6/16/94

Validation Rcvd 9/6/94

9/06/94

Data Validation Check List

for Project 100-BC-5

HEIS Samp Number	Client Sample Number	Master DP File Number	DP Sequence Number	Laboratory	Y/N	VOA	Y/N	SEMI VOA	Y/N	PEST/PCB	Y/N	WETCHEM	Y/N	METALS	COMMENTS	Y/N	RADCHEM	Date OSM Rcvd DP
BOBP43	equipment blank	W0031	041	ITC	N		N		N		N		Y	6/15/94	04/27/94 - SAF-94-129 - CHANGED FROM SDG W0043	N		6/15/94
BOBNY4		W0040	046	ITC	N		N		N		Y	6/13/94	Y	6/13/94	04/22/94 - SAF-94-129	Y	6/14/94	6/14/94
BOBNY5	filtered	W0040	046	ITC	N		N		N		N		Y	6/13/94	04/22/94 - SAF-94-129	N		6/14/94
BOBNY8		W0040	046	ITC	N		N		N		Y	6/13/94	Y	6/13/94	04/27/94 - SAF-94-129	Y	6/14/94	6/14/94
BOBNY9	filtered	W0040	046	ITC	N		N		N		N		Y	6/13/94	04/27/94 - SAF-94-129	N		6/13/94
BOBNZ0		W0040	046	ITC	N		N		N		Y	6/13/94	Y	6/13/94	04/25/94 - SAF-94-129	Y	6/14/94	6/14/94
BOBNZ1	filtered	W0040	046	ITC	N		N		N		N		Y	6/13/94	04/25/94 - SAF-94-129	N		6/13/94
BOBNZ6		W0040	046	ITC	N		N		N		Y	6/13/94	Y	6/13/94	04/25/94 - SAF-94-129	Y	6/14/94	6/14/94
BOBNZ7	filtered	W0040	046	ITC	N		N		N		N		Y	6/13/94	04/25/94 - SAF-94-129	N		6/13/94

Validation Rcvd 9/6/94

9/06/94

Data Validation Check List

for Project 100-BC-5

HEIS Samp Number	Client Sample Number	Master DP File Number	DP Sequence Number	Laboratory	Y/N	VOA	Y/N	SEMI VOA	Y/N	PEST/PCB	Y/N	WETCHEM	Y/N	METALS	COMMENTS	Y/N	RADCHEM	Date OSM Rcvd DP
B0BNZ8		W0040	046	ITC	N		N		N		Y	6/13/94	Y	6/13/94	04/25/94 - SAF-94-129	Y	6/14/94	6/14/94
B0BNZ9	filtered	W0040	046	ITC	N		N		N		N		Y	6/13/94	04/25/94 - SAF-94-129	N		6/13/94
B0BP00		W0040	046	ITC	N		N		N		Y	6/13/94	Y	6/13/94	04/22/94 - SAF-94-129	Y	6/14/94	6/14/94
B0BP01	filtered	W0040	046	ITC	N		N		N		N		Y	6/13/94	04/22/94 - SAF-94-129	N		6/13/94
B0BP02		W0040	046	ITC	N		N		N		Y	6/13/94	Y	6/13/94	04/22/94 - SAF-94-129	Y	6/14/94	6/14/94
B0BP03	filtered	W0040	046	ITC	N		N		N		N		Y	6/13/94	04/22/94 - SAF-94-129	N		6/13/94
B0BP04		W0040	046	ITC	N		N		N		Y	6/13/94	Y	6/13/94	04/25/94 - SAF-94-129	Y	6/14/94	6/14/94
B0BP05	filtered	W0040	046	ITC	N		N		N		N		Y	6/13/94	04/25/94 - SAF-94-129	N		6/13/94
B0BP10		W0040	046	ITC	N		N		N		Y	6/13/94	Y	6/13/94	04/22/94 - SAF-94-129	Y	6/14/94	6/14/94
B0BP11	filtered	W0040	046	ITC	N		N		N		N		Y	6/13/94	04/22/94 - SAF-94-129	N		6/13/94

Validation Rcvd 9/6/94

9/06/94

Data Validation Check List

for Project 100-BC-5

HEIS Samp Number	Client Sample Number	Master DP File Number	DP Sequence Number	Laboratory	Y N VOA	Y N SEMI VOA	Y N PEST/PCB	Y N WETCHEM	Y N METALS	COMMENTS	Y N RADCHEM	Date OSM Rcvd DP
B0BP26	split	W0040	046	ITC	N	N	N	Y 6/13/94	Y 6/13/94	04/22/94 - SAF-94-129	Y 6/14/94	6/14/94
B0BP27	split filtered	W0040	046	ITC	N	N	N	N	Y 6/13/94	04/22/94 - SAF-94-129	N	6/13/94

Data Entry Complete: DP SKW 9/7/94

DATATRAC

Validation Rcvd 9/6/94