START

9615404.0619

B01434-DAT-282

0043178

DATACHEM LABORATORIES
960 WEST LEVOY DRIVE
SALT LAKE CITY, UTAH 84123

WESTINGHOUSE HANFORD

****

CASE No. WHC25 SDG No. WHCM25 SF-0903-AD,BD,CD

CLIENT SAMPLE #	EPA SAMPLE #	LAB SAMPLE #
B01434	MC8581	CLP8481
B01440	MC8582	CLP8482
B01454	MC8583	CLP8483
B014H4	MC8584	CLP8584
MATRIX DUPLICATE (GFAA,HG)	MC8581D	CLP8481
MATRIX DUPLICATE (ICP)	MC8582D	CLP8482
MATRIX SPIKE (GFAA,HG)	MC8581S	CLP8481
MATRIX SPIKE (ICP)	MC8582S	CLP8482

PLEASE READ THIS CASE NARRATIVE BEFORE SCREENING THIS CASE.

SDG.: WHCM25 Case: WHC25

Sample MC8584 was actually a Preparation Blank for soil, but it was requested, by the client, that it be documented and reported as a regular sample. Therefore the values reported on Form III for PBS are the values for Sample MC8584.

The additional analytes Molybdenum, Titanium, and Zirconium are not EPA/CLP analytes, therefore they were analyzed using alternative methods. QC was performed according to EPA SW846 protocol.

FEB 1996
RECEIVED
EDMC

9613404.0620

1

INORGANIC ANALYSIS DATA SHEET

MC8581

Lab Name: DATACHEM LABORATORIES Contract:

Lab Code: DATAC Case No.: WHC25 SAS No.: SDG No.: WHCM25

Matrix (soil/water): SOIL Lab Sample ID: CLP8581

Level (low/med): LOW Date Received: 10/08/91

% Solids: 99.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9580			P
7440-36-0	Antimony	5.0	U	N	P
7440-38-2	Arsenic	1.0	B	W	F
7440-39-3	Barium	96.8			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.61	U		P
7440-70-2	Calcium	5060		*	P
7440-47-3	Chromium	14.3		*	P
7440-48-4	Cobalt	15.7			P
7440-50-8	Copper	12.2			P
	Cyanide				NR
7439-89-6	Iron	28400			P
7439-92-1	Lead	6.0		NS*	F
7439-95-4	Magnesium	5660			P
7439-96-5	Manganese	427		N	P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	19.9			P
7440-09-7	Potassium	2220			P
7782-49-2	Selenium	0.20	U	W	F
7440-22-4	Silver	0.61	U		P
7440-23-5	Sodium	294	B		P
7440-28-0	Thallium	0.20	U		F
	Titanium	2580			P
7440-62-2	Vanadium	75.0			P
7440-66-6	Zinc	55.8		E	P
	Zirconium	29.2		N	P

DOC 3

Color Before: BROWN Clarity Before: Texture: FINE

Color After: Clarity After: Artifacts:

Comments:
E - ICP SERIAL DILUTION OUTSIDE OF CONTROL LIMITS.

FORM I - IN
ENVIROFORMS/INORGANIC CLP

SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MC8582

Lab Name: DATACHEM LABORATORIES Contract:

Lab Code: DATAC Case No.: WHC25 SAS No.: SDG No.: WHCM25

Matrix (soil/water): SOIL Lab Sample ID: CLP8582

Level (low/med): LOW Date Received: 10/08/91

% Solids: 94.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11300			P
7440-36-0	Antimony	11.1	B	N	P
7440-38-2	Arsenic	4.5		S	F
7440-39-3	Barium	134			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.64	U		P
7440-70-2	Calcium	17400		*	P
7440-47-3	Chromium	12.0		*	P
7440-48-4	Cobalt	15.1			P
7440-50-8	Copper	16.5			P
	Cyanide				NR
7439-89-6	Iron	33000			P
7439-92-1	Lead	7.5		NS*	F
7439-95-4	Magnesium	4800			P
7439-96-5	Manganese	344		N	P
7439-97-6	Mercury	0.11	U		CV
7440-02-0	Nickel	12.1			P
7440-09-7	Potassium	1370			P
7782-49-2	Selenium	0.21	U	W	F
7440-22-4	Silver	0.64	U		P
7440-23-5	Sodium	424	B		P
7440-28-0	Thallium	0.21	U		F
	Titanium	2230			P
7440-62-2	Vanadium	86.3			P
7440-66-6	Zinc	66.2		E	P
	Zirconium	43.1		N	P

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: Clarity After: Artifacts:

Comments:
E - ICP SERIAL DILUTION OUTSIDE OF CONTROL LIMITS.

FORM I - IN
ENVIROFORMS/INORGANIC CLP

SAMPLE NO.

9613404.0622

1

INORGANIC ANALYSIS DATA SHEET

MC8583

Lab Name: DATACHEM LABORATORIES Contract:

Lab Code: DATAC Case No.: WHC25 SAS No.: SDG No.: WHCM25

Matrix (soil/water): SOIL Lab Sample ID: CLP8583

Level (low/med): LOW Date Received: 10/08/91

% Solids: 96.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6340			P
7440-36-0	Antimony	5.2	U	N	P
7440-38-2	Arsenic	2.3		S	F
7440-39-3	Barium	81.7			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.62	U		P
7440-70-2	Calcium	6410		*	P
7440-47-3	Chromium	7.3		*	P
7440-48-4	Cobalt	14.9			P
7440-50-8	Copper	14.3			P
	Cyanide				NR
7439-89-6	Iron	29700			P
7439-92-1	Lead	4.4		N*	F
7439-95-4	Magnesium	4820			P
7439-96-5	Manganese	378		N	P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	10.3			P
7440-09-7	Potassium	1170			P
7782-49-2	Selenium	0.21	U	W	F
7440-22-4	Silver	0.62	U		P
7440-23-5	Sodium	277	B		P
7440-28-0	Thallium	0.21	U		F
	Titanium	2350			P
7440-62-2	Vanadium	76.2			P
7440-66-6	Zinc	53.7		E	P
	Zirconium	30.3		N	P

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: Clarity After: Artifacts:

Comments:
E - ICP SERIAL DILUTION OUTSIDE OF CONTROL LIMITS.

FORM I - IN
ENVIROFORMS/INORGANIC CLP

SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MC8584

Lab Name: DATACHEM LABORATORIES Contract:

Lab Code: DATAC Case No.: WHC25 SAS No.: SDG No.: WHCM25

Matrix (soil/water): SOIL Lab Sample ID: CLP8584

Level (low/med): LOW Date Received: 10/08/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4.7	B		P
7440-36-0	Antimony	5.0	U	N	P
7440-38-2	Arsenic	0.20	U		F
7440-39-3	Barium	0.20	U		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.60	U		P
7440-70-2	Calcium	5.0	B	*	P
7440-47-3	Chromium	1.8	B	*	P
7440-48-4	Cobalt	1.2	U		P
7440-50-8	Copper	0.80	U		P
	Cyanide				NR
7439-89-6	Iron	6.4	B		P
7439-92-1	Lead	0.23	B	N*	F
7439-95-4	Magnesium	5.2	U		P
7439-96-5	Manganese	0.40	U	N	P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	3.2	U		P
7440-09-7	Potassium	88.4	U		P
7782-49-2	Selenium	0.20	U		F
7440-22-4	Silver	0.60	U		P
7440-23-5	Sodium	25.5	B		P
7440-28-0	Thallium	0.20	U		F
	Titanium	5.0	U		P
7440-62-2	Vanadium	0.60	U		P
7440-66-6	Zinc	1.2	B	E	P
	Zirconium	5.0	U	N	P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:
E - ICP SERIAL DILUTION OUTSIDE OF CONTROL LIMITS.
THIS SAMPLE IS ACTUALLY A PREPARATION BLANK AND IS INCLUDED ON FORM 3.

9613404.0624

DATA CHEM LABORATORIES

ENVIRONMENTAL WATER REPORT

Date _____
Agency Identification Number SF-0903-DD
Account No. 3534C

Westinghouse Hanford Company
2355 Stevens Drive
MSIN T6-08
Richland,, WA 99352
Attention: Jeanette Duncan

OCT 1991
RECEIVED
DATA RECEIPT

Telephone (509) 373-3225

Sampling Collection and Shipment

Sampling Site _____ Date of Collection October 01, 1991

Date Samples Received at DataChem October 08, 1991

Analytical Results

Parameter Name / Analysis Date / Method / Prep Method	Units	Field Number / Lab Number	BO1 434 CLP 8581	BO1 440 CLP 8582	BO1 454 CLP 8583	BO1 4H4 CLP 8584				* Limit of Detection
Fluoride (F) 10/17/1991 300.0 [1]	µg/g		ND*	ND*	ND*	ND*				1.
Chloride (Cl) 10/17/1991 300.0 [1]	µg/g		1.	18.	2.	ND*				1.
Nitrate (NO_3-N) 10/17/1991 300.0 [1]	µg/g		0.7	1.9	0.6	ND*				0.3
Nitrite (NO_2-N) 10/17/1991 300.0 [1]	µg/g		ND*	ND*	ND*	ND*				0.4
Phosphate (PO_4-P) 10/17/1991 300.0 [1]	µg/g		2.	ND*	ND*	ND*				2.
Sulfate (SO_4) 10/17/1991 300.0 [1]	µg/g		3.	32.	12.	ND*				1.
Ammonia (NH_3 - N) 10/17/1991 350.1 [1]	µg/g		1.	ND*	ND*	ND*				0.6

* See comment on last page.
ND Parameter not detected.
NR Parameter not requested.
[1] Analyses completed on or before this date.

** Parameter not analyzed (See comment page).
( ) Parameter between LOD and LOQ.
[ ] Method Reference (See comments page.)

Brian W. Motes
Analyst: Brian W. Motes

Debbie A. Christensen
Reviewer: Debbie A. Christensen

Norman K. Christensen
Laboratory Supervisor: Norman K. Christensen

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547 / (801) 266-7700
A Sorenson Company

DATA CHEM LABORATORIES

ENVIRONMENTAL WATER REPORT

Date _____

Agency Identification Number SF-0903-DD

Method Index -- **Method Reference** --

[1] EPA-600/4-79-020 "Methods for Chemical Analysis of Water and Wastes", March 1983.

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547 / (801) 266-7700
A Sorenson Company

2

9613404.0626

FORM OF PAYMENT

CASH ☐ GBL CBL ☐ FCCOD ☐

PPD ☒ COL ☐ OTH ☐ COMAT ☐

92

EMERY WORLDWIDE

A CF Company

SERVICES

UNITED STATES / CANADA: Same Day ☐ AM ☒ Second Day ☐ PM ☐ Saturday Delivery ☐

INTERNATIONAL: Express ☐ Preferred ☐ Standard ☐ Business Documents ☐ Customs Clearance ☐ Delivery ☐

E Shipper's Account Number: 850281585

Date: 10-07-91 | Origin: PSC | Shipment Number: 247425323 2

From:
WESTINGHOUSE SHIPPING DEPT (509) 376-6665
US DEPARTMENT OF ENERGY C/O
WESTINGHOUSE HANFORD
BLDG 1163
2355 STEVENS DRIVE
RICHLAND WA
Canada ☐ ☐

To:
ATTN: JIM JOHNSTON
DATA CHEM LAB
960 W. LEVOY DRIVE
SALT LAKE CITY UT
Canada ☐ ☐

Tariff Dest. | Gateway

Check to Shipper $

Hold for Pick Up ☐

EMERY WORLDWIDE will collect consignee's check made payable only to the shipper for the value of the goods in the amount shown above.

Customer's Reference Numbers: W81223 PK1BB W92-0-0018#1 | 99352

E Consignee's Account Number: 84123

Description	Pcs.	L	W	H	Total Pieces	Total Weight (In Lbs.)
1 UCE CGEST RM#5 SOIL SAMPLES B01434, B01440, B01454 W92-0-0018#1	1		16	11	1	30

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

Declared Value $

TODSR ☐ Haz Mat ☐ Edit ☐ A B C D E F G H I J K

OVERNIGHT DELIVERY
SIGNATURE SECURITY SERVICE

1 2 3 4 5 6
7 8 9 0 1 2

Envelope 9X12 ☒ Pack 12X15 ☒

Shipper's Signature X

International Shipments: Free Domicile ☐ | Commodity Code

Third party Account Number mandatory for Third party billing. E | Third Party Account Number

International Customs Value | International Insurance

Base Charge

Total Transportation Charges

Other Charges/Advance at Origin ☐ OC/AO- $

SLC-A

0 23

Terms and Conditions on Back

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Westinghouse Hanford Company 9613404.0627

CHAIN OF CUSTODY

Custody Form Initiator C.E. Heiden

Company Contact Chris Kramer Telephone 376-4186

Project Designation/Sampling Locations Site Wide Background Collection Date 9-26-91, 10-1-91

Ice Chest No. RM # 5 Field Logbook No.

Bill of Lading/Airbill No. 2474253232 Offsite Property No. W92-0-0018#1

Method of Shipment Emery

Shipped to Data Chem Labortories, Salt Lake City, UT

Possible Sample Hazards/Remarks —

Sample Identification

B01434 - Soil (3-120 ml)
B01440 - Soil (3-120 ml)
B01454 - Soil (3-120 ml)

☐ Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)		
Relinquished by: C.E. HEIDEN C.E. Heiden	Received by: T. Jackson	Date/Time: 10-8-91 1100 ~~1300~~
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

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A-6000-407 (12/90)

SAMPLE LOG-IN SHEET

SF- 0903

Lab Name: DataChem Laboratories 9613404 0628

Page ____ of ____

Received By (Print Name): Tom Jackson

Log-In Date: 10-8-91

Received By (Signature): [signature]

Case Number: WHC

Sample Delivery Group No.: ____

SAS Number: ____

CIRCLE THE APPROPRIATE RESPONSE:

1. Custody Seal(s) Present/Absent* Intact/Broken*
2. Custody Seal Nos.: None
3. Chain-of-Custody Records Present/Absent*
4. Traffic Reports or Packing List Present/Absent*
5. Airbill Airbill/Sticker Present/Absent*
6. Airbill No.: 2474253232
7. Sample Tags Present/Absent*
   Sample Tag Numbers Listed/Not Listed on Chain-of-Custody
8. Sample Condition: Intact/Broken*/Leaking*
9. Does information on custody records, traffic reports, and sample tags agree? Yes/No*
10. Date Received at Lab: 10-8-91
11. Time Received: 1100

SAMPLE TRANSFER

Fraction: Metal/Anion/Ammon.

Area #: Walkin

By: [initials]

On: 10-8-91

EPA SAMPLE #	SAMPLE TAG #	ASSIGNED LAB #	MATRIX	REMARKS: CONDITION OF SAMPLE SHIPMENT, ETC.
B01 434	N/A	CLP 8581	S	Acceptable (4°)
440		8582		
454		8583		
4H4		8584		

10-8-91

* If Circled, contact SMO and attach record of resolution.

11/89 Rev.

Reviewed By: [signature]

Date: October 10, 1991

Logbook No.: ____

Logbook Page No.: ____

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FORM DC-1

Westinghouse Hanford Company 9613404.0629

SAMPLE ANALYSIS REQUEST

Project No. 91-075

PART I: FIELD SECTION

Collector C. Kramer / J. Lucas / C. Heiden Date Sampled 10-1-91 Time — hours

Company Contact C. D. Kramer Telephone (509) 376-4186

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01434	3-120 ml jars	Soil	See attached Tables A-1, A-2
B01440	↓	↓	Each sample is to be analyzed
B01454			for all analytes by the
			method shown except for
			fluoride. Fluoride may be
			done by ion chromatography.
B01444	0 containers	None	Additional prep blank for
			all analyses. This sample
			number is provided to
			report and track this
			request. Contact Mark
			Back - WHC OSM (509) 373-4369
			if there are questions.

Field Information** Background sites #2, #14, and #13

Special Handling and/or Storage Sieve Samples. Use the less-than 2mm size fraction in analytical aliquots. Exclude stones, etc larger than 2mm.

Possible Sample Hazards None

PART II: LABORATORY SECTION

Received by [signature] Title Date 10-8-91

Analysis Required 237

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

Table A-1. Primary Inorganic Analytes.

Element	Typical expected (mg/kg)	Requested soil detection (mg/kg)	Requested method
Antimony	0 - 3	12	204.2 CLP-M
Arsenic	0 - 8	2	206.2 CLP-M
Barium	44 - 229	40	200.7 CLP-M
Beryllium	0 - 0.8	1	200.7 CLP-M
Cadmium	0 - 8	1	213.2 CLP-M
Chromium	2 - 48	2	200.7 CLP-M
Cobalt	0 - 15	10	200.7 CLP-M
Copper	0 - 20	5	200.7 CLP-M
Lead	1 - 13	0.6	239.2 CLP-M
Mercury	< 0.2	0.1	245.5 CLP-M
Nickel	6 - 25	8	200.7 CLP-M
Selenium	0 - 0.1	1	270.2 CLP-M
Silver	0 - 1.5	2	272.2 CLP-M
Thallium	0 - 0.2	2	279.2 CLP-M
Vanadium	24 - 96	10	200.7 CLP-M
Zinc	27 - 112	4	200.7 CLP-M

9613404.0631

Table A-2. Secondary Inorganic Analytes.

Element	Typical expected (mg/kg)	Requested soil detection (mg/kg)	Requested method
Aluminum	3600 - 13300	40	200.7 CLP-M
Calcium	2000 - 14000	1000	200.7 CLP-M
Iron	19000 - 29000	20	200.7 CLP-M
Magnesium	2780 - 6910	1000	200.7 CLP-M
Manganese	164 - 2870	3	200.7 CLP-M
Molybdenum	< 4	0.5	7481
Potassium	455 - 2600	1000	200.7 CLP-M
Sodium	125 - 1710	1000	200.7 CLP-M
Silicon	200 - 2900	20	200.7 CLP-M
Titanium	500 - 3500	50	Any method capable of meeting the requested DL
Zirconium	15 - 65	5	Any method capable of meeting the requested DL
Chloride	0 - 20	1	300.0
Nitrate and nitrite	0 - 15	1	300.0
Phosphate	0 - 3	2	300.0
Sulfate	0 - 35	2	300.0
Fluoride	0 - 8	1	Extraction by 300.0, Analysis by ASTM D 3868 - 79
Ammonium	0 - 4	1	Any method capable of meeting the requested DL
~~Carbonate~~	~~Highly Variable~~	~~1.0%~~	~~ASTM D 4373 - 84~~

Add Lithium by ICP (6010 or 200.7 or equivalent) for sample B014J8 and the additional requested prep blank.

9613404.0632

OSM INORGANIC DATA ASSESSMENT

DATE Feb. 12, 1992

REVIEWED BY L.L. Ames LLA

LABORATORY DataChem

CASE # WHC25

SDG # WHCM25

SAMPLES/MATRIX B01434

B01440

B01454

B01444

DATA ASSESSMENT SUMMARY

	ICP	AA	Hg	CN
1. Calibrations (Form II)	O	O	O	
2. Blanks (III)	X	X	O	
3. ICS (IV)	O			
4. Matrix Spike (V)	X	X	O	
5. Duplicate Analysis (VI)	X	O	O	
6. LCS (VII)	X	O		
7. Serial Dilution (IX)	X			
8. GFAA		O		
9. Holding Times (XIV)	O	O	O	
10. Other QC	X	X	X	

O = data had no problems
X = data qualified due to minor problems
M = data qualified due to major problems/some data may be unusable

OVERALL ASSESSSMENT: There were no major problems; all results were acceptable with the attached qualifications.

NOTES: WHC sample numbers can be found on the case narrative and on the Form Is.

o Refer to the corresponding attachments for explanation of any problems.

9613404.0633

INORGANIC QC - Calibrations

Name L.L.Ames LLA Date Feb. 12, 1992

COMMENTS: All initial and continuing calibration verification (ICV and CCV) %Rs are within control limits. The instruments (CFAA and ICP) used were calibrated with the required blanks and standards. Cyanide was not requested.

ACTION: No action was required because all of the blank and standards criteria were met.

sample #	constituent	value/qual	sample #	constituent	value/qual

9613404.0634

INORGANIC QC - Blanks

Name L.L. Ames LLA Date Feb. 12, 1992

COMMENTS: Contamination by aluminum, calcium, chromium, mercury and sodium was detected in the preparation blank. Negative values generated included silver, arsenic and vanadium in the preparation blank, and potassium and vanadium as well as arsenic in the CCBs. Other CCB contamination included calcium and magnesium at levels > the IDL. No contamination was found in the ICB.

ACTION: Results with <5x blank values were qualified as U. These occurred only in sample B014H4 (the preparation blank) along with false positive results for sodium. False negative results could occur for potassium and vanadium, but concentration levels are too high. Silver was qualified as UJ, while arsenic negative values were associated with CCBs not directly associated with these samples.

sample #	constituent	value/qual
B014H4	Aluminum	U
	Calcium	U
	Chromium	U
	Magnesium	U
All	Silver	UJ

sample #	constituent	value/qual

9613404.0635

INORGANIC QC - ICS

Name L.L. Ames LLA Date Feb. 12, 1992

COMMENTS: An initial and final Interference check Sample was run as required. The percent recoveries were all within the ±20% of true control limits.

ACTION: No action was required.

sample #	constituent	value/qual	sample #	constituent	value/qual

9615404.0636

INORGANIC QC - Matrix Spike

Name L.L. Ames LLA Date Feb. 12, 1992

COMMENTS: Spiked sample recovery results were not within control limits for antimony, lead, manganese and zirconium. The lead and zirconium %R were low, the %R for manganese was high and the %R for antimony was very low.

ACTION: Qualify lead, manganese and zirconium results as J and antimony results as R since the matrix spike %R was too low to be useable.

sample #	constituent	value/qual	sample #	constituent	value/qual
All	Antimony	R			
	Lead	J			
	Manganese	J			
	Zirconium	J			

9613404.0637

INORGANIC QC - Duplicate Analysis

Name L.L. Ames LLA Date Feb. 12, 1992

COMMENTS: Duplicate analyses for calcium (Ca) exceeded ±35% RPD guidelines for soil samples control limits.

ACTION: Qualify calcium results as estimated (J).

sample #	constituent	value/qual	sample #	constituent	value/qual
all	Calcium	J			

9613404.0638

INORGANIC QC - LCS

Name L.L. Ames LLA Date Feb. 12, 1992

COMMENTS: All solid LCS %R were within specified %R control limits except for zirconium and titanium. The %R for these elements was very low for the solid LCS. A liquid LCS was not run.

ACTION: Qualify zirconium and titanium values given for these samples as unusable (R).

sample #	constituent	value/qual
All	Zirconium	R
	Titanium	R

sample #	constituent	value/qual

9613404.0639

INORGANIC QC - Serial Dilution

Name L.L. Ames LLA Date Feb. 12, 1992

COMMENTS: The zinc serial dilution %D was out of the ±10% difference control limits. The sample B10444 (the preparation blank) zinc was <10X the IDL. Therefore, no control limits apply for zinc.

ACTION: No action was taken in the case of sample B01444 for the reason given above. Zinc in the remaining three samples was qualified as estimated (J).

sample #	constituent	value/qual
B01434	Zinc	J
B01440	Zinc	J
B01454	Zinc	J

sample #	constituent	value/qual

9613404.0640

INORGANIC QC - GFAA

Name L.L. Ames LLA Date Feb. 12, 1992

COMMENTS: GFAA duplicate % R was out of limits for lead and arsenic. An MSA was completed and all values for lead and arsenic were within the required correlation limits.

ACTION: No action was required.

sample #	constituent	value/qual	sample #	constituent	value/qual

9613404.0641

INORGANIC QC - Holding Times

Name L.L. Ames LLQ Date Feb. 12, 1992

COMMENTS: Examination of the records showed that all holding times for metals were met.

ACTION: No action was required.

sample #	constituent	value/qual	sample #	constituent	value/qual

9613404.0642

INORGANIC QC - other

Name L.L. Ames LLA Date Feb. 12, 1992

COMMENTS: The preparation blank also is reported as sample B014H4 although an additional preparation blank was clearly requested on the SAR (Sample Analysis Request).

ACTION: Data Chem was notified as to their failure to run the requested preparation blank in addition to sample B014H4, and were requested again to do so.

sample #	constituent	value/qual	sample #	constituent	value/qual

9613404.0643

DATACHEM LABORATORIES
960 WEST LEVOY DRIVE
SALT LAKE CITY, UTAH 84123

WESTINGHOUSE HANFORD

****

CASE No. WHC25 SDG No. WHCM25 SF-0903-AD,BD,CD

CLIENT SAMPLE #	EPA SAMPLE #	LAB SAMPLE #
BO1434	MC8581	CLP8481
BO1440	MC8582	CLP8482
BO1454	MC8583	CLP8483
BO14H4	MC8584	CLP8584
MATRIX DUPLICATE (GFAA,HG)	MC8581D	CLP8481
MATRIX DUPLICATE (ICP)	MC8582D	CLP8482
MATRIX SPIKE (GFAA,HG)	MC8581S	CLP8481
MATRIX SPIKE (ICP)	MC8582S	CLP8482

PLEASE READ THIS CASE NARRATIVE BEFORE SCREENING THIS CASE.

SDG.: WHCM25 Case: WHC25

Sample MC8584 was actually a Preparation Blank for soil, but it was requested, by the client, that it be documented and reported as a regular sample. Therefore the values reported on Form III for PBS are the values for Sample MC8584.

The additional analytes Molybdenum, Titanium, and Zirconium are not EPA/CLP analytes, therefore they were analyzed using alternative methods. QC was performed according to EPA SW846 protocol.

9613404.0644

B01434

1

INORGANIC ANALYSIS DATA SHEET

MC8581

Lab Name: DATACHEM LABORATORIES Contract:

Lab Code: DATAC Case No.: WHC25 SAS No.: SDG No.: WHCM25

Matrix (soil/water): SOIL Lab Sample ID: CLP8581

Level (low/med): LOW Date Received: 10/08/91

% Solids: 99.1

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

LKA 2/12/92

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9580			P
7440-36-0	Antimony	5.0	~~U~~	~~N~~ R	P
7440-38-2	Arsenic	1.0	B	W	F
7440-39-3	Barium	96.8			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.61	U		P
7440-70-2	Calcium	5060	J	~~*~~	P
7440-47-3	Chromium	14.3		*	P
7440-48-4	Cobalt	15.7			P
7440-50-8	Copper	12.2			P
	Cyanide				NR
7439-89-6	Iron	28400			P
7439-92-1	Lead	6.0	J	~~NS*~~	F
7439-95-4	Magnesium	5660			P
7439-96-5	Manganese	427	J	~~N~~	P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	19.9			P
7440-09-7	Potassium	2220			P
7782-49-2	Selenium	0.20	U	W	F
7440-22-4	Silver	0.61	U		P
7440-23-5	Sodium	294	B		P
7440-28-0	Thallium	0.20	U		F
	Titanium	2580	R		P
7440-62-2	Vanadium	75.0			P
7440-66-6	Zinc	55.8	J	~~E~~	P
	Zirconium	29.2	R	~~N~~	P

3

olor Before: BROWN Clarity Before: Texture: FINE

olor After: Clarity After: Artifacts:

omments:
E - ICP SERIAL DILUTION OUTSIDE OF CONTROL LIMITS.

FORM I - IN
ENVIROFORMS/INORGANIC CLP

SAMPLE NO.

9613404.0645

B01440

1

INORGANIC ANALYSIS DATA SHEET

MC8582

Lab Name: DATACHEM LABORATORIES Contract:

Lab Code: DATAC Case No.: WHC25 SAS No.: SDG No.: WHCM25

Matrix (soil/water): SOIL Lab Sample ID: CLP8582

Level (low/med): LOW Date Received: 10/08/91

% Solids: 94.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11300			P
7440-36-0	Antimony	11.1	B	~~NR~~	P
7440-38-2	Arsenic	4.5		S	F
7440-39-3	Barium	134			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.64	U		P
7440-70-2	Calcium	17400	J	~~*~~	P
7440-47-3	Chromium	12.0		*	P
7440-48-4	Cobalt	15.1			P
7440-50-8	Copper	16.5			P
	Cyanide				NR
7439-89-6	Iron	33000			P
7439-92-1	Lead	7.5	J	~~NS*~~	F
7439-95-4	Magnesium	4800			P
7439-96-5	Manganese	344	J	N	P
7439-97-6	Mercury	0.11	U		CV
7440-02-0	Nickel	12.1			P
7440-09-7	Potassium	1370			P
7782-49-2	Selenium	0.21	U	W	F
7440-22-4	Silver	0.64	UJ		P
7440-23-5	Sodium	424	B		P
7440-28-0	Thallium	0.21	U		F
	Titanium	2230	R		P
7440-62-2	Vanadium	86.3			P
7440-66-6	Zinc	66.2	J	~~E~~	P
	Zirconium	43.1	R	~~N~~	P

LKA 2/12/92

olor Before: BROWN Clarity Before: Texture: COARSE

olor After: Clarity After: Artifacts:

omments:
E - ICP SERIAL DILUTION OUTSIDE OF CONTROL LIMITS.

4

FORM I - IN
ENVIROFORMS/INORGANIC CLP

SAMPLE NO.

9613404.0646

B01454

1

INORGANIC ANALYSIS DATA SHEET

MC8583

Lab Name: DATACHEM LABORATORIES Contract:

Lab Code: DATAC Case No.: WHC25 SAS No.: SDG No.: WHCM25

Matrix (soil/water): SOIL Lab Sample ID: CLP8583

Level (low/med): LOW Date Received: 10/08/91

% Solids: 96.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6340			P
7440-36-0	Antimony	5.2	U	~~N~~ R	P
7440-38-2	Arsenic	2.3		S	F
7440-39-3	Barium	81.7			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.62	U		P
7440-70-2	Calcium	6410	J	~~*~~	P
7440-47-3	Chromium	7.3		*	P
7440-48-4	Cobalt	14.9			P
7440-50-8	Copper	14.3			P
	Cyanide				NR
7439-89-6	Iron	29700			P
7439-92-1	Lead	4.4	J	~~N*~~	F
7439-95-4	Magnesium	4820			P
7439-96-5	Manganese	378	J	~~N~~	P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	10.3			P
7440-09-7	Potassium	1170			P
7782-49-2	Selenium	0.21	U	W	F
7440-22-4	Silver	0.62	U		P
7440-23-5	Sodium	277	B		P
7440-28-0	Thallium	0.21	U		F
	Titanium	2350	R		P
7440-62-2	Vanadium	76.2			P
7440-66-6	Zinc	53.7	J	~~E~~	P
	Zirconium	30.3	R	~~N~~	P

LLA 2/12/92

olor Before: BROWN Clarity Before: Texture: COARSE

olor After: Clarity After: Artifacts:

omments:
E - ICP SERIAL DILUTION OUTSIDE OF CONTROL LIMITS.

FORM I - IN
ENVIROFORMS/INORGANIC CLP

SAMPLE NO.

9613404.0647

B014A4

1

INORGANIC ANALYSIS DATA SHEET

MC8584

Lab Name: DATACHEM LABORATORIES Contract:

Lab Code: DATAC Case No.: WHC25 SAS No.: SDG No.: WHCM25

Matrix (soil/water): SOIL Lab Sample ID: CLP8584

Level (low/med): LOW Date Received: 10/08/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4.7	~~B~~	U	P
7440-36-0	Antimony	5.0	~~U~~	~~N~~ R	P
7440-38-2	Arsenic	0.20	U		F
7440-39-3	Barium	0.20	U		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.60	U		P
7440-70-2	Calcium	5.0	~~B~~	~~*~~ J	P
7440-47-3	Chromium	1.8	~~B~~	~~*~~ U	P
7440-48-4	Cobalt	1.2	U		P
7440-50-8	Copper	0.80	U		P
	Cyanide				NR
7439-89-6	Iron	6.4	B		P
7439-92-1	Lead	0.23	~~B~~	~~N*~~ J	F
7439-95-4	Magnesium	5.2	U		P
7439-96-5	Manganese	0.40	~~U~~	~~N~~ J	P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	3.2	U		P
7440-09-7	Potassium	88.4	U		P
7782-49-2	Selenium	0.20	U		F
7440-22-4	Silver	0.60	U		P
7440-23-5	Sodium	25.5	B		P
7440-28-0	Thallium	0.20	U		F
	Titanium	5.0	~~U~~	R	P
7440-62-2	Vanadium	0.60	U		P
7440-66-6	Zinc	1.2	B	E	P
	Zirconium	5.0	~~U~~	~~N~~ R	P

LRC 2/12/92

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:
E - ICP SERIAL DILUTION OUTSIDE OF CONTROL LIMITS.
THIS SAMPLE IS ACTUALLY A PREPARATION BLANK AND IS INCLUDED ON FORM 3.

FORM I - IN
ENVIROFORMS/INORGANIC CLP

9613404.0648

OSM RCRA DATA ASSESSMENT

all soil

DATE 2/13/92 mas

SAMPLES/MATRIX B01434 B01440 B01454 B01444

REVIEWED BY Mark A. Beck

LABORATORY Data Chem

CASE # Site Wide Soil

SDG # SF# -0903-DD

DATA ASSESSMENT SUMMARY

QUALITY CONTROL CHECK	ANALYSIS	Anions by 300.0	ammonia by 350.1	
1. Holding time		M	O	
2. Matrix spikes		O	O	
3. Duplicates		X	O	
4. Blanks		O	O	
5. Calibration		O	O	
6. Other		O	O	
7.				
8.				
9.				
10.				

O = data had no problems
X = minor problems, data may be qualified
M = data qualified due to major problems/some data may be unusable

OVERALL ASSESSSMENT: The data are acceptable with the attached qualifiers.

NOTES: "Anions" includes fluoride, chloride, nitrite nitrate, ~~phosph~~ phosphate and sulfate.

o Refer to the corresponding attachments for explanation of any problems.

This SDG is associated with DataChem metals CLP package WHCM25

9613404.0649

RCRA QC

Name Mark A. Beck Date 2/13/92 MAB.

QC Check: Holding Times

COMMENTS: Holding time requirements were met for ammonia, fluoride, chloride, and sulfate, but were not met for nitrite, nitrate and phosphate.

ACTION: Qualify all nitrite, nitrate ~~and~~ and phosphate results as estimated (UJ or J)

sample #	constituent	value/qual	sample #	constituent	value/qual
all	nitrite	UJ			
all	nitrate	UJ or J			
all	phosphate	UJ or J			

___ of ___

9613404.0650

RCRA QC

Name Mark A. Beck Date 2/13/92 MAB.

QC Check: Matrix Spikes

COMMENTS: All anions spikes ~~were~~ had acceptable recovery levels. The ammonia spike also had an acceptable recovery.

ACTION: none, none needed

sample #	constituent	value/qual	sample #	constituent	value/qual

___ of ___

9613404.0651

RCRA QC

Name Mark A. Beck Date 2/13/92 mab

QC Check: Duplicates

COMMENTS: Duplicates were performed with the anion batch as sample duplicates and QC sample duplicates. However, the QC duplicate that was in calibration range was not run with this ~~gp~~ batch of samples, and therefore shouldn't be used for QC purposes. Chloride was out of control, but all other anions were acceptable. Ammonia duplicate met acceptance criteria.

ACTION: Qualify all chloride results as estimated, (UJ or J). Ammonia results require no qualification.

sample #	constituent	value/qual	sample #	constituent	value/qual
all	chloride	J			
except					
B014H4		UJ			

___ of ___

9613404.0652

RCRA QC

Name Mark A. Beck Date 2/13/92 mgs

QC Check: Blanks

COMMENTS: Anions no contaminants greater than the lowest standard (IDL) were ~~seen~~ seen in the initial calibration setup blank, nor were any seen in the ~~prep~~ preparation blank (B014H4). All ammonia blanks had concentrations less than the IDL.

ACTION: none for anions - none needed.
none for ~~fam~~ ammonia - none needed.

sample #	constituent	value/qual	sample #	constituent	value/qual

___ of ___

9613404.0653

RCRA QC

Name Mark A. Beck Date 2/13/92 MAB

QC Check: Calibration/LCS

COMMENTS: anions - appropriate set up calibration was performed for anions. The CCV (#5-2) was within control limits. The LCS (QC-3997) that was run was out of the calibration range, and the run of QC-3997 that was in range, was not run in this batch, and ~~so use~~ is useless ~~of~~ as an LCS.

x dilution

ACTION: anions - none, the CCV was within limits, which is enough for validation. Ammonia - none all calibration and LCS is acceptable.

sample #	constituent	value/qual

sample #	constituent	value/qual

Comments (continued):
Ammonia had an acceptable ~~set up~~ set-up calibration performed. ale LCS and CCV had % recoveries

___ of ___

9613404.0654

RCRA QC

Name Mark A. Beck Date 2/13/92 mab

QC Check: Other

COMMENTS: Anions, none. Ammonia, none

ACTION: Anions, none, none needed.
Ammonia, none.

sample #	constituent	value/qual	sample #	constituent	value/qual

___ of ___

9613404.0655

DATA CHEM LABORATORIES

ENVIRONMENTAL WATER REPORT

Date _____
Agency Identification Number SF-0903-DD
Account No. 3534C

Westinghouse Hanford Company
2355 Stevens Drive
MSIN T6-08
Richland,, WA 99352
Attention: Jeanette Duncan

OCT 1991 RECEIVED DATA RECEIPT

Telephone (509) 373-3225

Sampling Collection and Shipment

Sampling Site _____ Date of Collection October 01, 1991

Date Samples Received at DataChem October 08, 1991

Analytical Results

Parameter Name / Analysis Date / Method / Prep Method	Units	Field Number / Lab Number	B01 434 / CLP 8581	B01 440 / CLP 8582	B01 454 / CLP 8583	B01 4H4 / CLP 8584				* Limit of Detection
Fluoride (F) 10/17/1991 300.0 [1]	µg/g		ND*	ND*	ND*	ND*				1.
Chloride (Cl) 10/17/1991 300.0 [1]	µg/g		1. J	18 J	2. J	ND* UJ				1.
Nitrate (NO_3-N) 10/17/1991 300.0 [1]	µg/g		0.7 J	1.9 J	0.6 J	ND* UJ				0.3
Nitrite (NO_2-N) 10/17/1991 300.0 [1]	µg/g		ND* UJ	ND* UJ	ND* UJ	ND* UJ				0.4
Phosphate (PO_4-P) 10/17/1991 300.0 [1]	µg/g		2. J	ND* UJ	ND* UJ	ND* UJ				2.
Sulfate (SO_4) 10/17/1991 300.0 [1]	µg/g		3.	32.	12.	ND*				1.
Ammonia (NH_3 - N) 10/17/1991 350.1 [1]	µg/g		1.	ND*	ND*	ND*				0.6

* See comment on last page.
ND Parameter not detected.
NR Parameter not requested.
[1] Analyses completed on or before this date.

** Parameter not analyzed (See comment page).
( ) Parameter between LOD and LOQ.
[ ] Method Reference (See comments page.)

Brian W. Motes
Analyst: Brian W. Motes

Debbie A Christensen
Reviewer: Debbie A. Christensen

Norman K. Christensen
Laboratory Supervisor: Norman K. Christensen

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547 / (801) 266-7700
A Sorenson Company

2/13/92
mas