TMA
Thermo Analytical Inc.

9613500.1550

B012P5-TMA-114

0045591

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

OCT 1996 RECEIVED EDMC

APR 1992 RECEIVED OSM DMO

Federal Express 4009270296
January 30, 1992

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

Quality Control Narrative

Scope
Twenty (20) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 16, 1991 from Westinghouse/Hanford Company. The samples were analyzed for the USEPA CLP ICP metals only. The analysis was performed under Skinner and Sherman work order 9112157.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work 7/88 (CLP SOW788).

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

- The barium serial dilution exceeded control limits.

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

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

(for)
David N. Peterson
Assistant Laboratory Manager

4-26-96
MC

TMA 9613500L.1551
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
P.O. Box 4040
Richmond, CA 94804-0040
(415) 235-2633 Fax No. (415) 235-0438

SEP 1992
RECEIVED
OSM DMO

August 31, 1992

Briana Colley
Westinghouse Hanford Company
2355 Stevens Drive
Richland, WA 99352

Reference: Radiochemistry Data Package N1-12-056-9574
WHC Sample Nos. B012S2 & B012S0

Dear Briana:

This will confirm that the WHC samples referenced above should have been reported as B012S2 & B012S0 instead of B01252 & B01250.

Sincerely,

Dolores Sanchez
Program Coordinator

9615500.1552

Westinghouse Hanford Company

NONCONFORMANCE REPORT

1. Page 1 of 1

2. Preprinted No. 051177

QA Log No. EQA-92-105

3. P. O., W. O., or Job Control No.	4. System/End Use	5. Item/Material	6. Dwg./Spec./Other No.	7. Rev.
N/A	N/A	Environmental data	N/A	N/A

8. Program/Project/Other	9. Safety Class	10. ASME Code Items
300-FF-5 O.U.	N/A	☐ Yes ☒ No (If yes, notify authorized inspector)

11. Supplier Name/Address: Thermo analytical Labs

12. Notification of Potential Occurence Required: ☐ Yes ☒ No

13. Code: Lot/Heat/Serial	14. Lot Size	15. Sample	16. Qty. Acc.	17. Inspection Criteria
N/A	N/A	N/A	N/A	☐ Dwg. ☐ Spec. ☐ Insp. Plan ☒ Other * MA USEPA CLP SOW Rev 10/22/92 2/88

18. Item	19. Description of Nonconformance (list serial no. where applicable)	22. Disposition, Justification, and Instructions
	TMA labs has been issuing data packages that are incompatible with the HEIS format. The "GC column" field in the Summary reports (electronic and hardcopy) are supposed to have either "Pack" or "Cap", for Packed and Capillary, respectively. Several samples have "Wide" listed in this column. "Wide" does not match the laboratory contract and is preventing the data from being loaded into HEIS. The SOW for CLP analysis calls for either "Cap" or "Pack" in this field.	After consulting TMA, Bill Strohben (PSM) concluded that "Wide" stands for "Wide bore capillary". The lab recommends changing the "Wide" to "Cap" to correct this problem. TMA will send a letter confirming this. A copy of TMA's letter and this NCR shall be kept in the 300-FF-5 project files. The HEIS database shall change "Wide" to "Cap" for all 300-FF-5 samples. TMA will enter only "Cap" or "Pack" in this field from now on.
		* Pg H-7 of the USEPA CLP SOW for Organic Analysis Multi-Media Multi-Concentration Rev. 2/88 is the requirement which has been violated.

20. Originator's Signature	Date	23. Design Document Change Required?
Michael A. Fraser	10/13/92	☐ Yes, Doc. No. ☒ No
21. Cognizant QA Manager's Signature	**Date**	**24. Corrective Action Required?**
M Summers	10/26/92	☐ Yes, No. ☐ No

Disp. App.	25. Cognizant Engineer	Date	26. Technical Rep.	Date	Signature/Org.	Date
	LC Hulstrom	12/9/92				
	QA Engineer: JE McCallum	12/9/92	Signature/Org.	Date	Signature/Org.	Date

Close — 27. Accept ✓ Reject ____ Follow on NCR ____ JE McCallum QA/C Personnel 12/18/92 Date

A-7310-104 (10/91)

TMA
Thermo Analytical Inc.

TMA/Norcal
7040 Wright Avenue
P.O. Box 4040
Richmond, CA 94804-0040
(415) 235-2633 Fax No. (415) 235 0438

October 13, 1992

Bill Strohben
Westinghouse Hanford Company
Office of Sample Management
2355 Stevens Drive
Richland, WA, 99352

Re: WHC Contract # MBH-SVV-069262. Clarification and change to VOA forms.

Dear Bill:

As per your facsimile of October 12, 1992, I am writing to confirm that the designation "WIDE" on the VOA forms indicated the use of a wide bore capillary column in the analysis. Beginning with samples analyzed after September 3, 1992, this field on the VOA form uses the designation "CAP" instead of "WIDE".

Sincerely,

Daniel H. Stuermer, Ph.D.
Technical Director, TMA

Westinghouse Hanford Company

Hanford Operations and Engineering Contractor for the US Department of Energy
P.O. Box 1970 Richland, Wa. 99352

NONCONFORMANCE REPORT

Page 1 of 1

No. B 08481

1. MFR/ORG: WHC/OSM

ITEM/MATERIAL NAME: Environmental Sample
PART NO.: N/A
DRAWING/SPEC. NO.: N/A
REV.: N/A
PROGRAM/PROJECT: 300-FF-5
P.O./W.O. NO.: N/A
UNUSUAL OCCURRENCE REPORT REQUIRED: ☐ YES ☒ NO
SYSTEM/END USE: N/A
DATE: 5/29/92

2. DESCRIPTION OF NONCONFORMANCE

Data Transmittal X00769 dated April 17, 1992, listed 37 Samples in the data package (N1-12-068). There are actually 40 samples.

3. REQUIREMENT VIOLATED

	DOCUMENT	REV	ZONE/PAR.
Records Management	WHC-7-7	2	EII 1.6

Michael A. Fuad — ORIGINATOR
81222 — ORGANIZATION
5/29/92 — DATE

4. ASME CODE ITEM(s): ☒ NO ☐ YES. NOTIFY AUTHORIZED INSPECTOR.

WHC QAR: N/A

5. CAUSE OF NONCONFORMANCE

☐ PROCEDURES ☒ PERSONNEL ☐ MATERIALS
☐ EQUIPMENT ☐ OTHERS

REMARKS:

P/S = D3 SW-01 PN-003

6. CORRECTIVE ACTION TO ELIMINATE CAUSE

Better quality control during preparation of data Transmittals sent to EDMC.

INITIATION DATE: _____ SERIAL NO.: _____

Joan Kessner – OSM
RESPONSIBLE ORG. REP. — TITLE — DATE

7. RECOMMENDED DISPOSITION: ☒ ACCEPT ☐ REJECT ☐ REPAIR ☐ REWORK ☒ OTHER

8A. DISPOSITION JUSTIFICATION AND INSTRUCTIONS

Review of data package N1-12-068 revealed Three samples not listed on the transmittal sheet. These three samples are: B017T5, B017V7, & B017W7. OSM to correct data transmittal and notify EDMC of the changes.

Verified Corrected at EDMC on 8/20/92

8B. SUPPLIER ENG. _____ SUPPLIER QA _____

9. ADDITIONAL REVIEWS REQUIRED (WHC ONLY): ☐ YES ☒ NO
IF YES, IDENTIFY:

10. DISPOSITION APPROVAL (WHC ONLY)

☒ APPROVED ☐ DISAPPROVED
☐ OTHER (SEE CONTINUATION SHEET)

LL HULSTROM LC Hulstrom 8/20/92
COGNIZANT ENGINEER — DATE

JR McCALLUM JR McCallum 8/20/92
COGNIZANT QA ENGINEER — DATE

AUTHORIZED INSPECTOR REVIEW — DATE

11. ADDITIONAL APPROVALS

NAME	TITLE	DATE	NAME	TITLE	DATE
N/A					

12. DISPOSITION ACTION COMPLETE

N/A
NAME — DATE
QTY. ACCEPT _____ QTY. REJ. _____

FOLLOW ON NCR

QA LOG NO.: EQA-92-081

The issuance and acceptance of this request in no way limits or affects the warranty provisions of the order. This request shall not establish a precedent or obligation to accept similar conditions in the future.

FOLLOW-UP LEVEL: A ☐ B ☐ C ☐

A-7210-104 (8-87)

9615900.1556

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B012L5

.b Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

ıb Code: SKINER Case No.: N1-12-070 SAS No.: SDG No.: B012L5

ıtrix (soil/water): SOIL Lab Sample ID: 12157-05S

·vel (low/med): LOW Date Received: 12/16/91

Solids: 94.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	33.30	B		P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	18.70	B	E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	6.50			P
7440-70-2	Calcium	9910.00			P
7440-47-3	Chromium	0.82	U		P
7440-48-4	Cobalt	1.00	B		P
7440-50-8	Copper	3.60			P
7439-89-6	Iron	79.80			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	3290.00			P
7439-96-5	Manganese	298.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U		P
7440-09-7	Potassium	7490.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	83.10	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.41	U		P
7440-66-6	Zinc	364.00			P
	Cyanide				NR

ɔlor Before: BROWN Clarity Before: Texture: FINE

ɔlor After: BROWN Clarity After: Artifacts:

ɔmments:

FORM I - IN Rev.6/89

003

9615500.1556

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B012M0

b Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

b Code: SKINER Case No.: N1-12-070 SAS No.: SDG No.: B012L5

trix (soil/water): SOIL Lab Sample ID: 12157-15S

vel (low/med): LOW Date Received: 12/16/91

Solids: 94.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	105.00			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	63.50		E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	9.90			P
7440-70-2	Calcium	19900.00			P
7440-47-3	Chromium	0.83	U		P
7440-48-4	Cobalt	1.10	B		P
7440-50-8	Copper	6.00			P
7439-89-6	Iron	220.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	3680.00			P
7439-96-5	Manganese	63.70			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.10	B		P
7440-09-7	Potassium	5370.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	81.00	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.61	B		P
7440-66-6	Zinc	516.00			P
	Cyanide				NR

lor Before: BROWN Clarity Before: Texture: FINE

lor After: BROWN Clarity After: Artifacts:

mments:

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012M1

ab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

ab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012L5

atrix (soil/water): SOIL Lab Sample ID: 12157-12S

evel (low/med): LOW Date Received: 12/16/91

Solids: 93.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	67.60			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	82.60		E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	12.40			P
7440-70-2	Calcium	22000.00			P
7440-47-3	Chromium	0.83	U		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	4.40	B		P
7439-89-6	Iron	167.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	4230.00			P
7439-96-5	Manganese	34.30			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.10	B		P
7440-09-7	Potassium	4140.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	72.20	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.41	U		P
7440-66-6	Zinc	462.00			P
	Cyanide				NR

olor Before: BROWN Clarity Before: Texture: FINE

olor After: BROWN Clarity After: Artifacts:

omments:

005

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012M5

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012L5

Matrix (soil/water): SOIL Lab Sample ID: 12157-16S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	47.20			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	23.90	B	E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	4080.00			P
7440-47-3	Chromium	0.82	U		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	2.10	B		P
7439-89-6	Iron	118.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2130.00			P
7439-96-5	Manganese	14.10			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.87	B		P
7440-09-7	Potassium	9080.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	60.20	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.41	U		P
7440-66-6	Zinc	75.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

006

9615500.1555 WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012M7

ab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

ab Code: SKINER Case No.: N1-12-070 SAS No.: SDG No.: B012L5

atrix (soil/water): SOIL Lab Sample ID: 12157-02S

.evel (low/med): LOW Date Received: 12/16/91

. Solids: 94.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	77.60			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	33.50	B	E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	20400.00			P
7440-47-3	Chromium	0.83	U		P
7440-48-4	Cobalt	0.63	U		P
7440-50-8	Copper	4.10	B		P
7439-89-6	Iron	163.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2270.00			P
7439-96-5	Manganese	11.20			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.83	U		P
7440-09-7	Potassium	8330.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	79.00	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.42	U		P
7440-66-6	Zinc	8.60			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

007

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012M9

ab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

ab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012L5

atrix (soil/water): SOIL Lab Sample ID: 12157-17S

evel (low/med): LOW Date Received: 12/16/91

Solids: 96.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	108.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	40.10	B	E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	19900.00			P
7440-47-3	Chromium	0.80	U		P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	7.20			P
7439-89-6	Iron	289.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2810.00			P
7439-96-5	Manganese	27.10			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.80	U		P
7440-09-7	Potassium	16800.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	99.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.59	B		P
7440-66-6	Zinc	19.90			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B012N1

ab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

ab Code: SKINER Case No.: N1-12-070 SAS No.: SDG No.: B012L5

atrix (soil/water): SOIL Lab Sample ID: 12157-14S

evel (low/med): LOW Date Received: 12/16/91

Solids: 94.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	126.00			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	32.90	B	E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	21900.00			P
7440-47-3	Chromium	1.20	B		P
7440-48-4	Cobalt	0.63	U		P
7440-50-8	Copper	4.10	B		P
7439-89-6	Iron	257.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2170.00			P
7439-96-5	Manganese	15.10			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.89	B		P
7440-09-7	Potassium	13600.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	85.70	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.61	B		P
7440-66-6	Zinc	10.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

FORM I - IN Rev.6/89

9613500.1562

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B012N2

ab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

ab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012L5

atrix (soil/water): SOIL Lab Sample ID: 12157-13S

evel (low/med): LOW Date Received: 12/16/91

Solids: 94.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	115.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	35.30	B	E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	22000.00			P
7440-47-3	Chromium	1.00	B		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	4.30	B		P
7439-89-6	Iron	240.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2490.00			P
7439-96-5	Manganese	15.40			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.86	B		P
7440-09-7	Potassium	13600.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	88.10	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.40	U		P
7440-66-6	Zinc	11.40			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

010

9615500.1563

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012S6

ab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

.ab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012L5

atrix (soil/water): SOIL Lab Sample ID: 12157-06S

.evel (low/med): LOW Date Received: 12/16/91

: Solids: 95.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	180.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	59.10		E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	21700.00			P
7440-47-3	Chromium	0.81	U		P
7440-48-4	Cobalt	1.00	B		P
7440-50-8	Copper	6.40			P
7439-89-6	Iron	375.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2160.00			P
7439-96-5	Manganese	32.70			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.81	U		P
7440-09-7	Potassium	13700.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	68.90	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.61	B		P
7440-66-6	Zinc	32.40			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

012

FORM I - IN Rev.6/89

9613590.1569

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012N4

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012L5

Matrix (soil/water): SOIL Lab Sample ID: 12157-08S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	87.90			P
7440-36-0	Antimony	1.50	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	58.90		E	P
7440-41-7	Beryllium	0.19	U		P
7440-43-9	Cadmium	0.19	U		P
7440-70-2	Calcium	25700.00			P
7440-47-3	Chromium	1.30	B		P
7440-48-4	Cobalt	0.74	B		P
7440-50-8	Copper	5.20			P
7439-89-6	Iron	215.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2730.00			P
7439-96-5	Manganese	17.30			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.40	B		P
7440-09-7	Potassium	12000.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.39	U		P
7440-23-5	Sodium	58.10	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.39	U		P
7440-66-6	Zinc	21.30			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

011

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WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012T0

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070 SAS No.: SDG No.: B012L5

Matrix (soil/water): SOIL Lab Sample ID: 12157-09S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	179.00			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	41.30	B	E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	20100.00			P
7440-47-3	Chromium	4.20			P
7440-48-4	Cobalt	0.66	B		P
7440-50-8	Copper	5.90			P
7439-89-6	Iron	423.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2150.00			P
7439-96-5	Manganese	41.40			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.83	U		P
7440-09-7	Potassium	20800.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	75.60	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.64	B		P
7440-66-6	Zinc	24.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

013

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01360

ab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

ab Code: SKINER Case No.: N1-12-070 SAS No.: SDG No.: B012L5

atrix (soil/water): SOIL Lab Sample ID: 12157-18S

evel (low/med): LOW Date Received: 12/16/91

Solids: 93.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	58.30			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	58.70		E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	23700.00			P
7440-47-3	Chromium	2.30			P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	6.50			P
7439-89-6	Iron	203.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2580.00			P
7439-96-5	Manganese	28.10			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.83	U		P
7440-09-7	Potassium	11500.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	76.00	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.47	B		P
7440-66-6	Zinc	24.70			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

014

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WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01364

ab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

ab Code: SKINER Case No.: N1-12-070 SAS No.: SDG No.: B012L5

atrix (soil/water): SOIL Lab Sample ID: 12157-01S

evel (low/med): LOW Date Received: 12/16/91

Solids: 93.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	89.10			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	37.70	B	E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	21000.00			P
7440-47-3	Chromium	1.00	B		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	7.70			P
7439-89-6	Iron	187.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2250.00			P
7439-96-5	Manganese	18.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.81	U		P
7440-09-7	Potassium	15400.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	92.00	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.41	U		P
7440-66-6	Zinc	21.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

015

FORM I - IN Rev.6/89

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WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01367

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070 SAS No.: SDG No.: B012L5

Matrix (soil/water): SOIL Lab Sample ID: 12157-11S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	303.00			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	22.50	B	E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.34	B		P
7440-70-2	Calcium	3580.00			P
7440-47-3	Chromium	2.10			P
7440-48-4	Cobalt	0.93	B		P
7440-50-8	Copper	10.70			P
7439-89-6	Iron	553.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2110.00			P
7439-96-5	Manganese	53.50			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.89	B		P
7440-09-7	Potassium	15100.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	69.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	1.10	B		P
7440-66-6	Zinc	139.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

016

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9615500.1569

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017N6

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070 SAS No.: SDG No.: B012L5

Matrix (soil/water): SOIL Lab Sample ID: 12157-20S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 96.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	114.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	40.40		E	P
7440-41-7	Beryllium	0.19	U		P
7440-43-9	Cadmium	0.19	U		P
7440-70-2	Calcium	5600.00			P
7440-47-3	Chromium	1.10	B		P
7440-48-4	Cobalt	0.74	B		P
7440-50-8	Copper	2.90	B		P
7439-89-6	Iron	230.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1950.00			P
7439-96-5	Manganese	46.50			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.78	U		P
7440-09-7	Potassium	8220.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.39	U		P
7440-23-5	Sodium	70.20	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.39	U		P
7440-66-6	Zinc	139.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

017

9615500.1570

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B017N9

ab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

ab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012L5

atrix (soil/water): SOIL Lab Sample ID: 12157-10S

evel (low/med): LOW Date Received: 12/16/91

Solids: 96.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	76.50			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	21.30	B	E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	3850.00			P
7440-47-3	Chromium	6.60			P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	2.90	B		P
7439-89-6	Iron	164.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1940.00			P
7439-96-5	Manganese	28.80			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.79	U		P
7440-09-7	Potassium	6680.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.39	U		P
7440-23-5	Sodium	48.90	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.39	U		P
7440-66-6	Zinc	121.00			P
	Cyanide				NR

olor Before: BROWN Clarity Before: Texture: FINE

olor After: BROWN Clarity After: Artifacts:

omments:

013

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WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017P1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012L5

Matrix (soil/water): SOIL Lab Sample ID: 12157-03S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 95.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	54.70			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	33.20	B	E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	3990.00			P
7440-47-3	Chromium	3.50			P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	4.10	B		P
7439-89-6	Iron	117.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1590.00			P
7439-96-5	Manganese	18.50			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.80	U		P
7440-09-7	Potassium	10500.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	61.20	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.40	U		P
7440-66-6	Zinc	139.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

013

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9615500.1572

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B017P9

ab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

ab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012L5

atrix (soil/water): SOIL Lab Sample ID: 12157-07S

.evel (low/med): LOW Date Received: 12/16/91

Solids: 95.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	105.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	21.40	B	E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	5470.00			P
7440-47-3	Chromium	7.10			P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	3.00	B		P
7439-89-6	Iron	217.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2620.00			P
7439-96-5	Manganese	34.30			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.81	U		P
7440-09-7	Potassium	9210.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	56.60	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.41	U		P
7440-66-6	Zinc	56.80			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

020

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9413590.1573

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017Q5

ab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

.ab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012L5

.atrix (soil/water): SOIL Lab Sample ID: 12157-04S

.evel (low/med): LOW Date Received: 12/16/91

. Solids: 95.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	92.90			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	29.10	B	E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	6240.00			P
7440-47-3	Chromium	3.90			P
7440-48-4	Cobalt	0.79	B		P
7440-50-8	Copper	5.10	B		P
7439-89-6	Iron	208.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2850.00			P
7439-96-5	Manganese	40.10			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U		P
7440-09-7	Potassium	13600.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	76.60	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.61	B		P
7440-66-6	Zinc	86.30			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

021

9613500.1574

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017X2

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012L5

Matrix (soil/water): SOIL Lab Sample ID: 12157-19S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	320.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	19.50	B	E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.36	B		P
7440-70-2	Calcium	3640.00			P
7440-47-3	Chromium	2.50			P
7440-48-4	Cobalt	1.00	B		P
7440-50-8	Copper	5.70			P
7439-89-6	Iron	579.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1870.00			P
7439-96-5	Manganese	46.40			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.20	B		P
7440-09-7	Potassium	10800.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	70.60	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.91	B		P
7440-66-6	Zinc	84.50			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

022

9113910 1575

TMA/Skinner & Serman Labs **SAMPLE LOG-IN**

WORKORDER 9112157 CLIENT HANFORD NOR No. SAMPLES: ____ ____ ____

PROTCL CLP **TURNARND** 33 days

COOLER TEMP: ____ oC, or NA (Soil) (Water) (Specify Other)

CUSTODIAN A Benny SDG/BATCH

CUSTODY SEAL: PRESENT/ABSENT/INTACT/NOT CLIENT CASE N1-12-070

SHIPER & # Fedex #1414547654 PO/CONTRACT# ↓

TAGS: PRESENT/ABSENT/NA/SEE COC CONTACT Dolores Sanchez

CHAIN OF CUSTODY: PRESENT/ABSENT/NA, # N/A COMMENTS: None

SAMPLE CONTAINERS-INTACT/BROKEN COMMENTS

CLIENT COMMENT? YES/NO

SAMPLE LABELS AGREE WITH CHAIN OF CUSTODY INFO? YES/NO (COMMENT)

CLIENT PAPERWORK AGREES WITH SAMPLES & COC? YES/NO (COMMENT)

SHIPMENT DATES 12/16/91

LIST ANY DATE WITH PAPERWORK/SHIPMENT PROBLEMS & SPECIFY THE PROBLEM:

N/A

	CLIENT ID	MATRIX	RECEIVED	QC	TEST(S) (300 ICP30-S)	HOLD TIME UP
1	B01364	SOLID	12/16/91	D	ICP Metals	
2	B012M7	↓	↓	S	↓	
3	B017P1					
4	B017Q5					
5	B012L5					
6	B01256					
7	B017P9					
8	B012N4					
9	B012T0					
10	B017N9					
11	B01367					
12	B012M1					
13	B012N2					
14	B012N1					
15	B012M0					
16	B012M5					
17	B012N9					
18	B01360					
19	B017X2					
20	B017N6					
21						
22						
23						
24						
25						
26						
27						

Complete 12/18

SUBCONTRACT: YES/NO, TO: DATE:

REVIEWED Rev. 1.4 PAGE

Westinghouse Hanford Company

9615000.1576

CHAIN OF CUSTODY

3087

Custody Form Initiator NA. CADORET

Company Contact C.A. BRANDT

Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7

Collection Date 9/10/91

Ice Chest No. CAB-3

Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 2747217592

Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED, ~200g samples for metals analysis

Sample Identification

B01364	B01367
B012M7	B012M1
B017P1	B012N2
B017Q5	B012N1
B012L5	B012M0
B012S6	B012M5
B017P9	B012M9
B012N4	B01360
B012T0	B017X2
B017N9	B017N6

Field Transfer of Custody	CHAIN OF POSSESSION	(Sign and Print Names)
Relinquished by: NA CADORET	Received by: Kermit Blum	Date/Time: 11-26-91 1130
Relinquished by: Kermit Blum 12-12-91	Received by: [illegible]	Date/Time: 12/16/91 9:30
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: 105

tot. act. < 5.0 E+1 pCi/g

A-6000-407 (12/90)

9613500.1577

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

3206

PART I: FIELD SECTION

ollector W. CADORET Date Sampled 9-10/91 Time N/A hours

ompany Contact C A BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
201364	1-glass, ~20 g samples	plant matter	ICP metals
2012M7			
2017P1			
2017Q5			
3012L5			
3012S6			
3017P9			
3012N4			
3012T0			
3017N9			
3013L7			
3012M1			
3012N2			
B012N1			
B012M0			
B012M5			
B012M9			
B013L0			
B017X2			
B017N6			

eld Information** 300-FF-5, Task 7

pecial Handling and/or Storage N/A.

ossible Sample Hazards none detected

PART II: LABORATORY SECTION

eceived by Kermit Blum Title Sample Control Supervisor Date 11-26-91

nalysis Required 1.0 g

*Indicate whether sample is soil, sludge, water, etc.
**Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

TMA
Thermo Analytical Inc.

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

9615500.1578

Federal Express 4009270296
January 30, 1992

12-080

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

Quality Control Narrative

Scope
Twenty (20) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 16, 1991 from Westinghouse/Hanford Company. The samples were analyzed for the USEPA CLP ICP metals only. The analysis was performed under Skinner and Sherman work order 9112166.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work 7/88 (CLP SOW788).

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

- The barium ICP serial dilution exceeded control limits.

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

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

(for)

David N. Peterson
Assistant Laboratory Manager

4-26-96
MC

9613500.1579

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012L9

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112080 SAS No.: SDG No.: B012L9

Matrix (soil/water): SOIL Lab Sample ID: 12166-19S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 95.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	31.10	B		P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	15.70	B	E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	5.10			P
7440-70-2	Calcium	8480.00			P
7440-47-3	Chromium	6.50			P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	5.70			P
7439-89-6	Iron	105.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2880.00			P
7439-96-5	Manganese	251.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.79	U		P
7440-09-7	Potassium	5040.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.76	B		P
7440-23-5	Sodium	52.00	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.39	U		P
7440-66-6	Zinc	226.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

003

9613500.1580

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012M6

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112080 SAS No.: SDG No.: B012L9

Matrix (soil/water): SOIL Lab Sample ID: 12166-02S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 95.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	51.90			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	24.10	B	E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	3750.00			P
7440-47-3	Chromium	0.82	U		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	5.80			P
7439-89-6	Iron	140.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2360.00			P
7439-96-5	Manganese	14.60			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U		P
7440-09-7	Potassium	17100.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	19.30	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.41	U		P
7440-66-6	Zinc	163.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

004

FORM I - IN Rev.6/89

9613500.1581

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012W2

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112080 SAS No.: SDG No.: B012L9

Matrix (soil/water): SOIL Lab Sample ID: 12166-14S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	233.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	20.30	B	E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	5320.00			P
7440-47-3	Chromium	0.82	U		P
7440-48-4	Cobalt	0.70	B		P
7440-50-8	Copper	8.80			P
7439-89-6	Iron	488.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2550.00			P
7439-96-5	Manganese	50.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.95	B		P
7440-09-7	Potassium	17300.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	61.20	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.49	B		P
7440-66-6	Zinc	87.80			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

005

FORM I - IN Rev.6/89

9613500.1502

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01309

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112080 SAS No.: SDG No.: B012L9

Matrix (soil/water): SOIL Lab Sample ID: 12166-08S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 91.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	106.00			P
7440-36-0	Antimony	2.10	B		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	51.30		E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	25400.00			P
7440-47-3	Chromium	0.83	U		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	4.90	B		P
7439-89-6	Iron	252.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1840.00			P
7439-96-5	Manganese	21.40			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.86	B		P
7440-09-7	Potassium	16100.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.48	B		P
7440-23-5	Sodium	47.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.42	U		P
7440-66-6	Zinc	21.10			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

006

9613500.1583

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01327

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112080 SAS No.: SDG No.: B012L9

Matrix (soil/water): SOIL Lab Sample ID: 12166-13S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	52.40			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	56.50		E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	21000.00			P
7440-47-3	Chromium	0.83	U		P
7440-48-4	Cobalt	0.71	B		P
7440-50-8	Copper	3.70	B		P
7439-89-6	Iron	115.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2020.00			P
7439-96-5	Manganese	15.80			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.83	U		P
7440-09-7	Potassium	11600.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	31.20	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.41	U		P
7440-66-6	Zinc	13.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500.1584

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01330

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112080 SAS No.: SDG No.: B012L9

Matrix (soil/water): SOIL Lab Sample ID: 12166-07S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	84.30			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	60.40		E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	20700.00			P
7440-47-3	Chromium	0.83	U		P
7440-48-4	Cobalt	0.63	U		P
7440-50-8	Copper	6.10			P
7439-89-6	Iron	291.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2290.00			P
7439-96-5	Manganese	52.70			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.83	U		P
7440-09-7	Potassium	16000.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	37.10	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.42	U		P
7440-66-6	Zinc	19.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

008

9615500.1585

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01334

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112080 SAS No.: SDG No.: B012L9

Matrix (soil/water): SOIL Lab Sample ID: 12166-17S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	303.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	20.50	B	E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.25	B		P
7440-70-2	Calcium	5490.00			P
7440-47-3	Chromium	9.10			P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	10.10			P
7439-89-6	Iron	647.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	3190.00			P
7439-96-5	Manganese	64.30			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	2.00	B		P
7440-09-7	Potassium	19600.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	68.70	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.66	B		P
7440-66-6	Zinc	91.30			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500.1586

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B01335

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112080 SAS No.: SDG No.: B012L9

Matrix (soil/water): SOIL Lab Sample ID: 12166-04S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	251.00			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	32.70	B	E	P
7440-41-7	Beryllium	0.26	B		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	6150.00			P
7440-47-3	Chromium	0.83	U		P
7440-48-4	Cobalt	0.86	B		P
7440-50-8	Copper	10.60			P
7439-89-6	Iron	575.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	3520.00			P
7439-96-5	Manganese	130.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.30	B		P
7440-09-7	Potassium	20800.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	85.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.42	U		P
7440-66-6	Zinc	88.90			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

010

9615500.1587

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01338

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112080 SAS No.: SDG No.: B012L9

Matrix (soil/water): SOIL Lab Sample ID: 12166-18S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	81.10			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	75.50		E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	31100.00			P
7440-47-3	Chromium	2.10			P
7440-48-4	Cobalt	0.63	U		P
7440-50-8	Copper	5.50			P
7439-89-6	Iron	187.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2800.00			P
7439-96-5	Manganese	21.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.20	B		P
7440-09-7	Potassium	13600.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	37.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.42	U		P
7440-66-6	Zinc	25.90			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500.1588

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01341

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112080 SAS No.: SDG No.: B012L9

Matrix (soil/water): SOIL Lab Sample ID: 12166-05S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	102.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	69.30		E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	26400.00			P
7440-47-3	Chromium	0.82	U		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	4.70	B		P
7439-89-6	Iron	270.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2970.00			P
7439-96-5	Manganese	28.60			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.20	B		P
7440-09-7	Potassium	15500.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	40.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.41	U		P
7440-66-6	Zinc	25.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

012

FORM I - IN Rev.6/89

9615500.1589

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01342

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112080 SAS No.: SDG No.: B012L9

Matrix (soil/water): SOIL Lab Sample ID: 12166-16S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	75.40			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	67.70		E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	28700.00			P
7440-47-3	Chromium	2.40			P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	5.40			P
7439-89-6	Iron	182.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2600.00			P
7439-96-5	Manganese	18.70			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.81	U		P
7440-09-7	Potassium	13100.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	40.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.41	U		P
7440-66-6	Zinc	28.30			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500.1590

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01344

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112080 SAS No.: SDG No.: B012L9

Matrix (soil/water): SOIL Lab Sample ID: 12166-15S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	81.20			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	69.90		E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	28400.00			P
7440-47-3	Chromium	3.10			P
7440-48-4	Cobalt	0.63	U		P
7440-50-8	Copper	5.40			P
7439-89-6	Iron	198.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2590.00			P
7439-96-5	Manganese	18.30			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.70	B		P
7440-09-7	Potassium	12600.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.73	B		P
7440-23-5	Sodium	38.10	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.42	U		P
7440-66-6	Zinc	28.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

014

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WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01350

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112080 SAS No.: SDG No.: B012L9

Matrix (soil/water): SOIL Lab Sample ID: 12166-12S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	103.00			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	35.40	B	E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	19500.00			P
7440-47-3	Chromium	0.85	U		P
7440-48-4	Cobalt	0.63	U		P
7440-50-8	Copper	5.00	B		P
7439-89-6	Iron	235.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2170.00			P
7439-96-5	Manganese	22.10			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.85	U		P
7440-09-7	Potassium	15900.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	50.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.42	U		P
7440-66-6	Zinc	17.50			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500.1592

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01351

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112080 SAS No.: SDG No.: B012L9

Matrix (soil/water): SOIL Lab Sample ID: 12166-20S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	92.90			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	32.00	B	E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	23000.00			P
7440-47-3	Chromium	2.30			P
7440-48-4	Cobalt	0.63	U		P
7440-50-8	Copper	4.40	B		P
7439-89-6	Iron	233.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2390.00			P
7439-96-5	Manganese	26.70			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.97	B		P
7440-09-7	Potassium	14400.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.85	B		P
7440-23-5	Sodium	47.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.48	B		P
7440-66-6	Zinc	23.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500.1595

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01352

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112080 SAS No.: SDG No.: B012L9

Matrix (soil/water): SOIL Lab Sample ID: 12166-10S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	68.80			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	37.20	B	E	P
7440-41-7	Beryllium	0.26	B		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	20800.00			P
7440-47-3	Chromium	0.81	U		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	4.30	B		P
7439-89-6	Iron	172.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2080.00			P
7439-96-5	Manganese	18.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.20	B		P
7440-09-7	Potassium	13600.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	32.90	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.41	U		P
7440-66-6	Zinc	19.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9615001594

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01357

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112080 SAS No.: SDG No.: B012L9

Matrix (soil/water): SOIL Lab Sample ID: 12166-09S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	126.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	48.70		E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	24800.00			P
7440-47-3	Chromium	0.80	U		P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	4.70	B		P
7439-89-6	Iron	278.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2420.00			P
7439-96-5	Manganese	20.30			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.92	B		P
7440-09-7	Potassium	14800.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	62.10	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.40	U		P
7440-66-6	Zinc	19.70			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

C18

9615580.1595

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01359

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112080 SAS No.: SDG No.: B012L9

Matrix (soil/water): SOIL Lab Sample ID: 12166-06S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	59.80			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	59.50		E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	27800.00			P
7440-47-3	Chromium	6.90			P
7440-48-4	Cobalt	0.63	U		P
7440-50-8	Copper	7.00			P
7439-89-6	Iron	174.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2370.00			P
7439-96-5	Manganese	28.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.84	U		P
7440-09-7	Potassium	13300.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.48	B		P
7440-23-5	Sodium	38.00	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.42	U		P
7440-66-6	Zinc	24.10			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

FORM I - IN Rev.6/89

9215500.1596

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01361

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112080 SAS No.: SDG No.: B012L9

Matrix (soil/water): SOIL Lab Sample ID: 12166-01S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	50.90			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	48.30		E	P
7440-41-7	Beryllium	0.27	B		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	23600.00			P
7440-47-3	Chromium	0.85	U		P
7440-48-4	Cobalt	0.63	U		P
7440-50-8	Copper	7.90			P
7439-89-6	Iron	142.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2320.00			P
7439-96-5	Manganese	26.50			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.85	U		P
7440-09-7	Potassium	14000.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	50.30	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.42	U		P
7440-66-6	Zinc	26.80			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

020

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017P7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112080 SAS No.: SDG No.: B012L9

Matrix (soil/water): SOIL Lab Sample ID: 12166-03S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 96.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	308.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	26.40	B	E	P
7440-41-7	Beryllium	0.26	B		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	4360.00			P
7440-47-3	Chromium	0.81	U		P
7440-48-4	Cobalt	1.10	B		P
7440-50-8	Copper	6.30			P
7439-89-6	Iron	584.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2120.00			P
7439-96-5	Manganese	51.10			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.30	B		P
7440-09-7	Potassium	9650.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	39.10	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.64	B		P
7440-66-6	Zinc	118.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9513500.1599

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017X5

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112080 SAS No.: SDG No.: B012L9

Matrix (soil/water): SOIL Lab Sample ID: 12166-11S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	110.00			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	61.10		E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	24400.00			P
7440-47-3	Chromium	0.84	U		P
7440-48-4	Cobalt	0.63	U		P
7440-50-8	Copper	4.50	B		P
7439-89-6	Iron	292.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2730.00			P
7439-96-5	Manganese	26.30			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.84	U		P
7440-09-7	Potassium	13500.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	35.70	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.47	B		P
7440-66-6	Zinc	23.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613590 1599

TMA/Skinner & Serman Labs **SAMPLE LOG-IN**

WORKORDER 91-12-1666 CLIENT HANFORD-NOB No. SAMPLES: 20 Solids

PROTCL CLP **TURNARND** 33 days (Soil) (Water) (Specify Other)

COOLER TEMP: ____ oC, or NA

CUSTODIAN A. Benney SDG/BATCH N/A

CUSTODY SEAL: PRESENT/ABSENT/INTACT/NOT CLIENT CASE ~~91-~~ N1-12-080

SHIPER & # Fedex PO/CONTRACT# 9-B-2146-93. ↓

TAGS: PRESENT/ABSENT/NA/SEE COC CONTACT Dolores Sanchez

CHAIN OF CUSTODY: PRESENT/ABSENT/NA, # N/A COMMENTS: None

SAMPLE CONTAINERS INTACT/BROKEN COMMENTS

CLIENT COMMENT? YES/NO

SAMPLE LABELS AGREE WITH CHAIN OF CUSTODY INFO? YES/NO (COMMENT)

CLIENT PAPERWORK AGREES WITH SAMPLES & COC? YES/NO (COMMENT)

SHIPMENT DATES 12/16/91

LIST ANY DATE WITH PAPERWORK/SHIPMENT PROBLEMS & SPECIFY THE PROBLEM:

N/A

	CLIENT ID	MATRIX	RECEIVED	QC	TEST(S)	HOLD TIME UP
1	B01361	SOLID	12/16/91	D	ICP Metals	
2	B012M6	↓	↓	3	↓	
3	B017P7					
4	B01335					
5	B01341					
6	B01359					
7	B01330					
8	B01309					
9	B01357					
10	B01352					
11	B017X5					
12	B01350					
13	B01327					
14	B012W2					
15	B01344					
16	B01342					
17	B01334					
18	B01338					
19	B01269					
20	B01351					
21						
22						
23						
24						
25						
26						
27						

Complete 12/18/91 AB

SUBCONTRACT: YES/NO, TO: DATE:

REVIEWED Rev. 1.4 PAGE

Westinghouse Hanford Company 9613503.1600

CHAIN OF CUSTODY

2 OF 6

Custody Form Initiator NA. CADORET

Company Contact C.A. BRANDT Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7 Collection Date 9/10/91

Ice Chest No. CAB-1 Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 248 521 759 2 Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED, ~20 g samples for metals analysis

Sample Identification

B01361	B017X5
B012M6	B01350
B017P7	B01327
B01335	B012W2
B01341	B01344
B01359	B01342
B01330	B01334
B01309	B01338
B01357	B012L9
B01352	B01351

☐ Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
NA CADORET	Kermit Blum	11-26-91 1130
Relinquished by: Kermit Blum 12-12-91	Received by:	Date/Time: 12/16/91 9:30
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: 105

A-6000-407 (12/90)

tot. act. < 5.0 E+1 PiCi/G

9613050.1601

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

2975

PART I: FIELD SECTION

Collector W. CADORET Date Sampled 9-10/91 Time NA hours

Company Contact CA BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01361	1 - glass ~20g sample	plant matter	TCP metals
B012M6			
B017P7			
B01335			
B01341			
B01359			
B01330			
B01309			
B01357			
B01352			
B017X5			
B01350			
B01327			
B012W2			
B01344			
B01342			
B01334			
B01338			
B012L9			
B01351			

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 11-26-91

Analysis Required

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

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

A-6000-406 (05/90)

TMA
Thermo Analytical Inc.

Skinner & Sherman Laboratories Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521

(617) 890-7200

9615508.1602

Federal Express 4009270296
January 30, 1992

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

Quality Control Narrative

Scope
Twnety (20) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 16, 1991 from Westinghouse/Hanford Company. The samples were analyzed for the USEPA CLP ICP metals only. The analysis was performed under Skinner and Sherman work order 9112164.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work 7/88 (CLP SOW788).

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.

(for)

David N. Peterson
Assistant Laboratory Manager

ia 4-26-96 MC

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B012M3

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-080SAS No.: SDG No.: B012M3

Matrix (soil/water): SOIL Lab Sample ID: 12164-12S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	87.30			P
7440-36-0	Antimony	6.40	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	55.50			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	7.00			P
7440-70-2	Calcium	17900.00			P
7440-47-3	Chromium	1.10	B		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	5.50			P
7439-89-6	Iron	251.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	3450.00			P
7439-96-5	Manganese	89.20			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.10	B		P
7440-09-7	Potassium	7170.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	48.40	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.82	B		P
7440-66-6	Zinc	32.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B012W0

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-080SAS No.: SDG No.: B012M3

Matrix (soil/water): SOIL Lab Sample ID: 12164-10S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	84.50			P
7440-36-0	Antimony	6.20	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	44.30			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.57	B		P
7440-70-2	Calcium	21100.00			P
7440-47-3	Chromium	0.83	B		P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	7.20			P
7439-89-6	Iron	219.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2560.00			P
7439-96-5	Manganese	20.40			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.80	U		P
7440-09-7	Potassium	16700.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	46.60	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.60	U		P
7440-66-6	Zinc	24.60			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B012W3

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-080SAS No.: SDG No.: B012M3

Matrix (soil/water): SOIL Lab Sample ID: 12164-08S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	557.00			P
7440-36-0	Antimony	6.40	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	26.40	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.50	B		P
7440-70-2	Calcium	4870.00			P
7440-47-3	Chromium	2.20			P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	9.60			P
7439-89-6	Iron	1130.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2300.00			P
7439-96-5	Manganese	103.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	2.80	B		P
7440-09-7	Potassium	16000.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	76.30	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	2.00	B		P
7440-66-6	Zinc	87.70			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B012W5

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-080SAS No.: SDG No.: B012M3

Matrix (soil/water): SOIL Lab Sample ID: 12164-07S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	85.80			P
7440-36-0	Antimony	6.40	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	46.20			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.42	B		P
7440-70-2	Calcium	19100.00			P
7440-47-3	Chromium	0.78	B		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	4.70	B		P
7439-89-6	Iron	185.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1920.00			P
7439-96-5	Manganese	17.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U		P
7440-09-7	Potassium	16300.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	43.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.62	U		P
7440-66-6	Zinc	18.40			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B012X7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-080SAS No.: SDG No.: B012M3

Matrix (soil/water): SOIL Lab Sample ID: 12164-09S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	113.00			P
7440-36-0	Antimony	6.40	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	38.30	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.32	B		P
7440-70-2	Calcium	31500.00			P
7440-47-3	Chromium	1.60	B		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	6.90			P
7439-89-6	Iron	256.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	4490.00			P
7439-96-5	Manganese	21.50			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.70	B		P
7440-09-7	Potassium	16600.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	53.30	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.98	B		P
7440-66-6	Zinc	23.50			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B012Y1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-080SAS No.: SDG No.: B012M3

Matrix (soil/water): SOIL Lab Sample ID: 12164-11S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	102.00			P
7440-36-0	Antimony	6.40	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	19.70	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.41	B		P
7440-70-2	Calcium	4100.00			P
7440-47-3	Chromium	1.20	B		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	5.30			P
7439-89-6	Iron	231.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1580.00			P
7439-96-5	Manganese	24.10			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U		P
7440-09-7	Potassium	12600.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	48.70	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.65	B		P
7440-66-6	Zinc	14.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B012Z1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-080SAS No.: SDG No.: B012M3

Matrix (soil/water): SOIL Lab Sample ID: 12164-16S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	671.00			P
7440-36-0	Antimony	6.40	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	33.60	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.89	B		P
7440-70-2	Calcium	5900.00			P
7440-47-3	Chromium	2.80			P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	8.70			P
7439-89-6	Iron	1200.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2060.00			P
7439-96-5	Manganese	56.40			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	2.80	B		P
7440-09-7	Potassium	13600.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	75.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	2.50	B		P
7440-66-6	Zinc	127.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500.1010

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B012Z5

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-080SAS No.: SDG No.: B012M3

Matrix (soil/water): SOIL Lab Sample ID: 12164-18S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	116.00			P
7440-36-0	Antimony	6.10	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	40.70			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	16900.00			P
7440-47-3	Chromium	1.30	B		P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	4.90	B		P
7439-89-6	Iron	255.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2040.00			P
7439-96-5	Manganese	16.10			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.84	B		P
7440-09-7	Potassium	18000.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.99	U		P
7440-23-5	Sodium	57.60	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.93	B		P
7440-66-6	Zinc	21.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

FORM I - IN Rev.6/89

010

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B012Z9

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-080SAS No.: SDG No.: B012M3

Matrix (soil/water): SOIL Lab Sample ID: 12164-02S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 92.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	119.00			P
7440-36-0	Antimony	6.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	52.00			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	30600.00			P
7440-47-3	Chromium	1.40	B		P
7440-48-4	Cobalt	0.64	U		P
7440-50-8	Copper	8.70			P
7439-89-6	Iron	273.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2140.00			P
7439-96-5	Manganese	21.20			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.70	B		P
7440-09-7	Potassium	13600.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.10	U		P
7440-23-5	Sodium	65.60	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	1.30	B		P
7440-66-6	Zinc	19.30			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9615500.1010

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01300

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-080SAS No.: SDG No.: B012M3

Matrix (soil/water): SOIL Lab Sample ID: 12164-01S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 92.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	98.20			P
7440-36-0	Antimony	6.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	52.20			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.42	B		P
7440-70-2	Calcium	21200.00			P
7440-47-3	Chromium	1.80	B		P
7440-48-4	Cobalt	0.63	U		P
7440-50-8	Copper	15.50			P
7439-89-6	Iron	236.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2240.00			P
7439-96-5	Manganese	15.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.90	B		P
7440-09-7	Potassium	15500.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.10	U		P
7440-23-5	Sodium	64.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.92	B		P
7440-66-6	Zinc	19.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01303

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-080SAS No.: SDG No.: B012M3

Matrix (soil/water): SOIL Lab Sample ID: 12164-05S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	322.00			P
7440-36-0	Antimony	6.10	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	29.80	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.71	B		P
7440-70-2	Calcium	5080.00			P
7440-47-3	Chromium	2.40			P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	9.90			P
7439-89-6	Iron	630 00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2180.00			P
7439-96-5	Manganese	57.10			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	2.10	B		P
7440-09-7	Potassium	18400.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.98	U		P
7440-23-5	Sodium	66.40	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	1.70	B		P
7440-66-6	Zinc	143.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9615500.1014

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01305

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-080SAS No.: SDG No.: B012M3

Matrix (soil/water): SOIL Lab Sample ID: 12164-15S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	323.00			P
7440-36-0	Antimony	6.40	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	21.50	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.27	B		P
7440-70-2	Calcium	3800.00			P
7440-47-3	Chromium	1.40	B		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	9.30			P
7439-89-6	Iron	603.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2080.00			P
7439-96-5	Manganese	59.50			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.50	B		P
7440-09-7	Potassium	17100.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	71.90	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	1.10	B		P
7440-66-6	Zinc	107.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

WESTINGHOUSE/HANFORD

9613500.1615

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01306

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-080SAS No.: SDG No.: B012M3

Matrix (soil/water): SOIL Lab Sample ID: 12164-06S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	95.30			P
7440-36-0	Antimony	6.30	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	50.60			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	17800.00			P
7440-47-3	Chromium	0.85	B		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	5.80			P
7439-89-6	Iron	208.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2170.00			P
7439-96-5	Manganese	16.50			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U		P
7440-09-7	Potassium	11700.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	49.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.61	U		P
7440-66-6	Zinc	25.10			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

WESTINGHOUSE/HANFORD

9613500.1616

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01307

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-080SAS No.: SDG No.: B012M3

Matrix (soil/water): SOIL Lab Sample ID: 12164-14S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	100.00			P
7440-36-0	Antimony	6.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	56.00			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.24	B		P
7440-70-2	Calcium	21000.00			P
7440-47-3	Chromium	1.10	B		P
7440-48-4	Cobalt	0.64	U		P
7440-50-8	Copper	5.20	B		P
7439-89-6	Iron	243.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2510.00			P
7439-96-5	Manganese	21.50			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.85	U		P
7440-09-7	Potassium	12100.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.10	U		P
7440-23-5	Sodium	52.40	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.64	U		P
7440-66-6	Zinc	26.50			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01308

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-080SAS No.: SDG No.: B012M3

Matrix (soil/water): SOIL Lab Sample ID: 12164-13S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	106.00			P
7440-36-0	Antimony	6.40	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	55.80			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	26300.00			P
7440-47-3	Chromium	0.86	B		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	5.20	B		P
7439-89-6	Iron	242.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1900.00			P
7439-96-5	Manganese	18.80			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.83	U		P
7440-09-7	Potassium	15800.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	45.30	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.62	U		P
7440-66-6	Zinc	21.60			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

WESTINGHOUSE/HANFORD

9613500.1618

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01331

Lab Name: SKINNER & SHERMAN LABS: Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-080SAS No.: SDG No.: B012M3

Matrix (soil/water): SOIL Lab Sample ID: 12164-20S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	93.70			P
7440-36-0	Antimony	6.40	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	61.60			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.31	B		P
7440-70-2	Calcium	21300.00			P
7440-47-3	Chromium	0.62	B		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	5.80			P
7439-89-6	Iron	291.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2250.00			P
7439-96-5	Manganese	38.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U		P
7440-09-7	Potassium	13000.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	39.90	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.62	U		P
7440-66-6	Zinc	20.60			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

WESTINGHOUSE/HANFORD

9613500.1619

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01346

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-080SAS No.: SDG No.: B012M3

Matrix (soil/water): SOIL Lab Sample ID: 12164-19S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	423.00			P
7440-36-0	Antimony	6.40	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	24.70	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.58	B		P
7440-70-2	Calcium	4210.00			P
7440-47-3	Chromium	2.00	B		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	8.50			P
7439-89-6	Iron	897.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2220.00			P
7439-96-5	Manganese	102.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.80	B		P
7440-09-7	Potassium	17600.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	161.00	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	1.70	B		P
7440-66-6	Zinc	102.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

WESTINGHOUSE/HANFORD

9613500.1620

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01369

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-080SAS No.: SDG No.: B012M3

Matrix (soil/water): SOIL Lab Sample ID: 12164-17S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	593.00			P
7440-36-0	Antimony	6.40	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	35.30	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.55	B		P
7440-70-2	Calcium	5320.00			P
7440-47-3	Chromium	3.50			P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	8.50			P
7439-89-6	Iron	1070.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	3180.00			P
7439-96-5	Manganese	69.80			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	2.50	B		P
7440-09-7	Potassium	15900.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	55.40	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	1.90	B		P
7440-66-6	Zinc	143.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9615500.1621 WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017X1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-080SAS No.: SDG No.: B012M3

Matrix (soil/water): SOIL Lab Sample ID: 12164-04S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	146.00			P
7440-36-0	Antimony	6.40	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	60.30			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.26	B		P
7440-70-2	Calcium	28900.00			P
7440-47-3	Chromium	1.20	B		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	5.10			P
7439-89-6	Iron	313.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2260.00			P
7439-96-5	Manganese	23.20			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U		P
7440-09-7	Potassium	13600.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	62.30	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.62	U		P
7440-66-6	Zinc	18.30			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500.1BCC WESTINGHOUSE/HANFORD

1.

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017X3

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-080SAS No.: SDG No.: B012M3

Matrix (soil/water): SOIL Lab Sample ID: 12164-03S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	92.70			P
7440-36-0	Antimony	6.40	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	55.30			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.28	B		P
7440-70-2	Calcium	24300.00			P
7440-47-3	Chromium	0.41	U		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	6.60			P
7439-89-6	Iron	204.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2080.00			P
7439-96-5	Manganese	19.70			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.83	U		P
7440-09-7	Potassium	14800.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	54.10	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.62	U		P
7440-66-6	Zinc	23.70			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

TMA/Skinner & Serman Labs SAMPLE LOG-IN

WORKORDER 91-12-164 CLIENT HANFORD-NOR No. SAMPLES:

PROTCL CLP TURNARND 33 days 20 SOLIDS

COOLER TEMP: oC, or NA (Soil) (Water) (Specify Other)

CUSTODIAN A. Benney SDG/BATCH N/A

CUSTODY SEAL: PRESENT/ABSENT/INTACT/NOT CLIENT CASE 91-12-080

SHIPER & # Fedex PO/CONTRACT# ↓

TAGS: PRESENT/ABSENT/NA/SEE COC CONTACT Dolores Sanchez

CHAIN OF CUSTODY: PRESENT/ABSENT/NA, # N/A COMMENTS: NONE

SAMPLE CONTAINERS INTACT/BROKEN COMMENTS

CLIENT COMMENT? YES/NO

SAMPLE LABELS AGREE WITH CHAIN OF CUSTODY INFO? YES/NO (COMMENT)

CLIENT PAPERWORK AGREES WITH SAMPLES & COC? YES /NO (COMMENT)

SHIPMENT DATES 12/16/91

LIST ANY DATE WITH PAPERWORK/SHIPMENT PROBLEMS & SPECIFY THE PROBLEM:

N/A

	CLIENT ID	MATRIX	RECEIVED	QC	TEST(S)	HOLD TIME UP
1	B01300	SOLID	12/16/91	D	ICP metals	
2	B01279			S		
3	B017X3					
4	B017X1					
5	B01303					
6	B01306					
7	B012W5					
8	B012W3					
9	B012X7					
10	B012W0					
11	B012Y1					
12	B012M3					
13	B01308					
14	B01307					
15	B01305					
16	B01281					
17	B01369					
18	B01285					
19	B01346					
20	B01331					
21						
22						
23						
24						
25						
26						
27						

Complete 12/18/91 AB

SUBCONTRACT: YES/NO, TO: DATE:

REVIEWED Rev. 1.4 PAGE

Westinghouse Hanford Company 9613500.1624

CHAIN OF CUSTODY S&S

1 OF 6

Custody Form Initiator NA. CADORET

Company Contact C.A. BRANDT

Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7

Collection Date 9/10/91

Ice Chest No. CAB-1

Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 2485217792

Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED, ~20g samples for metals analysis

Sample Identification

B01300	B01241
B01279	B01243
B017X3	B01308
B017X1	B01307
B01303	B01305
B01306	B01271
B01245	B01369
B01243	B01275
B012X7	B01346
B01240	B01331

☐ Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
NA CADORET	Kermit Blum	11-26-91 1130
Relinquished by: 12-12-91 Kermit Blum	Received by:	Date/Time: 12/16/91 9:30
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: Also received B01342 for ICP metals, not listed.

tot. act. < 50 E+1 PiCi/G

A-6000-407 (12/90)

9613500.1625

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

1085

PART I: FIELD SECTION

Collector N. CADORET Date Sampled 9-10/91 Time N/A hours

Company Contact C A BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01300	1 ~20 g samples glass containers	plant matter	ICP Metals
B01279			
B017X3			
B01303			
B01306			
B012W5			
B012W3			
B012X7			
B012W0			
B01241			
B012M3			
B01308			
B01307			
B01305			
B01271			
B01369			
B01275			
B01346			
B01331			
B017X1			

Field Information** from 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards none detected

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 11-26-91

Analysis Required

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

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

A-6000-406 (05/90)

TMA
Thermo Analytical Inc.

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

9613500.1626

Federal Express 4009270296
January 30, 1992

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

Quality Control Narrative

Scope
Twnety (20) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 16, 1991 from Westinghouse/Hanford Company. The samples were analyzed for the USEPA CLP ICP metals only. The analysis was performed under Skinner and Sherman work order 9112158.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work 7/88 (CLP SOW788).

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

- The barium ICP serial dilution exceeded control limits.

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

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

(for)
David N. Peterson
Assistant Laboratory Manager

ia 4-26-96
MC

WESTINGHOUSE/HANFORD

9613500.1627

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B012M2

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012P1

Matrix (soil/water): SOIL Lab Sample ID: 12158-06S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	79.50			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	57.30		E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	7.70			P
7440-70-2	Calcium	21200.00			P
7440-47-3	Chromium	0.81	U		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	4.50	B		P
7439-89-6	Iron	166.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	4590.00			P
7439-96-5	Manganese	48.40			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.81	U		P
7440-09-7	Potassium	3800.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	52.00	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.44	B		P
7440-66-6	Zinc	301.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

FORM I - IN Rev.6/89

WESTINGHOUSE/HANFORD

9615500.1628

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B012M4

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012P1

Matrix (soil/water): SOIL Lab Sample ID: 12158-02S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	37.30	B		P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	23.50	B	E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.36	B		P
7440-70-2	Calcium	5210.00			P
7440-47-3	Chromium	0.81	U		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	4.60	B		P
7439-89-6	Iron	91.40			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2260.00			P
7439-96-5	Manganese	29.30			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.81	U		P
7440-09-7	Potassium	8080.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	37.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.41	U		P
7440-66-6	Zinc	110.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

WESTINGHOUSE/HANFORD

9613500.1629

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B012M8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012P1

Matrix (soil/water): SOIL Lab Sample ID: 12158-07S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	69.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	40.30	B	E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	23800.00			P
7440-47-3	Chromium	0.81	U		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	3.10	B		P
7439-89-6	Iron	156.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2480.00			P
7439-96-5	Manganese	14.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.81	U		P
7440-09-7	Potassium	8790.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	68.00	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.41	U		P
7440-66-6	Zinc	79.50			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

WESTINGHOUSE/HANFORD

9615500.1650

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012N0

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012P1

Matrix (soil/water): SOIL Lab Sample ID: 12158-03S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	88.50			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	40.60		E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	23300.00			P
7440-47-3	Chromium	0.80	U		P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	7.30			P
7439-89-6	Iron	329.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2800.00			P
7439-96-5	Manganese	30.10			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.20	B		P
7440-09-7	Potassium	17000.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	51.40	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.40	U		P
7440-66-6	Zinc	17.50			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

WESTINGHOUSE/HANFORD

9613500.1631

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B012N8

ab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

ab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012P1

atrix (soil/water): SOIL Lab Sample ID: 12158-10S

evel (low/med): LOW Date Received: 12/16/91

Solids: 93.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	132.00			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	32.70	B	E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.23	B		P
7440-70-2	Calcium	21400.00			P
7440-47-3	Chromium	0.83	U		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	6.90			P
7439-89-6	Iron	345.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	3640.00			P
7439-96-5	Manganese	35.40			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.87	B		P
7440-09-7	Potassium	18200.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	59.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.42	U		P
7440-66-6	Zinc	30.70			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

WESTINGHOUSE/HANFORD

9615500.1652

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

8012N9

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: 8012P1

Matrix (soil/water): SOIL Lab Sample ID: 12158-04S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	86.80			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	33.70	B	E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	21300.00			P
7440-47-3	Chromium	0.79	U		P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	7.00			P
7439-89-6	Iron	261.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	3410.00			P
7439-96-5	Manganese	30.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.79	U		P
7440-09-7	Potassium	18500.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.39	U		P
7440-23-5	Sodium	50.20	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.39	U		P
7440-66-6	Zinc	27.70			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B012P1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012P1

Matrix (soil/water): SOIL Lab Sample ID: 12158-13S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	75.60			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	28.50	B	E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.24	B		P
7440-70-2	Calcium	19100.00			P
7440-47-3	Chromium	0.88	B		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	6.70			P
7439-89-6	Iron	218.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2010.00			P
7439-96-5	Manganese	22.10			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.50	B		P
7440-09-7	Potassium	22800.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	69.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.72	B		P
7440-66-6	Zinc	27.80			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

WESTINGHOUSE/HANFORD

9613500.1654

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B012W1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012P1

Matrix (soil/water): SOIL Lab Sample ID: 12158-18S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	87.90			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	49.80		E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	24700.00			P
7440-47-3	Chromium	0.83	U		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	6.20			P
7439-89-6	Iron	236.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2830.00			P
7439-96-5	Manganese	21.30			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.83	U		P
7440-09-7	Potassium	17800.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	58.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.42	U		P
7440-66-6	Zinc	20.70			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

WESTINGHOUSE/HANFORD

9613500.1635

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012W4

ab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

ab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012P1

atrix (soil/water): SOIL Lab Sample ID: 12158-12S

evel (low/med): LOW Date Received: 12/16/91

Solids: 93.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	200.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	13.60	B	E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	4060.00			P
7440-47-3	Chromium	0.82	U		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	8.30			P
7439-89-6	Iron	431.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1890.00			P
7439-96-5	Manganese	28.20			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U		P
7440-09-7	Potassium	13800.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	59.30	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.61	B		P
7440-66-6	Zinc	75.90			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

WESTINGHOUSE/HANFORD

9615500.1656

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012X1

ab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

ab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012P1

atrix (soil/water): SOIL Lab Sample ID: 12158-17S

evel (low/med): LOW Date Received: 12/16/91

Solids: 93.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	75.50			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	29.30	B	E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	2.70			P
7440-70-2	Calcium	13000.00			P
7440-47-3	Chromium	0.83	U		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	4.50	B		P
7439-89-6	Iron	176.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2100.00			P
7439-96-5	Manganese	37.50			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.83	U		P
7440-09-7	Potassium	13500.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	73.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.42	U		P
7440-66-6	Zinc	167.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012X9

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012P1

Matrix (soil/water): SOIL Lab Sample ID: 12158-11S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	78.30			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	50.70		E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	B		P
7440-70-2	Calcium	36800.00			P
7440-47-3	Chromium	0.82	U		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	6.00			P
7439-89-6	Iron	222.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	4960.00			P
7439-96-5	Manganese	26.60			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.40	B		P
7440-09-7	Potassium	13600.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	73.20	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.72	B		P
7440-66-6	Zinc	22.40			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012Y3

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012P1

Matrix (soil/water): SOIL Lab Sample ID: 12158-09S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	106.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	42.20		E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	27400.00			P
7440-47-3	Chromium	0.81	U		P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	5.80			P
7439-89-6	Iron	263.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2950.00			P
7439-96-5	Manganese	21.30			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.81	U		P
7440-09-7	Potassium	16100.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	72.70	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.44	B		P
7440-66-6	Zinc	16.40			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

014

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012Y5

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012P1

Matrix (soil/water): SOIL Lab Sample ID: 12158-14S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	161.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	41.10		E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	32600.00			P
7440-47-3	Chromium	0.86	B		P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	4.30	B		P
7439-89-6	Iron	370.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2720.00			P
7439-96-5	Manganese	22.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.80	U		P
7440-09-7	Potassium	19100.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	66.90	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.45	B		P
7440-66-6	Zinc	16.90			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012Z2

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012P1

Matrix (soil/water): SOIL Lab Sample ID: 12158-19S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	364.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	20.00	B	E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.33	B		P
7440-70-2	Calcium	4230.00			P
7440-47-3	Chromium	1.30	B		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	7.70			P
7439-89-6	Iron	702.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1730.00			P
7439-96-5	Manganese	36.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.60	B		P
7440-09-7	Potassium	19200.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	112.00	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	1.60	B		P
7440-66-6	Zinc	79.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B012Z7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012P1

Matrix (soil/water): SOIL Lab Sample ID: 12158-16S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	104.00			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	46.30		E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.24	B		P
7440-70-2	Calcium	19400.00			P
7440-47-3	Chromium	0.83	U		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	4.80	B		P
7439-89-6	Iron	250.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2270.00			P
7439-96-5	Manganese	15.60			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.83	U		P
7440-09-7	Potassium	18200.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	64.60	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.41	U		P
7440-66-6	Zinc	16.50			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

017

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012Z8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012P1

Matrix (soil/water): SOIL Lab Sample ID: 12158-15S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	153.00			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	76.40		E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	B		P
7440-70-2	Calcium	41000.00			P
7440-47-3	Chromium	0.84	U		P
7440-48-4	Cobalt	0.63	U		P
7440-50-8	Copper	4.70	B		P
7439-89-6	Iron	362.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2670.00			P
7439-96-5	Manganese	26.60			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.10	B		P
7440-09-7	Potassium	14300.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	109.00	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	1.00	B		P
7440-66-6	Zinc	12.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01363

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012P1

Matrix (soil/water): SOIL Lab Sample ID: 12158-05S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	66.80			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	36.70	B	E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.30	B		P
7440-70-2	Calcium	20900.00			P
7440-47-3	Chromium	1.00	B		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	5.60			P
7439-89-6	Iron	151.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2140.00			P
7439-96-5	Manganese	16.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.81	U		P
7440-09-7	Potassium	11400.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	76.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.43	B		P
7440-66-6	Zinc	21.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01365

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012P1

Matrix (soil/water): SOIL Lab Sample ID: 12158-01S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 95.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	65.40			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	42.70		E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.21	B		P
7440-70-2	Calcium	22600.00			P
7440-47-3	Chromium	0.86	B		P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	7.80			P
7439-89-6	Iron	157.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2170.00			P
7439-96-5	Manganese	18.40			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.79	U		P
7440-09-7	Potassium	13100.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	79.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.42	B		P
7440-66-6	Zinc	22.50			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

WESTINGHOUSE/HANFORD

9613501.1895

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01368

ab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

.ab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012P1

latrix (soil/water): SOIL Lab Sample ID: 12158-08S

.evel (low/med): LOW Date Received: 12/16/91

; Solids: 94.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	298.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	21.60	B	E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	4030.00			P
7440-47-3	Chromium	2.00			P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	5.70			P
7439-89-6	Iron	570.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2180.00			P
7439-96-5	Manganese	52.80			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.30	B		P
7440-09-7	Potassium	13500.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	52.30	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	1.30	B		P
7440-66-6	Zinc	82.30			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B017X6

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-070SAS No.: SDG No.: B012P1

Matrix (soil/water): SOIL Lab Sample ID: 12158-20S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	93.40			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	44.80		E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.27	B		P
7440-70-2	Calcium	37200.00			P
7440-47-3	Chromium	0.83	U		P
7440-48-4	Cobalt	0.63	U		P
7440-50-8	Copper	5.50			P
7439-89-6	Iron	246.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	5090.00			P
7439-96-5	Manganese	21.50			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.10	B		P
7440-09-7	Potassium	15600.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	71.40	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.88	B		P
7440-66-6	Zinc	20.10			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9112500.1647

TMA/Skinner & Serman Labs SAMPLE LOG-IN

WORKORDER 9112158 CLIENT HANFORD-ARCI No. SAMPLES:

PROTCL ELP TURNARND 33 days 20 solids

COOLER TEMP: ____ oC, or NA (Soil) (Water) (Specify Other)

CUSTODIAN A. Benney SDG/BATCH N/A

CUSTODY SEAL: PRESENT/ABSENT/INTACT/NOT CLIENT CASE N1-12-076

SHIPER & # Fedex #1414547654 PO/CONTRACT# ↓

TAGS: PRESENT/ABSENT/NA/SEE COC CONTACT Dolores Sanchez

CHAIN OF CUSTODY: PRESENT/ABSENT/NA, # ____ COMMENTS: ____

SAMPLE CONTAINERS-INTACT/BROKEN COMMENTS ____

CLIENT COMMENT? YES/NO ____

SAMPLE LABELS AGREE WITH CHAIN OF CUSTODY INFO? YES/NO (COMMENT)

CLIENT PAPERWORK AGREES WITH SAMPLES & COC? YES/NO (COMMENT)

SHIPMENT DATES 12/16/91

LIST ANY DATE WITH PAPERWORK/SHIPMENT PROBLEMS & SPECIFY THE PROBLEM:

N/A

	CLIENT ID	MATRIX	RECEIVED	QC	TEST(S) (ICP-S)	HOLD TIME UP
1	B01365	SOLID	12/16/91	D	ICP Metals	
2	B012M4	↓	↓	S	↓	
3	B012N0					
4	B012N9					
5	B01363					
6	B012M2					
7	B012M8					
8	B01368					
9	B012Y3					
10	B012N8					
11	B012X9					
12	W4					
13	P1					
14	Y5					
15	Z8					
16	Z7					
17	X1					
18	W1					
19	Z2					
20	B017X6	↓	↓	↓	↓	
21						
22						
23						
24						
25						
26						
27						

Complete 12/17/91 AB

SUBCONTRACT: YES/NO, TO: ____ DATE: ____

REVIEWED ____ Rev. 1.4 PAGE ____

Westinghouse Hanford Company 9613500.1648

CHAIN OF CUSTODY

4 of 7

Custody Form Initiator NA. CADORET

Company Contact C.A. BRANDT Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7 Collection Date 9/10/91

Ice Chest No. CAB-3 Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 2445217592 Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED, ~20 g samples for metals analysis

Sample Identification

B01365	B012X9
B012M4	B012W4
B012N0	B012P1
B012N9	B012Y5
B01363	B012Z8
B012M2	B012Z7
B012M8	B012X1
B01365	B012W1
B012Y3	B012Z2
B012N8	B017X6

☐ Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
NA CADORET	Kermit Blum	11-26-91 1130
Relinquished by: 12-12-91 Kermit Blum	Received by:	Date/Time: 12/16/91 9:30
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: 105 tot. act. < 5.0 E+1 PiCi/G

A-6000-407 (12/90)

9613500.1649

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

426

PART I: FIELD SECTION

ollector N. CADORET Date Sampled 9-10/91 Time N/A hours

ompany Contact C A BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01365	1 - glass, ~20g samples	plant matter	ICP metals
B012M4			
B012N0			
B012N9			
B01363			
B012M2			
B012M8			
B01368			
B012W3			
B012N8			
B012X9			
B012W4			
B012P1			
B01245			
B012Z4			
B012Z7			
B012X1			
B012W1			
B012Z2			
B017X6			

eld Information** From 300-FF-5, Task 7

pecial Handling and/or Storage N/A

ossible Sample Hazards none detected

PART II: LABORATORY SECTION

eceived by Kermit Blum Title Sample Control Supervisor Date 11-26-91

nalysis Required

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

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

A-6000-406 (05/90)

TMA
Thermo Analytical Inc.

Skinner & Sherman Laboratories Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521

(617) 890-7200

9613500.1650

Federal Express 4009270241
January 29, 1992

TMA/ARLI
160 Taylor Street
Monrovia, CA 91016
Attention: Dennis Wells

Quality Control Narrative

Scope
Twenty (20) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 16, 1991 from Westinghouse/Hanford Company. The samples were analyzed for the USEPA CLP ICP metals only. The analysis was performed under Skinner and Sherman work order 9112154.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work 7/88 (CLP SOW788).

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.

David N. Peterson
Assistant Laboratory Manager

ia 4-26-96 MC

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B012N5

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012S2

Matrix (soil/water): SOIL Lab Sample ID: 12154-16S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	101.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	52.90			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	29200.00			P
7440-47-3	Chromium	0.82	U		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	6.10			P
7439-89-6	Iron	231.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2190.00			P
7439-96-5	Manganese	22.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.50	B		P
7440-09-7	Potassium	15100.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	54.40	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.41	U		P
7440-66-6	Zinc	21.60			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B012S2

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012S2

Matrix (soil/water): SOIL Lab Sample ID: 12154-18S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	137.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	54.70			P
7440-41-7	Beryllium	0.19	U		P
7440-43-9	Cadmium	0.19	U		P
7440-70-2	Calcium	21400.00			P
7440-47-3	Chromium	0.78	U		P
7440-48-4	Cobalt	0.58	U		P
7440-50-8	Copper	4.00	B		P
7439-89-6	Iron	319.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1850.00			P
7439-96-5	Manganese	38.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.96	B		P
7440-09-7	Potassium	13800.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.39	U		P
7440-23-5	Sodium	53.40	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.39	U		P
7440-66-6	Zinc	30.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B012S4

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012S2

Matrix (soil/water): SOIL Lab Sample ID: 12154-17S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 95.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	120.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	62.90			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	22500.00			P
7440-47-3	Chromium	0.79	U		P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	3.90	B		P
7439-89-6	Iron	283.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2640.00			P
7439-96-5	Manganese	33.10			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.30	B		P
7440-09-7	Potassium	10200.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.39	U		P
7440-23-5	Sodium	63.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.39	U		P
7440-66-6	Zinc	25.30			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B012T4

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012S2

Matrix (soil/water): SOIL Lab Sample ID: 12154-20S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 95.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	159.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	59.20			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	23400.00			P
7440-47-3	Chromium	0.82	U		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	5.00	B		P
7439-89-6	Iron	373.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2790.00			P
7439-96-5	Manganese	40.20			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U		P
7440-09-7	Potassium	11900.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	54.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.46	B		P
7440-66-6	Zinc	32.80			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B012T8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012S2

Matrix (soil/water): SOIL Lab Sample ID: 12154-19S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 95.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	56.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	24.90	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	4500.00			P
7440-47-3	Chromium	0.82	U		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	3.70	B		P
7439-89-6	Iron	133.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2290.00			P
7439-96-5	Manganese	19.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U		P
7440-09-7	Potassium	12900.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	31.90	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.41	U		P
7440-66-6	Zinc	102.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01707

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012S2

Matrix (soil/water): SOIL Lab Sample ID: 12154-09S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	106.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	36.40	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	7170.00			P
7440-47-3	Chromium	0.80	U		P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	3.70	B		P
7439-89-6	Iron	260.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	3360.00			P
7439-96-5	Manganese	28.50			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.80	U		P
7440-09-7	Potassium	14300.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	55.40	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.57	B		P
7440-66-6	Zinc	104.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B017R1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012S2

Matrix (soil/water): SOIL Lab Sample ID: 12154-03S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 95.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	287.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	25.30	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	5780.00			P
7440-47-3	Chromium	1.30	B		P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	4.50	B		P
7439-89-6	Iron	581.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2590.00			P
7439-96-5	Manganese	66.40			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.88	B		P
7440-09-7	Potassium	13200.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.39	U		P
7440-23-5	Sodium	53.70	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	1.10	B		P
7440-66-6	Zinc	16.30			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B017R3

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012S2

Matrix (soil/water): SOIL Lab Sample ID: 12154-12S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 95.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	125.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	20.60	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	3880.00			P
7440-47-3	Chromium	0.79	U		P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	2.50	B		P
7439-89-6	Iron	277.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2100.00			P
7439-96-5	Manganese	12.10			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.79	U		P
7440-09-7	Potassium	13200.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	56.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.44	B		P
7440-66-6	Zinc	77.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B017R5

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012S2

Matrix (soil/water): SOIL Lab Sample ID: 12154-15S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	319.00			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	32.10	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	6560.00			P
7440-47-3	Chromium	1.30	B		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	5.20			P
7439-89-6	Iron	626.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2480.00			P
7439-96-5	Manganese	39.70			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.85	B		P
7440-09-7	Potassium	10900.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	64.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.92	B		P
7440-66-6	Zinc	15.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B017R7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012S2

Matrix (soil/water): SOIL Lab Sample ID: 12154-10S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	385.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	24.70	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	4420.00			P
7440-47-3	Chromium	1.70	B		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	5.00	B		P
7439-89-6	Iron	734.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1990.00			P
7439-96-5	Manganese	45.10			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.60	B		P
7440-09-7	Potassium	8920.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	61.90	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	1.10	B		P
7440-66-6	Zinc	129.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B017R9

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-06&SAS No.: SDG No.: B012S2

Matrix (soil/water): SOIL Lab Sample ID: 12154-14S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	211.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	32.60	B		P
7440-41-7	Beryllium	0.19	U		P
7440-43-9	Cadmium	0.19	U		P
7440-70-2	Calcium	5260.00			P
7440-47-3	Chromium	0.89	B		P
7440-48-4	Cobalt	0.58	U		P
7440-50-8	Copper	4.90			P
7439-89-6	Iron	426.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2740.00			P
7439-96-5	Manganese	46.30			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.30	B		P
7440-09-7	Potassium	10800.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.39	U		P
7440-23-5	Sodium	54.40	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.72	B		P
7440-66-6	Zinc	134.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

SAMPLE NUMBER: B017T7

INORGANIC ANALYSIS DATA SHEET

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012S2

Matrix (soil/water): SOIL Lab Sample ID: 12154-13S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 95.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	330.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	18.80	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	4820.00			P
7440-47-3	Chromium	0.94	B		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	3.10	B		P
7439-89-6	Iron	635.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2060.00			P
7439-96-5	Manganese	25.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.10	B		P
7440-09-7	Potassium	6880.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	58.20	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.50	B		P
7440-66-6	Zinc	70.50			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B017V1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012S2

Matrix (soil/water): SOIL Lab Sample ID: 12154-08S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 95.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	160.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	35.90	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.45	B		P
7440-70-2	Calcium	16100.00			P
7440-47-3	Chromium	0.82	U		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	3.60	B		P
7439-89-6	Iron	348.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2610.00			P
7439-96-5	Manganese	39.10			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U		P
7440-09-7	Potassium	7700.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	78.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.60	B		P
7440-66-6	Zinc	53.40			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017V3

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012S2

Matrix (soil/water): SOIL Lab Sample ID: 12154-11S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 95.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	141.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	31.00	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.23	B		P
7440-70-2	Calcium	14000.00			P
7440-47-3	Chromium	0.81	U		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	3.60	B		P
7439-89-6	Iron	303.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2350.00			P
7439-96-5	Manganese	36.20			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.81	U		P
7440-09-7	Potassium	8450.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	59.10	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.41	U		P
7440-66-6	Zinc	43.50			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B017V5

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012S2

Matrix (soil/water): SOIL Lab Sample ID: 12154-01S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 95.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	167.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	29.00	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.22	B		P
7440-70-2	Calcium	14000.00			P
7440-47-3	Chromium	1.40	B		P
7440-48-4	Cobalt	0.62	B		P
7440-50-8	Copper	7.80			P
7439-89-6	Iron	365.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2130.00			P
7439-96-5	Manganese	35.40			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.90	B		P
7440-09-7	Potassium	10400.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	70.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.73	B		P
7440-66-6	Zinc	27.50			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B017V9

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012S2

Matrix (soil/water): SOIL Lab Sample ID: 12154-05S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	189.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	36.00	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.84	B		P
7440-70-2	Calcium	15800.00			P
7440-47-3	Chromium	0.79	U		P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	3.90	B		P
7439-89-6	Iron	401.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2160.00			P
7439-96-5	Manganese	35.70			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.79	U		P
7440-09-7	Potassium	7100.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.39	U		P
7440-23-5	Sodium	74.70	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.39	U		P
7440-66-6	Zinc	62.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B017W1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012S2

Matrix (soil/water): SOIL Lab Sample ID: 12154-04S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	259.00			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	30.10	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	16000.00			P
7440-47-3	Chromium	0.83	U		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	3.70	B		P
7439-89-6	Iron	570.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2320.00			P
7439-96-5	Manganese	38.20			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.30	B		P
7440-09-7	Potassium	7090.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	85.60	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.78	B		P
7440-66-6	Zinc	20.40			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9615500.1668

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017W5

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012S2

Matrix (soil/water): SOIL Lab Sample ID: 12154-07S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	192.00			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	43.50			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	1.40			P
7440-70-2	Calcium	16800.00			P
7440-47-3	Chromium	0.84	U		P
7440-48-4	Cobalt	0.63	U		P
7440-50-8	Copper	3.10	B		P
7439-89-6	Iron	387.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2320.00			P
7439-96-5	Manganese	25.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.84	U		P
7440-09-7	Potassium	6730.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	49.20	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.42	U		P
7440-66-6	Zinc	57.70			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017W9

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012S2

Matrix (soil/water): SOIL Lab Sample ID: 12154-02S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 95.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	125.00			P
7440-36-0	Antimony	1.50	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	32.40	B		P
7440-41-7	Beryllium	0.19	U		P
7440-43-9	Cadmium	0.55	B		P
7440-70-2	Calcium	12000.00			P
7440-47-3	Chromium	0.77	U		P
7440-48-4	Cobalt	0.58	U		P
7440-50-8	Copper	4.00	B		P
7439-89-6	Iron	271.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1980.00			P
7439-96-5	Manganese	16.40			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.77	U		P
7440-09-7	Potassium	7770.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.39	U		P
7440-23-5	Sodium	39.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.39	U		P
7440-66-6	Zinc	28.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9213500.1670

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B0I7V7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012S2

Matrix (soil/water): SOIL Lab Sample ID: 12154-06S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	238.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	42.10			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.81	B		P
7440-70-2	Calcium	19300.00			P
7440-47-3	Chromium	0.82	U		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	2.80	B		P
7439-89-6	Iron	504.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2400.00			P
7439-96-5	Manganese	47.10			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U		P
7440-09-7	Potassium	6710.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	154.00	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.41	U		P
7440-66-6	Zinc	75.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

TMA/Skinner & Serman Labs SAMPLE LOG-IN

WORKORDER 9112154 CLIENT HANFORD-NOB No. SAMPLES: 20 solids

PROTCL CLP TURNARND 33 days (Soil) (Water) (Specify Other)

COOLER TEMP: ___ oC, or NA

CUSTODIAN A. Benner SDG/BATCH

CUSTODY SEAL: PRESENT/ABSENT/INTACT/NOT CLIENT CASE N1-12-068

SHIPER & # Fedex # 1414547654 PO/CONTRACT# ↓

TAGS: PRESENT/ABSENT/NA/SEE COC CONTACT Dolores Sanchez

CHAIN OF CUSTODY: PRESENT/ABSENT/NA, # N/A COMMENTS: None

SAMPLE CONTAINERS-INTACT/BROKEN COMMENTS

CLIENT COMMENT? YES/NO

SAMPLE LABELS AGREE WITH CHAIN OF CUSTODY INFO? YES/NO (COMMENT)

CLIENT PAPERWORK AGREES WITH SAMPLES & COC? YES /NO (COMMENT)

SHIPMENT DATES 12/16/91

LIST ANY DATE WITH PAPERWORK/SHIPMENT PROBLEMS & SPECIFY THE PROBLEM:

N/A

	CLIENT ID	MATRIX	RECEIVED	QC	TEST(S) (Job (IC20-5))	HOLD TIME UP
1	B017V5	SOLID	12/16/91	D	ICP Metals	
2	W9			S		
3	B1					
4	W1					
5	V9					
6	V7					
7	W5					
8	V1					
9	Q7					
10	B7					
11	V3					
12	B3					
13	T7					
14	B9					
15	B5					
16	B012N5					
17	S4					
18	S2					
19	T8					
20	T4					
21						
22						
23						
24						
25						
26						
27						

Complete 12/16/91

SUBCONTRACT: YES/NO, TO: DATE:

REVIEWED Rev. 1.4 PAGE

AB

Westinghouse Hanford Company 9615500.1672

CHAIN OF CUSTODY

1 of 7

Custody Form Initiator NA. CADORET

Company Contact C.A. BRANDT Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7 Collection Date 9/10/91

Ice Chest No. CAB-3 Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 2498721759 2 Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED, ~20 g samples for metals analysis.

Sample Identification

B017V5	B017V3
B017W9	B017R3
B017R1	B017T7
B017W1	B017R9
B017V9	B017R5
B017V7	B012N5
B017W5	B012S4
B017V1	B012S2
B017Q7	B012T8
B017R7	B012T4

Field Transfer of Custody	CHAIN OF POSSESSION	(Sign and Print Names)
linquished by: NA CADORET	Received by: Kermit Blum	Date/Time: 11-26-91 1130
linquished by: Kermit Blum 12-12-91	Received by:	Date/Time: 12/16/91 9:30
linquished by:	Received by:	Date/Time:
inquished by:	Received by:	Date/Time:

Final Sample Disposition

posal Method:	Disposed by:	Date/Time:

nments: tot. act. < 5.0E+1 PiCi/G

106

A-6000-407 (12/90)

9613500.1673

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

1206

PART I: FIELD SECTION

Collector N. CADORET Date Sampled 9-10/91 Time N/A hours

Company Contact C A BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B017V5	1-glass, 20 g samples	plant matter	ICP-metals
B017W9			
B017R1			
B017W1			
B017V9			
B017V7			
B017W5			
B017V1			
B017Q7			
B017R7			
B017V3			
B017R3			
B017T7			
B017R9			
B017R5			
B012N5			
B012S4			
B012S2			
B012T6			
B012T4			

Field Information** From 300 FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards none detected.

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 11-26-91

Analysis Required

107

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

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

A-6000-406 (05/90)

Westinghouse Hanford Company 9613500.1674

CHAIN OF CUSTODY S&S 1 of 7

Custody Form Initiator NA. CADORET

Company Contact C.A. BRANDT Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7 Collection Date 9/10/91

Ice Chest No. CAB-3 Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 2498217592 Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED, ~20 g samples for metals analysis

Sample Identification

B017V5	B017V3
B017W9	B017R3
B017R1	B017T7
B017W1	B017R9
B017V9	B017R5
B017J7	B012N5
B017W5	B012S4
B017V1	B012S2
B017G7	B012T8
B017R7	B012T4

Field Transfer of Custody	CHAIN OF POSSESSION	(Sign and Print Names)
Relinquished by: NA CADORET	Received by: Kermit Blum	Date/Time: 11-26-91 1130
Relinquished by: Kermit Blum 12-12-91	Received by: [signature]	Date/Time: 12/16/91 9:30
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: tot. act. <5.0 E+1 PiCi/G

108

A-6000-407 (12/90)

9113300.1675

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

1206

PART I: FIELD SECTION

Collector W. CADORET Date Sampled 9-10/91 Time N/A hours

Company Contact C A BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B017V5	1-glass, 10 g samples	plant matter	ICP-metals
B017W9			
B017R1			
B017W1			
B017V9			
B017V7			
B017W5			
B017V1			
B017Q7			
B017R7			
B017V3			
B017R3			
B017T7			
B017R9			
B017R5			
B012N5			
B012S4			
B012S2			
B012T6			
B012T4	✓	✓	✓

ield Information** From 300-FF-5 Task 7

pecial Handling and/or Storage N/A

ossible Sample Hazards none detected.

PART II: LABORATORY SECTION

eceived by Kermit Blum Title Sample Control Supervisor Date 11-26-91

nalysis Required

indicate whether sample is soil, sludge, water, etc.
Use back of page for additional information relative to sample location.

109

A-6000-406 (05/90)

9013500.1676

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

1676

PART I: FIELD SECTION

Collector N. CADORET Date Sampled 9-10/91 Time NA hours

Company Contact C A BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B017V5	1-glass, 20 g samples	plant matter	ICP-metals
B017W9			
B017R1			
B017W1			
B017V9			
B017V7			
B017W5			
B017V1			
B017Q7			
B017R7			
B017V3			
B017R3			
B017T7			
B017R9			
B017R5			
B012N5			
B012S4			
B012S2			
B012T6			
B012T4	✓	✓	✓

Field Information** From 300-FF-5 Task 7

Special Handling and/or Storage NA

Possible Sample Hazards none detected.

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 11-26-91

Analysis Required

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

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

A-6000-406 (05/90)

109

TMA
Thermo Analytical Inc.

Skinner & Sherman Laboratories Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521

(617) 890-7200

9613500.1677

12-068

Federal Express 4009270241
January 29, 1992

TMA/ARLI
160 Taylor Street
Monrovia, CA 91016
Attention: Dennis Wells

Quality Control Narrative

Scope
Twenty (20) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 16, 1991 from Westinghouse/Hanford Company. The samples were analyzed for the USEPA CLP ICP metals only. The analysis was performed under Skinner and Sherman work order 9112155.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work 7/88 (CLP SOW788).

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.

David N. Peterson
Assistant Laboratory Manager

4-26-96
MC

9613500.1678

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B012L6

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012L6

Matrix (soil/water): SOIL Lab Sample ID: 12155-01S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	51.10			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	17.40	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	7.00			P
7440-70-2	Calcium	8400.00			P
7440-47-3	Chromium	0.82	U		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	10.20			P
7439-89-6	Iron	228.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	3270.00			P
7439-96-5	Manganese	256.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U		P
7440-09-7	Potassium	6250.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	100.00	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.41	U		P
7440-66-6	Zinc	344.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

003

9613500.1679

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012L7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012L6

Matrix (soil/water): SOIL Lab Sample ID: 12155-196

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	47.20			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	11.70	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	4.80			P
7440-70-2	Calcium	6620.00			P
7440-47-3	Chromium	0.84	U		P
7440-48-4	Cobalt	0.63	U		P
7440-50-8	Copper	5.50			P
7439-89-6	Iron	217.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	3260.00			P
7439-96-5	Manganese	244.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.84	U		P
7440-09-7	Potassium	7700.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	85.70	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.42	U		P
7440-66-6	Zinc	280.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613900.1680

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B012N3

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012L6

Matrix (soil/water): SOIL Lab Sample ID: 12155-10S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	81.50			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	62.90			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	26900.00			P
7440-47-3	Chromium	0.79	U		P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	4.10	B		P
7439-89-6	Iron	212.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2590.00			P
7439-96-5	Manganese	16.80			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.79	U		P
7440-09-7	Potassium	12700.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.39	U		P
7440-23-5	Sodium	45.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.44	B		P
7440-66-6	Zinc	19.50			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

005

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9613500.1681

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012R8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012L6

Matrix (soil/water): SOIL Lab Sample ID: 12155-18S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	159.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	80.70			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	35600.00			P
7440-47-3	Chromium	0.82	U		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	4.40	B		P
7439-89-6	Iron	349.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2960.00			P
7439-96-5	Manganese	28.50			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U		P
7440-09-7	Potassium	10100.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	96.00	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	1.00	B		P
7440-66-6	Zinc	16.50			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

006

9613500.1682

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B012V0

Lab Name: SKINNER & SHERMAN LABS Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012L6

Matrix (soil/water): SOIL Lab Sample ID: 12155-03S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	55.30			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	19.90	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	3890.00			P
7440-47-3	Chromium	0.83	U		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	7.10			P
7439-89-6	Iron	135.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2060.00			P
7439-96-5	Manganese	19.50			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.83	U		P
7440-09-7	Potassium	11800.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	37.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.45	B		P
7440-66-6	Zinc	124.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

007

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9613500.1683

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017M2

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012L6

Matrix (soil/water): SOIL Lab Sample ID: 12155-09S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 96.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	119.00			P
7440-36-0	Antimony	1.60	B		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	21.90	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	4370.00			P
7440-47-3	Chromium	0.78	U		P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	3.80	B		P
7439-89-6	Iron	279.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1950.00			P
7439-96-5	Manganese	48.40			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.78	U		P
7440-09-7	Potassium	12400.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.39	U		P
7440-23-5	Sodium	59.70	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.86	B		P
7440-66-6	Zinc	61.30			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

003

9613500.1684

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017M4

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-0685AS No.: SDG No.: B012L6

Matrix (soil/water): SOIL Lab Sample ID: 12155-14S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 96.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	321.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	17.90	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.30	B		P
7440-70-2	Calcium	3670.00			P
7440-47-3	Chromium	0.79	U		P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	4.80	B		P
7439-89-6	Iron	638.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1840.00			P
7439-96-5	Manganese	79.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.79	U		P
7440-09-7	Potassium	12800.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.39	U		P
7440-23-5	Sodium	63.60	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.77	B		P
7440-66-6	Zinc	77.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

003

9615530.1685

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B017M0

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012L6

Matrix (soil/water): SOIL Lab Sample ID: 12155-13S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 97.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	87.50			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	17.40	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	5070.00			P
7440-47-3	Chromium	0.79	U		P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	4.00	B		P
7439-89-6	Iron	207.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2060.00			P
7439-96-5	Manganese	21.20			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.79	U		P
7440-09-7	Potassium	11700.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	39.60	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.72	B		P
7440-66-6	Zinc	41.30			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500.1686

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B017P3

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012L6

Matrix (soil/water): SOIL Lab Sample ID: 12155-16S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 96.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	603.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	33.10	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.32	B		P
7440-70-2	Calcium	5430.00			P
7440-47-3	Chromium	1.20	B		P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	7.30			P
7439-89-6	Iron	1050.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2770.00			P
7439-96-5	Manganese	84.60			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.91	B		P
7440-09-7	Potassium	13400.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.39	U		P
7440-23-5	Sodium	97.30	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	1.80	B		P
7440-66-6	Zinc	141.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

011

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9613500.1687

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B017Q1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012L6

Matrix (soil/water): SOIL Lab Sample ID: 12155-15S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 95.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	103.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	26.10	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.28	B		P
7440-70-2	Calcium	5070.00			P
7440-47-3	Chromium	0.82	U		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	4.20	B		P
7439-89-6	Iron	233.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1950.00			P
7439-96-5	Manganese	39.40			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U		P
7440-09-7	Potassium	10100.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	54.40	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.46	B		P
7440-66-6	Zinc	82.60			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500.1688

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B017Q3

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012L6

Matrix (soil/water): SOIL Lab Sample ID: 12155-20S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	86.90			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	31.10	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	5940.00			P
7440-47-3	Chromium	0.82	U		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	3.00	B		P
7439-89-6	Iron	190.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	3370.00			P
7439-96-5	Manganese	37.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U		P
7440-09-7	Potassium	9260.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	49.20	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.60	B		P
7440-66-6	Zinc	59.70			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

013

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WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B01709

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINEP Case No.: N1-12-068SAS No.: SDG No.: B012L6

Matrix (soil/water): SOIL Lab Sample ID: 12155-17S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	144.00			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	29.20	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	6680.00			P
7440-47-3	Chromium	0.83	U		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	3.80	B		P
7439-89-6	Iron	315.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	3180.00			P
7439-96-5	Manganese	20.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.83	U		P
7440-09-7	Potassium	14800.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	60.00	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.76	B		P
7440-66-6	Zinc	96.90			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9615500.1690

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012S0

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012L6

Matrix (soil/water): SOIL Lab Sample ID: 12155-02S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	162.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	80.00			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	31500.00			P
7440-47-3	Chromium	0.79	U		P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	7.30			P
7439-89-6	Iron	339.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2450.00			P
7439-96-5	Manganese	38.20			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.79	U		P
7440-09-7	Potassium	14900.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	65.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.87	B		P
7440-66-6	Zinc	20.50			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500.1691

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012S8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012L6

Matrix (soil/water): SOIL Lab Sample ID: 12155-12S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	208.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	47.40			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	25800.00			P
7440-47-3	Chromium	0.82	U		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	4.40	B		P
7439-89-6	Iron	442.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2770.00			P
7439-96-5	Manganese	46.80			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U		P
7440-09-7	Potassium	15300.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	94.60	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	1.10	B		P
7440-66-6	Zinc	25.40			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500.1692

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B012T2

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012L6

Matrix (soil/water): SOIL Lab Sample ID: 12155-04S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	144.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	79.00			P
7440-41-7	Beryllium	0.19	U		P
7440-43-9	Cadmium	0.24	B		P
7440-70-2	Calcium	26800.00			P
7440-47-3	Chromium	0.78	U		P
7440-48-4	Cobalt	0.58	U		P
7440-50-8	Copper	5.70			P
7439-89-6	Iron	362.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2480.00			P
7439-96-5	Manganese	36.60			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.78	U		P
7440-09-7	Potassium	12700.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.39	U		P
7440-23-5	Sodium	58.90	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	1.00	B		P
7440-66-6	Zinc	30.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

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WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B012T6

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012L6

Matrix (soil/water): SOIL Lab Sample ID: 12155-115

Level (low/med): LOW Date Received: 12/16/91

% Solids: 95.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	64.30			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	26.40	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	5060.00			P
7440-47-3	Chromium	0.79	U		P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	4.60	B		P
7439-89-6	Iron	151.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2400.00			P
7439-96-5	Manganese	30.20			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.79	U		P
7440-09-7	Potassium	15600.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	33.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.40	U		P
7440-66-6	Zinc	123.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613580.1694

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017S7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012L6

Matrix (soil/water): SOIL Lab Sample ID: 12155-06S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 95.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	180.00			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	20.50	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	B		P
7440-70-2	Calcium	5370.00			P
7440-47-3	Chromium	0.97	B		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	9.10			P
7439-89-6	Iron	420.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2290.00			P
7439-96-5	Manganese	76.60			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.80	B		P
7440-09-7	Potassium	16800.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	173.00	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.94	B		P
7440-66-6	Zinc	181.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

019

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WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B017T3

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012L6

Matrix (soil/water): SOIL Lab Sample ID: 12155-07S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 95.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	195.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	26.00	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	6870.00			P
7440-47-3	Chromium	0.81	U		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	5.00	B		P
7439-89-6	Iron	383.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2700.00			P
7439-96-5	Manganese	18.20			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.81	U		P
7440-09-7	Potassium	11500.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	67.70	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.90	B		P
7440-66-6	Zinc	89.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

020

9615500.1696

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B017T5

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012L6

Matrix (soil/water): SOIL Lab Sample ID: 12155-08S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 95.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	243.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	16.80	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	4320.00			P
7440-47-3	Chromium	0.79	U		P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	3.70	B		P
7439-89-6	Iron	439.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1730.00			P
7439-96-5	Manganese	31.60			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.79	U		P
7440-09-7	Potassium	7550.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	47.60	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	1.00	B		P
7440-66-6	Zinc	68.40			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

021

FORM I - IN Rev.6/89

9215500.1697

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B017W7

Lab Name: SKINNER & SHEPMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-068SAS No.: SDG No.: B012L6

Matrix (soil/water): SOIL Lab Sample ID: 12155-05S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 95.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	145.00			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	31.50	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.84	B		P
7440-70-2	Calcium	12600.00			P
7440-47-3	Chromium	0.83	U		P
7440-48-4	Cobalt	0.66	B		P
7440-50-8	Copper	3.10	B		P
7439-89-6	Iron	288.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2450.00			P
7439-96-5	Manganese	18.80			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.83	U		P
7440-09-7	Potassium	7930.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	39.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.47	B		P
7440-66-6	Zinc	36.50			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

022

9815000.1698

TMA/Skinner & Serman Labs SAMPLE LOG-IN

WORKORDER 912155 CLIENT HANFORD-NOR No. SAMPLES:

PROTCL CLP TURNARND 33 days _____ _____ 20 solids

COOLER TEMP: 4 oC, or NA (Soil) (Water) (Specify Other)

CUSTODIAN A. Benney SDG/BATCH N/A

CUSTODY SEAL: PRESENT/ABSENT/INTACT/NOT CLIENT CASE N1-12-068

SHIPER & # Fedex #1414547654 PO/CONTRACT# ↓

TAGS: PRESENT/ABSENT/NA/SEE COC CONTACT Dolores Sanchez

CHAIN OF CUSTODY: PRESENT/ABSENT/NA,# _____ COMMENTS: _____

SAMPLE CONTAINERS-INTACT/BROKEN COMMENTS _____

CLIENT COMMENT? YES/NO _____

SAMPLE LABELS AGREE WITH CHAIN OF CUSTODY INFO? YES/NO (COMMENT)

CLIENT PAPERWORK AGREES WITH SAMPLES & COC? YES /NO (COMMENT)

SHIPMENT DATES 12/16/91

LIST ANY DATE WITH PAPERWORK/SHIPMENT PROBLEMS & SPECIFY THE PROBLEM:

N/A

	CLIENT ID	MATRIX	RECEIVED	QC	TEST(S)(IC20-S) poly	HOLD TIME UP
1	B01266	SOLID	12/16/91	D	ICP metals	
2	SO			S		
3	VO					
4	T2					
5	B017W7					
6	S7					
7	T3					
8	T5					
9	M2					
10	B012N3					
11	T6					
12	S8					
13	B017M0					
14	M4					
15	Q1					
16	P3					
17	Q9					
18	B012R8					
19	L7					
20	B017Q3					
21						
22						
23						
24						
25						
26						
27						

Complete 12/16/91

SUBCONTRACT: YES/NO, TO: _____ DATE: AB

REVIEWED _____ Rev. 1.4 PAGE _____

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE

AIRBILL
PACKAGE TRACKING NUMBER 1414547654

1275M 1414547654

Date 12-13-91

RECIPIENT'S COPY

1 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: SAMPLE CONTROL
Recipient's Phone Number (Very Important): ( )
Company: T M A / SKINNER & SHERMAN
Department/Floor No.
Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 300 SECOND AVE
City: WALTHAM State: MA ZIP Required: 02254

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.): 2370-6406

H IF HOLD FOR PICK-UP, Print FEDEX Address Here
Street Address
City State ZIP Required

3 PAYMENT 1 ☐ Bill Sender 2 ☐ Bill Recipient's FedEx Acct. No. 3 ☐ Bill 3rd Party FedEx Acct. No. 4 ☐ Bill Credit Card 5 ☐ Cash/Check

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning†)
- 11 ☒ YOUR PACKAGING
- 16 ☐ FEDEX LETTER *
- 12 ☐ FEDEX PAK *
- 13 ☐ FEDEX BOX
- 14 ☐ FEDEX TUBE

Standard Overnight (Delivery by next business afternoon†)
- 51 ☐ YOUR PACKAGING
- 56 ☐ FEDEX LETTER *
- 52 ☐ FEDEX PAK *
- 53 ☐ FEDEX BOX
- 54 ☐ FEDEX TUBE

Economy Two-Day (Delivery by second business day†)
- 30 ☐ ECONOMY

Government Overnight (Restricted to authorized users only)
- 46 ☐ GOVT LETTER
- 41 ☐ GOVT PACKAGE

Freight Service (for Extra Large or any package over 150 lbs.)
- 70 ☐ OVERNIGHT FREIGHT ** (Confirmed reservation required)
- 80 ☐ TWO-DAY FREIGHT **

† Delivery commitment may be later in some areas.
* Declared Value Limit $100
** Call for pricing schedule.

5 DELIVERY AND SPECIAL HANDLING (Check services required)
- 1 ☐ HOLD FOR PICK-UP (Fill in Box H).
- 2 ☒ DELIVER WEEKDAY
- 3 DELIVER SATURDAY (Extra charge) (Not available to all locations) ☐
- 4 ☐ DANGEROUS GOODS (Extra charge)
- 5 ☐
- 6 ☐ DRY ICE Lbs.
- 7 ☐ OTHER SPECIAL SERVICE
- 8 ☐
- 9 ☐ SATURDAY PICK-UP
- 10 ☐
- 11 ☐
- 12 ☐ HOLIDAY DELIVERY (If offered) (Extra charge)

6 PACKAGES 1 | WEIGHT In Pounds Only | YOUR DECLARED VALUE
Total | Total | Total

DIM SHIPMENT (Chargeable Weight) ☐ lbs.
x =
Received At
1 ☐ Regular Stop 3 ☐ Drop Box
2 ☐ On-Call Stop 4 ☐ BSC 5 ☐ Station

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 12/16/91 FedEx Employee Number 9:30

7 Release Signature:
FedEx Emp. No. Date/Time

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

REVISION DATE 6/91
PART #137204 FXEN 3/91
FORMAT #099
099
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Westinghouse Hanford Company 9615991.1700

CHAIN OF CUSTODY

207

Custody Form Initiator NA. CADORET

Company Contact C.A. BRANDT Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7 Collection Date 9/10/91

Ice Chest No. CAB-3 Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 24 4521 7592 Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED, ~20 g samples for metals analysis

Sample Identification

B012L6	B012T6
B012S0	B012S8
B012V0	B017M0
B012T2	B017M4
B017W7	B017Q1
B017S7	B017P3
B017T3	B017G9
B017T5	B012R8
B017M2	B012L7
B012N3	B017Q3

Field Transfer of Custody	CHAIN OF POSSESSION	(Sign and Print Names)
linquished by: NA CADORET	Received by: Kermit Blum	Date/Time: 11-26-91 1130
linquished by: Kermit Blum 12-12-91	Received by:	Date/Time: 12/16/91 9:30
inquished by:	Received by:	Date/Time:
inquished by:	Received by:	Date/Time:

Final Sample Disposition

posal Method:	Disposed by:	Date/Time:

nments:

207 tot. sct. 2 5.0 5+1 P:C:1/2

A-6000-407 (12/90)

9613500.1701

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

296

PART I: FIELD SECTION

Collector W. CADORET Date Sampled 9-10/91 Time NA hours

Company Contact CA BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B012L6	1-glass, 200g samples	plant matter	ICP metals
B012S0			
B012V0			
B012T2			
B017W7			
B017S7			
B017T3			
B017T5			
B017M2			
B012N3			
B012T6			
B012S8			
B017M0			
B017M4			
B017Q1			
B017P3			
B017Q9			
B012R7			
B012L7			
B017Q3			

eld Information** _____

ecial Handling and/or Storage _____

ssible Sample Hazards _____

PART II: LABORATORY SECTION

ceived by Kermit Blum Title Sample Control Supervisor Date 11-26-91

alysis Required _____

ndicate whether sample is soil, sludge, water, etc.

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

A-6000-406 (05/90)

Westinghouse Hanford Company 9613500.1702

CHAIN OF CUSTODY

207

Custody Form Initiator NA. CADORET

Company Contact C.A. BRANDT

Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7

Collection Date 9/10/91

ce Chest No. CAB-3

Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 24 4521 759 2

Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED, ~20 g samples for metals analysis

Sample Identification

B012L6	B012T6
B012S0	B012S8
B012V0	B017M0
B012T2	B017M4
B017W7	B017Q1
B017S7	B017P3
B017T3	B017Q9
B017T5	B012R8
B017M2	B012L7
B012N3	B017Q3

Field Transfer of Custody	CHAIN OF POSSESSION	(Sign and Print Names)
linquished by: NA C ADORET	Received by: Kermit Blum	Date/Time: 11-26-91 1130
inquished by: Kermit Blum 12-12-91	Received by:	Date/Time: 12/16/91 9:30
inquished by:	Received by:	Date/Time:
inquished by:	Received by:	Date/Time:

Final Sample Disposition

posal Method:	Disposed by:	Date/Time:

nments: tot. Act. <5.0 E+1 PiCi/G

A-6000-407 (12/90)

9615660.1705

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

296

PART I: FIELD SECTION

Collector W. CADORET Date Sampled 9-10/91 Time NA hours

Company Contact CA BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B012L6	1-glass, 200g samples	plant matter	ICP metals
B012S0			
B012V0			
B012T2			
B017W7			
B017S7			
B017T3			
B017T5			
B017M2			
B012N3			
B012T6			
B012S8			
B017M0			
B017M4			
B017Q1			
B017P3			
B017Q9			
B012R7			
B012L7			
B017Q3			

eld Information** _____

ecial Handling and/or Storage _____

ssible Sample Hazards _____

PART II: LABORATORY SECTION

ceived by Kermit Blum Title Sample Control Supervisor Date 11-26-91

alysis Required _____

ndicate whether sample is soil, sludge, water, etc.

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

A-6000-406 (05/90)

TMA
Thermo Analytical Inc.

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

9613500.1704

March 26, 1992

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

Quality Control Narrative

Scope
Seven (7) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on February 25, 1992 from Westinghouse/Hanford Company. The samples were analyzed for the USEPA CLP ICP metals only. The analysis was performed under Skinner and Sherman work order 9202148.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work 7/88 (CLP SOW788).

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

The barium ICP serial dilution exceeded the control limit requirements.

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

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

David N. Peterson
Assistant Laboratory Manager

ia 4-26-96
MC

9614500.1705

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017X7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-02-086SAS No.: SDG No.: B017X7

Matrix (soil/water): SOIL Lab Sample ID: 02148-01S

Level (low/med): LOW Date Received: 02/25/92

% Solids: 91.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	162.00			P
7440-36-0	Antimony	1.30	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	60.00		E	P
7440-41-7	Beryllium	0.16	U		P
7440-43-9	Cadmium	0.16	U		P
7440-70-2	Calcium	31100.00			P
7440-47-3	Chromium	0.94	B		P
7440-48-4	Cobalt	0.49	U		P
7440-50-8	Copper	3.90	B		P
7439-89-6	Iron	345.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2030.00			P
7439-96-5	Manganese	20.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.20	B		P
7440-09-7	Potassium	11300.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.33	U		P
7440-23-5	Sodium	91.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.55	B		P
7440-66-6	Zinc	12.80			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

002

9613500.1706

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017X8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-02-086SAS No.: SDG No.: B017X7

Matrix (soil/water): SOIL Lab Sample ID: 02148-02S

Level (low/med): LOW Date Received: 02/25/92

% Solids: 92.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	46.70			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	35.00	B	E	P
7440-41-7	Beryllium	0.22	B		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	6350.00			P
7440-47-3	Chromium	0.85	U		P
7440-48-4	Cobalt	0.64	U		P
7440-50-8	Copper	1.50	B		P
7439-89-6	Iron	102.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2760.00			P
7439-96-5	Manganese	33.20			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.20	B		P
7440-09-7	Potassium	7820.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	46.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.42	U		P
7440-66-6	Zinc	90.40			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

003

9615509.1707

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017X9

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-02-086SAS No.: SDG No.: B017X7

Matrix (soil/water): SOIL Lab Sample ID: 02148-03S

Level (low/med): LOW Date Received: 02/25/92

% Solids: 92.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	36.80	B		P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	24.10	B	E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	7.40			P
7440-70-2	Calcium	10600.00			P
7440-47-3	Chromium	0.85	U		P
7440-48-4	Cobalt	0.93	B		P
7440-50-8	Copper	7.20			P
7439-89-6	Iron	81.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	3380.00			P
7439-96-5	Manganese	310.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.10	B		P
7440-09-7	Potassium	7300.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	70.90	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.42	U		P
7440-66-6	Zinc	390.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

004

9613500.170B

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017Y0

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-02-086SAS No.: SDG No.: B017X7

Matrix (soil/water): SOIL Lab Sample ID: 02148-04S

Level (low/med): LOW Date Received: 02/25/92

% Solids: 93.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	135.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	123.00		E	P
7440-41-7	Beryllium	0.30	B		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	15300.00			P
7440-47-3	Chromium	1.00	B		P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	3.10	B		P
7439-89-6	Iron	186.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	4160.00			P
7439-96-5	Manganese	91.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.30	B		P
7440-09-7	Potassium	24700.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.39	U		P
7440-23-5	Sodium	44.70	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.39	U		P
7440-66-6	Zinc	19.50			P
	Cyanide				NR

Color Before: GREEN Clarity Before: Texture: FINE

Color After: GREEN Clarity After: Artifacts:

Comments:

9613500.1709

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017Y1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-02-086SAS No.: SDG No.: B017X7

Matrix (soil/water): SOIL Lab Sample ID: 02148-05S

Level (low/med): LOW Date Received: 02/25/92

% Solids: 92.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	428.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	6.60	B	E	P
7440-41-7	Beryllium	0.21	B		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	4070.00			P
7440-47-3	Chromium	2.50			P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	2.50	B		P
7439-89-6	Iron	130.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1100.00			P
7439-96-5	Manganese	648.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	3.10	B		P
7440-09-7	Potassium	3650.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	39.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.41	U		P
7440-66-6	Zinc	78.30			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

006

9213500.1710

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017Y2

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-02-086SAS No.: SDG No.: B017X7

Matrix (soil/water): SOIL Lab Sample ID: 02148-06S

Level (low/med): LOW Date Received: 02/25/92

% Solids: 92.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	113.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	123.00		E	P
7440-41-7	Beryllium	0.31	B		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	15500.00			P
7440-47-3	Chromium	1.20	B		P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	3.20	B		P
7439-89-6	Iron	180.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	4170.00			P
7439-96-5	Manganese	92.80			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.00	B		P
7440-09-7	Potassium	24700.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	39.40	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.40	U		P
7440-66-6	Zinc	19.80			P
	Cyanide				NR

Color Before: GREEN Clarity Before: Texture: FINE

Color After: GREEN Clarity After: Artifacts:

Comments:

007

9613500.1711

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017Y3

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-02-086SAS No.: SDG No.: B017X7

Matrix (soil/water): SOIL Lab Sample ID: 02148-07S

Level (low/med): LOW Date Received: 02/25/92

% Solids: 92.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	425.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	6.20	B	E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.34	B		P
7440-70-2	Calcium	4210.00			P
7440-47-3	Chromium	2.60			P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	2.40	B		P
7439-89-6	Iron	129.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1120.00			P
7439-96-5	Manganese	664.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	2.80	B		P
7440-09-7	Potassium	3760.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	35.70	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.40	U		P
7440-66-6	Zinc	106.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

TMA/Skinner & Serman Labs - SAMPLE LOG-IN
WORKORDER 52-02-148 CLIENT HANFORD-NOR No. SAMPLES:
PROTCL CLP TURNARND 33 days 7 (Soil) (Water) (Specify Other)
COOLER TEMP: 4 oC, or NA
CUSTODIAN Antonia Berney SDG/BATCH N/A
CUSTODY SEAL: PRESENT/ABSENT/INTACT/NOT CLIENT CASE N1-12-086
SHIPER & # Fedex #1414452270 PO/CONTRACT# ↓
TAGS: PRESENT/ABSENT/NA/SEE COC CONTACT Dolores Sanchez
CHAIN OF CUSTODY: PRESENT/ABSENT/NA, # N/A COMMENTS: NONE

SAMPLE CONTAINERS-INTACT/BROKEN COMMENTS

CLIENT COMMENT? YES/NO Samples contain radioactive material
SAMPLE LABELS AGREE WITH CHAIN OF CUSTODY INFO? YES/NO (COMMENT)
CLIENT PAPERWORK AGREES WITH SAMPLES & COC? YES /NO (COMMENT)

SHIPMENT DATES 02/25/92
LIST ANY DATE WITH PAPERWORK/SHIPMENT PROBLEMS & SPECIFY THE PROBLEM:

02/25/92

	CLIENT ID	MATRIX	RECEIVED	QC	TEST(S)	HOLD TIME UP
1	B017X7	SOIL	02/25/92	D	ICP metals	9/10/91 →
2	X8	↓	↓	S	↓	
3	X9	↓	↓	↓	↓	
4	Y0	↓	↓	↓	↓	RUN BY
5	Y1	↓	↓	↓	↓	MARCH 10
6	Y2	↓	↓	↓	↓	
7	Y3	↓	↓	↓	↓	
8						
9						
10						
11						
12						
13						
14						
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16						
17						
18						
19						
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21						
22						
23						
24						
25						
26						
27						

COMPLETE 02/25/92 AB

SUBCONTRACT: YES/NO, TO: DATE:
REVIEWED Rev. 1.4 PAGE

071

9613900_1715

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 1414452270

1275M 1414452270

RECIPIENT'S COPY

1 Date 2-24-92

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: Sample Control
Recipient's Phone Number (Very Important): (617) 890-7200
Company: Skinner & Sherman
Department/Floor No.
Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 300 Second Ave
City: Waltham State: MA ZIP Required: 02254

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.): 2305-6406

H IF HOLD FOR PICK-UP, Print FEDEX Address Here
Street Address
City State ZIP Required

3 PAYMENT 1 [X] Bill Sender 2 [ ] Bill Recipient's FedEx Acct. No. 3 [ ] Bill 3rd Party FedEx Acct. No 4 [ ] Bill Credit Card 5 [ ] Cash/Check

4 SERVICES (Check only one box)

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

Standard Overnight (Delivery by next business afternoon†)
51 [ ] YOUR PACKAGING
56 [ ] FEDEX LETTER *
52 [ ] FEDEX PAK *
53 [ ] FEDEX BOX
54 [ ] FEDEX TUBE

Economy Two-Day (Delivery by second business day†)
30 [ ] ECONOMY

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

Freight Service (for Extra Large or any package over 150 lbs.)
70 [ ] OVERNIGHT FREIGHT ** (Centennial reservation required)
80 [ ] TWO-DAY FREIGHT **
† Delivery commitment may be later in some areas.
*Declared Value Limit $100.
**Call for delivery schedule.

5 DELIVERY AND SPECIAL HANDLING (Check services required)
1 [ ] HOLD FOR PICK-UP (Fill in Box H)
2 [X] DELIVER WEEKDAY
3 DELIVER SATURDAY (Extra charge) (Not available to all locations) [ ]
4 [ ] DANGEROUS GOODS (Extra charge)
5 [ ]
6 [ ] DRY ICE _____ Lbs.
7 [ ] OTHER SPECIAL SERVICE _____
8 [ ]
9 [ ] SATURDAY PICK-UP (Extra charge)
10 [ ]
11 [ ] DESCRIPT
12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

6

PACKAGES	WEIGHT In Pounds Only	YOUR DECLARED VALUE
Total 1	Total 7	Total

DIM SHIPMENT (Chargeable Weight) [ ] _____ lbs.
L x W x H =

Received At
1 [X] Regular Stop 3 [ ] Drop Box
2 [ ] On-Call Stop 4 [ ] BSC 5 [ ] Station

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 2/25/92 FedEx Employee Number 9:30

7 Release Signature:
FedEx Emp. No Date/Time

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

REVISION DATE 6/91
PART #137204 FXEM 9/91
FORMAT #099
099
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PRINTED IN U.S.A.

072

9613500.1214 — 5515 — Container copy

Westinghouse Hanford Company | S & S | CHAIN OF CUSTODY ~~2 of 2~~

Custody Form Initiator: CA Brandt

Company Contact: CA Brandt — Telephone: 376-5345

Project Designation/Sampling Locations: 300-FF-5 Task 7 — Collection Date: 9-10/91

Ice Chest No.: CAB-5 — Field Logbook No.: BNW 58573

Bill of Lading/Airbill No.: 2485217625 — Offsite Property No.: PNL-92-277

Method of Shipment: Air

Shipped to: TMA/NORCAL

Possible Sample Hazards/Remarks: onsite samples < 50 pCi/g; offsite samples no hazard.

U/gamma splits		Sample Identification		ICP splits
~~B01X4~~	~~B01226~~	~~B01345~~	~~B017X3~~	B01741
~~B01215~~	~~B01228~~	~~B01308~~	~~B01741~~	B01740
~~B01227~~	~~B01221~~	~~B01302~~	~~B01740~~	B01742
~~B01224~~	~~B01223~~	~~B01307~~	~~B017X5~~	B01743
~~B01201~~	~~B01225~~	~~B01333~~	~~B01775~~	
~~B01228~~	~~B01203~~	~~B01300~~		
~~B01215~~	~~B01202~~	~~B01355~~		
~~B01204~~	~~B01339~~	~~B01303~~		
~~B01208~~	~~B01358~~	~~B01347~~		
~~B01291~~	~~B01344~~	~~B01787~~		
~~B01201~~	~~B01354~~	~~B017X4~~		

☐ Field Transfer of Custody — CHAIN OF POSSESSION — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
R J Fellows		12/2/91 RJF 10:10 AM
Relinquished by:	Received by: Kermit Blum	Date/Time: 12-4-91 1100
Relinquished by: 2-24-92 Kermit Blum	Received by: [signature]	Date/Time: 02/25/92 9:30
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: 073

A-6000-407 (12/90)

9613500.1715

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector CA Brandt Date Sampled 9-10/91 Time N/A hours

Company Contact CA Brandt Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B017Y1	1 ~20g glass	Plant matter	ICP metals
B017Y0	"	"	"
B017Y2	"	"	"
B017Y3	"	"	"

Field Information** From 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards none detected

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-4-91

Analysis Required

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

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

074

A-6000-406 (05/90)

9213500.1716 10/0 Consumer Cont

Westinghouse Hanford Company | S&S | **CHAIN OF CUSTODY** ~~1 of 2~~

Custody Form Initiator: C4 Brandt

Company Contact: CA Brandt Telephone: 376-5345

Project Designation/Sampling Locations: 300-FF-5 TASK 7 Collection Date: 9-10/91

Ice Chest No.: CAB-4 Field Logbook No.: BNW 53573

Bill of Lading/Airbill No.: 2485217625 Offsite Property No.: PNL-92-277

Method of Shipment: Air

Shipped to: TMA / NORCAL

Possible Sample Hazards/Remarks: Onsite samples <50 pCi/g; offsite samples no hazard.

U/gamma splits	Sample Identification	ICP splits
~~B012X6~~ ~~B012X6~~ ~~B01356~~		B017X9
~~B012Z0~~ ~~B012Z6~~ ~~B01341~~		B017X8
~~B012Z2~~ ~~B012W5~~ ~~B01310~~		B017X7
~~B012Y8~~ ~~B01229~~ ~~B01347~~		
~~B012Y1~~ ~~B012W0~~ ~~B01328~~		
~~B012Y3~~ ~~B01346~~ ~~B01331~~		
~~B012Y0~~ ~~B01357~~ ~~B01306~~		
~~B012N8~~ ~~B01329~~ ~~B01304~~		
~~B012X9~~ ~~B01351~~ ~~B017X9~~		
~~B012Y6~~ ~~B01353~~ ~~B017X7~~		
~~B012Y2~~ ~~B01334~~ ~~B017X8~~		

☐ Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
R A Fellows		12/2/91 10:00 am
Relinquished by:	Received by: Kermit Blum	Date/Time: 12-4-91 1100
Relinquished by: 2-24-92 Kermit Blum	Received by: [signature]	Date/Time: 2/25/92 9:30
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: 075

A-6000-407 (12/90)

9613500.1717

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector CA Brandt Date Sampled 9-10/91 Time NA hours

Company Contact CA Brandt Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B017X7	1, ~20g in glass	plant matter	ICP metals
B017X8	"	"	"
B017X9	"	"	"

Field Information** from 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards none detected

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-4-91

Analysis Required

076

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

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

A-6000-406 (05/90)

B012P5-TMA-114

9613590.1718

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

JUN 1992
RECEIVED
OSM DMO

June 19, 1992

SENT BY FEDERAL EXPRESS

Ref. TMA/Norcal N1-12-057-9575

Mr. John Bourgeault
Westinghouse Hanford Company
2355 Stevens Drive
Richland, WA 99352

Dear Mr. Bourgeault:

Enclosed on Attachment 1, are the ^{90}Sr, total uranium, and gamma scan results for the plant samples from 300-FF-5 Area, we received 26 November 1991. The QA/QC results are shown on Attachments 2, 3, and 4.

Please call if you have any questions concerning this data.

Sincerely,

D. P. Kharkar

Dinkar P. Kharkar, Ph.D.
Manager, Nuclear Programs

Envlosures: Section 1 through 9
Appendices

4-26-96
MC

ATTACHMENT 1 DATA TABLE

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B017P3 (Plant Matter)	1	^{90}Sr	(1.5 ± 3.2)	E-01
		Total Uranium	(8.1 ± 1.3) (1)	E-02
		Gamma Scan:		
		^{40}K	(9.325 ± 3.758)	E+00
		^{51}Cr	<9.231	E+02
		^{60}Co	<3.110	E-01
		^{65}Zn	<1.426	E+00
		^{134}Cs	<3.998	E-01
		^{137}Cs	<3.113	E-01
		^{226}Ra	<5.901	E-01
		^{228}Th	<4.814	E-01
		^{232}Th	<1.181	E+00
B01362 (Plant Matter)	2	^{90}Sr	(1.6 ± 3.3)	E-01
		Total Uranium	(2.2 ± 0.4) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.187 ± 0.290)	E+01
		^{51}Cr	<4.518	E+02
		^{60}Co	<3.469	E-01
		^{65}Zn	<7.718	E-01
		^{134}Cs	<2.212	E-01
		^{137}Cs	<1.920	E-01
		^{226}Ra	<3.489	E-01
		^{228}Th	<3.106	E-01
		^{232}Th	<7.943	E-01
B017X1 (Plant Matter)	3	^{90}Sr	(2.0 ± 1.8)	E-01
		Total Uranium	(3.7 ± 0.6) (1)	E-02
		Gamma Scan:		
		^{40}K	(5.878 ± 2.806)	E+00
		^{51}Cr	<5.190	E+02
		^{60}Co	<2.497	E-01
		^{65}Zn	<7.959	E-01
		^{134}Cs	<2.295	E-01
		^{137}Cs	<1.852	E-01
		^{226}Ra	<3.089	E-01
		^{228}Th	<3.331	E-01
		^{232}Th	<8.535	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B012V8 (Plant Matter)	4	^{90}Sr	(3.8 ± 2.7)	E-01
		Total Uranium	(3.8 ± 0.7) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.284 ± 0.319)	E+01
		^{51}Cr	<6.125	E+02
		^{60}Co	<2.227	E-01
		^{65}Zn	<7.788	E-01
		^{134}Cs	<2.180	E-01
		^{137}Cs	<1.918	E-01
		^{226}Ra	<4.682	E-01
		^{228}Th	<5.828	E-01
		^{232}Th	<9.293	E-01
B012M6 (Plant Matter)	5	^{90}Sr	(-0.1 ± 3.4)	E-01
		Total Uranium	(1.4 ± 0.3) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.085 ± 0.478)	E+01
		^{51}Cr	<9.977	E+02
		^{60}Co	<3.667	E-01
		^{65}Zn	<1.577	E+00
		^{134}Cs	<4.166	E-01
		^{137}Cs	<3.167	E-01
		^{226}Ra	<5.452	E-01
		^{228}Th	<4.805	E-01
		^{232}Th	<1.209	E+00
B012N9 (Plant Matter)	6	^{90}Sr	(-0.3 ± 4.4)	E-01
		Total Uranium	(2.6 ± 0.5) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.824 ± 0.413)	E+01
		^{51}Cr	<5.824	E+02
		^{60}Co	<4.442	E-01
		^{65}Zn	<1.021	E+00
		^{134}Cs	<3.774	E-01
		^{137}Cs	<1.949	E-01
		^{226}Ra	<4.260	E-01
		^{228}Th	<4.304	E-01
		^{232}Th	<1.096	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B01301	7	^{90}Sr	(0.6 ± 3.2)	E-01
(Plant Matter)		Total Uranium	(4.0 ± 0.8) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.364 ± 0.400)	E+01
		^{51}Cr	<5.912	E+02
		^{60}Co	<3.407	E-01
		^{65}Zn	<1.168	E+00
		^{134}Cs	<3.265	E-01
		^{137}Cs	<2.028	E-01
		^{226}Ra	<3.843	E-01
		^{228}Th	<3.989	E-01
		^{232}Th	<1.067	E+00
B017Q3	8	^{90}Sr	(-2.6 ± 3.1)	E-01
(Plant Matter)		Total Uranium	(1.5 ± 0.3) (1)	E-02
		Gamma Scan:		
		^{40}K	(5.021 ± 2.955)	E+00
		^{51}Cr	<9.127	E+02
		^{60}Co	<3.907	E-01
		^{65}Zn	<1.108	E+00
		^{134}Cs	<2.893	E-01
		^{137}Cs	<3.282	E-01
		^{226}Ra	<5.999	E-01
		^{228}Th	<5.124	E-01
		^{232}Th	<1.132	E+00
B017T7	9	^{90}Sr	(5.7 ± 2.6)	E-01
(Plant Matter)		Total Uranium	(8.7 ± 1.5) (1)	E-02
		Gamma Scan:		
		^{40}K	(5.923 ± 3.609)	E+00
		^{51}Cr	<1.056	E+03
		^{60}Co	<3.524	E-01
		^{65}Zn	<1.604	E+00
		^{134}Cs	<4.132	E-01
		^{137}Cs	<3.599	E-01
		^{226}Ra	<5.846	E-01
		^{228}Th	<5.609	E-01
		^{232}Th	<1.670	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page four)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B017R3 (Plant Matter)	10	^{90}Sr	(5.1 ± 2.6)	E-01
		Total Uranium	(3.0 ± 0.5) (1)	E-02
		Gamma Scan:		
		^{40}K	(9.732 ± 4.015)	E+00
		^{51}Cr	<7.495	E+02
		^{60}Co	<5.115	E-01
		^{65}Zn	<1.371	E+00
		^{134}Cs	<3.166	E-01
		^{137}Cs	<3.225	E-01
		^{226}Ra	<5.046	E-01
		^{228}Th	<4.194	E-01
		^{232}Th	<1.051	E+00
B017Q5 (Plant Matter)	11	^{90}Sr	(0.3 ± 4.0)	E-01
		Total Uranium	(1.4 ± 0.3) (1)	E-02
		Gamma Scan:		
		^{40}K	(9.843 ± 3.412)	E+00
		^{51}Cr	<7.326	E+02
		^{60}Co	<4.079	E-01
		^{65}Zn	<9.680	E-01
		^{134}Cs	<2.682	E-01
		^{137}Cs	<2.295	E-01
		^{226}Ra	<3.967	E-01
		^{228}Th	<3.308	E-01
		^{232}Th	<1.172	E+00
B012X7 (Plant Matter)	12	^{90}Sr	(-0.4 ± 4.1)	E-01
		Total Uranium	(1.6 ± 0.3) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.473 ± 0.356)	E+01
		^{51}Cr	<6.555	E+02
		^{60}Co	<2.743	E-01
		^{65}Zn	<7.787	E-01
		^{134}Cs	<2.542	E-01
		^{137}Cs	<2.092	E-01
		^{226}Ra	<3.929	E-01
		^{228}Th	<3.013	E-01
		^{232}Th	<8.979	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page five)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B017Q9 (Plant Matter)	13	^{90}Sr	(-1.6 ± 4.1)	E-01
		Total Uranium	(2.2 ± 0.4) (1)	E-02
		Gamma Scan:		
		^{40}K	(8.722 ± 1.589)	E+00
		^{51}Cr	<3.106	E+02
		^{60}Co	<1.219	E-01
		^{65}Zn	<4.589	E-01
		^{134}Cs	<1.319	E-01
		^{137}Cs	<1.010	E-01
		^{226}Ra	<1.845	E-01
		^{228}Th	<1.584	E-01
		^{232}Th	<4.277	E-01
B017P1 (Plant Matter)	14	^{90}Sr	(0.1 ± 1.7)	E-01
		Total Uranium	(0.6 ± 0.2) (1)	E-02
		Gamma Scan:		
		^{40}K	(8.595 ± 4.696)	E+00
		^{51}Cr	<1.157	E+03
		^{60}Co	<4.417	E-01
		^{65}Zn	<1.541	E+00
		^{134}Cs	<3.956	E-01
		^{137}Cs	<3.359	E-01
		^{226}Ra	<6.671	E-01
		^{228}Th	<5.850	E-01
		^{232}Th	<1.479	E+00
B017S7 (Plant Matter)	15	^{90}Sr	(0.8 ± 1.9)	E-01
		Total Uranium	(5.5 ± 1) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.119 ± 0.426)	E+01
		^{51}Cr	<9.233	E+02
		^{60}Co	<5.030	E-01
		^{65}Zn	<1.263	E+00
		^{134}Cs	<2.638	E-01
		^{137}Cs	<2.958	E-01
		^{226}Ra	<5.656	E-01
		^{228}Th	<4.940	E-01
		^{232}Th	<1.220	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page six)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B012V9 (Plant Matter)	16	^{90}Sr	(1.5 ± 1.9)	E-01
		Total Uranium	(5.0 ± 0.9) (1)	E-02
		Gamma Scan:		
		^{40}K	(9.989 ± 2.917)	E+00
		^{51}Cr	<5.603	E+02
		^{60}Co	<2.580	E-01
		^{65}Zn	<8.274	E-01
		^{134}Cs	<1.988	E-01
		^{137}Cs	<1.900	E-01
		^{226}Ra	<3.930	E-01
		^{228}Th	<3.230	E-01
		^{232}Th	<9.132	E-01
B017Q7 (Plant Matter)	17	^{90}Sr	(0.3 ± 4.3)	E-01
		Total Uranium	(3.2 ± 0.6) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.123 ± 0.389)	E+01
		^{51}Cr	<6.156	E+02
		^{60}Co	<2.476	E-01
		^{65}Zn	<1.227	E+00
		^{134}Cs	<2.560	E-01
		^{137}Cs	<3.019	E-01
		^{226}Ra	<4.848	E-01
		^{228}Th	<4.987	E-01
		^{232}Th	<1.162	E+00
B017P9 (Plant Matter)	18	^{90}Sr	(1.2 ± 4.2)	E-01
		Total Uranium	(1.5 ± 0.3) (1)	E-02
		Gamma Scan:		
		^{40}K	(6.183 ± 1.660)	E+00
		^{51}Cr	<3.729	E+02
		^{60}Co	<1.492	E-01
		^{65}Zn	<4.577	E-01
		^{134}Cs	<1.172	E-01
		^{137}Cs	<1.130	E-01
		^{226}Ra	<2.535	E-01
		^{228}Th	<2.388	E-01
		^{232}Th	<4.953	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page seven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B017R9 (Plant Matter)	19	^{90}Sr	(1.1 ± 2.2)	E-01
		Total Uranium	(4.8 ± 0.8) (1)	E-02
		Gamma Scan:		
		^{40}K	(6.421 ± 1.886)	E+00
		^{51}Cr	<4.004	E+02
		^{60}Co	<2.744	E-01
		^{65}Zn	<7.794	E-01
		^{134}Cs	<1.899	E-01
		^{137}Cs	<1.690	E-01
		^{226}Ra	<2.767	E-01
		^{228}Th	<2.510	E-01
		^{232}Th	<5.762	E-01
B01305 (Plant Matter)	20	^{90}Sr	(0.5 ± 1.7)	E-01
		Total Uranium	(1 ± 0.17) (1)	E-01
		Gamma Scan:		
		^{40}K	(1.413 ± 0.269)	E+01
		^{51}Cr	<5.042	E+02
		^{60}Co	<1.941	E-01
		^{65}Zn	<6.660	E-01
		^{134}Cs	<2.021	E-01
		^{137}Cs	<1.633	E-01
		^{226}Ra	<3.035	E-01
		^{228}Th	<2.882	E-01
		^{232}Th	<6.902	E-01
B017R1 (Plant Matter)	21	^{90}Sr	(0.2 ± 2.7)	E-01
		Total Uranium	(7.8 ± 1.3) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.170 ± 0.221)	E+01
		^{51}Cr	<4.910	E+02
		^{60}Co	<1.710	E-01
		^{65}Zn	<7.847	E-01
		^{134}Cs	<1.968	E-01
		^{137}Cs	<1.562	E-01
		^{226}Ra	<3.041	E-01
		^{228}Th	<2.469	E-01
		^{232}Th	<6.670	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page eight)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B017R5 (Plant Matter)	22	^{90}Sr	(-0.4 ± 6.3)	E-01
		Total Uranium	(1.0 ± 0.25) (1)	E-01
		Gamma Scan:		
		^{40}K	(9.759 ± 1.984)	E+00
		^{51}Cr	<4.092	E+02
		^{60}Co	<1.410	E-01
		^{65}Zn	<5.056	E-01
		^{134}Cs	<1.560	E-01
		^{137}Cs	<1.146	E-01
		^{226}Ra	<2.394	E-01
		^{228}Th	<3.517	E-01
		^{232}Th	<5.295	E-01
B017R7 (Plant Matter)	23	^{90}Sr	(-0.1 ± 5.2)	E-01
		Total Uranium	(1.02 ± 0.17) (1)	E-01
		Gamma Scan:		
		^{40}K	(3.565 ± 3.269)	E+00
		^{51}Cr	<1.321	E+03
		^{60}Co	<4.033	E-01
		^{65}Zn	<1.946	E+00
		^{134}Cs	<4.454	E-01
		^{137}Cs	<3.756	E-01
		^{226}Ra	<7.070	E-01
		^{228}Th	<5.592	E-01
		^{232}Th	<1.593	E+00
B017M2 (Plant Matter)	24	^{90}Sr	(-1.2 ± 4.1)	E-01
		Total Uranium	(1.39 ± 0.23) (1)	E-01
		Gamma Scan:		
		^{40}K	(8.184 ± 3.493)	E+00
		^{51}Cr	<7.819	E+02
		^{60}Co	<4.100	E-01
		^{65}Zn	<1.284	E+00
		^{134}Cs	<3.529	E-01
		^{137}Cs	<2.656	E-01
		^{226}Ra	<4.745	E-01
		^{228}Th	<4.531	E-00
		^{232}Th	<1.461	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page nine)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B017V5 (Plant Matter)	25	^{90}Sr	(0 ± 4.6)	E-01
		Total Uranium	(2.5 ± 0.5) (1)	E-02
		Gamma Scan:		
		^{40}K	(7.334 ± 3.277)	E+00
		^{51}Cr	<7.262	E+02
		^{60}Co	<3.647	E-01
		^{65}Zn	<1.050	E+00
		^{134}Cs	<3.047	E-01
		^{137}Cs	<2.563	E-01
		^{226}Ra	<4.851	E-01
		^{228}Th	<3.918	E-01
		^{232}Th	<1.142	E+00
B017W9 (Plant Matter)	26	^{90}Sr	(2.2 ± 2.5)	E-01
		Total Uranium	(7.1 ± 1.2) (1)	E-02
		Gamma Scan:		
		^{40}K	(5.467 ± 3.070)	E+00
		^{51}Cr	<8.133	E+02
		^{60}Co	<3.053	E-01
		^{65}Zn	<9.271	E-01
		^{134}Cs	<2.851	E-01
		^{137}Cs	<2.504	E-01
		^{226}Ra	<4.651	E-01
		^{228}Th	<4.257	E-01
		^{232}Th	<1.180	E+00
B017W1 (Plant Matter)	27	^{90}Sr	(0 ± 4.2)	E-01
		Total Uranium	(6.5 ± 1.1) (1)	E-02
		Gamma Scan:		
		^{40}K	(9.691 ± 5.811)	E+00
		^{51}Cr	<1.108	E+03
		^{60}Co	<4.437	E-01
		^{65}Zn	<1.674	E+00
		^{134}Cs	<4.161	E-01
		^{137}Cs	<3.242	E-01
		^{226}Ra	<6.499	E-01
		^{228}Th	<5.376	E-01
		^{232}Th	<1.571	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page ten)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B017V9	28	^{90}Sr	(0.5 ± 2.6)	E-01
(Plant Matter)		Total Uranium	(3.5 ± 0.6) (1)	E-02
		Gamma Scan:		
		^{40}K	(3.560 ± 2.708)	E+00
		^{51}Cr	<7.541	E+02
		^{60}Co	<5.636	E-01
		^{65}Zn	<1.444	E+00
		^{134}Cs	<3.410	E-01
		^{137}Cs	<2.847	E-01
		^{226}Ra	<5.257	E-01
		^{228}Th	<3.800	E-01
		^{232}Th	<1.370	E+00
B017V7	29	^{90}Sr	(0 ± 7.5)	E-01
(Plant Matter)		Total Uranium	(4.6 ± 1) (1)	E-02
		Gamma Scan:		
		^{40}K	(5.929 ± 2.905)	E+00
		^{51}Cr	<6.442	E+02
		^{60}Co	<2.559	E-01
		^{65}Zn	<8.711	E-01
		^{134}Cs	<2.098	E-01
		^{137}Cs	<2.116	E-01
		^{226}Ra	<3.868	E-01
		^{228}Th	(6.053 ± 3.908)	E-01
		^{232}Th	<9.545	E-01
B017W5	30	^{90}Sr	(0.3 ± 5.9)	E-01
(Plant Matter)		Total Uranium	(5.3 ± 0.9) (1)	E-02
		Gamma Scan:		
		^{40}K	(5.790 ± 2.978)	E+00
		^{51}Cr	<6.948	E+02
		^{60}Co	<3.034	E-01
		^{65}Zn	<5.924	E-01
		^{134}Cs	<2.402	E-01
		^{137}Cs	<2.282	E-01
		^{226}Ra	<5.044	E-01
		^{228}Th	<4.026	E-01
		^{232}Th	<9.013	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page eleven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B012S4 (Plant Matter)	31	^{90}Sr	(0.3 ± 4.5)	E-01
		Total Uranium	(3.5 ± 0.6) (1)	E-02
		Gamma Scan:		
		^{40}K	(7.762 ± 3.074)	E+00
		^{51}Cr	<1.009	E+03
		^{60}Co	<3.825	E-01
		^{65}Zn	<1.726	E+00
		^{134}Cs	<3.695	E-01
		^{137}Cs	<2.717	E-01
		^{226}Ra	<4.585	E-01
		^{228}Th	<4.755	E-01
		^{232}Th	<1.316	E+00
B012T6 (Plant Matter)	32	^{90}Sr	(0.4 ± 2.1)	E-01
		Total Uranium	(2.0 ± 0.4) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.174 ± 0.498)	E+01
		^{51}Cr	<7.975	E+02
		^{60}Co	<5.583	E-01
		^{65}Zn	<1.719	E+00
		^{134}Cs	<4.090	E-01
		^{137}Cs	<3.093	E-01
		^{226}Ra	<6.237	E-01
		^{228}Th	<4.957	E-01
		^{232}Th	<8.788	E-01
B012R8 (Plant Matter)	33	^{90}Sr	(1.2 ± 4.1)	E-01
		Total Uranium	(2.3 ± 0.4) (1)	E-02
		Gamma Scan:		
		^{40}K	(7.067 ± 2.467)	E+00
		^{51}Cr	<5.270	E+02
		^{60}Co	<2.348	E-01
		^{65}Zn	<8.741	E-01
		^{134}Cs	<2.291	E-01
		^{137}Cs	<1.710	E-01
		^{226}Ra	<3.016	E-01
		^{228}Th	<2.760	E-01
		^{232}Th	<8.826	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page twelve)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B012L7 (Plant Matter)	34	^{90}Sr	(-0.7 ± 5.0)	E-01
		Total Uranium	<0.003 (1)	
		Gamma Scan:		
		^{40}K	(4.590 ± 2.472)	E+00
		^{51}Cr	<5.982	E+02
		^{60}Co	<2.336	E-01
		^{65}Zn	<8.143	E-01
		^{134}Cs	<1.501	E-01
		^{137}Cs	<1.923	E-01
		^{226}Ra	<4.492	E-01
		^{228}Th	<5.305	E-01
		^{232}Th	<1.014	E+00
B01364 (Plant Matter)	35	^{90}Sr	(-0.5 ± 2.8)	E-01
		Total Uranium	(1.0 ± 0.2) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.429 ± 0.353)	E+01
		^{51}Cr	<9.734	E+02
		^{60}Co	<3.107	E-01
		^{65}Zn	<1.429	E+00
		^{134}Cs	<4.000	E-01
		^{137}Cs	<2.781	E-01
		^{226}Ra	<5.067	E-01
		^{228}Th	<4.730	E-01
		^{232}Th	<1.303	E+00
B012M7 (Plant Matter)	36	^{90}Sr	(0.5 ± 2.1)	E-01
		Total Uranium	(1.7 ± 0.3) (1)	E-02
		Gamma Scan:		
		^{40}K	(9.321 ± 2.933)	E+00
		^{51}Cr	<5.789	E+02
		^{60}Co	<3.235	E-01
		^{65}Zn	<1.047	E+00
		^{134}Cs	<3.250	E-01
		^{137}Cs	<1.934	E-01
		^{226}Ra	<3.624	E-01
		^{228}Th	<3.371	E-01
		^{232}Th	<1.075	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page thirteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B012L5 (Plant Matter)	37	^{90}Sr	(3.1 ± 2.8)	E-01
		Total Uranium	<0.003 (1)	
		Gamma Scan:		
		^{40}K	(3.873 ± 2.636)	E+00
		^{51}Cr	<6.578	E+02
		^{60}Co	<2.095	E-01
		^{65}Zn	<1.024	E+00
		^{134}Cs	<2.389	E-01
		^{137}Cs	<1.956	E-01
		^{226}Ra	<3.618	E-01
		^{228}Th	<3.488	E-01
		^{232}Th	<8.607	E-01
B012S6 (Plant Matter)	38	^{90}Sr	(6.9 ± 5.8)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(8.715 ± 2.710)	E+00
		^{51}Cr	<5.429	E+02
		^{60}Co	<2.956	E-01
		^{65}Zn	<7.006	E-01
		^{134}Cs	<2.397	E-01
		^{137}Cs	<1.593	E-01
		^{226}Ra	<3.655	E-01
		^{228}Th	<6.587	E-01
		^{232}Th	(1.019 ± 0.572)	E+00
B012N4 (Plant Matter)	39	^{90}Sr	(0.2 ± 2.1)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(8.184 ± 3.351)	E+00
		^{51}Cr	<8.579	E+02
		^{60}Co	<2.888	E-01
		^{65}Zn	<1.205	E+00
		^{134}Cs	<3.104	E-01
		^{137}Cs	<2.745	E-01
		^{226}Ra	<4.885	E-01
		^{228}Th	<3.943	E-01
		^{232}Th	<1.128	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page fourteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B012T0 (Plant Matter)	40	^{90}Sr	(0.6 ± 2.1)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(1.594 ± 0.365)	E+01
		^{51}Cr	<6.643	E+02
		^{60}Co	<3.293	E-01
		^{65}Zn	<9.977	E-01
		^{134}Cs	<2.984	E-01
		^{137}Cs	<1.988	E-01
		^{226}Ra	<3.160	E-01
		^{228}Th	(5.647 ± 4.527)	E-01
		^{232}Th	<6.520	E-01
B01367 (Plant Matter)	41	^{90}Sr	(-0.6 ± 4.2)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(1.325 ± 0.358)	E+01
		^{51}Cr	<7.998	E+02
		^{60}Co	<3.031	E-01
		^{65}Zn	<1.195	E+00
		^{134}Cs	<3.184	E-01
		^{137}Cs	<3.038	E-01
		^{226}Ra	<3.866	E-01
		^{228}Th	(4.387 ± 3.744)	E-01
		^{232}Th	<1.007	E+00
B012M1 (Plant Matter)	42	^{90}Sr	(3.7 ± 4.0)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(3.553 ± 2.036)	E+00
		^{51}Cr	<8.255	E+02
		^{60}Co	<3.142	E-01
		^{65}Zn	<8.905	E-01
		^{134}Cs	<1.686	E-01
		^{137}Cs	<2.753	E-01
		^{226}Ra	<4.856	E-01
		^{228}Th	<4.442	E-01
		^{232}Th	<1.047	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page fifteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B012N2 (Plant Matter)	43	^{90}Sr	(-0.1 ± 2.5)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(1.092 ± 0.243)	E+01
		^{51}Cr	<5.104	E+02
		^{60}Co	<2.181	E-01
		^{65}Zn	<7.746	E-01
		^{134}Cs	<2.149	E-01
		^{137}Cs	<1.688	E-01
		^{226}Ra	<3.033	E-01
		^{228}Th	<2.558	E-01
		^{232}Th	<7.580	E-01
B012M0 (Plant Matter)	44	^{90}Sr	(2.3 ± 2.3)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(2.857 ± 2.595)	E+00
		^{51}Cr	<5.867	E+02
		^{60}Co	<2.219	E-01
		^{65}Zn	<8.155	E-01
		^{134}Cs	<2.134	E-01
		^{137}Cs	<1.895	E-01
		^{226}Ra	<3.457	E-01
		^{228}Th	<3.109	E-01
		^{232}Th	<8.316	E-01
B012M5 (Plant Matter)	45	^{90}Sr	(0.7 ± 4.5)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(7.402 ± 2.311)	E+00
		^{51}Cr	<5.251	E+02
		^{60}Co	<1.976	E-01
		^{65}Zn	<6.423	E-01
		^{134}Cs	<1.867	E-01
		^{137}Cs	<1.540	E-01
		^{226}Ra	<3.169	E-01
		^{228}Th	<3.012	E-01
		^{232}Th	<6.385	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page sixteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B01365 (Plant Matter)	46	^{90}Sr	(4.3 ± 5.4)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(7.238 ± 2.587)	E+00
		^{51}Cr	<5.140	E+02
		^{60}Co	<2.081	E-01
		^{65}Zn	<6.369	E-01
		^{134}Cs	<2.184	E-01
		^{137}Cs	<1.646	E-01
		^{226}Ra	<2.732	E-01
		^{228}Th	<2.636	E-01
		^{232}Th	<7.487	E-01
B01340 (Plant Matter)	47	^{90}Sr	(2.8 ± 2.7)	E-01
		Total Uranium	(1.05 ± 0.17) (1)	E-01
		Gamma Scan:		
		^{40}K	(1.005 ± 0.293)	E+01
		^{51}Cr	<5.765	E+02
		^{60}Co	<1.704	E-01
		^{65}Zn	<9.024	E-01
		^{134}Cs	<2.335	E-01
		^{137}Cs	<1.530	E-01
		^{226}Ra	<3.449	E-01
		^{228}Th	<3.448	E-01
		^{232}Th	<6.910	E-01
B01343 (Plant Matter)	48	^{90}Sr	(2.2 ± 2.4)	E-01
		Total Uranium	(2.66 ± 0.44) (1)	E-01
		Gamma Scan:		
		^{40}K	(1.142 ± 0.334)	E+01
		^{51}Cr	<6.750	E+02
		^{60}Co	<3.258	E-01
		^{65}Zn	<1.027	E+00
		^{134}Cs	<2.746	E-01
		^{137}Cs	<2.026	E-01
		^{226}Ra	<4.490	E-01
		^{228}Th	<5.373	E-01
		^{232}Th	<8.629	E-01

(1) Units are μg/gram.

CASE NARRATIVE

1. Project 300-FF-5, Task 7, Plant Material (TMA/Norcal Group No. 9575) were processed together and the results of the analyses are reported. The sample ID's are:

Customer Sample ID	TMA/Norcal Group No.	Customer Sample ID	TMA/Norcal Group No.
B017P3 (Plant Material)	9575-1	B017V5 (Plant Material)	9575-25
B01362 (Plant Material)	9575-2	B017W9 (Plant Material)	9575-26
B017X1 (Plant Material)	9575-3	B017W1 (Plant Material)	9575-27
B012V8 (Plant Material)	9575-4	B017V9 (Plant Material)	9575-28
B012M6 (Plant Material)	9575-5	B017V7 (Plant Material)	9575-29
B012N9 (Plant Material)	9575-6	B017W5 (Plant Material)	9575-30
B01301 (Plant Material)	9575-7	B012S4 (Plant Material)	9575-31
B017Q3 (Plant Material)	9575-8	B012T6 (Plant Material)	9575-32
B017T7 (Plant Material)	9575-9	B012R8 (Plant Material)	9575-33
B017R3 (Plant Material)	9575-10	B012L7 (Plant Material)	9575-34
B017Q5 (Plant Material)	9575-11	B01364 (Plant Material)	9575-35
B012X7 (Plant Material)	9575-12	B012M7 (Plant Material)	9575-36
B017Q9 (Plant Material)	9575-13	B012L5 (Plant Material)	9575-37
B017P1 (Plant Material)	9575-14	B01256 (Plant Material)	9575-38
B017S7 (Plant Material)	9575-15	B012N4 (Plant Material)	9575-39
B012V9 (Plant Material)	9575-16	B012T0 (Plant Material)	9575-40
B017Q7 (Plant Material)	9575-17	B01367 (Plant Material)	9575-41
B017P9 (Plant Material)	9575-18	B012M1 (Plant Material)	9575-42
B017R9 (Plant Material)	9575-19	B012N2 (Plant Material)	9575-43
B01305 (Plant Material)	9575-20	B012M0 (Plant Material)	9575-44
B017R1 (Plant Material)	9575-21	B012M5 (Plant Material)	9575-45
B017R5 (Plant Material)	9575-22	B01365 (Plant Material)	9575-46
B017R7 (Plant Material)	9575-23	B01340 (Plant Material)	9575-47
B017M2 (Plant Material)	9575-24	B01343 (Plant Material)	9575-48

2. The analyses reported are:

Analyte	PLANT MATERIAL Group # & Sample #
^{90}Sr	9575-1 through 48
Total U	9575-1 through 48
Gamma Scan	9575-1 through 48

3. Results are reported pCi/gram dry material with 2 σ errors, except for total uranium which are reported μgm/gram dry material with 2 σ errors.

4. Strontium-90 analyses were processed in five batches, with ^{90}Sr QCs with each batch.

5. The QC samples consisting of a spike, a lab control sample, and a replicate were processed with this batch as shown on Table 1.

TABLE 1

Preparation Batch Samples Processed	Data Package
9575-1 through 48	- PLANT MATERIAL

QC SAMPLES PROCESSED:

Sample I.D.	Type	Analyses	Reported with Data Package
9575-49 (QC 7406)	Spike	^{90}Sr	X
9575-50 (QC 7407)	Spike	^{90}Sr	X
9575-51 (QC 7408)	Spike	^{90}Sr	X
9575-52 (QC 7409)	Spike	^{90}Sr	X
9575-53 (QC 7410)	Spike	^{90}Sr	X
9575-54 (QC 7411)	LCS	^{90}Sr	X
9575-55 (QC 7412)	LCS	^{90}Sr	X
9575-56 (QC 7413)	LCS	^{90}Sr	X
9575-57 (QC 7414)	LCS	^{90}Sr	X
9575-58 (QC 7415)	LCS	^{90}Sr	X
9575-59 (QC 7416)	Replicate	^{90}Sr	X
9575-60 (QC 7417)	Replicate	^{90}Sr	X
9575-61 (QC 7418)	Replicate	^{90}Sr	X
9575-62 (QC 7419)	Replicate	^{90}Sr	X
9575-63 (QC 7420)	Replicate	^{90}Sr	X
9575-64 (QC 7421)	Spike	Total U	X
9575-65 (QC 7422)	Spike	Total U	X
9575-66 (QC 7423)	Spike	Total U	X
9575-67 (QC 7424)	LCS	Total U	X
9575-68 (QC 7425)	LCS	Total U	X
9575-69 (QC 7426)	LCS	Total U	X
9575-70 (QC 7427)	Replicate	Total U	X
9575-71 (QC 7428)	Replicate	Total U	X
9575-72 (QC 7429)	Replicate	Total U	X
9575-73 (QC 7430)	Spike	Gamma Scan	X
9575-74 (QC 7431)	Spike	Gamma Scan	X
9575-75 (QC 7432)	Spike	Gamma Scan	X
9575-76 (QC 7433)	LCS	Gamma Scan	X
9575-77 (QC 7434)	LCS	Gamma Scan	X
9575-78 (QC 7435)	LCS	Gamma Scan	X
9575-79 (QC 7436)	Replicate	Gamma Scan	X
9575-80 (QC 7437)	Replicate	Gamma Scan	X
9575-81 (QC 7438)	Replicate	Gamma Scan	X

6. Analyses, reanalyses, and reworks, etc.

Strontium Analyses: The average yield for 48 analyses was 75%. The lowest yield was 51% and the highest was 87%. No abnormalities were encountered. The results of the spike, the Laboratory Control Sample, and the replicate were satisfactory.

Gamma Scan Analyses: The spike sample processed had only ^{60}Co and ^{137}Cs activity. The found/added ratio of the spike look good. The results of the spike, the laboratory control sample, and the replicate were satisfactory.

Total Uranium Analyses (Plant Matter): No abnormalities were encountered. The results of the spike, the Laboratory Control Sample, and the replicate were satisfactory.

Westinghouse Hanford Company 9613500.1738

B012P8

CHAIN OF CUSTODY

526

Custody Form Initiator NA. CADORET

Company Contact C.A. BRANDT

Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7

Collection Date 9/10/91

Ice Chest No. CAB-1

Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 248175921 521

Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED, ~130 g samples for SR-90, Total U, Gamma Scan

Sample Identification

B017P3	B017Q5
B01362	B012X7
B017X1	B017Q9
B012V8	B017P1
B012M6	B017S7
B012N9	B012V9
B01301	B017Q7
B017Q3	B017P9
B017T7	B017R9
B017R3	B01305

☐ Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
NA CADORET	Kermit Blum	11-26-91 1130
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:

A-6000-407 (12/90)

2

Westinghouse Hanford Company 9613508.1759

CHAIN OF CUSTODY

607

Custody Form Initiator NA. CADORET

Company Contact C.A. BRANDT Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7 Collection Date 9/10/91

Ice Chest No. CAB-3 Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 2485217592 Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED; ~130g samples for Total U, SR-90, + Gamma Scan analysis.

Sample Identification

B01VU5	B01364
B01VW9	B012M7
B01VW1	B012L5
B01VV9	B012S6
B01VV7	B012N4
B01VW5	B012T0
B012S4	B01367
B012T6	B012M1
B012R8	B012N2
B012L7	B012M0

☐ Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
NA CADORET	Kermit Blum	11-26-91 1130
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:

A-6000-407 (12/90)

Westinghouse Hanford Company 9613500.1740

CHAIN OF CUSTODY

636

Custody Form Initiator NA. CADORET

Company Contact C.A. BRANDT

Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7

Collection Date 9/10/91

Ice Chest No. CAB-1

Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 248 521 7592

Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED, 2130g samples for SR-90, TOTAL, Gamma Scan

Sample Identification

- B017R1
- B017R5
- B017R7
- B017M2

☐ Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
NA CADORET	Kermit Blum	11-26-91 1130
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:

A-6000-407 (12/90)

Westinghouse Hanford Company P6135000.1741

CHAIN OF CUSTODY

7037

Custody Form Initiator NA. CADORET

Company Contact C.A. BRANDT

Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7

Collection Date 9/10/91

Ice Chest No. CAB-3

Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 2485217593

Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED, 2 1300g samples for Gamma Scan, Total U, Sr-90 analysis.

Sample Identification

- B01245
- B01365
- B01340 *
- B01343

☐ Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
NA CADORET	Kermit Blum	11-26-91 1130
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: * B01340 received broken.

A-6000-407 (12/90)

9615500.1742

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

4025

PART I: FIELD SECTION

Collector W. CADORET Date Sampled 9-10/91 Time N/A hours

Company Contact C A BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01333	1 - glass ~200 g sample	plant matter	ICP metal
B01326			
B01337			
B01329			
B01244			
B01310			
B017R1	1 - glass ~130g sample	plant matter	Gamma Scan, Sr-90, Total U
B017R5			
B017R7			
B017M2			

Field Information** from 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards none detected.

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 11-26-91

Analysis Required

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

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

A-6000-406 (05/90)

9613500.1745

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

505

PART I: FIELD SECTION

Collector W. CADORET Date Sampled 9-10/91 Time NA hours

Company Contact CA BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
BC17P3	1 - glass, 200g. samples	plant matter	Gamma Scan, Total U, Sr-90.
BC1362			
BC17X1			
BC12V8			
BC12M6			
BC12N9			
BC1301			
BC17G3			
BC17T7			
BC17R3			
BC17G5			
BC12X7			
BC17G9			
BC17P1			
BC17S7			
BC12V9			
BC17G7			
BC17M9			
BC17R9			
BC3005	✓	✓	✓

Field Information** From 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards none detected.

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 11-26-91

Analysis Required

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

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

A-6000-406 (05/90)

3

9613500.1744

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

626

PART I: FIELD SECTION

Collector N. CADORET Date Sampled 9-10/91 Time N/A hours

Company Contact C A BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B017V5	1 glass - 130 g samples	plastic matrix	Total U, Sr 90, gamma scan
B017W9			
B017W1			
B017V9			
B017V7			
B017W5			
B012S4			
B012T6			
B012R7			
B012L7			
B012M4			
B012M7			
B012L5			
B012S6			
B012N4			
B012T0			
B012M7			
B012M1			
B012N2			
B012M0			

Field Information** From 300' EF-5, Tank 7

Special Handling and/or Storage N/A

Possible Sample Hazards none detected

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 11-26-91

Analysis Required

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

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

A-6000-406 (05/90)

35

B012P5-TMA-114

9613500.1745

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

JUN 1992
RECEIVED
OSM DMO

June 18, 1992

SENT BY FEDERAL EXPRESS

Ref. TMA/Norcal N1-12-031-9572

Mr. John Bourgeault
Westinghouse Hanford Company
2355 Stevens Drive
Richland, WA 99352

Dear Mr. Bourgeault:

Enclosed on Attachment 1, are the ^{90}Sr, total uranium, and gamma scan results for the plant samples from 300-FF-5 Area, we received 4 December 1991. The QA/QC results are shown on Attachments 2, 3, and 4.

Please call if you have any questions concerning this data.

Sincerely,

D.P. Kharkar

Dinkar P. Kharkar, Ph.D.
Manager, Nuclear Programs

Envlosures: Section 1 through 9
Appendices

4-26-96
MC

ATTACHMENT 1 DATA TABLE

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B012X4 (Plant Matter)	1	^{90}Sr	(1 ± 3)	E-01
		Total Uranium	(0.155 ± 0.026) (1)	
		Gamma Scan:		
		^{40}K	(8.208 ± 4.403)	E+00
		^{51}Cr	<1.256	E+03
		^{60}Co	<4.245	E-01
		^{65}Zn	<1.729	E+00
		^{134}Cs	<3.922	E-01
		^{137}Cs	<3.504	E-01
		^{226}Ra	<6.904	E-01
		^{228}Th	<5.138	E-01
		^{232}Th	<1.406	E+00
B012Y5 (Plant Matter)	2	^{90}Sr	(2 ± 3)	E+00
		Total Uranium	(0.041 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(1.183 ± 0.334)	E+01
		^{51}Cr	<9.988	E+02
		^{60}Co	<2.895	E-01
		^{65}Zn	<1.226	E+00
		^{134}Cs	<2.984	E-01
		^{137}Cs	<2.053	E-01
		^{226}Ra	<4.284	E-01
		^{228}Th	<5.515	E-01
		^{232}Th	<9.256	E-01
B012Z7 (Plant Matter)	3	^{90}Sr	(1 ± 3)	E-01
		Total Uranium	(0.022 ± 0.004) (1)	
		Gamma Scan:		
		^{40}K	(1.083 ± 0.420)	E+01
		^{51}Cr	<1.371	E+03
		^{60}Co	<3.482	E-01
		^{65}Zn	<1.478	E+00
		^{134}Cs	<3.665	E-01
		^{137}Cs	<3.205	E-01
		^{226}Ra	<6.448	E-01
		^{228}Th	<5.494	E-01
		^{232}Th	<1.449	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B012Z4 (Plant Matter)	4	^{90}Sr	(3 ± 2)	E-01
		Total Uranium	(0.029 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(1.186 ± 0.374)	E+01
		^{51}Cr	<1.110	E+03
		^{60}Co	<2.656	E-01
		^{65}Zn	<1.028	E+00
		^{134}Cs	<3.474	E-01
		^{137}Cs	<2.499	E-01
		^{226}Ra	<4.037	E-01
		^{228}Th	<4.504	E-01
		^{232}Th	<1.020	E+00
B012X1 (Plant Matter)	5	^{90}Sr	(0.4 ± 2)	E-01
		Total Uranium	(0.034 ± 0.006) (1)	
		Gamma Scan:		
		^{40}K	(1.169 ± 0.361)	E+01
		^{51}Cr	<9.585	E+02
		^{60}Co	<4.875	E-01
		^{65}Zn	<1.423	E+00
		^{134}Cs	<3.047	E-01
		^{137}Cs	<2.765	E-01
		^{226}Ra	<4.317	E-01
		^{228}Th	<6.312	E-01
		^{232}Th	<1.039	E+00
B012Z8 (Plant Matter)	6	^{90}Sr	(2 ± 2)	E-01
		Total Uranium	(0.070 ± 0.012) (1)	
		Gamma Scan:		
		^{40}K	(8.031 ± 3.080)	E+00
		^{51}Cr	<7.494	E+02
		^{60}Co	<2.064	E-01
		^{65}Zn	<7.816	E-01
		^{134}Cs	<2.168	E-01
		^{137}Cs	<2.077	E-01
		^{226}Ra	<3.220	E-01
		^{228}Th	<3.319	E-01
		^{232}Th	<7.365	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B012P5 (Plant Matter)	7	^{90}Sr	(1 ± 1)	E-01
		Total Uranium	(0.030 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(1.054 ± 0.357)	E+01
		^{51}Cr	<1.050	E+03
		^{60}Co	<2.458	E-01
		^{65}Zn	<1.111	E+00
		^{134}Cs	<3.239	E-01
		^{137}Cs	<2.214	E-01
		^{226}Ra	<3.844	E-01
		^{228}Th	<4.324	E-01
		^{232}Th	<8.347	E-01
B012W4 (Plant Matter)	8	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	(0.079 ± 0.013) (1)	
		Gamma Scan:		
		^{40}K	(1.239 ± 0.385)	E+01
		^{51}Cr	<9.033	E+02
		^{60}Co	<5.564	E-01
		^{65}Zn	<1.235	E+00
		^{134}Cs	<3.605	E-01
		^{137}Cs	<2.967	E-01
		^{226}Ra	<5.037	E-01
		^{228}Th	(5.607 ± 4.506)	E-01
		^{232}Th	<1.374	E+00
B012W8 (Plant Matter)	9	^{90}Sr	(-1 ± 2)	E-01
		Total Uranium	(0.119 ± 0.020) (1)	
		Gamma Scan:		
		^{40}K	(1.308 ± 0.456)	E+01
		^{51}Cr	<1.137	E+03
		^{60}Co	<4.397	E-01
		^{65}Zn	<1.445	E+00
		^{134}Cs	<3.411	E-01
		^{137}Cs	<2.812	E-01
		^{226}Ra	<4.845	E-01
		^{228}Th	<4.793	E-01
		^{232}Th	<1.221	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page four)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B012P1 (Plant Matter)	10	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	<0.030 (1)	
		Gamma Scan:		
		^{40}K	(1.669 ± 0.378)	E+01
		^{51}Cr	<8.378	E+02
		^{60}Co	<2.784	E-01
		^{65}Zn	<1.149	E+00
		^{134}Cs	<2.798	E-01
		^{137}Cs	<1.440	E-01
		^{226}Ra	<3.773	E-01
		^{228}Th	<3.845	E-01
		^{232}Th	<6.894	E-01
B012W1 (Plant Matter)	11	^{90}Sr	(-1 ± 1)	E+00
		Total Uranium	(0.035 ± 0.006) (1)	
		Gamma Scan:		
		^{40}K	(1.259 ± 0.326)	E+01
		^{51}Cr	<8.773	E+02
		^{60}Co	<3.605	E-01
		^{65}Zn	<1.045	E+00
		^{134}Cs	<3.288	E-01
		^{137}Cs	<1.909	E-01
		^{226}Ra	<3.658	E-01
		^{228}Th	<3.229	E-01
		^{232}Th	<9.817	E-01
B012Z6 (Plant Matter)	12	^{90}Sr	(3 ± 4)	E-01
		Total Uranium	(0.043 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(9.874 ± 2.352)	E+00
		^{51}Cr	<7.552	E+02
		^{60}Co	<2.217	E-01
		^{65}Zn	<8.314	E-01
		^{134}Cs	<2.057	E-01
		^{137}Cs	<1.426	E-01
		^{226}Ra	<3.087	E-01
		^{228}Th	<3.868	E-01
		^{232}Th	<6.334	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page five)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B012L8 (Plant Matter)	13	^{90}Sr	(3 ± 4)	E-01
		Total Uranium	<0.030 (1)	
		Gamma Scan:		
		^{40}K	(2.886 ± 1.899)	E+00
		^{51}Cr	<5.126	E+02
		^{60}Co	<2.454	E-01
		^{65}Zn	<7.082	E-01
		^{134}Cs	<2.038	E-01
		^{137}Cs	<1.472	E-01
		^{226}Ra	<2.742	E-01
		^{228}Th	<3.404	E-01
		^{232}Th	<5.817	E-01
B012Z1 (Plant Matter)	14	^{90}Sr	(5 ± 5)	E-01
		Total Uranium	(0.154 ± 0.026) (1)	
		Gamma Scan:		
		^{40}K	(1.274 ± 0.472)	E+01
		^{51}Cr	<1.491	E+03
		^{60}Co	<4.797	E-01
		^{65}Zn	<1.665	E+00
		^{134}Cs	<4.213	E-01
		^{137}Cs	<3.095	E-01
		^{226}Ra	<7.022	E-01
		^{228}Th	<5.897	E-01
		^{232}Th	<1.456	E+00
B012Z3 (Plant Matter)	15	^{90}Sr	(6 ± 8)	E-01
		Total Uranium	<0.30 (1)	
		Gamma Scan:		
		^{40}K	(2.047 ± 0.472)	E+01
		^{51}Cr	<1.016	E+03
		^{60}Co	<5.572	E-01
		^{65}Zn	<1.356	E+00
		^{134}Cs	<4.101	E-01
		^{137}Cs	<3.274	E-01
		^{226}Ra	(5.098 ± 4.220)	E-01
		^{228}Th	<7.303	E-01
		^{232}Th	<1.536	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page six)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B012Z5 (Plant Matter)	16	^{90}Sr	(5 ± 4)	E-01
		Total Uranium	(0.050 ± 0.009) (1)	
		Gamma Scan:		
		^{40}K	(1.217 ± 0.459)	E+01
		^{51}Cr	<1.028	E+03
		^{60}Co	<3.088	E-01
		^{65}Zn	<1.296	E+00
		^{134}Cs	<3.028	E-01
		^{137}Cs	<2.436	E-01
		^{226}Ra	<4.994	E-01
		^{228}Th	<4.667	E-01
		^{232}Th	<1.075	E+00
B012W3 (Plant Matter)	17	^{90}Sr	(0 ± 3)	E-01
		Total Uranium	(0.277 ± 0.046) (1)	
		Gamma Scan:		
		^{40}K	(1.209 ± 0.435)	E+01
		^{51}Cr	<1.051	E+03
		^{60}Co	<4.785	E-01
		^{65}Zn	<1.516	E+00
		^{134}Cs	<3.776	E-01
		^{137}Cs	<2.718	E-01
		^{226}Ra	<4.848	E-01
		^{228}Th	<5.307	E-01
		^{232}Th	<1.628	E+00
B012W2 (Plant Matter)	18	^{90}Sr	(1 ± 4)	E-01
		Total Uranium	(0.151 ± 0.026) (1)	
		Gamma Scan:		
		^{40}K	(1.481 ± 0.527)	E+01
		^{51}Cr	<1.620	E+03
		^{60}Co	<4.798	E-01
		^{65}Zn	<1.807	E+00
		^{134}Cs	<4.719	E-01
		^{137}Cs	<4.125	E-01
		^{226}Ra	<7.684	E-01
		^{228}Th	<7.222	E-01
		^{232}Th	<1.664	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page seven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B01339 (Plant Matter)	19	^{90}Sr	(3 ± 4)	E-01
		Total Uranium	(0.088 ± 0.015) (1)	
		Gamma Scan:		
		^{40}K	(9.633 ± 3.380)	E+00
		^{51}Cr	<8.026	E+02
		^{60}Co	<4.338	E-01
		^{65}Zn	<1.179	E+00
		^{134}Cs	<3.792	E-01
		^{137}Cs	<2.266	E-01
		^{226}Ra	<3.315	E-01
		^{228}Th	<3.413	E-01
		^{232}Th	<1.189	E+00
B01338 (Plant Matter)	20	^{90}Sr	(4 ± 4)	E-01
		Total Uranium	(0.063 ± 0.011) (1)	
		Gamma Scan:		
		^{40}K	(7.972 ± 3.441)	E+00
		^{51}Cr	<8.627	E+02
		^{60}Co	<2.873	E-01
		^{65}Zn	<8.817	E-01
		^{134}Cs	<2.633	E-01
		^{137}Cs	<2.258	E-01
		^{226}Ra	<4.144	E-01
		^{228}Th	<3.305	E-01
		^{232}Th	<1.156	E+00
B01344 (Plant Matter)	21	^{90}Sr	(7 ± 4)	E-01
		Total Uranium	(0.055 ± 0.009) (1)	
		Gamma Scan:		
		^{40}K	(9.654 ± 2.920)	E+00
		^{51}Cr	<7.925	E+02
		^{60}Co	<2.671	E-01
		^{65}Zn	<6.401	E-01
		^{134}Cs	<3.068	E-01
		^{137}Cs	<1.543	E-01
		^{226}Ra	<3.600	E-01
		^{228}Th	<3.380	E-01
		^{232}Th	<7.876	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page eight)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B01354 (Plant Matter)	22	^{90}Sr	(3 ± 3)	E-01
		Total Uranium	(0.234 ± 0.039) (1)	
		Gamma Scan:		
		^{40}K	(8.352 ± 2.895)	E+00
		^{51}Cr	<7.754	E+02
		^{60}Co	<3.311	E-01
		^{65}Zn	<1.134	E+00
		^{134}Cs	<2.939	E-01
		^{137}Cs	<2.079	E-01
		^{226}Ra	<3.036	E-01
		^{228}Th	<3.326	E-01
		^{232}Th	<6.947	E-01
B01345 (Plant Matter)	23	^{90}Sr	(6 ± 7)	E-01
		Total Uranium	(0.043 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(1.538 ± 0.448)	E+01
		^{51}Cr	<1.068	E+03
		^{60}Co	<3.483	E-01
		^{65}Zn	<1.557	E+00
		^{134}Cs	<3.344	E-01
		^{137}Cs	<2.560	E-01
		^{226}Ra	<5.047	E-01
		^{228}Th	<4.121	E-01
		^{232}Th	<1.100	E+00
B01308 (Plant Matter)	24	^{90}Sr	(4 ± 4)	E-01
		Total Uranium	(0.042 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(1.387 ± 0.330)	E+01
		^{51}Cr	<7.716	E+02
		^{60}Co	<2.492	E-01
		^{65}Zn	<7.806	E-01
		^{134}Cs	<2.740	E-01
		^{137}Cs	<2.206	E-01
		^{226}Ra	<3.634	E-01
		^{228}Th	<3.769	E-01
		^{232}Th	<8.240	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page nine)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B01302 (Plant Matter)	25	^{90}Sr	(2 ± 4)	E-01
		Total Uranium	(0.034 ± 0.006) (1)	
		Gamma Scan:		
		^{40}K	(1.149 ± 0.423)	E+01
		^{51}Cr	<9.550	E+02
		^{60}Co	<3.292	E-01
		^{65}Zn	<1.127	E+00
		^{134}Cs	<3.586	E-01
		^{137}Cs	<2.364	E-01
		^{226}Ra	<4.099	E-01
		^{228}Th	<3.981	E-01
		^{232}Th	<1.056	E+00
B01307 (Plant Matter)	26	^{90}Sr	(1 ± 4)	E-01
		Total Uranium	(0.045 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(9.635 ± 3.466)	E+00
		^{51}Cr	<9.376	E+02
		^{60}Co	<3.336	E-01
		^{65}Zn	<1.029	E+00
		^{134}Cs	<2.183	E-01
		^{137}Cs	<2.083	E-01
		^{226}Ra	<3.618	E-01
		^{228}Th	<3.340	E-01
		^{232}Th	<7.873	E-01
B01333 (Plant Matter)	27	^{90}Sr	(3 ± 4)	E-01
		Total Uranium	(0.053 ± 0.009) (1)	
		Gamma Scan:		
		^{40}K	(1.137 ± 0.351)	E+01
		^{51}Cr	<1.016	E+03
		^{60}Co	<2.488	E-01
		^{65}Zn	<1.071	E+00
		^{134}Cs	<3.268	E-01
		^{137}Cs	<2.353	E-01
		^{226}Ra	<4.557	E-01
		^{228}Th	<4.140	E-01
		^{232}Th	<1.136	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page ten)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B01300	28	^{90}Sr	(2 ± 4)	E-01
(Plant Matter)		Total Uranium	(0.041 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(1.212 ± 0.380)	E+01
		^{51}Cr	<1.023	E+03
		^{60}Co	<3.094	E-01
		^{65}Zn	<1.296	E+00
		^{134}Cs	<3.414	E-01
		^{137}Cs	<2.091	E-01
		^{226}Ra	<4.946	E-01
		^{228}Th	<6.001	E-01
		^{232}Th	<1.167	E+00
B01355	29	^{90}Sr	(-1 ± 3)	E-01
(Plant Matter)		Total Uranium	(0.302 ± 0.050) (1)	
		Gamma Scan:		
		^{40}K	(1.019 ± 0.345)	E+01
		^{51}Cr	<8.742	E+02
		^{60}Co	<2.859	E-01
		^{65}Zn	<1.242	E+00
		^{134}Cs	<2.923	E-01
		^{137}Cs	<2.362	E-01
		^{226}Ra	<4.547	E-01
		^{228}Th	<3.942	E-01
		^{232}Th	<1.029	E+00
B01303	30	^{90}Sr	(2 ± 8)	E-01
(Plant Matter)		Total Uranium	(0.246 ± 0.041) (1)	
		Gamma Scan:		
		^{40}K	(1.203 ± 0.444)	E+01
		^{51}Cr	<1.553	E+03
		^{60}Co	<6.771	E-01
		^{65}Zn	<9.530	E-01
		^{134}Cs	<5.009	E-01
		^{137}Cs	<3.835	E-01
		^{226}Ra	<5.938	E-01
		^{228}Th	<5.077	E-01
		^{232}Th	<1.644	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page eleven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B01327 (Plant Matter)	31	^{90}Sr	(3 ± 4)	E-01
		Total Uranium	(0.059 ± 0.010) (1)	
		Gamma Scan:		
		^{40}K	(8.726 ± 3.502)	E+00
		^{51}Cr	<9.451	E+02
		^{60}Co	<3.331	E-01
		^{65}Zn	<9.658	E-01
		^{134}Cs	<2.478	E-01
		^{137}Cs	<2.356	E-01
		^{226}Ra	<4.563	E-01
		^{228}Th	<3.715	E-01
		^{232}Th	<1.093	E+00
B017P7 (Plant Matter)	32	^{90}Sr	(3 ± 4)	E-01
		Total Uranium	(0.070 ± 0.012) (1)	
		Gamma Scan:		
		^{40}K	(9.856 ± 3.095)	E+00
		^{51}Cr	<1.059	E+03
		^{60}Co	<2.902	E-01
		^{65}Zn	<1.176	E+00
		^{134}Cs	<2.940	E-01
		^{137}Cs	<2.682	E-01
		^{226}Ra	<5.710	E-01
		^{228}Th	<5.741	E-01
		^{232}Th	<1.116	E+00
B017X4 (Plant Matter)	33	^{90}Sr	(1 ± 4)	E-01
		Total Uranium	(0.301 ± 0.050) (1)	
		Gamma Scan:		
		^{40}K	(8.558 ± 2.497)	E+00
		^{51}Cr	<6.779	E+02
		^{60}Co	<1.901	E-01
		^{65}Zn	<8.204	E-01
		^{134}Cs	<1.650	E-01
		^{137}Cs	<1.636	E-01
		^{226}Ra	<2.694	E-01
		^{228}Th	<3.351	E-01
		^{232}Th	<6.767	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page twelve)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B017X3	34	^{90}Sr	(4 ± 4)	E-01
(Plant Matter)		Total Uranium	(0.042 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(8.885 ± 3.225)	E+00
		^{51}Cr	<1.090	E+03
		^{60}Co	<3.389	E-01
		^{65}Zn	<1.208	E+00
		^{134}Cs	<3.140	E-01
		^{137}Cs	<2.390	E-01
		^{226}Ra	<4.649	E-01
		^{228}Th	<3.545	E-01
		^{232}Th	<1.260	E+00
B017Y1	35	^{90}Sr	(3 ± 4)	E-01
(Plant Matter)		Total Uranium	(0.043 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(1.159 ± 1.106)	E+00
		^{51}Cr	<8.546	E+02
		^{60}Co	<3.207	E-01
		^{65}Zn	<1.105	E+00
		^{134}Cs	<2.396	E-01
		^{137}Cs	(4.601 ± 1.774)	E-01
		^{226}Ra	<2.973	E-01
		^{228}Th	<3.204	E-01
		^{232}Th	<8.976	E-01
B017Y0	36	^{90}Sr	(1.7 ± 0.5)	E+00
(Plant Matter)		Total Uranium	(0.027 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(1.878 ± 0.527)	E+01
		^{51}Cr	<1.180	E+03
		^{60}Co	<3.411	E-01
		^{65}Zn	<1.630	E+00
		^{134}Cs	<5.041	E-01
		^{137}Cs	<2.971	E-01
		^{226}Ra	(5.931 ± 3.923)	E-01
		^{228}Th	(6.438 ± 5.044)	E-01
		^{232}Th	<1.660	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page thirteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B017X5 (Plant Matter)	37	^{90}Sr	(6 ± 6)	E-01
		Total Uranium	(0.069 ± 0.011) (1)	
		Gamma Scan:		
		^{40}K	(1.138 ± 0.344)	E+01
		^{51}Cr	<9.330	E+02
		^{60}Co	<2.153	E-01
		^{65}Zn	<8.762	E-01
		^{134}Cs	<2.780	E-01
		^{137}Cs	<2.095	E-01
		^{226}Ra	<3.773	E-01
		^{228}Th	<4.235	E-01
		^{232}Th	<1.042	E+00
B017P5 (Plant Matter)	38	^{90}Sr	(3 ± 4)	E-01
		Total Uranium	(0.050 ± 0.008) (1)	
		Gamma Scan:		
		^{40}K	(5.969 ± 1.062)	E+00
		^{51}Cr	<3.096	E+02
		^{60}Co	<7.924	E-02
		^{65}Zn	<3.260	E-01
		^{134}Cs	<9.408	E-02
		^{137}Cs	<7.935	E-02
		^{226}Ra	<1.404	E-01
		^{228}Th	<1.224	E-01
		^{232}Th	<3.355	E-01

(1) Units are μg/gram.

CASE NARRATIVE

1. Project 300-FF-5, Task 7, Plant Material (TMA/Norcal Group No. 9572) were processed together and the results of the analyses are reported. The sample ID's are:

Customer Sample ID	TMA/Norcal Group No.	Customer Sample ID	TMA/Norcal Group No.
B012X4 (Plant Material)	9572-1	B01338 (Plant Material)	9572-20
B012Y5 (Plant Material)	9572-2	B01344 (Plant Material)	9572-21
B012Z7 (Plant Material)	9572-3	B01354 (Plant Material)	9572-22
B012Z4 (Plant Material)	9572-4	B01345 (Plant Material)	9572-23
B012X1 (Plant Material)	9572-5	B01308 (Plant Material)	9572-24
B012Z8 (Plant Material)	9572-6	B01302 (Plant Material)	9572-25
B012P5 (Plant Material)	9572-7	B01307 (Plant Material)	9572-26
B012W4 (Plant Material)	9572-8	B01333 (Plant Material)	9572-27
B012W8 (Plant Material)	9572-9	B01300 (Plant Material)	9572-28
B012P1 (Plant Material)	9572-10	B01355 (Plant Material)	9572-29
B012W1 (Plant Material)	9572-11	B01303 (Plant Material)	9572-30
B012Z6 (Plant Material)	9572-12	B01327 (Plant Material)	9572-31
B012L8 (Plant Material)	9572-13	B017P7 (Plant Material)	9572-32
B012Z1 (Plant Material)	9572-14	B017X4 (Plant Material)	9572-33
B012Z3 (Plant Material)	9572-15	B017X3 (Plant Material)	9572-34
B012Z5 (Plant Material)	9572-16	B017Y1 (Plant Material)	9572-35
B012W3 (Plant Material)	9572-17	B017Y0 (Plant Material)	9572 36
B012W2 (Plant Material)	9572-18	B017X5 (Plant Material)	9572-37
B01339 (Plant Material)	9572-19	B017P5 (Plant Material)	9572-38

2. The analyses reported are:

Analyte	PLANT MATERIAL Group # & Sample #
^{90}Sr	9572-1 through 38
Total U	9572-1 through 38
Gamma Scan	9572-1 through 38

3. Results are reported pCi/gram dry material with 2 σ errors, except for total uranium which arreported μgm/gram dry material with 2 σ errors.

4. Strontium-90 analyses were processed in four batches, with ^{90}Sr QCs with each batch.

5. The QC samples consisting of a spike, a lab control sample, and a replicate were processed with this batch as shown on Table 1.

TABLE 1

Preparation Batch Samples Processed	Data Package
9572-1 through 38	- PLANT MATERIAL

QC SAMPLES PROCESSED:

Sample I.D.	Type	Analyses	Reported with Data Package
9572-39 (QC 7349)	Spike	^{90}Sr	X
9572-40 (QC 7350)	Spike	^{90}Sr	X
9572-41 (QC 7351)	Spike	^{90}Sr	X
9572-42 (QC 7352)	Spike	^{90}Sr	X
9572-43 (QC 7353)	LCS	^{90}Sr	X
9572-44 (QC 7354)	LCS	^{90}Sr	X
9572-45 (QC 7355)	LCS	^{90}Sr	X
9572-46 (QC 7356)	LCS	^{90}Sr	X
9572-47 (QC 7357)	Replicate	^{90}Sr	X
9572-48 (QC 7358)	Replicate	^{90}Sr	X
9572-49 (QC 7359)	Replicate	^{90}Sr	X
9572-50 (QC 7360)	Replicate	^{90}Sr	X
9572-51 (QC 7361)	Spike	Total U	X
9572-52 (QC 7362)	Spike	Total U	X
9572-53 (QC 7363)	LCS	Total U	X
9572-54 (QC 7364)	LCS	Total U	X
9572-55 (QC 7365)	Replicate	Total U	X
9572-56 (QC 7366)	Replicate	Total U	X
9572-57 (QC 7367)	Spike	Gamma Scan	X
9572-58 (QC 7368)	Spike	Gamma Scan	X
9572-59 (QC 7369)	LCS	Gamma Scan	X
9572-60 (QC 7370)	LCS	Gamma Scan	X
9572-61 (QC 7371)	Replicate	Gamma Scan	X
9572-62 (QC 7372)	Replicate	Gamma Scan	X

6. Analyses, reanalyses, and reworks, etc.

Strontium Analyses (Plant Material): The average yield for 38 analyses was 72%. The lowest yield was 32% and the highest was 87%. No abnormalities were encountered. The results of the spike, the Laboratory Control Sample, and the replicate were satisfactory.

Gamma Scan Analyses (Plant Material): The spike samples processed had only ^{60}Co and ^{137}Cs activity and the found/added ratio of the spikes look good. The results of the spike, the laboratory control sample, and the replicate were satisfactory.

Total Uranium Analyses (Plant Material): No abnormalities were encountered. The results of the spike, the Laboratory Control Sample, and the replicate were satisfactory.

5316 container CAB5

Westinghouse Hanford Company 9613590.1761

CHAIN OF CUSTODY

2 of 2

Custody Form Initiator: CA Brandt

Company Contact: CA Brandt

Telephone: 376-5395

Project Designation/Sampling Locations: 300-FF-5 Task 7

Collection Date: 9-10/91

Ice Chest No.: CAB-5

Field Logbook No.: BNW 53573

Bill of Lading/Airbill No.: 2485217625

Offsite Property No.: PNL-92-277

Method of Shipment: Air

Shipped to: TMA/NORCAL

Possible Sample Hazards/Remarks: onsite samples < 50 pCi/g; offsite samples no hazard.

Sample Identification

U/gamma splits				ICP splits
B012X4	B012Z6	B01345	B017X3	B017Y1
B012Y5	B012L8	B01308	B017Y1	B017Y0
B012Z7	B012Z1	B01302	B017Y0	B017Y2
B012Z4 (CAB 5 pt)	B012Z3	B01307	B017X5	B017Y3
B012X1	B012Z5	B01333	B017P5	
B012Z8	B012W3	B01300		
B012P5	B012W2	B01355		
B012W4	B01339	B01303		
B012W8	B01338	B01327		
B012P1	B01344	B017P7		
B012W1	B01354	B017X4		

☐ Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
R J Hellens		12/2/91 RJH 10:00 AM
Relinquished by:	Received by: Kermit Blum	Date/Time: 12-4-91 1100
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90)

Air
OVERNIGHT DELIVERY

S.S.S.

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT)
PNL		PNL-92-272

PART I – TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
Environmental Sciences Dept.	Ecological Resources & Assess.	Applied Ecology

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

Routing ☒ Contractor ☐ Vendor

Shipped to	Off-site Custodian
TMA/NORCAL 2030 Wright Avenue Richmond, CA 94804	Robert Fox
	Full Title Project Coordinator

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
2 48 # 53 #	Poly Containers #CAB-4, CAB-5. Contains Plant Samples that are Bagged and Packed in Vermiculite. Samples are Non-Hazardous. CAB-4 CAB-5	N/A

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

Necessity for the Off-Site Use of this Property

To support 300-FF-5 Task 7.

2485217625

Bill of Lading # _____

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
Fred L. D. Corna	200449	12-3-91

Location of Property (Area & Bldg.)	Contact	Phone
3000 Area/LSL II	RJ Fellows	375-2247

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
	PC2FA	Packaging & Containers 12-20-91

Originated By	Date	Authorized By	Date
CA Brandt	12/2/91	HE Westerdahl	12/2/91
Signature and Name of Property Control	Custodian Date	Property Management Approval	Date

PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient	Return Order No.	Date Issued	Purchase Order No.	Date Issued
J. Lenaurt				
Date 12-3-91				

DISTRIBUTION

By Originator	Shipping Operation – Sign all Copies and Forward to:

9613500.1763

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector CA Brandt Date Sampled 9-10-91 Time N/A hours

Company Contact CA Brandt Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B012X4	1, ~150g glass	plant matter	gamma scan, Sr^{90}, total U
B012Y5			
B012Z7			
B012Z4			
B012X1			
B012Z8			
B012P5			
B012W4			
B012W8			
B012P1			
B012W1			
B012Z6			
B012L8	ibid.	ibid	ibid
B012Z1			
B012Z3			
B012Z5			
B012W3			
B012W2			
B01339			
B01338			

Field Information** From 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards None detected

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-4-91

Analysis Required

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

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

A-6000-406 (05/90)

2

9613500.1764

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector CA Brandt Date Sampled 9-10/91 Time N/A hours

Company Contact CA Brandt Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B017Y1	1 ~20g glass	Plant matter	ICP metals
B017Y0	"	"	"
B017Y2	"	"	"
B017Y3	"	"	"

Field Information** from 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards none detected

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-4-91

Analysis Required

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

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

A-6000-406 (05/90)

3

9613500.1765

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector CA Brandt Date Sampled 9-10/91 Time N/A hours

Company Contact CA Brandt Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01344	1, ~150g glass	Plant matter	gamma scan, Sr^{90}, total U
B01354			
B01345			
B01308			
B01302			
B01307			
B01333			
B01300			
B01355			
B01303			
B01327	ibid.	ibid.	ibid.
B017P7			
B017X4			
B017X3			
B017Y1			
B017Y0			
B017X5			
B017P5			

Field Information** From 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards None detected.

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-4-91

Analysis Required

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

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

A-6000-406 (05/90)

FORM OF PAYMENT

Check ☐ GBL ☐ FCCOD ☐

Bill to Shipper ☒ Bill to Consignee ☐ Third Party Billing ☐

Shipper's Account Number: E 850282294

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 ☐

Date: 12-03-91 | Origin: PBC | Shipment Number: 248521762 5

PULL FOR SHPT. NO. TAB

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

To:
ROBERT FOX
TMA/NORCAL
2030 WRIGHT AVENUE
RICHMOND CA
Canada ☐ Hold for Pick-Up ☐

Tariff Dest. | Gateway

Check to Shipper $

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: D7D82 PC2FA PNL 92-272

Zip: 99352

Consignee's Account Number: E

Zip: 94804

Description	Pcs.	L	W	H	Total Pieces	Total Weight (In Lbs.)
POLY CONTAINERS/PLANT SAMPLES	2				2	101

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

Declared Value $

248521762 5

Remarks: OVERNIGHT DELIVERY SIGNATURE SECURITY SERVICE

Shipper's Signature X 12-3-91

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 ☒

International Shipments: Free Domicile ☐

Third Party Account Number

International Insurance

Other Charges/Advances at Origin: OCAO $

1-OAK-A

Terms and Conditions on Back

CONSIGNEE — PACKAGE COPY — 4

FOR INFOR

32.

B012P5-TMA-114

9613500.1767

TMA
Thermo Analytical Inc.

Skinner & Sherman Laboratories Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521

(617) 890-7200

Federal Express 4009270296
January 30, 1992

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

Quality Control Narrative

Scope
Twenty (20) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 16, 1991 from Westinghouse/Hanford Company. The samples were analyzed for the USEPA CLP ICP metals only. The analysis was performed under Skinner and Sherman work order 9112168.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work 7/88 (CLP SOW788).

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.

RWPR (for)

David N. Peterson
Assistant Laboratory Manager

ia 4-26-96 MC

9613500.1768

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B012L8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112082 SAS No.: SDG No.: B012L8

Matrix (soil/water): SOIL Lab Sample ID: 12168-12S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 94.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	26.70	B		P
7440-36-0	Antimony	6.10	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	14.40	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	5.40			P
7440-70-2	Calcium	8570.00			P
7440-47-3	Chromium	1.10	B		P
7440-48-4	Cobalt	0.63	B		P
7440-50-8	Copper	6.40			P
7439-89-6	Iron	107.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	3160.00			P
7439-96-5	Manganese	299.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.00	B		P
7440-09-7	Potassium	4990.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.99	U		P
7440-23-5	Sodium	37.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.70	B		P
7440-66-6	Zinc	219.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

003

FORM I - IN Rev.6/89

9613500.1769

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01328

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112082 SAS No.: SDG No.: B012L8

Matrix (soil/water): SOIL Lab Sample ID: 12168-16S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 93.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	70.60			P
7440-36-0	Antimony	6.20	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	64.30			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.48	B		P
7440-70-2	Calcium	24100.00			P
7440-47-3	Chromium	0.81	B		P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	5.30			P
7439-89-6	Iron	177.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2430.00			P
7439-96-5	Manganese	24.70			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.80	U		P
7440-09-7	Potassium	16800.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	24.20	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.60	U		P
7440-66-6	Zinc	22.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

004

9613500.1770

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01332

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112082 SAS No.: SDG No.: B012L8

Matrix (soil/water): SOIL Lab Sample ID: 12168-08S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 91.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	72.20			P
7440-36-0	Antimony	6.50	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	59.90			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.50	B		P
7440-70-2	Calcium	23200.00			P
7440-47-3	Chromium	0.77	B		P
7440-48-4	Cobalt	0.63	U		P
7440-50-8	Copper	5.30			P
7439-89-6	Iron	167.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2240.00			P
7439-96-5	Manganese	12.50			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.96	B		P
7440-09-7	Potassium	19000.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	30.20	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.63	U		P
7440-66-6	Zinc	10.70			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

005

9613500.1771

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01336

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112082 SAS No.: SDG No.: B012L8

Matrix (soil/water): SOIL Lab Sample ID: 12168-09S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 94.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	254.00			P
7440-36-0	Antimony	6.30	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	25.20	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.43	B		P
7440-70-2	Calcium	5100.00			P
7440-47-3	Chromium	1.10	B		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	9.60			P
7439-89-6	Iron	531.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2720.00			P
7439-96-5	Manganese	70.80			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.40	B		P
7440-09-7	Potassium	19900.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	40.40	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.87	B		P
7440-66-6	Zinc	56.60			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

006

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9615500.1772

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01339

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112082 SAS No.: SDG No.: B012L8

Matrix (soil/water): SOIL Lab Sample ID: 12168-19S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 93.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	62.30			P
7440-36-0	Antimony	6.30	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	71.00			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.26	B		P
7440-70-2	Calcium	27500.00			P
7440-47-3	Chromium	1.10	B		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	5.50			P
7439-89-6	Iron	154.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2410.00			P
7439-96-5	Manganese	16.40			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.10	B		P
7440-09-7	Potassium	14300.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	33.40	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.61	U		P
7440-66-6	Zinc	24.90			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

007

FORM I - IN Rev.6/89

9613500.1773

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01340

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112082 SAS No.: SDG No.: B012L8

Matrix (soil/water): SOIL Lab Sample ID: 12168-11S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 93.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	97.50			P
7440-36-0	Antimony	6.50	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	94.30			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.40	B		P
7440-70-2	Calcium	34300.00			P
7440-47-3	Chromium	1.10	B		P
7440-48-4	Cobalt	0.63	U		P
7440-50-8	Copper	6.20			P
7439-89-6	Iron	222.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2880.00			P
7439-96-5	Manganese	19.60			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.84	U		P
7440-09-7	Potassium	14400.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	38.70	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.63	U		P
7440-66-6	Zinc	24.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

008

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9613580.1774

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01343

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112082 SAS No.: SDG No.: B012L8

Matrix (soil/water): SOIL Lab Sample ID: 12168-18S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 93.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	88.60			P
7440-36-0	Antimony	6.30	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	84.60			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.28	B		P
7440-70-2	Calcium	31700.00			P
7440-47-3	Chromium	1.20	B		P
7440-48-4	Cobalt	0.65	B		P
7440-50-8	Copper	5.60			P
7439-89-6	Iron	304.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	3530.00			P
7439-96-5	Manganese	39.10			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.10	B		P
7440-09-7	Potassium	14200.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	34.30	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.62	B		P
7440-66-6	Zinc	29.90			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

009

FORM I - IN Rev.6/89

9613500L1775

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01345

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112082 SAS No.: SDG No.: B012L8

Matrix (soil/water): SOIL Lab Sample ID: 12168-20S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 92.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	71.80			P
7440-36-0	Antimony	6.20	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	43.20			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	20100.00			P
7440-47-3	Chromium	1.10	B		P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	5.70			P
7439-89-6	Iron	180.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2700.00			P
7439-96-5	Manganese	17.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.10	B		P
7440-09-7	Potassium	20000.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	32.60	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.60	U		P
7440-66-6	Zinc	32.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

010

9615500.1776

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01347

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112082 SAS No.: SDG No.: B012L8

Matrix (soil/water): SOIL Lab Sample ID: 12168-07S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 93.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	54.30			P
7440-36-0	Antimony	6.40	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	20.50	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.36	B		P
7440-70-2	Calcium	6370.00			P
7440-47-3	Chromium	0.83	B		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	4.80	B		P
7439-89-6	Iron	128.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2740.00			P
7439-96-5	Manganese	17.50			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U		P
7440-09-7	Potassium	13300.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	24.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.62	U		P
7440-66-6	Zinc	80.10			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

011

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9613506.1777

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01348

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112082 SAS No.: SDG No.: B012L8

Matrix (soil/water): SOIL Lab Sample ID: 12168-03S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 94.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	72.40			P
7440-36-0	Antimony	6.30	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	22.40	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.30	B		P
7440-70-2	Calcium	4930.00			P
7440-47-3	Chromium	1.20	B		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	6.40			P
7439-89-6	Iron	185.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2130.00			P
7439-96-5	Manganese	24.10			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U		P
7440-09-7	Potassium	13200.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	16.20	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.61	U		P
7440-66-6	Zinc	109.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

012

9613500.1778

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01349

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112082 SAS No.: SDG No.: B012L8

Matrix (soil/water): SOIL Lab Sample ID: 12168-14S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 94.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	133.00			P
7440-36-0	Antimony	6.30	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	44.50			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	25000.00			P
7440-47-3	Chromium	1.20	B		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	5.70			P
7439-89-6	Iron	297.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2850.00			P
7439-96-5	Manganese	28.40			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.94	B		P
7440-09-7	Potassium	15800.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	44.70	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.61	U		P
7440-66-6	Zinc	21.90			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

013

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WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01353

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112082 SAS No.: SDG No.: B012L8

Matrix (soil/water): SOIL Lab Sample ID: 12168-05S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 94.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	107.00			P
7440-36-0	Antimony	6.20	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	37.10	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.51	B		P
7440-70-2	Calcium	25800.00			P
7440-47-3	Chromium	1.10	B		P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	6.80			P
7439-89-6	Iron	276.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2330.00			P
7439-96-5	Manganese	31.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.91	B		P
7440-09-7	Potassium	16700.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.99	U		P
7440-23-5	Sodium	45.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.60	U		P
7440-66-6	Zinc	21.10			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9615900.1780

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01354

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112082 SAS No.: SDG No.: B012L8

Matrix (soil/water): SOIL Lab Sample ID: 12168-17S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 93.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	88.20			P
7440-36-0	Antimony	6.40	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	44.70			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	25400.00			P
7440-47-3	Chromium	1.10	B		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	5.50			P
7439-89-6	Iron	232.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2400.00			P
7439-96-5	Manganese	27.50			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.30	B		P
7440-09-7	Potassium	14500.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	51.70	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.62	U		P
7440-66-6	Zinc	21.90			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

015

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9615SDL179

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01355

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112082 SAS No.: SDG No.: B012L8

Matrix (soil/water): SOIL Lab Sample ID: 12168-13S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 93.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	111.00			P
7440-36-0	Antimony	6.20	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	57.00			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	30300.00			P
7440-47-3	Chromium	0.64	B		P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	5.90			P
7439-89-6	Iron	252.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2540.00			P
7439-96-5	Manganese	21.30			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.79	U		P
7440-09-7	Potassium	15400.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.99	U		P
7440-23-5	Sodium	44.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.68	B		P
7440-66-6	Zinc	18.50			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

016

FORM I - IN Rev.6/89

9115901.1782

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01356

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112082 SAS No.: SDG No.: B012L8

Matrix (soil/water): SOIL Lab Sample ID: 12168-02S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 93.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	125.00			P
7440-36-0	Antimony	6.30	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	57.20			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	32400.00			P
7440-47-3	Chromium	0.83	B		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	8.70			P
7439-89-6	Iron	294.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2810.00			P
7439-96-5	Manganese	27.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.10	B		P
7440-09-7	Potassium	15300.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	55.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.96	B		P
7440-66-6	Zinc	22.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500L1783

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01358

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112082 SAS No.: SDG No.: B012L8

Matrix (soil/water): SOIL Lab Sample ID: 12168-01S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 93.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	38.00	B		P
7440-36-0	Antimony	6.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	50.70			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	23200.00			P
7440-47-3	Chromium	1.20	B		P
7440-48-4	Cobalt	0.64	U		P
7440-50-8	Copper	14.90			P
7439-89-6	Iron	140.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2540.00			P
7439-96-5	Manganese	27.80			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.85	U		P
7440-09-7	Potassium	11700.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.10	U		P
7440-23-5	Sodium	23.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.64	U		P
7440-66-6	Zinc	26.30			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

018

FORM I - IN Rev.6/89

9615740.1784

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01362

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112082 SAS No.: SDG No.: B012L8

Matrix (soil/water): SOIL Lab Sample ID: 12168-10S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 93.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	71.80			P
7440-36-0	Antimony	6.30	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	45.70			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	28400.00			P
7440-47-3	Chromium	1.70	B		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	7.10			P
7439-89-6	Iron	182.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2480.00			P
7439-96-5	Manganese	22.60			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U		P
7440-09-7	Potassium	13400.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	55.60	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.61	U		P
7440-66-6	Zinc	26.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500.1785

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01366

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112082 SAS No.: SDG No.: B012L8

Matrix (soil/water): SOIL Lab Sample ID: 12168-04S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 94.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	58.00			P
7440-36-0	Antimony	6.10	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	35.20	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	20900.00			P
7440-47-3	Chromium	1.80	B		P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	8.40			P
7439-89-6	Iron	153.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2020.00			P
7439-96-5	Manganese	18.80			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.79	U		P
7440-09-7	Potassium	13300.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.98	U		P
7440-23-5	Sodium	44.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.59	U		P
7440-66-6	Zinc	27.10			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500.1786

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017P5

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112082 SAS No.: SDG No.: B012L8

Matrix (soil/water): SOIL Lab Sample ID: 12168-15S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 95.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	209.00			P
7440-36-0	Antimony	6.20	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	28.70	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	5700.00			P
7440-47-3	Chromium	1.20	B		P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	6.30			P
7439-89-6	Iron	430.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2690.00			P
7439-96-5	Manganese	34.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.92	B		P
7440-09-7	Potassium	9550.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	32.30	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.77	B		P
7440-66-6	Zinc	111.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9615500.1787

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B017X4

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112082 SAS No.: SDG No.: B012L8

Matrix (soil/water): SOIL Lab Sample ID: 12168-06S

Level (low/med): LOW Date Received: 12/18/91

% Solids: 93.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	92.40			P
7440-36-0	Antimony	6.10	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	31.60	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.50	B		P
7440-70-2	Calcium	25800.00			P
7440-47-3	Chromium	0.80	B		P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	5.90			P
7439-89-6	Iron	244.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2630.00			P
7439-96-5	Manganese	32.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.79	U		P
7440-09-7	Potassium	13900.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.98	U		P
7440-23-5	Sodium	35.90	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.59	U		P
7440-66-6	Zinc	23.30			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500.1788

TMA/Skinner & Serman Labs SAMPLE LOG-IN

WORKORDER 91-12-168 CLIENT HANFORD-NOR No. SAMPLES: 20 solids

PROTCL CLP TURNARND 33 days

COOLER TEMP: ___ oC, or NA (Soil) (Water) (Specify Other)

CUSTODIAN A. Benavi SDG/BATCH N/A

CUSTODY SEAL: PRESENT/ABSENT/INTACT/NOT CLIENT CASE N1-12-082

SHIPER & # Fedex PO/CONTRACT# ↓

TAGS: PRESENT/ABSENT/NA/SEE COC CONTACT Dolores Sanchez

CHAIN OF CUSTODY: PRESENT/ABSENT/NA,# N/A COMMENTS: NONE

SAMPLE CONTAINERS INTACT/BROKEN COMMENTS

CLIENT COMMENT? YES/NO

SAMPLE LABELS AGREE WITH CHAIN OF CUSTODY INFO? YES/NO (COMMENT)

CLIENT PAPERWORK AGREES WITH SAMPLES & COC? YES/NO (COMMENT)

SHIPMENT DATES 12/16/91

LIST ANY DATE WITH PAPERWORK/SHIPMENT PROBLEMS & SPECIFY THE PROBLEM:

N/A

	CLIENT ID	MATRIX	RECEIVED	QC	TEST(S)	HOLD TIME UP
1	B01358	SOLID	12/16/91	D	ICP mtls.	
2	356			S		
3	348					
4	366					
5	353					
6	B017X4					
7	B01347					
8	B01332					
9	B01336					
10	B01362					
11	B01340					
12	B01268					
13	B01355					
14	B01349					
15	B01325					
16	B01328					
17	B01354					
18	B01343					
19	B01339					
20	B01345					
21						
22						
23						
24						
25						
26						
27						

Complete 12/18/91 AP

SUBCONTRACT: YES/NO, TO: DATE:

REVIEWED Rev. 1.4 PAGE

Westinghouse Hanford Company 9613500.1789

CHAIN OF CUSTODY

3 of 6

Custody Form Initiator NA. CADORET

Company Contact C.A. BRANDT Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7 Collection Date 9/10/91

Ice Chest No. CAB-1 Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 2485217592 Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED, ~20g samples for metals analysis

Sample Identification

B01358	B01340
B01356	B01248
B01353	B01355
B01336	B01349
B01398	B01795
B01366	B01328
B01784	B01354
B01347	B01343
B01332	B01339
B01362	B01345

☐ Field Transfer of Custody

CHAIN OF POSSESSION		(Sign and Print Names)
Relinquished by: NA C. ADORET	Received by: Kermit Blum	Date/Time: 11-26-91 1130
Relinquished by: Kermit Blum ~~12-9~~ KB 12-12-91	Received by:	Date/Time: 12/16/91 9:30
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

106

A-6000-407 (12/90)

tot. act. < 5.0 E+1 PiCi/G

9115001790

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

385

PART I: FIELD SECTION

Collector W. CADORET Date Sampled 9-10/91 Time NA hours

Company Contact CA BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01358	1 – glass, ~200g sample	plant matter	ICP metals
B01356			
B01353			
B01336			
B01348			
B01366			
B01764			
B01347			
B01332			
B01362			
B01340			
B01258			
B01355			
B01349			
B01765			
B01328			
B01354			
B01343			
B01339			
B01345			

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 11-26-91

Analysis Required

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

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

107

A-6000-406 (05/90)

TMA
Thermo Analytical Inc.

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

9613500.1791

Federal Express 4009270300
January 31, 1992

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

Quality Control Narrative

Scope
Six (6) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 16, 1991 from Westinghouse/Hanford Company. The samples were analyzed for the USEPA CLP ICP metals only. The analysis was performed under Skinner and Sherman work order 9112169.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work 7/88 (CLP SOW788).

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

The chromium, iron, and nickel duplicates exceeded the control limit requirements.

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

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

David N. Peterson
Assistant Laboratory Manager

4-26-96
MC

9613500.1792

WESTINGHOUSE/HANFORD

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: 8012Y3

Lab Name: SKINNER & SHERMAN LABS Contract: 68-D0-0108

Lab Code: SKINER Case No.: [illegible] SAS No.: SDG No.: 8012Y3

Matrix (soil/water): SOIL Lab Sample ID: 12169-055

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	148.00			P
7440-36-0	Antimony	6.20	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	49.10			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	34300.00			P
7440-47-3	Chromium	1.20	B		P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	6.60			P
7439-89-6	Iron	338.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2910.00			P
7439-96-5	Manganese	20.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.80	U		P
7440-09-7	Potassium	14300.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	46.90	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.72	B		P
7440-66-6	Zinc	17.40			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

002

FORM I - IN Rev.6/89

9613500.1793

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

S01310

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0103

Lab Code: SKINNR Case No.: N1-IC-0832SAS No.: SDG No.: 301243

Matrix (soil/water): SOIL Lab Sample ID: 12149-065

Level (low/med): LOW Date Received: 12/16/91

% Solids: 92.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	117.00			P
7440-36-0	Antimony	6.40	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	48.50			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.28	B		P
7440-70-2	Calcium	18500.00			P
7440-47-3	Chromium	1.20	B	*	P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	2.50			P
7439-89-6	Iron	265.00		*	P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2050.00			P
7439-96-5	Manganese	19.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.00	B	*	P
7440-09-7	Potassium	18400.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	49.10	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.62	U		P
7440-66-6	Zinc	24.60			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500.1794

WESTINGHOUSE/HANFORD

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

801306

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-1C-082SAS No.: SDG No. 801Y3

Matrix (soil/water): SOIL Lab Sample ID: 12169-003

Level (low/med): LOW Date Received: 10/16/91

% Solids: 93.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	[illegible]			P
7440-36-0	Antimony	[illegible]	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	[illegible]			P
7440-41-7	Beryllium	[illegible]	U		P
7440-43-9	Cadmium	[illegible]	U		P
7440-70-2	Calcium	33100.00			P
7440-47-3	Chromium	0.72	B	*	P
7440-48-4	Cobalt	[illegible]	U		P
7440-50-8	Copper	2.70			P
7439-89-6	Iron	170.00		*	P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2750.00			P
7439-96-5	Manganese	[illegible]			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	[illegible]	U	*	P
7440-09-7	Potassium	13500.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	[illegible]	U		P
7440-23-5	Sodium	[illegible]	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	[illegible]	U		P
7440-66-6	Zinc	16.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500.1795

WESTINGHOUSE/HANFORD

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: 801199

Lab Name: SKINNER & SHERMAN ; ABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N/A SAS No.: SDG No.: 301199

Matrix (soil/water): SOIL Lab Sample ID: 12169-048

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	24.00			P
7440-36-0	Antimony	6.40	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	72.70			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.33	B		P
7440-70-2	Calcium	26000.00			P
7440-47-3	Chromium	0.70	B	*	P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	2.00			P
7439-89-6	Iron	139.00		*	P
7439-92-1	Lead				NR
7439-95-4	Magnesium	3300.00			P
7439-96-5	Manganese	28.30			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.00	B	*	P
7440-09-7	Potassium	13900.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	41.00	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.62	U		P
7440-66-6	Zinc	27.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500.1796

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

D01333

Lab Name: SKINNER & SHERMAN LABS Contract: 68-D0-0109

Lab Code: SKINER Case No.: N1-10-082 SAS No.: SDG No.: B012Y8

Matrix (soil/water): SOIL Lab Sample ID: 12119-019

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14.30			P
7440-36-0	Antimony	6.30	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	65.40			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.30	U		P
7440-70-2	Calcium	27000.00			P
7440-47-3	Chromium	15.10		*	P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	13.10			P
7439-89-6	Iron	311.00		*	P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2400.00			P
7439-96-5	Manganese	26.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	15.00		*	P
7440-09-7	Potassium	15700.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	36.40	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.61	U		P
7440-66-6	Zinc	23.60			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

006

FORM I - IN Rev.6/89

9613500.1797

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: 801337

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0103

Lab Code: SKINFR Case No.: N1-12-0[illegible] SAS No.: SDG No.: 801278

Matrix (soil/water): SOIL Lab Sample ID: 12169-03S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	117.00			P
7440-36-0	Antimony	6.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	93.30			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.24	B		P
7440-70-2	Calcium	33200.00			P
7440-47-3	Chromium	1.20	B	*	P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	7.60			P
7439-89-6	Iron	260.00		*	P
7439-92-1	Lead				NR
7439-95-4	Magnesium	[illegible]20.00			P
7439-96-5	Manganese	24.10			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.82	U	*	P
7440-09-7	Potassium	[illegible]2200.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	50.90	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.62	U		P
7440-66-6	Zinc	23.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

FORM I - IN Rev.6/90

9613500.1798

TMA/Skinner & Serman Labs SAMPLE LOG-IN

WORKORDER 91-12-169 CLIENT HANFORD-NOR No. SAMPLES: 6 solids (Soil) (Water) (Specify Other)

PROTCL CLP TURNARND 33 days

COOLER TEMP: ___ gC, or NA

CUSTODIAN A. Benney SDG/BATCH N/A

CUSTODY SEAL: PRESENT/ABSENT/INTACT/NOT CLIENT CASE N1-12-082

SHIPER & # Fedex PO/CONTRACT# ↓

TAGS: PRESENT/ABSENT/NA/SEE COC CONTACT Dolores Sanchez

CHAIN OF CUSTODY: PRESENT/ABSENT/NA, # N/A COMMENTS: NONE

SAMPLE CONTAINERS-INTACT/BROKEN COMMENTS

CLIENT COMMENT? YES/NO

SAMPLE LABELS AGREE WITH CHAIN OF CUSTODY INFO? YES/NO (COMMENT)

CLIENT PAPERWORK AGREES WITH SAMPLES & COC? YES/NO (COMMENT)

SHIPMENT DATES 12/16/91

LIST ANY DATE WITH PAPERWORK/SHIPMENT PROBLEMS & SPECIFY THE PROBLEM:

N/A

	CLIENT ID	MATRIX	RECEIVED	QC	TEST(S)	HOLD TIME UP
1	B01333	SOLID	12/16/91	D	ICP Mtls.	
2	326	↓	↓	5	↓	
3	337					
4	329					
5	B01248					
6	B01310					
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						

Complete AB 12/16/91

SUBCONTRACT: YES/NO, TO: DATE:

REVIEWED Rev. 1.4 PAGE

Westinghouse Hanford Company 9613190.1799

CHAIN OF CUSTODY

4076

Custody Form Initiator NA. CADORET

Company Contact C.A. BRANDT Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7 Collection Date 9/10/91

Ice Chest No. CAB-1 Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 248 521 7592 Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED, ~20 g samples for metals analysis

Sample Identification

B01333 -
B01326 -
B01337 -
B01329 -
B01248 -
B01310 -

] Field Transfer of Custody	CHAIN OF POSSESSION	(Sign and Print Names)
Relinquished by: NA CADORET	Received by: Kermit Blum	Date/Time: 11-26-91 1130
Relinquished by: Kermit Blum 12-12-91	Received by: [illegible]	Date/Time: 12/16/91 9:30
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

071

A-6000-407 (12/90)

tot. act. < 5.0 E+1 PiCi/G

9615500.1800

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

4085

PART I: FIELD SECTION

Collector W. CADORET Date Sampled 9-10/91 Time N/A hours

Company Contact C A BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01333	1 - glass ≈20g sample	plant matter	ICP metal
B01326			
B01337			
B01329			
B01249			
B01310			
~~B017R1~~	~~1 - glass ≈20g samples~~	~~plant matter~~	~~Gamma scan, Sr 90, Total U~~
~~B017R5~~			
~~B017R7~~			
~~B019M2~~			

Field Information** from 300-FF-5 Task 7

Special Handling and/or Storage N/A.

Possible Sample Hazards none detected.

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 11-26-91

Analysis Required

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

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

072

A-6000-406 (05/90)

TMA
Thermo Analytical Inc.

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

9615903.1801

Federal Express 4009270296
January 30, 1992

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

Quality Control Narrative

Scope
Sixteen (16) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 16, 1991 from Westinghouse/Hanford Company. The samples were analyzed for the USEPA CLP ICP metals only. The analysis was performed under Skinner and Sherman work order 9112156.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work 7/88 (CLP SOW788).

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.

(for)

David N. Peterson
Assistant Laboratory Manager

ia 4-26-96
MC

9613500.1802

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012P5

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-072SAS No.: SDG No.: B012P5

Matrix (soil/water): SOIL Lab Sample ID: 12156-10S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	67.40			P
7440-36-0	Antimony	6.50	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	30.60	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.27	B		P
7440-70-2	Calcium	21000.00			P
7440-47-3	Chromium	0.99	B		P
7440-48-4	Cobalt	0.63	U		P
7440-50-8	Copper	8.10			P
7439-89-6	Iron	210.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2420.00			P
7439-96-5	Manganese	19.70			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.90	B		P
7440-09-7	Potassium	18700.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	73.90	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.79	B		P
7440-66-6	Zinc	25.50			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

02

9613500.1803

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012V8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-072SAS No.: SDG No.: B012P5

Matrix (soil/water): SOIL Lab Sample ID: 12156-15S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	131.00			P
7440-36-0	Antimony	6.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	56.30			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	25700.00			P
7440-47-3	Chromium	1.00	B		P
7440-48-4	Cobalt	0.64	U		P
7440-50-8	Copper	6.00			P
7439-89-6	Iron	305.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2480.00			P
7439-96-5	Manganese	22.70			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.30	B		P
7440-09-7	Potassium	15300.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.10	U		P
7440-23-5	Sodium	59.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.81	B		P
7440-66-6	Zinc	22.10			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

03

9613500.1804

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012V9

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-072SAS No.: SDG No.: B012P5

Matrix (soil/water): SOIL Lab Sample ID: 12156-12S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	119.00			P
7440-36-0	Antimony	6.50	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	68.60			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	34500.00			P
7440-47-3	Chromium	0.42	U		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	7.50			P
7439-89-6	Iron	301.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	3020.00			P
7439-96-5	Manganese	23.50			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.83	U		P
7440-09-7	Potassium	14100.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	89.10	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.62	U		P
7440-66-6	Zinc	28.70			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

04

9613500.1805

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012W8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-072SAS No.: SDG No.: B012P5

Matrix (soil/water): SOIL Lab Sample ID: 12156-06S

Level (low/med): LOW Date Received: 12/16/91

% 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	204.00			P
7440-36-0	Antimony	6.10	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	18.20	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	4090.00			P
7440-47-3	Chromium	0.43	B		P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	8.00			P
7439-89-6	Iron	398.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1870.00			P
7439-96-5	Manganese	31.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.30	B		P
7440-09-7	Potassium	17100.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.98	U		P
7440-23-5	Sodium	82.10	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.82	B		P
7440-66-6	Zinc	84.80			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500.1806

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012X4

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-072SAS No.: SDG No.: B012P5

Matrix (soil/water): SOIL Lab Sample ID: 12156-04S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	165.00			P
7440-36-0	Antimony	6.50	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	24.20	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.33	B		P
7440-70-2	Calcium	6560.00			P
7440-47-3	Chromium	1.30	B		P
7440-48-4	Cobalt	0.77	B		P
7440-50-8	Copper	10.60			P
7439-89-6	Iron	381.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2650.00			P
7439-96-5	Manganese	71.20			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.60	B		P
7440-09-7	Potassium	21000.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	89.90	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.96	B		P
7440-66-6	Zinc	72.90			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

06

9613500.1807

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012X6

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-072SAS No.: SDG No.: B012P5

Matrix (soil/water): SOIL Lab Sample ID: 12156-08S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	86.70			P
7440-36-0	Antimony	6.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	48.10			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.27	B		P
7440-70-2	Calcium	41900.00			P
7440-47-3	Chromium	0.61	B		P
7440-48-4	Cobalt	0.64	U		P
7440-50-8	Copper	7.40			P
7439-89-6	Iron	248.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	5420.00			P
7439-96-5	Manganese	22.80			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.10	B		P
7440-09-7	Potassium	16200.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.10	U		P
7440-23-5	Sodium	93.20	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.64	U		P
7440-66-6	Zinc	23.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

07

9613508.1908

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B012Y0

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-072SAS No.: SDG No.: B012P5

Matrix (soil/water): SOIL Lab Sample ID: 12156-01S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	214.00			P
7440-36-0	Antimony	6.50	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	22.40	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	4860.00			P
7440-47-3	Chromium	0.98	B		P
7440-48-4	Cobalt	0.63	U		P
7440-50-8	Copper	15.70			P
7439-89-6	Iron	438.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2090.00			P
7439-96-5	Manganese	40.50			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.20	B		P
7440-09-7	Potassium	17700.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	74.90	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.79	B		P
7440-66-6	Zinc	84.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

08

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012Y2

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-072SAS No.: SDG No.: B012P5

Matrix (soil/water): SOIL Lab Sample ID: 12156-02S

Level (low/med): LOW Date Received: 12/16/91

% 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	135.00			P
7440-36-0	Antimony	6.10	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	39.20	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	20700.00			P
7440-47-3	Chromium	0.39	U		P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	9.10			P
7439-89-6	Iron	304.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2350.00			P
7439-96-5	Manganese	19.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.20	B		P
7440-09-7	Potassium	15000.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.98	U		P
7440-23-5	Sodium	73.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.60	B		P
7440-66-6	Zinc	18.40			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

09

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WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012Y6

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-072SAS No.: SDG No.: B012P5

Matrix (soil/water): SOIL Lab Sample ID: 12156-03S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	149.00			P
7440-36-0	Antimony	6.10	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	48.20			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	32300.00			P
7440-47-3	Chromium	0.39	U		P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	7.00			P
7439-89-6	Iron	362.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2590.00			P
7439-96-5	Manganese	24.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.79	U		P
7440-09-7	Potassium	14700.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.98	U		P
7440-23-5	Sodium	54.20	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.60	B		P
7440-66-6	Zinc	15.50			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

10

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B012Z0

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-072SAS No.: SDG No.: B012P5

Matrix (soil/water): SOIL Lab Sample ID: 12156-07S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	117.00			P
7440-36-0	Antimony	6.40	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	33.00	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.26	B		P
7440-70-2	Calcium	28200.00			P
7440-47-3	Chromium	0.75	B		P
7440-48-4	Cobalt	0.77	B		P
7440-50-8	Copper	6.50			P
7439-89-6	Iron	283.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2660.00			P
7439-96-5	Manganese	22.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.92	B		P
7440-09-7	Potassium	13600.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	103.00	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.94	B		P
7440-66-6	Zinc	15.70			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

11

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WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012Z3

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-072SAS No.: SDG No.: B012P5

Matrix (soil/water): SOIL Lab Sample ID: 12156-14S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	707.00			P
7440-36-0	Antimony	6.20	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	31.70	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.35	B		P
7440-70-2	Calcium	4170.00			P
7440-47-3	Chromium	1.90	B		P
7440-48-4	Cobalt	1.40	B		P
7440-50-8	Copper	10.30			P
7439-89-6	Iron	1540.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1930.00			P
7439-96-5	Manganese	138.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	2.80	B		P
7440-09-7	Potassium	21700.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	395.00	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	2.60	B		P
7440-66-6	Zinc	83.70			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

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WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012Z4

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-072SAS No.: SDG No.: B012P5

Matrix (soil/water): SOIL Lab Sample ID: 12156-09S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	140.00			P
7440-36-0	Antimony	6.50	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	58.20			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	35100.00			P
7440-47-3	Chromium	0.68	B		P
7440-48-4	Cobalt	0.63	U		P
7440-50-8	Copper	5.00	B		P
7439-89-6	Iron	325.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2380.00			P
7439-96-5	Manganese	24.20			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	4.40	B		P
7440-09-7	Potassium	14700.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	89.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.95	B		P
7440-66-6	Zinc	20.50			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500.1814

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B012Z6

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-072SAS No.: SDG No.: B012P5

Matrix (soil/water): SOIL Lab Sample ID: 12156-05S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	144.00			P
7440-36-0	Antimony	6.50	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	66.90			P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	33200.00			P
7440-47-3	Chromium	0.46	B		P
7440-48-4	Cobalt	0.63	U		P
7440-50-8	Copper	5.40			P
7439-89-6	Iron	336.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2390.00			P
7439-96-5	Manganese	23.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	0.84	U		P
7440-09-7	Potassium	12600.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.10	U		P
7440-23-5	Sodium	87.20	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.80	B		P
7440-66-6	Zinc	17.80			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

14

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WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01301

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-072SAS No.: SDG No.: B012P5

Matrix (soil/water): SOIL Lab Sample ID: 12156-13S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	141.00			P
7440-36-0	Antimony	10.10	B		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	33.90	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.47	B		P
7440-70-2	Calcium	19200.00			P
7440-47-3	Chromium	0.42	U		P
7440-48-4	Cobalt	1.70	B		P
7440-50-8	Copper	5.90			P
7439-89-6	Iron	318.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2420.00			P
7439-96-5	Manganese	27.20			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.50	B		P
7440-09-7	Potassium	16600.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.10	U		P
7440-23-5	Sodium	90.70	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.80	B		P
7440-66-6	Zinc	22.90			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

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WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01302

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-072SAS No.: SDG No.: B012P5

Matrix (soil/water): SOIL Lab Sample ID: 12156-11S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 93.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	93.20			P
7440-36-0	Antimony	6.30	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	45.60			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	25900.00			P
7440-47-3	Chromium	0.58	B		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	5.10			P
7439-89-6	Iron	277.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2180.00			P
7439-96-5	Manganese	24.60			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.10	B		P
7440-09-7	Potassium	15200.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	81.70	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.99	B		P
7440-66-6	Zinc	18.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613500.1817

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01304

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N1-12-072SAS No.: SDG No.: B012P5

Matrix (soil/water): SOIL Lab Sample ID: 12156-16S

Level (low/med): LOW Date Received: 12/16/91

% Solids: 94.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	165.00			P
7440-36-0	Antimony	6.40	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	21.30	B		P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	3630.00			P
7440-47-3	Chromium	0.59	B		P
7440-48-4	Cobalt	0.62	U		P
7440-50-8	Copper	5.50			P
7439-89-6	Iron	320.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2030.00			P
7439-96-5	Manganese	60.20			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.00	B		P
7440-09-7	Potassium	12900.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	1.00	U		P
7440-23-5	Sodium	46.30	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.86	B		P
7440-66-6	Zinc	57.60			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

17

TMA/Skinner & Serman Labs SAMPLE LOG-IN

WORKORDER 9112156 CLIENT HANFORD-NOR No. SAMPLES: 16 Solids

PROTCL CLP TURNARND 33 days (Soil) (Water) (Specify Other)

COOLER TEMP: oC, or NA

CUSTODIAN A. Benney SDG/BATCH N/A

CUSTODY SEAL: PRESENT/ABSENT/INTACT/NOT CLIENT CASE N1-12-072

SHIPER & # Fedex #1414547654 PO/CONTRACT#

TAGS: PRESENT/ABSENT/NA/SEE COC CONTACT Dolores Sanchez

CHAIN OF CUSTODY: PRESENT/ABSENT/NA, # COMMENTS:

SAMPLE CONTAINERS-INTACT/BROKEN COMMENTS

CLIENT COMMENT? YES/NO

SAMPLE LABELS AGREE WITH CHAIN OF CUSTODY INFO? YES/NO (COMMENT)

CLIENT PAPERWORK AGREES WITH SAMPLES & COC? YES /NO (COMMENT)

SHIPMENT DATES 12/16/91

LIST ANY DATE WITH PAPERWORK/SHIPMENT PROBLEMS & SPECIFY THE PROBLEM:

N/A

	CLIENT ID	MATRIX	RECEIVED	QC	TEST(S) (ICP-S)	HOLD TIME UP
1	B012Y0	SOLID	12/16/91	D	ICP Metals	
2	Y2			S		
3	Y6					
4	X4					
5	Z6					
6	W8					
7	20					
8	X6					
9	Z4					
10	P5					
11	B01302					
12	B012V9					
13	B01301					
14	B01223					
15	V8					
16	B01304					
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						

12/16/91

COMPLETE

AB

SUBCONTRACT: YES/NO, TO: DATE:

REVIEWED Rev. 1.4 PAGE

Westinghouse Hanford Company 9615500.1819

CHAIN OF CUSTODY

4 of 7

Custody Form Initiator NA. CADORET

Company Contact C.A. BRANDT Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7 Collection Date 9/10/91

Ice Chest No. CAB-3 Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 2485217592 Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED, ~20 g samples for metals analysis

Sample Identification

B012Y0	B013D2
B012Y2	B012V9
B012Y6	B01301
B012X4	B012Z3
B012Z6	B012V8
B012W8	B01304
B012Z0	
B012X6	
B012Z4	
B012P5	

] Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
NA CADORET	Kermit Blum	11-26-91 1130
Relinquished by: Kermit Blum 12-12-91	Received by:	Date/Time: 12/16/91 9:30
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: 97 tot. act. < 5.0 E+1 PiCi/G

A-6000-407 (12/90)

9613500.1200

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

506

PART I: FIELD SECTION

Collector W. CADORET Date Sampled 9-10/91 Time NA hours

Company Contact C A BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01240	1-glass, 120 g samples	plant matter	ICP metals
B01242			
B01246			
B01244			
B01276			
B01248			
B01280			
B01246			
B01274			
B01P5			
B01302			
B01249			
B01301			
B01248			
B01304			
B01273			
~~B01245~~	~~1-glass, 120 g samples~~		~~Complete scan, Total, Sr-90~~
~~B01365~~			
~~B01270~~			
~~B01273~~			

Field Information** From 300-FF-5 Table 7

Special Handling and/or Storage NA.

Possible Sample Hazards none detected.

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 11-26-91

Analysis Required

98

*Indicate whether sample is soil, sludge, water, etc.
**Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

B012P5-TMA-114

9613500.1821

TMA
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
P.O. Box 4040
Richmond, CA 94804-0040
(415) 235-2633 Fax No. (415) 235-0438

JUN 1992
RECEIVED
OSM DMO

June 11, 1992

SENT BY FEDERAL EXPRESS

Ref. TMA/Norcal N1-12-032-9571

Mr. John Bourgeault
Westinghouse Hanford Company
2355 Stevens Drive
Richland, WA 99352

Dear Mr. Bourgeault:

Enclosed on Attachment 1, are the ^{90}Sr, total uranium, and gamma scan results for the plant samples from 300-FF-5 Area, we received 4 December 1991.

Please call if you have any questions concerning this data.

Sincerely,

D.P. Kharkar

Dinkar P. Kharkar, Ph.D.
Manager, Nuclear Programs

Envlosures: Section 1 through 9
Appendices

1

ATTACHMENT 1 DATA TABLE

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012X6 (Plant Matter)	1	^{90}Sr	(-2 ± 4)	E-01
		Total Uranium	0.032 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.056 ± 0.242)	E+01
		^{51}Cr	<2.964	E+02
		^{60}Co	<2.194	E-01
		^{65}Zn	<7.035	E-01
		^{134}Cs	<2.381	E-01
		^{137}Cs	<1.739	E-01
		^{226}Ra	<3.287	E-01
		^{228}Th	<3.908	E-01
		^{232}Th	<7.594	E-01
B012Z0 (Plant Matter)	2	^{90}Sr	(1.4 ± 0.6) E+00	
		Total Uranium	0.031 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.055 ± 0.308)	E+01
		^{51}Cr	<3.606	E+02
		^{60}Co	<2.430	E-01
		^{65}Zn	<8.902	E-01
		^{134}Cs	<2.187	E-01
		^{137}Cs	<1.434	E-01
		^{226}Ra	<3.419	E-01
		^{228}Th	<3.022	E-01
		^{232}Th	<8.842	E-01
B012Z2 (Plant Matter)	3	^{90}Sr	(0.5 ± 1)	E-01
		Total Uranium	0.196 ± 0.032 (1)	
		Gamma Scan:		
		^{40}K	(1.222 ± 0.492)	E+01
		^{51}Cr	<7.633	E+02
		^{60}Co	<4.732	E-01
		^{65}Zn	<1.808	E-01
		^{134}Cs	<5.075	E-01
		^{137}Cs	<4.447	E-01
		^{226}Ra	<8.148	E-01
		^{228}Th	<6.845	E-01
		^{232}Th	<1.633	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012Y8 (Plant Matter)	4	^{90}Sr	(2 ± 7)	E-01
		Total Uranium	0.031 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.067 ± 0.334)	E+01
		^{51}Cr	<2.809	E+02
		^{60}Co	<2.916	E-01
		^{65}Zn	<9.990	E-01
		^{134}Cs	<2.786	E-01
		^{137}Cs	<2.004	E-01
		^{226}Ra	<3.928	E-01
		^{228}Th	<2.653	E-01
		^{232}Th	<9.354	E-01
B012Y1 (Plant Matter)	5	^{90}Sr	(-0.1 ± 0.1)	E+00
		Total Uranium	0.041 ± 0.008 (1)	
		Gamma Scan:		
		^{40}K	(1.149 ± 0.449)	E+01
		^{51}Cr	<7.220	E+02
		^{60}Co	<3.706	E-01
		^{65}Zn	<1.609	E+00
		^{134}Cs	<4.791	E-01
		^{137}Cs	<3.375	E-01
		^{226}Ra	<7.008	E-01
		^{228}Th	<6.271	E-01
		^{232}Th	<1.458	E-01
B012Y3 (Plant Matter)	6	^{90}Sr	(0.02 ± 2)	E-01
		Total Uranium	0.029 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.095 ± 0.288)	E+01
		^{51}Cr	<3.658	E+02
		^{60}Co	<3.205	E-01
		^{65}Zn	<1.085	E+00
		^{134}Cs	<2.178	E-01
		^{137}Cs	<1.623	E-01
		^{226}Ra	<2.662	E-01
		^{228}Th	<2.636	E-01
		^{232}Th	<8.171	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012Y0 (Plant Matter)	7	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.133 ± 0.022 (1)	
		Gamma Scan:		
		^{40}K	(1.585 ± 0.412)	E+01
		^{51}Cr	<5.717	E+02
		^{60}Co	<3.748	E-01
		^{65}Zn	<1.310	E+00
		^{134}Cs	<2.870	E-01
		^{137}Cs	<2.072	E-01
		^{226}Ra	<4.896	E-01
		^{228}Th	<4.364	E-01
		^{232}Th	<1.229	E-01
B012N8 (Plant Matter)	8	^{90}Sr	(0 ± 1)	E+00
		Total Uranium	0.029 ± 0.005 (1)	
		Gamma Scan:		
		^{40}K	(1.307 ± 0.375)	E+01
		^{51}Cr	<4.589	E+02
		^{60}Co	<2.331	E-01
		^{65}Zn	<9.359	E-01
		^{134}Cs	<2.363	E-01
		^{137}Cs	<2.050	E-01
		^{226}Ra	<5.060	E-01
		^{228}Th	<4.439	E-01
		^{232}Th	<1.024	E+00
B012X9 (Plant Matter)	9	^{90}Sr	(0 ± 1)	E+00
		Total Uranium	0.028 ± 0.005 (1)	
		Gamma Scan:		
		^{40}K	(1.028 ± 0.311)	E+01
		^{51}Cr	<3.503	E+02
		^{60}Co	<3.273	E-01
		^{65}Zn	<8.059	E-01
		^{134}Cs	<3.334	E-01
		^{137}Cs	<1.721	E-01
		^{226}Ra	<2.499	E-01
		^{228}Th	<2.725	E-01
		^{232}Th	<6.670	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page four)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012Y6	10	^{90}Sr	(-2 ± 3)	E-01
(Plant Matter)		Total Uranium	0.027 ± 0.005 (1)	
		Gamma Scan:		
		^{40}K	(1.330 ± 0.343)	E+01
		^{51}Cr	<4.210	E+02
		^{60}Co	<2.031	E-01
		^{65}Zn	<8.333	E-01
		^{134}Cs	<2.324	E-01
		^{137}Cs	<2.146	E-01
		^{226}Ra	<3.670	E-01
		^{228}Th	<3.299	E-01
		^{232}Th	<9.509	E-01
B012Y2	11	^{90}Sr	(-0.4 ± 2)	E+00
(Plant Matter)		Total Uranium	0.033 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.216 ± 0.291)	E+01
		^{51}Cr	<3.139	E+02
		^{60}Co	<2.164	E-01
		^{65}Zn	<9.908	E-01
		^{134}Cs	<2.268	E-01
		^{137}Cs	<1.375	E-01
		^{226}Ra	<3.932	E-01
		^{228}Th	<3.333	E-01
		^{232}Th	<8.473	E-01
B017X6	12	^{90}Sr	(1 ± 2)	E-01
(Plant Matter)		Total Uranium	0.031 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.046 ± 0.293)	E+01
		^{51}Cr	<3.672	E+02
		^{60}Co	<2.279	E-01
		^{65}Zn	<8.911	E-01
		^{134}Cs	<2.671	E-01
		^{137}Cs	<1.953	E-01
		^{226}Ra	<3.740	E-01
		^{228}Th	<2.853	E-01
		^{232}Th	<9.588	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page five)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012L6 (Plant Matter)	13	^{90}Sr	(-3 ± 5)	E-01
		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	<3.544	E+00
		^{51}Cr	<3.804	E+02
		^{60}Co	<3.745	E-01
		^{65}Zn	<9.799	E-01
		^{134}Cs	<2.109	E-01
		^{137}Cs	<1.936	E-01
		^{226}Ra	<3.698	E-01
		^{228}Th	<3.452	E-01
		^{232}Th	<6.296	E-01
B012W5 (Plant Matter)	14	^{90}Sr	(2 ± 2)	E-01
		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	(1.243 ± 0.333)	E+01
		^{51}Cr	<3.760	E+02
		^{60}Co	<2.580	E-01
		^{65}Zn	<1.030	E+00
		^{134}Cs	<2.495	E-01
		^{137}Cs	<1.980	E-01
		^{226}Ra	<3.804	E-01
		^{228}Th	<3.372	E-01
		^{232}Th	<9.269	E-01
B012Z9 (Plant Matter)	15	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.031 ± 0.005 (1)	
		Gamma Scan:		
		^{40}K	(7.723 ± 2.330)	E+00
		^{51}Cr	<3.422	E+02
		^{60}Co	<1.457	E-01
		^{65}Zn	<6.063	E-01
		^{134}Cs	<2.527	E-01
		^{137}Cs	<1.729	E-01
		^{226}Ra	<3.131	E-01
		^{228}Th	<3.729	E-01
		^{232}Th	<7.232	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page six)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012W0 (Plant Matter)	16	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.041 ± 0.007 (1)	
		Gamma Scan:		
		^{40}K	(1.256 ± 0.441)	E+01
		^{51}Cr	<5.598	E+02
		^{60}Co	<3.825	E-01
		^{65}Zn	<1.246	E+00
		^{134}Cs	<3.619	E-01
		^{137}Cs	<2.543	E-01
		^{226}Ra	<5.993	E-01
		^{228}Th	<3.738	E-01
		^{232}Th	<1.168	E+00
B01346 (Plant Matter)	17	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.330 ± 0.055 (1)	
		Gamma Scan:		
		^{40}K	(8.644 ± 3.969)	E+00
		^{51}Cr	<5.475	E+02
		^{60}Co	<5.577	E-01
		^{65}Zn	<1.680	E+00
		^{134}Cs	<3.852	E-01
		^{137}Cs	<2.931	E-01
		^{226}Ra	<5.952	E-01
		^{228}Th	<4.476	E-01
		^{232}Th	<1.365	E+00
B01357 (Plant Matter)	18	^{90}Sr	(2 ± 2)	E-01
		Total Uranium	0.280 ± 0.047 (1)	
		Gamma Scan:		
		^{40}K	(1.116 ± 0.342)	E+01
		^{51}Cr	<3.718	E+02
		^{60}Co	<2.411	E-01
		^{65}Zn	<7.321	E-01
		^{134}Cs	<2.234	E-01
		^{137}Cs	<2.115	E-01
		^{226}Ra	<3.076	E-01
		^{228}Th	<3.153	E-01
		^{232}Th	<7.158	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page seven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B01329 (Plant Matter)	19	^{90}Sr	(0.4 ± 2)	E-01
		Total Uranium	0.063 ± 0.011 (1)	
		Gamma Scan:		
		^{40}K	(9.906 ± 3.266)	E+00
		^{51}Cr	<3.635	E+02
		^{60}Co	<2.593	E-01
		^{65}Zn	<9.114	E-01
		^{134}Cs	<2.459	E-01
		^{137}Cs	<2.159	E-01
		^{226}Ra	<3.837	E-01
		^{228}Th	<4.110	E-01
		^{232}Th	<1.008	E+00
B01351 (Plant Matter)	20	^{90}Sr	(1 ± 4)	E-01
		Total Uranium	0.021 ± 0.004 (1)	
		Gamma Scan:		
		^{40}K	(1.254 ± 0.316)	E+00
		^{51}Cr	<2.917	E+02
		^{60}Co	<2.635	E-01
		^{65}Zn	<8.972	E-01
		^{134}Cs	<1.638	E-01
		^{137}Cs	<1.472	E-01
		^{226}Ra	<3.609	E-01
		^{228}Th	<3.104	E-01
		^{232}Th	<8.572	E-01
B01353 (Plant Matter)	21	^{90}Sr	(2 ± 2)	E-01
		Total Uranium	0.233 ± 0.039 (1)	
		Gamma Scan:		
		^{40}K	(1.357 ± 0.345)	E+01
		^{51}Cr	<3.899	E+02
		^{60}Co	<2.269	E-01
		^{65}Zn	<1.040	E+00
		^{134}Cs	<2.823	E-01
		^{137}Cs	<2.061	E-01
		^{226}Ra	<3.353	E-01
		^{228}Th	<3.238	E-01
		^{232}Th	<9.507	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page eight)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B01334 (Plant Matter)	22	^{90}Sr	(0.04 ± 1)	E+00
		Total Uranium	0.240 ± 0.040 (1)	
		Gamma Scan:		
		^{40}K	(1.341 ± 0.433)	E+01
		^{51}Cr	<6.522	E+02
		^{60}Co	<3.860	E-01
		^{65}Zn	<1.117	E+00
		^{134}Cs	<3.893	E-01
		^{137}Cs	<3.826	E-01
		^{226}Ra	<6.166	E-01
		^{228}Th	<7.790	E-01
		^{232}Th	<1.268	E+00
B01356 (Plant Matter)	23	^{90}Sr	(6 ± 2)	E-01
		Total Uranium	0.330 ± 0.055 (1)	
		Gamma Scan:		
		^{40}K	(9.254 ± 3.422)	E+00
		^{51}Cr	<4.280	E+02
		^{60}Co	<3.475	E-01
		^{65}Zn	<1.211	E+00
		^{134}Cs	<3.128	E-01
		^{137}Cs	<1.960	E-01
		^{226}Ra	<4.145	E-01
		^{228}Th	<3.318	E-01
		^{232}Th	<1.095	E-01
B01341 (Plant Matter)	24	^{90}Sr	(2 ± 3)	E-01
		Total Uranium	0.067 ± 0.011 (1)	
		Gamma Scan:		
		^{40}K	(1.007 ± 0.270)	E+01
		^{51}Cr	<3.731	E+02
		^{60}Co	<1.664	E-01
		^{65}Zn	<7.745	E-01
		^{134}Cs	<3.235	E-01
		^{137}Cs	<1.943	E-01
		^{226}Ra	<3.892	E-01
		^{228}Th	<3.908	E-01
		^{232}Th	(7.472 ± 5.512)	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page nine)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B01310 (Plant Matter)	25	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.044 ± 0.007 (1)	
		Gamma Scan:		
		^{40}K	(1.587 ± 0.432)	E+01
		^{51}Cr	<4.947	E+02
		^{60}Co	<3.827	E-01
		^{65}Zn	<1.682	E+00
		^{134}Cs	<4.010	E-01
		^{137}Cs	<3.177	E-01
		^{226}Ra	<5.911	E-01
		^{228}Th	<4.049	E-01
		^{232}Th	<1.657	E+00
B01347 (Plant Matter)	26	^{90}Sr	(-0.1 ± 1)	E+00
		Total Uranium	0.017 ± 0.003 (1)	
		Gamma Scan:		
		^{40}K	(8.979 ± 3.634)	E+00
		^{51}Cr	<5.365	E+02
		^{60}Co	<3.678	E-01
		^{65}Zn	<9.285	E-01
		^{134}Cs	<3.023	E-01
		^{137}Cs	<2.413	E-01
		^{226}Ra	<4.246	E-01
		^{228}Th	<5.365	E-01
		^{232}Th	<1.102	E+00
B01328 (Plant Matter)	27	^{90}Sr	(1 ± 3)	E-01
		Total Uranium	0.065 ± 0.011 (1)	
		Gamma Scan:		
		^{40}K	(1.366 ± 0.419)	E+01
		^{51}Cr	<5.356	E+02
		^{60}Co	<3.765	E-01
		^{65}Zn	<1.332	E+00
		^{134}Cs	<3.495	E-01
		^{137}Cs	<2.510	E-01
		^{226}Ra	<3.546	E-01
		^{228}Th	<3.567	E-01
		^{232}Th	<1.279	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page ten)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B01331	28	^{90}Sr	(3 ± 2)	E-01
(Plant Matter)		Total Uranium	0.050 ± 0.050 (1)	
		Gamma Scan:		
		^{40}K	(1.143 ± 0.400)	E+01
		^{51}Cr	<5.967	E+02
		^{60}Co	<3.682	E-01
		^{65}Zn	<9.956	E+00
		^{134}Cs	<3.524	E-01
		^{137}Cs	<2.704	E-01
		^{226}Ra	<4.638	E-01
		^{228}Th	<5.088	E-01
		^{232}Th	<1.251	E+00
B01306	29	^{90}Sr	(0.002 ± 1)	E+00
(Plant Matter)		Total Uranium	0.033 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(8.100 ± 2.826)	E+00
		^{51}Cr	<4.551	E+02
		^{60}Co	<2.976	E-01
		^{65}Zn	<8.702	E-01
		^{134}Cs	<2.024	E-01
		^{137}Cs	<2.262	E-01
		^{226}Ra	<5.236	E-01
		^{228}Th	<6.205	E-01
		^{232}Th	<8.232	E-01
B01304	30	^{90}Sr	(0.4 ± 2)	E-01
(Plant Matter)		Total Uranium	0.059 ± 0.010 (1)	
		Gamma Scan:		
		^{40}K	(1.026 ± 0.361)	E+01
		^{51}Cr	<7.969	E+02
		^{60}Co	<3.064	E-01
		^{65}Zn	<1.232	E+00
		^{134}Cs	<3.793	E-01
		^{137}Cs	<3.487	E-01
		^{226}Ra	<5.650	E-01
		^{228}Th	<5.380	E-01
		^{232}Th	<1.383	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page eleven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B017X9 (Plant Matter)	31	^{90}Sr	(0.4 ± 2)	E-01
		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	(4.663 ± 2.038)	E+00
		^{51}Cr	<4.072	E+02
		^{60}Co	<2.065	E-01
		^{65}Zn	<8.796	E-01
		^{134}Cs	<2.398	E-01
		^{137}Cs	<1.497	E-01
		^{226}Ra	<3.894	E-01
		^{228}Th	<4.070	E-01
		^{232}Th	<7.868	E-01
B017X7 (Plant Matter)	32	^{90}Sr	(0.6 ± 1)	E-01
		Total Uranium	0.071 ± 0.012 (1)	
		Gamma Scan:		
		^{40}K	(9.258 ± 3.701)	E+00
		^{51}Cr	<5.947	E+02
		^{60}Co	<3.028	E-01
		^{65}Zn	<1.071	E+00
		^{134}Cs	<2.978	E-01
		^{137}Cs	<2.405	E-01
		^{226}Ra	<3.829	E-01
		^{228}Th	<3.503	E-01
		^{232}Th	<1.003	E+00
B017X8 (Plant Matter)	33	^{90}Sr	(0.7 ± 2)	E-01
		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	(5.317 ± 2.772)	E+00
		^{51}Cr	<5.989	E+02
		^{60}Co	<2.698	E-01
		^{65}Zn	<9.602	E-01
		^{134}Cs	<3.323	E-01
		^{137}Cs	<2.252	E-01
		^{226}Ra	<4.747	E-01
		^{228}Th	<4.279	E-01
		^{232}Th	<8.908	E-01

(1) Units are μg/gram.

CASE NARRATIVE

1. Project 300-FF-5, Task 7, Plant Material (TMA/Norcal Group No. 9571) were processed together and the results of the analyses are reported. The sample ID's are:

Customer Sample ID	TMA/Norcal Group No.	Customer Sample ID	TMA/Norcal Group No.
B012X6 (Plant Material)	9571-1	B01346 (Plant Material)	9571-17
B012Z0 (Plant Material)	9571-2	B01357 (Plant Material)	9571-18
B012Z2 (Plant Material)	9571-3	B01329 (Plant Material)	9571-19
B012Y8 (Plant Material)	9571-4	B01351 (Plant Material)	9571-10
B012Y1 (Plant Material)	9571-5	B01353 (Plant Material)	9571-21
B012Y3 (Plant Material)	9571-6	B01334 (Plant Material)	9571-22
B012Y0 (Plant Material)	9571-7	B01356 (Plant Material)	9571-23
B012N8 (Plant Material)	9571-8	B01341 (Plant Material)	9571-24
B012X9 (Plant Material)	9571-9	B01310 (Plant Material)	9571-25
B012Y6 (Plant Material)	9571-10	B01347 (Plant Material)	9571-26
B012Y2 (Plant Material)	9571-11	B01328 (Plant Material)	9571-27
B017X6 (Plant Material)	9571-12	B01331 (Plant Material)	9571-28
B012L6 (Plant Material)	9571-13	B01306 (Plant Material)	9571-29
B012W5 (Plant Material)	9571-14	B01304 (Plant Material)	9571-30
B012Z9 (Plant Material)	9571-15	B017X9 (Plant Material)	9571-31
B012WO (Plant Material)	9571-16	B017X7 (Plant Material)	9571-32
		B017X8 (Plant Material)	9571-33

2. The analyses reported are:

PLANT MATERIAL	
Analyte	Group # & Sample #
^{90}Sr	9571-1 through 33
Total U	9571-1 through 33
Gamma Scan	9571-1 through 33

3. Results are reported pCi/gram dry material with 2 σ errors, except for total uranium which arreported μgm/gram dry material with 2 σ errors.

4. Strontium-90 analyses were processed in three batches, with ^{90}Sr QCs with each batch.

5. The QC samples consisting of a spike, a lab control sample, and a replicate were processed with this batch as shown on Table 1.

TABLE 1

Preparation Batch Samples Processed	Data Package
9571-1 through 33	- PLANT MATERIAL

QC SAMPLES PROCESSED:

Sample I.D.	Type	Analyses	Reported with Data Package
9571-34 (QC 7280)	Spike	^{90}Sr	X
9571-35 (QC 7281)	Spike	^{90}Sr	X
9571-36 (QC 7282)	Spike	^{90}Sr	X
9571-37 (QC 7283)	LCS	^{90}Sr	X
9571-38 (QC 7284)	LCS	^{90}Sr	X
9571-39 (QC 7285)	LCS	^{90}Sr	X
9571-40 (QC 7286)	Replicate	^{90}Sr	X
9571-41 (QC 7287)	Replicate	^{90}Sr	X
9571-42 (QC 7288)	Replicate	^{90}Sr	X
9571-43 (QC 7289)	Spike	Total U	X
9571-44 (QC 7290)	Spike	Total U	X
9571-45 (QC 7291)	LCS	Total U	X
9571-46 (QC 7292)	LCS	Total U	X
9571-47 (QC 7293)	Replicate	Total U	X
9571-48 (QC 7294)	Replicate	Total U	X
9571-49 (QC 7295)	Spike	Gamma Scan	X
9571-50 (QC 7296)	Spike	Gamma Scan	X
9571-51 (QC 7297)	LCS	Gamma Scan	X
9571-52 (QC 7298)	LCS	Gamma Scan	X
9571-53 (QC 7299)	Replicate	Gamma Scan	X
9571-54 (QC 7300)	Replicate	Gamma Scan	X

6. Analyses, reanalyses, and reworks, etc.

Strontium Analyses (Plant Material): The average yield for 33 analyses was 74%. The lowest yield was 20% and the highest was 90%. No abnormalities were encountered. The results of the spike, the Laboratory Control Sample, and the replicate were satisfactory.

Gamma Scan Analyses (Plant Material): The spike samples processed had only ^{60}Co and ^{137}Cs activity and the found/added ratio of the spikes look good. The results of the spike, the laboratory control sample, and the replicate were satisfactory.

Total Uranium Analyses (Plant Material): No abnormalities were encountered. The results of the spike, the Laboratory Control Sample, and the replicate were satisfactory.

786 container CAB4

Westinghouse Hanford Company | 9615600.1835 | **CHAIN OF CUSTODY** | 1 of 2

Custody Form Initiator: C4 Brandt

Company Contact: CA Brandt | Telephone: 376-5345

Project Designation/Sampling Locations: 300-FF-5 TASK 7 | Collection Date: 9-10/91

Ice Chest No.: CAB-4 | Field Logbook No.: BNW 53573

Bill of Lading/Airbill No.: 2485217625 | Offsite Property No.: PNL-92-272

Method of Shipment: Air

Shipped to: TMA / NORCAL

Possible Sample Hazards/Remarks: onsite samples <50 pCi/g; offsite samples no hazard.

U/gamma splits			Sample Identification	ICP splits
B012X6	B012X6	B01356		B017X9
B012Z0	B012L6	B01341		B017X8
B012Z2	B012W5	B01310		B017X7
B012Y8	B012Z9	B01347		
B012Y1	B012W0	B01328		
B012Y3	B01346	B01331		
B012Y0	B01357	B01306		
B012N8	B01329	B01304		
B012X9	B01351	B017X9		
B012Y6	B01353	B017X7		
B012Y2	B01334	B017X8		

Field Transfer of Custody — **CHAIN OF POSSESSION** — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
R A Fellows		12/2/91 10:00 am
Relinquished by:	Received by: Kermit Blum	Date/Time: 12-4-91 1100
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90)

9615290.1856

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector CA Brandt Date Sampled 9-10/91 Time N/A hours

Company Contact CA Brandt Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01353	1, ~150g glass	Plant matter	gamma scan, Sr^{90}, total U
B01334			
B01356			
B01341			
B01310			
B01347			
B01328			
B01331	ibid.	ibid.	ibid.
B01306			
B01304			
B017X9			
B017X7			
B017X8			

Field Information** from 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards none detected.

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-4-91

Analysis Required

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

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

A-6000-406 (05/90)

20

9614500.1857

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector CA Brandt Date Sampled 9-10/91 Time N/A hours

Company Contact CA Brandt Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B012X6	1, ~150g glass	Plant matter	gamma scan, Sr^{90}, total U
B012Z0			
B012Z2			
B012Y8			
B012Y1			
B012Y3			
B012Y0			
B012N8			
B012X9			
B012Y6			
B012Y2			
B017X6			
B012L6			
B012W5	Ibid.	Ibid.	Ibid.
B012Z9			
B012W0			
B01346			
B01357			
B01329			
B01351			

Field Information** From 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards None detected.

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-4-91

Analysis Required

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

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

A-6000-406 (05/90)

2

9615500.1858

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector CA Brandt Date Sampled 9-10/91 Time NA hours

Company Contact CA Brandt Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B017X7	1, ~20g in glass	plant matter	ICP metals
B017X8	"	"	"
B017X9	"	"	"

Field Information** from 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards none detected

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-4-91

Analysis Required

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

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

A-6000-406 (05/90)

2

B012P5-TMA-114

9613500.1839

TMA
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
P.O. Box 4040
Richmond, CA 94804-0040
(415) 235-2633 Fax No. (415) 235-0438

JUN 1992
RECEIVED
OSM
DMO

June 11, 1992

SENT BY FEDERAL EXPRESS

Ref. TMA/Norcal N1-12-056·9574

Mr. John Bourgeault
Westinghouse Hanford Company
2355 Stevens Drive
Richland, WA 99352

Dear Mr. Bourgeault:

Enclosed on Attachment 1, are the ^{90}Sr, total uranium, and gamma scan results for the plant samples from 300-FF-5 Area, Task 7, we received 26 November 1991.

Please call if you have any questions concerning this data.

Sincerely,

D. P. Kharkar

Dinkar P. Kharkar, Ph.D.
Manager, Nuclear Programs

Envlosures: Section 1 through 9
Appendices

4-29-96
MC

ATTACHMENT 1 DATA TABLE

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B012N5 (Plant Matter)	1	^{90}Sr	(4 ± 5)	E-01
		Total Uranium	(0.012 ± 0.002) (1)	
		Gamma Scan:		
		^{40}K	(1.191 ± 0.328)	E+01
		^{51}Cr	<7.087	E+02
		^{60}Co	<1.190	E-01
		^{65}Zn	<1.033	E+00
		^{134}Cs	<2.810	E-01
		^{137}Cs	<1.583	E-01
		^{226}Ra	<4.226	E-01
		^{228}Th	<3.147	E-01
		^{232}Th	<7.304	E-01
B012M8 (Plant Matter)	2	^{90}Sr	(3 ± 6)	E-01
		Total Uranium	0.016 ± 0.003) (1)	
		Gamma Scan:		
		^{40}K	(5.891 ± 3.151)	E+00
		^{51}Cr	<9.367	E+02
		^{60}Co	<3.768	E-01
		^{65}Zn	<1.459	E+00
		^{134}Cs	<3.689	E-01
		^{137}Cs	<2.821	E-01
		^{226}Ra	<5.115	E-01
		^{228}Th	<4.997	E-01
		^{232}Th	<1.283	E+00
B01368 (Plant Matter)	3	^{90}Sr	(-0.07 ± 1)	E+00
		Total Uranium	(0.046 ± 0.008) (1)	
		Gamma Scan:		
		^{40}K	(7.584 ± 3.315)	E+00
		^{51}Cr	<8.839	E+02
		^{60}Co	<2.436	E-01
		^{65}Zn	<1.209	E+00
		^{134}Cs	<3.080	E-01
		^{137}Cs	<3.032	E-01
		^{226}Ra	<5.561	E-01
		^{228}Th	<4.606	E-01
		^{232}Th	<1.052	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01252 (Plant Matter)	4	^{90}Sr	(-0.1 ± 2)	E+00
		Total Uranium	(0.026 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(7.806 ± 3.199)	E+00
		^{51}Cr	<8.761	E+02
		^{60}Co	<2.570	E-01
		^{65}Zn	<1.132	E+00
		^{134}Cs	<3.428	E-01
		^{137}Cs	<2.238	E-01
		^{226}Ra	<4.252	E-01
		^{228}Th	<4.107	E-01
		^{232}Th	<1.194	E+00
B017X2 (Plant Matter)	5	^{90}Sr	(-0.1 ± 0.3)	E+00
		Total Uranium	(0.056 ± 0.010) (1)	
		Gamma Scan:		
		^{40}K	(8.454 ± 3.711)	E+00
		^{51}Cr	<8.679	E+02
		^{60}Co	<2.750	E-01
		^{65}Zn	<1.183	E+00
		^{134}Cs	<3.533	E-01
		^{137}Cs	<2.615	E-01
		^{226}Ra	<4.462	E-01
		^{228}Th	<4.832	E-01
		^{232}Th	<1.250	E+00
B012T8 (Plant Matter)	6	^{90}Sr	(0 ± 1)	E+00
		Total Uranium	(0.008 ± 0.001) (1)	
		Gamma Scan:		
		^{40}K	(9.911 ± 5.220)	E+00
		^{51}Cr	<1.156	E+03
		^{60}Co	<4.272	E-01
		^{65}Zn	<1.786	E+00
		^{134}Cs	<5.197	E-01
		^{137}Cs	<3.572	E-01
		^{226}Ra	<6.103	E-01
		^{228}Th	<5.349	E-01
		^{232}Th	<1.304	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B017T5 (Plant Matter)	7	^{90}Sr	(0.03 ± 0.3)	E+00
		Total Uranium	(0.052 ± 0.009) (1)	
		Gamma Scan:		
		^{40}K	(6.075 ± 2.775)	E+00
		^{51}Cr	<7.849	E+02
		^{60}Co	<3.914	E-01
		^{65}Zn	<1.130	E+00
		^{134}Cs	<2.796	E-01
		^{137}Cs	<2.472	E-01
		^{226}Ra	<5.136	E-01
		^{228}Th	<4.741	E-01
		^{232}Th	<9.380	E-01
B012N3 (Plant Matter)	8	^{90}Sr	(-0.005 ± 0.3)	E+00
		Total Uranium	(0.016 ± 0.003) (1)	
		Gamma Scan:		
		^{40}K	(9.534 ± 2.609)	E+00
		^{51}Cr	<5.786	E+02
		^{60}Co	<3.595	E-01
		^{65}Zn	<1.118	E+00
		^{134}Cs	<2.654	E-01
		^{137}Cs	<1.959	E-01
		^{226}Ra	(6.250 ± 3.155)	E-01
		^{228}Th	<3.390	E-01
		^{232}Th	<8.758	E-01
B01363 (Plant Matter)	9	^{90}Sr	(0.02 ± 0.4)	E+00
		Total Uranium	(0.034 ± 0.006) (1)	
		Gamma Scan:		
		^{40}K	(1.069 ± 0.338)	E+01
		^{51}Cr	<6.023	E+02
		^{60}Co	<3.296	E-01
		^{65}Zn	<9.030	E-01
		^{134}Cs	<2.642	E-01
		^{137}Cs	<2.173	E-01
		^{226}Ra	(5.566 ± 3.401)	E-01
		^{228}Th	(3.819 ± 3.628)	E-01
		^{232}Th	<9.611	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page four)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B012M2 (Plant Matter)	10	^{90}Sr	(2 ± 3)	E-01
		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	(4.302 ± 2.652	E+00
		^{51}Cr	<9.150	E+02
		^{60}Co	<3.461	E-01
		^{65}Zn	<9.417	E-01
		^{134}Cs	<2.160	E-01
		^{137}Cs	<2.515	E-01
		^{226}Ra	<7.615	E-01
		^{228}Th	<6.342	E-01
		^{232}Th	<1.055	E+00
B012M9 (Plant Matter)	11	^{90}Sr	(0 ± 1)	E+00
		Total Uranium	(0.011 ± 0.002) (1)	
		Gamma Scan:		
		^{40}K	(8.197 ± 2.948)	E+00
		^{51}Cr	<5.504	E+02
		^{60}Co	<1.911	E-01
		^{65}Zn	<6.385	E-01
		^{134}Cs	<2.441	E-01
		^{137}Cs	<1.720	E-01
		^{226}Ra	<2.670	E-01
		^{228}Th	<3.319	E-01
		^{232}Th	<7.362	E-01
B017W7 (Plant Matter)	12	^{90}Sr	(-0.2 ± 0.1)	E+00
		Total Uranium	(0.065 ± 0.011) (1)	
		Gamma Scan:		
		^{40}K	(7.824 ± 3.641)	E+00
		^{51}Cr	<1.143	E+03
		^{60}Co	<4.247	E-01
		^{65}Zn	<1.640	E-01
		^{134}Cs	<5.060	E-01
		^{137}Cs	<3.397	E-01
		^{226}Ra	<6.113	E-01
		^{228}Th	<5.431	E-01
		^{232}Th	<1.149	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page five)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B017T3 (Plant Matter)	13	^{90}Sr	(-0.07 ± 1)	E+00
		Total Uranium	(0.043 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(1.002 ± 0.308)	E+01
		^{51}Cr	<7.738	E+02
		^{60}Co	<4.093	E-01
		^{65}Zn	<9.076	E-01
		^{134}Cs	<3.262	E-01
		^{137}Cs	<2.526	E-01
		^{226}Ra	<5.520	E-01
		^{228}Th	<6.203	E-01
		^{232}Th	<1.065	E+00
B01335 (Plant Matter)	14	^{90}Sr	(0.06 ± 0.03)	E+00
		Total Uranium	(0.057 ± 0.010) (1)	
		Gamma Scan:		
		^{40}K	(1.971 ± 0.586)	E+01
		^{51}Cr	<1.339	E+03
		^{60}Co	<5.164	E-01
		^{65}Zn	<1.803	E+00
		^{134}Cs	<4.856	E-01
		^{137}Cs	<4.445	E-01
		^{226}Ra	<7.728	E-01
		^{228}Th	<5.959	E-01
		^{232}Th	<1.531	E+00
B01349 (Plant Matter)	15	^{90}Sr	(0.07 ± 0.2)	E+00
		Total Uranium	(0.328 ± 0.056) (1)	
		Gamma Scan:		
		^{40}K	(1.354 ± 0.283)	E+01
		^{51}Cr	<5.794	E+02
		^{60}Co	<2.245	E-01
		^{65}Zn	<6.652	E-01
		^{134}Cs	<2.904	E-01
		^{137}Cs	<1.926	E-01
		^{226}Ra	<2.695	E-01
		^{228}Th	<3.513	E-01
		^{232}Th	<8.871	E-01

ATTACHMENT 1 DATA TABLE (cont'd., page six)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01360 (Plant Matter)	16	^{90}Sr	(2 ± 2)	E-01
		Total Uranium	(0.007 ± 0.002) (1)	
		Gamma Scan:		
		^{40}K	(1.021 ± 0.361)	E+01
		^{51}Cr	<1.041	E+03
		^{60}Co	<3.129	E-01
		^{65}Zn	<1.325	E+00
		^{134}Cs	<3.478	E-01
		^{137}Cs	<3.198	E-01
		^{226}Ra	<4.932	E-01
		^{228}Th	<4.346	E-01
		^{232}Th	<1.230	E+00
B01309 (Plant Matter)	17	^{90}Sr	(2 ± 4)	E-01
		Total Uranium	(0.041 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(1.292 ± 0.398)	E+01
		^{51}Cr	<1.109	E+03
		^{60}Co	<3.956	E-01
		^{65}Zn	<1.621	E+00
		^{134}Cs	<3.754	E-01
		^{137}Cs	<3.023	E-01
		^{226}Ra	<6.158	E-01
		^{228}Th	<4.867	E-01
		^{232}Th	<1.531	E+00
B012M4 (Plant Matter)	18	^{90}Sr	(-0.1 ± 1)	E+00
		Total Uranium	(0.025 ± 0.004 (1)	
		Gamma Scan:		
		^{40}K	(6.695 ± 4.217)	E+00
		^{51}Cr	<1.181	E+03
		^{60}Co	<4.864	E-01
		^{65}Zn	<1.303	E+00
		^{134}Cs	<4.532	E-01
		^{137}Cs	<3.596	E-01
		^{226}Ra	<6.788	E-01
		^{228}Th	<5.256	E-01
		^{232}Th	<1.591	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page seven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01352 (Plant Matter)	19	^{90}Sr	(-0.4 ± 1)	E+00
		Total Uranium	(0.153 ± 0.026) (1)	
		Gamma Scan:		
		^{40}K	(8.972 ± 3.264)	E+00
		^{51}Cr	<8.424	E+02
		^{60}Co	<4.1327	E-01
		^{65}Zn	<9.447	E-01
		^{134}Cs	<3.065	E-01
		^{137}Cs	<2.067	E-01
		^{226}Ra	<3.756	E-01
		^{228}Th	<3.213	E-01
		^{232}Th	<9.249	E-01
B01330 (Plant Matter)	20	^{90}Sr	(0.2 ± 2)	E+00
		Total Uranium	(0.036 ± 0.006) (1)	
		Gamma Scan:		
		^{40}K	(1.224 ± 0.397)	E+01
		^{51}Cr	<1.018	E+03
		^{60}Co	<3.477	E-01
		^{65}Zn	<1.385	E+00
		^{134}Cs	<3.900	E-01
		^{137}Cs	<3.243	E-01
		^{226}Ra	<4.958	E-01
		^{228}Th	<5.073	E-01
		^{232}Th	<1.257	E+00
B01350 (Plant Matter)	21	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	(0.284 ± 0.048) (1)	
		Gamma Scan:		
		^{40}K	(1.299 ± 0.437)	E+01
		^{51}Cr	<1.002	E+03
		^{60}Co	<3.367	E-01
		^{65}Zn	<1.380	E+00
		^{134}Cs	<3.871	E-01
		^{137}Cs	<3.047	E-01
		^{226}Ra	<5.993	E-01
		^{228}Th	<4.717	E-01
		^{232}Th	<1.242	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page eight)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01337	22	^{90}Sr	(0.7 ± 1)	E-01
(Plant Matter)		Total Uranium	(0.081 ± 0.014) (1)	
		Gamma Scan:		
		^{40}K	(1.242 ± 0.349)	E+01
		^{51}Cr	<1.017	E+03
		^{60}Co	<3.648	E-01
		^{65}Zn	<1.268	E+00
		^{134}Cs	<3.837	E-01
		^{137}Cs	<3.176	E-01
		^{226}Ra	<4.580	E-01
		^{228}Th	<4.584	E-01
		^{232}Th	<1.391	E+00
B01342	23	^{90}Sr	(-0.04 ± 0.7)	E+00
(Plant Matter)		Total Uranium	(0.046 ± 0.008) (1)	
		Gamma Scan:		
		^{40}K	(1.237 ± 0.483)	E+01
		^{51}Cr	<1.174	E+03
		^{60}Co	<4.311	E-01
		^{65}Zn	<1.735	E+00
		^{134}Cs	<3.822	E-01
		^{137}Cs	<2.758	E-01
		^{226}Ra	<6.379	E-01
		^{228}Th	<5.148	E-01
		^{232}Th	<1.432	E+00
B01332	24	^{90}Sr	(1 ± 2)	E-01
(Plant Matter)		Total Uranium	(0.080 ± 0.013) (1)	
		Gamma Scan:		
		^{40}K	(1.338 ± 0.401)	E+01
		^{51}Cr	<9.379	E+02
		^{60}Co	<2.648	E-01
		^{65}Zn	<1.482	E+00
		^{134}Cs	<2.844	E-01
		^{137}Cs	<2.000	E-01
		^{226}Ra	<4.257	E-01
		^{228}Th	<4.869	E-01
		^{232}Th	<1.049	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page nine)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01326	25	^{90}Sr	(2 ± 2)	E-01
(Plant Matter)		Total Uranium	(0.054 ± 0.009) (1)	
		Gamma Scan:		
		^{40}K	(1.092 ± 0.397)	E+01
		^{51}Cr	<1.036	E+03
		^{60}Co	<3.807	E-01
		^{65}Zn	<1.302	E+00
		^{134}Cs	<4.171	E-01
		^{137}Cs	<3.066	E-01
		^{226}Ra	<5.678	E-01
		^{228}Th	<4.667	E-01
		^{232}Th	<1.199	E+00
B017Q1	26	^{90}Sr	(0.3 ± 2)	E-01
(Plant Matter)		Total Uranium	(0.028 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(9.750 ± 3.496)	E+00
		^{51}Cr	<8.070	E+02
		^{60}Co	<3.909	E-01
		^{65}Zn	<1.377	E+00
		^{134}Cs	<3.892	E-01
		^{137}Cs	<2.427	E-01
		^{226}Ra	(3.371 ± 3.135)	E-01
		^{228}Th	<4.633	E-01
		^{232}Th	<9.656	E-01
B012N1	27	^{90}Sr	(0 ± 1)	E+00
(Plant Matter)		Total Uranium	(0.018 ± 0.003) (1)	
		Gamma Scan:		
		^{40}K	(8.047 ± 1.472)	E+00
		^{51}Cr	<3.006	E+02
		^{60}Co	<1.106	E-01
		^{65}Zn	<4.295	E-01
		^{134}Cs	<1.213	E-01
		^{137}Cs	<9.146	E-02
		^{226}Ra	<1.738	E-01
		^{228}Th	<1.476	E-01
		^{232}Th	<4.230	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page ten)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01359 (Plant Matter)	28	^{90}Sr	(0 ± 1)	E+00
		Total Uranium	(0.013 ± 0.003) (1)	
		Gamma Scan:		
		^{40}K	(8.769 ± 1.468)	E+00
		^{51}Cr	<3.104	E+02
		^{60}Co	<9.977	E-02
		^{65}Zn	<4.156	E-01
		^{134}Cs	<1.020	E-01
		^{137}Cs	<8.123	E-02
		^{226}Ra	<1.882	E-01
		^{228}Th	<1.708	E-01
		^{232}Th	<3.570	E-01
B01369 (Plant Matter)	29	^{90}Sr	(-0.004 ± 0.2)	E+00
		Total Uranium	(0.114 ± 0.019) (1)	
		Gamma Scan:		
		^{40}K	(1.613 ± 0.471)	E+01
		^{51}Cr	<1.108	E+03
		^{60}Co	<4.061	E-01
		^{65}Zn	<1.529	E+00
		^{134}Cs	<5.100	E-01
		^{137}Cs	<3.926	E-01
		^{226}Ra	<6.604	E-01
		^{228}Th	<5.097	E-01
		^{232}Th	<1.170	E+00
B012N0 (Plant Matter)	30	^{90}Sr	(0.1 ± 0.4)	E+00
		Total Uranium	(0.014 ± 0.003) (1)	
		Gamma Scan:		
		^{40}K	(9.412 ± 3.017)	E+00
		^{51}Cr	<7.159	E+02
		^{60}Co	<3.178	E-01
		^{65}Zn	<8.585	E-01
		^{134}Cs	<2.702	E-01
		^{137}Cs	<2.146	E-01
		^{226}Ra	<4.195	E-01
		^{228}Th	<5.392	E-01
		^{232}Th	<1.039	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page eleven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01358 (Plant Matter)	31	^{90}Sr	(3 ± 2)	E-01
		Total Uranium	(0.007 ± 0.002) (1)	
		Gamma Scan:		
		^{40}K	(6.994 ± 3.485)	E+01
		^{51}Cr	<7.801	E+02
		^{60}Co	<3.633	E-01
		^{65}Zn	<1.033	E+00
		^{134}Cs	<3.169	E-01
		^{137}Cs	<1.654	E-01
		^{226}Ra	(6.909 ± 4.350)	E-01
		^{228}Th	(4.256 ± 3.741)	E-01
		^{232}Th	<1.079	E+00
B017N9 (Plant Matter)	32	^{90}Sr	(-0.8 ± 6)	E+00
		Total Uranium	(0.012 ± 0.002) (1)	
		Gamma Scan:		
		^{40}K	(3.367 ± 2.790)	E+00
		^{51}Cr	<7.657	E+02
		^{60}Co	<2.603	E-01
		^{65}Zn	<9.285	E-01
		^{134}Cs	<2.643	E-01
		^{137}Cs	<2.049	E-01
		^{226}Ra	<4.462	E-01
		^{228}Th	<3.203	E-01
		^{232}Th	<9.391	E-01
B01250 (Plant Matter)	33	^{90}Sr	(0.1 ± 4)	E-01
		Total Uranium	(0.019 ± 0.003) (1)	
		Gamma Scan:		
		^{40}K	(9.510 ± 3.256)	E+00
		^{51}Cr	<7.595	E+02
		^{60}Co	<3.203	E-01
		^{65}Zn	<1.294	E+00
		^{134}Cs	<3.523	E-01
		^{137}Cs	<2.130	E-01
		^{226}Ra	<4.850	E-01
		^{228}Th	<3.571	E-01
		^{232}Th	<9.922	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page twelve)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01348 (Plant Matter)	34	^{90}Sr	(-0.1 ± 0.3)	E+00
		Total Uranium	(0.027 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(1.002 ± 0.367)	E+01
		^{51}Cr	<8.303	E+02
		^{60}Co	<5.073	E-01
		^{65}Zn	<1.161	E+00
		^{134}Cs	<3.009	E-01
		^{137}Cs	<2.545	E-01
		^{226}Ra	<4.571	E-01
		^{228}Th	<3.872	E-01
		^{232}Th	<9.796	E-01
B012V0 (Plant Matter)	35	^{90}Sr	(1 ± 4)	E-01
		Total Uranium	(0.061 ± 0.010) (1)	
		Gamma Scan:		
		^{40}K	(5.382 ± 3.349)	E+00
		^{51}Cr	<7.636	E+02
		^{60}Co	<3.578	E-01
		^{65}Zn	<1.273	E+00
		^{134}Cs	<3.110	E-01
		^{137}Cs	<2.637	E-01
		^{226}Ra	<4.494	E-01
		^{228}Th	<4.333	E-01
		^{232}Th	<1.110	E+00
B017N6 (Plant Matter)	36	^{90}Sr	(2 ± 3)	E-01
		Total Uranium	(0.026 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(3.342 ± 2.640)	E+00
		^{51}Cr	<9.226	E+02
		^{60}Co	<3.295	E-01
		^{65}Zn	<1.319	E+00
		^{134}Cs	<3.935	E-01
		^{137}Cs	<3.557	E-01
		^{226}Ra	<5.773	E-01
		^{228}Th	<8.308	E-01
		^{232}Th	<1.065	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page thirteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01366 (Plant Matter)	37	^{90}Sr	(-0.7 ± 4)	E-01
		Total Uranium	(0.012 ± 0.002) (1)	
		Gamma Scan:		
		^{40}K	(8.203 ± 3.915)	E+00
		^{51}Cr	<1.083	E+03
		^{60}Co	<3.297	E-01
		^{65}Zn	<1.364	E+00
		^{134}Cs	<3.516	E-01
		^{137}Cs	<2.790	E-01
		^{226}Ra	<6.026	E-01
		^{228}Th	<3.936	E-01
		^{232}Th	<1.193	E+00
B01361 (Plant Matter)	38	^{90}Sr	(-0.2 ± 0.4)	E+00
		Total Uranium	(0.008 ± 0.002) (1)	
		Gamma Scan:		
		^{40}K	(8.053 ± 3.248)	E+00
		^{51}Cr	<5.951	E+02
		^{60}Co	<2.273	E-01
		^{65}Zn	<1.038	E+00
		^{134}Cs	<1.865	E-01
		^{137}Cs	<1.865	E-01
		^{226}Ra	<4.444	E-01
		^{228}Th	<4.026	E-01
		^{232}Th	<7.821	E-01
B01336 (Plant Matter)	39	^{90}Sr	(0.06 ± 0.3)	E+00
		Total Uranium	(1.581 ± 0.266) (1)	
		Gamma Scan:		
		^{40}K	(1.611 ± 0.438)	E+01
		^{51}Cr	<1.114	E+03
		^{60}Co	<5.423	E-01
		^{65}Zn	<1.802	E+00
		^{134}Cs	<5.207	E-01
		^{137}Cs	<3.933	E-01
		^{226}Ra	<6.864	E-01
		^{228}Th	<5.797	E-01
		^{232}Th	<1.605	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page fourteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B017M0 (Plant Matter)	40	^{90}Sr	(0.06 ± 0.2)	E+00
		Total Uranium	(0.260 ± 0.044) (1)	
		Gamma Scan:		
		^{40}K	(7.803 ± 2.925)	E+00
		^{51}Cr	<9.007	E+02
		^{60}Co	<2.033	E-01
		^{65}Zn	<9.230	E-01
		^{134}Cs	<3.072	E-01
		^{137}Cs	<2.201	E-01
		^{226}Ra	<3.194	E-01
		^{228}Th	<4.164	E-01
		^{232}Th	<9.708	E-01
B012M3 (Plant Matter)	41	^{90}Sr	(5 ± 4)	E-01
		Total Uranium	(0.122 ± 0.020) (1)	
		Gamma Scan:		
		^{40}K	<5.398	E+00
		^{51}Cr	<9.735	E+02
		^{60}Co	<5.274	E-01
		^{65}Zn	<1.120	E+00
		^{134}Cs	<4.500	E-01
		^{137}Cs	<2.738	E-01
		^{226}Ra	<5.124	E-01
		^{228}Th	(4.411 ± 3.757)	E-01
		^{232}Th	<1.299	E+00
B017M4 (Plant Matter)	42	^{90}Sr	(0 ± 3)	E-01
		Total Uranium	(0.231 ± 0.039) (1)	
		Gamma Scan:		
		^{40}K	(1.009 ± 0.335)	E+01
		^{51}Cr	<8.392	E+02
		^{60}Co	<2.499	E-01
		^{65}Zn	<7.666	E-01
		^{134}Cs	<2.603	E-01
		^{137}Cs	<2.202	E-01
		^{226}Ra	<4.096	E-01
		^{228}Th	<4.215	E-01
		^{232}Th	<9.193	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page fifteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B012T4 (Plant Matter)	43	^{90}Sr	(0.7 ± 3)	E-01
		Total Uranium	(0.023 ± 0.004) (1)	
		Gamma Scan:		
		^{40}K	(8.107 ± 2.521)	E+00
		^{51}Cr	<9.475	E+02
		^{60}Co	<2.780	E-01
		^{65}Zn	<1.142	E+00
		^{134}Cs	<2.962	E-01
		^{137}Cs	<2.202	E-01
		^{226}Ra	<3.996	E-01
		^{228}Th	<3.633	E-01
		^{232}Th	<1.061	E+00
B012L9 (Plant Matter)	44	^{90}Sr	(-0.1 ± 0.2	E+00
		Total Uranium	<0.003 (1)	
		Gamma Scan:		
		^{40}K	(5.899 ± 2.284)	E+00
		^{51}Cr	<7.043	E+02
		^{60}Co	<2.404	E-01
		^{65}Zn	<1.130	E+00
		^{134}Cs	<2.403	E-01
		^{137}Cs	<2.497	E-01
		^{226}Ra	<4.186	E-01
		^{228}Th	<3.938	E-01
		^{232}Th	<6.645	E-01
B012S8 (Plant Matter)	45	^{90}Sr	(1 ± 3)	E-01
		Total Uranium	(0.029 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(1.153 ± 0.431)	E+01
		^{51}Cr	<9.359	E+02
		^{60}Co	<3.829	E-01
		^{65}Zn	<1.227	E-01
		^{134}Cs	<3.508	E-01
		^{137}Cs	<2.570	E-01
		^{226}Ra	<4.893	E-01
		^{228}Th	<4.154	E-01
		^{232}Th	<1.258	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page sixteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B012T2 (Plant Matter)	46	^{90}Sr	(0.9 ± 2)	E-01
		Total Uranium	(0.020 ± 0.004) (1)	
		Gamma Scan:		
		^{40}K	(1.040 ± 0.271)	E+01
		^{51}Cr	<7.612	E+02
		^{60}Co	<2.035	E-01
		^{65}Zn	<8.304	E-01
		^{134}Cs	<1.810	E-01
		^{137}Cs	<1.416	E-01
		^{226}Ra	<3.509	E-01
		^{228}Th	<3.905	E-01
		^{232}Th	<9.132	E-01
B017V1 (Plant Matter)	47	^{90}Sr	(-0.2 ± 3)	E-00
		Total Uranium	(0.026 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(5.764 ± 4.148)	E+00
		^{51}Cr	<1.186	E+03
		^{60}Co	<3.420	E-01
		^{65}Zn	<1.677	E+00
		^{134}Cs	<4.564	E-01
		^{137}Cs	<4.075	E-01
		^{226}Ra	<6.195	E-01
		^{228}Th	<5.088	E-01
		^{232}Th	<1.524	E+00
B017V3 (Plant Matter)	48	^{90}Sr	(2 ± 3)	E-01
		Total Uranium	(0.027 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(6.692 ± 3.359)	E+00
		^{51}Cr	<8.406	E+02
		^{60}Co	<2.524	E-01
		^{65}Zn	<1.119	E-01
		^{134}Cs	<3.092	E-01
		^{137}Cs	<2.184	E-01
		^{226}Ra	<4.229	E-01
		^{228}Th	<4.520	E-01
		^{232}Th	<1.033	E+00

(1) Units are μgm/gram dry weight.

CASE NARRATIVE

1. Project 300-FF-5, Task 7, Plant Material (TMA/Norcal Group No. 9574 were processed together and the results of the analyses are reported. The sample ID's are:

Customer Sample ID	TMA/Norcal Group No.	Customer Sample ID	TMA/Norcal Group No.
B012N5 (Plant Material))	9574-1	B01326 (Plant Material)	9574-25
B012M8 (Plant Material))	9574-2	B017Q1 (Plant Material)	9574-26
B01368 (Plant Material))	9574-3	B012N1 (Plant Material)	9574-27
B01252 (Plant Material))	9574-4	B01359 (Plant Material)	9574-28
B017X2 (Plant Material))	9574-5	B01369 (Plant Material)	9574-29
B01TY8 (Plant Material))	9574-6	B012N0 (Plant Material)	9574-30
B017T5 (Plant Material))	9574-7	B01358 (Plant Material)	9574-31
B012N3 (Plant Material))	9574-8	B017N9 (Plant Material)	9574-32
B01363 (Plant Material))	9574-9	B012S0 (Plant Material)	9574-33
B012M2 (Plant Material))	9574-10	B01348 (Plant Material)	9574-34
B012M9 (Plant Material))	9574-11	B012V0 (Plant Material)	9574-35
B017W7 (Plant Material))	9574-12	B017N6 (Plant Material)	9574-36
B017T3 (Plant Material))	9574-13	B01366 (Plant Material)	9574-37
B01335 (Plant Material))	9574-14	B01361 (Plant Material)	9574-38
B01349 (Plant Material))	9574-15	B01336 (Plant Material)	9574-39
B01360 (Plant Material))	9574-16	B017M0 (Plant Material)	9574-40
B01309 (Plant Material))	9574-17	B012M3 (Plant Material)	9574-41
B012M4 (Plant Material))	9574-18	B017M4 (Plant Material)	9574-32
B01352 (Plant Material))	9574-19	B012T4 (Plant Material)	9574-43
B01330 (Plant Material))	9574-20	B012L9 (Plant Material)	9574-44
B01350 (Plant Material))	9574-21	B012S8 (Plant Material)	9574-45
B01337 (Plant Material))	9574-22	B01272 (Plant Material)	9574-46
B01342 (Plant Material))	9574-23	B017V1 (Plant Material)	9574-47
B01332 (Plant Material))	9574-24	B017V3 (Plant Material)	9574-48

2. The analyses reported are:

PLANT MATERIAL	
Analyte	Group # & Sample #
^{90}Sr	9574-1 through 48
Total U	9574-1 through 48
Gamma Scan	9574-1 through 48

3. Results are reported pCi/gram dry material with 2 σ errors.

4. Strontium-90 analyses were processed in five batches, with ^{90}Sr QCs with each batch.

5. The QC samples consisting of a spike, a lab control sample, and a replicate were processed with this batch as shown on Table 1.

TABLE 1

Preparation Batch Samples Processed	Data Package
9574-1 through 48	- PLANT MATERIAL

QC SAMPLES PROCESSED:

Sample I.D.	Type	Analyses	Reported with Data Package
9574-49 (QC 7373)	Spike	^{90}Sr	X
9574-50 (QC 7374)	Spike	^{90}Sr	X
9574-51 (QC 7375)	Spike	^{90}Sr	X
9574-52 (QC 7376)	Spike	^{90}Sr	X
9574-53 (QC 7377)	Spike	^{90}Sr	X
9574-54 (QC 7378)	LCS	^{90}Sr	X
9574-55 (QC 7379)	LCS	^{90}Sr	X
9574-56 (QC 7380)	LCS	^{90}Sr	X
9574-57 (QC 7381)	LCS	^{90}Sr	X
9574-58 (QC 7382)	LCS	^{90}Sr	X
9574-59 (QC 7383)	Replicate	^{90}Sr	X
9574-60 (QC 7384)	Replicate	^{90}Sr	X
9574-61 (QC 7385)	Replicate	^{90}Sr	X
9574-62 (QC 7386)	Replicate	^{90}Sr	X
9574-63 (QC 7387)	Replicate	^{90}Sr	X
9574-64 (QC 7388)	Spike	Total U	X
9574-65 (QC 7389)	Spike	Total U	X
9574-66 (QC 7390)	Spike	Total U	X
9574-67 (QC 7391)	LCS	Total U	X
9574-68 (QC 7392)	LCS	Total U	X
9574-69 (QC 7393)	LCS	Total U	X
9574-70 (QC 7394)	Replicate	Total U	X
9574-71 (QC 7395)	Replicate	Total U	X
9574-72 (QC 7396)	Replicate	Total U	X
9574-73 (QC 7297)	Spike	Gamma Scan	X
9574-74 (QC 7298)	Spike	Gamma Scan	X
9574-75 (QC 7299)	Spike	Gamma Scan	X
9574-76 (QC 7400)	LCS	Gamma Scan	X
9574-77 (QC 7401)	LCS	Gamma Scan	X
9574-78 (QC 7402)	LCS	Gamma Scan	X
9574-79 (QC 7403)	Replicate	Gamma Scan	X
9574-80 (QC 7404)	Replicate	Gamma Scan	X
9574-81 (QC 7405)	Replicate	Gamma Scan	X

6. Analyses, reanalyses, and reworks, etc.

Strontium Analyses (Plant Matter): The average yield for 48 analyses was 78%. The lowest yield was 62% and the highest was 89%. No abnormalities were encountered. The results of the spike, the Laboratory Control Sample, and the replicate were satisfactory, except for one spike which had a Found/Added ratio of 0.77 ± 0.06.

Gamma Scan Analyses (Plant Matter): The spike sample processed had only ^{60}Co and ^{137}Cs activity. The found/added ratio of the spike look good. The results of the spike, the laboratory control sample, and the replicate were satisfactory.

Total Uranium Analyses (Plant Matter): No abnormalities were encountered. The results of the spike, the Laboratory Control Sample, and the replicate were satisfactory.

Westinghouse Hanford Company 9613500.1859

CHAIN OF CUSTODY

1 of 3

Custody Form Initiator NA. CADORET

Company Contact C.A. BRANDT

Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7

Collection Date 9/10/91

Ice Chest No. CAB-2

Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 24 X5 21 7592

Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED, ~130g samples for gamma scan, SR-90, + Total U

Sample Identification

B012N5	B012M9
B012M8	B017W7
B01368	B017T3
B012S2	B01335
B017X2	B01349
B012T8	B01360
B017T5	B01309
B012N3	B012M4
B01363	B01352
B012M2	B01330

☐ Field Transfer of Custody

CHAIN OF POSSESSION

(Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
NA CADORET	Kermit Blum	11-26-91 1130
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:

A-6000-407 (12/90)

Westinghouse Hanford Company 9615500.1860

CHAIN OF CUSTODY

Custody Form Initiator NA. CADORET

Company Contact C.A. BRANDT Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7 Collection Date 9/10/91

Ice Chest No. CAB-2 Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 24852759 2 Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED, ~130, samples for ~~metals~~ SR-90, Total U, gamma scan. NC 11/22/91

Sample Identification

B01350	B01358
B01337	B017N9
B01342	~~B01250~~ B01250 NC 11/22/91
B01332	B01348
B01326	B012V0
B017Q1	B017N6
B012N1	B01366
B01359	B01361
B01369	B01336
B012N0	B017M0

☐ Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
NA CADORET	Kermit Blum	11-26-91 1130
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:

A-6000-407 (12/90)

Westinghouse Hanford Company 9613500.1861

CHAIN OF CUSTODY

3 of 3

Custody Form Initiator: NA. CADORET

Company Contact: C.A. BRANDT

Telephone: 6-5345

Project Designation/Sampling Locations: 300-FF-5 TASK 7

Collection Date: 9/10/91

Ice Chest No.: CAB-2

Field Logbook No.: BNW 53573 + 52960

Bill of Lading/Airbill No.: 2485217592

Offsite Property No.: PNL92-219

Method of Shipment: AIR

Shipped to: TMA/NORCAL

Possible Sample Hazards/Remarks: NONE DETECTED, ~130g. samples for SR-90, Gamma Scan, + Total U.

Sample Identification

- B012M3
- B017M4
- B012T4
- B012L9X
- B012S8
- B012T2
- B017V1
- B017V3

☐ Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
NA CADORET	Kermit Blum	11-26-91 1130
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:

A-6000-407 (12/90)

3

9613500.1862

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

123

PART I: FIELD SECTION

Collector W. CADORET Date Sampled 9-10/91 Time N/A hours

Company Contact C A BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B012N5	1 - glass, ~130g samples	plant matter	Gamma Scan, Sr-90, Total U
B012M8			
B01368			
B012S2			
B017X2			
B012T8			
B017T5			
B012N3			
B01363			
B012M2			
B012M9			
B017W7			
B017T3			
B01335			
B01349			
B01360			
B01309			
B012M4			
B01352			
B01330			

Field Information** from 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards none detected

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 11-26-91

Analysis Required

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

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

A-6000-406 (05/90)

9150P.1863

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

2 of 3

PART I: FIELD SECTION

Collector W. CADORET Date Sampled 9-10/91 Time N/A hours

Company Contact C A BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01350	1 - glass, 130g samples	Nail matter	Gamma scan, Sr-90, Total U
B01337			
B01342			
B01332			
B01326			
B017Q1			
B012N1			
B01359			
B01369			
B012N0			
B01357			
B017N9			
B012S0			
B01348			
B012V0			
B017N6			
B01366			
B01361			
B01336			
B017M0			

Field Information** from 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards none detected

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 11-26-91

Analysis Required

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

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

A-6000-406 (05/90)

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

3073

PART I: FIELD SECTION

Collector N. CADORET Date Sampled 9-10/91 Time N/A hours

Company Contact C A BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B012M3	1-glass, 130g samples	plant matter	Gamma scan, Total U, Sr-90
B017M4			
B012T4			
B012L9			
B012S8			
B012T2			
B017V1			
B017V3			

Field Information** from 300-FF-5

Special Handling and/or Storage N/A

Possible Sample Hazards none detected.

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 11-26-91

Analysis Required

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

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

A-6000-406 (05/90)

9613500.1865

VALIDATION SUMMARY

Verification
A. Kocher 1° on 6/26/92
J. Reid 2° on 7/20/92

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST - FORM A-6

A. Kocher

PROJECT: Westinghouse Hanford	REVIEWER: J. Reid	DATE: 6-26-92
LABORATORY: TMA	CASE: N1-12-080	SDG: B012M3 B012L9
SAMPLE/MATRIX: 40/Biota Metals B0-12M3, B0-12W0, B012W3, B0-12W5, B0-12X7, B0-12Y1, B0-12Z1, B0-12Z5, B0-12Z9, B0-12L9, B0-1300, B0-1303, B0-1305, B0-1306, B0-1307, B0-1308, B0-1331, B0-1336, B0-1369, B0-1330, B0-17X1, B0-17X3, B0-12M6, B0-12W2, ~~B0-1213~~ B0-1309 ~~1309~~, B0-1327, B0-1334, B0-1335, B0-1338, B0-1341, B0-1342, B0-1344, B0-1350, B0-1351, B0-1352, B0-1357, B0-1359, B0-1361, B0-17P7, B0-17X5		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	☑	☐	☐
Cover Page	☑	☐	☐
Traffic Reports	☑	☐	☐
Sample Data			
Inorganic Analysis Data Sheets	☑	☐	☐
Standards Data			
Initial and Continuing Calibration Verification	☑	☐	☐
CRDL Standard for AA and ICP	☑	☐	☐
QC Summary			
Blanks	☑	☐	☐
ICP Interference Check Summary	☑	☐	☐
Spike Sample Recovery	☑	☐	☐
Post-Digestion Spike Sample Recovery	☑	☐	☐
Duplicate	☑	☐	☐
Laboratory Control Sample	☑	☐	☐
Standard Addition Results	☑	☐	☐
ICP Serial Dilutions	☑	☐	☐
Instrument Detection Limits	☑	☐	☐
ICP Interelement Correction Factors	☑	☐	☐
ICP Linear Ranges	☑	☐	☐
Preparation Log	☑	☐	☐
Analysis Run Log	☑	☐	☐
Raw Data			
ICP Raw Data	☑	☐	☐
Furnace AA Raw Data	☐	☑ *	☐
Mercury Raw Data	☐	☑ *	☐
Cyanide Raw Data	☐	☑ *	☐
Additional Data			
Internal laboratory chain-of-custody No	~~☑~~	☑	☐
Laboratory Sample Preparation Records	☑	☐	☐

* Only ICP run - no GFAA or CVAA or cyanide

Data Package Item	Present?: Yes	No	N/A
Percent Solids Analysis Records	☒	☐	☐
Reduction Formulae	☒	☐	☐
Instrument Run Logs	☒	☐	☐
Chemist notebook pages	☒	☐	☐

2. HOLDING TIMES (Form B-1)

Have all samples been analyzed within holding times?	Yes	No	N/A

ACTION: If any holding times have been exceeded qualify all affected results as estimated (J for\ detects and UJ for nondetects).

3. INITIAL CALIBRATIONS (Form B-2)

Were all instruments calibrated daily, each set-up time and was the proper number of standards used?	Yes	No	N/A
Are the correlation coefficients ≥0.995?	Yes	No	N/A
Was a midrange cyanide standard distilled?	Yes	No	N/A

ACTION: Qualify all data as unusable if reported from an analysis in which an instrument was not calibrated or was calibrated with less than the minimum number of standards. Qualify associated sample results >IDL as estimated (J) and results <IDL as estimated (UJ), if the correlation coefficient is <0.0995 or the laboratory did not distill the midrange cyanide standard.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION (Form B-2)

Are ICV and CCV percent recoveries within control limits?	Yes	No	N/A
Are there calculation errors?	Yes	No	N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

5. ICP INTERFERENCE CHECK SAMPLE (Form B-2)

Has an ICS sample been analyzed at the proper frequency?	Yes	No	N/A
Are the AB solution %R values within control?	Yes	No	N/A
Are there calculation errors?	Yes	No	N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST - FORM A-6

PROJECT: WESTINGHOUSE	REVIEWER: S. PETERSON	DATE: 7-6-92
LABORATORY: SKINNER & SHERMAN	CASE: N1-12-080	SDG: B012-M3
SAMPLE/MATRIX: 20 BIOTA FOR ICP METALS		
SAMPLE NUMBERS: B012M3, B012W0, B012W3, B012W5,		
B012X7, B012Y1, B012Z1, B012Z5, B012Z9, B012Z9S, spike		
duplicate B013000, B013000D, B01303, B01305, B01306, B01307,		
B013008, B01331, B01346, B01369, B017X1, B017X3		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

data package completeness verification completed by Andrew Kocher

Data Package Item Present?:	Yes	No	N/A
Case Narrative	☐	☐	☐
Cover Page	☐	☐	☐
Traffic Reports	☐	☐	☐
Sample Data			
Inorganic Analysis Data Sheets	☐	☐	☐
Standards Data			
Initial and Continuing Calibration Verification	☐	☐	☐
CRDL Standard for AA and ICP	☐	☐	☐
QC Summary			
Blanks	☐	☐	☐
ICP Interference Check Summary	☐	☐	☐
Spike Sample Recovery	☐	☐	☐
Post-Digestion Spike Sample Recovery	☐	☐	☐
Duplicate	☐	☐	☐
Laboratory Control Sample	☐	☐	☐
Standard Addition Results	☐	☐	☐
ICP Serial Dilutions	☐	☐	☐
Instrument Detection Limits	☐	☐	☐
ICP Interelement Correction Factors	☐	☐	☐
ICP Linear Ranges	☐	☐	☐
Preparation Log	☐	☐	☐
Analysis Run Log	☐	☐	☐
Raw Data			
ICP Raw Data	☐	☐	☐
Furnace AA Raw Data	☐	☐	☐
Mercury Raw Data	☐	☐	☐
Cyanide Raw Data	☐	☐	☐
Additional Data			
Internal laboratory chain-of-custody	☐	☐	☐
Laboratory Sample Preparation Records	☐	☐	☐

See preceding page

Data Package Item	Present?: Yes	No	N/A
Percent Solids Analysis Records	☐	☐	☐
Reduction Formulae	☐	☐	☐
Instrument Run Logs	☐	☐	☐
Chemist notebook pages	☐	☐	☐

2. HOLDING TIMES (Form B-1)

Have all samples been analyzed within holding times?	Yes	No	N/A

ACTION: If any holding times have been exceeded qualify all affected results as estimated (J for\ detects and UJ for nondetects).

3. INITIAL CALIBRATIONS (Form B-2)

Were all instruments calibrated daily, each set-up time and was the proper number of standards used?	Yes	No	N/A
Are the correlation coefficients ≥0.995?	Yes	No	N/A
Was a midrange cyanide standard distilled?	Yes	No	N/A

ACTION: Qualify all data as unusable if reported from an analysis in which an instrument was not calibrated or was calibrated with less than the minimum number of standards. Qualify associated sample results >IDL as estimated (J) and results <IDL as estimated (UJ), if the correlation coefficient is <0.0995 or the laboratory did not distill the midrange cyanide standard.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION (Form B-2)

Are ICV and CCV percent recoveries within control limits?	Yes	No	N/A
Are there calculation errors?	Yes	No	N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

5. ICP INTERFERENCE CHECK SAMPLE (Form B-2)

Has an ICS sample been analyzed at the proper frequency?	Yes	No	N/A
Are the AB solution %R values within control?	Yes	No	N/A
Are there calculation errors?	Yes	No	N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

B012m3

6. LABORATORY BLANKS (Form B-3) EAH 7/16/92

Are target compounds present in the blanks? Yes ~~No~~ N/A

ACTION: Qualify all associated positive results for any analyte <5 times the amount in any laboratory blank as nondetected (U). If analyte concentrations in the blank are >CRDL or below the negative CRDL, verify the laboratory has redigested and reanalyzed associated samples with analyte concentrations <10 times the blank concentration. If the laboratory has not redigested and reanalyzed the samples, note in the validation narrative.

7. FIELD BLANKS (Form B-3)

Are target analytes present in the field blanks? Yes No N/A

ACTION: Qualify all sample results for any analyte <5 times the amount in any field blank as nondetected (U).

8. MATRIX SPIKE SAMPLE ANALYSIS (Form B-4)

Are spike recoveries within the control limits? Yes No N/A

ACTION: Qualify the affected sample data according to the following requirements:

If spike recovery is >125% and sample results are <IDL no qualification is required. If spike recovery is >125% or <75% qualify all positive results as estimated (J). If spike recovery is 30% to 74% qualify all nondetects as estimated (UJ). If spike recovery is <30%, reject all nondetects (R). If the field blank has been used for spike analysis, note in the validation narrative.

9. LABORATORY CONTROL SAMPLE (Form B-4)

Are percent recoveries within the acceptance limits? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify the sample data according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results >IDL, for which the LCS %R falls within the range 50-79% or >120%. Qualify as estimated (UJ), all sample results <IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R <50%.

SOLID LCS - Qualify as estimated (J), all sample results >IDL for which the LCS result is outside the established control limits. Qualify as estimated (UJ), all sample results <IDL for which the LCS %R are lower than the established control limits.

B012m

10. PERFORMANCE AUDIT ANALYSIS

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample analysis in the data validation narrative.

11. DUPLICATE SAMPLE ANALYSIS (Form B-5)

Are RPD values acceptable? Yes No N/A

ACTION: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD results fall outside the appropriate control limits. If field blanks were used for laboratory duplicates, note in the validation narrative.

12. ICP SERIAL DILUTION (Form B-6)

Are the serial dilution results acceptable? Yes No N/A

Is there evidence of negative interference? Yes No N/A

ACTION: Qualify the associated data as estimated (J) for those analytes in which the %D is outside the control limits. If evidence of negative interference is found, use professional judgement to qualify the data.

13. FIELD DUPLICATE SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field duplicate samples in the validation narrative.

14. FIELD SPLIT SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field split samples in the validation narrative.

15/16. FURNACE ATOMIC ABSORPTION QUALITY CONTROL (Form B-6)

Do all applicable analyses have duplicate injections? Yes No N/A

Are applicable duplicate injection RSD values within control limits? Yes No N/A

If no, were samples rerun once as required? Yes No N/A

Does the RSD for the rerun fall within the control limits? Yes No N/A

Were analytical spike recoveries within the control limits? Yes No N/A

B012m3

If no, were MSA analyses performed when required?	Yes	No	N/A
Are MSA correlation coefficients ≥0.995?	Yes	No	N/A
If no, was a second MSA analysis performed?	Yes	No	N/A

ACTION: If duplicate injections are outside the acceptance limits and the sample has not been reanalyzed or the reanalysis is outside the acceptance limits, qualify the associated data as estimated (J for detects and UJ for nondetects). If the analytical spike recovery is <40% qualify detects as estimated (J). If the analytical spike recovery is ≥10% but <40%, qualify all nondetects as estimated (UJ) and if the analytical spike recovery is <10%, reject all nondetects (R). If the sample absorbance is <50% of the analytical spike absorbance and the analytical spike recovery is <85% or >115%, qualify all results as estimated (J for detects and UJ for nondetects). If method of standard additions (MSA) was required but was not performed, the MSA samples were spiked incorrectly, or the MSA correlation coefficient was <0.995, qualify the associated detected results as estimated (J).

17. ANALYTE QUANTITATION AND DETECTION LIMITS (Form B-6)

Have results been reported and calculated correctly?	Yes	No	N/A
Are results within the calibration range of the instruments and within the linear range of the ICP?	Yes	No	N/A
Are all detection limits below the CRQL?	Yes	No	N/A

ACTION: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

18. OVERALL ASSESSMENT AND SUMMARY (Form B-7)

Have the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

B012m3

COMMENTS (attach additional sheets as necessary): Findings

① ~~Cadmium RPD for the field duplicates was greater than 2xCRDL. See Form B-6 for details~~

EAH 7/16/92

Overall, the data are of good quality, minor qualification was required for the following reason:

1. Blank contamination

The prep. blank, ICB & CCB, were contaminated at a low level with some of the analytes listed on Form (3). The associated sample results <5 times the blank concentration were considered non-detect & qualified w/ (U).

No other qualification was required.

B012m

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST - FORM A-6

PROJECT: Westinghouse	REVIEWER: KSH	DATE: 7/2/92
LABORATORY: TMA Skinner & Sherman	CASE: N112080	SDG: B01249
SAMPLE/MATRIX: 20 "soil" ("biota") - plant matter		
B01249, B012M6, B012W2, B01309, B01327, B01330, B01334, B01335		
B01338, B01341, B01342, B01344, B01350, B01351, B01352,		
B01357, B01359, B01361, B017P7, B017X5		
+ B012M6S, B01361D (spike, duplicate)		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

verification done by AK.

see preceding page

Data Package Item	Present?: Yes	No	N/A
Case Narrative	☐	☐	☐
Cover Page	☐	☐	☐
Traffic Reports	☐	☐	☐
Sample Data			
Inorganic Analysis Data Sheets	☐	☐	☐
Standards Data			
Initial and Continuing Calibration Verification	☐	☐	☐
CRDL Standard for AA and ICP	☐	☐	☐
QC Summary			
Blanks	☐	☐	☐
ICP Interference Check Summary	☐	☐	☐
Spike Sample Recovery	☐	☐	☐
Post-Digestion Spike Sample Recovery	☐	☐	☐
Duplicate	☐	☐	☐
Laboratory Control Sample	☐	☐	☐
Standard Addition Results	☐	☐	☐
ICP Serial Dilutions	☐	☐	☐
Instrument Detection Limits	☐	☐	☐
ICP Interelement Correction Factors	☐	☐	☐
ICP Linear Ranges	☐	☐	☐
Preparation Log	☐	☐	☐
Analysis Run Log	☐	☐	☐
Raw Data			
ICP Raw Data	☐	☐	☐
Furnace AA Raw Data	☐	☐	☐
Mercury Raw Data	☐	☐	☐
Cyanide Raw Data	☐	☐	☐
Additional Data			
Internal laboratory chain-of-custody	☐	☐	☐
Laboratory Sample Preparation Records	☐	☐	☐

Data Package Item	Present?:	Yes	No	N/A
Percent Solids Analysis Records	Done by A.K.	☐	☐	☐
Reduction Formulae		☐	☐	☐
Instrument Run Logs		☐	☐	☐
Chemist notebook pages		☐	☐	☐

2. HOLDING TIMES (Form B-1)

Have all samples been analyzed within holding times?	(Yes)	No	N/A

ACTION: If any holding times have been exceeded qualify all affected results as estimated (J for\ detects and UJ for nondetects).

3. INITIAL CALIBRATIONS (Form B-2)

Were all instruments calibrated daily, each set-up time and was the proper number of standards used?	(Yes)	No	N/A
Are the correlation coefficients ≥0.995?	Yes	No	(N/A)
Was a midrange cyanide standard distilled?	Yes	No	(N/A)

ACTION: Qualify all data as unusable if reported from an analysis in which an instrument was not calibrated or was calibrated with less than the minimum number of standards. Qualify associated sample results >IDL as estimated (J) and results <IDL as estimated (UJ), if the correlation coefficient is <0.0995 or the laboratory did not distill the midrange cyanide standard.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION (Form B-2)

Are ICV and CCV percent recoveries within control limits?	(Yes)	No	N/A
Are there calculation errors?	Yes	(No)	N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

5. ICP INTERFERENCE CHECK SAMPLE (Form B-2)

Has an ICS sample been analyzed at the proper frequency?	(Yes)	No	N/A
Are the AB solution %R values within control?	(Yes)	No	N/A
Are there calculation errors?	Yes	(No)	N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

6. LABORATORY BLANKS (Form B-3)

Are target compounds present in the blanks? Yes No N/A

ACTION: Qualify all associated positive results for any analyte <5 times the amount in any laboratory blank as nondetected (U). If analyte concentrations in the blank are >CRDL or below the negative CRDL, verify the laboratory has redigested and reanalyzed associated samples with analyte concentrations <10 times the blank concentration. If the laboratory has not redigested and reanalyzed the samples, note in the validation narrative.

7. FIELD BLANKS (Form B-3)

Are target analytes present in the field blanks? Yes No N/A

ACTION: Qualify all sample results for any analyte <5 times the amount in any field blank as nondetected (U).

8. MATRIX SPIKE SAMPLE ANALYSIS (Form B-4)

Are spike recoveries within the control limits? Yes No N/A

ACTION: Qualify the affected sample data according to the following requirements:

If spike recovery is >125% and sample results are <IDL no qualification is required. If spike recovery is >125% or <75% qualify all positive results as estimated (J). If spike recovery is 30% to 74% qualify all nondetects as estimated (UJ). If spike recovery is <30%, reject all nondetects (R). If the field blank has been used for spike analysis, note in the validation narrative.

9. LABORATORY CONTROL SAMPLE (Form B-4)

Are percent recoveries within the acceptance limits? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify the sample data according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results >IDL, for which the LCS %R falls within the range 50-79% or >120%. Qualify as estimated (UJ), all sample results <IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R <50%.

SOLID LCS - Qualify as estimated (J), all sample results >IDL for which the LCS result is outside the established control limits. Qualify as estimated (UJ), all sample results <IDL for which the LCS %R are lower than the established control limits.

10. PERFORMANCE AUDIT ANALYSIS

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample analysis in the data validation narrative.

11. DUPLICATE SAMPLE ANALYSIS (Form B-5)

Are RPD values acceptable? Yes No N/A

ACTION: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD results fall outside the appropriate control limits. If field blanks were used for laboratory duplicates, note in the validation narrative.

12. ICP SERIAL DILUTION (Form B-6)

Are the serial dilution results acceptable? Yes No N/A

Is there evidence of negative interference? Yes No N/A

ACTION: Qualify the associated data as estimated (J) for those analytes in which the %D is outside the control limits. If evidence of negative interference is found, use professional judgement to qualify the data.

13. FIELD DUPLICATE SAMPLES

Do the RPD values exceed the control limits? Yes No N/A 2nd not this pack

ACTION: Note the results of the field duplicate samples in the validation narrative.

14. FIELD SPLIT SAMPLES

Do the RPD values exceed the control limits? Yes No N/A not in this pack

ACTION: Note the results of the field split samples in the validation narrative.

15/16. FURNACE ATOMIC ABSORPTION QUALITY CONTROL (Form B-6)

Do all applicable analyses have duplicate injections? Yes No N/A

Are applicable duplicate injection RSD values within control limits? Yes No N/A

If no, were samples rerun once as required? Yes No N/A

Does the RSD for the rerun fall within the control limits? Yes No N/A

Were analytical spike recoveries within the control limits? Yes No N/A

If no, were MSA analyses performed when required?	Yes	No	N/A
Are MSA correlation coefficients ≥0.995?	Yes	No	N/A
If no, was a second MSA analysis performed?	Yes	No	N/A

ACTION: If duplicate injections are outside the acceptance limits and the sample has not been reanalyzed or the reanalysis is outside the acceptance limits, qualify the associated data as estimated (J for detects and UJ for nondetects). If the analytical spike recovery is <40% qualify detects as estimated (J). If the analytical spike recovery is ≥10% but <40%, qualify all nondetects as estimated (UJ) and if the analytical spike recovery is <10%, reject all nondetects (R). If the sample absorbance is <50% of the analytical spike absorbance and the analytical spike recovery is <85% or >115%, qualify all results as estimated (J for detects and UJ for nondetects). If method of standard additions (MSA) was required but was not performed, the MSA samples were spiked incorrectly, or the MSA correlation coefficient was <0.995, qualify the associated detected results as estimated (J).

17. ANALYTE QUANTITATION AND DETECTION LIMITS (Form B-6)

Have results been reported and calculated correctly?	Yes	No	N/A
Are results within the calibration range of the instruments and within the linear range of the ICP?	Yes	No	N/A
Are all detection limits below the CRQL?	Yes	No	N/A

ACTION: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

18. OVERALL ASSESSMENT AND SUMMARY (Form B-7)

Have the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary): Findings

① The laboratory blanks were found to contain target compounds in them. Associated sample results were flagged (U) estimated for any analyte < 5 times the amount found in a blank for any positive sample results. Reference Form B-3 for details.

Overall Assessment

Overall the data quality is good & acceptable with the added qualifiers & changes noted. The laboratory conducted the analysis in accordance with the analytical SOW, but the project specific data quality objectives were not met due to the laboratory blank contamination.

HOLDING TIME SUMMARY - FORM B-1

SDG: B012m3	REVIEWER: S. Peterson			DATE: 7-6-92		PAGE 1 OF 2	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, ~~DAYS~~	ANALYSIS HOLDING TIME, ~~DAYS~~	QUALIFIER
B012m3	ICP Metals	9-10/91	1-20-92	1-28-92	< 6 Months	< 6 Months	None
B012W0	↓	↓	↓	↓	↓	↓	↓
B012W3	↓	↓	↓	↓	↓	↓	↓
B012W5	↓	↓	↓	↓	↓	↓	↓
B012X7	↓	↓	↓	↓	↓	↓	↓
B012Y1	↓	↓	↓	↓	↓	↓	↓
B012Z1	↓	↓	↓	↓	↓	↓	↓
B012Z5	↓	↓	↓	↓	↓	↓	↓
B012Z9	↓	↓	↓	↓	↓	↓	↓
B0~~1279~~ 1300	↓	↓	↓	↓	↓	↓	↓
B013003	↓	↓	↓	↓	↓	↓	↓
B013005	↓	↓	↓	↓	↓	↓	↓
B013006	↓	↓	↓	↓	↓	↓	↓
B013007	↓	↓	↓	↓	↓	↓	↓
B013008	↓	↓	↓	↓	↓	↓	↓
B01331	↓	↓	↓	↓	↓	↓	↓

HOLDING TIME SUMMARY - FORM B-1

SDG: B012m3	REVIEWER: S. Peterson			DATE: 7-6-92		PAGE 2 OF 2	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B01346	ICP Metals	9-10/91	1-20-92	1-28-92	<6 Months	<6 Months	None
B01369	↓	↓	↓	↓	↓	↓	↓
B017X1	↓	↓	↓	↓	↓	↓	↓
B017X3	↓	↓	↓	↓	↓	↓	↓

CALIBRATION DATA SUMMARY - FORM B-2

SDG: B012MS	REVIEWER: E. Heik	DATE: 7/16/92	PAGE ___ OF ___			
COMMENTS:						
CALIB.TYPE:	INITIAL CONTINUING	INSTRUMENT:				
CALIB. DATE	COMPOUND	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER	

EHH

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG: B012MS	REVIEWER: E. Haik	DATE: 7/16/92	PAGE OF
COMMENTS:			

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
prep. blank	Cd	0.214	B		mg/kg	1.07	—	13 samples	u
IcB		0.22	B		mg/kg	1.10	—		
ccB1		0.34	B			1.7	—		
ccB2		0.52	B			2.6	—		
ccB3		0.52	B			2.6	—		
ccB1		0.48	B			2.4	—		
ccB2		0.6	B			3.0	—		
ccB1	Ba	0.28	B			1.4		None	None
ccB2 & ccB3		0.38	B			1.9			
ccB1 & ccB2		0.32	B			1.6			
prep. blank	Cr	1.204	B			6.02		19 samples	u
ccB2		0.68	B			3.4			
ccB3		0.44	B			2.2			
prep. blank	Cu	2.786	B			13.9		All samples	u
ccB2		0.7	B			3.5			
ccB1 & ccB2	Mn	0.32	B			1.6		None	None

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG: B012M5	REVIEWER: E. Hauk	DATE: 7/16/92	PAGE OF

COMMENTS:

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB2	Mn	0.26	B		mg/kg	1.3		None	None
CCB2	↓	0.30	B			1.5		↓	↓
prep. blank	Na	11.042	B			55.2		10 samples	"
CCB1	↓	7.32	B			36.6		↓	
CCB2	V	0.7	B			3.5		5 samples	"
prep. blank	Zn	3.076	B			15.4		None	None

EAH

ACCURACY DATA SUMMARY - FORM B-4

SDG: BØ12MS	REVIEWER: E. Haik	DATE:	PAGE OF
COMMENTS:			

SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
				EAH

PRECISION DATA SUMMARY - FORM B-5

SDG: B012M3	REVIEWER: E. Hair	DATE: 7/16/92	PAGE ___ OF ___		
COMMENTS: For field duplicate see Form B-6					
COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER

ER 7/17

9615500.1886

9614590.1887

WHC-SD-EN-SPP-002, Rev. 1

CALCULATION SUMMARY - FORM B-6

SDG: BØ12M3	REVIEWER: S. Peterson	DATE: 7-6-92	PAGE 1 OF 1

COMMENTS:

RE: Field Duplicate Samples

CRDL	BØ1308	B017X3	RPD	Limit
~~13.2~~ 43.0 Al	106 *	92.7 *	13.4	35
~~0.2~~ 43.0 Ba	55.8 *	55.3 *	.9	35
~~18.4~~ 1075 Ca	26300 *	24300 *	7.9	35
~~1.2~~ 2.9 Cr	.86B	U	2	~~2.4~~ 4.4 EAH
~~2.8~~ ~~0.6~~ 5.4 Cu	5.2 B *	6.6 *	23.7	35 7/16/92
~~7.0~~ 21.5 Fe	242 *	204 *	17.0	35
~~13.8~~ 1075 Mg	1900 *	2080 *	9.0	35
~~0.2~~ 3.2 Mn	18.8 *	19.7 *	4.7	35
~~15.2~~ 1075 K	15800 *	14800 *	6.5	35
~~6.8~~ 1075 Na	45.3 B *	54.1 B *	17.7	35
~~2.2~~ 4.3 Zn	21.6 *	23.7 *	9.3	35
~~0.2~~ 1.07 Cd	U	0.28 B	2	~~0.4~~ 2.14
Solid	% 93.1	93.2%		EAH 7/16/92

* 5 x CRDL ~~(CRDL Based on reported U for Preparation Blanks)~~ EAH 7/16/92

~~All RPDs are acceptable except for Cadmium (Cd)~~

RE: ANALYTE QUANTITATION

Sample No.	Lab ID	Analyte	Calc.	Reported
BØ12Y1	-11S	Iron	$\frac{1.12 \times 200}{1.03 \times .943} = 230.5$	231 ✓
BØ13ØØ	-01S	Magnesium	$\frac{10.597 \times 200}{1.02 \times .928} = 2239$	2240 ✓

HOLDING TIME SUMMARY - FORM B-1

SDG: B012L9	REVIEWER: KSH			DATE: 7/2/92		PAGE 1 OF 2	
COMMENTS: Metals							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
~~AH~~ B012L9	ICP met	9/10/91	1/20/92	1/29/92	132	9	none
B012M6	↓	↓	↓	1/29/92	↓	↓	↓
B012W2	↓	↓	↓	↓	↓	↓	↓
B01309	↓	↓	↓	↓	↓	↓	↓
B01327	↓	↓	↓	↓	↓	↓	↓
B01330	↓	↓	↓	↓	↓	↓	↓
B01334	↓	↓	↓	↓	↓	↓	↓
B01335	↓	↓	↓	↓	↓	↓	↓
B01338	↓	↓	↓	↓	↓	↓	↓
B01341	↓	↓	↓	↓	↓	↓	↓
B01342	↓	↓	↓	↓	↓	↓	↓
B01344	↓	↓	↓	↓	↓	↓	↓
B01350	↓	↓	↓	↓	↓	↓	↓
B01351	↓	↓	↓	↓	↓	↓	↓
B01352	↓	↓	↓	↓	↓	↓	↓
B01357	↓	↓	↓	↓	↓	↓	↓

HOLDING TIME SUMMARY - FORM B-1

SDG: B01229	REVIEWER: KSH			DATE: 7/2/92		PAGE 2 OF 2	
COMMENTS: Metals							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B01359	ICP met	9/10/91	1/20/92	1/29/92	132	9	none
B01361	↓	↓	↓	1/29/92	↓	↓	↓
B017P7	↓	↓	↓	↓	↓	↓	↓
B017X5	↓	↓	↓	↓	↓	↓	↓

CALIBRATION DATA SUMMARY - FORM B-2

SDG: B01249	REVIEWER: KSH	DATE: 7/16/92	PAGE 1 OF 1		
COMMENTS: Metals					
CALIB.TYPE: INITIAL CONTINUING		INSTRUMENT:			
CALIB. DATE	COMPOUND	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG: B012L9 | REVIEWER: KSH | DATE: 7/16/92 | PAGE 1 OF 1

COMMENTS: Metals

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
PBS	Calcium	8.754	B		mg/kg	43.77		all	none
	Copper	0.848	B			4.24			B01327
	Iron	5.090	B			25.45			none
	Silver	0.462	B			2.31			All five samp—B (*) → U (Blank conc.)
	Vanadium	-0.696	B			-3.48	-6.96	none	—
	Zinc	2.258	B			11.29			none
ICB	Antimony	15.3	B		µg/L	76.5		B01309	U
	Copper	3.5	B			17.5			
	Iron	-18.3	B			-91.5	-183.0	none	—
	Silver	4.6	B			23.0	~~EAH 8/3/92 = 20.1~~		
	Vanadium	-2.1	B			-10.5	-20.1	~~none~~ All reported results < 10x the blank conc required redigestion	
	Zinc	6.9	B			34.5			EAH 8/3/92
CCB 1	Aluminum	22.4	B		µg/L	112.0			
	Antimony	8.6	B			43.0			
	Copper	5.6	B			28.0			
	Iron	11.6	B			58.0			

(*) B012L9, B01309, B01344, B01351, B01359

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG: B012L9	REVIEWER: KSH			DATE: 7/16/92				PAGE 2 OF 2	
COMMENTS: Metals									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB 2	Copper	4.9	B		µg/L	24.5		all	
CCB 2	Silver	3.5	B		µg/L	17.5			
CCB 3	Copper	3.5	B		µg/L	17.5			
CCB 3	Silver	3.5	B		µg/L	17.5			
CCB 4	Barium	10.6	B		µg/L	53.0			
	Cadmium	1.7	B			8.5		BD1334 only	U
	Iron	12.7	B			63.5			
	Manganese	2.4	B			12.0			
	Silver	2.3	B			11.5			
CCB 5	Aluminum	26.5	B		µg/L	132.5		none	
	Antimony	8.6	B			43.0			
	Barium	16.0	B			80.0			
	Cadmium	1.0	B			5.0			
	Copper	4.2	B			21.0			
	Manganese	2.4	B			12.0			
	Silver	3.5	B			17.5			

ACCURACY DATA SUMMARY - FORM B-4

SDG: B012L9	REVIEWER: KSM	DATE: 7/16/92	PAGE 1 OF 1	
COMMENTS: Metals				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED

PRECISION DATA SUMMARY - FORM B-5

SDG: 801249	REVIEWER: KSH	DATE: 7/16/92	PAGE 1 OF 1		
COMMENTS: Metals					
COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Aluminum	B01341	B017X5	7.5	none	none
Barium	↓	↓	12.6	↓	↓
Calcium	↓	↓	7.9	↓	↓
Copper	↓	↓	4.3	↓	↓
Iron	↓	↓	7.8	↓	↓
Magnesium	↓	↓	8.4	↓	↓
Manganese	↓	↓	8.4	↓	↓
Potassium	↓	↓	13.8	↓	↓
Sodium	↓	↓	13.3	↓	↓
Zinc	↓	↓	8.3	↓	↓

COMPOUND IDENTIFICATION AND QUANTITATION COMMENTS - FORM B-6

SDG: B012L9	REVIEWER: D. Verdon	DATE: 7/6/92	PAGE 1 OF 2

COMMENTS:

Sample	Result	Analyte	% Solids	Analysis Date/Time
B012L9 (12166-19S)	5.7 mg/kg	copper	95.0	1/29/92 @ 1520

$$\frac{C \times D}{W \times S} = \frac{(.02907)(200\ ml)}{(1.07)\ 95.0/100}$$

$$= 5.7\ mg/kg \checkmark$$

Sample	Result	Analyte	% solids	Analysis Date/Time
B01327 (12166-13S)	15.80	Mn	94.1	1/29/92 @ 1458

$$\frac{C \times D}{W \times S} = \frac{(.07659)(200\ ml)}{(1.03)\ (94.1/100)}$$

$$= 15.80 \checkmark$$

9615500.1896

CALCULATION SUMMARY - FORM B-6

SDG:	REVIEWER:	DATE:	PAGE 2 OF 2

COMMENTS:

Re: Field Duplicate Results

5xCRDL		B01341	B17P7
1000	Al	102	308
1000	Ba	69.3	26.4 B
25000	Ca	* 26400	4360
125	Cu	4.7 B	6.3
500	Fe	270	*584
25000	Mg	2970	2120
75	Mn	28.6	51.1
200	Ni	1.2 B	1.3 B
25000	K	15500	9650
25000	Na	40.8 B	39.1 B
100	Zn	25.2	*118
25	Be	~~0.26~~ U	0.26 B
250	Co	U	1.1 B
250	V	U	0.64 B

* > 5xCRDL

9613590.1897

TELEPHONE CONTACT SUMMARY - FORM B-8

REVIEWER:	DATE:	TIME:	PAGE ___ OF ___
COMPANY:			
ADDRESS:			
PERSON CONTACTED:			
TELEPHONE:		FAX:	
PROJECT/CASE/SDG:			
REMARKS:			
ACTION:			

originals

5-93-06/2973-50

WESTINGHOUSE HANFORD COMPANY
300-FF-5 RI DATA VALIDATION
DISTRIBUTION FORM

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Project Files (1=Adm: 2=Corres: 3=Source Information: 4=Technical Data & Products)

1.1	File Index	2.1	Incoming Correspondence		4.4.5	Biota/Small Mammals	X
1.2	Distribution Lists	2.2	Outgoing Correspondence	X	4.4.6	Surface Water/Sediments	
1.3	Project Procedures	2.3	Internal Correspondence		4.5	Data Val. & Qual. Summary/Rpts.	
1.4	Project Modifications				4.5.1	Round 1 Groundwater	
1.5.1	Staff Resumes	3.1	Task Order		4.5.1.1	Internal Drafts/Comments/Resol.	
1.5.2	Staff Training	3.2	Sample Lists		4.5.1.2	WHC Review Draft/Comments/Resol.	
1.5.3	Auth./Former Site Employee	3.3	Data Validation Procedures		4.5.1.3	Final Report	
1.6.1	QA Manual	3.4	Original Chemical Data		4.5.2	Round 2 Groundwater	
1.6.2	QA Implementation	3.5	Original Radiochem Data		4.5.2.1	Internal Drafts/Comments/Resol.	
1.6.3.1	QA Audits-Deliverables				4.5.2.2	WHC Review Draft/Comments/Resol.	
1.6.3.2	QA Audits-Files	4.1	Task Plan		4.5.2.3	Final Report	
1.6.4.1	Audit Resps-Deliverables	4.2	Data Pkg. Completeness Verif.		4.5.3	Round 3 Groundwater	
1.6.4.2	Audit Resps-Files	4.2.1	Checklists - Round 1 GW		4.5.3.1	Internal Drafts/Comments/Resol.	
1.6.5	Training	4.2.2	Checklists - Round 2 GW		4.5.3.2	WHC Review Draft/Comments/Resol.	
1.6.6.1	QA Manual Doc Log	4.2.3	Checklists - Round 3 GW		4.5.3.3	Final Report	
1.6.6.2	Procedures Doc Log	4.2.4	Checklists - Round 4 GW		4.5.4	Round 4 Groundwater	
1.6.6.3	Plans Document Log	4.2.5	Checklists - Biota/Small Mam.		4.5.4.1	Internal Drafts/Comments/Resol.	
1.6.6.4	Deliverables Doc Log	4.2.6	Checklists - Surface Wtr./Sed.		4.5.4.2	WHC Review Draft/Comments/Resol.	
1.7.1	Downloads	4.3	Data Val. Calcs./Annotated CP		4.5.4.3	Final Report	
1.7.2	M-119s	4.3.1	Round 1 Groundwater		4.5.5	Biota/Small Mammals	
1.7.3	A-208s	4.3.2	Round 2 Groundwater		4.5.5.1	Internal Drafts/Comments/Resol.	
1.7.4	Budget Status	4.3.3	Round 3 Groundwater		4.5.5.2	WHC Review Draft/Comments/Resol.	
1.7.5	Invoices	4.3.4	Round 4 Groundwater		4.5.5.3	Final Report	
1.8.1	Requisitions	4.3.5	Biota/Small Mammals		4.5.6	Surface Water/Sediments	
1.9	Meeting Minutes	4.3.6	Surface Water/Sediments		4.5.6.1	Internal Drafts/Comments/Resol.	
1.10	Record of Telecons	4.4	Preliminary QA Records		4.5.6.2	WHC Review Draft/Comments/Resol.	
1.11	Progress Reports	4.4.1	Round 1 Groundwater		4.5.6.3	Final Report	
1.12	Subcontractor (HC)	4.4.2	Round 2 Groundwater	X	4.6	Weekly Status Reports	
		4.4.3	Round 3 Groundwater		4.7	Weekly Management Reports	
		4.4.4	Round 4 Groundwater				

9613500.1899

HARTCROWSER

Earth and Environmental Technologies

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2978-50

December 17, 1992

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

Subject: WHC Order No. MLW-SVV-037106
Task Order No. E-93-06
Preliminary Quality Assurance Record - 300-FF-5 RI/FS
TMA Case Number N1-12-031-9572

Dear Mr. Hulstrom:

Ebasco and Hart Crowser are pleased to provide you with the attached results of our review and validation of the subject data from the 300-FF-5 Operable Unit Remedial Investigation/Feasibility Study (RI/FS). The attached results are provided to you in partial fulfillment of Subtask 03 of our task plan dated November 6, 1992. The subject data package consisted of 38 plant material samples submitted for the following radiochemical analyses: strontium 90, total uranium, and gamma scan. The samples were analyzed by Thermo Analytical, Inc. according to requirements specified in the Analytical Laboratory Statement of Work issued by WHC. Sample results from eight of the 24 samples were selected for validation as being representative of the entire package. These results, together with the data qualifiers assigned are presented in Attachment 4. The results of all samples in this package and any qualifiers assigned as a result of our review will be presented in the final summary report.

DATA QUALITY OBJECTIVES SUMMARY

The data quality for these results were deficient in several areas. Holding times were exceeded for all analytes for the samples validated. Precision for strontium 90 results was low. The contract required detection limit (CRDL) was not achieved for gamma scan analytes cobalt 60 and cesium 137. Accuracy as determined with spiked sample results was acceptable and no evidence of blank contamination was discovered.

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MAJOR DEFICIENCIES (REJECTED DATA)

No data were rejected in this data delivery group.

MINOR DEFICIENCIES (OTHER QUALIFIED DATA)

The following general trends resulting in the qualification of data from multiple samples have been noted. All qualified data are discussed in Attachments 3 and 5.

The holding times were exceeded for all analyses leading to all results being qualified as estimated (J or UJ). Low method precision for strontium 90 analyses caused these results to be qualified as estimated as well. The trend in low precision primarily stems from the use of replicates containing nondetectable concentrations of analyte.

We trust that these preliminary results meet your needs. Our qualifier assignments will be finalized at the time the summary report for this sampling round is published. The final qualifiers may vary from those presented here, reflecting any trends in data quality or laboratory performance observed over the course of the 300-FF-5 RI/FS. Please contact me if you have any questions with regard to our activities.

Sincerely,

HART CROWSER, INC.

D. MARK GERBOTH, P.E.
Project Manager
HC#130:RL1551.DOC

Attachments

cc: Mark Gerboth (w/o attachments)
Jeff Grover (w/o attachments)
Westinghouse EDMC
Project File - HCRL-WHC/9306-L-92-062

9615500_1901

THIS APPENDIX CONSISTS OF FIVE ATTACHMENTS

Attachment 1 - Glossary of Data Qualifiers

This attachment provides a glossary explaining all data qualifiers applied as a result of the validation.

Attachment 2 - As Received Laboratory Sample Concentration Reports

This attachment provides a copy of the as-received sample concentration reports. This may be a tabular summary similar to that provided in Attachment 4, or may be a copy of the laboratory reports.

Attachment 3 - Summary of Data Qualifications

This attachment provides a complete summary of all qualifications applied as a result of the validation.

Attachment 4 - As Qualified Data Summary

This attachment provides a tabular data summary of all data qualified from the validation.

Attachment 5 - Data Review Supporting Documentation

This attachment provides copies of the data validation checklists, data summary forms, telephone contact memoranda and other documentation completed as a result of the data validation.

9613500.1902

ATTACHMENT 1

Glossary of Data Qualifiers

9613500.1903

ATTACHMENT 1

Glossary of Data Qualifiers

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

UJ - Indicates the compound or analyte was analyzed for and not detected. Due to quality control deficiencies identified during data validation the value reported may not accurately reflect the sample quantitation limit.

J - Indicates the compound or analyte was analyzed for and detected. The associated value is estimated but the data are useable for decision making processes.

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

9613500.1904

ATTACHMENT 2

As Received Laboratory Sample Concentration Reports

9613500.1905 N1-12-031-9572

TMA

ATTACHMENT 1 DATA TABLE

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B012X4 (Plant Matter)	1	^{90}Sr	(1 ± 3)	E-01
		Total Uranium	(0.155 ± 0.026) (1)	
		Gamma Scan:		
		^{40}K	(8.208 ± 4.403)	E+00
		^{51}Cr	<1.256	E+03
		^{60}Co	<4.245	E-01
		^{65}Zn	<1.729	E+00
		^{134}Cs	<3.922	E-01
		^{137}Cs	<3.504	E-01
		^{226}Ra	<6.904	E-01
		^{228}Th	<5.138	E-01
		^{232}Th	<1.406	E+00
B012Y5 (Plant Matter)	2	^{90}Sr	(2 ± 3)	E+00
		Total Uranium	(0.041 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(1.183 ± 0.334)	E+01
		^{51}Cr	<9.988	E+02
		^{60}Co	<2.895	E-01
		^{65}Zn	<1.226	E+00
		^{134}Cs	<2.984	E-01
		^{137}Cs	<2.053	E-01
		^{226}Ra	<4.284	E-01
		^{228}Th	<5.515	E-01
		^{232}Th	<9.256	E-01
B012Z7 (Plant Matter)	3	^{90}Sr	(1 ± 3)	E-01
		Total Uranium	(0.022 ± 0.004) (1)	
		Gamma Scan:		
		^{40}K	(1.083 ± 0.420)	E+01
		^{51}Cr	<1.371	E+03
		^{60}Co	<3.482	E-01
		^{65}Zn	<1.478	E+00
		^{134}Cs	<3.665	E-01
		^{137}Cs	<3.205	E-01
		^{226}Ra	<6.448	E-01
		^{228}Th	<5.494	E-01
		^{232}Th	<1.449	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B012Z4 (Plant Matter)	4	^{90}Sr	(3 ± 2)	E-01
		Total Uranium	(0.029 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(1.186 ± 0.374)	E+01
		^{51}Cr	<1.110	E+03
		^{60}Co	<2.656	E-01
		^{65}Zn	<1.028	E+00
		^{134}Cs	<3.474	E-01
		^{137}Cs	<2.499	E-01
		^{226}Ra	<4.037	E-01
		^{228}Th	<4.504	E-01
		^{232}Th	<1.020	E+00
B012X1 (Plant Matter)	5	^{90}Sr	(0.4 ± 2)	E-01
		Total Uranium	(0.034 ± 0.006) (1)	
		Gamma Scan:		
		^{40}K	(1.169 ± 0.361)	E+01
		^{51}Cr	<9.585	E+02
		^{60}Co	<4.875	E-01
		^{65}Zn	<1.423	E+00
		^{134}Cs	<3.047	E-01
		^{137}Cs	<2.765	E-01
		^{226}Ra	<4.317	E-01
		^{228}Th	<6.312	E-01
		^{232}Th	<1.039	E+00
B012Z8 (Plant Matter)	6	^{90}Sr	(2 ± 2)	E-01
		Total Uranium	(0.070 ± 0.012) (1)	
		Gamma Scan:		
		^{40}K	(8.031 ± 3.080)	E+00
		^{51}Cr	<7.494	E+02
		^{60}Co	<2.064	E-01
		^{65}Zn	<7.816	E-01
		^{134}Cs	<2.168	E-01
		^{137}Cs	<2.077	E-01
		^{226}Ra	<3.220	E-01
		^{228}Th	<3.319	E-01
		^{232}Th	<7.365	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B012P5 (Plant Matter)	7	^{90}Sr	(1 ± 1)	E-01
		Total Uranium	(0.030 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(1.054 ± 0.357)	E+01
		^{51}Cr	<1.050	E+03
		^{60}Co	<2.458	E-01
		^{65}Zn	<1.111	E+00
		^{134}Cs	<3.239	E-01
		^{137}Cs	<2.214	E-01
		^{226}Ra	<3.844	E-01
		^{228}Th	<4.324	E-01
		^{232}Th	<8.347	E-01
B012W4 (Plant Matter)	8	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	(0.079 ± 0.013) (1)	
		Gamma Scan:		
		^{40}K	(1.239 ± 0.385)	E+01
		^{51}Cr	<9.033	E+02
		^{60}Co	<5.564	E-01
		^{65}Zn	<1.235	E+00
		^{134}Cs	<3.605	E-01
		^{137}Cs	<2.967	E-01
		^{226}Ra	<5.037	E-01
		^{228}Th	(5.607 ± 4.506)	E-01
		^{232}Th	<1.374	E+00
B012W8 (Plant Matter)	9	^{90}Sr	(-1 ± 2)	E-01
		Total Uranium	(0.119 ± 0.020) (1)	
		Gamma Scan:		
		^{40}K	(1.308 ± 0.456)	E+01
		^{51}Cr	<1.137	E+03
		^{60}Co	<4.397	E-01
		^{65}Zn	<1.445	E+00
		^{134}Cs	<3.411	E-01
		^{137}Cs	<2.812	E-01
		^{226}Ra	<4.845	E-01
		^{228}Th	<4.793	E-01
		^{232}Th	<1.221	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page four)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B012P1 (Plant Matter)	10	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	<0.030 (1)	
		Gamma Scan:		
		^{40}K	(1.669 ± 0.378)	E+01
		^{51}Cr	<8.378	E+02
		^{60}Co	<2.784	E-01
		^{65}Zn	<1.149	E+00
		^{134}Cs	<2.798	E-01
		^{137}Cs	<1.440	E-01
		^{226}Ra	<3.773	E-01
		^{228}Th	<3.845	E-01
		^{232}Th	<6.894	E-01
B012W1 (Plant Matter)	11	^{90}Sr	(-1 ± 1)	E+00
		Total Uranium	(0.035 ± 0.006) (1)	
		Gamma Scan:		
		^{40}K	(1.259 ± 0.326)	E+01
		^{51}Cr	<8.773	E+02
		^{60}Co	<3.605	E-01
		^{65}Zn	<1.045	E+00
		^{134}Cs	<3.288	E-01
		^{137}Cs	<1.909	E-01
		^{226}Ra	<3.658	E-01
		^{228}Th	<3.229	E-01
		^{232}Th	<9.817	E-01
B012Z6 (Plant Matter)	12	^{90}Sr	(3 ± 4)	E-01
		Total Uranium	(0.043 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(9.874 ± 2.352)	E+00
		^{51}Cr	<7.552	E+02
		^{60}Co	<2.217	E-01
		^{65}Zn	<8.314	E-01
		^{134}Cs	<2.057	E-01
		^{137}Cs	<1.426	E-01
		^{226}Ra	<3.087	E-01
		^{228}Th	<3.868	E-01
		^{232}Th	<6.334	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page five)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B012L8 (Plant Matter)	13	^{90}Sr	(3 ± 4)	E-01
		Total Uranium	<0.030 (1)	
		Gamma Scan:		
		^{40}K	(2.886 ± 1.899)	E+00
		^{51}Cr	<5.126	E+02
		^{60}Co	<2.454	E-01
		^{65}Zn	<7.082	E-01
		^{134}Cs	<2.038	E-01
		^{137}Cs	<1.472	E-01
		^{226}Ra	<2.742	E-01
		^{228}Th	<3.404	E-01
		^{232}Th	<5.817	E-01
B012Z1 (Plant Matter)	14	^{90}Sr	(5 ± 5)	E-01
		Total Uranium	(0.154 ± 0.026) (1)	
		Gamma Scan:		
		^{40}K	(1.274 ± 0.472)	E+01
		^{51}Cr	<1.491	E+03
		^{60}Co	<4.797	E-01
		^{65}Zn	<1.665	E+00
		^{134}Cs	<4.213	E-01
		^{137}Cs	<3.095	E-01
		^{226}Ra	<7.022	E-01
		^{228}Th	<5.897	E-01
		^{232}Th	<1.456	E+00
B012Z3 (Plant Matter)	15	^{90}Sr	(6 ± 8)	E-01
		Total Uranium	<0.30 (1)	
		Gamma Scan:		
		^{40}K	(2.047 ± 0.472)	E+01
		^{51}Cr	<1.016	E+03
		^{60}Co	<5.572	E-01
		^{65}Zn	<1.356	E+00
		^{134}Cs	<4.101	E-01
		^{137}Cs	<3.274	E-01
		^{226}Ra	(5.098 ± 4.220)	E-01
		^{228}Th	<7.303	E-01
		^{232}Th	<1.536	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page six)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B012Z5 (Plant Matter)	16	^{90}Sr	(5 ± 4)	E-01
		Total Uranium	(0.050 ± 0.009) (1)	
		Gamma Scan:		
		^{40}K	(1.217 ± 0.459)	E+01
		^{51}Cr	<1.028	E+03
		^{60}Co	<3.088	E-01
		^{65}Zn	<1.296	E+00
		^{134}Cs	<3.028	E-01
		^{137}Cs	<2.436	E-01
		^{226}Ra	<4.994	E-01
		^{228}Th	<4.667	E-01
		^{232}Th	<1.075	E+00
B012W3 (Plant Matter)	17	^{90}Sr	(0 ± 3)	E-01
		Total Uranium	(0.277 ± 0.046) (1)	
		Gamma Scan:		
		^{40}K	(1.209 ± 0.435)	E+01
		^{51}Cr	<1.051	E+03
		^{60}Co	<4.785	E-01
		^{65}Zn	<1.516	E+00
		^{134}Cs	<3.776	E-01
		^{137}Cs	<2.718	E-01
		^{226}Ra	<4.848	E-01
		^{228}Th	<5.307	E-01
		^{232}Th	<1.628	E+00
B012W2 (Plant Matter)	18	^{90}Sr	(1 ± 4)	E-01
		Total Uranium	(0.151 ± 0.026) (1)	
		Gamma Scan:		
		^{40}K	(1.481 ± 0.527)	E+01
		^{51}Cr	<1.620	E+03
		^{60}Co	<4.798	E-01
		^{65}Zn	<1.807	E+00
		^{134}Cs	<4.719	E-01
		^{137}Cs	<4.125	E-01
		^{226}Ra	<7.684	E-01
		^{228}Th	<7.222	E-01
		^{232}Th	<1.664	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page seven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B01339 (Plant Matter)	19	^{90}Sr	(3 ± 4)	E-01
		Total Uranium	(0.088 ± 0.015) (1)	
		Gamma Scan:		
		^{40}K	(9.633 ± 3.380)	E+00
		^{51}Cr	<8.026	E+02
		^{60}Co	<4.338	E-01
		^{65}Zn	<1.179	E+00
		^{134}Cs	<3.792	E-01
		^{137}Cs	<2.266	E-01
		^{226}Ra	<3.315	E-01
		^{228}Th	<3.413	E-01
		^{232}Th	<1.189	E+00
B01338 (Plant Matter)	20	^{90}Sr	(4 ± 4)	E-01
		Total Uranium	(0.063 ± 0.011) (1)	
		Gamma Scan:		
		^{40}K	(7.972 ± 3.441)	E+00
		^{51}Cr	<8.627	E+02
		^{60}Co	<2.873	E-01
		^{65}Zn	<8.817	E-01
		^{134}Cs	<2.633	E-01
		^{137}Cs	<2.258	E-01
		^{226}Ra	<4.144	E-01
		^{228}Th	<3.305	E-01
		^{232}Th	<1.156	E+00
B01344 (Plant Matter)	21	^{90}Sr	(7 ± 4)	E-01
		Total Uranium	(0.055 ± 0.009) (1)	
		Gamma Scan:		
		^{40}K	(9.654 ± 2.920)	E+00
		^{51}Cr	<7.925	E+02
		^{60}Co	<2.671	E-01
		^{65}Zn	<6.401	E-01
		^{134}Cs	<3.068	E-01
		^{137}Cs	<1.543	E-01
		^{226}Ra	<3.600	E-01
		^{228}Th	<3.380	E-01
		^{232}Th	<7.876	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page eight)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B01354 (Plant Matter)	22	^{90}Sr	(3 ± 3)	E-01
		Total Uranium	(0.234 ± 0.039) (1)	
		Gamma Scan:		
		^{40}K	(8.352 ± 2.895)	E+00
		^{51}Cr	<7.754	E+02
		^{60}Co	<3.311	E-01
		^{65}Zn	<1.134	E+00
		^{134}Cs	<2.939	E-01
		^{137}Cs	<2.079	E-01
		^{226}Ra	<3.036	E-01
		^{228}Th	<3.326	E-01
		^{232}Th	<6.947	E-01
B01345 (Plant Matter)	23	^{90}Sr	(6 ± 7)	E-01
		Total Uranium	(0.043 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(1.538 ± 0.448)	E+01
		^{51}Cr	<1.068	E+03
		^{60}Co	<3.483	E-01
		^{65}Zn	<1.557	E+00
		^{134}Cs	<3.344	E-01
		^{137}Cs	<2.560	E-01
		^{226}Ra	<5.047	E-01
		^{228}Th	<4.121	E-01
		^{232}Th	<1.100	E+00
B01308 (Plant Matter)	24	^{90}Sr	(4 ± 4)	E-01
		Total Uranium	(0.042 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(1.387 ± 0.330)	E+01
		^{51}Cr	<7.716	E+02
		^{60}Co	<2.492	E-01
		^{65}Zn	<7.806	E-01
		^{134}Cs	<2.740	E-01
		^{137}Cs	<2.206	E-01
		^{226}Ra	<3.634	E-01
		^{228}Th	<3.769	E-01
		^{232}Th	<8.240	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page nine)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B01302 (Plant Matter)	25	^{90}Sr	(2 ± 4)	E-01
		Total Uranium	(0.034 ± 0.006) (1)	
		Gamma Scan:		
		^{40}K	(1.149 ± 0.423)	E+01
		^{51}Cr	<9.550	E+02
		^{60}Co	<3.292	E-01
		^{65}Zn	<1.127	E+00
		^{134}Cs	<3.586	E-01
		^{137}Cs	<2.364	E-01
		^{226}Ra	<4.099	E-01
		^{228}Th	<3.981	E-01
		^{232}Th	<1.056	E+00
B01307 (Plant Matter)	26	^{90}Sr	(1 ± 4)	E-01
		Total Uranium	(0.045 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(9.635 ± 3.466)	E+00
		^{51}Cr	<9.376	E+02
		^{60}Co	<3.336	E-01
		^{65}Zn	<1.029	E+00
		^{134}Cs	<2.183	E-01
		^{137}Cs	<2.083	E-01
		^{226}Ra	<3.618	E-01
		^{228}Th	<3.340	E-01
		^{232}Th	<7.873	E-01
B01333 (Plant Matter)	27	^{90}Sr	(3 ± 4)	E-01
		Total Uranium	(0.053 ± 0.009) (1)	
		Gamma Scan:		
		^{40}K	(1.137 ± 0.351)	E+01
		^{51}Cr	<1.016	E+03
		^{60}Co	<2.488	E-01
		^{65}Zn	<1.071	E+00
		^{134}Cs	<3.268	E-01
		^{137}Cs	<2.353	E-01
		^{226}Ra	<4.557	E-01
		^{228}Th	<4.140	E-01
		^{232}Th	<1.136	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page ten)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B01300	28	^{90}Sr	(2 ± 4)	E-01
(Plant Matter)		Total Uranium	(0.041 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(1.212 ± 0.380)	E+01
		^{51}Cr	<1.023	E+03
		^{60}Co	<3.094	E-01
		^{65}Zn	<1.296	E+00
		^{134}Cs	<3.414	E-01
		^{137}Cs	<2.091	E-01
		^{226}Ra	<4.946	E-01
		^{228}Th	<6.001	E-01
		^{232}Th	<1.167	E+00
B01355	29	^{90}Sr	(-1 ± 3)	E-01
(Plant Matter)		Total Uranium	(0.302 ± 0.050) (1)	
		Gamma Scan:		
		^{40}K	(1.019 ± 0.345)	E+01
		^{51}Cr	<8.742	E+02
		^{60}Co	<2.859	E-01
		^{65}Zn	<1.242	E+00
		^{134}Cs	<2.923	E-01
		^{137}Cs	<2.362	E-01
		^{226}Ra	<4.547	E-01
		^{228}Th	<3.942	E-01
		^{232}Th	<1.029	E+00
B01303	30	^{90}Sr	(2 ± 8)	E-01
(Plant Matter)		Total Uranium	(0.246 ± 0.041) (1)	
		Gamma Scan:		
		^{40}K	(1.203 ± 0.444)	E+01
		^{51}Cr	<1.553	E+03
		^{60}Co	<6.771	E-01
		^{65}Zn	<9.530	E-01
		^{134}Cs	<5.009	E-01
		^{137}Cs	<3.835	E-01
		^{226}Ra	<5.938	E-01
		^{228}Th	<5.077	E-01
		^{232}Th	<1.644	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page eleven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B01327 (Plant Matter)	31	^{90}Sr	(3 ± 4)	E-01
		Total Uranium	(0.059 ± 0.010) (1)	
		Gamma Scan:		
		^{40}K	(8.726 ± 3.502)	E+00
		^{51}Cr	<9.451	E+02
		^{60}Co	<3.331	E-01
		^{65}Zn	<9.658	E-01
		^{134}Cs	<2.478	E-01
		^{137}Cs	<2.356	E-01
		^{226}Ra	<4.563	E-01
		^{228}Th	<3.715	E-01
		^{232}Th	<1.093	E+00
B017P7 (Plant Matter)	32	^{90}Sr	(3 ± 4)	E-01
		Total Uranium	(0.070 ± 0.012) (1)	
		Gamma Scan:		
		^{40}K	(9.856 ± 3.095)	E+00
		^{51}Cr	<1.059	E+03
		^{60}Co	<2.902	E-01
		^{65}Zn	<1.176	E+00
		^{134}Cs	<2.940	E-01
		^{137}Cs	<2.682	E-01
		^{226}Ra	<5.710	E-01
		^{228}Th	<5.741	E-01
		^{232}Th	<1.116	E+00
B017X4 (Plant Matter)	33	^{90}Sr	(1 ± 4)	E-01
		Total Uranium	(0.301 ± 0.050) (1)	
		Gamma Scan:		
		^{40}K	(8.558 ± 2.497)	E+00
		^{51}Cr	<6.779	E+02
		^{60}Co	<1.901	E-01
		^{65}Zn	<8.204	E-01
		^{134}Cs	<1.650	E-01
		^{137}Cs	<1.636	E-01
		^{226}Ra	<2.694	E-01
		^{228}Th	<3.351	E-01
		^{232}Th	<6.767	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page twelve)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B017X3 (Plant Matter)	34	^{90}Sr	(4 ± 4)	E-01
		Total Uranium	(0.042 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(8.885 ± 3.225)	E+00
		^{51}Cr	<1.090	E+03
		^{60}Co	<3.389	E-01
		^{65}Zn	<1.208	E+00
		^{134}Cs	<3.140	E-01
		^{137}Cs	<2.390	E-01
		^{226}Ra	<4.649	E-01
		^{228}Th	<3.545	E-01
		^{232}Th	<1.260	E+00
B017Y1 (Plant Matter)	35	^{90}Sr	(3 ± 4)	E-01
		Total Uranium	(0.043 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(1.159 ± 1.106)	E+00
		^{51}Cr	<8.546	E+02
		^{60}Co	<3.207	E-01
		^{65}Zn	<1.105	E+00
		^{134}Cs	<2.396	E-01
		^{137}Cs	(4.601 ± 1.774)	E-01
		^{226}Ra	<2.973	E-01
		^{228}Th	<3.204	E-01
		^{232}Th	<8.976	E-01
B017Y0 (Plant Matter)	36	^{90}Sr	(1.7 ± 0.5)	E+00
		Total Uranium	(0.027 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(1.878 ± 0.527)	E+01
		^{51}Cr	<1.180	E+03
		^{60}Co	<3.411	E-01
		^{65}Zn	<1.630	E+00
		^{134}Cs	<5.041	E-01
		^{137}Cs	<2.971	E-01
		^{226}Ra	(5.931 ± 3.923)	E-01
		^{228}Th	(6.438 ± 5.044)	E-01
		^{232}Th	<1.660	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page thirteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B017X5 (Plant Matter)	37	^{90}Sr	(6 ± 6)	E-01
		Total Uranium	(0.069 ± 0.011) (1)	
		Gamma Scan:		
		^{40}K	(1.138 ± 0.344)	E+01
		^{51}Cr	<9.330	E+02
		^{60}Co	<2.153	E-01
		^{65}Zn	<8.762	E-01
		^{134}Cs	<2.780	E-01
		^{137}Cs	<2.095	E-01
		^{226}Ra	<3.773	E-01
		^{228}Th	<4.235	E-01
		^{232}Th	<1.042	E+00
B017P5 (Plant Matter)	38	^{90}Sr	(3 ± 4)	E-01
		Total Uranium	(0.050 ± 0.008) (1)	
		Gamma Scan:		
		^{40}K	(5.969 ± 1.062)	E+00
		^{51}Cr	<3.096	E+02
		^{60}Co	<7.924	E-02
		^{65}Zn	<3.260	E-01
		^{134}Cs	<9.408	E-02
		^{137}Cs	<7.935	E-02
		^{226}Ra	<1.404	E-01
		^{228}Th	<1.224	E-01
		^{232}Th	<3.355	E-01

(1) Units are μg/gram.

9613500.1918

ATTACHMENT 3

Summary of Data Qualifications

Strontium 90 (CRDL=2pCi/l)

Customer I.D. #	Reported Results	Q
B012X4	0.100	UJ
B012Z3	0.600	UJ
B012W3	0.000	UJ
B012W2	0.100	UJ
B01303	0.200	UJ
B017P5	0.300	UJ
B017Y0	1.700	J
B017Y1	0.300	UJ

Total U (CRDL=.1pCi/l)

Customer I.D. #	Reported Results	Q
B012X4	0.155	J
B012Z3	0.300	J
B012W3	0.277	J
B012W2	0.151	J
B01303	0.246	J
B017P5	0.050	J
B017Y0	0.027	UJ
B017Y1	0.043	J

Gamma Spec

Cobalt 60 (CRDL=25pCi/l)

Customer I.D. #	Reported Results	Q
B012X4	0.425	UJ
B012Z3	0.557	UJ
B012W3	0.479	UJ
B012W2	0.480	UJ
B01303	0.677	UJ
B017P5	0.079	UJ
B017Y0	0.341	UJ
B017Y1	0.321	UJ

Cesium 137 (CRDL=15pCi/l)

Customer I.D. #	Reported Results	Q
B012X4	0.350	UJ
B012Z3	0.327	UJ
B012W3	0.272	UJ
B012W2	0.413	J
B01303	0.384	UJ
B017P5	0.079	J
B017Y0	0.297	UJ
B017Y1	0.460	J

Thorium 228 (CRDL=not reported)

Customer I.D. #	Reported Results	Q
B012X4	0.514	UJ
B012Z3	0.730	UJ
B012W3	0.531	UJ
B012W2	0.722	UJ
B01303	0.508	UJ
B017P5	0.122	UJ
B017Y0	0.644	J
B017Y1	0.320	UJ

9613500.1920

ATTACHMENT 4

As Qualified Data Summary

Holding time exceeded for all analytes
CRDL NOT Achieved for Co-60 & Cs-137
Precision indeterminant for Sr-90

TMA

ITTACHMENT 1 DATA TABLE

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ		
B012X4	1	^{90}Sr	(1 ± 3)	E-01	UJ
(Plant Matter)		Total Uranium	(0.155 ± 0.026) (1)		J
		Gamma Scan:			
	OK	^{40}K	(8.208 ± 4.403)	E+00	UJ
		^{51}Cr	<1.256	E+03	
		^{60}Co	<4.245	E-01	
		^{65}Zn	<1.729	E+00	
		^{134}Cs	<3.922	E-01	
		^{137}Cs	<3.504	E-01	
		^{226}Ra	<6.904	E-01	
		^{228}Th	<5.138	E-01	
		^{232}Th	<1.406	E+00	
B012Y5	2	^{90}Sr	(2 ± 3)	E+00	
(Plant Matter)		Total Uranium	(0.041 ± 0.007) (1)		
		Gamma Scan:			
		^{40}K	(1.183 ± 0.334)	E+01	
		^{51}Cr	<9.988	E+02	
		^{60}Co	<2.895	E-01	
		^{65}Zn	<1.226	E+00	
		^{134}Cs	<2.984	E-01	
		^{137}Cs	<2.053	E-01	
		^{226}Ra	<4.284	E-01	
		^{228}Th	<5.515	E-01	
		^{232}Th	<9.256	E-01	
B012Z7	3	^{90}Sr	(1 ± 3)	E-01	
(Plant Matter)		Total Uranium	(0.022 ± 0.004) (1)		
		Gamma Scan:			
		^{40}K	(1.083 ± 0.420)	E+01	
		^{51}Cr	<1.371	E+03	
		^{60}Co	<3.482	E-01	
		^{65}Zn	<1.478	E+00	
		^{134}Cs	<3.665	E-01	
		^{137}Cs	<3.205	E-01	
		^{226}Ra	<6.448	E-01	
		^{228}Th	<5.494	E-01	
		^{232}Th	<1.449	E+00	

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B012Z4 (Plant Matter)	4	^{90}Sr	(3 ± 2)	E-01
		Total Uranium	(0.029 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(1.186 ± 0.374)	E+01
		^{51}Cr	<1.110	E+03
		^{60}Co	<2.656	E-01
		^{65}Zn	<1.028	E+00
		^{134}Cs	<3.474	E-01
		^{137}Cs	<2.499	E-01
		^{226}Ra	<4.037	E-01
		^{228}Th	<4.504	E-01
		^{232}Th	<1.020	E+00
B012X1 (Plant Matter)	5	^{90}Sr	(0.4 ± 2)	E-01
		Total Uranium	(0.034 ± 0.006) (1)	
		Gamma Scan:		
		^{40}K	(1.169 ± 0.361)	E+01
		^{51}Cr	<9.585	E+02
		^{60}Co	<4.875	E-01
		^{65}Zn	<1.423	E+00
		^{134}Cs	<3.047	E-01
		^{137}Cs	<2.765	E-01
		^{226}Ra	<4.317	E-01
		^{228}Th	<6.312	E-01
		^{232}Th	<1.039	E+00
B012Z8 (Plant Matter)	6	^{90}Sr	(2 ± 2)	E-01
		Total Uranium	(0.070 ± 0.012) (1)	
		Gamma Scan:		
		^{40}K	(8.031 ± 3.080)	E+00
		^{51}Cr	<7.494	E+02
		^{60}Co	<2.064	E-01
		^{65}Zn	<7.816	E-01
		^{134}Cs	<2.168	E-01
		^{137}Cs	<2.077	E-01
		^{226}Ra	<3.220	E-01
		^{228}Th	<3.319	E-01
		^{232}Th	<7.365	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B012P5 (Plant Matter)	7	^{90}Sr	(1 ± 1)	E-01
		Total Uranium	(0.030 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(1.054 ± 0.357)	E+01
		^{51}Cr	<1.050	E+03
		^{60}Co	<2.458	E-01
		^{65}Zn	<1.111	E+00
		^{134}Cs	<3.239	E-01
		^{137}Cs	<2.214	E-01
		^{226}Ra	<3.844	E-01
		^{228}Th	<4.324	E-01
		^{232}Th	<8.347	E-01
B012W4 (Plant Matter)	8	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	(0.079 ± 0.013) (1)	
		Gamma Scan:		
		^{40}K	(1.239 ± 0.385)	E+01
		^{51}Cr	<9.033	E+02
		^{60}Co	<5.564	E-01
		^{65}Zn	<1.235	E+00
		^{134}Cs	<3.605	E-01
		^{137}Cs	<2.967	E-01
		^{226}Ra	<5.037	E-01
		^{228}Th	(5.607 ± 4.506)	E-01
		^{232}Th	<1.374	E+00
B012W8 (Plant Matter)	9	^{90}Sr	(-1 ± 2)	E-01
		Total Uranium	(0.119 ± 0.020) (1)	
		Gamma Scan:		
		^{40}K	(1.308 ± 0.456)	E+01
		^{51}Cr	<1.137	E+03
		^{60}Co	<4.397	E-01
		^{65}Zn	<1.445	E+00
		^{134}Cs	<3.411	E-01
		^{137}Cs	<2.812	E-01
		^{226}Ra	<4.845	E-01
		^{228}Th	<4.793	E-01
		^{232}Th	<1.221	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page four)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B012P1 (Plant Matter)	10	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	<0.030 (1)	
		Gamma Scan:		
		^{40}K	(1.669 ± 0.378)	E+01
		^{51}Cr	<8.378	E+02
		^{60}Co	<2.784	E-01
		^{65}Zn	<1.149	E+00
		^{134}Cs	<2.798	E-01
		^{137}Cs	<1.440	E-01
		^{226}Ra	<3.773	E-01
		^{228}Th	<3.845	E-01
		^{232}Th	<6.894	E-01
B012W1 (Plant Matter)	11	^{90}Sr	(-1 ± 1)	E+00
		Total Uranium	(0.035 ± 0.006) (1)	
		Gamma Scan:		
		^{40}K	(1.259 ± 0.326)	E+01
		^{51}Cr	<8.773	E+02
		^{60}Co	<3.605	E-01
		^{65}Zn	<1.045	E+00
		^{134}Cs	<3.288	E-01
		^{137}Cs	<1.909	E-01
		^{226}Ra	<3.658	E-01
		^{228}Th	<3.229	E-01
		^{232}Th	<9.817	E-01
B012Z6 (Plant Matter)	12	^{90}Sr	(3 ± 4)	E-01
		Total Uranium	(0.043 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(9.874 ± 2.352)	E+00
		^{51}Cr	<7.552	E+02
		^{60}Co	<2.217	E-01
		^{65}Zn	<8.314	E-01
		^{134}Cs	<2.057	E-01
		^{137}Cs	<1.426	E-01
		^{226}Ra	<3.087	E-01
		^{228}Th	<3.868	E-01
		^{232}Th	<6.334	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page five)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B012L8 (Plant Matter)	13	^{90}Sr	(3 ± 4)	E-01
		Total Uranium	<0.030 (1)	
		Gamma Scan:		
		^{40}K	(2.886 ± 1.899)	E+00
		^{51}Cr	<5.126	E+02
		^{60}Co	<2.454	E-01
		^{65}Zn	<7.082	E-01
		^{134}Cs	<2.038	E-01
		^{137}Cs	<1.472	E-01
		^{226}Ra	<2.742	E-01
		^{228}Th	<3.404	E-01
		^{232}Th	<5.817	E-01
B012Z1 (Plant Matter)	14	^{90}Sr	(5 ± 5)	E-01
		Total Uranium	(0.154 ± 0.026) (1)	
		Gamma Scan:		
		^{40}K	(1.274 ± 0.472)	E+01
		^{51}Cr	<1.491	E+03
		^{60}Co	<4.797	E-01
		^{65}Zn	<1.665	E+00
		^{134}Cs	<4.213	E-01
		^{137}Cs	<3.095	E-01
		^{226}Ra	<7.022	E-01
		^{228}Th	<5.897	E-01
		^{232}Th	<1.456	E+00
B012Z3 (Plant Matter)	15	^{90}Sr	(6 ± 8)	E-01 UJ
		Total Uranium	<0.30 (1)	J
	OK	Gamma Scan:		
		^{40}K	(2.047 ± 0.472)	E+01 UJ
		^{51}Cr	<1.016	E+03
		^{60}Co	<5.572	E-01
		^{65}Zn	<1.356	E+00
		^{134}Cs	<4.101	E-01
		^{137}Cs	<3.274	E-01
		^{226}Ra	(5.098 ± 4.220)	E-01 J
		^{228}Th	<7.303	E-01 UJ
		^{232}Th	<1.536	E+00 UJ

ATTACHMENT 1 DATA TABLE (cont'd, page six)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B012Z5 (Plant Matter)	16	^{90}Sr	(5 ± 4)	E-01
		Total Uranium	(0.050 ± 0.009) (1)	
		Gamma Scan:		
		^{40}K	(1.217 ± 0.459)	E+01
		^{51}Cr	<1.028	E+03
		^{60}Co	<3.088	E-01
		^{65}Zn	<1.296	E+00
		^{134}Cs	<3.028	E-01
		^{137}Cs	<2.436	E-01
		^{226}Ra	<4.994	E-01
		^{228}Th	<4.667	E-01
		^{232}Th	<1.075	E+00
B012W3 ✓ (Plant Matter)	17	^{90}Sr	(0 ± 3)	E-01 UJ
		Total Uranium	(0.277 ± 0.046) (1) J	
	OK	Gamma Scan:		
		^{40}K	(1.209 ± 0.435)	E+01 UJ
		^{51}Cr	<1.051	E+03
		^{60}Co	<4.785	E-01
		^{65}Zn	<1.516	E+00
		^{134}Cs	<3.776	E-01
		^{137}Cs	<2.718	E-01
		^{226}Ra	<4.848	E-01
		^{228}Th	<5.307	E-01
		^{232}Th	<1.628	E+00
B012W2 ✓ (Plant Matter)	18	^{90}Sr	(1 ± 4)	E-01 UJ
		Total Uranium	(0.151 ± 0.026) (1) J	
		Gamma Scan:		
		^{40}K	(1.481 ± 0.527)	E+01 UJ
	OK	^{51}Cr	<1.620	E+03
		^{60}Co	<4.798	E-01
		^{65}Zn	<1.807	E+00
		^{134}Cs	<4.719	E-01
		^{137}Cs	<4.125	E-01 J
		^{226}Ra	<7.684	E-01 UJ
		^{228}Th	<7.222	E-01
		^{232}Th	<1.664	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page seven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B01339 (Plant Matter)	19	^{90}Sr	(3 ± 4)	E-01
		Total Uranium	(0.088 ± 0.015) (1)	
		Gamma Scan:		
		^{40}K	(9.633 ± 3.380)	E+00
		^{51}Cr	<8.026	E+02
		^{60}Co	<4.338	E-01
		^{65}Zn	<1.179	E+00
		^{134}Cs	<3.792	E-01
		^{137}Cs	<2.266	E-01
		^{226}Ra	<3.315	E-01
		^{228}Th	<3.413	E-01
		^{232}Th	<1.189	E+00
B01338 (Plant Matter)	20	^{90}Sr	(4 ± 4)	E-01
		Total Uranium	(0.063 ± 0.011) (1)	
		Gamma Scan:		
		^{40}K	(7.972 ± 3.441)	E+00
		^{51}Cr	<8.627	E+02
		^{60}Co	<2.873	E-01
		^{65}Zn	<8.817	E-01
		^{134}Cs	<2.633	E-01
		^{137}Cs	<2.258	E-01
		^{226}Ra	<4.144	E-01
		^{228}Th	<3.305	E-01
		^{232}Th	<1.156	E+00
B01344 (Plant Matter)	21	^{90}Sr	(7 ± 4)	E-01
		Total Uranium	(0.055 ± 0.009) (1)	
		Gamma Scan:		
		^{40}K	(9.654 ± 2.920)	E+00
		^{51}Cr	<7.925	E+02
		^{60}Co	<2.671	E-01
		^{65}Zn	<6.401	E-01
		^{134}Cs	<3.068	E-01
		^{137}Cs	<1.543	E-01
		^{226}Ra	<3.600	E-01
		^{228}Th	<3.380	E-01
		^{232}Th	<7.876	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page eight)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B01354 (Plant Matter)	22	^{90}Sr	(3 ± 3)	E-01
		Total Uranium	(0.234 ± 0.039) (1)	
		Gamma Scan:		
		^{40}K	(8.352 ± 2.895)	E+00
		^{51}Cr	<7.754	E+02
		^{60}Co	<3.311	E-01
		^{65}Zn	<1.134	E+00
		^{134}Cs	<2.939	E-01
		^{137}Cs	<2.079	E-01
		^{226}Ra	<3.036	E-01
		^{228}Th	<3.326	E-01
		^{232}Th	<6.947	E-01
B01345 (Plant Matter)	23	^{90}Sr	(6 ± 7)	E-01
		Total Uranium	(0.043 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(1.538 ± 0.448)	E+01
		^{51}Cr	<1.068	E+03
		^{60}Co	<3.483	E-01
		^{65}Zn	<1.557	E+00
		^{134}Cs	<3.344	E-01
		^{137}Cs	<2.560	E-01
		^{226}Ra	<5.047	E-01
		^{228}Th	<4.121	E-01
		^{232}Th	<1.100	E+00
B01308 (Plant Matter)	24	^{90}Sr	(4 ± 4)	E-01
		Total Uranium	(0.042 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(1.387 ± 0.330)	E+01
		^{51}Cr	<7.716	E+02
		^{60}Co	<2.492	E-01
		^{65}Zn	<7.806	E-01
		^{134}Cs	<2.740	E-01
		^{137}Cs	<2.206	E-01
		^{226}Ra	<3.634	E-01
		^{228}Th	<3.769	E-01
		^{232}Th	<8.240	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page nine)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B01302 (Plant Matter)	25	^{90}Sr	(2 ± 4)	E-01
		Total Uranium	(0.034 ± 0.006) (1)	
		Gamma Scan:		
		^{40}K	(1.149 ± 0.423)	E+01
		^{51}Cr	<9.550	E+02
		^{60}Co	<3.292	E-01
		^{65}Zn	<1.127	E+00
		^{134}Cs	<3.586	E-01
		^{137}Cs	<2.364	E-01
		^{226}Ra	<4.099	E-01
		^{228}Th	<3.981	E-01
		^{232}Th	<1.056	E+00
B01307 (Plant Matter)	26	^{90}Sr	(1 ± 4)	E-01
		Total Uranium	(0.045 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(9.635 ± 3.466)	E+00
		^{51}Cr	<9.376	E+02
		^{60}Co	<3.336	E-01
		^{65}Zn	<1.029	E+00
		^{134}Cs	<2.183	E-01
		^{137}Cs	<2.083	E-01
		^{226}Ra	<3.618	E-01
		^{228}Th	<3.340	E-01
		^{232}Th	<7.873	E-01
B01333 (Plant Matter)	27	^{90}Sr	(3 ± 4)	E-01
		Total Uranium	(0.053 ± 0.009) (1)	
		Gamma Scan:		
		^{40}K	(1.137 ± 0.351)	E+01
		^{51}Cr	<1.016	E+03
		^{60}Co	<2.488	E-01
		^{65}Zn	<1.071	E+00
		^{134}Cs	<3.268	E-01
		^{137}Cs	<2.353	E-01
		^{226}Ra	<4.557	E-01
		^{228}Th	<4.140	E-01
		^{232}Th	<1.136	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page ten)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B01300	28	^{90}Sr	(2 ± 4)	E-01
(Plant Matter)		Total Uranium	(0.041 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(1.212 ± 0.380)	E+01
		^{51}Cr	<1.023	E+03
		^{60}Co	<3.094	E-01
		^{65}Zn	<1.296	E+00
		^{134}Cs	<3.414	E-01
		^{137}Cs	<2.091	E-01
		^{226}Ra	<4.946	E-01
		^{228}Th	<6.001	E-01
		^{232}Th	<1.167	E+00
B01355	29	^{90}Sr	(-1 ± 3)	E-01
(Plant Matter)		Total Uranium	(0.302 ± 0.050) (1)	
		Gamma Scan:		
		^{40}K	(1.019 ± 0.345)	E+01
		^{51}Cr	<8.742	E+02
		^{60}Co	<2.859	E-01
		^{65}Zn	<1.242	E+00
		^{134}Cs	<2.923	E-01
		^{137}Cs	<2.362	E-01
		^{226}Ra	<4.547	E-01
		^{228}Th	<3.942	E-01
		^{232}Th	<1.029	E+00
B01303 ✓	30	^{90}Sr	(2 ± 8)	E-01 UJ
(Plant Matter)		Total Uranium	(0.246 ± 0.041) (1) J	
		Gamma Scan:		
	OK	^{40}K	(1.203 ± 0.444)	E+01 UJ
		^{51}Cr	<1.553	E+03
		^{60}Co	<6.771	E-01
		^{65}Zn	<9.530	E-01
		^{134}Cs	<5.009	E-01
		^{137}Cs	<3.835	E-01
		^{226}Ra	<5.938	E-01
		^{228}Th	<5.077	E-01
		^{232}Th	<1.644	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page eleven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B01327 (Plant Matter)	31	^{90}Sr	(3 ± 4)	E-01
		Total Uranium	(0.059 ± 0.010) (1)	
		Gamma Scan:		
		^{40}K	(8.726 ± 3.502)	E+00
		^{51}Cr	<9.451	E+02
		^{60}Co	<3.331	E-01
		^{65}Zn	<9.658	E-01
		^{134}Cs	<2.478	E-01
		^{137}Cs	<2.356	E-01
		^{226}Ra	<4.563	E-01
		^{228}Th	<3.715	E-01
		^{232}Th	<1.093	E+00
B017P7 (Plant Matter)	32	^{90}Sr	(3 ± 4)	E-01
		Total Uranium	(0.070 ± 0.012) (1)	
		Gamma Scan:		
		^{40}K	(9.856 ± 3.095)	E+00
		^{51}Cr	<1.059	E+03
		^{60}Co	<2.902	E-01
		^{65}Zn	<1.176	E+00
		^{134}Cs	<2.940	E-01
		^{137}Cs	<2.682	E-01
		^{226}Ra	<5.710	E-01
		^{228}Th	<5.741	E-01
		^{232}Th	<1.116	E+00
B017X4 (Plant Matter)	33	^{90}Sr	(1 ± 4)	E-01
		Total Uranium	(0.301 ± 0.050) (1)	
		Gamma Scan:		
		^{40}K	(8.558 ± 2.497)	E+00
		^{51}Cr	<6.779	E+02
		^{60}Co	<1.901	E-01
		^{65}Zn	<8.204	E-01
		^{134}Cs	<1.650	E-01
		^{137}Cs	<1.636	E-01
		^{226}Ra	<2.694	E-01
		^{228}Th	<3.351	E-01
		^{232}Th	<6.767	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page twelve)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B017X3	34	^{90}Sr	(4 ± 4)	E-01
(Plant Matter)		Total Uranium	(0.042 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(8.885 ± 3.225)	E+00
		^{51}Cr	<1.090	E+03
		^{60}Co	<3.389	E-01
		^{65}Zn	<1.208	E+00
		^{134}Cs	<3.140	E-01
		^{137}Cs	<2.390	E-01
		^{226}Ra	<4.649	E-01
		^{228}Th	<3.545	E-01
		^{232}Th	<1.260	E+00
B017Y1	35	^{90}Sr	(3 ± 4)	E-01 UJ
(Plant Matter)		Total Uranium	(0.043 ± 0.007) (1) J	
		Gamma Scan:		
		^{40}K	(1.159 ± 1.106)	E+00
		^{51}Cr	<8.546	E+02 UJ
		^{60}Co	<3.207	E-01
		^{65}Zn	<1.105	E+00
		^{134}Cs	<2.396	E-01
		^{137}Cs	(4.601 ± 1.774)	E-01 J
		^{226}Ra	<2.973	E-01 UJ
		^{228}Th	<3.204	E-01
		^{232}Th	<8.976	E-01
B017Y0	36	^{90}Sr	(1.7 ± 0.5)	E+00 J
(Plant Matter)		Total Uranium	(0.027 ± 0.005) (1)	UJ
		Gamma Scan:		
		^{40}K	(1.878 ± 0.527)	E+01 J
		^{51}Cr	<1.180	E+03
		^{60}Co	<3.411	E-01
		^{65}Zn	<1.630	E+00
		^{134}Cs	<5.041	E-01
		^{137}Cs	<2.971	E-01
		^{226}Ra	(5.931 ± 3.923)	E-01 J
		^{228}Th	(6.438 ± 5.044)	E-01 J
		^{232}Th	<1.660	E+00 UJ

ATTACHMENT 1 DATA TABLE (cont'd, page thirteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9572	Analysis	Results pCi/g ± 2 σ	
B017X5 (Plant Matter)	37	^{90}Sr	(6 ± 6)	E-01
		Total Uranium	(0.069 ± 0.011) (1)	
		Gamma Scan:		
		^{40}K	(1.138 ± 0.344)	E+01
		^{51}Cr	<9.330	E+02
		^{60}Co	<2.153	E-01
		^{65}Zn	<8.762	E-01
		^{134}Cs	<2.780	E-01
		^{137}Cs	<2.095	E-01
		^{226}Ra	<3.773	E-01
		^{228}Th	<4.235	E-01
		^{232}Th	<1.042	E+00
B017P5 (Plant Matter)	38	^{90}Sr	(3 ± 4)	E-01 UJ
		Total Uranium	(0.050 ± 0.008) (1) J	
		Gamma Scan:		
		^{40}K	(5.969 ± 1.062)	E+00 DSM
		^{51}Cr	<3.096	E+02 UJ
		^{60}Co	<7.924	E-02
		^{65}Zn	<3.260	E-01
		^{134}Cs	<9.408	E-02
		^{137}Cs	<7.935	E-02
		^{226}Ra	<1.404	E-01
		^{228}Th	<1.224	E-01
		^{232}Th	<3.355	E-01

(1) Units are μg/gram.

9613500.1934

ATTACHMENT 5

Data Review Supporting Documentation

9613500.1935

Data Package Completeness Checklists

TMA/Norcal N-1-12-031-957Z

B012X4
B012Z3
B012W3
B012W2
B01303
B017P5
B017Y0
B017Y1

SR-90

Supplemental Requirements for Analyses Using Gas Proportional Counters

A.0 Completeness Checklist

Analysis Results

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Counting Logs, Printouts, Notebook Pages)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification
- ✓ Analysis Date and Initials of Analyst
- ✓ Amounts of Samples Prepared or Counted
- ✓ Weights of Solids Counted

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
- ✓ Amount of (Check) Standard Used
- ✓ Raw Data including Counts and Count Duration for Standards
- ✓ Weights of Preparations
- ✓ Efficiencies
- ✓ Weights of Carriers Added, If Applicable
- ✓ Results of Statistical Tests Used to Evaluate Instrument Reliability and Efficiency Checks
- ✓ Raw Data of Background Counts and Count Duration
- ✓ Results of Statistical Test Used to Evaluate Instrument Background
- NA Control Limits for Check Source and Background Counts

Blanks (LCS)

- ✓ Detector Identification
- ✓ Date of Analysis
- NO MDA of Method will calculate
- ✓ Amounts of Reagents Used in Blank

Supplemental Requirements for Analyses Using Gas Proportional Counters (Cont.)

Radiometric and Gravimetric Yields

- ✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- ✓ Weights of Precipitates or Solids Counted
- ✓ Calculated Recoveries

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Aliquots of Samples
- ✓ Weights of Solids Counted
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Calculated Precision

Laboratory Control Samples (spikes)

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses

9615500.1958

Supplemental Requirements for Analyses Using Gamma Spectroscopy

Gamma Ra

C.0 Completeness Checklist

Analysis Results

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Spectra, Printouts of Counts per Channel, Notebook Pages)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification and Counting Position
- ✓ Analysis Date and Initials of Analyst
- ✓ Amounts of Samples Counted

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclides, Certification, Expiration Date, and Activity
- NA Amount of (Check) Standard Used
- ✓ Raw Data including Counts and Count Duration for Standards
- ✓ Efficiencies and/or Geometry and Matrix Factors
- ✓ Raw Data of Background Counts, Count Dates, and Duration of Counts
- ✓ Kev/Channel
- ✓ FWHM

Blanks

- ✓ Detector Identification
- ✓ Date of Analysis
- No MDA of Method will calculate
- ✓ Amounts of Reagents Used in Blank
- ✓ Raw Data

Supplemental Requirements for Analyses Using Gamma Spectroscopy (Cont.)

Duplicates

✓ Detector Identification
✓ Date of Analysis
✓ Amounts of Samples
✓ Count Durations
✓ Sample Identifications
✓ Results of Analyses and Calculated Precision
✓ Raw Data

Radiometric and Gravimetric Yields

_____ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
_____ Weights of Precipitates or Solids Counted
_____ Calculated Recoveries

Laboratory Control Samples

✓ Detector Identification
✓ Date of Analysis
✓ Calculation of Recoveries
✓ Results of Analyses

9613500.1940

Total Uranium by kPA

Supplemental Requirements for Analyses Using kPA for Total Uranium

Analysis Results

✓ Results Reported for Sample Analyses
✓ Raw Data (including Prep Volume, Aliquot Volume, kPA output)
✓ Calculation Sheets
✓ Sample Identifications
✓ Detector Identification
✓ Analysis Date and Initials of Analyst

Initial and Continuing Calibration

✓ Detector Identification
✓ Calibration Date(s) and Initials of Analyst
✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
✓ Amount of Standard Used
✓ Raw count/Activity data
✓ Determination of Calibration Equation

Blanks/Backgrounds

✓ Detector Identification
✓ Date of Analysis
✓ MDA of Method
✓ Amount of Reagent Used (Prep Volume)
✓ Count Durations

9613500.1941

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Amounts of Samples
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Results of Analysis and Calculated Precision
- ✓ Raw Data

Matrix Spikes

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Amounts of Samples
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Results of Analysis and Calculated Precision
- ✓ Identification of Matrix Spike Radionuclide, Certification, Expiration Date, and Activity
- ✓ Amount of Matrix Spike Used
- ✓ Raw Data
- ✓ Results of Analysis and Comparison to Amount Added

9613500.1942

SECTION 2 Case Narrative

CASE NARRATIVE

1. Project 300-FF-5, Task 7, Plant Material (TMA/Norcal Group No. 9572) were processed together and the results of the analyses are reported. The sample ID's are:

Customer Sample ID	TMA/Norcal Group No.	Customer Sample ID	TMA/Norcal Group No.
B012X4 (Plant Material)	9572-1	B01338 (Plant Material)	9572-20
B012Y5 (Plant Material)	9572-2	B01344 (Plant Material)	9572-21
B012Z7 (Plant Material)	9572-3	B01354 (Plant Material)	9572-22
B012Z4 (Plant Material)	9572-4	B01345 (Plant Material)	9572-23
B012X1 (Plant Material)	9572-5	B01308 (Plant Material)	9572-24
B012Z8 (Plant Material)	9572-6	B01302 (Plant Material)	9572-25
B012P5 (Plant Material)	9572-7	B01307 (Plant Material)	9572-26
B012W4 (Plant Material)	9572-8	B01333 (Plant Material)	9572-27
B012W8 (Plant Material)	9572-9	B01300 (Plant Material)	9572-28
B012P1 (Plant Material)	9572-10	B01355 (Plant Material)	9572-29
B012W1 (Plant Material)	9572-11	B01303 (Plant Material)	9572-30
B012Z6 (Plant Material)	9572-12	B01327 (Plant Material)	9572-31
B012L8 (Plant Material)	9572-13	B017P7 (Plant Material)	9572-32
B012Z1 (Plant Material)	9572-14	B017X4 (Plant Material)	9572-33
B012Z3 (Plant Material)	9572-15	B017X3 (Plant Material)	9572-34
B012Z5 (Plant Material)	9572-16	B017Y1 (Plant Material)	9572-35
B012W3 (Plant Material)	9572-17	B017Y0 (Plant Material)	9572 36
B012W2 (Plant Material)	9572-18	B017X5 (Plant Material)	9572-37
B01339 (Plant Material)	9572-19	B017P5 (Plant Material)	9572-38

2. The analyses reported are:

Analyte	PLANT MATERIAL Group # & Sample #
^{90}Sr	9572-1 through 38
Total U	9572-1 through 38
Gamma Scan	9572-1 through 38

3. Results are reported pCi/gram dry material with 2 σ errors, except for total uranium which arreported μgm/gram dry material with 2 σ errors.

4. Strontium-90 analyses were processed in four batches, with ^{90}Sr QCs with each batch.

5. The QC samples consisting of a spike, a lab control sample, and a replicate were processed with this batch as shown on Table 1.

TABLE 1

Preparation Batch Samples Processed	Data Package
9572-1 through 38	- PLANT MATERIAL

QC SAMPLES PROCESSED:

Sample I.D.	Type	Analyses	Reported with Data Package
9572-39 (QC 7349)	Spike	^{90}Sr	X
9572-40 (QC 7350)	Spike	^{90}Sr	X
9572-41 (QC 7351)	Spike	^{90}Sr	X
9572-42 (QC 7352)	Spike	^{90}Sr	X
9572-43 (QC 7353)	LCS	^{90}Sr	X
9572-44 (QC 7354)	LCS	^{90}Sr	X
9572-45 (QC 7355)	LCS	^{90}Sr	X
9572-46 (QC 7356)	LCS	^{90}Sr	X
9572-47 (QC 7357)	Replicate	^{90}Sr	X
9572-48 (QC 7358)	Replicate	^{90}Sr	X
9572-49 (QC 7359)	Replicate	^{90}Sr	X
9572-50 (QC 7360)	Replicate	^{90}Sr	X
9572-51 (QC 7361)	Spike	Total U	X
9572-52 (QC 7362)	Spike	Total U	X
9572-53 (QC 7363)	LCS	Total U	X
9572-54 (QC 7364)	LCS	Total U	X
9572-55 (QC 7365)	Replicate	Total U	X
9572-56 (QC 7366)	Replicate	Total U	X
9572-57 (QC 7367)	Spike	Gamma Scan	X
9572-58 (QC 7368)	Spike	Gamma Scan	X
9572-59 (QC 7369)	LCS	Gamma Scan	X
9572-60 (QC 7370)	LCS	Gamma Scan	X
9572-61 (QC 7371)	Replicate	Gamma Scan	X
9572-62 (QC 7372)	Replicate	Gamma Scan	X

6. Analyses, reanalyses, and reworks, etc.

Strontium Analyses (Plant Material): The average yield for 38 analyses was 72%. The lowest yield was 32% and the highest was 87%. No abnormalities were encountered. The results of the spike, the Laboratory Control Sample, and the replicate were satisfactory.

Gamma Scan Analyses (Plant Material): The spike samples processed had only ^{60}Co and ^{137}Cs activity and the found/added ratio of the spikes look good. The results of the spike, the laboratory control sample, and the replicate were satisfactory.

Total Uranium Analyses (Plant Material): No abnormalities were encountered. The results of the spike, the Laboratory Control Sample, and the replicate were satisfactory.

SECTION 3: QC SUMMARY

QUALITY CONTROL SUMMARY

Attachment 2, 3, and 4 gives the results of the QC samples. The recovery ratios were determined by the QC Officer based upon the final data obtained for each. The laboratory control samples were calculated with an aliquot of 1.00 and, therefore, the presented data cannot be compared directly with the sample data. To compare them directly, the laboratory control sample data would need to be divided by sample aliquots.

The results of the spike, the laboratory control and the replicate for ^{90}Sr, total uranium, and gamma scan were satisfactory.

D.P. Kharkar

Dinkar P. Kharkar, Ph.D.
TMA/Norcal Program Manager

ATTACHMENT 2 QUALITY CONTROL SAMPLE RESULTS, SPIKES AND BLANKS

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found	Added	Recovery Ratio Found/Added ± 2 σ
Spikes for Plant Materail:				
9572-39 QC-7349	^{90}Sr	7.34 ± 1.08	8.56 ± 0.34	0.86 ± 0.13
9572-40 QC-7350	^{90}Sr	13.53 ± 0.95	12.83 ± 0.51	1.05 ± 0.08
9572-41 QC-7351	^{90}Sr	8.65 ± 1.44	10.27 ± 0.41	0.84 ± 0.14
9572-42 QC-7352	^{90}Sr	11.14 ± 0.96	12.83 ± 0.51	0.90 ± 0.09
9572-51 QC-7361	Total U	55.80 ± 9.59 (1)	48.80 ± 1.95 (1)	1.14 ± 0.10
9572-52 QC-7362	Total U	35.6 ± 6.12 (1)	32.53 ± 1.30 (1)	1.09 ± 0.10
9572-57 QC-7367	Gamma Scan:			
	^{60}Co	52 ± 18	54 ± 2	0.97 ± 0.34
	^{137}Cs	59 ± 16	84 ± 3	0.71 ± 0.20
9572-58 QC-7368	Gamma Scan:			
	^{60}Co	42 ± 19	54 ± 2	0.78 ± 0.36
	^{137}Cs	54 ± 15	63 ± 3	0.85 ± 0.23

(1) Units are μg/sample.

ATTACHMENT 3 QUALITY CONTROL SAMPLE RESULTS, LABORATORY CONTROL SAMPLES

TMA

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found		Added	Recovery Ratio Found/Added ± 2 σ
Laboratory Control Samples (Plant Material) (Blank)					
9572-43 QC-7353	^{90}Sr	0 ± 0.5		0	Satisfactory
9572-44 QC-7354	^{90}Sr	0.1 ± 0.2		0	Satisfactory
9572-45 QC-7355	^{90}Sr	-0.1 ± 0.2		0	Satisfactory
9572-46 QC-7356	^{90}Sr	(0.3 ± 0.2)		0	Satisfactory
9572-53 QC-7363	Total U	<0.0001 (1)		0	Satisfactory
9572-54 QC-7364	Total U	0.0001 ± 0.0001 (1)		0	Satisfactory
9572-59 QC-7369	Gamma Scan:				
	^{40}K	<2.307	E+02	0	Satisfactory
	^{51}Cr	<7.745	E+01	0	Satisfactory
	^{60}Co	<1.734	E+01	0	Satisfactory
	^{65}Zn	<2.915	E+01	0	Satisfactory
	^{134}Cs	<1.368	E+01	0	Satisfactory
	^{137}Cs	<1.460	E+01	0	Satisfactory
	^{226}Ra	<2.831	E+01	0	Satisfactory
	^{228}Th	<1.990	E+01	0	Satisfactory
	^{232}Th	<7.334	E+01	0	Satisfactory
9572-60 QC-7370	Gamma Scan:				
	^{40}K	<1.190	E+02	0	Satisfactory
	^{51}Cr	<1.233	E+02	0	Satisfactory
	^{60}Co	<2.431	E+01	0	Satisfactory
	^{65}Zn	<3.342	E+01	0	Satisfactory
	^{134}Cs	<1.068	E+01	0	Satisfactory
	^{137}Cs	<1.051	E+01	0	Satisfactory
	^{226}Ra	<2.157	E+01	0	Satisfactory
	^{228}Th	<1.743	E+01	0	Satisfactory
	^{232}Th	<5.915	E+01	0	Satisfactory

ATTACHMENT 4 QUALITY CONTROL RESULTS, REPLICATES

Nuclide	Results pCi/g ± error 2 σ			
	No. 9572-47 Replicate dup		No. 9572-1 Original	
QC 7357 ^{90}Sr	(0 ± 2) E-01		(1 ± 3) E-01	
	No. 9572-48 Replicate		No. 9572-2 Original	
QC 7358 ^{90}Sr	(0.1 ± 1) E+00		(2 ± 3) E+00	
	No. 9572-49 Replicate		No. 9572-3 Original	
QC 7359 ^{90}Sr	(6 ± 3) E-01		(1 ± 3) E-01	
	No. 9572-50 Replicate		No. 9572-4 Original	
QC 7360 ^{90}Sr	(-0.3 ± 0.3) E+00		(3 ± 2) E-01	
	No. 9572-55 Replicate		No. 9572-1 Original	
QC-7365 Total U	0.122 ± 0.051 (1)		0.155 ± 0.026 (1)	
	No. 9572-56 Replicate		No. 9572-2 Original	
QC-7366 Total U	0.050 ± 0.017 (1)		0.041 ± 0.007 (1)	
	No. 9572-61 Replicate		No. 9572-1 Original	
QC-7371 Gamma Scan:				
^{40}K	(1.165 ± 0.533)	E+01	(8.208 ± 4.403)	E+00
^{51}Cr	<1.650	E+03	<1.256	E+03
^{60}Co	<4.270	E-01	<4.245	E-01
^{65}Zn	<1.629	E+00	<1.729	E+00
^{134}Cs	<4.610	E-01	<3.922	E-01
^{137}Cs	<3.464	E-01	<3.504	E-01
^{226}Ra	<6.175	E-01	<6.904	E-01
^{228}Th	<6.335	E-01	<5.138	E-01
^{232}Th	<1.555	E+00	<1.406	E+00

ATTACHMENT 4 QUALITY CONTROL RESULTS, REPLICATES

Nuclide	Results pCi/g ± error 2 σ			
	No. 9572-62 Replicate		No. 9572-2 Original	
QC-7372 Gamma Scan:				
^{40}K	(2.030 ± 0.509)	E+01	(1.183 ± 0.334)	E+01
^{51}Cr	<1.578	E+03	<9.988	E+02
^{60}Co	<6.166	E-01	<2.895	E-01
^{65}Zn	<1.687	E+00	<1.226	E+00
^{134}Cs	<4.728	E-01	<2.984	E-01
^{137}Cs	<3.756	E-01	<2.053	E-01
^{226}Ra	<5.599	E-01	<4.284	E-01
^{228}Th	<8.696	E-01	<5.515	E-01
^{232}Th	<1.741	E+00	<9.256	E-01

(1) Units are μg/gram.

9613500.1951

SECTION 4 Chains-of-Custody Copies

9615500.1952

Air
OVERNIGHT DELIVERY

S.S.S.

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT)
PNL		PNL-92-272

PART I – TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
Environmental Sciences Dept.	Ecological Resources & Assess.	Applied Ecology

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

Routing ☒ Contractor ☐ Vendor

Shipped to	Off-site Custodian
TMA/NORCAL 2030 Wright Avenue Richmond, CA 94804	Robert Fox
	Full Title Project Coordinator

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
2	Poly Containers #CAB-4, CAB-5. Contains Plant Samples that are Bagged and Packed in Vermiculite. Samples are Non-Hazardous.	N/A
48 #	CAB-4	
53 #	CAB-5	

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

Necessity for the Off-Site Use of this Property

To support 300-FF-5 Task 7.

2405217625

Bill of Lading # _____

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
Fred L. D. Corra	200449	12-3-91

Location of Property (Area & Bldg.)	Contact	Phone
3000 Area/LSL II	RJ Fellows	375-2247

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
	PC2FA	Packaging & Containers 12-20-91

Originated By	Date	Authorized By	Date
CA Brandt	12/2/91	HE Westerdahl	12/2/91
Signature and Name of Property Control	Custodian Date	Property Management Approval	Date

PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient	Return Order No.	Date Issued	Purchase Order No.	Date Issued
Date 12-3-91				

DISTRIBUTION

By Originator	Shipping Operation – Sign all Copies and Forward to:

5315 Container CAB5

Westinghouse Hanford Company 9613500.1953

CHAIN OF CUSTODY

2 of 2

Custody Form Initiator: CA Brandt

Company Contact: CA Brandt Telephone: 376-5345

Project Designation/Sampling Locations: 300-FF-5 Task 7 Collection Date: 9-10/91

Ice Chest No.: CAB-5 Field Logbook No.: BNW 58573

Bill of Lading/Airbill No.: 2485217625 Offsite Property No.: PNL-92-272

Method of Shipment: Air

Shipped to: TMA/NORCAL

Possible Sample Hazards/Remarks: onsite samples < 50 pCi/g; offsite samples no hazard.

U/gamma splits		Sample Identification		ICP splits
B012X4	B012Z6	B01345	B017X3	B017Y1
B012Y5	B012L8	B01308	B017Y1	B017Y0
B012Z7	B012Z1	B01302	B017Y0	B017Y2
B012Z4 (CAB split)	B012Z3	B01307	B017X5	B017Y3
B012X1	B012Z5	B01333	B017P5	
B012Z8	B012W3	B01300		
B012P5	B012W2	B01355		
B012W4	B01339	B01303		
B012W8	B01338	B01327		
B012P1	B01344	B017P7		
B012W1	B01354	B017X4		

] Field Transfer of Custody	CHAIN OF POSSESSION	(Sign and Print Names)
Relinquished by: R J Fellows	Received by:	Date/Time: 12/2/91 10:00 am RJF
Relinquished by:	Received by: Kermit Blum	Date/Time: 12-4-91 1100
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90)

9613500.1954

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector CA Brandt Date Sampled 9-10/91 Time N/A hours

Company Contact CA Brandt Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B017Y1	1 ~20g glass	Plant matter	ICP metals
B017Y0	"	"	"
B017Y2	"	"	"
B017Y3	"	"	"

Field Information** From 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards none detected

PART II: LABORATORY SECTION

ceived by Kermit Blum Title Sample Control Supervisor Date 12-4-91

Analysis Required

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

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

A-6000-406 (05/90)

9613500.1955

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector CA Brandt Date Sampled 9-10-91 Time N/A hours

Company Contact CA Brandt Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B012X4	1, ~150g glass	plant matter	gamma scan, Sr^{90}, total U
B012Y5			
B012Z7			
B012Z4			
B012X1			
B012Z8			
B012P5			
B012W4			
B012W8			
B012P1			
B012W1			
B012Z6			
B012L8	ibid.	ibid	ibid
B012Z1			
B012Z3			
B012Z5			
B012W3			
B012W2			
B01339			
B01338			

Field Information** From 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards None detected

PART II: LABORATORY SECTION

eived by Kermit Blum Title Sample Control Supervisor Date 12-4-91

Analysis Required

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

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

A-6000-406 (05/90)

9613500.1956

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector CA Brandt Date Sampled 9-10/91 Time N/A hours

Company Contact CA Brandt Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01344	1, ~150g glass	Plant matter	gamma scan, Sr^{90}, total U
B01354			
B01345			
B01308			
B01302			
B01307			
B01333			
B01300			
B01355			
B01303			
B01327	ibid.	ibid.	ibid.
B017P7			
0017X4			
B017X3			
B017Y1			
B017Y0			
B017X5			
B017P5			

Field Information** from 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards none detected.

PART II: LABORATORY SECTION

.eived by Kermit Blum Title Sample Control Supervisor Date 12-4-91

Analysis Required

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

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

A-6000-406 (05/90)

FORM OF PAYMENT

Check ☐ GBL ☐ FCCOD ☐

Bill to Shipper ☒ Bill to Consignee ☐ Third Party Billing ☐

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 ☐

PULL FOR SHPT. NO. TAB

Shipper's Account Number: E 850282294

Date: 12-03-91 | Origin: PSC | Shipment Number: 248521762 5

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

To:
ROBERT FOX
TMA/NORCAL
2030 WRIGHT AVENUE
RICHMOND CA
Hold for Pick Up ☐ Canada ☐

Tariff Dest. | Gateway

Check to Shipper $

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: D7D82 PC2FA PNL 92-272 | Zip: 99352

E Consignee's Account Number | Zip: 94804

Description	Pcs.	L	W	H	Total Pieces	Total Weight (In Lbs.)
POLY CONTAINERS/PLANT SAMPLES	2				2	101

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

Declared Value $

248521762 5

Remarks: OVERNIGHT DELIVERY SIGNATURE SECURITY SERVICE

Shipper's Signature X 12-3-91

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 ☐

International Shipments: Free Domicile ☐ | Third Party Account Number

International Insurance

FOR INFOR

Charges | Other Charges/Advances at Origin | OCIAC

1-OAK-A

Terms and Conditions on Back

CONSIGNEE — PACKAGE COPY — 4

9613500.1958

SECTION 5 Analytical Methods Used

ANALYTICAL METHODS USED - SOIL AND VEGETATION

1. Gross Alpha and Gross Beta: Approximately a 0.200 gram was uniformly deposited on a stainless steel planchet and counted on a low background proportional counter for gross alpha and gross beta determination.

2. Strontium-90: ^{90}Sr was determined on a 1 gram aliquot. Approximately 3 gram dry soil was dissolved completely by $HF-HNO_3-HCl$ treatment and made to a known volume. One gram aliquot was taken for ^{90}Sr determination. Yttrium carrier was added Yttrium was extracted by HDEHP extraction. Yttrium was converted to yttrium oxide and beta counted.

3. Isotopic Uranium: Uranium was determined on a 1 gram aliquot. Approximately 3 gram dry soil was dissolved completely by $HF-HNO_3-HCl$ treatment and made to a known volume. A one gram aliquot was taken for isotopic uranium determination. An appropriate uranium tracer was added and uranium purified by selective ion exchange procedures. The purified extract was electroplated on a stainless steel disc for alpha pulse analysis.

4. Technetium-99: Approximately 2 gram was ashed at 500°C with ^{99m}Tc tracer and ammonia. The ash was leached with H_2SO_4 and $K_2S_2O_8$. The leached sample is filtered. H_2SO4 and $K_2S_2O_8$ was added to a 10 mL aliquot of water. The water and the leached samaple of soil was extracted with TBP and purified by coprecipitation and anion exchange procedure. The purified Tc was electroplated on a stainless steel disc and counted on a gamma detector to determine yield. After decay of ^{99m}Tc, the disc was counted on a low background beta counter.

5. Gamma-Scan: Approximately 200 to 750 gram dry soil was placed in an appropriate geometry and counted on a Ge(Li) detector.

6. Total Uranium: 0.250 gram dry material was dissolved in 20 mL 1N HNO_3. An aliquot was taken for laser phosphorometric determination of uranium.

7. Tritium: Tritium was azeotropically distilled from ≈ 20 gram vegetation and the distillate was counted by liquid scintillation.

SAMPLE NUMBER:	9572-1	9572-15	9572-17	9572-18	9572-30	9572-35
COLLECTION DATE:	09/10/91	09/10/91	09/10/91	09/10/91	09/10/91	09/10/91
CHAIN OF CUSTODY:	12/02/91	12/02/91	12/02/91	12/02/91	12/02/91	12/02/91
STRONTIUM 90:						
DATE RUN:	05/07/92	05/08/92	05/08/92	05/08/92	05/09/92	05/09/92
TOTAL URANIUM:						
DATE RUN:	06/11/92	06/11/92	06/11/92	06/11/92	06/11/92	06/11/92
GAMMA SCAN						
DATE RUN:	05/27/92	05/30/92	05/30/92	05/30/92	05/30/92	05/30/92
COBALT 60:						
CESIUM 137:						
THORIUM 228:						

SAMPLE NUMBER:	9572-36	9572-38	9572-39	9572-40	9572-41	9572-42	9572-43
COLLECTION DATE:	09/10/91	09/10/91					
CHAIN OF CUSTODY:	12/02/91	12/02/91					
STRONTIUM 90:							
DATE RUN:	05/09/92	05/09/92	05/07/92	05/09/92	05/09/92	05/09/92	05/07/92
TOTAL URANIUM:							
DATE RUN:	06/11/92	06/11/92					
GAMMA SCAN							
DATE RUN:	05/30/92	05/30/92					
COBALT 60:							
CESIUM 137:							
THORIUM 228:							

SAMPLE NUMBER:	9572-44	9572-45	9572-46	9572-47	9572-48	9572-49
COLLECTION DATE:						
CHAIN OF CUSTODY:						
STRONTIUM 90:						
DATE RUN:	05/08/92	05/09/92	05/09/92	05/07/92	05/08/92	05/09/92
TOTAL URANIUM:						
DATE RUN:						
GAMMA SCAN						
DATE RUN:						
COBALT 60:						
CESIUM 137:						
THORIUM 228:						

SAMPLE NUMBER:	9572-50	9572-51	9572-52	9572-53	9572-54	9572-55
COLLECTION DATE:						
CHAIN OF CUSTODY:						
STRONTIUM 90:						
DATE RUN:	05/09/92					
TOTAL URANIUM:						
DATE RUN:		06/11/92	06/11/92	06/11/92	06/11/92	06/11/92
GAMMA SCAN						
DATE RUN:						
COBALT 60:						
CESIUM 137:						
THORIUM 228:						

SAMPLE NUMBER:	9572-56	9572-57	9572-58	9572-59	9572-60	9572-61
COLLECTION DATE:						
CHAIN OF CUSTODY:						
STRONTIUM 90:						
DATE RUN:						
TOTAL URANIUM:						
DATE RUN:	06/11/92					
GAMMA SCAN						
DATE RUN:		05/31/92	05/31/92	05/31/92	05/31/92	05/31/92
COBALT 60:						
CESIUM 137:						
THORIUM 228:						

SAMPLE NUMBER:	9572-62
COLLECTION DATE:	
CHAIN OF CUSTODY:	
STRONTIUM 90:	
DATE RUN:	
TOTAL URANIUM:	
DATE RUN:	
GAMMA SCAN	
DATE RUN:	05/31/92
COBALT 60:	
CESIUM 137:	
THORIUM 228:	

9572-18
Reported Results do not match ~~Calculated~~ RAW Results

TMA/Norcal N1-12-031-9572

Biota Samples

SR90	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2														
3			GROSS	COUNT	BKG		NET							
4	SAMPLE	ET	CTS	TIME	CPM	SF	CPM	X	Ws	Wb	WY	WX	WXY	WX^2
5	9572-1	0.44300	18.00000	25.01000	0.45480	0.98460	0.26083	0.89004	33.55353	1099.38434	8.75185	29.86407	7.78952	26.58030
6	B012X4	1.13300	14.00000	27.30000	0.72560	1.02420	-0.21793	0.74383	49.27321	689.08490	0.04927	36.65097	0.03665	27.26215
7	Plant Matter	2.46900	8.00000	26.17000	0.54110	1.00380	-0.23630	0.52566	78.22098	924.04361	0.07822	41.11742	0.04112	21.61367
8		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
9		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
10		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12		DELTA=	567.28810					SUMS=	161.04772	2712.51285	8.87935	107.63247	7.86729	75.45612
13														
14						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
15		Y @ MILK	REPORTED	CALCULATED		1.46317		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
16		1 COMP=	0.10400	0.10426	OK					0.12133	0.05465	*	0.33767	No
17		2 COMP=	NA	0.54876	*	P-FACTOR		C-ZERO						
18						1.75900		0.07126						
19														
20	9572-15	0.51300	26.00000	25.26000	0.51710	1.05050	0.53806	0.87398	23.79785	966.93096	12.80470	20.79895	11.19111	18.17797
21	B012Z3	2.23700	11.00000	25.03000	0.51710	1.05000	-0.08151	0.55836	53.68105	966.93096	0.05366	29.96229	0.02996	16.72981
22	Plant Matter	4.22000	28.00000	36.62000	0.54110	1.00400	0.22440	0.33329	45.26259	924.04361	10.15708	15.08538	3.38521	5.02774
23		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
24		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
25		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
26		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
27		DELTA=	565.16779					SUMS=	122.72148	2857.90554	23.01544	65.84663	14.60628	39.93552
28														
29						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
30		Y @ MILK	REPORTED	CALCULATED		0.63941		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
31		1 COMP=	0.22800	0.36575	*					0.60687	0.43872	*	0.84682	No
32		2 COMP=	NA	0.49015	*	P-FACTOR		C-ZERO						
33						1.75900		0.57201						
34														
35	9572-17	0.53300	13.00000	25.42000	0.54110	1.00450	-0.02983	0.86945	47.03803	924.04361	0.04704	40.89703	0.04090	35.55776
36	B012W3	2.25500	12.00000	25.30000	0.51710	1.05000	-0.04493	0.55575	50.42310	966.93096	0.05042	28.02253	0.02802	15.57347
37	Plant Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
38		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
39		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
40		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
41		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
42		DELTA=	233.40075					SUMS=	97.46113	1890.97458	0.09746	68.91956	0.06892	51.13122
43														
44						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
45		Y @ MILK	REPORTED	CALCULATED		1.25720		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
46		1 COMP=	NA	0.00135	*					-0.02987	0.00000	*	0.42946	No

96 1500 1966

SR90	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2														
3			GROSS	COUNT	BKG		NET							
4	SAMPLE	ET	CTS	TIME	CPM	SF	CPM	X	Ws	Wb	WY	WX	WXY	WX^2
47		2 COMP=	0.00000	0.00000	*	P-FACTOR		C-ZERO						
48						1.75900		0.00000						
49														
50	9572-18	0.53300	15.00000	25.42000	0.57680	0.98710	0.01312	0.86945	40.90746	866.85160	0.53651	35.56682	0.46646	30.92343
51	B012W2	2.19700	13.00000	25.91000	0.51710	1.05000	-0.01613	0.56417	48.88675	966.93096	0.04889	27.58045	0.02758	15.56007
52	Plant Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
53		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
54		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
55		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
56		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
57		DELTA=	186.37088					SUMS=	89.79420	1833.78256	0.58539	63.14728	0.49404	46.48350
58														
59						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
60		Y @ MILK	REPORTED	CALCULATED		1.38246		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
61		1 COMP=	0.01000	0.01063	OK					0.01291	0.00590	*	0.39972	No
62		2 COMP=	NA	0.03969	*	P-FACTOR		C-ZERO						
63						1.75900		0.00769						
64														
65	9572-30	0.88100	20.00000	27.78000	0.57980	1.07290	0.15036	0.79416	36.77542	862.36633	5.52951	29.20553	4.39131	23.19383
66	B01303	1.52000	23.00000	26.14000	0.57980	1.07280	0.32192	0.67270	28.57634	862.36633	9.19939	19.22324	6.18841	12.93143
67	Plant Matter	2.58200	39.00000	28.01000	0.71130	1.01650	0.69230	0.51039	19.39180	702.93628	13.42489	9.89744	6.85197	5.05159
68		3.60400	70.00000	112.60000	0.56490	0.98850	0.05612	0.38955	148.41637	885.11241	8.32865	57.81613	3.24445	22.52248
69		4.98700	46.00000	47.95000	0.72630	1.01520	0.23657	0.27288	46.15397	688.42076	10.91886	12.59467	2.97958	3.43688
70		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
71		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
72		DELTA=	2178.85923					SUMS=	279.31390	4001.20412	47.40130	128.73701	23.65572	67.13621
73														
74						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
75		Y @ MILK	REPORTED	CALCULATED		1.54188		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
76		1 COMP=	NA	0.35235	*					0.18158	0.11531	*	0.35834	No
77		2 COMP=	0.16400	0.23181	*	P-FACTOR		C-ZERO						
78						1.75900		0.15034						
79														
80	9572-38	0.92600	24.00000	26.45000	0.64210	1.04230	0.27649	0.78498	27.95276	778.69491	7.72875	21.94239	6.06693	17.22437
81	B017P5	2.60400	26.00000	27.40000	0.72560	1.02210	0.22824	0.50750	27.55932	689.08490	6.29014	13.98635	3.19225	7.09807
82	Plant Matter	3.71000	15.00000	25.73000	0.54930	1.00470	0.03384	0.38075	41.95942	910.24941	1.41971	15.97595	0.54055	6.08281
83		4.98700	24.00000	47.95000	0.56490	0.98710	-0.06355	0.27288	86.02469	885.11241	0.08602	23.47474	0.02347	6.40587
84		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
85		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
86		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
87		DELTA=	1072.64120					SUMS=	183.49619	3263.14162	15.52463	75.37944	9.82320	36.81112
88														

SR90	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2														
3			GROSS	COUNT	BKG		NET							
4	SAMPLE	ET	CTS	TIME	CPM	SF	CPM	X	Ws	Wb	WY	WX	WXY	WX^2
89						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
90		Y @ MILK	REPORTED	CALCULATED		1.52110		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
91		1 COMP=	0.26700	0.26685	OK					0.29877	0.13456	*	0.38612	No
92		2 COMP=	NA	0.58946	*	P-FACTOR		C-ZERO						
93						1.75900		0.17543						
94														
95	9572-36	0.92600	48.00000	26.45000	0.51710	1.04910	1.38136	0.78498	14.20746	966.93096	19.34145	11.15259	15.18268	8.75457
96	B017Y0	2.60300	42.00000	27.15000	0.61930	1.00830	0.83536	0.50784	17.01972	907.36315	15.91958	8.63987	8.08140	4.38593
97	Plant Matter	3.68900	25.00000	26.38000	0.54950	1.01530	0.40428	0.38282	26.86327	909.91811	10.86028	10.28375	4.18751	3.93680
98		4.98700	43.00000	47.95000	0.71930	1.01970	0.18096	0.27288	49.20853	695.12026	8.90495	13.42621	2.43002	3.66434
99		5.90300	26.00000	33.60000	0.54450	0.96050	0.22025	0.21524	41.23070	918.27385	9.08114	8.87448	1.95462	1.91014
100		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
101		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
102		DELTA=	620.91465					SUMS=	148.52968	4297.60612	64.10740	52.37889	31.80622	22.65179
103														
104						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
105		Y @ MILK	REPORTED	CALCULATED		1.36919		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
106		1 COMP=	1.40500	1.40414	OK					1.74670	0.78656	*	0.38621	Yes
107		2 COMP=	NA	2.20045	*	P-FACTOR		C-ZERO						
108						1.75900		1.02552						
109														
110	9572-35	0.90300	20.00000	26.05000	0.55140	1.01120	0.21878	0.78970	32.56506	906.78273	7.12450	25.71678	5.62625	20.30867
111	B017Y1	2.58600	18.00000	27.57000	0.54110	1.00400	0.11223	0.50987	40.22680	924.04361	4.51468	20.51064	2.30192	10.45786
112	Plant Matter	3.68900	18.00000	26.38000	0.64280	1.04140	0.04117	0.38282	36.68920	777.84692	1.51056	14.04529	0.57827	5.37679
113		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
114		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
115		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
116		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
117		DELTA=	324.20911					SUMS=	109.48108	2608.67327	13.14975	60.27271	8.50645	36.14332
118														
119						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
120		Y @ MILK	REPORTED	CALCULATED		1.34672		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
121		1 COMP=	0.23600	0.23535	OK					0.29796	0.13404	*	0.40112	No
122		2 COMP=	NA	0.42788	*	P-FACTOR		C-ZERO						
123						1.75900		0.17476						
124														

TotalU	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
2	Sample #	9572-1		9572-15		9572-17		9572-18		9572-30		9572-38		9572-36		9572-35	
3	Cust. I.D. #	B012X4		B012Z3		B012W3		B012W2		B01303		B017P5		B017Y0		B017Y1	
4	Type	Plant Matter		Plant Matter		Plant Matter		Plant Matter		Plant Matter		Plant Matter		Plant Matter		Plant Matter	
5	Final Result (ug/l)	1.94200		3.70000		3.45600		1.27900		3.08100		0.62900		0.33900		0.53600	
6	Prep Volume (l)	0.02000		0.02000		0.02000		1.88400		0.02000		0.02000		0.02000		0.02000	
7	Aliquot (g or l)	0.25000		0.25000		0.25000		0.25000		0.25000		0.25000		0.25000		0.25000	
8	Reported Results (ug/unit aliquot)	0.15500		0.30000		0.27700		0.15100		0.24600		0.05000		0.02700		0.04300	
9	Calculated Results (ug/unit aliquot)	0.15536	OK	0.29600	OK	0.27648	OK	9.63854	*	0.24648	OK	0.05032	OK	0.02712	OK	0.04288	OK
10	MDA	0.03700		0.03700		0.03700		0.03700		0.03700		0.03700		0.03700		0.03700	
11	Results > MDA ?	YES		YES		YES		YES		YES		YES		NO		YES	

Gamma	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
2	Sample #	9572-1		9572-15		9572-17		9572-18		9572-30		9572-38		9572-36		9572-35	
3	Cust. I.D. #	B012X4		B012Z3		B012W3		B012W2		B01303		B017P5		B017Y0		B017Y1	
4	Type	Plant Matter		Plant Matter		Plant Matter		Plant Matter		Plant Matter		Plant Matter		Plant Matter		Plant Matter	
5	Detector	G-1 JR		G-2 JR		G-5 JR		G-1 JR		G-2 JR		G-1 JR		G-3 JR		G-2 JR	
6	Aliquot (g or l)	49.40000		44.76000		41.67000		45.43000		46.33000		65.16000		49.64000		76.72000	
7	Counting Time (min)	109.65000		113.72000		113.55000		102.00000		100.68000		1165.43000		100.60000		100.50000	
8	[Cobalt 60; Co-60]																
9	Background CTS	0.00000		0.00000		0.00000		11.00000		2.00000		0.00000		0.00000		0.00000	
10	Background CPM	0.03170		0.07650		0.01170		0.03170		0.07650		0.03170		0.02110		0.07650	
11	Net CPM	0.16400		0.16300		0.14600		0.21700		0.20500		0.04000		0.13900		0.16100	
12	Branch Fraction	1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000	
13	Efficiency	0.00388		0.00324		0.00362		0.00388		0.00324		0.00388		0.00408		0.00324	
14	Reported Results (pCi/g or pCi/l)	<	*	<	*	<	*	<	*	<	*	<	*	<	*	<	*
15	Calculated Results (pCi/g or pCi/l)	0.38542		0.50629		0.43598		0.55454		0.61517		0.07127		0.30915		0.29176	
16	Reported MDA	0.42450	*	0.55720	*	0.47850	OK	0.60890	OK	0.67710	*	0.07924	*	0.34110	*	0.32070	OK
17	Calculated MDA	0.18621		0.37541		0.14125		0.44047		0.43263		0.04330		0.15010		0.23298	
18	Detect/Non Detect	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES
19	Results > MDA?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
20	[Cesium 137; Cs-137]																
21	Background CTS	0.00000		0.00000		0.00000		56.00000		0.00000		0.00000		0.00000		5.00000	
22	Background CPM	0.02830		0.02700		0.00000		0.02830		0.02700		0.02830		0.03210		0.02700	
23	Net CPM	0.25500		0.18100		0.15000		0.21600		0.21900		0.07600		0.22800		0.43600	
24	Branch Fraction	0.85100		0.85100		0.85000		0.85100		0.85100		0.85100		0.85100		0.85100	
25	Efficiency	0.00794		0.00664		0.00718		0.00794		0.00664		0.00794		0.00831		0.00664	
26	Reported Results (pCi/g or pCi/l)	<	*	<	*	<	*	0.32280	OK	<	*	<	*	<	*	0.46010	OK
27	Calculated Results (pCi/g or pCi/l)	0.34412		0.32236		0.26569		0.31696		0.37682		0.07776		0.29256		0.45303	
28	Reported MDA	0.35040	OK	0.32740	OK	0.27180	OK	NA	*	0.38350	OK	0.07935	OK	0.29710	OK	NA	*
29	Calculated MDA	0.10103		0.12788		0.00000		0.51446		0.13131		0.02349		0.10681		0.13381	
30	Detect/Non Detect	Non Detect	YES	Non Detect	YES	Non Detect	YES	Detect	NO	Non Detect	YES	Non Detect	YES	Non Detect	YES	Detect	YES
31	Results > MDA?	YES	YES	YES	YES	NO	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES	NO
32	[Thorium 228; Th-228]																
33	Background CTS	0.00000		46.00000		0.00000		249.00000		0.00000		1210.00000		120.00000		0.00000	
34	Background CPM	0.24600		0.14060		0.27930		0.24600		0.14060		0.24600		0.18620		0.14060	
35	Net CPM	0.44200		0.23900		0.32700		0.91200		0.33200		0.13900		0.57600		0.34700	
36	Branch Fraction	0.44800		0.44800		0.44800		0.44800		0.44800		0.44800		0.44800		0.44800	
37	Efficiency	0.02269		0.01844		0.01928		0.02269		0.01844		0.02269		0.02354		0.01844	
38	Reported Results (pCi/g or pCi/l)	<	*	0.37750	*	<	*	<	*	<	*	<	*	0.64380	*	<	*
39	Calculated Results (pCi/g or pCi/l)	0.39649		0.29115		0.40925		22.00000		0.39074		0.09453		0.49563		0.24662	
40	Reported MDA	0.51380	*	NA	*	0.53070	*	1.15500	*	0.50770	*	0.12240	*	NA	*	0.32040	*
41	Calculated MDA	0.19800		0.39303		0.28925		0.73778		0.20495		0.10520		0.46947		0.12388	
42	Detect/Non Detect	Non Detect	YES	Detect	NO	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	NO	Detect	YES	Non Detect	YES
43	Results > MDA?	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES

TMA/Norcal N1-12-031-9572

Biota Samples

Strontium 90

MDA	2xMDA	5xMDA
0.33 ~~1.000~~	0.66 ~~2.000~~	1.65 ~~5.000~~

Customer I.D. #	Original S	Duplicate D	RPD	Q
9572-47	0.100	0.000	200.000	
9572-48	2.000	0.100	180.952	J or UJ
9572-49	0.100	0.600	142.857	J
9572-50	0.300	-0.300	ERR	

Total Uranium

MDA	2xMDA	5xMDA
0.037 ~~1.000~~	0.04 ~~2.000~~	0.185 5.000

Customer I.D. #	Original S	Duplicate D	RPD	Q
9572-55	0.155	0.122	23.827	ok
9572-56	0.041	0.500	169.686	

Gamma Spec

Colbolt 60

MDA	2xMDA	5xMDA
0.32 ~~0.010~~	0.64 ~~0.020~~	1.60 ~~0.050~~

Customer I.D. #	Original S	Duplicate D	RPD	Q
9572-61	0.425	0.427	0.587	ok
9572-62	0.290	0.617	72.200	

Cesium 137

MDA	2xMDA	5xMDA
0.27 ~~0.010~~	0.54 ~~0.020~~	1.35 ~~0.050~~

Customer I.D. #	Original S	Duplicate D	RPD	Q
9572-61	0.350	0.346	1.148	ok
9572-62	0.205	0.376	58.633	

Thorium 228

MDA	2xMDA	5xMDA
0.10 ~~0.010~~	0.20 ~~0.020~~	0.50 ~~0.050~~

Customer I.D. #	Original S	Duplicate D	RPD	Q
9572-61	0.514	0.634	20.866	ok
9572-62	0.552	0.870	44.768	

TMA/Norcal N1-12-031-9572

Biota Samples

Strontium 90

Customer I.D. #	Calculated Results	Raw Data Results	Reported Results	Q
B012X4	0.055	0.121	0.100	UJ
B012Z3	0.439	0.607	0.600	UJ
B012W3	0.000	-0.030	0.000	UJ
B012W2	0.006	0.013	0.100	UJ
B01303	0.115	0.182	0.200	UJ
B017P5	0.135	0.299	0.300	UJ ~~J~~
B017Y0	0.787	1.747	1.700	J
B017Y1	0.134	0.298	0.300	UJ

Total Uranium

Customer I.D. #	Calculated Results	Raw Data Results	Reported Results	Q
B012X4	0.155	0.155	0.155	J
B012Z3	0.296	0.300	0.300	J
B012W3	0.276	0.277	0.277	J
B012W2	9.639	0.151	0.151	J
B01303	0.246	0.246	0.246	J
B017P5	0.050	0.050	0.050	~~J~~ UJ
B017Y0	0.027	0.027	0.027	UJ
B017Y1	0.043	0.043	0.043	J

Gamma Spec

Colbolt 60

Customer I.D. #	Calculated Results	Raw Data Results	Reported Results	Q
B012X4	0.385	0.425	0.425	UJ
B012Z3	0.506	0.557	0.557	UJ
B012W3	0.436	0.479	0.479	UJ
B012W2	0.555	0.609	0.480	UJ
B01303	0.615	0.677	0.677	UJ
B017P5	0.071	0.079	0.079	UJ
B017Y0	0.309	0.341	0.341	UJ
B017Y1	0.292	0.321	0.321	UJ

Cesium 137

Customer I.D. #	Calculated Results	Raw Data Results	Reported Results	Q
B012X4	0.344	0.350	0.350	UJ
B012Z3	0.322	0.327	0.327	UJ
B012W3	0.266	0.272	0.272	UJ
B012W2	0.317	0.323	0.413	J
B01303	0.377	0.384	0.384	UJ
B017P5	0.078	0.079	0.079	J
B017Y0	0.293	0.297	0.297	UJ
B017Y1	0.453	0.460	0.460	J

Thorium 228

Customer I.D. #	Calculated Results	Raw Data Results	Reported Results	Q
B012X4	0.396	0.514	0.514	UJ
B012Z3	0.291	0.378	0.730	UJ
B012W3	0.409	0.531	0.531	UJ
B012W2	22.000	1.155	0.722	UJ
B01303	0.391	0.508	0.508	UJ
B017P5	0.095	0.122	0.122	UJ
B017Y0	0.496	0.644	0.644	J
B017Y1	0.247	0.320	0.320	UJ

TD 12/15/92

X00769 9613500.1858

DATA VERIFICATION CHECKLIST

Metals

PROJECT: Westinghouse Hanford	REVIEWER: E.Haik / A. Kocher	DATE: 7 / 30 / 92
LABORATORY: Weston / TMA/Norcal /	CASE: N1-12-068	SDG: BØ12L6
SAMPLE/MATRIX: Soil Water Biota		
BØ12L6, BØ12L7, BØ12N3, BØ12R8, BØ12SØ, BØ12T2, BØ12T6, BØ12V0, BØ12S0, BØ17M2, BØ17M4, BØ17MØ, BØ17P3, BØ17Q1, BØ17Q3, BØ17Q9, BØ17S7, BØ17T3, BØ17T5 & BØW7		

1. VOLATILE ORGANIC DATA PACKAGE COMPLETENESS

N/A

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	☐	☐	☐
Data Summary	☐	☐	☐
Chain-of-Custody	☐	☐	☐
QC Summary			
Surrogate report	☐	☐	☐
MS/MSD report	☐	☐	☐
Blank Summary	☐	☐	☐
GC/MS tuning report	☐	☐	☐
Internal standard summary report	☐	☐	☐
Sample Data			
Sample reports	☐	☐	☐
TIC reports for each sample	☐	☐	☐
RIC reports for all samples	☐	☐	☐
Raw and corrected spectra for all detected results	☐	☐	☐
Raw and corrected library search data for all TIC	☐	☐	☐
Quantitation and calculation data for all TIC	☐	☐	☐
Standard Data			
Initial calibration report	☐	☐	☐
RIC and quantitation reports for initial calibration	☐	☐	☐
Continuing calibration reports	☐	☐	☐
RIC and quantitation reports for cont. calibrations	☐	☐	☐
Internal standard summary report	☐	☐	☐
Raw QC Data			
Tuning report, spectra and mass lists	☐	☐	☐
Blank analysis reports	☐	☐	☐
TIC reports for all blanks	☐	☐	☐
RIC and quantitation reports for blanks	☐	☐	☐
Raw and corrected spectra for all detected results in blanks	☐	☐	☐
Raw and corrected library search data for all reported TIC	☐	☐	☐
Quantitation and calculation data for all TIC	☐	☐	☐
MS/MSD report forms	☐	☐	☐
RIC and quantitation reports for MS/MSD	☐	☐	☐
Additional Data			
Moisture/% solids data sheets	☐	☐	☐
Reduction formulae	☐	☐	☐
Instrument time logs	☐	☐	☐
Chemist notebook pages	☐	☐	☐
Sample preparation sheets	☐	☐	☐

9613500.1974

N/A

2. SEMI-VOLATILE ORGANIC DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	☐	☐	☐
Data Summary	☐	☐	☐
Chain-of-Custody	☐	☐	☐
QC Summary			
Surrogate report	☐	☐	☐
MS/MSD report	☐	☐	☐
Blank Summary	☐	☐	☐
GC/MS tuning report	☐	☐	☐
Internal standard summary report	☐	☐	☐
Sample Data			
Sample reports	☐	☐	☐
TIC reports for each sample	☐	☐	☐
RIC reports for all samples	☐	☐	☐
Raw and corrected spectra for all detected results	☐	☐	☐
Raw and corrected library search data for all reported TIC	☐	☐	☐
Quantitation and calculation data for all TIC	☐	☐	☐
Standard Data			
Initial calibration report	☐	☐	☐
RIC and quantitation reports for initial calibration	☐	☐	☐
Continuing calibration reports	☐	☐	☐
RIC and quantitation reports for cont. calibrations	☐	☐	☐
Internal standard summary report	☐	☐	☐
Raw QC Data			
Tuning report, spectra and mass lists	☐	☐	☐
Blank analysis reports	☐	☐	☐
TIC reports for all blanks	☐	☐	☐
RIC and quantitation reports for blanks	☐	☐	☐
Raw and corrected spectra for all detected results in blanks	☐	☐	☐
Raw and corrected library search data for all reported TIC	☐	☐	☐
Quantitation and calculation data for all TIC	☐	☐	☐
MS/MSD report forms	☐	☐	☐
RIC and quantitation reports for MS/MSD	☐	☐	☐
Additional Data			
Moisture/% solids data sheets	☐	☐	☐
Reduction formulae	☐	☐	☐
Instrument time logs	☐	☐	☐
Chemist notebook pages	☐	☐	☐
Sample preparation sheets	☐	☐	☐

N/A

3. PESTICIDE/PCB DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for resubmittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	☐	☐	☐
Data Summary	☐	☐	☐
Chain-of-Custody	☐	☐	☐
QC Summary			
Surrogate report	☐	☐	☐
MS/MSD report	☐	☐	☐
Blank Summary	☐	☐	☐
Sample Data			
Sample reports	☐	☐	☐
Chromatograms	☐	☐	☐
GC integration reports	☐	☐	☐
Worksheets	☐	☐	☐
UV traces from GPC	☐	☐	☐
GC/MS confirmation spectra	☐	☐	☐
Standard Data			
Pesticides Evaluation Standards Summary	☐	☐	☐
Pesticides/PCB Standards Summary	☐	☐	☐
Pesticides/PCB identification	☐	☐	☐
Pesticides standard chromatograms	☐	☐	☐
Raw QC Data			
Blank analysis report forms and chromatograms	☐	☐	☐
MS/MSD report forms and chromatograms	☐	☐	☐
Additional Data			
Moisture % solids data sheets	☐	☐	☐
Reduction formulae	☐	☐	☐
Instrument time logs	☐	☐	☐
Chemist notebook pages	☐	☐	☐
Sample preparation sheets	☐	☐	☐

9615500.1976

4. INORGANIC DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	☒	☐	☐
Cover Page	☒	☐	☐
Traffic Reports	☒	☐	☐
Sample Data			
Inorganic Analysis Data Sheets	☒	☐	☐
Standards Data			
Initial and Continuing Calibration Verification	☒	☐	☐
CRDL Standard for AA and ICP	☒	☐	☐
QC Summary			
Blanks	☒	☐	☐
ICP Interference Check Summary	☒	☐	☐
Spike Sample Recovery	☒	☐	☐
Post-Digestion Spike Sample Recovery	☐	☒	☐
Duplicate	☒	☐	☐
Laboratory Control Sample	☒	☐	☐
Standard Addition Results	☒	☐	☐
ICP Serial Dilutions	☒	☐	☐
Instrument Detection Limits	☒	☐	☐
ICP Interelement Correction Factors	☒	☐	☐
ICP Linear Ranges	☒	☐	☐
Preparation Log	☒	☐	☐
Analysis Run Log	☒	☐	☐
Raw Data			
ICP Raw Data	☒	☐	☐
Furnace AA Raw Data	☐	☐	☒
Mercury Raw Data	☐	☐	☒
Cyanide Raw Data	☐	☐	☒
Additional Data			
Internal laboratory chain-of-custody	☐	☒	☐
Laboratory Sample Preparation Records	☒	☐	☐
Percent Solids Analysis Records	☒	☐	☐
Reduction Formulae	☐	☒	☐
Instrument Run Logs	☒	☐	☐
Chemist notebook pages	☒	☐	☐

961500.1977

N/A

5. WET CHEMISTRY DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?:	Yes	No	N/A
Case Narrative		☐	☐	☐
Cover Page		☐	☐	☐
Traffic Reports/Chain-of-Custody		☐	☐	☐
Sample Analysis Data Report Forms		☐	☐	☐
Standards Data		☐	☐	☐
QC Summary				
Blanks Summary Report Forms		☐	☐	☐
Spike Sample Recovery Report Forms		☐	☐	☐
Duplicate Sample Analysis Report Forms		☐	☐	☐
Laboratory Control Sample Report Forms		☐	☐	☐
Raw Data				
Ion Chromatograph Chromatograms		☐	☐	☐
TOC and TOX Instrument Printouts		☐	☐	☐
Laboratory Bench Sheets		☐	☐	☐
Additional Data				
Laboratory Sample Preparation Logs		☐	☐	☐
Instrument Run Logs		☐	☐	☐
Internal Laboratory Chain-of-Custody		☐	☐	☐
Percent Solids Analysis Records		☐	☐	☐
Reduction Formulae		☐	☐	☐
Chemist Notebook Pages		☐	☐	☐

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST - FORM A-6

PROJECT: Westinghouse	REVIEWER: EH	DATE: 11-5-92
LABORATORY: TMA	CASE: N2-02-086	SDG: N2-02-086
SAMPLE/MATRIX: ~~B017Z8, B017~~ ~~ver~~ B017Z 4 samples		
~~B017Y0, B017Y1, B017Y2, B017Y3 ver~~		
B017X7, B017X8, B017X9, B017Y0		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	☑	☐	☐
Cover Page	☑	☐	☐
Traffic Reports	☑	☐	☐
Sample Data			
Inorganic Analysis Data Sheets	☑	☐	☐
Standards Data			
Initial and Continuing Calibration Verification	☑	☐	☐
CRDL Standard for AA and ICP	☑	☐	☐
QC Summary			
Blanks	☑	☐	☐
ICP Interference Check Summary	☑	☐	☐
Spike Sample Recovery	☑	☐	☐
Post-Digestion Spike Sample Recovery	☐	☐	☑
Duplicate	☑	☐	☐
Laboratory Control Sample	☑	☐	☐
Standard Addition Results	☑	☐	☐
ICP Serial Dilutions	☑	☐	☐
Instrument Detection Limits	☑	☐	☐
ICP Interelement Correction Factors	☑	☐	☐
ICP Linear Ranges	☑	☐	☐
Preparation Log	☑	☐	☐
Analysis Run Log	☑	☐	☐
Raw Data			
ICP Raw Data	☑	☐	☐
Furnace AA Raw Data	☐	☐	☑
Mercury Raw Data	☐	☐	☑
Cyanide Raw Data	☐	☐	☑
Additional Data			
Internal laboratory chain-of-custody	☑	☑	☐
Laboratory Sample Preparation Records	☑	☐	☐

Data Package Item	Present?: Yes	No	N/A
Percent Solids Analysis Records	☑	☐	☐
Reduction Formulae	☐	☑	☐
Instrument Run Logs	☐	☑	☐
Chemist notebook pages	☑	☐	☐

2. HOLDING TIMES (Form B-1)

Have all samples been analyzed within holding times? (Yes) No N/A

ACTION: If any holding times have been exceeded qualify all affected results as estimated (J for detects and UJ for nondetects).

3. INITIAL CALIBRATIONS (Form B-2)

Were all instruments calibrated daily, each set-up time and was the proper number of standards used? Yes No N/A

Are the correlation coefficients ≥0.995? UnKnown Yes No N/A

Was a midrange cyanide standard distilled? Yes No (N/A)

ACTION: Qualify all data as unusable if reported from an analysis in which an instrument was not calibrated or was calibrated with less than the minimum number of standards. Qualify associated sample results >IDL as estimated (J) and results <IDL as estimated (UJ), if the correlation coefficient is <0.0995 or the laboratory did not distill the midrange cyanide standard.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION (Form B-2)

Are ICV and CCV percent recoveries within control limits? (Yes) No N/A

Are there calculation errors? Yes (No) N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

5. ICP INTERFERENCE CHECK SAMPLE (Form B-2)

Has an ICS sample been analyzed at the proper frequency? (Yes) No N/A

Are the AB solution %R values within control? (Yes) No N/A

Are there calculation errors? Yes (No) N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

6. LABORATORY BLANKS (Form B-3)

Are target compounds present in the blanks? Yes No N/A

ACTION: Qualify all associated positive results for any analyte <5 times the amount in any laboratory blank as nondetected (U). If analyte concentrations in the blank are >CRDL or below the negative CRDL, verify the laboratory has redigested and reanalyzed associated samples with analyte concentrations <10 times the blank concentration. If the laboratory has not redigested and reanalyzed the samples, note in the validation narrative.

7. FIELD BLANKS (Form B-3) No field blanks.

Are target analytes present in the field blanks? Yes No N/A

ACTION: Qualify all sample results for any analyte <5 times the amount in any field blank as nondetected (U).

8. MATRIX SPIKE SAMPLE ANALYSIS (Form B-4)

Are spike recoveries within the control limits? Yes No N/A

ACTION: Qualify the affected sample data according to the following requirements:

If spike recovery is >125% and sample results are <IDL no qualification is required. If spike recovery is >125% or <75% qualify all positive results as estimated (J). If spike recovery is 30% to 74% qualify all nondetects as estimated (UJ). If spike recovery is <30%, reject all nondetects (R). If the field blank has been used for spike analysis, note in the validation narrative.

9. LABORATORY CONTROL SAMPLE (Form B-4)

Are percent recoveries within the acceptance limits? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify the sample data according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results >IDL, for which the LCS %R falls within the range 50-79% or >120%. Qualify as estimated (UJ), all sample results <IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R <50%.

SOLID LCS - Qualify as estimated (J), all sample results >IDL for which the LCS result is outside the established control limits. Qualify as estimated (UJ), all sample results <IDL for which the LCS %R are lower than the established control limits.

10. PERFORMANCE AUDIT ANALYSIS

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample analysis in the data validation narrative.

11. DUPLICATE SAMPLE ANALYSIS (Form B-5)

Are RPD values acceptable? Yes No N/A

ACTION: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD results fall outside the appropriate control limits. If field blanks were used for laboratory duplicates, note in the validation narrative.

12. ICP SERIAL DILUTION (Form B-6)

Are the serial dilution results acceptable? Yes No N/A

Is there evidence of negative interference? Yes No N/A

ACTION: Qualify the associated data as estimated (J) for those analytes in which the %D is outside the control limits. If evidence of negative interference is found, use professional judgement to qualify the data.

13. FIELD DUPLICATE SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field duplicate samples in the validation narrative.

14. FIELD SPLIT SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field split samples in the validation narrative.

15/16. FURNACE ATOMIC ABSORPTION QUALITY CONTROL (Form B-6)

Do all applicable analyses have duplicate injections? Yes No N/A

Are applicable duplicate injection RSD values within control limits? Yes No N/A

If no, were samples rerun once as required? Yes No N/A

Does the RSD for the rerun fall within the control limits? Yes No N/A

Were analytical spike recoveries within the control limits? Yes No N/A

If no, were MSA analyses performed when required?	Yes	No	N/A
Are MSA correlation coefficients ≥0.995?	Yes	No	N/A
If no, was a second MSA analysis performed?	Yes	No	N/A

ACTION: If duplicate injections are outside the acceptance limits and the sample has not been reanalyzed or the reanalysis is outside the acceptance limits, qualify the associated data as estimated (J for detects and UJ for nondetects). If the analytical spike recovery is <40% qualify detects as estimated (J). If the analytical spike recovery is ≥10% but <40%, qualify all nondetects as estimated (UJ) and if the analytical spike recovery is <10%, reject all nondetects (R). If the sample absorbance is <50% of the analytical spike absorbance and the analytical spike recovery is <85% or >115%, qualify all results as estimated (J for detects and UJ for nondetects). If method of standard additions (MSA) was required but was not performed, the MSA samples were spiked incorrectly, or the MSA correlation coefficient was <0.995, qualify the associated detected results as estimated (J).

17. ANALYTE QUANTITATION AND DETECTION LIMITS (Form B-6)

Have results been reported and calculated correctly?	Yes	No	N/A
Are results within the calibration range of the instruments and within the linear range of the ICP?	Yes	No	N/A
Are all detection limits below the CRQL?	Yes	No	N/A

ACTION: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

18. OVERALL ASSESSMENT AND SUMMARY (Form B-7)

Have the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

9613500.1983

COMMENTS (attach additional sheets as necessary):

1. Correlation coefficient calculations for ICP not available. Qualify all results as "J" or "UJ" as appropriate.

2

HOLDING TIME SUMMARY - FORM B-1

SDG: B017X7	REVIEWER: D. Anderson			DATE: 11/23/92		PAGE___OF___	
COMMENTS: Case No. N2-02-086							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B017X7	ICP METALS	9/10/91	2/27/92	3/9/92		~~180~~ 140	NONE
B017X8	↓	↓	↓	↓		↓	↓
B017X9							
B017X0							
B017X1							
B017X2		✓					
B017X3	↓		↓	↓		✓	✓

CALIBRATION DATA SUMMARY - FORM B-2

SDG: B017X7	REVIEWER: D. Anderson	DATE: 11/23/92		PAGE____OF____	
COMMENTS: Case No. N2-02-86		All initial and Continuing Calibrations are acceptable			
CALIB. TYPE: (INITIAL) ~~CONTINUING~~		INSTRUMENT: ICP			
CALIB. DATE	COMPOUND	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER
3/9/92	All No MESA Correlation	Coefficients provided		All	J

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG: B017~~X~~7 REVIEWER: D. Anderson DATE: 11/23/92 PAGE___OF___

COMMENTS: Cas No. N2-02-086

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
	Calcium	14.69	B		ug/L	73.45	146.90	none	none
	Iron	4.22	B		ug/L	21.10	42.20	none	non
	Nickel	0.89	B		ug/L	4.45	8.90	none	none
	Sodium	24.26	B		ug/L	121.30	242.60	none	none
	Zinc	2.79	B		ug/L	13.95	27.90	none	none

ACCURACY DATA SUMMARY - FORM B-4

SDG: B017X7	REVIEWER: D. Anderson	DATE: 11/23/92	PAGE____OF____	
COMMENTS: Case No. N2-02-086				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B017X8S	Antimony	88.5	None	None
	Barium	96.4		
	Beryllium	97.9		
	Cadmium	93.7		
	Chromium	92.7		
	Cobalt	94.2		
	Copper	96.3		
	Manganese	93.4		
	Nickel	93.0		
	Silver	~~103.0~~ 103.3 DO 11/23/92		
	Vanadium	95.3		
	Zinc	92.0		

PRECISION DATA SUMMARY - FORM B-5

SDG: B017X7 | REVIEWER D. Anderson | DATE: 11/23/92 | PAGE___OF___

COMMENTS: Cas No. N2-02-086

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Aluminum	B017X7D	B017X7	9.4	none	none
Barium			1.6		
Calcium			2.7		
Chromium			25.0		
Copper			9.3		
Iron			2.4		
Magnesium			2.5		
Manganese			1.9		
Nickel			10.5		
Potassium			1.8		
Sodium			2.6		
Vanadium			16.6		
Zinc			5.2		

CALCULATION SUMMARY - FORM B-6

SDG:	REVIEWER:	DATE:	PAGE___OF___
COMMENTS:			

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: B017X7	REVIEWER: DA	DATE: 11/23/92	PAGE___OF___
COMMENTS: CAS No. N2-02-086			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Qualify all results as "J" or "UJ" as appropriate			Correlation coefficient NOT Available.

TELEPHONE CONTACT SUMMARY - FORM B-8

REVIEWER:	DATE:	TIME:	PAGE___OF __
COMPANY:			
ADDRESS:			
PERSON CONTACTED:			
TELEPHONE:		FAX:	
PROJECT/CASE/SDG:			
REMARKS:			
ACTION:			

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST - FORM A-6

X00769

PROJECT: Westinghouse Hanford	REVIEWER: E. Hoik J. Reid	DATE: 7-30-92
LABORATORY: TMA	CASE: N1-12-068	SDG: B012L6 B012N5
SAMPLE/MATRIX: Biota Metals		

B012L6, B012L7, B012N3, B012R8, B012S0, B012T2, B012T6, B012V0, B012S8, B017M2 ~~B012~~, B017M4, B017M0, B017P3, B017Q1, B017Q3, B017Q9, B017S7, B017T3, B017T5, B017W7, B012N5, B012S2, B012T4, B012T8, B012S4, B017Q7, B017R1, B017R3, B017R5, B017R7, B017R9, B017T7, B017V1, B017V3, B017V5, B017V9, B017W1, B017W5, B017W9, B017V7

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?:	Yes	No	N/A
Case Narrative		☑	☐	☐
Cover Page		☑	☐	☐
Traffic Reports		☑	☐	☐
Sample Data				
Inorganic Analysis Data Sheets		☑	☐	☐
Standards Data				
Initial and Continuing Calibration Verification		☑	☐	☐
CRDL Standard for AA and ICP		☑	☐	☐
QC Summary				
Blanks		☑	☐	☐
ICP Interference Check Summary		☑	☐	☐
Spike Sample Recovery		☑	☐	☐
Post-Digestion Spike Sample Recovery		☐	☑	☐
Duplicate		☑	☐	☐
Laboratory Control Sample		☑	☐	☐
Standard Addition Results		☑	☐	☐
ICP Serial Dilutions		☑	☐	☐
Instrument Detection Limits		☑	☐	☐
ICP Interelement Correction Factors		☑	☐	☐
ICP Linear Ranges		☑	☐	☐
Preparation Log		☑	☐	☐
Analysis Run Log		☑	☐	☐
Raw Data				
ICP Raw Data		☑	☐	☐
Furnace AA Raw Data	ICP ONLY	☐	☐	☑
Mercury Raw Data		☐	☐	☑
Cyanide Raw Data		☐	☐	☑
Additional Data				
Internal laboratory chain-of-custody		☐	☑	☐
Laboratory Sample Preparation Records		☑	☐	☐

Data Package Item	Present?: Yes	No	N/A
Percent Solids Analysis Records	☑	☐	☐
Reduction Formulae	☐	☑	☐
Instrument Run Logs	☑	☐	☐
Chemist notebook pages	☑	☐	☐

2. HOLDING TIMES (Form B-1)

Have all samples been analyzed within holding times? See attached — Yes No N/A

ACTION: If any holding times have been exceeded qualify all affected results as estimated (J for\ detects and UJ for nondetects).

3. INITIAL CALIBRATIONS (Form B-2)

Were all instruments calibrated daily, each set-up time and was the proper number of standards used? — Yes No N/A

Are the correlation coefficients ≥0.995? — Yes No N/A

Was a midrange cyanide standard distilled? — Yes No N/A

ACTION: Qualify all data as unusable if reported from an analysis in which an instrument was not calibrated or was calibrated with less than the minimum number of standards. Qualify associated sample results >IDL as estimated (J) and results <IDL as estimated (UJ), if the correlation coefficient is <0.0995 or the laboratory did not distill the midrange cyanide standard.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION (Form B-2)

Are ICV and CCV percent recoveries within control limits? — Yes No N/A

Are there calculation errors? — Yes No N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

5. ICP INTERFERENCE CHECK SAMPLE (Form B-2)

Has an ICS sample been analyzed at the proper frequency? — Yes No N/A

Are the AB solution %R values within control? — Yes No N/A

Are there calculation errors? — Yes No N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST - FORM A-6

PROJECT: WHC	REVIEWER: E Hair	DATE: 8-5-92
LABORATORY: TMA	CASE: N1-12-068	SDG: B01226
SAMPLES/MATRIX: Biota Metals		

1. COMPLETENESS AND CONTRACT COMPLIANCE

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Verification completed by EK JR see 1st 2 pages of this Appendix

Data Package Item	Present?: Yes	No	N/A
Case Narrative	—	—	—
Cover Page	—	—	—
Traffic Reports	—	—	—
Sample Data			
Inorganic Analysis Data Sheets	—	—	—
Standards Data			
Initial and Continuing Calibration Verification	—	—	—
CRDL Standard for AA and ICP	—	—	—
QC Summary			
Blanks	—	—	—
ICP Interference Check Summary	—	—	—
Spike Sample Recovery	—	—	—
Post-Digestion Spike Sample Recovery	—	—	—
Duplicate	—	—	—
Laboratory Control Sample	—	—	—
Standard Addition Results	—	—	—
ICP Serial Dilutions	—	—	—
Instrument Detection Limits	—	—	—
ICP Interelement Correction Factors	—	—	—
ICP Linear Ranges	—	—	—
Preparation Log	—	—	—
Analysis Run Log	—	—	—
Raw Data			
ICP Raw Data	—	—	—
Furnace AA Raw Data	—	—	—
Mercury Raw Data	—	—	—
Cyanide Raw Data	—	—	—
Additional Data			
Internal laboratory chain-of-custody	—	—	—
Laboratory Sample Preparation Records	—	—	—

Data Package Item	Present?: Yes	No	N/A
Percent Solids Analysis Records	___	___	___
Reduction Formulae	___	___	___
Instrument Run Logs	___	___	___
Chemist Notebook Pages	___	___	___

2. HOLDING TIMES

Have all samples been analyzed within holding times?	(Yes)	No	N/A

ACTION: If any holding times have been exceeded qualify all affected results as estimated (J for detects and UJ for nondetects).

3. INITIAL CALIBRATIONS

Were all instruments calibrated daily, each set-up time and were the proper number of standards used?	(Yes)	No	N/A
Are the correlation coefficients ≥0.995?	Yes	No	(N/A)
Was a midrange cyanide standard distilled?	Yes	No	(N/A)

ACTION: Qualify all data as unusable if reported from an analysis in which an instrument was not calibrated or was calibrated with less than the minimum number of standards. Qualify associated sample results > IDL as estimated (J) and results < IDL as estimated (UJ), if the correlation coefficient is <0.995 or the laboratory did not distill the midrange cyanide standard.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION

Are ICV and CCV percent recoveries within control?	(Yes)	No	N/A
Are there calculation errors?	Yes	(No)	N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

5. ICP INTERFERENCE CHECK SAMPLE

Has an ICS sample been analyzed at the proper frequency?	(Yes)	No	N/A
Are the AB solution %R values within control?	(Yes)	No	N/A
Are there calculation errors?	Yes	(No)	N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

6. LABORATORY BLANKS

Are target analytes present in the laboratory blanks? (Yes) No N/A

ACTION: Qualify all associated sample results for any analyte < 5 times the amount in any laboratory blank as nondetected (U). If analyte concentrations in the blank are > CRDL or below the negative CRDL, verify the laboratory has redigested and reanalyzed associated samples with analyte concentrations < 10 times the blank concentration. If the laboratory has not redigested and reanalyzed the samples, note in the validation narrative.

7. FIELD BLANKS

Are target analytes present in the field blanks? Yes No (N/A)

ACTION: Qualify all sample results for any analyte < 5 times the amount in any valid field blank as nondetected (U).

8. MATRIX SPIKE SAMPLE ANALYSIS

Are spike recoveries within the control limits? (Yes) No N/A

ACTION: Qualify the affected sample data according to the following requirements:

If spike recovery is > 125% and sample results are < IDL no qualification is required. If spike recovery is > 125% or < 75% qualify all positive results as estimated (J). If spike recovery is 30% to 74% qualify all nondetects as estimated (UJ). If spike recovery is < 30%, reject all nondetects (R). If the field blank has been used for spike analysis, note in the validation narrative.

9. LABORATORY CONTROL SAMPLE

Are percent recoveries within the acceptance limits? (Yes) No N/A

Are there calculation errors? Yes (No) N/A

ACTION: Qualify the sample data according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results > IDL, for which the LCS %R falls within the range 50-79% or > 120%. Qualify as estimated (UJ), all sample results < IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R < 50%.

SOLID LCS - Qualify as estimated (J), all sample results > IDL for which the LCS result is outside the established control limits. Qualify as estimated (UJ), all sample results < IDL for which the LCS %R are lower than the established control limits.

10. PERFORMANCE AUDIT ANALYSES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample analyses in the data validation narrative.

11. DUPLICATE SAMPLE ANALYSIS

Are RPD values acceptable? Yes No N/A

ACTION: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD results fall outside the appropriate control limits. If field blanks were used for laboratory duplicates, note in the validation narrative.

12. ICP SERIAL DILUTION

Are the serial dilution results acceptable? Yes No N/A

Is there evidence of negative interference? Yes No N/A

ACTION: Qualify the associated data as estimated (J) for those analytes in which the %D is outside the control limits. If evidence of negative interference is found, use professional judgment to qualify the data.

13. FIELD DUPLICATE SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field duplicate samples in the validation narrative.

14. FIELD SPLIT SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field split samples in the validation narrative.

1516. FURNACE ATOMIC ABSORPTION QUALITY CONTROL

Do all applicable analyses have duplicate injections? Yes No N/A

Are applicable duplicate injection RSD values within control? Yes No N/A

If no, were samples rerun once as required? Yes No N/A

Does the RSD for the rerun fall within the control limits? Yes No N/A

Were analytical spike recoveries within the control limits? Yes No N/A

If no, were MSA analyses performed when required?	Yes	No	N/A
Are MSA correlation coefficients ≥0.995?	Yes	No	N/A
If no, was a second MSA analysis performed?	Yes	No	N/A

ACTION: If duplicate injections are outside the acceptance limits and the sample has not been reanalyzed or the reanalysis is outside the acceptance limits, qualify the associated data as estimated (J for detects and UJ for nondetects). If the analytical spike recovery is <40% qualify detects as estimated (J). If the analytical spike recovery is ≥10% but <40%, qualify all nondetects as estimated (UJ) and if the analytical spike recovery is <10%, reject all nondetects (R). If the sample absorbance is <50% of the analytical spike absorbance and the analytical spike recovery is <85% or >115%, qualify all results as estimated (J for detects and UJ for nondetects). If method of standard additions (MSA) was required but was not performed, the MSA samples were spiked incorrectly, or the MSA correllation coefficient was <0.995, qualify the associated detected results as estimated (J).

17. ANALYTE QUANTITATION AND DETECTION LIMITS

Have results been reported and calculated correctly?	Yes	No	N/A
Are results within the calibrated range of the instruments and within the linear range of the ICP?	Yes	No	N/A
Are all detection limits below the CRQL?	Yes	No	N/A

Action: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

18. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary): Overall, the data are of good quality, qualification of the data was based on blank contamination see form B3-7 for more details.

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST - FORM A-6

PROJECT: WHC	REVIEWER: E. Hale	DATE: 8-6-92
LABORATORY: TMA	CASE: N1-12-068	SDG: B012N5
SAMPLES/MATRIX: Biota Metals		

1. COMPLETENESS AND CONTRACT COMPLIANCE

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?:	Yes	No	N/A
Case Narrative		—	—	—
Cover Page		—	—	—
Traffic Reports		—	—	—
Sample Data				
Inorganic Analysis Data Sheets	Verification completed by EH JR see 1st 2 pages of this appendix	—	—	—
Standards Data				
Initial and Continuing Calibration Verification		—	—	—
CRDL Standard for AA and ICP		—	—	—
QC Summary				
Blanks		—	—	—
ICP Interference Check Summary		—	—	—
Spike Sample Recovery		—	—	—
Post-Digestion Spike Sample Recovery		—	—	—
Duplicate		—	—	—
Laboratory Control Sample		—	—	—
Standard Addition Results		—	—	—
ICP Serial Dilutions		—	—	—
Instrument Detection Limits		—	—	—
ICP Interelement Correction Factors		—	—	—
ICP Linear Ranges		—	—	—
Preparation Log		—	—	—
Analysis Run Log		—	—	—
Raw Data				
ICP Raw Data		—	—	—
Furnace AA Raw Data		—	—	—
Mercury Raw Data		—	—	—
Cyanide Raw Data		—	—	—
Additional Data				
Internal laboratory chain-of-custody		—	—	—
Laboratory Sample Preparation Records		—	—	—

Data Package Item	Present?:	Yes	No	N/A
Percent Solids Analysis Records		—	—	—
Reduction Formulae		—	—	—
Instrument Run Logs		—	—	—
Chemist Notebook Pages		—	—	—

2. HOLDING TIMES

Have all samples been analyzed within holding times?	Yes	No	N/A

ACTION: If any holding times have been exceeded qualify all affected results as estimated (J for detects and UJ for nondetects).

3. INITIAL CALIBRATIONS

Were all instruments calibrated daily, each set-up time and were the proper number of standards used?	Yes	No	N/A
Are the correlation coefficients ≥0.995?	Yes	No	N/A
Was a midrange cyanide standard distilled?	Yes	No	N/A

ACTION: Qualify all data as unusable if reported from an analysis in which an instrument was not calibrated or was calibrated with less than the minimum number of standards. Qualify associated sample results > IDL as estimated (J) and results < IDL as estimated (UJ), if the correlation coefficient is <0.995 or the laboratory did not distill the midrange cyanide standard.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION

Are ICV and CCV percent recoveries within control?	Yes	No	N/A
Are there calculation errors?	Yes	No	N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

5. ICP INTERFERENCE CHECK SAMPLE

Has an ICS sample been analyzed at the proper frequency?	Yes	No	N/A
Are the AB solution %R values within control?	Yes	No	N/A
Are there calculation errors?	Yes	No	N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

6. LABORATORY BLANKS

Are target analytes present in the laboratory blanks? Yes No N/A

ACTION: Qualify all associated sample results for any analyte < 5 times the amount in any laboratory blank as nondetected (U). If analyte concentrations in the blank are > CRDL or below the negative CRDL, verify the laboratory has redigested and reanalyzed associated samples with analyte concentrations < 10 times the blank concentration. If the laboratory has not redigested and reanalyzed the samples, note in the validation narrative.

7. FIELD BLANKS

Are target analytes present in the field blanks? Yes No N/A

ACTION: Qualify all sample results for any analyte < 5 times the amount in any valid field blank as nondetected (U).

8. MATRIX SPIKE SAMPLE ANALYSIS

Are spike recoveries within the control limits? Yes No N/A

ACTION: Qualify the affected sample data according to the following requirements:

If spike recovery is > 125% and sample results are < IDL no qualification is required. If spike recovery is > 125% or < 75% qualify all positive results as estimated (J). If spike recovery is 30% to 74% qualify all nondetects as estimated (UJ). If spike recovery is < 30%, reject all nondetects (R). If the field blank has been used for spike analysis, note in the validation narrative.

9. LABORATORY CONTROL SAMPLE

Are percent recoveries within the acceptance limits? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify the sample data according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results > IDL, for which the LCS %R falls within the range 50-79% or > 120%. Qualify as estimated (UJ), all sample results < IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R < 50%.

SOLID LCS - Qualify as estimated (J), all sample results > IDL for which the LCS result is outside the established control limits. Qualify as estimated (UJ), all sample results < IDL for which the LCS %R are lower than the established control limits.

10. PERFORMANCE AUDIT ANALYSES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample analyses in the data validation narrative.

11. DUPLICATE SAMPLE ANALYSIS

Are RPD values acceptable? Yes No N/A

ACTION: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD results fall outside the appropriate control limits. If field blanks were used for laboratory duplicates, note in the validation narrative.

12. ICP SERIAL DILUTION

Are the serial dilution results acceptable? Yes No N/A

Is there evidence of negative interference? Yes No N/A

ACTION: Qualify the associated data as estimated (J) for those analytes in which the %D is outside the control limits. If evidence of negative interference is found, use professional judgment to qualify the data.

13. FIELD DUPLICATE SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field duplicate samples in the validation narrative.

14. FIELD SPLIT SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field split samples in the validation narrative.

1516. FURNACE ATOMIC ABSORPTION QUALITY CONTROL

Do all applicable analyses have duplicate injections? Yes No N/A

Are applicable duplicate injection RSD values within control? Yes No N/A

If no, were samples rerun once as required? Yes No N/A

Does the RSD for the rerun fall within the control limits? Yes No N/A

Were analytical spike recoveries within the control limits? Yes No N/A

If no, were MSA analyses performed when required?	Yes	No	N/A
Are MSA correlation coefficients ≥0.995?	Yes	No	N/A
If no, was a second MSA analysis performed?	Yes	No	N/A

ACTION: If duplicate injections are outside the acceptance limits and the sample has not been reanalyzed or the reanalysis is outside the acceptance limits, qualify the associated data as estimated (J for detects and UJ for nondetects). If the analytical spike recovery is <40% qualify detects as estimated (J). If the analytical spike recovery is ≥10% but <40%, qualify all nondetects as estimated (UJ) and if the analytical spike recovery is <10%, reject all nondetects (R). If the sample absorbance is <50% of the analytical spike absorbance and the analytical spike recovery is <85% or >115%, qualify all results as estimated (J for detects and UJ for nondetects). If method of standard additions (MSA) was required but was not performed, the MSA samples were spiked incorrectly, or the MSA correllation coefficient was <0.995, qualify the associated detected results as estimated (J).

17. ANALYTE QUANTITATION AND DETECTION LIMITS

Have results been reported and calculated correctly?	Yes	No	N/A
Are results within the calibrated range of the instruments and within the linear range of the ICP?	Yes	No	N/A
Are all detection limits below the CRQL?	Yes	No	N/A

Action: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

18. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

96 15 00 2005

COMMENTS (attach additional sheets as necessary):

Overall, the data are of good quality, minor qualification was required due to the blank contamination for more details see Form B3 & B7

HOLDING TIME SUMMARY - FORM B-1

SDG: BØ12L6	REVIEWER: E. Heik	DATE: 8/5/92	PAGE 1 OF 2
COMMENTS: Metals			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BØ12L6	Icp-Metals	9/10/91	1/15/92	1/24/92	127	136	None
BØ12L7							
BØ12N3							
BØ12R8							
BØ12SØ							
BØ12T2							
BØ12T6							
BØ12V0							
BØ12S8							
BØ17M2							
BØ17M4							
BØ17M0							
BØ17P3							
BØ17Q1							
BØ17Q3							
BØ17Q9	↓	↓	↓	↓	↓	↓	↓

HOLDING TIME SUMMARY - FORM B-1

SDG: B0124	REVIEWER: E. Heik	DATE: 8/5/92	PAGE 2 OF 2
COMMENTS: Metals			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B0175 7	ICP-Metals	9/10/91	1/15/92	1/24/92	127	136	None
B0175 3	↓	↓	↓	↓	↓	↓	↓
B0175 5	↓	↓	↓	↓	↓	↓	↓
B0175 7	↓	↓	↓	↓	↓	↓	↓
							EAH

9614000.2008

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG: BØ126 REVIEWER: E. Heik DATE: 8/5/92 PAGE 1 OF 2

COMMENTS: Metals

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
ICB	AL	-21.7	B		µg/L	—	-217.0	All sample >10X	None
	Cr	-5.4	B			—	-54	BØ1757, BØ17P3	redigestion was required.
	Fe	-15.4	B			—	-154	All samples >10X	None
	Ni	-5.0	B			—	-50	BØ1757, BØ17P3	redigestion was required
	Ag	-4.0	B				-40	All sample non-detect	None
prep. blank	Ca	8.93	B		mg/kg	44.6		None	
	Co	1.216	B			6.08		BØ17W7	u
	Mn	0.262	B			1.31		None	
	K	26.84	B			134.2		None	
	Ag	-0.68	B			—	-6.8	None	
	V	0.560	B			2.8		All positive results	u
CCB1	Cd	1.2	B		µg/L			BØ2T2 ~~None~~	u
	Cr	-5.4	B				-54.0	None	
	Cu	3.0	B					None	
	Mn	1.3	B					None	
	Ni	-4.6	B				-46	None	
	Ag	-5.1	B				-51	None	
	V	3.5	B					BØ1250, 12VØ 12T2	u

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG: B012616 REVIEWER: E. Heik DATE: 8/5/92 PAGE 2 OF 2

COMMENTS: Metals

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB2	Cd	2.2	B		µg/L		~~B017M4~~	B017M4, 17W7 B017S8	u
	Ag	-3.4	B				-34	None	
	V	2.1	B					B012N3, 17M2, 17S7 17M4, 17M0, 17S8, 17T3	u
CCB3	Cd	2.1	B					17T5, 17W2 B017P3, 17Q1	u
	Ag	-2.3	B				-23	None	
	V	2.8	B					All positive	u
	Zn	5.9	B					None	
CCB4	Cd	2.1	B					+ve	u
	Cr	-4.6	B				-46	-	
	Cu	-3.0	B				-30	-	
	Mn	1.3	B					-	
	Ag	-4.0	B				-40	-	
	V	2.8	B					-	
CCB5	Cd	2.2	B					-	
	Cu	3.0	B					-	
	Mn	1.6	B					-	
	Ag	-4.5	B				-45	-	

PRECISION DATA SUMMARY - FORM B-5

SDG: B0126	REVIEWER E. Heik	DATE: 8/5/92	PAGE 1 OF 1
COMMENTS: Metals			

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER

9613500.2011

CALCULATION SUMMARY - FORM B-6

SDG: BØ12L6	REVIEWER: E. Haik	DATE: 8/5/92	PAGE 1 OF 1
COMMENTS: Metals			

HOLDING TIME SUMMARY - FORM B-1

SDG: BØ12S2	REVIEWER: E. Haik	DATE: 8/6/92	PAGE 1 OF 2
COMMENTS: Metals			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BØ12N5	Icp-metals	9/10/91	1/15/92	1/24/92	127	136	None
BØ12S2							
BØ12T4							
BØ12T8							
BØ12S4							
BØ17Q7							
BØ17R1							
BØ17R3							
BØ17R5							
BØ17R7							
BØ17R9							
BØ17T7							
BØ17V1							
BØ17V3							
BØ17V5							
BØ17V9							

HOLDING TIME SUMMARY - FORM B-1

SDG: B0/252	REVIEWER: E. Haik	DATE: 8/6/92	PAGE 2 OF 2
COMMENTS: Metals			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B017W1	Icp-Metals	9/10/91	1/15/92	1/24/92	127	136	None
B017W5	↓	↓	↓	↓	↓	↓	↓
B017W9	↓	↓	↓	↓	↓	↓	↓
B017W9	↓	↓	↓	↓	↓	↓	↓

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG: B0125	REVIEWER: E. Haik	DATE: 8/6/92	PAGE 1 OF 1
COMMENTS: Metals			

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
ICB	sb	10.7	B		µg/L	53.5	—	None	
↓	Mn	-1.3	B		↓	—	-13	None	
prep blank	Ca	15.928	B		mg/kg	79.6	—	None	
	Cu	1.158	B		~~5.79~~	5.79	—	B0125 S2, S4, T4, T8, R7, V3, R1, R3, R5, R7, R9, T7, V1, V5, V9, W1, W5, W9, V4	u
	↓								↓
↓	Na	24.212	B		mg/kg	121.1	—	All samples	u
↓	V	-0.54	B		↓	—	-5.4	All positive results <10	times the blank required reclassification
CCB1	V	-2.7	B		µg/L	—	-27	↓	
CCB2	V	2.0	B		↓	10	—	↓	
CCB3	sb	14.3	B		↓	71.5	—	None	
↓	Cd	1.1	B		↓	5.5	—	B0117 V1, V3, V9, V7	u
CCB4	Mg	80.2	B		↓	401	—	None	
↓	K	-155.6	B		↓	—	-1556	↓	

ACCURACY DATA SUMMARY - FORM B-4

SDG: B0 12S2	REVIEWER: E. Heik	DATE: 8/6/92	PAGE 1 OF 1	
COMMENTS: Mitab				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED

PRECISION DATA SUMMARY - FORM B-5

SDG: B0 1252	REVIEWER E. Heck	DATE: 8/6/92	PAGE 1 OF 1
COMMENTS: Metals			

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER

9614500.2017

CALCULATION SUMMARY - FORM B-6

SDG: 60126	REVIEWER: E. Hait	DATE: 8/6/92	PAGE 1 OF 1

COMMENTS: Metals

EAH

E-33-06/2978-50

WESTINGHOUSE HANFORD COMPANY
300 AREA DATA VALIDATION
DISTRIBUTION FORM

originals

Document Title: Prelim. QA Records Trip Case # N1-12-056-9574

Document Number: HCRL-WHC-PCL-L-92-06 Date: 12/17/92

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Project Files (1=Adm: 2=Corres: 3=Source Information: 4=Technical Data & Products)

1	File Index	2.1	Incoming Correspondence		4.3.5	Biota/Small Mammals	X
2	Distribution Lists	2.2	Outgoing Correspondence	X	4.4.6	Surface Water Sediments	
3	Project Procedures	2.3	Internal Correspondence		4.5	Data Val. & Qual. Summary Rpts.	
4	Project Modifications				4.5.1	Round 1 Groundwater	
5.1	Staff Resumes	3.1	Task Order		4.5.1.1	Internal Drafts/Comments/Resol.	
5.2	Staff Training	3.2	Sample Lists		4.5.1.2	WHC Review Draft/Comments/Resol.	
5.3	Auth.-Former Site Employee	3.3	Data Validation Procedures		4.5.1.3	Final Report	
6.1	QA Manual	3.4	Original Chemical Data		4.5.2	Round 2 Groundwater	
6.2	QA Implementation	3.5	Original Radiochem Data		4.5.2.1	Internal Drafts/Comments/Resol.	
6.3.1	QA Audits-Deliverables				4.5.2.2	WHC Review Draft/Comments/Resol.	
6.3.2	QA Audits-Files	4.1	Task Plan		4.5.2.3	Final Report	
6.4.1	Audit Resps-Deliverables	4.2	Data Pkg. Completeness Verif.		4.5.3	Round 3 Groundwater	
6.4.2	Audit Resps-Files	4.2.1	Checklists - Round 1 GW		4.5.3.1	Internal Drafts/Comments/Resol.	
6.5	Training	4.2.2	Checklists - Round 2 GW		4.5.3.2	WHC Review Draft/Comments/Resol.	
6.6.1	QA Manual Doc Log	4.2.3	Checklists - Round 3 GW		4.5.3.3	Final Report	
6.6.2	Procedures Doc Log	4.2.4	Checklists - Round 4 GW		4.5.4	Round 4 Groundwater	
6.6.3	Plans Document Log	4.2.5	Checklists - Biota/Small Mam.		4.5.4.1	Internal Drafts/Comments/Resol.	
6.6.4	Deliverables Doc Log	4.2.6	Checklists - Surface Wtr./Sed.		4.5.4.2	WHC Review Draft/Comments/Resol.	
7.1	Downloads	4.3	Data Val. Calcs./Annotated CP		4.5.4.3	Final Report	
7.2	M-113s	4.3.1	Round 1 Groundwater		4.5.5	Biota/Small Mammals	
7.3	A-208s	4.3.2	Round 2 Groundwater		4.5.5.1	Internal Drafts/Comments/Resol.	
7.4	Budget Status	4.3.3	Round 3 Groundwater		4.5.5.2	WHC Review Draft/Comments/Resol.	
7.5	Invoices	4.3.4	Round 4 Groundwater		4.5.5.3	Final Report	
8.1	Requisitions	4.3.5	Biota/Small Mammals		4.5.6	Surface Water/Sediments	
9	Meeting Minutes	4.3.6	Surface Water Sediments		4.5.6.1	Internal Drafts/Comments/Resol.	
10	Record of Telecons	4.4	Preliminary QA Records		4.5.6.2	WHC Review Draft/Comments/Resol.	
11	Progress Reports	4.4.1	Round 1 Groundwater		4.5.6.3	Final Report	
12	Subcontractor (HC)	4.4.2	Round 2 Groundwater		4.6	Weekly Status Reports	
		4.4.3	Round 3 Groundwater		4.7	Weekly Management Reports	
		4.4.4	Round 4 Groundwater				

9615500.2019

HARTCROWSER

Hart Crowser, Inc.
1201 Jadwin Avenue, Suite 204
Richland, Washington 99352
FAX 509 946 4203
509 946 4344

Earth and Environmental Technologies

J-2978-50

July 22, 1993

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

Re: WHC Order No. MLW-SVV-037106
Task Order No. E-93-06
Return of Original Data for 300-FF-5 RI Samples

Dear Ms. Duncan:

Enclosed please find the 300-FF-5 Operable Unit Remedial Investigations (RI), Final Quality Assurance Reports (FQARs) listed on the attachment. Please contact me if you have any questions with regard to the materials being returned to you.

Sincerely,

HART CROWSER, INC.

D. MARK GERBOTH, P.E.
Task Manager

RECEIVED
JUL 22 1993
VALIDATION DOCUMENTATION
SDLA

cc: L. Hulstrom, Westinghouse Hanford
300-FF-5 Project File (HCRL-WHC/9306-L-93-148)
Attachment - Data Returned to Westinghouse Hanford, July 22, 1993

Data Returned to Westinghouse Hanford								
July 22, 1993								
			Work Completed		Data included with this transmittal:			
Sample Delivery Group Number	Case Numbers	Project	Verified	Validated	ODP	VCL	PQAR	FQAR
B01842-TMA-299	N2-10--044-7100	300-FF-5	X	X				X
B07G70-TMA-300	N2-10-042-7098	300-FF-5	X	X				X
B012N5-TMA-115	N1-12-057-9575	300-FF-5	X	X				X
B012P5-TMA-114	N1-12-032-9571	300-FF-5	X	X				X
B01DT7-TMA-073	N1-12-031-9572	300-FF-5	X	X				X
B012N5-TMA-115	N1-12-056-9574	300-FF-5	X	X				X
B017X7-TMA-119	N2-01-111-7024	300-FF-5	X	X				X
B017Z1-TMA-236	N2-07-076-7058	300-FF-5	X	X				X
B01818-TMA-181	N2-05-029-7036	300-FF-5	X	X				X
B01370-TMA-149	N1-10-010-9546	300-FF-5	X	X				X
Notes:								
ODP = Original Data Package								
VCL = Verification Checklist								
PQAR = Preliminary Quality Assurance Report								
FQAR = Final Quality Assurance Record								

RECEIVED
JUL 22 1993
VALIDATION DOCUMENTATION
SDLA

9613500.2021

HARTCROWSER

Hart Crowser, Inc.
1201 Jadwin Avenue, Suite 204
Richland, WA 99352
FAX 509.946.4203
509.946.4344

Earth and Environmental Technologies

2978-50

December 17, 1992

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

Subject: WHC Order No. MLW-SVV-037106
Task Order No. E-93-06
Preliminary Quality Assurance Record - 300-FF-5 RI/FS
TMA Case Number N1-12-056-9574

Dear Mr. Hulstrom:

Ebasco and Hart Crowser are pleased to provide you with the attached results of our review and validation of the subject data from the 300-FF-5 Operable Unit Remedial Investigation/Feasibility Study (RI/FS). The attached results are provided to you in partial fulfillment of Subtask 03 of our task plan dated November 6, 1992. The subject data package consisted of 48 plant material samples submitted for the following radiochemical analyses: strontium 90, total uranium, and gamma scan. The samples were analyzed by Thermo Analytical, Inc. according to requirements specified in the Analytical Laboratory Statement of Work issued by WHC. Results from 11 of the 24 samples were selected for validation as being representative of the entire package. These results, together with the data qualifiers assigned are presented in Attachment 4. The results of all samples in this package and any qualifiers assigned as a result of our review will be presented in the final summary report.

DATA QUALITY OBJECTIVES SUMMARY

Data quality objectives were not met in several areas. Holding times were exceeded for all analytes for the samples validated. In addition, accuracy for gamma scan results for cobalt 60 did not meet criteria, and the contract required detection limit (CRDL) was not achieved for gamma scan analytes cobalt 60 and cesium 137. No evidence of blank contamination was discovered.

9615500.2022

MAJOR DEFICIENCIES (REJECTED DATA)

All strontium 90 results are rejected since the minimum detectable amount (MDA) was not reported and sufficient information is not contained in the data package to allow independent calculation of the MDA or verification of data reduction calculations.

MINOR DEFICIENCIES (OTHER QUALIFIED DATA)

The following general trends resulting in the qualification of data from multiple samples have been noted. All qualified data are discussed in Attachments 3 and 5.

The holding times were exceeded for all analyses, leading to all results being qualified as estimated (J or UJ). In addition, accuracy was low for cobalt 60 analyses and the CRDL was not achieved for cobalt 60 and cesium 137 results.

We trust that these preliminary results meet your needs. Our qualifier assignments will be finalized at the time the summary report for this sampling round is published. The final qualifiers may vary from those presented here, reflecting any trends in data quality or laboratory performance observed over the course of the 300-FF-5 RI/FS. Please contact me if you have any questions with regard to our activities.

Sincerely,

HART CROWSER, INC.

D. MARK GERBOTH, P.E.
Project Manager
HC#130:RL1555.DOC

Attachments

cc: Mark Gerboth (w/o attachments)
Jeff Grover (w/o attachments)
Westinghouse EDMC
Project File - HCRL-WHC/9306-L-92-066

9615590.2023

THIS APPENDIX CONSISTS OF FIVE ATTACHMENTS

Attachment 1 - Glossary of Data Qualifiers

This attachment provides a glossary explaining all data qualifiers applied as a result of the validation.

Attachment 2 - As Received Laboratory Sample Concentration Reports

This attachment provides a copy of the as-received sample concentration reports. This may be a tabular summary similar to that provided in Attachment 4, or may be a copy of the laboratory reports.

Attachment 3 - Summary of Data Qualifications

This attachment provides a complete summary of all qualifications applied as a result of the validation.

Attachment 4 - As Qualified Data Summary

This attachment provides a tabular data summary of all data qualified from the validation.

Attachment 5 - Data Review Supporting Documentation

This attachment provides copies of the data validation checklists, data summary forms, telephone contact memoranda and other documentation completed as a result of the data validation.

9613500.2024

ATTACHMENT 1

Glossary of Data Qualifiers

9613500.2025

ATTACHMENT 1

Glossary of Data Qualifiers

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

UJ - Indicates the compound or analyte was analyzed for and not detected. Due to quality control deficiencies identified during data validation the value reported may not accurately reflect the sample quantitation limit.

J - Indicates the compound or analyte was analyzed for and detected. The associated value is estimated but the data are useable for decision making processes.

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

9613500.2026

ATTACHMENT 2

As Received Laboratory Sample Concentration Reports

ATTACHMENT 1 DATA TABLE

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B012N5 (Plant Matter)	1	^{90}Sr	(4 ± 5)	E-01
		Total Uranium	(0.012 ± 0.002) (1)	
		Gamma Scan:		
		^{40}K	(1.191 ± 0.328)	E+01
		^{51}Cr	<7.087	E+02
		^{60}Co	<1.190	E-01
		^{65}Zn	<1.033	E+00
		^{134}Cs	<2.810	E-01
		^{137}Cs	<1.583	E-01
		^{226}Ra	<4.226	E-01
		^{228}Th	<3.147	E-01
		^{232}Th	<7.304	E-01
B012M8 (Plant Matter)	2	^{90}Sr	(3 ± 6)	E-01
		Total Uranium	0.016 ± 0.003) (1)	
		Gamma Scan:		
		^{40}K	(5.891 ± 3.151)	E+00
		^{51}Cr	<9.367	E+02
		^{60}Co	<3.768	E-01
		^{65}Zn	<1.459	E+00
		^{134}Cs	<3.689	E-01
		^{137}Cs	<2.821	E-01
		^{226}Ra	<5.115	E-01
		^{228}Th	<4.997	E-01
		^{232}Th	<1.283	E+00
B01368 (Plant Matter)	3	^{90}Sr	(-0.07 ± 1)	E+00
		Total Uranium	(0.046 ± 0.008) (1)	
		Gamma Scan:		
		^{40}K	(7.584 ± 3.315)	E+00
		^{51}Cr	<8.839	E+02
		^{60}Co	<2.436	E-01
		^{65}Zn	<1.209	E+00
		^{134}Cs	<3.080	E-01
		^{137}Cs	<3.032	E-01
		^{226}Ra	<5.561	E-01
		^{228}Th	<4.606	E-01
		^{232}Th	<1.052	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01252 (Plant Matter)	4	^{90}Sr	(-0.1 ± 2)	E+00
		Total Uranium	(0.026 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(7.806 ± 3.199)	E+00
		^{51}Cr	<8.761	E+02
		^{60}Co	<2.570	E-01
		^{65}Zn	<1.132	E+00
		^{134}Cs	<3.428	E-01
		^{137}Cs	<2.238	E-01
		^{226}Ra	<4.252	E-01
		^{228}Th	<4.107	E-01
		^{232}Th	<1.194	E+00
B017X2 (Plant Matter)	5	^{90}Sr	(-0.1 ± 0.3)	E+00
		Total Uranium	(0.056 ± 0.010) (1)	
		Gamma Scan:		
		^{40}K	(8.454 ± 3.711)	E+00
		^{51}Cr	<8.679	E+02
		^{60}Co	<2.750	E-01
		^{65}Zn	<1.183	E+00
		^{134}Cs	<3.533	E-01
		^{137}Cs	<2.615	E-01
		^{226}Ra	<4.462	E-01
		^{228}Th	<4.832	E-01
		^{232}Th	<1.250	E+00
B012T8 (Plant Matter)	6	^{90}Sr	(0 ± 1)	E+00
		Total Uranium	(0.008 ± 0.001) (1)	
		Gamma Scan:		
		^{40}K	(9.911 ± 5.220)	E+00
		^{51}Cr	<1.156	E+03
		^{60}Co	<4.272	E-01
		^{65}Zn	<1.786	E+00
		^{134}Cs	<5.197	E-01
		^{137}Cs	<3.572	E-01
		^{226}Ra	<6.103	E-01
		^{228}Th	<5.349	E-01
		^{232}Th	<1.304	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B017T5 (Plant Matter)	7	^{90}Sr	(0.03 ± 0.3)	E+00
		Total Uranium	(0.052 ± 0.009) (1)	
		Gamma Scan:		
		^{40}K	(6.075 ± 2.775)	E+00
		^{51}Cr	<7.849	E+02
		^{60}Co	<3.914	E-01
		^{65}Zn	<1.130	E+00
		^{134}Cs	<2.796	E-01
		^{137}Cs	<2.472	E-01
		^{226}Ra	<5.136	E-01
		^{228}Th	<4.741	E-01
		^{232}Th	<9.380	E-01
B012N3 (Plant Matter)	8	^{90}Sr	(-0.005 ± 0.3)	E+00
		Total Uranium	(0.016 ± 0.003) (1)	
		Gamma Scan:		
		^{40}K	(9.534 ± 2.609)	E+00
		^{51}Cr	<5.786	E+02
		^{60}Co	<3.595	E-01
		^{65}Zn	<1.118	E+00
		^{134}Cs	<2.654	E-01
		^{137}Cs	<1.959	E-01
		^{226}Ra	(6.250 ± 3.155)	E-01
		^{228}Th	<3.390	E-01
		^{232}Th	<8.758	E-01
B01363 (Plant Matter)	9	^{90}Sr	(0.02 ± 0.4)	E+00
		Total Uranium	(0.034 ± 0.006) (1)	
		Gamma Scan:		
		^{40}K	(1.069 ± 0.338)	E+01
		^{51}Cr	<6.023	E+02
		^{60}Co	<3.296	E-01
		^{65}Zn	<9.030	E-01
		^{134}Cs	<2.642	E-01
		^{137}Cs	<2.173	E-01
		^{226}Ra	(5.566 ± 3.401)	E-01
		^{228}Th	(3.819 ± 3.628)	E-01
		^{232}Th	<9.611	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page four)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B012M2 (Plant Matter)	10	^{90}Sr	(2 ± 3)	E-01
		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	(4.302 ± 2.652	E+00
		^{51}Cr	<9.150	E+02
		^{60}Co	<3.461	E-01
		^{65}Zn	<9.417	E-01
		^{134}Cs	<2.160	E-01
		^{137}Cs	<2.515	E-01
		^{226}Ra	<7.615	E-01
		^{228}Th	<6.342	E-01
		^{232}Th	<1.055	E+00
B012M9 (Plant Matter)	11	^{90}Sr	(0 ± 1)	E+00
		Total Uranium	(0.011 ± 0.002) (1)	
		Gamma Scan:		
		^{40}K	(8.197 ± 2.948)	E+00
		^{51}Cr	<5.504	E+02
		^{60}Co	<1.911	E-01
		^{65}Zn	<6.385	E-01
		^{134}Cs	<2.441	E-01
		^{137}Cs	<1.720	E-01
		^{226}Ra	<2.670	E-01
		^{228}Th	<3.319	E-01
		^{232}Th	<7.362	E-01
B017W7 (Plant Matter)	12	^{90}Sr	(-0.2 ± 0.1)	E+00
		Total Uranium	(0.065 ± 0.011) (1)	
		Gamma Scan:		
		^{40}K	(7.824 ± 3.641)	E+00
		^{51}Cr	<1.143	E+03
		^{60}Co	<4.247	E-01
		^{65}Zn	<1.640	E-01
		^{134}Cs	<5.060	E-01
		^{137}Cs	<3.397	E-01
		^{226}Ra	<6.113	E-01
		^{228}Th	<5.431	E-01
		^{232}Th	<1.149	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page five)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B017T3 (Plant Matter)	13	^{90}Sr	(-0.07 ± 1)	E+00
		Total Uranium	(0.043 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(1.002 ± 0.308)	E+01
		^{51}Cr	<7.738	E+02
		^{60}Co	<4.093	E-01
		^{65}Zn	<9.076	E-01
		^{134}Cs	<3.262	E-01
		^{137}Cs	<2.526	E-01
		^{226}Ra	<5.520	E-01
		^{228}Th	<6.203	E-01
		^{232}Th	<1.065	E+00
B01335 (Plant Matter)	14	^{90}Sr	(0.06 ± 0.03)	E+00
		Total Uranium	(0.057 ± 0.010) (1)	
		Gamma Scan:		
		^{40}K	(1.971 ± 0.586)	E+01
		^{51}Cr	<1.339	E+03
		^{60}Co	<5.164	E-01
		^{65}Zn	<1.803	E+00
		^{134}Cs	<4.856	E-01
		^{137}Cs	<4.445	E-01
		^{226}Ra	<7.728	E-01
		^{228}Th	<5.959	E-01
		^{232}Th	<1.531	E+00
B01349 (Plant Matter)	15	^{90}Sr	(0.07 ± 0.2)	E+00
		Total Uranium	(0.328 ± 0.056) (1)	
		Gamma Scan:		
		^{40}K	(1.354 ± 0.283)	E+01
		^{51}Cr	<5.794	E+02
		^{60}Co	<2.245	E-01
		^{65}Zn	<6.652	E-01
		^{134}Cs	<2.904	E-01
		^{137}Cs	<1.926	E-01
		^{226}Ra	<2.695	E-01
		^{228}Th	<3.513	E-01
		^{232}Th	<8.871	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page six)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01360	16	^{90}Sr	(2 ± 2)	E-01
(Plant Matter)		Total Uranium	(0.007 ± 0.002) (1)	
		Gamma Scan:		
		^{40}K	(1.021 ± 0.361)	E+01
		^{51}Cr	<1.041	E+03
		^{60}Co	<3.129	E-01
		^{65}Zn	<1.325	E+00
		^{134}Cs	<3.478	E-01
		^{137}Cs	<3.198	E-01
		^{226}Ra	<4.932	E-01
		^{228}Th	<4.346	E-01
		^{232}Th	<1.230	E+00
B01309	17	^{90}Sr	(2 ± 4)	E-01
(Plant Matter)		Total Uranium	(0.041 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(1.292 ± 0.398)	E+01
		^{51}Cr	<1.109	E+03
		^{60}Co	<3.956	E-01
		^{65}Zn	<1.621	E+00
		^{134}Cs	<3.754	E-01
		^{137}Cs	<3.023	E-01
		^{226}Ra	<6.158	E-01
		^{228}Th	<4.867	E-01
		^{232}Th	<1.531	E+00
B012M4	18	^{90}Sr	(-0.1 ± 1)	E+00
(Plant Matter)		Total Uranium	(0.025 ± 0.004 (1)	
		Gamma Scan:		
		^{40}K	(6.695 ± 4.217)	E+00
		^{51}Cr	<1.181	E+03
		^{60}Co	<4.864	E-01
		^{65}Zn	<1.303	E+00
		^{134}Cs	<4.532	E-01
		^{137}Cs	<3.596	E-01
		^{226}Ra	<6.788	E-01
		^{228}Th	<5.256	E-01
		^{232}Th	<1.591	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page seven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01352 (Plant Matter)	19	^{90}Sr	(-0.4 ± 1)	E+00
		Total Uranium	(0.153 ± 0.026) (1)	
		Gamma Scan:		
		^{40}K	(8.972 ± 3.264)	E+00
		^{51}Cr	<8.424	E+02
		^{60}Co	<4.1327	E-01
		^{65}Zn	<9.447	E-01
		^{134}Cs	<3.065	E-01
		^{137}Cs	<2.067	E-01
		^{226}Ra	<3.756	E-01
		^{228}Th	<3.213	E-01
		^{232}Th	<9.249	E-01
B01330 (Plant Matter)	20	^{90}Sr	(0.2 ± 2)	E+00
		Total Uranium	(0.036 ± 0.006) (1)	
		Gamma Scan:		
		^{40}K	(1.224 ± 0.397)	E+01
		^{51}Cr	<1.018	E+03
		^{60}Co	<3.477	E-01
		^{65}Zn	<1.385	E+00
		^{134}Cs	<3.900	E-01
		^{137}Cs	<3.243	E-01
		^{226}Ra	<4.958	E-01
		^{228}Th	<5.073	E-01
		^{232}Th	<1.257	E+00
B01350 (Plant Matter)	21	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	(0.284 ± 0.048) (1)	
		Gamma Scan:		
		^{40}K	(1.299 ± 0.437)	E+01
		^{51}Cr	<1.002	E+03
		^{60}Co	<3.367	E-01
		^{65}Zn	<1.380	E+00
		^{134}Cs	<3.871	E-01
		^{137}Cs	<3.047	E-01
		^{226}Ra	<5.993	E-01
		^{228}Th	<4.717	E-01
		^{232}Th	<1.242	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page eight)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01337 (Plant Matter)	22	^{90}Sr	(0.7 ± 1)	E-01
		Total Uranium	(0.081 ± 0.014) (1)	
		Gamma Scan:		
		^{40}K	(1.242 ± 0.349)	E+01
		^{51}Cr	<1.017	E+03
		^{60}Co	<3.648	E-01
		^{65}Zn	<1.268	E+00
		^{134}Cs	<3.837	E-01
		^{137}Cs	<3.176	E-01
		^{226}Ra	<4.580	E-01
		^{228}Th	<4.584	E-01
		^{232}Th	<1.391	E+00
B01342 (Plant Matter)	23	^{90}Sr	(-0.04 ± 0.7)	E+00
		Total Uranium	(0.046 ± 0.008) (1)	
		Gamma Scan:		
		^{40}K	(1.237 ± 0.483)	E+01
		^{51}Cr	<1.174	E+03
		^{60}Co	<4.311	E-01
		^{65}Zn	<1.735	E+00
		^{134}Cs	<3.822	E-01
		^{137}Cs	<2.758	E-01
		^{226}Ra	<6.379	E-01
		^{228}Th	<5.148	E-01
		^{232}Th	<1.432	E+00
B01332 (Plant Matter)	24	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	(0.080 ± 0.013) (1)	
		Gamma Scan:		
		^{40}K	(1.338 ± 0.401)	E+01
		^{51}Cr	<9.379	E+02
		^{60}Co	<2.648	E-01
		^{65}Zn	<1.482	E+00
		^{134}Cs	<2.844	E-01
		^{137}Cs	<2.000	E-01
		^{226}Ra	<4.257	E-01
		^{228}Th	<4.869	E-01
		^{232}Th	<1.049	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page nine)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01326	25	^{90}Sr	(2 ± 2)	E-01
(Plant Matter)		Total Uranium	(0.054 ± 0.009) (1)	
		Gamma Scan:		
		^{40}K	(1.092 ± 0.397)	E+01
		^{51}Cr	<1.036	E+03
		^{60}Co	<3.807	E-01
		^{65}Zn	<1.302	E+00
		^{134}Cs	<4.171	E-01
		^{137}Cs	<3.066	E-01
		^{226}Ra	<5.678	E-01
		^{228}Th	<4.667	E-01
		^{232}Th	<1.199	E+00
B017Q1	26	^{90}Sr	(0.3 ± 2)	E-01
(Plant Matter)		Total Uranium	(0.028 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(9.750 ± 3.496)	E+00
		^{51}Cr	<8.070	E+02
		^{60}Co	<3.909	E-01
		^{65}Zn	<1.377	E+00
		^{134}Cs	<3.892	E-01
		^{137}Cs	<2.427	E-01
		^{226}Ra	(3.371 ± 3.135)	E-01
		^{228}Th	<4.633	E-01
		^{232}Th	<9.656	E-01
B012N1	27	^{90}Sr	(0 ± 1)	E+00
(Plant Matter)		Total Uranium	(0.018 ± 0.003) (1)	
		Gamma Scan:		
		^{40}K	(8.047 ± 1.472)	E+00
		^{51}Cr	<3.006	E+02
		^{60}Co	<1.106	E-01
		^{65}Zn	<4.295	E-01
		^{134}Cs	<1.213	E-01
		^{137}Cs	<9.146	E-02
		^{226}Ra	<1.738	E-01
		^{228}Th	<1.476	E-01
		^{232}Th	<4.230	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page ten)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01359 (Plant Matter)	28	^{90}Sr	(0 ± 1)	E+00
		Total Uranium	(0.013 ± 0.003) (1)	
		Gamma Scan:		
		^{40}K	(8.769 ± 1.468)	E+00
		^{51}Cr	<3.104	E+02
		^{60}Co	<9.977	E-02
		^{65}Zn	<4.156	E-01
		^{134}Cs	<1.020	E-01
		^{137}Cs	<8.123	E-02
		^{226}Ra	<1.882	E-01
		^{228}Th	<1.708	E-01
		^{232}Th	<3.570	E-01
B01369 (Plant Matter)	29	^{90}Sr	(-0.004 ± 0.2)	E+00
		Total Uranium	(0.114 ± 0.019) (1)	
		Gamma Scan:		
		^{40}K	(1.613 ± 0.471)	E+01
		^{51}Cr	<1.108	E+03
		^{60}Co	<4.061	E-01
		^{65}Zn	<1.529	E+00
		^{134}Cs	<5.100	E-01
		^{137}Cs	<3.926	E-01
		^{226}Ra	<6.604	E-01
		^{228}Th	<5.097	E-01
		^{232}Th	<1.170	E+00
B012N0 (Plant Matter)	30	^{90}Sr	(0.1 ± 0.4)	E+00
		Total Uranium	(0.014 ± 0.003) (1)	
		Gamma Scan:		
		^{40}K	(9.412 ± 3.017)	E+00
		^{51}Cr	<7.159	E+02
		^{60}Co	<3.178	E-01
		^{65}Zn	<8.585	E-01
		^{134}Cs	<2.702	E-01
		^{137}Cs	<2.146	E-01
		^{226}Ra	<4.195	E-01
		^{228}Th	<5.392	E-01
		^{232}Th	<1.039	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page eleven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01358 (Plant Matter)	31	^{90}Sr	(3 ± 2)	E-01
		Total Uranium	(0.007 ± 0.002) (1)	
		Gamma Scan:		
		^{40}K	(6.994 ± 3.485)	E+01
		^{51}Cr	<7.801	E+02
		^{60}Co	<3.633	E-01
		^{65}Zn	<1.033	E+00
		^{134}Cs	<3.169	E-01
		^{137}Cs	<1.654	E-01
		^{226}Ra	(6.909 ± 4.350)	E-01
		^{228}Th	(4.256 ± 3.741)	E-01
		^{232}Th	<1.079	E+00
B017N9 (Plant Matter)	32	^{90}Sr	(-0.8 ± 6)	E+00
		Total Uranium	(0.012 ± 0.002) (1)	
		Gamma Scan:		
		^{40}K	(3.367 ± 2.790)	E+00
		^{51}Cr	<7.657	E+02
		^{60}Co	<2.603	E-01
		^{65}Zn	<9.285	E-01
		^{134}Cs	<2.643	E-01
		^{137}Cs	<2.049	E-01
		^{226}Ra	<4.462	E-01
		^{228}Th	<3.203	E-01
		^{232}Th	<9.391	E-01
B01250 (Plant Matter)	33	^{90}Sr	(0.1 ± 4)	E-01
		Total Uranium	(0.019 ± 0.003) (1)	
		Gamma Scan:		
		^{40}K	(9.510 ± 3.256)	E+00
		^{51}Cr	<7.595	E+02
		^{60}Co	<3.203	E-01
		^{65}Zn	<1.294	E+00
		^{134}Cs	<3.523	E-01
		^{137}Cs	<2.130	E-01
		^{226}Ra	<4.850	E-01
		^{228}Th	<3.571	E-01
		^{232}Th	<9.922	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page twelve)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01348 (Plant Matter)	34	^{90}Sr	(-0.1 ± 0.3)	E+00
		Total Uranium	(0.027 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(1.002 ± 0.367)	E+01
		^{51}Cr	<8.303	E+02
		^{60}Co	<5.073	E-01
		^{65}Zn	<1.161	E+00
		^{134}Cs	<3.009	E-01
		^{137}Cs	<2.545	E-01
		^{226}Ra	<4.571	E-01
		^{228}Th	<3.872	E-01
		^{232}Th	<9.796	E-01
B012V0 (Plant Matter)	35	^{90}Sr	(1 ± 4)	E-01
		Total Uranium	(0.061 ± 0.010) (1)	
		Gamma Scan:		
		^{40}K	(5.382 ± 3.349)	E+00
		^{51}Cr	<7.636	E+02
		^{60}Co	<3.578	E-01
		^{65}Zn	<1.273	E+00
		^{134}Cs	<3.110	E-01
		^{137}Cs	<2.637	E-01
		^{226}Ra	<4.494	E-01
		^{228}Th	<4.333	E-01
		^{232}Th	<1.110	E+00
B017N6 (Plant Matter)	36	^{90}Sr	(2 ± 3)	E-01
		Total Uranium	(0.026 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(3.342 ± 2.640)	E+00
		^{51}Cr	<9.226	E+02
		^{60}Co	<3.295	E-01
		^{65}Zn	<1.319	E+00
		^{134}Cs	<3.935	E-01
		^{137}Cs	<3.557	E-01
		^{226}Ra	<5.773	E-01
		^{228}Th	<8.308	E-01
		^{232}Th	<1.065	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page thirteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01366 (Plant Matter)	37	^{90}Sr	(-0.7 ± 4)	E-01
		Total Uranium	(0.012 ± 0.002) (1)	
		Gamma Scan:		
		^{40}K	(8.203 ± 3.915)	E+00
		^{51}Cr	<1.083	E+03
		^{60}Co	<3.297	E-01
		^{65}Zn	<1.364	E+00
		^{134}Cs	<3.516	E-01
		^{137}Cs	<2.790	E-01
		^{226}Ra	<6.026	E-01
		^{228}Th	<3.936	E-01
		^{232}Th	<1.193	E+00
B01361 (Plant Matter)	38	^{90}Sr	(-0.2 ± 0.4)	E+00
		Total Uranium	(0.008 ± 0.002) (1)	
		Gamma Scan:		
		^{40}K	(8.053 ± 3.248)	E+00
		^{51}Cr	<5.951	E+02
		^{60}Co	<2.273	E-01
		^{65}Zn	<1.038	E+00
		^{134}Cs	<1.865	E-01
		^{137}Cs	<1.865	E-01
		^{226}Ra	<4.444	E-01
		^{228}Th	<4.026	E-01
		^{232}Th	<7.821	E-01
B01336 (Plant Matter)	39	^{90}Sr	(0.06 ± 0.3)	E+00
		Total Uranium	(1.581 ± 0.266) (1)	
		Gamma Scan:		
		^{40}K	(1.611 ± 0.438)	E+01
		^{51}Cr	<1.114	E+03
		^{60}Co	<5.423	E-01
		^{65}Zn	<1.802	E+00
		^{134}Cs	<5.207	E-01
		^{137}Cs	<3.933	E-01
		^{226}Ra	<6.864	E-01
		^{228}Th	<5.797	E-01
		^{232}Th	<1.605	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page fourteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B017M0 (Plant Matter)	40	^{90}Sr	(0.06 ± 0.2)	E+00
		Total Uranium	(0.260 ± 0.044) (1)	
		Gamma Scan:		
		^{40}K	(7.803 ± 2.925)	E+00
		^{51}Cr	<9.007	E+02
		^{60}Co	<2.033	E-01
		^{65}Zn	<9.230	E-01
		^{134}Cs	<3.072	E-01
		^{137}Cs	<2.201	E-01
		^{226}Ra	<3.194	E-01
		^{228}Th	<4.164	E-01
		^{232}Th	<9.708	E-01
B012M3 (Plant Matter)	41	^{90}Sr	(5 ± 4)	E-01
		Total Uranium	(0.122 ± 0.020) (1)	
		Gamma Scan:		
		^{40}K	<5.398	E+00
		^{51}Cr	<9.735	E+02
		^{60}Co	<5.274	E-01
		^{65}Zn	<1.120	E+00
		^{134}Cs	<4.500	E-01
		^{137}Cs	<2.738	E-01
		^{226}Ra	<5.124	E-01
		^{228}Th	(4.411 ± 3.757)	E-01
		^{232}Th	<1.299	E+00
B017M4 (Plant Matter)	42	^{90}Sr	(0 ± 3)	E-01
		Total Uranium	(0.231 ± 0.039) (1)	
		Gamma Scan:		
		^{40}K	(1.009 ± 0.335)	E+01
		^{51}Cr	<8.392	E+02
		^{60}Co	<2.499	E-01
		^{65}Zn	<7.666	E-01
		^{134}Cs	<2.603	E-01
		^{137}Cs	<2.202	E-01
		^{226}Ra	<4.096	E-01
		^{228}Th	<4.215	E-01
		^{232}Th	<9.193	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page fifteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B012T4 (Plant Matter)	43	^{90}Sr	(0.7 ± 3)	E-01
		Total Uranium	(0.023 ± 0.004) (1)	
		Gamma Scan:		
		^{40}K	(8.107 ± 2.521)	E+00
		^{51}Cr	<9.475	E+02
		^{60}Co	<2.780	E-01
		^{65}Zn	<1.142	E+00
		^{134}Cs	<2.962	E-01
		^{137}Cs	<2.202	E-01
		^{226}Ra	<3.996	E-01
		^{228}Th	<3.633	E-01
		^{232}Th	<1.061	E+00
B012L9 (Plant Matter)	44	^{90}Sr	(-0.1 ± 0.2	E+00
		Total Uranium	<0.003 (1)	
		Gamma Scan:		
		^{40}K	(5.899 ± 2.284)	E+00
		^{51}Cr	<7.043	E+02
		^{60}Co	<2.404	E-01
		^{65}Zn	<1.130	E+00
		^{134}Cs	<2.403	E-01
		^{137}Cs	<2.497	E-01
		^{226}Ra	<4.186	E-01
		^{228}Th	<3.938	E-01
		^{232}Th	<6.645	E-01
B012S8 (Plant Matter)	45	^{90}Sr	(1 ± 3)	E-01
		Total Uranium	(0.029 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(1.153 ± 0.431)	E+01
		^{51}Cr	<9.359	E+02
		^{60}Co	<3.829	E-01
		^{65}Zn	<1.227	E-01
		^{134}Cs	<3.508	E-01
		^{137}Cs	<2.570	E-01
		^{226}Ra	<4.893	E-01
		^{228}Th	<4.154	E-01
		^{232}Th	<1.258	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page sixteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B012T2 (Plant Matter)	46	^{90}Sr	(0.9 ± 2)	E-01
		Total Uranium	(0.020 ± 0.004) (1)	
		Gamma Scan:		
		^{40}K	(1.040 ± 0.271)	E+01
		^{51}Cr	<7.612	E+02
		^{60}Co	<2.035	E-01
		^{65}Zn	<8.304	E-01
		^{134}Cs	<1.810	E-01
		^{137}Cs	<1.416	E-01
		^{226}Ra	<3.509	E-01
		^{228}Th	<3.905	E-01
		^{232}Th	<9.132	E-01
B017V1 (Plant Matter)	47	^{90}Sr	(-0.2 ± 3)	E-00
		Total Uranium	(0.026 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(5.764 ± 4.148)	E+00
		^{51}Cr	<1.186	E+03
		^{60}Co	<3.420	E-01
		^{65}Zn	<1.677	E+00
		^{134}Cs	<4.564	E-01
		^{137}Cs	<4.075	E-01
		^{226}Ra	<6.195	E-01
		^{228}Th	<5.088	E-01
		^{232}Th	<1.524	E+00
B017V3 (Plant Matter)	48	^{90}Sr	(2 ± 3)	E-01
		Total Uranium	(0.027 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(6.692 ± 3.359)	E+00
		^{51}Cr	<8.406	E+02
		^{60}Co	<2.524	E-01
		^{65}Zn	<1.119	E-01
		^{134}Cs	<3.092	E-01
		^{137}Cs	<2.184	E-01
		^{226}Ra	<4.229	E-01
		^{228}Th	<4.520	E-01
		^{232}Th	<1.033	E+00

(1) Units are μgm/gram dry weight.

9613500.2043

ATTACHMENT 3

Summary of Data Qualifications

Strontium 90 (CRDL = 1 pCi/g)

Customer I.D. #	Reported Results	Q
B012N3	-0.005	R
B01363	0.020	R
B017W7	-0.200	R
B01349	0.070	R
B017Q1	0.030	R
B01369	-0.004	R
B017N6	0.200	R
B01336	0.060	R
B012M3	0.500	R
B012T4	0.070	R
B017V1	-0.200	R

Total U (CRDL = 1 ug/g)

Customer I.D. #	Reported Results	Q
B012N3	0.016	UJ
B01363	0.034	UJ
B017W7	0.065	J
B01349	0.328	J
B017Q1	0.028	UJ
B01369	0.114	J
B017N6	0.026	UJ
B01336	1.581	
B012M3	0.122	J
B012T4	0.023	UJ
B017V1	0.026	

Gamma Spec

Cobalt 60 (CRDL = 0.05 pCi/g)

Customer I.D. #	Reported Results	Q
B012N3	0.360	UJ
B01363	0.330	UJ
B017W7	0.425	UJ
B01349	0.225	UJ
B017Q1	0.391	UJ
B01369	0.406	UJ
B017N6	0.330	UJ
B01336	0.542	
B012M3	0.527	UJ
B012T4	0.278	UJ
B017V1	0.342	UJ

Cesium 137 (CRDL = 0.1 pCi/g)

Customer I.D. #	Reported Results	Q
B012N3	0.196	UJ
B01363	0.217	UJ
B017W7	0.340	UJ
B01349	0.193	UJ
B017Q1	0.243	UJ
B01369	0.393	UJ
B017N6	0.356	UJ
B01336	0.393	
B012M3	0.274	UJ
B012T4	0.220	UJ
B017V1	0.408	UJ

Thorium 228 (CRDL = Not reported)

Customer I.D. #	Reported Results	Q
B012N3	0.339	UJ
B01363	0.382	J
B017W7	0.543	UJ
B01349	0.351	UJ
B017Q1	0.463	UJ
B01369	0.510	UJ
B017N6	0.831	UJ
B01336	0.580	
B012M3	0.441	J
B012T4	0.363	UJ
B017V1	0.509	UJ

9613500.2045

ATTACHMENT 4

As Qualified Data Summary

SECTION 1 Data Report

9613500.2047

TMA

9574-39 - highlighted
9574-37 - entered.
Resolve

ATTACHMENT 1 DATA TABLE

Holding times exceeded for all analyses
Low Accuracy for Co-60

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B012N5 (Plant Matter)	1	^{90}Sr	(4 ± 5)	E-01
		Total Uranium	(0.012 ± 0.002) (1)	
		Gamma Scan:		
		^{40}K	(1.191 ± 0.328)	E+01
		^{51}Cr	<7.087	E+02
		^{60}Co	<1.190	E-01
		^{65}Zn	<1.033	E+00
		^{134}Cs	<2.810	E-01
		^{137}Cs	<1.583	E-01
		^{226}Ra	<4.226	E-01
		^{228}Th	<3.147	E-01
		^{232}Th	<7.304	E-01
B012M8 (Plant Matter)	2	^{90}Sr	(3 ± 6)	E-01
		Total Uranium	0.016 ± 0.003) (1)	
		Gamma Scan:		
		^{40}K	(5.891 ± 3.151)	E+00
		^{51}Cr	<9.367	E+02
		^{60}Co	<3.768	E-01
		^{65}Zn	<1.459	E+00
		^{134}Cs	<3.689	E-01
		^{137}Cs	<2.821	E-01
		^{226}Ra	<5.115	E-01
		^{228}Th	<4.997	E-01
		^{232}Th	<1.283	E+00
B01368 (Plant Matter)	3	^{90}Sr	(-0.07 ± 1)	E+00
		Total Uranium	(0.046 ± 0.008) (1)	
		Gamma Scan:		
		^{40}K	(7.584 ± 3.315)	E+00
		^{51}Cr	<8.839	E+02
		^{60}Co	<2.436	E-01
		^{65}Zn	<1.209	E+00
		^{134}Cs	<3.080	E-01
		^{137}Cs	<3.032	E-01
		^{226}Ra	<5.561	E-01
		^{228}Th	<4.606	E-01
		^{232}Th	<1.052	E+00

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ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01252 (Plant Matter)	4	^{90}Sr	(-0.1 ± 2)	E+00
		Total Uranium	(0.026 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(7.806 ± 3.199)	E+00
		^{51}Cr	<8.761	E+02
		^{60}Co	<2.570	E-01
		^{65}Zn	<1.132	E+00
		^{134}Cs	<3.428	E-01
		^{137}Cs	<2.238	E-01
		^{226}Ra	<4.252	E-01
		^{228}Th	<4.107	E-01
		^{232}Th	<1.194	E+00
B017X2 (Plant Matter)	5	^{90}Sr	(-0.1 ± 0.3)	E+00
		Total Uranium	(0.056 ± 0.010) (1)	
		Gamma Scan:		
		^{40}K	(8.454 ± 3.711)	E+00
		^{51}Cr	<8.679	E+02
		^{60}Co	<2.750	E-01
		^{65}Zn	<1.183	E+00
		^{134}Cs	<3.533	E-01
		^{137}Cs	<2.615	E-01
		^{226}Ra	<4.462	E-01
		^{228}Th	<4.832	E-01
		^{232}Th	<1.250	E+00
B012T8 (Plant Matter)	6	^{90}Sr	(0 ± 1)	E+00
		Total Uranium	(0.008 ± 0.001) (1)	
		Gamma Scan:		
		^{40}K	(9.911 ± 5.220)	E+00
		^{51}Cr	<1.156	E+03
		^{60}Co	<4.272	E-01
		^{65}Zn	<1.786	E+00
		^{134}Cs	<5.197	E-01
		^{137}Cs	<3.572	E-01
		^{226}Ra	<6.103	E-01
		^{228}Th	<5.349	E-01
		^{232}Th	<1.304	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B017T5 (Plant Matter)	7	^{90}Sr	(0.03 ± 0.3)	E+00
		Total Uranium	(0.052 ± 0.009) (1)	
		Gamma Scan:		
		^{40}K	(6.075 ± 2.775)	E+00
		^{51}Cr	<7.849	E+02
		^{60}Co	<3.914	E-01
		^{65}Zn	<1.130	E+00
		^{134}Cs	<2.796	E-01
		^{137}Cs	<2.472	E-01
		^{226}Ra	<5.136	E-01
		^{228}Th	<4.741	E-01
		^{232}Th	<9.380	E-01
B012N3 (Plant Matter)	8	^{90}Sr	(-0.005 ± 0.3)	E~~+00~~ ~~U~~ R
		Total Uranium	(0.016 ± 0.003) (1) UJ	
		Gamma Scan:		
		^{40}K	(9.534 ± 2.609)	E+00 UJ
		^{51}Cr	<5.786	E+02
		^{60}Co	<3.595	E-01
		^{65}Zn	<1.118	E+00
		^{134}Cs	<2.654	E-01
		^{137}Cs	<1.959	E-01
		^{226}Ra	(6.250 ± 3.155)	E-01
		^{228}Th	<3.390	E-01
		^{232}Th	<8.758	E-01
B01363 (Plant Matter)	9	^{90}Sr	(0.02 ± 0.4)	E+00 R
		Total Uranium	(0.034 ± 0.006) (1) UJ	
		Gamma Scan:		
		^{40}K	(1.069 ± 0.338)	E+01
		^{51}Cr	<6.023	E+02 UJ
		^{60}Co	<3.296	E-01
		^{65}Zn	<9.030	E-01
		^{134}Cs	<2.642	E-01
		^{137}Cs	<2.173	E-01
		^{226}Ra	(5.566 ± 3.401)	E-01
		^{228}Th	(3.819 ± 3.628)	E-01 J
		^{232}Th	<9.611	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page four)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B012M2 (Plant Matter)	10	^{90}Sr	(2 ± 3)	E-01
		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	(4.302 ± 2.652	E+00
		^{51}Cr	<9.150	E+02
		^{60}Co	<3.461	E-01
		^{65}Zn	<9.417	E-01
		^{134}Cs	<2.160	E-01
		^{137}Cs	<2.515	E-01
		^{226}Ra	<7.615	E-01
		^{228}Th	<6.342	E-01
		^{232}Th	<1.055	E+00
B012M9 (Plant Matter)	11	^{90}Sr	(0 ± 1)	E+00
		Total Uranium	(0.011 ± 0.002) (1)	
		Gamma Scan:		
		^{40}K	(8.197 ± 2.948)	E+00
		^{51}Cr	<5.504	E+02
		^{60}Co	<1.911	E-01
		^{65}Zn	<6.385	E-01
		^{134}Cs	<2.441	E-01
		^{137}Cs	<1.720	E-01
		^{226}Ra	<2.670	E-01
		^{228}Th	<3.319	E-01
		^{232}Th	<7.362	E-01
B017W7 (Plant Matter)	12	^{90}Sr	(-0.2 ± 0.1)	E+00 UR
		Total Uranium	(0.065 ± 0.011) (1) J	
		Gamma Scan:		
		^{40}K	(7.824 ± 3.641)	E+00 J
		^{51}Cr	<1.143	E+03
		^{60}Co	<4.247	E-01
		^{65}Zn	<1.640	E-01
		^{134}Cs	<5.060	E-01
		^{137}Cs	<3.397	E-01
		^{226}Ra	<6.113	E-01
		^{228}Th	<5.431	E-01
		^{232}Th	<1.149	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page five)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B017T3 (Plant Matter)	13	^{90}Sr	(-0.07 ± 1)	E+00
		Total Uranium	(0.043 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(1.002 ± 0.308)	E+01
		^{51}Cr	<7.738	E+02
		^{60}Co	<4.093	E-01
		^{65}Zn	<9.076	E-01
		^{134}Cs	<3.262	E-01
		^{137}Cs	<2.526	E-01
		^{226}Ra	<5.520	E-01
		^{228}Th	<6.203	E-01
		^{232}Th	<1.065	E+00
B01335 (Plant Matter)	14	^{90}Sr	(0.06 ± 0.03)	E+00
		Total Uranium	(0.057 ± 0.010) (1)	
		Gamma Scan:		
		^{40}K	(1.971 ± 0.586)	E+01
		^{51}Cr	<1.339	E+03
		^{60}Co	<5.164	E-01
		^{65}Zn	<1.803	E+00
		^{134}Cs	<4.856	E-01
		^{137}Cs	<4.445	E-01
		^{226}Ra	<7.728	E-01
		^{228}Th	<5.959	E-01
		^{232}Th	<1.531	E+00
B01349 (Plant Matter)	15	^{90}Sr	(0.07 ± 0.2)	E+00 R
		Total Uranium	(0.328 ± 0.056) (1) J	
		Gamma Scan:		
		^{40}K	(1.354 ± 0.283)	E+01 UJ
		^{51}Cr	<5.794	E+02
		^{60}Co	<2.245	E-01
		^{65}Zn	<6.652	E-01
		^{134}Cs	<2.904	E-01
		^{137}Cs	<1.926	E-01
		^{226}Ra	<2.695	E-01
		^{228}Th	<3.513	E-01
		^{232}Th	<8.871	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page six)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01360 (Plant Matter)	16	^{90}Sr	(2 ± 2)	E-01
		Total Uranium	(0.007 ± 0.002) (1)	
		Gamma Scan:		
		^{40}K	(1.021 ± 0.361)	E+01
		^{51}Cr	<1.041	E+03
		^{60}Co	<3.129	E-01
		^{65}Zn	<1.325	E+00
		^{134}Cs	<3.478	E-01
		^{137}Cs	<3.198	E-01
		^{226}Ra	<4.932	E-01
		^{228}Th	<4.346	E-01
		^{232}Th	<1.230	E+00
B01309 (Plant Matter)	17	^{90}Sr	(2 ± 4)	E-01
		Total Uranium	(0.041 ± 0.007) (1)	
		Gamma Scan:		
		^{40}K	(1.292 ± 0.398)	E+01
		^{51}Cr	<1.109	E+03
		^{60}Co	<3.956	E-01
		^{65}Zn	<1.621	E+00
		^{134}Cs	<3.754	E-01
		^{137}Cs	<3.023	E-01
		^{226}Ra	<6.158	E-01
		^{228}Th	<4.867	E-01
		^{232}Th	<1.531	E+00
B012M4 (Plant Matter)	18	^{90}Sr	(-0.1 ± 1)	E+00
		Total Uranium	(0.025 ± 0.004 (1)	
		Gamma Scan:		
		^{40}K	(6.695 ± 4.217)	E+00
		^{51}Cr	<1.181	E+03
		^{60}Co	<4.864	E-01
		^{65}Zn	<1.303	E+00
		^{134}Cs	<4.532	E-01
		^{137}Cs	<3.596	E-01
		^{226}Ra	<6.788	E-01
		^{228}Th	<5.256	E-01
		^{232}Th	<1.591	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page seven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01352	19	^{90}Sr	(-0.4 ± 1)	E+00
(Plant Matter)		Total Uranium	(0.153 ± 0.026) (1)	
		Gamma Scan:		
		^{40}K	(8.972 ± 3.264)	E+00
		^{51}Cr	<8.424	E+02
		^{60}Co	<4.1327	E-01
		^{65}Zn	<9.447	E-01
		^{134}Cs	<3.065	E-01
		^{137}Cs	<2.067	E-01
		^{226}Ra	<3.756	E-01
		^{228}Th	<3.213	E-01
		^{232}Th	<9.249	E-01
B01330	20	^{90}Sr	(0.2 ± 2)	E+00
(Plant Matter)		Total Uranium	(0.036 ± 0.006) (1)	
		Gamma Scan:		
		^{40}K	(1.224 ± 0.397)	E+01
		^{51}Cr	<1.018	E+03
		^{60}Co	<3.477	E-01
		^{65}Zn	<1.385	E+00
		^{134}Cs	<3.900	E-01
		^{137}Cs	<3.243	E-01
		^{226}Ra	<4.958	E-01
		^{228}Th	<5.073	E-01
		^{232}Th	<1.257	E+00
B01350	21	^{90}Sr	(1 ± 2)	E-01
(Plant Matter)		Total Uranium	(0.284 ± 0.048) (1)	
		Gamma Scan:		
		^{40}K	(1.299 ± 0.437)	E+01
		^{51}Cr	<1.002	E+03
		^{60}Co	<3.367	E-01
		^{65}Zn	<1.380	E+00
		^{134}Cs	<3.871	E-01
		^{137}Cs	<3.047	E-01
		^{226}Ra	<5.993	E-01
		^{228}Th	<4.717	E-01
		^{232}Th	<1.242	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page eight)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01337 (Plant Matter)	22	^{90}Sr	(0.7 ± 1)	E-01
		Total Uranium	(0.081 ± 0.014) (1)	
		Gamma Scan:		
		^{40}K	(1.242 ± 0.349)	E+01
		^{51}Cr	<1.017	E+03
		^{60}Co	<3.648	E-01
		^{65}Zn	<1.268	E+00
		^{134}Cs	<3.837	E-01
		^{137}Cs	<3.176	E-01
		^{226}Ra	<4.580	E-01
		^{228}Th	<4.584	E-01
		^{232}Th	<1.391	E+00
B01342 (Plant Matter)	23	^{90}Sr	(-0.04 ± 0.7)	E+00
		Total Uranium	(0.046 ± 0.008) (1)	
		Gamma Scan:		
		^{40}K	(1.237 ± 0.483)	E+01
		^{51}Cr	<1.174	E+03
		^{60}Co	<4.311	E-01
		^{65}Zn	<1.735	E+00
		^{134}Cs	<3.822	E-01
		^{137}Cs	<2.758	E-01
		^{226}Ra	<6.379	E-01
		^{228}Th	<5.148	E-01
		^{232}Th	<1.432	E+00
B01332 (Plant Matter)	24	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	(0.080 ± 0.013) (1)	
		Gamma Scan:		
		^{40}K	(1.338 ± 0.401)	E+01
		^{51}Cr	<9.379	E+02
		^{60}Co	<2.648	E-01
		^{65}Zn	<1.482	E+00
		^{134}Cs	<2.844	E-01
		^{137}Cs	<2.000	E-01
		^{226}Ra	<4.257	E-01
		^{228}Th	<4.869	E-01
		^{232}Th	<1.049	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page nine)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01326	25	^{90}Sr	(2 ± 2)	E-01
(Plant Matter)		Total Uranium	(0.054 ± 0.009) (1)	
		Gamma Scan:		
		^{40}K	(1.092 ± 0.397)	E+01
		^{51}Cr	<1.036	E+03
		^{60}Co	<3.807	E-01
		^{65}Zn	<1.302	E+00
		^{134}Cs	<4.171	E-01
		^{137}Cs	<3.066	E-01
		^{226}Ra	<5.678	E-01
		^{228}Th	<4.667	E-01
		^{232}Th	<1.199	E+00
B017Q1	26	^{90}Sr	(0.3 ± 2)	E-01 R
(Plant Matter)		Total Uranium	(0.028 ± 0.005) (1)	UJ
		Gamma Scan:		
		^{40}K	(9.750 ± 3.496)	E+00 UJ
		^{51}Cr	<8.070	E+02
		^{60}Co	<3.909	E-01
		^{65}Zn	<1.377	E+00
		^{134}Cs	<3.892	E-01
		^{137}Cs	<2.427	E-01
		^{226}Ra	(3.371 ± 3.135)	E-01
		^{228}Th	<4.633	E-01
		^{232}Th	<9.656	E-01
B012N1	27	^{90}Sr	(0 ± 1)	E+00
(Plant Matter)		Total Uranium	(0.018 ± 0.003) (1)	
		Gamma Scan:		
		^{40}K	(8.047 ± 1.472)	E+00
		^{51}Cr	<3.006	E+02
		^{60}Co	<1.106	E-01
		^{65}Zn	<4.295	E-01
		^{134}Cs	<1.213	E-01
		^{137}Cs	<9.146	E-02
		^{226}Ra	<1.738	E-01
		^{228}Th	<1.476	E-01
		^{232}Th	<4.230	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page ten)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01359	28	^{90}Sr	(0 ± 1)	E+00
(Plant Matter)		Total Uranium	(0.013 ± 0.003)	(1)
		Gamma Scan:		
		^{40}K	(8.769 ± 1.468)	E+00
		^{51}Cr	<3.104	E+02
		^{60}Co	<9.977	E-02
		^{65}Zn	<4.156	E-01
		^{134}Cs	<1.020	E-01
		^{137}Cs	<8.123	E-02
		^{226}Ra	<1.882	E-01
		^{228}Th	<1.708	E-01
		^{232}Th	<3.570	E-01
B01369	29	^{90}Sr	(-0.004 ± 0.2)	E+00 UR
(Plant Matter)		Total Uranium	(0.114 ± 0.019)	(1) J
		Gamma Scan:		
		^{40}K	(1.613 ± 0.471)	E+01 UJ
		^{51}Cr	<1.108	E+03
		^{60}Co	<4.061	E-01
		^{65}Zn	<1.529	E+00
		^{134}Cs	<5.100	E-01
		^{137}Cs	<3.926	E-01
		^{226}Ra	<6.604	E-01
		^{228}Th	<5.097	E-01
		^{232}Th	<1.170	E+00
B012N0	30	^{90}Sr	(0.1 ± 0.4)	E+00
(Plant Matter)		Total Uranium	(0.014 ± 0.003)	(1)
		Gamma Scan:		
		^{40}K	(9.412 ± 3.017)	E+00
		^{51}Cr	<7.159	E+02
		^{60}Co	<3.178	E-01
		^{65}Zn	<8.585	E-01
		^{134}Cs	<2.702	E-01
		^{137}Cs	<2.146	E-01
		^{226}Ra	<4.195	E-01
		^{228}Th	<5.392	E-01
		^{232}Th	<1.039	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page eleven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01358 (Plant Matter)	31	^{90}Sr	(3 ± 2)	E-01
		Total Uranium	(0.007 ± 0.002) (1)	
		Gamma Scan:		
		^{40}K	(6.994 ± 3.485)	E+01
		^{51}Cr	<7.801	E+02
		^{60}Co	<3.633	E-01
		^{65}Zn	<1.033	E+00
		^{134}Cs	<3.169	E-01
		^{137}Cs	<1.654	E-01
		^{226}Ra	(6.909 ± 4.350)	E-01
		^{228}Th	(4.256 ± 3.741)	E-01
		^{232}Th	<1.079	E+00
B017N9 (Plant Matter)	32	^{90}Sr	(-0.8 ± 6)	E+00
		Total Uranium	(0.012 ± 0.002) (1)	
		Gamma Scan:		
		^{40}K	(3.367 ± 2.790)	E+00
		^{51}Cr	<7.657	E+02
		^{60}Co	<2.603	E-01
		^{65}Zn	<9.285	E-01
		^{134}Cs	<2.643	E-01
		^{137}Cs	<2.049	E-01
		^{226}Ra	<4.462	E-01
		^{228}Th	<3.203	E-01
		^{232}Th	<9.391	E-01
B01250 (Plant Matter)	33	^{90}Sr	(0.1 ± 4)	E-01
		Total Uranium	(0.019 ± 0.003) (1)	
		Gamma Scan:		
		^{40}K	(9.510 ± 3.256)	E+00
		^{51}Cr	<7.595	E+02
		^{60}Co	<3.203	E-01
		^{65}Zn	<1.294	E+00
		^{134}Cs	<3.523	E-01
		^{137}Cs	<2.130	E-01
		^{226}Ra	<4.850	E-01
		^{228}Th	<3.571	E-01
		^{232}Th	<9.922	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page twelve)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ		
B01348 (Plant Matter)	34	^{90}Sr	(-0.1 ± 0.3)	E+00	
		Total Uranium	(0.027 ± 0.005) (1)		
		Gamma Scan:			
		^{40}K	(1.002 ± 0.367)	E+01	
		^{51}Cr	<8.303	E+02	
		^{60}Co	<5.073	E-01	
		^{65}Zn	<1.161	E+00	
		^{134}Cs	<3.009	E-01	
		^{137}Cs	<2.545	E-01	
		^{226}Ra	<4.571	E-01	
		^{228}Th	<3.872	E-01	
		^{232}Th	<9.796	E-01	
B012V0 (Plant Matter)	35	^{90}Sr	(1 ± 4)	E-01	
		Total Uranium	(0.061 ± 0.010) (1)		
		Gamma Scan:			
		^{40}K	(5.382 ± 3.349)	E+00	
		^{51}Cr	<7.636	E+02	
		^{60}Co	<3.578	E-01	
		^{65}Zn	<1.273	E+00	
		^{134}Cs	<3.110	E-01	
		^{137}Cs	<2.637	E-01	
		^{226}Ra	<4.494	E-01	
		^{228}Th	<4.333	E-01	
		^{232}Th	<1.110	E+00	
B017N6 (Plant Matter)	36	^{90}Sr	(2 ± 3)	E-01	R
		Total Uranium	(0.026 ± 0.005) (1)		UJ
		Gamma Scan:			
		^{40}K	(3.342 ± 2.640)	E+00	UJ
		^{51}Cr	<9.226	E+02	
		^{60}Co	<3.295	E-01	
		^{65}Zn	<1.319	E+00	
		^{134}Cs	<3.935	E-01	
		^{137}Cs	<3.557	E-01	
		^{226}Ra	<5.773	E-01	
		^{228}Th	<8.308	E-01	UJ
		^{232}Th	<1.065	E+00	

ATTACHMENT 1 DATA TABLE (cont'd, page thirteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B01366 (Plant Matter)	37	^{90}Sr	(-0.7 ± 4)	E-01
		Total Uranium	(0.012 ± 0.002) (1)	
		Gamma Scan:		
		^{40}K	(8.203 ± 3.915)	E+00
		^{51}Cr	<1.083	E+03
		^{60}Co	<3.297	E-01
		^{65}Zn	<1.364	E+00
		^{134}Cs	<3.516	E-01
		^{137}Cs	<2.790	E-01
		^{226}Ra	<6.026	E-01
		^{228}Th	<3.936	E-01
		^{232}Th	<1.193	E+00
B01361 (Plant Matter)	38	^{90}Sr	(-0.2 ± 0.4)	E+00
		Total Uranium	(0.008 ± 0.002) (1)	
		Gamma Scan:		
		^{40}K	(8.053 ± 3.248)	E+00
		^{51}Cr	<5.951	E+02
		^{60}Co	<2.273	E-01
		^{65}Zn	<1.038	E+00
		^{134}Cs	<1.865	E-01
		^{137}Cs	<1.865	E-01
		^{226}Ra	<4.444	E-01
		^{228}Th	<4.026	E-01
		^{232}Th	<7.821	E-01
B01336 (Plant Matter)	39	^{90}Sr	(0.06 ± 0.3)	E+00 ~~UR~~
		Total Uranium	(1.581 ± 0.266) (1)	UJ
		Gamma Scan:		
		^{40}K	(1.611 ± 0.438)	E+01
		^{51}Cr	<1.114	E+03
		^{60}Co	<5.423	E-01
		^{65}Zn	<1.802	E+00
		^{134}Cs	<5.207	E-01
		^{137}Cs	<3.933	E-01
		^{226}Ra	<6.864	E-01
		^{228}Th	<5.797	E-01
		^{232}Th	<1.605	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page fourteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B017M0 (Plant Matter)	40	^{90}Sr	(0.06 ± 0.2)	E+00
		Total Uranium	(0.260 ± 0.044) (1)	
		Gamma Scan:		
		^{40}K	(7.803 ± 2.925)	E+00
		^{51}Cr	<9.007	E+02
		^{60}Co	<2.033	E-01
		^{65}Zn	<9.230	E-01
		^{134}Cs	<3.072	E-01
		^{137}Cs	<2.201	E-01
		^{226}Ra	<3.194	E-01
		^{228}Th	<4.164	E-01
		^{232}Th	<9.708	E-01
B012M3 (Plant Matter)	41	^{90}Sr	(5 ± 4)	E-01 R
		Total Uranium	(0.122 ± 0.020) (1) J	
		Gamma Scan:		
		^{40}K	<5.398	E+00 UJ
		^{51}Cr	<9.735	E+02
		^{60}Co	<5.274	E-01
		^{65}Zn	<1.120	E+00
		^{134}Cs	<4.500	E-01
		^{137}Cs	<2.738	E-01
		^{226}Ra	<5.124	E-01
		^{228}Th	(4.411 ± 3.757)	E-01 J
		^{232}Th	<1.299	E+00
B017M4 (Plant Matter)	42	^{90}Sr	(0 ± 3)	E-01
		Total Uranium	(0.231 ± 0.039) (1)	
		Gamma Scan:		
		^{40}K	(1.009 ± 0.335)	E+01
		^{51}Cr	<8.392	E+02
		^{60}Co	<2.499	E-01
		^{65}Zn	<7.666	E-01
		^{134}Cs	<2.603	E-01
		^{137}Cs	<2.202	E-01
		^{226}Ra	<4.096	E-01
		^{228}Th	<4.215	E-01
		^{232}Th	<9.193	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page fifteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B012T4 (Plant Matter)	43	^{90}Sr	(0.7 ± 3)	E-01 ~~U~~ R
		Total Uranium	(0.023 ± 0.004) (1)	UJ
		Gamma Scan:		
		^{40}K	(8.107 ± 2.521)	E+00 UJ
		^{51}Cr	<9.475	E+02
		^{60}Co	<2.780	E-01
		^{65}Zn	<1.142	E+00
		^{134}Cs	<2.962	E-01
		^{137}Cs	<2.202	E-01
		^{226}Ra	<3.996	E-01
		^{228}Th	<3.633	E-01
		^{232}Th	<1.061	E+00
B012L9 (Plant Matter)	44	^{90}Sr	(-0.1 ± 0.2	E+00
		Total Uranium	<0.003 (1)	
		Gamma Scan:		
		^{40}K	(5.899 ± 2.284)	E+00
		^{51}Cr	<7.043	E+02
		^{60}Co	<2.404	E-01
		^{65}Zn	<1.130	E+00
		^{134}Cs	<2.403	E-01
		^{137}Cs	<2.497	E-01
		^{226}Ra	<4.186	E-01
		^{228}Th	<3.938	E-01
		^{232}Th	<6.645	E-01
B012S8 (Plant Matter)	45	^{90}Sr	(1 ± 3)	E-01
		Total Uranium	(0.029 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(1.153 ± 0.431)	E+01
		^{51}Cr	<9.359	E+02
		^{60}Co	<3.829	E-01
		^{65}Zn	<1.227	E-01
		^{134}Cs	<3.508	E-01
		^{137}Cs	<2.570	E-01
		^{226}Ra	<4.893	E-01
		^{228}Th	<4.154	E-01
		^{232}Th	<1.258	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page sixteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9574	Analysis	Results pCi/g ± 2 σ	
B012T2 (Plant Matter)	46	^{90}Sr	(0.9 ± 2)	E-01
		Total Uranium	(0.020 ± 0.004) (1)	
		Gamma Scan:		
		^{40}K	(1.040 ± 0.271)	E+01
		^{51}Cr	<7.612	E+02
		^{60}Co	<2.035	E-01
		^{65}Zn	<8.304	E-01
		^{134}Cs	<1.810	E-01
		^{137}Cs	<1.416	E-01
		^{226}Ra	<3.509	E-01
		^{228}Th	<3.905	E-01
		^{232}Th	<9.132	E-01
B017V1 (Plant Matter)	47	^{90}Sr	(-0.2 ± 3)	E-00 ~~UJ~~ R
		Total Uranium	(0.026 ± 0.005) (1)	UJ
		Gamma Scan:		
		^{40}K	(5.764 ± 4.148)	E+00
		^{51}Cr	<1.186	E+03 ✓ J
		^{60}Co	<3.420	E-01
		^{65}Zn	<1.677	E+00
		^{134}Cs	<4.564	E-01
		^{137}Cs	<4.075	E-01
		^{226}Ra	<6.195	E-01
		^{228}Th	<5.088	E-01
		^{232}Th	<1.524	E+00
B017V3 (Plant Matter)	48	^{90}Sr	(2 ± 3)	E-01
		Total Uranium	(0.027 ± 0.005) (1)	
		Gamma Scan:		
		^{40}K	(6.692 ± 3.359)	E+00
		^{51}Cr	<8.406	E+02
		^{60}Co	<2.524	E-01
		^{65}Zn	<1.119	E-01
		^{134}Cs	<3.092	E-01
		^{137}Cs	<2.184	E-01
		^{226}Ra	<4.229	E-01
		^{228}Th	<4.520	E-01
		^{232}Th	<1.033	E+00

(1) Units are μgm/gram dry weight.

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ATTACHMENT 5

Data Review Supporting Documentation

9613500.2064

Data Package Completeness Checklists

TMA/NORCAL N1-12-056-9574

B012N3
B01363
B017W7
B01349
B017Q1
B01369
B017N6
B01336
B012M3
B012T4
B017V1

SR-90

Supplemental Requirements for Analyses Using Gas Proportional Counters

A.0 Completeness Checklist

Analysis Results

- ✓ Results Report for Sample Analyses and Reanalyses
- ___ Raw Data (Counting Logs, Printouts, Notebook Pages) 2 Beta Count Sheet missing; Raw Data Not complete.
- ___ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification
- ✓ Analysis Date and Initials of Analyst
- ✓ Amounts of Samples Prepared or Counted
- ✓ Weights of Solids Counted

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
- ✓ Amount of (Check) Standard Used
- ✓ Raw Data including Counts and Count Duration for Standards
- ✓ Weights of Preparations
- ✓ Efficiencies
- ✓ Weights of Carriers Added, If Applicable
- ✓ Results of Statistical Tests Used to Evaluate Instrument Reliability and Efficiency Checks
- ✓ Raw Data of Background Counts and Count Duration
- ✓ Results of Statistical Test Used to Evaluate Instrument Background
- NA ✓ Control Limits for Check Source and Background Counts

Blanks

- ✓ Detector Identification
- ✓ Date of Analysis
- NO MDA of Method will calculate
- ✓ Amounts of Reagents Used in Blank

Supplemental Requirements for Analyses Using Gas Proportional Counters (Cont.)

Radiometric and Gravimetric Yields

✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
✓ Weights of Precipitates or Solids Counted
✓ Calculated Recoveries

Duplicates

✓ Detector Identification
✓ Date of Analysis
✓ Aliquots of Samples
✓ Weights of Solids Counted
✓ Count Durations
✓ Sample Identifications
✓ Calculated Precision

Laboratory Control Samples

✓ Detector Identification
✓ Date of Analysis
✓ Calculation of Recoveries
✓ Results of Analyses

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Supplemental Requirements for Analyses Using
Gamma Spectroscopy

Gamma D

C.0 Completeness Checklist

Analysis Results

✓ Results Report for Sample Analyses and Reanalyses
✓ Raw Data (Spectra, Printouts of Counts per Channel, Notebook Pages)
✓ Calculation Sheets
✓ Sample Identifications
✓ Detector Identification and Counting Position
✓ Analysis Date and Initials of Analyst
✓ Amounts of Samples Counted

Initial and Continuing Calibration

✓ Detector Identification
✓ Calibration Date(s) and Initials of Analyst
✓ Identification of Calibration and Check Standards including Radionuclides, Certification, Expiration Date, and Activity
NA Amount of (Check) Standard Used
✓ Raw Data including Counts and Count Duration for Standards
✓ Efficiencies and/or Geometry and Matrix Factors
✓ Raw Data of Background Counts, Count Dates, and Duration of Counts
✓ Kev/Channel
✓ FWHM

Blanks

✓ Detector Identification
✓ Date of Analysis
NO MDA of Method will calculate
✓ Amounts of Reagents Used in Blank
✓ Raw Data

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Supplemental Requirements for Analyses Using Gamma Spectroscopy (Cont.)

Duplicates

✓ Detector Identification
✓ Date of Analysis
✓ Amounts of Samples
✓ Count Durations
✓ Sample Identifications
✓ Results of Analyses and Calculated Precision
✓ Raw Data

Radiometric and Gravimetric Yields

____ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
____ Weights of Precipitates or Solids Counted
✓ Calculated Recoveries

Laboratory Control Samples

✓ Detector Identification
✓ Date of Analysis
✓ Calculation of Recoveries
✓ Results of Analyses

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Total Uranium by kPA

Supplemental Requirements for Analyses Using kPA for Total Uranium

Analysis Results

- ✓ Results Reported for Sample Analyses
- ✓ Raw Data (including Prep Volume, Aliquot Volume, kPA output)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification
- ✓ Analysis Date and Initials of Analyst

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
- ✓ Amount of Standard Used
- ✓ Raw count/Activity data
- ✓ Determination of Calibration Equation

Blanks/Backgrounds

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ MDA of Method
- ✓ Amount of Reagent Used (Prep Volume)
- ✓ Count Durations

Duplicates

✓ Detector Identification
✓ Date of Analysis
✓ Amounts of Samples
✓ Count Durations
✓ Sample Identifications
✓ Results of Analysis and Calculated Precision
✓ Raw Data

Matrix Spikes

✓ Detector Identification
✓ Date of Analysis
✓ Amounts of Samples
✓ Count Durations
✓ Sample Identifications
✓ Results of Analysis and Calculated Precision
✓ Identification of Matrix Spike Radionuclide, Certification, Expiration Date, and Activity
✓ Amount of Matrix Spike Used
✓ Raw Data
✓ Results of Analysis and Comparison to Amount Added

TMA
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
P.O. Box 4040
Richmond, CA 94804-0040
(415) 235-2633 Fax No. (415) 235-0438

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Ref. TMA/Norcal N1-12-056-9574

Mr. John Bourgeault
Westinghouse Hanford Company
2355 Stevens Drive
Richland, WA 99352

Dear Mr. Bourgeault:

Enclosed on Attachment 1, are the ^{90}Sr, total uranium, and gamma scan results for the plant samples from 300-FF-5 Area, Task 7, we received 26 November 1991.

Please call if you have any questions concerning this data.

Sincerely,

D.P. Kharkar

Dinkar P. Kharkar, Ph.D.
Manager, Nuclear Programs

Envlosures: Section 1 through 9
Appendices

INDEX OF DOCUMENTS

SECTION 1	Data Report
SECTION 2	Case Narrative
SECTION 3	QC Summary
SECTION 4	Chains-of-Custody Copies
SECTION 5	Analytical Methods Used
SECTION 6	Aliquot Information
SECTION 7	Raw Data for ^{90}Sr
SECTION 8	Raw Data for Total Uranium
SECTION 9	Raw Data for Gamma Scan

SEE NEXT PAGE FOR APPENDICES TO BE INCLUDED IN THE DATA PACKAGE

INDEX OF APPENDICES TO BE INCLUDED IN DATA PACKAGE

9574

____	Appendix 1 :	Tritium Standard Solution Certificate and Preparation Information.
____	Appendix 2 :	Isotopic Uranium Standard Solution Certificates and Preparation Information.
X	Appendix 3 :	Natural Uranium Standard Solution Certificates and Preparation Information.
X	Appendix 4 :	Preparation Log For QC Samples.
____	Appendix 5 :	Am Standard Solution Certificate and Preparation Information.
____	Appendix 6 :	^{99}Tc Standard Solution Certificate and Preparation Information.
X	Appendix 7 :	^{90}Sr Stock Solution Certificate, Preparation and Dilutions Information.
X	Appendix 8 :	Yttrium Carrier Certificate, Preparation and Dilutions Information.
____	Appendix 12 :	Continuing Calibration Data for Tritium for LSC Counters 4 and 5.
X	Appendix 15 :	Raw Data for Continuing Calibration for Beta Counters.
X	Appendix 16 :	Primary Calibration References.

SECTION 2 Case Narrative

CASE NARRATIVE

1. Project 300-FF-5, Task 7, Plant Material (TMA/Norcal Group No. 9574 were processed together and the results of the analyses are reported. The sample ID's are:

Customer Sample ID	TMA/Norcal Group No.	Customer Sample ID	TMA/Norcal Group No.
B012N5 (Plant Material))	9574-1	B01326 (Plant Material)	9574-25
B012M8 (Plant Material))	9574-2	B017Q1 (Plant Material)	9574-26
B01368 (Plant Material))	9574-3	B012N1 (Plant Material)	9574-27
B01252 (Plant Material))	9574-4	B01359 (Plant Material)	9574-28
B017X2 (Plant Material))	9574-5	B01369 (Plant Material)	9574-29
B01TY8 (Plant Material))	9574-6	B012N0 (Plant Material)	9574-30
B017T5 (Plant Material))	9574-7	B01358 (Plant Material)	9574-31
B012N3 (Plant Material))	9574-8	B017N9 (Plant Material)	9574-32
B01363 (Plant Material))	9574-9	B012S0 (Plant Material)	9574-33
B012M2 (Plant Material))	9574-10	B01348 (Plant Material)	9574-34
B012M9 (Plant Material))	9574-11	B012V0 (Plant Material)	9574-35
B017W7 (Plant Material))	9574-12	B017N6 (Plant Material)	9574-36
B017T3 (Plant Material))	9574-13	B01366 (Plant Material)	9574-37
B01335 (Plant Material))	9574-14	B01361 (Plant Material)	9574-38
B01349 (Plant Material))	9574-15	B01336 (Plant Material)	9574-39
B01360 (Plant Material))	9574-16	B017M0 (Plant Material)	9574-40
B01309 (Plant Material))	9574-17	B012M3 (Plant Material)	9574-41
B012M4 (Plant Material))	9574-18	B017M4 (Plant Material)	9574-32
B01352 (Plant Material))	9574-19	B012T4 (Plant Material)	9574-43
B01330 (Plant Material))	9574-20	B012L9 (Plant Material)	9574-44
B01350 (Plant Material))	9574-21	B012S8 (Plant Material)	9574-45
B01337 (Plant Material))	9574-22	B01272 (Plant Material)	9574-46
B01342 (Plant Material))	9574-23	B017V1 (Plant Material)	9574-47
B01332 (Plant Material))	9574-24	B017V3 (Plant Material)	9574-48

2. The analyses reported are:

PLANT MATERIAL	
Analyte	Group # & Sample #
^{90}Sr	9574-1 through 48
Total U	9574-1 through 48
Gamma Scan	9574-1 through 48

3. Results are reported pCi/gram dry material with 2 σ errors.

4. Strontium-90 analyses were processed in five batches, with ^{90}Sr QCs with each batch.

5. The QC samples consisting of a spike, a lab control sample, and a replicate were processed with this batch as shown on Table 1.

TABLE 1

Preparation Batch Samples Processed	Data Package
9574-1 through 48	- PLANT MATERIAL

QC SAMPLES PROCESSED:

Sample I.D.	Type	Analyses	Reported with Data Package
9574-49 (QC 7373)	Spike	^{90}Sr	X
9574-50 (QC 7374)	Spike	^{90}Sr	X
9574-51 (QC 7375)	Spike	^{90}Sr	X
9574-52 (QC 7376)	Spike	^{90}Sr	X
9574-53 (QC 7377)	Spike	^{90}Sr	X
9574-54 (QC 7378)	LCS	^{90}Sr	X
9574-55 (QC 7379)	LCS	^{90}Sr	X
9574-56 (QC 7380)	LCS	^{90}Sr	X
9574-57 (QC 7381)	LCS	^{90}Sr	X
9574-58 (QC 7382)	LCS	^{90}Sr	X
9574-59 (QC 7383)	Replicate	^{90}Sr	X
9574-60 (QC 7384)	Replicate	^{90}Sr	X
9574-61 (QC 7385)	Replicate	^{90}Sr	X
9574-62 (QC 7386)	Replicate	^{90}Sr	X
9574-63 (QC 7387)	Replicate	^{90}Sr	X
9574-64 (QC 7388)	Spike	Total U	X
9574-65 (QC 7389)	Spike	Total U	X
9574-66 (QC 7390)	Spike	Total U	X
9574-67 (QC 7391)	LCS	Total U	X
9574-68 (QC 7392)	LCS	Total U	X
9574-69 (QC 7393)	LCS	Total U	X
9574-70 (QC 7394)	Replicate	Total U	X
9574-71 (QC 7395)	Replicate	Total U	X
9574-72 (QC 7396)	Replicate	Total U	X
9574-73 (QC 7297)	Spike	Gamma Scan	X
9574-74 (QC 7298)	Spike	Gamma Scan	X
9574-75 (QC 7299)	Spike	Gamma Scan	X
9574-76 (QC 7400)	LCS	Gamma Scan	X
9574-77 (QC 7401)	LCS	Gamma Scan	X
9574-78 (QC 7402)	LCS	Gamma Scan	X
9574-79 (QC 7403)	Replicate	Gamma Scan	X
9574-80 (QC 7404)	Replicate	Gamma Scan	X
9574-81 (QC 7405)	Replicate	Gamma Scan	X

6. Analyses, reanalyses, and reworks, etc.

Strontium Analyses (Plant Matter): The average yield for 48 analyses was 78%. The lowest yield was 62% and the highest was 89%. No abnormalities were encountered. The results of the spike, the Laboratory Control Sample, and the replicate were satisfactory, except for one spike which had a Found/Added ratio of 0.77 ± 0.06.

Gamma Scan Analyses (Plant Matter): The spike sample processed had only ^{60}Co and ^{137}Cs activity. The found/added ratio of the spike look good. The results of the spike, the laboratory control sample, and the replicate were satisfactory.

Total Uranium Analyses (Plant Matter): No abnormalities were encountered. The results of the spike, the Laboratory Control Sample, and the replicate were satisfactory.

SECTION 3: QC SUMMARY

QUALITY CONTROL SUMMARY

Attachment 2, 3, and 4 gives the results of the QC samples. The recovery ratios were determined by the QC Officer based upon the final data obtained for each. The laboratory control samples were calculated with an aliquot of 1.00 and, therefore, the presented data cannot be compared directly with the sample data. To compare them directly, the laboratory control sample data would need to be divided by sample aliquots.

The results of the spike, the laboratory control and the replicate for ^{90}Sr, total uranium, and gamma scan were satisfactory except for one ^{90}Sr spike which gave the Found/Added ratio of 0.77 ± 0.16.

D. P. Kharkar

Dinkar P. Kharkar, Ph.D.
TMA/Norcal Program Manager

ATTACHMENT 2 QUALITY CONTROL SAMPLE RESULTS, SPIKES AND BLANKS

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found	Added	Recovery Ratio Found/Added ± 2 σ
Spikes for Plant Materail.				
9574-49 QC-7373	^{90}Sr	9.13 ± 1.11	10.27 ± 0.41	0.89 ± 0.12
9574-50 QC-7374	^{90}Sr	9.24 ± 2.05	10.27 ± 0.41	0.90 ± 0.21
9574-51 QC-7375	^{90}Sr	9.84 ± 1.98	12.83 ± 0.51	0.77 ± 0.16
9574-52 QC-7376	^{90}Sr	8.11 ± 1.81	8.56 ± 0.34	0.95 ± 0.22
9574-53 QC-7377	^{90}Sr	11.74 ± 0.71	12.83 ± 0.51	0.92 ± 0.06
9574-64 QC-7388	Total U	41.40 ± 7.03 (1)	40.67 ± 1.63 (1)	1.09 ± 0.16
9574-65 QC-7389	Total U	30.60 ± 5.14 (1)	32.53 ± 1.30 (1)	0.94 ± 0.16
9574-66 QC-7390	Total U	51.20 ± 8.60 (1)	48.80 ± 1.95 (1)	1.05 ± 0.18
9574-73 QC-7397	Gamma Scan:			
	^{60}Co	46 ± 22	67 ± 3	0.69 ± 0.32
	^{137}Cs	56 ± 19	84 ± 3	0.67 ± 0.23
9574-74 QC-7398	Gamma Scan:			
	^{60}Co	46 ± 15	54 ± 2	0.85 ± 0.19
	^{137}Cs	63 ± 17	71 ± 3	0.88 ± 0.25
9574-75 QC-7399	Gamma Scan:			
	^{60}Co	74 ± 24	59 ± 2	1.24 ± 0.42
	^{137}Cs	61 ± 20	71 ± 3	0.86 ± 0.28

(1) Units are μg/sample.

ATTACHMENT 3 QUALITY CONTROL SAMPLE RESULTS, LABORATORY CONTROL SAMPLES

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found	Added	Recovery Ratio Found/Added ± 2 σ
Laboratory Control Samples (Plant Material)				
9574-54 QC-7378	^{90}Sr	-0.88 ± 2.6	0	Satisfactory
9574-55 QC-7379	^{90}Sr	-0.04 ± 0.6	0	Satisfactory
9574-56 QC-7380	^{90}Sr	0.2 ± 0.4	0	Satisfactory
9574-57 QC-7381	^{90}Sr	0.4 ± 0.6	0	Satisfactory
9574-58 QC-7382	^{90}Sr	0 ± 0.6	0	Satisfactory
9574-67 QC-7391	Total U	<0.001 (1)	0	Satisfactory
9574-68 QC-7392	Total U	<0.001 (1)	0	Satisfactory
9574-69 QC-7393	Total U	<0.001 (1)	0	Satisfactory
9574-76 QC-7400	Gamma Scan:			
	^{40}K	(2.423 ± 1.197) E+02	0	Satisfactory
	^{51}Cr	<8.782 E+01	0	Satisfactory
	^{60}Co	<1.683 E+01	0	Satisfactory
	^{65}Zn	<2.651 E+01	0	Satisfactory
	^{134}Cs	<1.627 E+01	0	Satisfactory
	^{137}Cs	<1.234 E+01	0	Satisfactory
	^{226}Ra	<1.859 E+01	0	Satisfactory
	^{228}Th	<1.827 E+01	0	Satisfactory
	^{232}Th	<6.414 E+01	0	Satisfactory
9574-77 QC-7401	Gamma Scan:			
	^{40}K	<2.749 E+02	0	Satisfactory
	^{51}Cr	<1.019 E+02	0	Satisfactory
	^{60}Co	<2.137 E+01	0	Satisfactory
	^{65}Zn	<4.190 E+01	0	Satisfactory
	^{134}Cs	<1.780 E+01	0	Satisfactory
	^{137}Cs	<1.549 E+01	0	Satisfactory
	^{226}Ra	<2.874 E+01	0	Satisfactory
	^{228}Th	<2.197 E+01	0	Satisfactory
	^{232}Th	<6.131 E+01	0	Satisfactory

ATTACHMENT 3 QUALITY CONTROL SAMPLE RESULTS, LABORATORY CONTROL SAMPLES (cont'd, page two)

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found		Added	Recovery Ratio Found/Added ± 2 σ
Laboratory Control Samples (Plant Material)					
9574-78					
QC-7402	Gamma Scan:				
	^{40}K	<1.796	E+02	0	Satisfactory
	^{51}Cr	<6.744	E+01	0	Satisfactory
	^{60}Co	<1.528	E+01	0	Satisfactory
	^{65}Zn	<2.413	E+01	0	Satisfactory
	^{134}Cs	<1.715	E+01	0	Satisfactory
	^{137}Cs	<1.438	E+01	0	Satisfactory
	^{226}Ra	<2.645	E+01	0	Satisfactory
	^{228}Th	<2.609	E+01	0	Satisfactory
	^{232}Th	<5.243	E+01	0	Satisfactory

ATTACHMENT 4 QUALITY CONTROL RESULTS, REPLICATES

Nuclide	Results	
	pCi/g ± error 2 σ	
	No. 9574-59 Replicate	No. 9574-1 Original
QC 7383 ^{90}Sr	(0 ± 5) E-01	(4 ± 5) E-01
	No. 9574-60 Replicate	No. 9574-2 Original
QC 7384 ^{90}Sr	(0.4 ± 2) E-01	(3 ± 6) E-01
	No. 9574-61 Replicate	No. 9574-3 Original
QC 7385 ^{90}Sr	(0.01 ± 0.3) E+00	(-0.07 ± 1) E+00
	No. 9574-62 Replicate	No. 9574-4 Original
QC 7386 ^{90}Sr	(0.8 ± 2) E-01	(-0.1 ± 2) E+00
	No. 9574-63 Replicate	No. 9574-5 Original
QC 7387 ^{90}Sr	(2 ± 2) E-01	(-0.1 ± 0.3) E+00
	No. 9574-70 Replicate	No. 9574-1 Original
QC-7394 Total U	0.016 ± 0.003 (1)	0.012 ± 0.002 (1)
	No. 9574-71 Replicate	No. 9574-2 Original
QC-7295 Total U	0.018 ± 0.003 (1)	0.016 ± 0.003 (1)
	No. 9574-72 Replicate	No. 9574-3 Original
QC-7296 Total U	0.050 ± 0.008 (1)	0.046 ± 0.008 (1)

ATTACHMENT 4 QUALITY CONTROL RESULTS, REPLICATES (cont'd, page two)

Nuclide	Results			
	pCi/g ± error 2 σ			
	No. 9574-79 Replicate		No. 9574-1 Original	
QC-7403				
Gamma Scan:				
^{40}K	(1.473 ± 0.598)	E+01	(1.191 ± 0.328)	E+01
^{51}Cr	<1.559	E+03	<7.087	E+02
^{60}Co	<4.848	E-01	<1.910	E-01
^{65}Zn	<1.880	E+00	<1.033	E+00
^{134}Cs	<5.623	E-01	<2.810	E-01
^{137}Cs	<3.581	E-01	<1.583	E-01
^{226}Ra	<6.523	E-01	<4.226	E-01
^{228}Th	<5.968	E-01	<3.147	E-01
^{232}Th	<1.692	E+00	<7.304	E-01
	No. 9574-80 Replicate		No. 9574-2 Original	
QC-7404				
Gamma Scan:				
^{40}K	(1.050 ± 0.420)	E+01	(5.891 ± 3.151)	E+00
^{51}Cr	<9.245	E+02	<9.367	E+02
^{60}Co	<3.908	E-01	<3.768	E-01
^{65}Zn	<8.225	E-01	<1.459	E+00
^{134}Cs	<4.547	E-01	<3.689	E-01
^{137}Cs	<3.024	E-01	<2.821	E-01
^{226}Ra	(5.081 ± 3.451)	E-01	<5.115	E-01
^{228}Th	<5.673	E-01	<4.997	E-01
^{232}Th	<1.047	E+00	<1.283	E+00
	No. 9574-81 Replicate		No. 9574-3 Original	
QC-7405				
Gamma Scan:				
^{40}K	(6.833 ± 4.686)	E+00	(7.584 ± 3.315)	E+00
^{51}Cr	<1.233	E+03	<8.839	E+02
^{60}Co	<3.819	E-01	<2.436	E-01
^{65}Zn	<1.575	E-00	<1.209	E+00
^{134}Cs	<3.636	E-01	<3.080	E-01
^{137}Cs	<3.366	E-01	<3.032	E-01
^{226}Ra	<5.720	E-01	<5.561	E-01
^{228}Th	<5.080	E-01	<4.606	E-01
^{232}Th	<1.476	E+00	<1.052	E+00

(1) Units are μg/gram.

SECTION 4 Chains-of-Custody Copies

Westinghouse Hanford Company 9613500.2086

CHAIN OF CUSTODY

1 OF 3

Custody Form Initiator NA. CADORET

npany Contact C.A. BRANDT Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7 Collection Date 9/10/91

Ice Chest No. CAB-2 Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 2485 21 7592 Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED, ~130g samples for gamma scan, SR-90, + Total U

Sample Identification

B012N5 ✓	B012M9 ✓
B012M8 ✓	B017W7 ✓
B01368 ✓	B017T3 ✓
B01252 ✓	B01335 ✓
B017X2 ✓	B01349 ✓
B012T8 ✓	B01360 ✓
B017T5 ✓	B01309 ✓
B012N3 ✓	B012M4 ✓
B01363 ✓	B01352 ✓
B012M2 ✓	B01330 ✓

☐ Field Transfer of Custody

CHAIN OF POSSESSION

(Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
NA CADORET	Kermit Blum	11-26-91 1130
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:

A-6000-407 (12/90)

Westinghouse Hanford Company 9613500.2087

CHAIN OF CUSTODY

2 of 3

Custody Form Initiator NA. CADORET

npany Contact C.A. BRANDT Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7 Collection Date 9/10/91

Ice Chest No. CAB-2 Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 24652759 2 Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED ~130 g samples ~~Lte~~ ~~method~~ SD-90 NC 11/22/91 Total U, gamma scan

Sample Identification

B01350	B01358
B01337	B017N9
B01342	~~B01250~~ NC 11/22/91 B01250
B01332	B01348
B01326	B012V0
B017Q1	B017N6
B012N1	B01366
B01359	B01361
B01369	B01336
B012N0	B017M0

☐ Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
NA CADORET	Kermit Blum	11-26-91 1130
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:

A-6000-407 (12/90)

Westinghouse Hanford Company 9613590.2088

CHAIN OF CUSTODY

3 of 3

Custody Form Initiator NA. CADORET

npany Contact C.A. BRANDT Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7 Collection Date 9/10/91

Ice Chest No. CAB-2 Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 248 521 759 2 Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED, ~130g. samples for SR-90, Gamma Scan, + Total U.

Sample Identification

- B012M3
- B017M4
- B012T4
- B012L9X
- B012S8
- B012T2
- B017V1
- B017V3

☐ Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)		
Relinquished by: NA CADORET	Received by: Kermit Blum	Date/Time: 11-26-91 1130
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:

A-6000-407 (12/90)

9613500.2009

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

1 of 3

PART I: FIELD SECTION

Collector N. CADORET Date Sampled 9-10/91 Time NA hours

Company Contact C A BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B012N5	1 - glass ~130g samples	plant material	Gamma Scan, Sr-90, Total U
B012M8			
B013G8			
B012S2			
B017X2			
B012T8			
B017T5			
B012N3			
B013G3			
B012M2			
B012M9			
B017W7			
17T3			
B01335			
B01349			
B01360			
B01309			
B012M4			
B01352			
B01330			

Field Information** from 300-FF-5 Task 7

Special Handling and/or Storage NA

Possible Sample Hazards none detected

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 11-26-91

Analysis Required

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

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

A-6000-406 (05/90)

9615600.2090

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

2 of 3

PART I: FIELD SECTION

Collector W. CADORET Date Sampled 9-10/91 Time N/A hours

Company Contact C A BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01350	1 - glass 1300 g samples	Nonliquid matter	Gamma scan, Sr-90, Total U
B01337			
B01342			
B01332			
B01326			
B017Q1			
B012N1			
B01359			
B01369			
B012N0			
B01358			
B017N9			
B012S0			
B01348			
B012V0			
B017N6			
B01366			
B01361			
B01336			
B017M0			

Field Information** from 300-FF-5 To sh 7

Special Handling and/or Storage N/A

Possible Sample Hazards none detected

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 11-26-91

Analysis Required

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

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

A-6000-406 (05/90)

9613500.2091

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

3 of 3

PART I: FIELD SECTION

Collector N. CADORET Date Sampled 9-10/91 Time NA hours

Company Contact C A BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B012M3	1-glass, 130 g samples	plant matter	Gamma scan, Total U, Sr-90
B017M4			
B012T4			
B012L9			
B012S8			
B012T2			
B017V1			
B017V3			

Field Information** Farm 300-FF-5

Special Handling and/or Storage NA

Possible Sample Hazards none detected.

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 11-26-91

Analysis Required

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

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

A-6000-406 (05/90)

SECTION 5 Analytical Methods Used

ANALYTICAL METHODS USED - SOIL AND VEGETATION

1. Gross Alpha and Gross Beta: Approximately a 0.200 gram was uniformly deposited on a stainless steel planchet and counted on a low background proportional counter for gross alpha and gross beta determination.

2. Strontium-90: ^{90}Sr was determined on a 1 gram aliquot. Approximately 3 gram dry soil was dissolved completely by HF-HNO_3-HCl treatment and made to a known volume. One gram aliquot was taken for ^{90}Sr determination. Yttrium carrier was added Yttrium was extracted by HDEHP extraction. Yttrium was converted to yttrium oxide and beta counted.

3. Isotopic Uranium: Uranium was determined on a 1 gram aliquot. Approximately 3 gram dry soil was dissolved completely by HF-HNO_3-HCl treatment and made to a known volume. A one gram aliquot was taken for isotopic uranium determination. An appropriate uranium tracer was added and uranium purified by selective ion exchange procedures. The purified extract was electroplated on a stainless steel disc for alpha pulse analysis.

4. Technetium-99: Approximately 2 gram was ashed at 500°C with ^{99m}Tc tracer and ammonia. The ash was leached with H_2SO_4 and $K_2S_2O_8$. The leached sample is filtered. H_2SO4 and $K_2S_2O_8$ was added to a 10 mL aliquot of water. The water and the leached samaple of soil was extracted with TBP and purified by coprecipitation and anion exchange procedure. The purified Tc was electroplated on a stainless steel disc and counted on a gamma detector to determine yield. After decay of ^{99m}Tc, the disc was counted on a low background beta counter.

5. Gamma-Scan: Approximately 200 to 750 gram dry soil was placed in an appropriate geometry and counted on a Ge(Li) detector.

6. Total Uranium: 0.250 gram dry material was dissolved in 20 mL 1N HNO_3. An aliquot was taken for laser phosphorometric determination of uranium.

7. Tritium: Tritium was azeotropically distilled from ≈ 20 gram vegetation and the distillate was counted by liquid scintillation.

SR90	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2														
3			GROSS	COUNT	BKG		NET							
4	SAMPLE	ET	CTS	TIME	CPM	SF	CPM	X	Ws	Wb	WY	WX	WXY	WX^2
47		2 COMP=	0.00000	0.00000	ERR	P-FACTOR		C-ZERO						
48						1.75900		0.00000						
49														
50	9574-15	1.26200	22.00000	27.48000	MISSING		0.00000	0.71930	34.15595	ERR	0.00000	24.56836	0.00000	17.67201
51	B01349	2.51400	12.00000	25.12000			0.00000	0.51957	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
52	Plant Material	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
53		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
54		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
55		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
56		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
57		DELTA=	0.00000					SUMS=	34.15595	ERR	0.00000	24.56836	0.00000	17.67201
58														
59						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
60		Y @ MILK	REPORTED	CALCULATED		1.35565		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
61		1 COMP=	NA	0.00000	ERR					0.07246	0.00000	ERR	0.00000	Yes
62		2 COMP=	0.12800	0.00000	ERR	P-FACTOR		C-ZERO						
63						1.75900		0.00000						
64														
65	9574-26	1.73100	20.00000	25.56000	MISSING		0.00000	0.63682	32.51934	ERR	0.00000	20.70900	0.00000	13.18792
66	B017Q1	2.91600	14.00000	25.43000			0.00000	0.46802	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
67	Plant Material	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
68		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
69		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
71		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
72		DELTA=	0.00000					SUMS=	32.51934	ERR	0.00000	20.70900	0.00000	13.18792
73														
74						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
75		Y @ MILK	REPORTED	REP MDA		1.70156		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
76		1 COMP=	0.06300	0.00000	ERR					0.02820	0.00000	ERR	0.00000	Yes
77		2 COMP=	NA	0.00000	ERR	P-FACTOR		C-ZERO						
78						1.75900		0.00000						
79														
80	9574-29	1.73100	6.00000	25.56000	MISSING		0.00000	0.63682	108.73880	ERR	0.00000	69.24714	0.00000	44.09803
81	B01369	2.91600	22.00000	25.43000			0.00000	0.46802	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
82	Plant Material	7.81800	6.00000	25.23000			0.00000	0.13091	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
83		8.80600	22.00000	25.53000			0.00000	0.10126	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
84		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
85		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
86		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
87		DELTA=	0.00000					SUMS=	108.73880	ERR	0.00000	69.24714	0.00000	44.09803
88														

SR90	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2														
3			GROSS	COUNT	BKG		NET							
4	SAMPLE	ET	CTS	TIME	CPM	SF	CPM	X	Ws	Wb	WY	WX	WXY	WX^2
89						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
90		Y @ MILK	REPORTED	REP MDA		1.70156		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
91		1 COMP=	NA	0.00000	ERR					-0.00365	0.00000	ERR	0.00000	No
92		2 COMP=	-0.00800	0.00000	ERR	P-FACTOR		C-ZERO						
93						1.75900		0.00000						
94														
95	9574-36	1.46400	21.00000	25.11000	MISSING		0.00000	0.68260	29.88319	ERR	0.00000	20.39820	0.00000	13.92377
96	B017N6	7.69600	19.00000	34.11000			0.00000	0.13506	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
97	Plant Material	8.54900	15.00000	26.34000			0.00000	0.10825	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
98		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
99		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
100		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
101		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
102		DELTA=	0.00000					SUMS=	29.88319	ERR	0.00000	20.39820	0.00000	13.92377
103														
104						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
105		Y @ MILK	REPORTED	REP MDA		1.43620		1.00000		RESULTS	RESULTS		MDA	Results > MDA ?
106		1 COMP=	0.43600	0.00000	ERR					0.02329	0.00000	ERR	0.00000	Yes
107		2 COMP=	NA	0.00000	ERR	P-FACTOR		C-ZERO						
108						1.75900		0.00000						
109														
110	9574-37	1.46400	14.00000	25.11000	MISSING		0.00000	0.68260	44.89516	ERR	0.00000	30.64534	0.00000	20.91845
111	B01336	7.69600	21.00000	34.11000			0.00000	0.13506	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
112	Plant Material	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
113		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
114		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
115		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
116		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
117		DELTA=	0.00000					SUMS=	44.89516	ERR	0.00000	30.64534	0.00000	20.91845
118														
119						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
120		Y @ MILK	REPORTED	REP MDA		1.49775		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
121		1 COMP=	NA	0.00000	ERR					-0.06492	0.00000	ERR	0.00000	No
122		2 COMP=	-0.12700	0.00000	ERR	P-FACTOR		C-ZERO						
123						1.75900		0.00000						
124														
125	9574-41	0.81500	41.00000	25.11000	MISSING		0.00000	0.80802	15.23776	ERR	0.00000	12.31238	0.00000	9.94857
126	B012M3	6.90200	31.00000	30.86000			0.00000	0.18605	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
127	Plant Material	7.87800	16.00000	25.18000			0.00000	0.12888	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
128		8.99100	18.00000	28.98000			0.00000	0.09649	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
129		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
130		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

SR90	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2														
3			GROSS	COUNT	BKG		NET							
4	SAMPLE	ET	CTS	TIME	CPM	SF	CPM	X	Ws	Wb	WY	WX	WXY	WX^2
131		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
132		DELTA=	0.00000					SUMS=	15.23778	ERR	0.00000	12.31236	0.00000	9.94857
133														
134						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
135		Y @ MILK	REPORTED	REP MDA		1.65335		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
136		1 COMP=	NA	0.00000	ERR					0.52948	0.00000	ERR	0.00000	Yes
137		2 COMP=	1.14100	0.00000	ERR	P-FACTOR		C-ZERO						
138						1.75900		0.00000						
139														
140	9574-43	0.97900	18.00000	24.83000	MISSING		0.00000	0.77431	34.11345	ERR	0.00000	26.41439	0.00000	20.45293
141	B012T4	7.07900	29.00000	26.33000			0.00000	0.15882	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
142	Plant Material	7.90500	22.00000	28.15000			0.00000	0.12796	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
143		8.99100	15.00000	28.98000			0.00000	0.09649	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
144		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
145		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
146		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
147		DELTA=	-0.00000					SUMS=	34.11345	ERR	0.00000	26.41439	0.00000	20.45293
148														
149						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
150		Y @ MILK	REPORTED	REP MDA		1.57786		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
151		1 COMP=	NA	0.00000	ERR					0.07151	0.00000	ERR	0.00000	Yes
152		2 COMP=	0.14700	0.00000	ERR	P-FACTOR		C-ZERO						
153						1.75900		0.00000						
154														
155	9574-47	0.97900	13.00000	24.83000	MISSING		0.00000	0.77431	47.28699	ERR	0.00000	36.61480	0.00000	28.35121
156	B017V1	7.07900	15.00000	26.33000			0.00000	0.15882	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
157	Plant Material	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
158		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
159		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
160		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
161		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
162		DELTA=	-0.00000					SUMS=	47.28699	ERR	0.00000	36.61480	0.00000	28.35121
163														
164						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
165		Y @ MILK	REPORTED	REP MDA		1.75211		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
166		1 COMP=	NA	0.00000	ERR					-0.01504	0.00000	ERR	0.00000	No
167		2 COMP=	-0.03400	0.00000	ERR	P-FACTOR		C-ZERO						
168						1.75900		0.00000						
169														

TotalU	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Sample #	9574-8		9574-9		9574-12		9574-15		9574-26		9574-29		9574-36		9574-37		9574-41	
3	Cust. I.D. #	B012N3		B01383		B017W7		B01349		B017Q1		B01369		B017N6		B01336		B012M3	
4	Type	Plant Material		Plant Material		Plant Material		Plant Material		Plant Material		Plant Material		Plant Material		Plant Material		Plant Material	
5	Final Result (ug/l)	0.19700		0.42100		0.81700		4.09900		0.35600		1.43100		0.31900		0.14500		1.51900	
6	Prep Volume (l)	0.02000		0.02000		0.02000		0.02000		0.02000		0.02000		0.02000		0.02000		0.02000	
7	Aliquot (g or l)	0.25000		0.25000		0.25000		0.25000		0.25000		0.25000		0.25000		0.25000		0.25000	
8	Reported Results (ug/unit aliquot)	0.01600		0.03400		0.06500		0.32800		0.02800		0.11400		0.02600		0.01200		0.12200	
9	Calculated Results (ug/unit aliquot)	0.01576	OK	0.03368	OK	0.06536	OK	0.32792	OK	0.02848	OK	0.11446	OK	0.02552	OK	0.01180	OK	0.12152	OK
10	MDA	0.04200		0.04200		0.04200		0.04200		0.04200		0.04200		0.04200		0.04200		0.04200	
11	Results > MDA ?	NO		NO		YES		YES		NO		YES		NO		NO		YES	

96135Q0.209

TotalU	A	T	U	V	W
2	Sample #	9574-43		9574-47	
3	Cust. I.D. #	B012T4		B017V1	
4	Type	Plant Material		Plant Material	
5	Final Result (ug/l)	0.28400		0.32700	
6	Prep Volume (l)	0.02000		0.02000	
7	Aliquot (g or l)	0.25000		0.25000	
8	Reported Results (ug/unit aliquot)	0.02300		0.02600	
9	Calculated Results (ug/unit aliquot)	0.02272	OK	0.02616	OK
10	MDA	0.04200		0.04200	
11	Results > MDA ?	NO		NO	

Gamma	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
2	Sample #	9574-8		9574-9		9574-12		9574-15		9574-26		9574-29		9574-36		9574-37	
3	Cust. I.D. #	B012N3		B01383		B017W7		B01349		B017Q1		B01369		B017N6		B01336	
4	Type	Plant Material		Plant Material		Plant Material		Plant Material		Plant Material		Plant Material		Plant Material		Plant Material	
5	Detector	G-2 JR		G-3 JR		G-1 JR		G-5 JR		G-5 JR		G-1 JR		G-5 JR		G-1 JR	
6	Aliquot (g or l)	70.91000		62.93000		59.89000		74.39000		55.08000		55.74000		52.76000		64.01000	
7	Counting Time (min)	116.12000		116.27000		100.32000		121.15000		104.90000		100.55000		100.65000		105.88000	
8	[Cobalt 60; Co-60]																
9	Background CTS	1.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
10	Background CPM	0.07970		0.02110		0.03170		0.01170		0.01170		0.03170		0.01170		0.03170	
11	Net CPM	0.16700		0.17100		0.20000		0.12200		0.15800		0.17800		0.12700		0.16500	
12	Branch Fraction	1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000	
13	Efficiency	0.00324		0.00408		0.00388		0.00362		0.00362		0.00388		0.00362		0.00388	
14	Reported Results (pCi/g or pCi/l)	<	*	<	*	<	*	<	*	<	*	<	*	<	*	<	*
15	Calculated Results (pCi/g or pCi/l)	0.32742		0.30000		0.38770		0.20407		0.35695		0.37074		0.29953		0.29926	
16	Reported MDA	0.35950	OK	0.32960	OK	0.42470	OK	0.22450	*	0.39090	OK	0.40610	OK	0.32950	*	0.32970	*
17	Calculated MDA	0.25196		0.11013		0.16058		0.07680		0.11118		0.17233		0.11850		0.14624	
18	Detect/Non Detect	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES
19	Results > MDA?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
20	[Cesium 137; Cs-137]																
21	Background CTS	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
22	Background CPM	0.02700		0.03210		0.02830		0.00000		0.00000		0.02830		0.00000		0.02830	
23	Net CPM	0.17200		0.21100		0.30000		0.19100		0.17800		0.32300		0.25100		0.26400	
24	Branch Fraction	0.85100		0.85100		0.85100		0.85100		0.85100		0.85100		0.85100		0.85100	
25	Efficiency	0.00664		0.00831		0.00794		0.00718		0.00718		0.00794		0.00718		0.00794	
26	Reported Results (pCi/g or pCi/l)	<	*	<	*	<	*	<	*	<	*	<	*	<	*	<	*
27	Calculated Results (pCi/g or pCi/l)	0.19336		0.21357		0.33394		0.18928		0.23824		0.38631		0.35072		0.27495	
28	Reported MDA	0.19590	OK	0.21730	OK	0.33970	OK	0.19260	OK	0.24270	OK	0.39280	OK	0.35570	OK	0.27900	OK
29	Calculated MDA	0.07988		0.07837		0.08712		0.00000		0.00000		0.09350		0.00000		0.07935	
30	Detect/Non Detect	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES
31	Results > MDA?	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	YES	YES	NO	NO	YES	YES
32	[Thorium 228; Th-228]																
33	Background CTS	33.00000		128.00000		0.00000		0.00000		83.00000		0.00000		56.00000		0.00000	
34	Background CPM	0.14470		0.19220		0.23860		0.27610		0.27610		0.23860		0.27610		0.23860	
35	Net CPM	0.34200		0.43700		0.57000		0.38900		0.38000		0.49700		0.33700		0.44000	
36	Branch Fraction	0.44800		0.44800		0.44800		0.44800		0.44800		0.44800		0.44800		0.44800	
37	Efficiency	0.01844		0.02354		0.02269		0.01928		0.01928		0.02269		0.01928		0.02269	
38	Reported Results (pCi/g or pCi/l)	<	*	0.38190	*	<	*	<	*	<	*	<	*	0.42930	*	<	*
39	Calculated Results (pCi/g or pCi/l)	0.26298		0.29661		0.42175		0.27271		0.35979		0.39512		0.33311		0.30461	
40	Reported MDA	0.33900	*	NA	*	0.54310	*	0.35130	*	0.46330	*	0.50970	*	<	*	0.39360	*
41	Calculated MDA	0.21777		0.33356		0.16815		0.15596		0.44506		0.18047		0.41891		0.15314	
42	Detect/Non Detect	Non Detect	YES	Detect	NO	Non Detect	YES	Non Detect	YES	Non Detect	NO	Non Detect	YES	Detect	NO	Non Detect	YES
43	Results > MDA?	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES

Gamma	A	R	S	T	U	V	W
2	Sample #	9574-41		9574-43		9574-47	
3	Cust. I.D. #	B012M3		B012T4		B017V1	
4	Type	Plant Material		Plant Material		Plant Material	
5	Detector	G-2 JR		G-1 JR		G-1 JR	
6	Aliquot (g or l)	47.21000		82.43000		50.40000	
7	Counting Time (min)	113.77000		102.12000		107.07000	
8	[Cobalt 60; Co-60]						
9	Background CTS	0.00000		0.00000		0.00000	
10	Background CPM	0.07650		0.03170		0.03170	
11	Net CPM	0.16300		0.18000		0.13500	
12	Branch Fraction	1.00000		1.00000		1.00000	
13	Efficiency	0.00324		0.00388		0.00388	
14	Reported Results (pCi/g or pCi/l)	<	*	<	*	<	*
15	Calculated Results (pCi/g or pCi/l)	0.48002		0.25351		0.31097	
16	Reported MDA	0.52740	OK	0.27800	OK	0.34200	OK
17	Calculated MDA	0.35585		0.11564		0.18470	
18	Detect/Non Detect	Non Detect	YES	Non Detect	YES	Non Detect	YES
19	Results > MDA?	YES	YES	YES	YES	YES	YES
20	[Cesium 137; Cs-137]						
21	Background CTS	0.00000		0.00000		0.00000	
22	Background CPM	0.02700		0.02830		0.02830	
23	Net CPM	0.16000		0.26800		0.30300	
24	Branch Fraction	0.85100		0.85100		0.85100	
25	Efficiency	0.00664		0.00794		0.00794	
26	Reported Results (pCi/g or pCi/l)	<	*	<	*	<	*
27	Calculated Results (pCi/g or pCi/l)	0.27017		0.21674		0.40078	
28	Reported MDA	0.27380	OK	0.22020	OK	0.40750	OK
29	Calculated MDA	0.12122		0.08274		0.10021	
30	Detect/Non Detect	Non Detect	YES	Non Detect	YES	Non Detect	YES
31	Results > MDA?	YES	YES	YES	YES	YES	YES
32	[Thorium 228; Th-228]						
33	Background CTS	238.00000		0.00000		0.00000	
34	Background CPM	0.14060		0.24600		0.24600	
35	Net CPM	0.29500		0.52200		0.44700	
36	Branch Fraction	0.44600		0.44600		0.44600	
37	Efficiency	0.01844		0.02269		0.02269	
38	Reported Results (pCi/g or pCi/l)	0.44110	*	<	*	<	*
39	Calculated Results (pCi/g or pCi/l)	0.34072		0.28062		0.39302	
40	Reported MDA	NA	*	0.36330	*	0.50880	*
41	Calculated MDA	0.75398		0.12296		0.19639	
42	Detect/Non Detect	Detect	NO	Non Detect	YES	Non Detect	YES
43	Results > MDA?	NO	YES	YES	YES	YES	YES

Strontium 90

?

MDA	2xMDA	5xMDA
1.000	2.000	5.000

Customer I.D. #	Original S	Duplicate D	RPD	Q
QC 7383	0.400	0.000	200.000	
QC 7384	0.300	0.040	152.941	Not Determined
QC 7385	-0.070	0.010	-266.667	
QC 7386	-0.100	0.080	-1800.000	
QC 7387	-0.100	0.200	600.000	

Total Uranium

0.042 0.084 0.210

MDA	2xMDA	5xMDA
1.000	2.000	5.000

Customer I.D. #	Original S	Duplicate D	RPD	Q
QC 7394	0.012	0.016	28.571	
QC 7395	0.016	0.018	11.765	
QC 7396	0.046	0.050	8.333	ok

Gamma Spec

Colbolt 60

0.44 1.10

0.22

MDA	2xMDA	5xMDA
~~0.010~~	~~0.020~~	~~0.050~~

Customer I.D. #	Original S	Duplicate D	RPD	Q
QC 7403	0.191	0.485	86.949	
QC 7404	0.377	0.391	3.648	ok
QC 7405	0.244	0.382	44.221	

Cesium 137

0.38 =0.95

0.19

MDA	2xMDA	5xMDA
~~0.010~~	~~0.020~~	~~0.050~~

Customer I.D. #	Original S	Duplicate D	RPD	Q
QC 7403	0.158	0.358	77.382	
QC 7404	0.282	0.302	6.946	ok
QC 7405	0.303	0.337	10.441	

Thorium 228

0.56

0.28 1.40

MDA	2xMDA	5xMDA
~~0.010~~	~~0.020~~	~~0.050~~

Customer I.D. #	Original S	Duplicate D	RPD	Q
QC 7403	0.315	0.597	61.898	
QC 7404	4.997	0.567	159.219	ok
QC 7405	0.461	0.508	9.787	

0.597
0.315
0.282

LAB SAMPLE NUMBER:	9574-8	9574-9	9574-12	9574-15	9574-26	9574-29	9574-36
WHC SAMPLE NUMBER:	B012N3	B01363	B017W7	B01349	B017Q1	B01369	B017N6
SAMPLE TYPE:	plant matter	plant matter	plant matter	plant matter	plant matter	plant matter	plant matter
COLLECTION DATE:	09/10/91	09/10/91	09/10/91	09/10/91	09/10/91	09/10/91	09/10/91
CHAIN OF CUSTODY:	11/26/91	11/26/91	11/26/91	11/26/91	11/26/91	11/26/91	11/26/91
STRONTIUM 90:							
DATE RUN:	05/10/92	05/10/92	05/12/92	05/12/92	05/13/92	05/13/92	05/13/92
TOTAL URANIUM:							
DATE RUN:	06/08/92	06/08/92	06/08/92	06/08/92	06/08/92	06/08/92	06/08/92
GAMMA SCAN							
DATE RUN:	05/21/92	05/21/92	05/21/92	05/22/92	05/23/92	05/23/92	05/23/92
COBALT 60:							
CESIUM 137:							
THORIUM 228:							

LAB SAMPLE NUMBER:	9574-39	9574-41	9574-43	9574-47	9574-49	9574-50	9574-51	9574-52
WHC SAMPLE NUMBER:	B01336	B012M3	B012T4	B017V1	QC 7373	QC 7374	QC 7375	QC 7376
SAMPLE TYPE:	plant matter	plant matter	plant matter	plant matter	Spike	Spike	Spike	Spike
COLLECTION DATE:	09/10/91	09/10/91	09/10/91	09/10/91				
CHAIN OF CUSTODY:	11/26/91	11/26/91	11/26/91	11/26/91				
STRONTIUM 90:								
DATE RUN:	05/13/92	05/13/92	05/13/92	05/13/92	05/10/92	05/13/92	05/13/92	05/13/92
TOTAL URANIUM:								
DATE RUN:	06/08/92	06/08/92	06/08/92	06/08/92				
GAMMA SCAN								
DATE RUN:	05/25/92	05/26/92	05/26/92	05/26/92				
COBALT 60:								
CESIUM 137:								
THORIUM 228:								

LAB SAMPLE NUMBER:	9574-53	9574-54	9574-55	9574-56	9574-57	9574-58	9574-59
WHC SAMPLE NUMBER:	QC 7377	QC 7378	QC 7379	QC 7380	QC 7381	QC 7382	QC 7383
SAMPLE TYPE:	Spike	Blank	Blank	Blank	Blank	Blank	Duplicate of 9574-1
COLLECTION DATE:							
CHAIN OF CUSTODY:							
STRONTIUM 90:							
DATE RUN:	05/13/92	05/10/92	05/13/92	05/13/92	05/13/92	05/13/92	05/10/92
TOTAL URANIUM:							
DATE RUN:							
GAMMA SCAN							
DATE RUN:							
COBALT 60:							
CESIUM 137:							
THORIUM 228:							

LAB SAMPLE NUMBER:	9574-60	9574-61	9574-62	9574-63	9574-64
WHC SAMPLE NUMBER:	QC 7384	QC 7385	QC 7386	QC 7387	QC 7388
SAMPLE TYPE:	Duplicate of 9574-2	Duplicate of 9574-3	Duplicate of 9574-4	Duplicate of 9574-5	Spike
COLLECTION DATE:					
CHAIN OF CUSTODY:					
STRONTIUM 90:					
DATE RUN:	05/13/92	05/13/92	05/13/92	05/13/92	
TOTAL URANIUM:					
DATE RUN:					06/09/92
GAMMA SCAN					
DATE RUN:					
COBALT 60:					
CESIUM 137:					
THORIUM 228:					

LAB SAMPLE NUMBER:	9574-65	9574-66	9574-67	9574-68	9574-69	9574-70	9574-71
WHC SAMPLE NUMBER:	QC 7389	QC 7390	QC 7391	QC 7392	QC 7393	QC 7394	QC 7395
SAMPLE TYPE:	Spike	Spike	Blank	Blank	Blank	Duplicate of 9574-1	Duplicate of 9574-2
COLLECTION DATE:							
CHAIN OF CUSTODY:							
STRONTIUM 90:							
DATE RUN:							
TOTAL URANIUM:							
DATE RUN:	06/09/92	06/09/92	06/09/92	06/09/92	06/09/92	06/08/92	06/08/92
GAMMA SCAN							
DATE RUN:							
COBALT 60:							
CESIUM 137:							
THORIUM 228:							

LAB SAMPLE NUMBER:	9574-72	9574-73	9574-74	9574-75	9574-76	9574-77	9574-78
WHC SAMPLE NUMBER:	QC 7396	QC 7397	QC 7398	QC 7399	QC 7400	QC 7401	QC 7402
SAMPLE TYPE:	Duplicate of 9574-3	Spike	Spike	Spike	Blank	Blank	Blank
COLLECTION DATE:							
CHAIN OF CUSTODY:							
STRONTIUM 90:							
DATE RUN:							
TOTAL URANIUM:							
DATE RUN:	06/08/92						
GAMMA SCAN							
DATE RUN:		05/26/92	05/26/92	05/26/92	05/27/92	05/27/92	05/27/92
COBALT 60:							
CESIUM 137:							
THORIUM 228:							

LAB SAMPLE NUMBER:	9574-79	9574-80	9574-81
WHC SAMPLE NUMBER:	QC 7403	QC 7404	QC 7405
SAMPLE TYPE:	Duplicate of 9574-1	Duplicate of 9574-2	Duplicate of 9574-3
COLLECTION DATE:			
CHAIN OF CUSTODY:			
STRONTIUM 90:			
DATE RUN:			
TOTAL URANIUM:			
DATE RUN:			
GAMMA SCAN			
DATE RUN:	05/27/92	05/27/92	05/27/92
COBALT 60:			
CESIUM 137:			
THORIUM 228:			

[illegible] 9613583.2109 E-93-06/2978-50

Originally

WESTINGHOUSE HANFORD COMPANY
300-FF-5 RI DATA VALIDATION
DISTRIBUTION FORM

ument Title: Irelin QA Records Time Case. # N1-12-057-9575

ument Number: HPRL-WHC/FFCL-L-92-064 Date: 12/17/92

		DISTRIBUTION			
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oject Files (1=Adm: 2=Corres: 3=Source Information: 4=Technical Data & Products)

1	File Index	2.1	Incoming Correspondence		4.4.5	Biota/Small Mammals	X
2	Distribution Lists	2.2	Outgoing Correspondence	X	4.4.6	Surface Water/Sediments	
3	Project Procedures	2.3	Internal Correspondence		4.5	Data Val. & Qual. Summary Rpts.	
4	Project Modifications				4.5.1	Round 1 Groundwater	
5.1	Staff Resumes	3.1	Task Order		4.5.1.1	Internal Drafts/Comments/Resol.	
5.2	Staff Training	3.2	Sample Lists		4.5.1.2	WHC Review Draft/Comments/Resol.	
5.3	Auth./Former Site Employee	3.3	Data Validation Procedures		4.5.1.3	Final Report	
6.1	QA Manual	3.4	Original Chemical Data		4.5.2	Round 2 Groundwater	
6.2	QA Implementation	3.5	Original Radiochem Data		4.5.2.1	Internal Drafts/Comments/Resol.	
6.3.1	QA Audits-Deliverables				4.5.2.2	WHC Review Draft/Comments/Resol.	
6.3.2	QA Audits-Files	4.1	Task Plan		4.5.2.3	Final Report	
6.4.1	Audit Resps-Deliverables	4.2	Data Rvw. Completeness Verif.		4.5.3	Round 3 Groundwater	
6.4.2	Audit Resps-Files	4.2.1	Checklists - Round 1 GW		4.5.3.1	Internal Drafts/Comments/Resol.	
6.5	Training	4.2.2	Checklists - Round 2 GW		4.5.3.2	WHC Review Draft/Comments/Resol.	
6.6.1	QA Manual Doc Log	4.2.3	Checklists - Round 3 GW		4.5.3.3	Final Report	
6.6.2	Procedures Doc Log	4.2.4	Checklists - Round 4 GW		4.5.4	Round 4 Groundwater	
6.6.3	Plans Document Log	4.2.5	Checklists - Biota/Small Mam.		4.5.4.1	Internal Drafts/Comments/Resol.	
6.6.4	Deliverables Doc Log	4.2.6	Checklists - Surface Wtr./Sed.		4.5.4.2	WHC Review Draft/Comments/Resol.	
1.7.1	Downloads	4.3	Data Val. Calcs. Annotated DP		4.5.4.3	Final Report	
1.7.2	M-113s	4.3.1	Round 1 Groundwater		4.5.5	Biota/Small Mammals	
1.7.3	A-208s	4.3.2	Round 2 Groundwater		4.5.5.1	Internal Drafts/Comments/Resol.	
1.7.4	Budget Status	4.3.3	Round 3 Groundwater		4.5.5.2	WHC Review Draft/Comments/Resol.	
1.7.5	Invoices	4.3.4	Round 4 Groundwater		4.5.5.3	Final Report	
1.8.1	Requisitions	4.3.5	Biota/Small Mammals		4.5.6	Surface Water/Sediments	
1.9	Meeting Minutes	4.3.6	Surface Water/Sediments		4.5.6.1	Internal Drafts/Comments/Resol.	
1.10	Record of Telecons	4.4	Preliminary QA Records		4.5.6.2	WHC Review Draft/Comments/Resol.	
1.11	Progress Reports	4.4.1	Round 1 Groundwater		4.5.6.3	Final Report	
1.12	Subcontractor (HC)	4.4.2	Round 2 Groundwater		4.6	Weekly Status Reports	
		4.4.3	Round 3 Groundwater		4.7	Weekly Management Reports	
		4.4.4	Round 4 Groundwater				

9613500.2110

HARTCROWSER

Hart Crowser, Inc.
1201 Jadwin Avenue, Suite 204
Richland, WA 99352
FAX 509.946.4203
509.946.4344

Earth and Environmental Technologies

2978-50

December 17, 1992

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

Subject: WHC Order No. MLW-SVV-037106
Task Order No. E-93-06
Preliminary Quality Assurance Record - 300-FF-5 RI/FS
TMA Case Number N1-12-057-9575

Dear Mr. Hulstrom:

Ebasco and Hart Crowser are pleased to provide you with the attached results of our review and validation of the subject data from the 300-FF-5 Operable Unit Remedial Investigation/Feasibility Study (RI/FS). The attached results are provided to you in partial fulfillment of Subtask 03 of our task plan dated November 6, 1992. The subject data package consisted of 48 plant material samples submitted for the following radiochemical analyses: strontium 90, total uranium, and gamma scan. The samples were analyzed by Thermo Analytical, Inc. according to requirements specified in the Analytical Laboratory Statement of Work issued by WHC. Sample results from 17 of the 48 samples were selected for validation as being representative of the entire package. These results, together with the data qualifiers assigned are presented in Attachment 4. The results of all samples in this package and any qualifiers assigned as a result of our review will be presented in the final summary report.

DATA QUALITY OBJECTIVES SUMMARY

The data quality for these results were deficient in several areas. Holding times were exceeded for all analytes for the samples validated. Precision for strontium 90 results was low and the accuracy for gamma scan results for cobalt 60 did not meet criteria. The contract required detection limit was not achieved for gamma scan analytes cobalt 60 and cesium 137. No evidence of blank contamination was discovered.

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MAJOR DEFICIENCIES (REJECTED DATA)

No data were rejected in this data delivery group.

MINOR DEFICIENCIES (OTHER QUALIFIED DATA)

The following general trends resulting in the qualification of data from multiple samples have been noted. All qualified data are discussed in Attachments 3 and 5.

The holding times were exceeded for all analyses leading to all results being qualified as estimated (J or UJ). In addition, accuracy was low for cobalt 60 analyses. Low method precision for strontium 90 analyses caused these results to be qualified as estimates. The trend in low precision primarily stems from the laboratory's use of replicates containing nondetectable concentrations of analyte.

We trust that these preliminary results meet your needs. Our qualifier assignments will be finalized at the time the summary report for this sampling round is published. The final qualifiers may vary from those presented here, reflecting any trends in data quality or laboratory performance observed over the course of the 300-FF-5 RI/FS. Please contact me if you have any questions with regard to our activities.

Sincerely,

HART CROWSER, INC.

D. MARK GERBOTH, P.E.
Project Manager
HC#130:RL1553.DOC

Attachments

cc: Mark Gerboth (w/o attachments)
Jeff Grover (w/o attachments)
Westinghouse EDMC
Project File - HCRL-WHC/9306-L-92-064

9616500.2112

THIS APPENDIX CONSISTS OF FIVE ATTACHMENTS

Attachment 1 - Glossary of Data Qualifiers

This attachment provides a glossary explaining all data qualifiers applied as a result of the validation.

Attachment 2 - As Received Laboratory Sample Concentration Reports

This attachment provides a copy of the as-received sample concentration reports. This may be a tabular summary similar to that provided in Attachment 4, or may be a copy of the laboratory reports.

Attachment 3 - Summary of Data Qualifications

This attachment provides a complete summary of all qualifications applied as a result of the validation.

Attachment 4 - As Qualified Data Summary

This attachment provides a tabular data summary of all data qualified from the validation.

Attachment 5 - Data Review Supporting Documentation

This attachment provides copies of the data validation checklists, data summary forms, telephone contact memoranda and other documentation completed as a result of the data validation.

9613500.2113

ATTACHMENT 1

Glossary of Data Qualifiers

9613500.2114

ATTACHMENT 1

Glossary of Data Qualifiers

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

UJ - Indicates the compound or analyte was analyzed for and not detected. Due to quality control deficiencies identified during data validation the value reported may not accurately reflect the sample quantitation limit.

J - Indicates the compound or analyte was analyzed for and detected. The associated value is estimated but the data are useable for decision making processes.

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

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ATTACHMENT 2

As Received Laboratory Sample Concentration Reports

ATTACHMENT 1 DATA TABLE

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B017P3 (Plant Matter)	1	^{90}Sr	(1.5 ± 3.2)	E-01
		Total Uranium	(8.1 ± 1.3) (1)	E-02
		Gamma Scan:		
		^{40}K	(9.325 ± 3.758)	E+00
		^{51}Cr	<9.231	E+02
		^{60}Co	<3.110	E-01
		^{65}Zn	<1.426	E+00
		^{134}Cs	<3.998	E-01
		^{137}Cs	<3.113	E-01
		^{226}Ra	<5.901	E-01
		^{228}Th	<4.814	E-01
		^{232}Th	<1.181	E+00
B01362 (Plant Matter)	2	^{90}Sr	(1.6 ± 3.3)	E-01
		Total Uranium	(2.2 ± 0.4) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.187 ± 0.290)	E+01
		^{51}Cr	<4.518	E+02
		^{60}Co	<3.469	E-01
		^{65}Zn	<7.718	E-01
		^{134}Cs	<2.212	E-01
		^{137}Cs	<1.920	E-01
		^{226}Ra	<3.489	E-01
		^{228}Th	<3.106	E-01
		^{232}Th	<7.943	E-01
B017X1 (Plant Matter)	3	^{90}Sr	(2.0 ± 1.8)	E-01
		Total Uranium	(3.7 ± 0.6) (1)	E-02
		Gamma Scan:		
		^{40}K	(5.878 ± 2.806)	E+00
		^{51}Cr	<5.190	E+02
		^{60}Co	<2.497	E-01
		^{65}Zn	<7.959	E-01
		^{134}Cs	<2.295	E-01
		^{137}Cs	<1.852	E-01
		^{226}Ra	<3.089	E-01
		^{228}Th	<3.331	E-01
		^{232}Th	<8.535	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B012V8 (Plant Matter)	4	^{90}Sr	(3.8 ± 2.7)	E-01
		Total Uranium	(3.8 ± 0.7) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.284 ± 0.319)	E+01
		^{51}Cr	<6.125	E+02
		^{60}Co	<2.227	E-01
		^{65}Zn	<7.788	E-01
		^{134}Cs	<2.180	E-01
		^{137}Cs	<1.918	E-01
		^{226}Ra	<4.682	E-01
		^{228}Th	<5.828	E-01
		^{232}Th	<9.293	E-01
B012M6 (Plant Matter)	5	^{90}Sr	(-0.1 ± 3.4)	E-01
		Total Uranium	(1.4 ± 0.3) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.085 ± 0.478)	E+01
		^{51}Cr	<9.977	E+02
		^{60}Co	<3.667	E-01
		^{65}Zn	<1.577	E+00
		^{134}Cs	<4.166	E-01
		^{137}Cs	<3.167	E-01
		^{226}Ra	<5.452	E-01
		^{228}Th	<4.805	E-01
		^{232}Th	<1.209	E+00
B012N9 (Plant Matter)	6	^{90}Sr	(-0.3 ± 4.4)	E-01
		Total Uranium	(2.6 ± 0.5) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.824 ± 0.413)	E+01
		^{51}Cr	<5.824	E+02
		^{60}Co	<4.442	E-01
		^{65}Zn	<1.021	E+00
		^{134}Cs	<3.774	E-01
		^{137}Cs	<1.949	E-01
		^{226}Ra	<4.260	E-01
		^{228}Th	<4.304	E-01
		^{232}Th	<1.096	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B01301 (Plant Matter)	7	^{90}Sr	(0.6 ± 3.2)	E-01
		Total Uranium	(4.0 ± 0.8) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.364 ± 0.400)	E+01
		^{51}Cr	<5.912	E+02
		^{60}Co	<3.407	E-01
		^{65}Zn	<1.168	E+00
		^{134}Cs	<3.265	E-01
		^{137}Cs	<2.028	E-01
		^{226}Ra	<3.843	E-01
		^{228}Th	<3.989	E-01
		^{232}Th	<1.067	E+00
B017Q3 (Plant Matter)	8	^{90}Sr	(-2.6 ± 3.1)	E-01
		Total Uranium	(1.5 ± 0.3) (1)	E-02
		Gamma Scan:		
		^{40}K	(5.021 ± 2.955)	E+00
		^{51}Cr	<9.127	E+02
		^{60}Co	<3.907	E-01
		^{65}Zn	<1.108	E+00
		^{134}Cs	<2.893	E-01
		^{137}Cs	<3.282	E-01
		^{226}Ra	<5.999	E-01
		^{228}Th	<5.124	E-01
		^{232}Th	<1.132	E+00
B017T7 (Plant Matter)	9	^{90}Sr	(5.7 ± 2.6)	E-01
		Total Uranium	(8.7 ± 1.5) (1)	E-02
		Gamma Scan:		
		^{40}K	(5.923 ± 3.609)	E+00
		^{51}Cr	<1.056	E+03
		^{60}Co	<3.524	E-01
		^{65}Zn	<1.604	E+00
		^{134}Cs	<4.132	E-01
		^{137}Cs	<3.599	E-01
		^{226}Ra	<5.846	E-01
		^{228}Th	<5.609	E-01
		^{232}Th	<1.670	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page four)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B017R3 (Plant Matter)	10	^{90}Sr	(5.1 ± 2.6)	E-01
		Total Uranium	(3.0 ± 0.5) (1)	E-02
		Gamma Scan:		
		^{40}K	(9.732 ± 4.015)	E+00
		^{51}Cr	<7.495	E+02
		^{60}Co	<5.115	E-01
		^{65}Zn	<1.371	E+00
		^{134}Cs	<3.166	E-01
		^{137}Cs	<3.225	E-01
		^{226}Ra	<5.046	E-01
		^{228}Th	<4.194	E-01
		^{232}Th	<1.051	E+00
B017Q5 (Plant Matter)	11	^{90}Sr	(0.3 ± 4.0)	E-01
		Total Uranium	(1.4 ± 0.3) (1)	E-02
		Gamma Scan:		
		^{40}K	(9.843 ± 3.412)	E+00
		^{51}Cr	<7.326	E+02
		^{60}Co	<4.079	E-01
		^{65}Zn	<9.680	E-01
		^{134}Cs	<2.682	E-01
		^{137}Cs	<2.295	E-01
		^{226}Ra	<3.967	E-01
		^{228}Th	<3.308	E-01
		^{232}Th	<1.172	E+00
B012X7 (Plant Matter)	12	^{90}Sr	(-0.4 ± 4.1)	E-01
		Total Uranium	(1.6 ± 0.3) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.473 ± 0.356)	E+01
		^{51}Cr	<6.555	E+02
		^{60}Co	<2.743	E-01
		^{65}Zn	<7.787	E-01
		^{134}Cs	<2.542	E-01
		^{137}Cs	<2.092	E-01
		^{226}Ra	<3.929	E-01
		^{228}Th	<3.013	E-01
		^{232}Th	<8.979	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page five)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B017Q9 (Plant Matter)	13	^{90}Sr	(-1.6 ± 4.1)	E-01
		Total Uranium	(2.2 ± 0.4) (1)	E-02
		Gamma Scan:		
		^{40}K	(8.722 ± 1.589)	E+00
		^{51}Cr	<3.106	E+02
		^{60}Co	<1.219	E-01
		^{65}Zn	<4.589	E-01
		^{134}Cs	<1.319	E-01
		^{137}Cs	<1.010	E-01
		^{226}Ra	<1.845	E-01
		^{228}Th	<1.584	E-01
		^{232}Th	<4.277	E-01
B017P1 (Plant Matter)	14	^{90}Sr	(0.1 ± 1.7)	E-01
		Total Uranium	(0.6 ± 0.2) (1)	E-02
		Gamma Scan:		
		^{40}K	(8.595 ± 4.696)	E+00
		^{51}Cr	<1.157	E+03
		^{60}Co	<4.417	E-01
		^{65}Zn	<1.541	E+00
		^{134}Cs	<3.956	E-01
		^{137}Cs	<3.359	E-01
		^{226}Ra	<6.671	E-01
		^{228}Th	<5.850	E-01
		^{232}Th	<1.479	E+00
B017S7 (Plant Matter)	15	^{90}Sr	(0.8 ± 1.9)	E-01
		Total Uranium	(5.5 ± 1) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.119 ± 0.426)	E+01
		^{51}Cr	<9.233	E+02
		^{60}Co	<5.030	E-01
		^{65}Zn	<1.263	E+00
		^{134}Cs	<2.638	E-01
		^{137}Cs	<2.958	E-01
		^{226}Ra	<5.656	E-01
		^{228}Th	<4.940	E-01
		^{232}Th	<1.220	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page six)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B012V9 (Plant Matter)	16	^{90}Sr	(1.5 ± 1.9)	E-01
		Total Uranium	(5.0 ± 0.9) (1)	E-02
		Gamma Scan:		
		^{40}K	(9.989 ± 2.917)	E+00
		^{51}Cr	<5.603	E+02
		^{60}Co	<2.580	E-01
		^{65}Zn	<8.274	E-01
		^{134}Cs	<1.988	E-01
		^{137}Cs	<1.900	E-01
		^{226}Ra	<3.930	E-01
		^{228}Th	<3.230	E-01
		^{232}Th	<9.132	E-01
B017Q7 (Plant Matter)	17	^{90}Sr	(0.3 ± 4.3)	E-01
		Total Uranium	(3.2 ± 0.6) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.123 ± 0.389)	E+01
		^{51}Cr	<6.156	E+02
		^{60}Co	<2.476	E-01
		^{65}Zn	<1.227	E+00
		^{134}Cs	<2.560	E-01
		^{137}Cs	<3.019	E-01
		^{226}Ra	<4.848	E-01
		^{228}Th	<4.987	E-01
		^{232}Th	<1.162	E+00
B017P9 (Plant Matter)	18	^{90}Sr	(1.2 ± 4.2)	E-01
		Total Uranium	(1.5 ± 0.3) (1)	E-02
		Gamma Scan:		
		^{40}K	(6.183 ± 1.660)	E+00
		^{51}Cr	<3.729	E+02
		^{60}Co	<1.492	E-01
		^{65}Zn	<4.577	E-01
		^{134}Cs	<1.172	E-01
		^{137}Cs	<1.130	E-01
		^{226}Ra	<2.535	E-01
		^{228}Th	<2.388	E-01
		^{232}Th	<4.953	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page seven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B017R9 (Plant Matter)	19	^{90}Sr	(1.1 ± 2.2)	E-01
		Total Uranium	(4.8 ± 0.8) (1)	E-02
		Gamma Scan:		
		^{40}K	(6.421 ± 1.886)	E+00
		^{51}Cr	<4.004	E+02
		^{60}Co	<2.744	E-01
		^{65}Zn	<7.794	E-01
		^{134}Cs	<1.899	E-01
		^{137}Cs	<1.690	E-01
		^{226}Ra	<2.767	E-01
		^{228}Th	<2.510	E-01
		^{232}Th	<5.762	E-01
B01305 (Plant Matter)	20	^{90}Sr	(0.5 ± 1.7)	E-01
		Total Uranium	(1 ± 0.17) (1)	E-01
		Gamma Scan:		
		^{40}K	(1.413 ± 0.269)	E+01
		^{51}Cr	<5.042	E+02
		^{60}Co	<1.941	E-01
		^{65}Zn	<6.660	E-01
		^{134}Cs	<2.021	E-01
		^{137}Cs	<1.633	E-01
		^{226}Ra	<3.035	E-01
		^{228}Th	<2.882	E-01
		^{232}Th	<6.902	E-01
B017R1 (Plant Matter)	21	^{90}Sr	(0.2 ± 2.7)	E-01
		Total Uranium	(7.8 ± 1.3) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.170 ± 0.221)	E+01
		^{51}Cr	<4.910	E+02
		^{60}Co	<1.710	E-01
		^{65}Zn	<7.847	E-01
		^{134}Cs	<1.968	E-01
		^{137}Cs	<1.562	E-01
		^{226}Ra	<3.041	E-01
		^{228}Th	<2.469	E-01
		^{232}Th	<6.670	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page eight)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B017R5 (Plant Matter)	22	^{90}Sr	(-0.4 ± 6.3)	E-01
		Total Uranium	(1.0 ± 0.25) (1)	E-01
		Gamma Scan:		
		^{40}K	(9.759 ± 1.984)	E+00
		^{51}Cr	<4.092	E+02
		^{60}Co	<1.410	E-01
		^{65}Zn	<5.056	E-01
		^{134}Cs	<1.560	E-01
		^{137}Cs	<1.146	E-01
		^{226}Ra	<2.394	E-01
		^{228}Th	<3.517	E-01
		^{232}Th	<5.295	E-01
B017R7 (Plant Matter)	23	^{90}Sr	(-0.1 ± 5.2)	E-01
		Total Uranium	(1.02 ± 0.17) (1)	E-01
		Gamma Scan:		
		^{40}K	(3.565 ± 3.269)	E+00
		^{51}Cr	<1.321	E+03
		^{60}Co	<4.033	E-01
		^{65}Zn	<1.946	E+00
		^{134}Cs	<4.454	E-01
		^{137}Cs	<3.756	E-01
		^{226}Ra	<7.070	E-01
		^{228}Th	<5.592	E-01
		^{232}Th	<1.593	E+00
B017M2 (Plant Matter)	24	^{90}Sr	(-1.2 ± 4.1)	E-01
		Total Uranium	(1.39 ± 0.23) (1)	E-01
		Gamma Scan:		
		^{40}K	(8.184 ± 3.493)	E+00
		^{51}Cr	<7.819	E+02
		^{60}Co	<4.100	E-01
		^{65}Zn	<1.284	E+00
		^{134}Cs	<3.529	E-01
		^{137}Cs	<2.656	E-01
		^{226}Ra	<4.745	E-01
		^{228}Th	<4.531	E-00
		^{232}Th	<1.461	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page nine)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B017V5 (Plant Matter)	25	^{90}Sr	(0 ± 4.6)	E-01
		Total Uranium	(2.5 ± 0.5) (1)	E-02
		Gamma Scan:		
		^{40}K	(7.334 ± 3.277)	E+00
		^{51}Cr	<7.262	E+02
		^{60}Co	<3.647	E-01
		^{65}Zn	<1.050	E+00
		^{134}Cs	<3.047	E-01
		^{137}Cs	<2.563	E-01
		^{226}Ra	<4.851	E-01
		^{228}Th	<3.918	E-01
		^{232}Th	<1.142	E+00
B017W9 (Plant Matter)	26	^{90}Sr	(2.2 ± 2.5)	E-01
		Total Uranium	(7.1 ± 1.2) (1)	E-02
		Gamma Scan:		
		^{40}K	(5.467 ± 3.070)	E+00
		^{51}Cr	<8.133	E+02
		^{60}Co	<3.053	E-01
		^{65}Zn	<9.271	E-01
		^{134}Cs	<2.851	E-01
		^{137}Cs	<2.504	E-01
		^{226}Ra	<4.651	E-01
		^{228}Th	<4.257	E-01
		^{232}Th	<1.180	E+00
B017W1 (Plant Matter)	27	^{90}Sr	(0 ± 4.2)	E-01
		Total Uranium	(6.5 ± 1.1) (1)	E-02
		Gamma Scan:		
		^{40}K	(9.691 ± 5.811)	E+00
		^{51}Cr	<1.108	E+03
		^{60}Co	<4.437	E-01
		^{65}Zn	<1.674	E+00
		^{134}Cs	<4.161	E-01
		^{137}Cs	<3.242	E-01
		^{226}Ra	<6.499	E-01
		^{228}Th	<5.376	E-01
		^{232}Th	<1.571	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page ten)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B017V9	28	^{90}Sr	(0.5 ± 2.6)	E-01
(Plant Matter)		Total Uranium	(3.5 ± 0.6) (1)	E-02
		Gamma Scan:		
		^{40}K	(3.560 ± 2.708)	E+00
		^{51}Cr	<7.541	E+02
		^{60}Co	<5.636	E-01
		^{65}Zn	<1.444	E+00
		^{134}Cs	<3.410	E-01
		^{137}Cs	<2.847	E-01
		^{226}Ra	<5.257	E-01
		^{228}Th	<3.800	E-01
		^{232}Th	<1.370	E+00
B017V7	29	^{90}Sr	(0 ± 7.5)	E-01
(Plant Matter)		Total Uranium	(4.6 ± 1) (1)	E-02
		Gamma Scan:		
		^{40}K	(5.929 ± 2.905)	E+00
		^{51}Cr	<6.442	E+02
		^{60}Co	<2.559	E-01
		^{65}Zn	<8.711	E-01
		^{134}Cs	<2.098	E-01
		^{137}Cs	<2.116	E-01
		^{226}Ra	<3.868	E-01
		^{228}Th	(6.053 ± 3.908)	E-01
		^{232}Th	<9.545	E-01
B017W5	30	^{90}Sr	(0.3 ± 5.9)	E-01
(Plant Matter)		Total Uranium	(5.3 ± 0.9) (1)	E-02
		Gamma Scan:		
		^{40}K	(5.790 ± 2.978)	E+00
		^{51}Cr	<6.948	E+02
		^{60}Co	<3.034	E-01
		^{65}Zn	<5.924	E-01
		^{134}Cs	<2.402	E-01
		^{137}Cs	<2.282	E-01
		^{226}Ra	<5.044	E-01
		^{228}Th	<4.026	E-01
		^{232}Th	<9.013	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page eleven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B012S4 (Plant Matter)	31	^{90}Sr	(0.3 ± 4.5)	E-01
		Total Uranium	(3.5 ± 0.6) (1)	E-02
		Gamma Scan:		
		^{40}K	(7.762 ± 3.074)	E+00
		^{51}Cr	<1.009	E+03
		^{60}Co	<3.825	E-01
		^{65}Zn	<1.726	E+00
		^{134}Cs	<3.695	E-01
		^{137}Cs	<2.717	E-01
		^{226}Ra	<4.585	E-01
		^{228}Th	<4.755	E-01
		^{232}Th	<1.316	E+00
B012T6 (Plant Matter)	32	^{90}Sr	(0.4 ± 2.1)	E-01
		Total Uranium	(2.0 ± 0.4) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.174 ± 0.498)	E+01
		^{51}Cr	<7.975	E+02
		^{60}Co	<5.583	E-01
		^{65}Zn	<1.719	E+00
		^{134}Cs	<4.090	E-01
		^{137}Cs	<3.093	E-01
		^{226}Ra	<6.237	E-01
		^{228}Th	<4.957	E-01
		^{232}Th	<8.788	E-01
B012R8 (Plant Matter)	33	^{90}Sr	(1.2 ± 4.1)	E-01
		Total Uranium	(2.3 ± 0.4) (1)	E-02
		Gamma Scan:		
		^{40}K	(7.067 ± 2.467)	E+00
		^{51}Cr	<5.270	E+02
		^{60}Co	<2.348	E-01
		^{65}Zn	<8.741	E-01
		^{134}Cs	<2.291	E-01
		^{137}Cs	<1.710	E-01
		^{226}Ra	<3.016	E-01
		^{228}Th	<2.760	E-01
		^{232}Th	<8.826	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page twelve)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B012L7 (Plant Matter)	34	^{90}Sr	(-0.7 ± 5.0)	E-01
		Total Uranium	<0.003 (1)	
		Gamma Scan:		
		^{40}K	(4.590 ± 2.472)	E+00
		^{51}Cr	<5.982	E+02
		^{60}Co	<2.336	E-01
		^{65}Zn	<8.143	E-01
		^{134}Cs	<1.501	E-01
		^{137}Cs	<1.923	E-01
		^{226}Ra	<4.492	E-01
		^{228}Th	<5.305	E-01
		^{232}Th	<1.014	E+00
B01364 (Plant Matter)	35	^{90}Sr	(-0.5 ± 2.8)	E-01
		Total Uranium	(1.0 ± 0.2) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.429 ± 0.353)	E+01
		^{51}Cr	<9.734	E+02
		^{60}Co	<3.107	E-01
		^{65}Zn	<1.429	E+00
		^{134}Cs	<4.000	E-01
		^{137}Cs	<2.781	E-01
		^{226}Ra	<5.067	E-01
		^{228}Th	<4.730	E-01
		^{232}Th	<1.303	E+00
B012M7 (Plant Matter)	36	^{90}Sr	(0.5 ± 2.1)	E-01
		Total Uranium	(1.7 ± 0.3) (1)	E-02
		Gamma Scan:		
		^{40}K	(9.321 ± 2.933)	E+00
		^{51}Cr	<5.789	E+02
		^{60}Co	<3.235	E-01
		^{65}Zn	<1.047	E+00
		^{134}Cs	<3.250	E-01
		^{137}Cs	<1.934	E-01
		^{226}Ra	<3.624	E-01
		^{228}Th	<3.371	E-01
		^{232}Th	<1.075	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page thirteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B012L5 (Plant Matter)	37	^{90}Sr	(3.1 ± 2.8)	E-01
		Total Uranium	<0.003 (1)	
		Gamma Scan:		
		^{40}K	(3.873 ± 2.636)	E+00
		^{51}Cr	<6.578	E+02
		^{60}Co	<2.095	E-01
		^{65}Zn	<1.024	E+00
		^{134}Cs	<2.389	E-01
		^{137}Cs	<1.956	E-01
		^{226}Ra	<3.618	E-01
		^{228}Th	<3.488	E-01
		^{232}Th	<8.607	E-01
B012S6 (Plant Matter)	38	^{90}Sr	(6.9 ± 5.8)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(8.715 ± 2.710)	E+00
		^{51}Cr	<5.429	E+02
		^{60}Co	<2.956	E-01
		^{65}Zn	<7.006	E-01
		^{134}Cs	<2.397	E-01
		^{137}Cs	<1.593	E-01
		^{226}Ra	<3.655	E-01
		^{228}Th	<6.587	E-01
		^{232}Th	(1.019 ± 0.572)	E+00
B012N4 (Plant Matter)	39	^{90}Sr	(0.2 ± 2.1)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(8.184 ± 3.351)	E+00
		^{51}Cr	<8.579	E+02
		^{60}Co	<2.888	E-01
		^{65}Zn	<1.205	E+00
		^{134}Cs	<3.104	E-01
		^{137}Cs	<2.745	E-01
		^{226}Ra	<4.885	E-01
		^{228}Th	<3.943	E-01
		^{232}Th	<1.128	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page fourteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B012T0 (Plant Matter)	40	^{90}Sr	(0.6 ± 2.1)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(1.594 ± 0.365)	E+01
		^{51}Cr	<6.643	E+02
		^{60}Co	<3.293	E-01
		^{65}Zn	<9.977	E-01
		^{134}Cs	<2.984	E-01
		^{137}Cs	<1.988	E-01
		^{226}Ra	<3.160	E-01
		^{228}Th	(5.647 ± 4.527)	E-01
		^{232}Th	<6.520	E-01
B01367 (Plant Matter)	41	^{90}Sr	(-0.6 ± 4.2)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(1.325 ± 0.358)	E+01
		^{51}Cr	<7.998	E+02
		^{60}Co	<3.031	E-01
		^{65}Zn	<1.195	E+00
		^{134}Cs	<3.184	E-01
		^{137}Cs	<3.038	E-01
		^{226}Ra	<3.866	E-01
		^{228}Th	(4.387 ± 3.744)	E-01
		^{232}Th	<1.007	E+00
B012M1 (Plant Matter)	42	^{90}Sr	(3.7 ± 4.0)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(3.553 ± 2.036)	E+00
		^{51}Cr	<8.255	E+02
		^{60}Co	<3.142	E-01
		^{65}Zn	<8.905	E-01
		^{134}Cs	<1.686	E-01
		^{137}Cs	<2.753	E-01
		^{226}Ra	<4.856	E-01
		^{228}Th	<4.442	E-01
		^{232}Th	<1.047	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page fifteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B012N2 (Plant Matter)	43	^{90}Sr	(-0.1 ± 2.5)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(1.092 ± 0.243)	E+01
		^{51}Cr	<5.104	E+02
		^{60}Co	<2.181	E-01
		^{65}Zn	<7.746	E-01
		^{134}Cs	<2.149	E-01
		^{137}Cs	<1.688	E-01
		^{226}Ra	<3.033	E-01
		^{228}Th	<2.558	E-01
		^{232}Th	<7.580	E-01
B012M0 (Plant Matter)	44	^{90}Sr	(2.3 ± 2.3)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(2.857 ± 2.595)	E+00
		^{51}Cr	<5.867	E+02
		^{60}Co	<2.219	E-01
		^{65}Zn	<8.155	E-01
		^{134}Cs	<2.134	E-01
		^{137}Cs	<1.895	E-01
		^{226}Ra	<3.457	E-01
		^{228}Th	<3.109	E-01
		^{232}Th	<8.316	E-01
B012M5 (Plant Matter)	45	^{90}Sr	(0.7 ± 4.5)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(7.402 ± 2.311)	E+00
		^{51}Cr	<5.251	E+02
		^{60}Co	<1.976	E-01
		^{65}Zn	<6.423	E-01
		^{134}Cs	<1.867	E-01
		^{137}Cs	<1.540	E-01
		^{226}Ra	<3.169	E-01
		^{228}Th	<3.012	E-01
		^{232}Th	<6.385	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page sixteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B01365 (Plant Matter)	46	^{90}Sr	(4.3 ± 5.4)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(7.238 ± 2.587)	E+00
		^{51}Cr	<5.140	E+02
		^{60}Co	<2.081	E-01
		^{65}Zn	<6.369	E-01
		^{134}Cs	<2.184	E-01
		^{137}Cs	<1.646	E-01
		^{226}Ra	<2.732	E-01
		^{228}Th	<2.636	E-01
		^{232}Th	<7.487	E-01
B01340 (Plant Matter)	47	^{90}Sr	(2.8 ± 2.7)	E-01
		Total Uranium	(1.05 ± 0.17) (1)	E-01
		Gamma Scan:		
		^{40}K	(1.005 ± 0.293)	E+01
		^{51}Cr	<5.765	E+02
		^{60}Co	<1.704	E-01
		^{65}Zn	<9.024	E-01
		^{134}Cs	<2.335	E-01
		^{137}Cs	<1.530	E-01
		^{226}Ra	<3.449	E-01
		^{228}Th	<3.448	E-01
		^{232}Th	<6.910	E-01
B01343 (Plant Matter)	48	^{90}Sr	(2.2 ± 2.4)	E-01
		Total Uranium	(2.66 ± 0.44) (1)	E-01
		Gamma Scan:		
		^{40}K	(1.142 ± 0.334)	E+01
		^{51}Cr	<6.750	E+02
		^{60}Co	<3.258	E-01
		^{65}Zn	<1.027	E+00
		^{134}Cs	<2.746	E-01
		^{137}Cs	<2.026	E-01
		^{226}Ra	<4.490	E-01
		^{228}Th	<5.373	E-01
		^{232}Th	<8.629	E-01

(1) Units are μg/gram.

9613500.2132

ATTACHMENT 3

Summary of Data Qualifications

TMA/Norcal N1-12-057-9575

Biota Samples

Strontium 90 (CRDL=1pCi/g)

Customer I.D. #	Reported Results	Q
BO17P3	0.150	UJ
B017Q5	0.030	UJ
B017Q9	-0.160	UJ
B017P1	0.010	UJ
B017S7	0.080	UJ
B017P9	0.120	UJ
B01305	0.050	UJ
B017R1	0.020	UJ
B017R5	-0.040	UJ
B017R7	-0.010	UJ
B017V5	0.000	UJ
B017W1	0.000	UJ
B017V7	0.000	UJ
B017W5	0.030	UJ
B012M7	0.050	UJ
B012S6	0.690	J
B01343	0.220	UJ

Total Uranium (CRDL=1ug/g)

Customer I.D. #	Reported Results	Q
BO17P3	0.081	J
B017Q5	0.014	UJ
B017Q9	0.022	UJ
B017P1	0.006	UJ
B017S7	0.055	J
B017P9	0.015	UJ
B01305	0.100	J
B017R1	0.078	J
B017R5	0.100	UJ
B017R7	0.102	J
B017V5	0.025	UJ
B017W1	0.065	J
B017V7	0.046	J
B017W5	0.053	J
B012M7	0.017	UJ
B012S6	0.030	UJ
B01343	0.266	J

Gamma Spec

Cobalt 60 (CRDL=.05pCi/g)

Customer I.D. #	Reported Results	Q
BO17P3	0.311	UJ
B017Q5	0.408	UJ
B017Q9	0.122	UJ
B017P1	0.442	UJ
B017S7	0.503	UJ
B017P9	0.149	UJ
B01305	0.194	UJ
B017R1	0.171	UJ
B017R5	0.141	UJ
B017R7	0.403	UJ
B017V5	0.365	UJ
B017W1	0.444	UJ
B017V7	0.256	UJ
B017W5	0.303	UJ
B012M7	0.324	UJ
B012S6	0.296	UJ
B01343	0.326	UJ

Cesium 137 (CRDL=.1pCi/g)

Customer I.D. #	Reported Results	Q
BO17P3	0.311	UJ
B017Q5	0.230	UJ
B017Q9	0.101	UJ
B017P1	0.336	UJ
B017S7	0.296	UJ
B017P9	0.113	UJ
B01305	0.163	UJ
B017R1	0.156	UJ
B017R5	0.115	UJ
B017R7	0.376	UJ
B017V5	0.256	UJ
B017W1	0.324	UJ
B017V7	0.212	UJ
B017W5	0.228	UJ
B012M7	0.193	UJ
B012S6	0.159	UJ
B01343	0.203	UJ

Thorium 228 (CRDL=not reported)

Customer I.D. #	Reported Results	Q
BO17P3	0.481	UJ
B017Q5	0.331	UJ
B017Q9	0.158	UJ
B017P1	0.585	UJ
B017S7	0.494	UJ
B017P9	0.239	UJ
B01305	0.288	UJ
B017R1	0.247	UJ
B017R5	0.352	UJ
B017R7	0.559	UJ
B017V5	0.392	UJ
B017W1	0.538	UJ
B017V7	0.605	J
B017W5	0.403	UJ
B012M7	0.337	UJ
B012S6	0.659	UJ
B01343	0.537	UJ

9613500.2134

ATTACHMENT 4

As Qualified Data Summary

All analytes exceed holding times for analysis.
Accuracy deficient for Co-60 - J or UJ
Strontium 90 - low precision

TMA

ATTACHMENT 1 DATA TABLE

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ		
B017P3 (Plant Matter)	1	^{90}Sr	(1.5 ± 3.2)	E-01	UJ
		Total Uranium	(8.1 ± 1.3) (1)	E-02	J
		Gamma Scan:			
		^{40}K	(9.325 ± 3.758)	E+00	UJ
		^{51}Cr	<9.231	E+02	
		^{60}Co	<3.110	E-01	
		^{65}Zn	<1.426	E+00	
		^{134}Cs	<3.998	E-01	
		^{137}Cs	<3.113	E-01	
		^{226}Ra	<5.901	E-01	
		^{228}Th	<4.814	E-01	
		^{232}Th	<1.181	E+00	
B01362 (Plant Matter)	2	^{90}Sr	(1.6 ± 3.3)	E-01	
		Total Uranium	(2.2 ± 0.4) (1)	E-02	
		Gamma Scan:			
		^{40}K	(1.187 ± 0.290)	E+01	
		^{51}Cr	<4.518	E+02	
		^{60}Co	<3.469	E-01	
		^{65}Zn	<7.718	E-01	
		^{134}Cs	<2.212	E-01	
		^{137}Cs	<1.920	E-01	
		^{226}Ra	<3.489	E-01	
		^{228}Th	<3.106	E-01	
		^{232}Th	<7.943	E-01	
B017X1 (Plant Matter)	3	^{90}Sr	(2.0 ± 1.8)	E-01	
		Total Uranium	(3.7 ± 0.6) (1)	E-02	
		Gamma Scan:			
		^{40}K	(5.878 ± 2.806)	E+00	
		^{51}Cr	<5.190	E+02	
		^{60}Co	<2.497	E-01	
		^{65}Zn	<7.959	E-01	
		^{134}Cs	<2.295	E-01	
		^{137}Cs	<1.852	E-01	
		^{226}Ra	<3.089	E-01	
		^{228}Th	<3.331	E-01	
		^{232}Th	<8.535	E-01	

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B012V8 (Plant Matter)	4	^{90}Sr	(3.8 ± 2.7)	E-01
		Total Uranium	(3.8 ± 0.7) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.284 ± 0.319)	E+01
		^{51}Cr	<6.125	E+02
		^{60}Co	<2.227	E-01
		^{65}Zn	<7.788	E-01
		^{134}Cs	<2.180	E-01
		^{137}Cs	<1.918	E-01
		^{226}Ra	<4.682	E-01
		^{228}Th	<5.828	E-01
		^{232}Th	<9.293	E-01
B012M6 (Plant Matter)	5	^{90}Sr	(-0.1 ± 3.4)	E-01
		Total Uranium	(1.4 ± 0.3) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.085 ± 0.478)	E+01
		^{51}Cr	<9.977	E+02
		^{60}Co	<3.667	E-01
		^{65}Zn	<1.577	E+00
		^{134}Cs	<4.166	E-01
		^{137}Cs	<3.167	E-01
		^{226}Ra	<5.452	E-01
		^{228}Th	<4.805	E-01
		^{232}Th	<1.209	E+00
B012N9 (Plant Matter)	6	^{90}Sr	(-0.3 ± 4.4)	E-01
		Total Uranium	(2.6 ± 0.5) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.824 ± 0.413)	E+01
		^{51}Cr	<5.824	E+02
		^{60}Co	<4.442	E-01
		^{65}Zn	<1.021	E+00
		^{134}Cs	<3.774	E-01
		^{137}Cs	<1.949	E-01
		^{226}Ra	<4.260	E-01
		^{228}Th	<4.304	E-01
		^{232}Th	<1.096	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B01301 (Plant Matter)	7	^{90}Sr	(0.6 ± 3.2)	E-01
		Total Uranium	(4.0 ± 0.8) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.364 ± 0.400)	E+01
		^{51}Cr	<5.912	E+02
		^{60}Co	<3.407	E-01
		^{65}Zn	<1.168	E+00
		^{134}Cs	<3.265	E-01
		^{137}Cs	<2.028	E-01
		^{226}Ra	<3.843	E-01
		^{228}Th	<3.989	E-01
		^{232}Th	<1.067	E+00
B017Q3 (Plant Matter)	8	^{90}Sr	(-2.6 ± 3.1)	E-01
		Total Uranium	(1.5 ± 0.3) (1)	E-02
		Gamma Scan:		
		^{40}K	(5.021 ± 2.955)	E+00
		^{51}Cr	<9.127	E+02
		^{60}Co	<3.907	E-01
		^{65}Zn	<1.108	E+00
		^{134}Cs	<2.893	E-01
		^{137}Cs	<3.282	E-01
		^{226}Ra	<5.999	E-01
		^{228}Th	<5.124	E-01
		^{232}Th	<1.132	E+00
B017T7 (Plant Matter)	9	^{90}Sr	(5.7 ± 2.6)	E-01
		Total Uranium	(8.7 ± 1.5) (1)	E-02
		Gamma Scan:		
		^{40}K	(5.923 ± 3.609)	E+00
		^{51}Cr	<1.056	E+03
		^{60}Co	<3.524	E-01
		^{65}Zn	<1.604	E+00
		^{134}Cs	<4.132	E-01
		^{137}Cs	<3.599	E-01
		^{226}Ra	<5.846	E-01
		^{228}Th	<5.609	E-01
		^{232}Th	<1.670	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page four)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B017R3 (Plant Matter)	10	^{90}Sr	(5.1 ± 2.6)	E-01
		Total Uranium	(3.0 ± 0.5) (1)	E-02
		Gamma Scan:		
		^{40}K	(9.732 ± 4.015)	E+00
		^{51}Cr	<7.495	E+02
		^{60}Co	<5.115	E-01
		^{65}Zn	<1.371	E+00
		^{134}Cs	<3.166	E-01
		^{137}Cs	<3.225	E-01
		^{226}Ra	<5.046	E-01
		^{228}Th	<4.194	E-01
		^{232}Th	<1.051	E+00
B017Q5 (Plant Matter)	11	^{90}Sr	(0.3 ± 4.0)	E-01 UJ
		Total Uranium	(1.4 ± 0.3) (1)	E-02 UJ
		Gamma Scan:		
		^{40}K	(9.843 ± 3.412)	E+00 UJ
		^{51}Cr	<7.326	E+02
		^{60}Co	<4.079	E-01
		^{65}Zn	<9.680	E-01
		^{134}Cs	<2.682	E-01
		^{137}Cs	<2.295	E-01
		^{226}Ra	<3.967	E-01
		^{228}Th	<3.308	E-01
		^{232}Th	<1.172	E+00
B012X7 (Plant Matter)	12	^{90}Sr	(-0.4 ± 4.1)	E-01
		Total Uranium	(1.6 ± 0.3) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.473 ± 0.356)	E+01
		^{51}Cr	<6.555	E+02
		^{60}Co	<2.743	E-01
		^{65}Zn	<7.787	E-01
		^{134}Cs	<2.542	E-01
		^{137}Cs	<2.092	E-01
		^{226}Ra	<3.929	E-01
		^{228}Th	<3.013	E-01
		^{232}Th	<8.979	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page five)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B017Q9 (Plant Matter)	13	^{90}Sr	(-1.6 ± 4.1)	E-01 UJ
		Total Uranium	(2.2 ± 0.4) (1)	E-02 UJ
		Gamma Scan:		
		^{40}K	(8.722 ± 1.589)	E+00 UJ
		^{51}Cr	<3.106	E+02
		^{60}Co	<1.219	E-01
		^{65}Zn	<4.589	E-01
		^{134}Cs	<1.319	E-01
		^{137}Cs	<1.010	E-01
		^{226}Ra	<1.845	E-01
		^{228}Th	<1.584	E-01
		^{232}Th	<4.277	E-01
B017P1 (Plant Matter)	14	^{90}Sr	(0.1 ± 1.7)	E-01 UJ
		Total Uranium	(0.6 ± 0.2) (1)	E-02 UJ
		Gamma Scan:		
		^{40}K	(8.595 ± 4.696)	E+00 UJ
		^{51}Cr	<1.157	E+03
		^{60}Co	<4.417	E-01
		^{65}Zn	<1.541	E+00
		^{134}Cs	<3.956	E-01
		^{137}Cs	<3.359	E-01
		^{226}Ra	<6.671	E-01
		^{228}Th	<5.850	E-01
		^{232}Th	<1.479	E+00
B017S7 (Plant Matter)	15	^{90}Sr	(0.8 ± 1.9)	E-01 UJ
		Total Uranium	(5.5 ± 1) (1)	E-02 J
		Gamma Scan:		
		^{40}K	(1.119 ± 0.426)	E+01 UJ
		^{51}Cr	<9.233	E+02
		^{60}Co	<5.030	E-01
		^{65}Zn	<1.263	E+00
		^{134}Cs	<2.638	E-01
		^{137}Cs	<2.958	E-01
		^{226}Ra	<5.656	E-01
		^{228}Th	<4.940	E-01
		^{232}Th	<1.220	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page six)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B012V9 (Plant Matter)	16	^{90}Sr	(1.5 ± 1.9)	E-01
		Total Uranium	(5.0 ± 0.9) (1)	E-02
		Gamma Scan:		
		^{40}K	(9.989 ± 2.917)	E+00
		^{51}Cr	<5.603	E+02
		^{60}Co	<2.580	E-01
		^{65}Zn	<8.274	E-01
		^{134}Cs	<1.988	E-01
		^{137}Cs	<1.900	E-01
		^{226}Ra	<3.930	E-01
		^{228}Th	<3.230	E-01
		^{232}Th	<9.132	E-01
B017Q7 (Plant Matter)	17	^{90}Sr	(0.3 ± 4.3)	E-01
		Total Uranium	(3.2 ± 0.6) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.123 ± 0.389)	E+01
		^{51}Cr	<6.156	E+02
		^{60}Co	<2.476	E-01
		^{65}Zn	<1.227	E+00
		^{134}Cs	<2.560	E-01
		^{137}Cs	<3.019	E-01
		^{226}Ra	<4.848	E-01
		^{228}Th	<4.987	E-01
		^{232}Th	<1.162	E+00
B017P9 (Plant Matter)	18	^{90}Sr	(1.2 ± 4.2)	E-01 UJ
		Total Uranium	(1.5 ± 0.3) (1)	E-02 UJ
		Gamma Scan:		
		^{40}K	(6.183 ± 1.660)	E+00 UJ
		^{51}Cr	<3.729	E+02
		^{60}Co	<1.492	E-01
		^{65}Zn	<4.577	E-01
		^{134}Cs	<1.172	E-01
		^{137}Cs	<1.130	E-01
		^{226}Ra	<2.535	E-01
		^{228}Th	<2.388	E-01
		^{232}Th	<4.953	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page seven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B017R9 (Plant Matter)	19	^{90}Sr	(1.1 ± 2.2)	E-01
		Total Uranium	(4.8 ± 0.8) (1)	E-02
		Gamma Scan:		
		^{40}K	(6.421 ± 1.886)	E+00
		^{51}Cr	<4.004	E+02
		^{60}Co	<2.744	E-01
		^{65}Zn	<7.794	E-01
		^{134}Cs	<1.899	E-01
		^{137}Cs	<1.690	E-01
		^{226}Ra	<2.767	E-01
		^{228}Th	<2.510	E-01
		^{232}Th	<5.762	E-01
B01305 (Plant Matter)	20	^{90}Sr	(0.5 ± 1.7)	E-01 UJ
		Total Uranium	(1 ± 0.17) (1)	E-01 J
		Gamma Scan:		
		^{40}K	(1.413 ± 0.269)	E+01 UJ
		^{51}Cr	<5.042	E+02
		^{60}Co	<1.941	E-01
		^{65}Zn	<6.660	E-01
		^{134}Cs	<2.021	E-01
		^{137}Cs	<1.633	E-01
		^{226}Ra	<3.035	E-01
		^{228}Th	<2.882	E-01
		^{232}Th	<6.902	E-01
B017R1 (Plant Matter)	21	^{90}Sr	(0.2 ± 2.7)	E-01 UJ
		Total Uranium	(7.8 ± 1.3) (1)	E-02 J
		Gamma Scan:		
		^{40}K	(1.170 ± 0.221)	E+01 UJ
		^{51}Cr	<4.910	E+02
		^{60}Co	<1.710	E-01
		^{65}Zn	<7.847	E-01
		^{134}Cs	<1.968	E-01
		^{137}Cs	<1.562	E-01
		^{226}Ra	<3.041	E-01
		^{228}Th	<2.469	E-01
		^{232}Th	<6.670	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page eight)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B017R5 (Plant Matter)	22	^{90}Sr	(-0.4 ± 6.3)	E-01 UJ
		Total Uranium	(1.0 ± 0.25) (1)	E-01 J
		Gamma Scan:		
		^{40}K	(9.759 ± 1.984)	E+00
		^{51}Cr	<4.092	E+02 UJ
		^{60}Co	<1.410	E-01
		^{65}Zn	<5.056	E-01
		^{134}Cs	<1.560	E-01
		^{137}Cs	<1.146	E-01
		^{226}Ra	<2.394	E-01
		^{228}Th	<3.517	E-01 UJ
		^{232}Th	<5.295	E-01
B017R7 (Plant Matter)	23	^{90}Sr	(-0.1 ± 5.2)	E-01 UJ
		Total Uranium	(1.02 ± 0.17) (1)	E-01 J
		Gamma Scan:		
		^{40}K	(3.565 ± 3.269)	E+00 UJ
		^{51}Cr	<1.321	E+03
		^{60}Co	<4.033	E-01
		^{65}Zn	<1.946	E+00
		^{134}Cs	<4.454	E-01
		^{137}Cs	<3.756	E-01
		^{226}Ra	<7.070	E-01
		^{228}Th	<5.592	E-01
		^{232}Th	<1.593	E+00
B017M2 (Plant Matter)	24	^{90}Sr	(-1.2 ± 4.1)	E-01 ~~U~~ DSn
		Total Uranium	(1.39 ± 0.23) (1)	E-01
		Gamma Scan:		
		^{40}K	(8.184 ± 3.493)	E+00
		^{51}Cr	<7.819	E+02
		^{60}Co	<4.100	E-01
		^{65}Zn	<1.284	E+00
		^{134}Cs	<3.529	E-01
		^{137}Cs	<2.656	E-01
		^{226}Ra	<4.745	E-01
		^{228}Th	<4.531	E-00
		^{232}Th	<1.461	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page nine)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ		
B017V5 (Plant Matter)	25	^{90}Sr	(0 ± 4.6)	E-01	UJ
		Total Uranium	(2.5 ± 0.5) (1)	E-02	UJ
		Gamma Scan:			
		^{40}K	(7.334 ± 3.277)	E+00	UJ
		^{51}Cr	<7.262	E+02	
		^{60}Co	<3.647	E-01	
		^{65}Zn	<1.050	E+00	
		^{134}Cs	<3.047	E-01	
		^{137}Cs	<2.563	E-01	
		^{226}Ra	<4.851	E-01	
		^{228}Th	<3.918	E-01	
		^{232}Th	<1.142	E+00	
B017W9 (Plant Matter)	26	^{90}Sr	(2.2 ± 2.5)	E-01	
		Total Uranium	(7.1 ± 1.2) (1)	E-02	
		Gamma Scan:			
		^{40}K	(5.467 ± 3.070)	E+00	
		^{51}Cr	<8.133	E+02	
		^{60}Co	<3.053	E-01	
		^{65}Zn	<9.271	E-01	
		^{134}Cs	<2.851	E-01	
		^{137}Cs	<2.504	E-01	
		^{226}Ra	<4.651	E-01	
		^{228}Th	<4.257	E-01	
		^{232}Th	<1.180	E+00	
B017W1 (Plant Matter)	27	^{90}Sr	(0 ± 4.2)	E-01	UJ
		Total Uranium	(6.5 ± 1.1) (1)	E-02	J
		Gamma Scan:			
		^{40}K	(9.691 ± 5.811)	E+00	UJ
		^{51}Cr	<1.108	E+03	
		^{60}Co	<4.437	E-01	
		^{65}Zn	<1.674	E+00	
		^{134}Cs	<4.161	E-01	
		^{137}Cs	<3.242	E-01	
		^{226}Ra	<6.499	E-01	
		^{228}Th	<5.376	E-01	
		^{232}Th	<1.571	E+00	

ATTACHMENT 1 DATA TABLE (cont'd, page ten)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B017V9 (Plant Matter)	28	^{90}Sr	(0.5 ± 2.6)	E-01
		Total Uranium	(3.5 ± 0.6) (1)	E-02
		Gamma Scan:		
		^{40}K	(3.560 ± 2.708)	E+00
		^{51}Cr	<7.541	E+02
		^{60}Co	<5.636	E-01
		^{65}Zn	<1.444	E+00
		^{134}Cs	<3.410	E-01
		^{137}Cs	<2.847	E-01
		^{226}Ra	<5.257	E-01
		^{228}Th	<3.800	E-01
		^{232}Th	<1.370	E+00
B017V7 (Plant Matter)	29	^{90}Sr	(0 ± 7.5)	E-01 UJ
		Total Uranium	(4.6 ± 1) (1)	E-02 J
		Gamma Scan:		
		^{40}K	(5.929 ± 2.905)	E+00 UJ
		^{51}Cr	<6.442	E+02
		^{60}Co	<2.559	E-01
		^{65}Zn	<8.711	E-01
		^{134}Cs	<2.098	E-01
		^{137}Cs	<2.116	E-01
		^{226}Ra	<3.868	E-01
		^{228}Th	(6.053 ± 3.908)	E-01 J
		^{232}Th	<9.545	E-01 U
B017W5 (Plant Matter)	30	^{90}Sr	(0.3 ± 5.9)	E-01 UJ
		Total Uranium	(5.3 ± 0.9) (1)	E-02 J
		Gamma Scan:		
		^{40}K	(5.790 ± 2.978)	E+00 UJ
		^{51}Cr	<6.948	E+02
		^{60}Co	<3.034	E-01
		^{65}Zn	<5.924	E-01
		^{134}Cs	<2.402	E-01
		^{137}Cs	<2.282	E-01
		^{226}Ra	<5.044	E-01
		^{228}Th	<4.026	E-01
		^{232}Th	<9.013	E-01 U

ATTACHMENT 1 DATA TABLE (cont'd, page eleven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B012S4 (Plant Matter)	31	^{90}Sr	(0.3 ± 4.5)	E-01
		Total Uranium	(3.5 ± 0.6) (1)	E-02
		Gamma Scan:		
		^{40}K	(7.762 ± 3.074)	E+00
		^{51}Cr	<1.009	E+03
		^{60}Co	<3.825	E-01
		^{65}Zn	<1.726	E+00
		^{134}Cs	<3.695	E-01
		^{137}Cs	<2.717	E-01
		^{226}Ra	<4.585	E-01
		^{228}Th	<4.755	E-01
		^{232}Th	<1.316	E+00
B012T6 (Plant Matter)	32	^{90}Sr	(0.4 ± 2.1)	E-01
		Total Uranium	(2.0 ± 0.4) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.174 ± 0.498)	E+01
		^{51}Cr	<7.975	E+02
		^{60}Co	<5.583	E-01
		^{65}Zn	<1.719	E+00
		^{134}Cs	<4.090	E-01
		^{137}Cs	<3.093	E-01
		^{226}Ra	<6.237	E-01
		^{228}Th	<4.957	E-01
		^{232}Th	<8.788	E-01
B012R8 (Plant Matter)	33	^{90}Sr	(1.2 ± 4.1)	E-01
		Total Uranium	(2.3 ± 0.4) (1)	E-02
		Gamma Scan:		
		^{40}K	(7.067 ± 2.467)	E+00
		^{51}Cr	<5.270	E+02
		^{60}Co	<2.348	E-01
		^{65}Zn	<8.741	E-01
		^{134}Cs	<2.291	E-01
		^{137}Cs	<1.710	E-01
		^{226}Ra	<3.016	E-01
		^{228}Th	<2.760	E-01
		^{232}Th	<8.826	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page twelve)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B012L7 (Plant Matter)	34	^{90}Sr	(-0.7 ± 5.0)	E-01
		Total Uranium	<0.003 (1)	
		Gamma Scan:		
		^{40}K	(4.590 ± 2.472)	E+00
		^{51}Cr	<5.982	E+02
		^{60}Co	<2.336	E-01
		^{65}Zn	<8.143	E-01
		^{134}Cs	<1.501	E-01
		^{137}Cs	<1.923	E-01
		^{226}Ra	<4.492	E-01
		^{228}Th	<5.305	E-01
		^{232}Th	<1.014	E+00
B01364 (Plant Matter)	35	^{90}Sr	(-0.5 ± 2.8)	E-01
		Total Uranium	(1.0 ± 0.2) (1)	E-02
		Gamma Scan:		
		^{40}K	(1.429 ± 0.353)	E+01
		^{51}Cr	<9.734	E+02
		^{60}Co	<3.107	E-01
		^{65}Zn	<1.429	E+00
		^{134}Cs	<4.000	E-01
		^{137}Cs	<2.781	E-01
		^{226}Ra	<5.067	E-01
		^{228}Th	<4.730	E-01
		^{232}Th	<1.303	E+00
B012M7 (Plant Matter)	36	^{90}Sr	(0.5 ± 2.1)	E-01 UJ
		Total Uranium	(1.7 ± 0.3) (1)	E-02 UJ
		Gamma Scan:		
		^{40}K	(9.321 ± 2.933)	E+00 UJ
		^{51}Cr	<5.789	E+02
		^{60}Co	<3.235	E-01
		^{65}Zn	<1.047	E+00
		^{134}Cs	<3.250	E-01
		^{137}Cs	<1.934	E-01
		^{226}Ra	<3.624	E-01
		^{228}Th	<3.371	E-01
		^{232}Th	<1.075	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page thirteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B012L5 (Plant Matter)	37	^{90}Sr	(3.1 ± 2.8)	E-01
		Total Uranium	<0.003 (1)	
		Gamma Scan:		
		^{40}K	(3.873 ± 2.636)	E+00
		^{51}Cr	<6.578	E+02
		^{60}Co	<2.095	E-01
		^{65}Zn	<1.024	E+00
		^{134}Cs	<2.389	E-01
		^{137}Cs	<1.956	E-01
		^{226}Ra	<3.618	E-01
		^{228}Th	<3.488	E-01
		^{232}Th	<8.607	E-01
B012S6 (Plant Matter)	38	^{90}Sr	(6.9 ± 5.8)	E-01 J
		Total Uranium	<0.03 (1)	UJ
		Gamma Scan:		
		^{40}K	(8.715 ± 2.710)	E+00
		^{51}Cr	<5.429	E+02 UJ
		^{60}Co	<2.956	E-01
		^{65}Zn	<7.006	E-01
		^{134}Cs	<2.397	E-01
		^{137}Cs	<1.593	E-01
		^{226}Ra	<3.655	E-01
		^{228}Th	<6.587	E-01 UJ
		^{232}Th	(1.019 ± 0.572)	E+00
B012N4 (Plant Matter)	39	^{90}Sr	(0.2 ± 2.1)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(8.184 ± 3.351)	E+00
		^{51}Cr	<8.579	E+02
		^{60}Co	<2.888	E-01
		^{65}Zn	<1.205	E+00
		^{134}Cs	<3.104	E-01
		^{137}Cs	<2.745	E-01
		^{226}Ra	<4.885	E-01
		^{228}Th	<3.943	E-01
		^{232}Th	<1.128	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page fourteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B012T0 (Plant Matter)	40	^{90}Sr	(0.6 ± 2.1)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(1.594 ± 0.365)	E+01
		^{51}Cr	<6.643	E+02
		^{60}Co	<3.293	E-01
		^{65}Zn	<9.977	E-01
		^{134}Cs	<2.984	E-01
		^{137}Cs	<1.988	E-01
		^{226}Ra	<3.160	E-01
		^{228}Th	(5.647 ± 4.527)	E-01
		^{232}Th	<6.520	E-01
B01367 (Plant Matter)	41	^{90}Sr	(-0.6 ± 4.2)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(1.325 ± 0.358)	E+01
		^{51}Cr	<7.998	E+02
		^{60}Co	<3.031	E-01
		^{65}Zn	<1.195	E+00
		^{134}Cs	<3.184	E-01
		^{137}Cs	<3.038	E-01
		^{226}Ra	<3.866	E-01
		^{228}Th	(4.387 ± 3.744)	E-01
		^{232}Th	<1.007	E+00
B012M1 (Plant Matter)	42	^{90}Sr	(3.7 ± 4.0)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(3.553 ± 2.036)	E+00
		^{51}Cr	<8.255	E+02
		^{60}Co	<3.142	E-01
		^{65}Zn	<8.905	E-01
		^{134}Cs	<1.686	E-01
		^{137}Cs	<2.753	E-01
		^{226}Ra	<4.856	E-01
		^{228}Th	<4.442	E-01
		^{232}Th	<1.047	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page fifteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B012N2 (Plant Matter)	43	^{90}Sr	(-0.1 ± 2.5)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(1.092 ± 0.243)	E+01
		^{51}Cr	<5.104	E+02
		^{60}Co	<2.181	E-01
		^{65}Zn	<7.746	E-01
		^{134}Cs	<2.149	E-01
		^{137}Cs	<1.688	E-01
		^{226}Ra	<3.033	E-01
		^{228}Th	<2.558	E-01
		^{232}Th	<7.580	E-01
B012M0 (Plant Matter)	44	^{90}Sr	(2.3 ± 2.3)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(2.857 ± 2.595)	E+00
		^{51}Cr	<5.867	E+02
		^{60}Co	<2.219	E-01
		^{65}Zn	<8.155	E-01
		^{134}Cs	<2.134	E-01
		^{137}Cs	<1.895	E-01
		^{226}Ra	<3.457	E-01
		^{228}Th	<3.109	E-01
		^{232}Th	<8.316	E-01
B012M5 (Plant Matter)	45	^{90}Sr	(0.7 ± 4.5)	E-01
		Total Uranium	<0.03 (1)	
		Gamma Scan:		
		^{40}K	(7.402 ± 2.311)	E+00
		^{51}Cr	<5.251	E+02
		^{60}Co	<1.976	E-01
		^{65}Zn	<6.423	E-01
		^{134}Cs	<1.867	E-01
		^{137}Cs	<1.540	E-01
		^{226}Ra	<3.169	E-01
		^{228}Th	<3.012	E-01
		^{232}Th	<6.385	E-01

MISSING REQUEST FOR ANALYSIS
HAVE C.O.C.

ATTACHMENT 1 DATA TABLE (cont'd, page sixteen)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9575	Analysis	Results pCi/g ± 2 σ	
B01365 (Plant Matter)	46	^{90}Sr	(4.3 ± 5.4)	E-01
		Total Uranium	<0.03 (1)	
(MISSING REQUEST FOR ANALYSIS C.O.C. IS PRESENT)		Gamma Scan:		
		^{40}K	(7.238 ± 2.587)	E+00
		^{51}Cr	<5.140	E+02
		^{60}Co	<2.081	E-01
		^{65}Zn	<6.369	E-01
		^{134}Cs	<2.184	E-01
		^{137}Cs	<1.646	E-01
		^{226}Ra	<2.732	E-01
		^{228}Th	<2.636	E-01
		^{232}Th	<7.487	E-01
B01340 (Plant Matter)	47	^{90}Sr	(2.8 ± 2.7)	E-01
		Total Uranium	(1.05 ± 0.17) (1)	E-01
(MISSING REQUEST FOR ANALYSIS C.O.C. IS PRESENT)		Gamma Scan:		
		^{40}K	(1.005 ± 0.293)	E+01
		^{51}Cr	<5.765	E+02
		^{60}Co	<1.704	E-01
		^{65}Zn	<9.024	E-01
		^{134}Cs	<2.335	E-01
		^{137}Cs	<1.530	E-01
		^{226}Ra	<3.449	E-01
		^{228}Th	<3.448	E-01
		^{232}Th	<6.910	E-01
B01343 (Plant Matter)	48	^{90}Sr	(2.2 ± 2.4)	E-01 UJ
		Total Uranium	(2.66 ± 0.44) (1)	E-01 J
(MISSING REQUEST FOR ANALYSIS C.O.C. IS PRESENT)		Gamma Scan:		
		^{40}K	(1.142 ± 0.334)	E+01
		^{51}Cr	<6.750	E+02 UJ
		^{60}Co	<3.258	E-01
		^{65}Zn	<1.027	E+00
		^{134}Cs	<2.746	E-01
		^{137}Cs	<2.026	E-01
		^{226}Ra	<4.490	E-01
		^{228}Th	<5.373	E-01 UJ
		^{232}Th	<8.629	E-01 UJ

(1) Units are μg/gram.

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ATTACHMENT 5

Data Review Supporting Documentation

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Data Package Completeness Checklists

TMA/Norcal N1-12-057-9575

B017P3
B017Q5
B017Q9
B017P1
B017S7
B017P9
B01305
B017R1
B017R5
B017R7
B017V5
B017W1
B017V7
B017W5
B012M7
B01256
B01343

SR-90

Supplemental Requirements for Analyses Using Gas Proportional Counters

A.0 Completeness Checklist

Analysis Results

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Counting Logs, Printouts, Notebook Pages)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification
- ✓ Analysis Date and Initials of Analyst
- ✓ Amounts of Samples Prepared or Counted
- ✓ Weights of Solids Counted

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
- ✓ Amount of (Check) Standard Used
- ✓ Raw Data including Counts and Count Duration for Standards
- ✓ Weights of Preparations
- ✓ Efficiencies
- ✓ Weights of Carriers Added, If Applicable
- ✓ Results of Statistical Tests Used to Evaluate Instrument Reliability and Efficiency Checks
- ✓ Raw Data of Background Counts and Count Duration
- ✓ Results of Statistical Test Used to Evaluate Instrument Background
- NA Control Limits for Check Source and Background Counts

Blanks

- ✓ Detector Identification
- ✓ Date of Analysis
- NO MDA of Method will calculate
- ✓ Amounts of Reagents Used in Blank

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Supplemental Requirements for Analyses Using Gas Proportional Counters (Cont.)

Radiometric and Gravimetric Yields

- ✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- ✓ Weights of Precipitates or Solids Counted
- ✓ Calculated Recoveries

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Aliquots of Samples
- ✓ Weights of Solids Counted
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Calculated Precision

Laboratory Control Samples

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses

Supplemental Requirements for Analyses Using Gamma Spectroscopy

Gamma Ex

C.0 Completeness Checklist

Analysis Results

✓ Results Report for Sample Analyses and Reanalyses
✓ Raw Data (Spectra, Printouts of Counts per Channel, Notebook Pages)
✓ Calculation Sheets
✓ Sample Identifications
✓ Detector Identification and Counting Position
✓ Analysis Date and Initials of Analyst
✓ Amounts of Samples Counted

Initial and Continuing Calibration

✓ Detector Identification
✓ Calibration Date(s) and Initials of Analyst
✓ Identification of Calibration and Check Standards including Radionuclides, Certification, Expiration Date, and Activity
NA Amount of (Check) Standard Used
✓ Raw Data including Counts and Count Duration for Standards
✓ Efficiencies and/or Geometry and Matrix Factors
✓ Raw Data of Background Counts, Count Dates, and Duration of Counts
✓ Kev/Channel
✓ FWHM

Blanks

✓ Detector Identification
✓ Date of Analysis
NO MDA of Method will calculate
~~Amounts of Reagents Used in Blank~~
✓ Raw Data

Supplemental Requirements for Analyses Using Gamma Spectroscopy (Cont.)

Duplicates

✓ Detector Identification
✓ Date of Analysis
✓ Amounts of Samples
✓ Count Durations
✓ Sample Identifications
✓ Results of Analyses and Calculated Precision
✓ Raw Data

Radiometric and Gravimetric Yields

_____ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
_____ Weights of Precipitates or Solids Counted
_____ Calculated Recoveries

Laboratory Control Samples

✓ Detector Identification
✓ Date of Analysis
✓ Calculation of Recoveries
✓ Results of Analyses

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Total Uranium by kPA

Supplemental Requirements for Analyses Using kPA for Total Uranium

Analysis Results

✓ Results Reported for Sample Analyses
✓ Raw Data (including Prep Volume, Aliquot Volume, kPA output)
✓ Calculation Sheets
✓ Sample Identifications
✓ Detector Identification
✓ Analysis Date and Initials of Analyst

Initial and Continuing Calibration

✓ Detector Identification
✓ Calibration Date(s) and Initials of Analyst
✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
✓ Amount of Standard Used
✓ Raw count/Activity data
✓ Determination of Calibration Equation

Blanks/Backgrounds

✓ Detector Identification
✓ Date of Analysis
✓ MDA of Method
✓ Amount of Reagent Used (Prep Volume)
✓ Count Durations

Duplicates

✓ Detector Identification
✓ Date of Analysis
✓ Amounts of Samples
✓ Count Durations
✓ Sample Identifications
✓ Results of Analysis and Calculated Precision
✓ Raw Data

Matrix Spikes

✓ Detector Identification
✓ Date of Analysis
✓ Amounts of Samples
✓ Count Durations
✓ Sample Identifications
✓ Results of Analysis and Calculated Precision
✓ Identification of Matrix Spike Radionuclide, Certification, Expiration Date, and Activity
✓ Amount of Matrix Spike Used
✓ Raw Data
✓ Results of Analysis and Comparison to Amount Added

SECTION 2 Case Narrative

CASE NARRATIVE

1. Project 300-FF-5, Task 7, Plant Material (TMA/Norcal Group No. 9575) were processed together and the results of the analyses are reported. The sample ID's are:

Customer Sample ID	TMA/Norcal Group No.	Customer Sample ID	TMA/Norcal Group No.
B017P3 (Plant Material)	9575-1	B017V5 (Plant Material)	9575-25
B01362 (Plant Material)	9575-2	B017W9 (Plant Material)	9575-26
B017X1 (Plant Material)	9575-3	B017W1 (Plant Material)	9575-27
B012V8 (Plant Material)	9575-4	B017V9 (Plant Material)	9575-28
B012M6 (Plant Material)	9575-5	B017V7 (Plant Material)	9575-29
B012N9 (Plant Material)	9575-6	B017W5 (Plant Material)	9575-30
B01301 (Plant Material)	9575-7	B012S4 (Plant Material)	9575-31
B017Q3 (Plant Material)	9575-8	B012T6 (Plant Material)	9575-32
B017T7 (Plant Material)	9575-9	B012R8 (Plant Material)	9575-33
B017R3 (Plant Material)	9575-10	B012L7 (Plant Material)	9575-34
B017Q5 (Plant Material)	9575-11	B01364 (Plant Material)	9575-35
B012X7 (Plant Material)	9575-12	B012M7 (Plant Material)	9575-36
B017Q9 (Plant Material)	9575-13	B012L5 (Plant Material)	9575-37
B017P1 (Plant Material)	9575-14	B01256 (Plant Material)	9575-38
B017S7 (Plant Material)	9575-15	B012N4 (Plant Material)	9575-39
B012V9 (Plant Material)	9575-16	B012T0 (Plant Material)	9575-40
B017Q7 (Plant Material)	9575-17	B01367 (Plant Material)	9575-41
B017P9 (Plant Material)	9575-18	B012M1 (Plant Material)	9575-42
B017R9 (Plant Material)	9575-19	B012N2 (Plant Material)	9575-43
B01305 (Plant Material)	9575-20	B012M0 (Plant Material)	9575-44
B017R1 (Plant Material)	9575-21	B012M5 (Plant Material)	9575-45
B017R5 (Plant Material)	9575-22	B01365 (Plant Material)	9575-46
B017R7 (Plant Material)	9575-23	B01340 (Plant Material)	9575-47
B017M2 (Plant Material)	9575-24	B01343 (Plant Material)	9575-48

2. The analyses reported are:

Analyte	PLANT MATERIAL Group # & Sample #
^{90}Sr	9575-1 through 48
Total U	9575-1 through 48
Gamma Scan	9575-1 through 48

3. Results are reported pCi/gram dry material with 2 σ errors, except for total uranium which are reported μgm/gram dry material with 2 σ errors.

4. Strontium-90 analyses were processed in five batches, with ^{90}Sr QCs with each batch.

5. The QC samples consisting of a spike, a lab control sample, and a replicate were processed with this batch as shown on Table 1.

TABLE 1

Preparation Batch Samples Processed	Data Package
9575-1 through 48	- PLANT MATERIAL

QC SAMPLES PROCESSED:

Sample I.D.	Type	Analyses	Reported with Data Package
9575-49 (QC 7406)	Spike	^{90}Sr	X
9575-50 (QC 7407)	Spike	^{90}Sr	X
9575-51 (QC 7408)	Spike	^{90}Sr	X
9575-52 (QC 7409)	Spike	^{90}Sr	X
9575-53 (QC 7410)	Spike	^{90}Sr	X
9575-54 (QC 7411)	LCS	^{90}Sr	X
9575-55 (QC 7412)	LCS	^{90}Sr	X
9575-56 (QC 7413)	LCS	^{90}Sr	X
9575-57 (QC 7414)	LCS	^{90}Sr	X
9575-58 (QC 7415)	LCS	^{90}Sr	X
9575-59 (QC 7416)	Replicate	^{90}Sr	X
9575-60 (QC 7417)	Replicate	^{90}Sr	X
9575-61 (QC 7418)	Replicate	^{90}Sr	X
9575-62 (QC 7419)	Replicate	^{90}Sr	X
9575-63 (QC 7420)	Replicate	^{90}Sr	X
9575-64 (QC 7421)	Spike	Total U	X
9575-65 (QC 7422)	Spike	Total U	X
9575-66 (QC 7423)	Spike	Total U	X
9575-67 (QC 7424)	LCS	Total U	X
9575-68 (QC 7425)	LCS	Total U	X
9575-69 (QC 7426)	LCS	Total U	X
9575-70 (QC 7427)	Replicate	Total U	X
9575-71 (QC 7428)	Replicate	Total U	X
9575-72 (QC 7429)	Replicate	Total U	X
9575-73 (QC 7430)	Spike	Gamma Scan	X
9575-74 (QC 7431)	Spike	Gamma Scan	X
9575-75 (QC 7432)	Spike	Gamma Scan	X
9575-76 (QC 7433)	LCS	Gamma Scan	X
9575-77 (QC 7434)	LCS	Gamma Scan	X
9575-78 (QC 7435)	LCS	Gamma Scan	X
9575-79 (QC 7436)	Replicate	Gamma Scan	X
9575-80 (QC 7437)	Replicate	Gamma Scan	X
9575-81 (QC 7438)	Replicate	Gamma Scan	X

6. Analyses, reanalyses, and reworks, etc.

Strontium Analyses: The average yield for 48 analyses was 75%. The lowest yield was 51% and the highest was 87%. No abnormalities were encountered. The results of the spike, the Laboratory Control Sample, and the replicate were satisfactory.

Gamma Scan Analyses: The spike sample processed had only ^{60}Co and ^{137}Cs activity. The found/added ratio of the spike look good. The results of the spike, the laboratory control sample, and the replicate were satisfactory.

Total Uranium Analyses (Plant Matter): No abnormalities were encountered. The results of the spike, the Laboratory Control Sample, and the replicate were satisfactory.

SECTION 3: QC SUMMARY

QUALITY CONTROL SUMMARY

Attachment 2, 3, and 4 gives the results of the QC samples. The recovery ratios were determined by the QC Officer based upon the final data obtained for each. The laboratory control samples were calculated with an aliquot of 1.00 and, therefore, the presented data cannot be compared directly with the sample data. To compare them directly, the laboratory control sample data would need to be divided by sample aliquots.

The results of the spike, the laboratory control and the replicate for ^{90}Sr, total uranium, and gamma scan were satisfactory.

D. P. Kharkar

Dinkar P. Kharkar, Ph.D.
TMA/Norcal Program Manager

ATTACHMENT 2 QUALITY CONTROL SAMPLE RESULTS, SPIKES AND BLANKS

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found	Added	Recovery Ratio Found/Added ± 2 σ
Spikes for Plant Materail:				
9575-49 QC-7406	^{90}Sr	(1.210 ± 0.161) E+01	(12.83 ± 0.513) E+00	0.94 ± 0.13
9575-50 QC-7407	^{90}Sr	(7.318 ± 0.538) E+00	(8.555 ± 3.342) E+00	0.86 ± 0.07
9575-51 QC-7408	^{90}Sr	(1.048 ± 0.23) E+01	(12.83 ± 0.513) E+00	0.82 ± 0.19
9575-52 QC-7409	^{90}Sr	(9.979 ± 2.412) E+00	(10.26 ± 0.410) E+00	0.97 ± 0.23
9575-53 QC-7410	^{90}Sr	(1.170 ± 0.107) E+01	(11.97 ± 0.479) E+00	0.98 ± 0.10
9575-64 QC-7421	Total U	(29.8 ± 4.4) (1)	(32.53 ± 1.30) (1)	0.92 ± 0.13
9575-65 QC-7422	Total U	(49.0 ± 7.3) (1)	(48.80 ± 1.95) (1)	1.00 ± 0.15
9575-66 QC-7423	Total U	(42.8 ± 6.3) (1)	(40.67 ± 1.63) (1)	1.05 ± 0.16
9574-73 QC-7430	Gamma Scan:			
	^{60}Co	(4.069 ± 1.842) E+01	(5.939 ± 0.238) E+01	0.69 ± 0.31
	^{137}Cs	(5.473 ± 1.619) E+01	(6.277 ± 0.251) E+01	0.87 ± 0.26
9574-74 QC-7431	Gamma Scan:			
	^{60}Co	(3.713 ± 1.773) E+01	(5.939 ± 0.238) E+01	0.63 ± 0.30
	^{137}Cs	(6.952 ± 1.910) E+01	(8.367 ± 0.335) E+01	0.83 ± 0.23
9574-75 QC-7432	Gamma Scan:			
	^{60}Co	(6.011 ± 1.972) E+01	(6.478 ± 0.259) E+01	0.93 ± 0.31
	^{137}Cs	(5.084 ± 1.793) E+01	(7.112 ± 0.284) E+01	0.72 ± 0.26

(1) Units are μg/sample.

ATTACHMENT 3 QUALITY CONTROL SAMPLE RESULTS, LABORATORY CONTROL SAMPLES

TMA

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found	Added	Recovery Ratio Found/Added ± 2 σ
Laboratory Control Samples (Plant Material)				
9575-54 QC-7411	^{90}Sr	(2.5 ± 4.5) E-01	0	Satisfactory
9575-55 QC-7412	^{90}Sr	(-0.4 ± 5.9) E-01	0	Satisfactory
9575-56 QC-7413	^{90}Sr	(-0.9 ± 6.7) E-01	0	Satisfactory
9575-57 QC-7414	^{90}Sr	(7.0 ± 7.0) E-01	0	Satisfactory
9575-58 QC-7415	^{90}Sr	(7.6 ± 6.4) E-01	0	Satisfactory
9575-67 QC-7424	Total U	<0.003 (1)	0	Satisfactory
9575-68 QC-7425	Total U	<0.003 (1)	0	Satisfactory
9575-69 QC-7426	Total U	<0.003 (1)	0	Satisfactory
9575-76 QC-7433	Gamma Scan:			
	^{40}K	<2.230 E+02	0	Satisfactory
	^{51}Cr	<7.803 E+01	0	Satisfactory
	^{60}Co	<1.413 E+01	0	Satisfactory
	^{65}Zn	<2.522 E+01	0	Satisfactory
	^{134}Cs	<1.228 E+01	0	Satisfactory
	^{137}Cs	<1.371 E+01	0	Satisfactory
	^{226}Ra	<2.422 E+01	0	Satisfactory
	^{228}Th	<1.683 E+01	0	Satisfactory
	^{232}Th	<5.320 E+01	0	Satisfactory
9575-77 QC-7434	Gamma Scan:			
	^{40}K	<1.056 E+02	0	Satisfactory
	^{51}Cr	<6.146 E+01	0	Satisfactory
	^{60}Co	<1.143 E+01	0	Satisfactory
	^{65}Zn	<1.529 E+01	0	Satisfactory
	^{134}Cs	<1.124 E+01	0	Satisfactory
	^{137}Cs	<1.058 E+01	0	Satisfactory
	^{226}Ra	<1.768 E+01	0	Satisfactory
	^{228}Th	<1.475 E+01	0	Satisfactory
	^{232}Th	<4.164 E+01	0	Satisfactory

ATTACHMENT 3 QUALITY CONTROL SAMPLE RESULTS, LABORATORY CONTROL SAMPLES

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found		Added	Recovery Ratio Found/Added ± 2 σ
Laboratory Control Samples (Plant Material)					
9575-78					
QC-7435	Gamma Scan:				
	^{40}K	<2.850	E+02	0	Satisfactory
	^{51}Cr	<1.103	E+02	0	Satisfactory
	^{60}Co	<2.060	E+01	0	Satisfactory
	^{65}Zn	<3.990	E+01	0	Satisfactory
	^{134}Cs	<2.344	E+01	0	Satisfactory
	^{137}Cs	<1.730	E+01	0	Satisfactory
	^{226}Ra	<3.197	E+01	0	Satisfactory
	^{228}Th	<2.320	E+01	0	Satisfactory
	^{232}Th	<9.300	E+01	0	Satisfactory

(1) Units are μg/sample.

ATTACHMENT 4 QUALITY CONTROL RESULTS, REPLICATES

Nuclide	Results	
	pCi/g ± error 2 σ	
	No. 9575-59 Replicate	No. 9575-1 Original
QC 7416 ^{90}Sr	(2.2 ± 2.1) E-01	(1.5 ± 3.2) E-01
	No. 9575-60 Replicate	No. 9575-2 Original
QC 7417 ^{90}Sr	(0.9 ± 3.0) E-01	(1.6 ± 3.3) E-01
	No. 9575-61 Replicate	No. 9575-3 Original
QC 7418 ^{90}Sr	(-2.2 ± 6.4) E-01	(0.2 ± 1.8) E-01
	No. 9575-62 Replicate	No. 9575-4 Original
QC 7419 ^{90}Sr	(1.7 ± 5.7) E-01	(3.8 ± 2.7) E-01
	No. 9575-63 Replicate	No. 9575-5 Original
QC 7420 ^{90}Sr	(1.5 ± 2.2) E-01	(-0.1 ± 3.4) E-01
	No. 9575-70 Replicate	No. 9575-1 Original
QC-7427 Total U	(8.9 ± 1.5) E-02 (1)	(8.1 ± 1.3) E-02 (1)
	No. 9575-71 Replicate	No. 9575-2 Original
QC-7428 Total U	(1.2 ± 0.4) E-02 (1)	(2.2 ± 0.4) E-02 (1)
	No. 9575-72 Replicate	No. 9575-3 Original
QC-7429 Total U	(3.7 ± 0.6) E-02 (1)	(3.7 ± 0.6) E-02 (1)
	No. 9575-79 Replicate	No. 9575-1 Original
QC-7436 Gamma Scan:		
^{40}K	(9.419 ± 3.089) E+00	(9.325 ± 3.758) E+00
^{51}Cr	<7.046 E+02	<9.231 E+02
^{60}Co	<3.047 E-01	<3.110 E-01
^{65}Zn	<1.457 E+00	<1.426 E+00
^{134}Cs	<3.318 E-01	<3.998 E-01
^{137}Cs	(2.012 ± 1.676) E-01	<3.113 E-01
^{226}Ra	<5.225 E-01	<5.901 E-01
^{228}Th	<7.618 E-01	<4.814 E-01
^{232}Th	<8.617 E-01	<1.181 E+00

ATTACHMENT 4 QUALITY CONTROL RESULTS, REPLICATES

Nuclide	Results			
	pCi/g ± error 2 σ			
	No. 9575-80 Replicate		No. 9575-2 Original	
QC-7437				
Gamma Scan:				
^{40}K	(8.618 ± 5.230)	E+00	(1.187 ± 0.290)	E+01
^{51}Cr	<1.390	E+03	<4.518	E+02
^{60}Co	<5.392	E-01	<3.469	E-01
^{65}Zn	<2.130	E+00	<7.718	E-01
^{134}Cs	<5.551	E-01	<2.212	E-01
^{137}Cs	<4.635	E-01	<1.920	E-01
^{226}Ra	<8.980	E-01	<3.489	E-01
^{228}Th	<6.936	E-01	<3.106	E-01
^{232}Th	<1.816	E+00	<7.943	E-01
	No. 9575-81 Replicate		No. 9575-3 Original	
QC-7438				
Gamma Scan:				
^{40}K	(8.263 ± 3.752)	E+00	(5.878 ± 2.806)	E+00
^{51}Cr	<9.326	E+02	<5.190	E+02
^{60}Co	<2.387	E-01	<2.497	E-01
^{65}Zn	<1.445	E+00	<7.959	E-01
^{134}Cs	<2.654	E-01	<2.295	E-01
^{137}Cs	<1.964	E-01	<1.852	E-01
^{226}Ra	<4.579	E-01	<3.089	E-01
^{228}Th	<4.995	E-01	<3.331	E-01
^{232}Th	<1.431	E+00	<8.535	E-01

(1) Units are μg/gram.

SECTION 4 Chains-of-Custody Copies

		ET	GROSS CTB	COUNT TIME	BKG CPM	SF	NET CPM	X	Ws	Wb	WY	WX	WXY	WX^2
9575-1	9575-1	1.57100	37.00000	35.96000	0.72630	1.01570	0.30737	0.68349	32.99923	888.42078	10.14305	21.69460	6.72979	14.52881
B017P3	B017P3	6.79100	21.00000	24.97000	0.71180	1.01780	0.13151	0.17096	26.35791	702.44451	3.72932	4.84805	0.63756	0.82882
Plant Matter	Plant Matter	7.69300	24.00000	24.99000	0.71180	1.01800	0.25306	0.13523	24.96139	702.44451	6.31670	3.37559	0.85422	0.45649
		8.68500	20.00000	29.10000	0.51630	1.04720	0.17906	0.10448	40.39273	988.42921	7.23255	4.22005	0.75562	0.44089
		9.76200	36.00000	56.78000	0.54560	1.00270	0.08886	0.07685	80.98471	918.42229	7.18049	6.38564	0.56618	0.50351
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		DELTA=	1821.82295					SUMS=	207.69598	3978.16127	34.60211	40.72394	9.54338	16.75652

Y @ MILK	REPORTED	CALCULATED		PRODUCT	NBS CORR.	REPORTED RESULTS	CALCULATED RESULTS		Calculated MDA	Reported Results > MDA ?
				1.64421	0.96800					
1 COMP=	NA	0.56953	*			0.14739	0.14671	OK	0.32164	No
2 COMP=	0.31600	0.31451	OK	P-FACTOR	C-ZERO					
				1.75900	0.19129					

9575-11	9575-11	0.87600	25.00000	39.23000	0.54930	1.00410	0.06833	0.79470	57.35799	910.24941	5.08632	45.58241	4.02621	38.22436
B017Q5	B017Q5	6.06800	15.00000	24.97000	0.54130	0.96670	0.05744	0.20630	39.64871	923.70220	2.27751	8.17955	0.46965	1.68745
Plant Matter	Plant Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		DELTA=	787.35058					SUMS=	97.00870	1833.95161	7.34383	53.76197	4.49606	37.91181

Y @ MILK	REPORTED	CALCULATED		PRODUCT	NBS CORR.	REPORTED RESULTS	CALCULATED RESULTS		Calculated MDA	Reported Results > MDA ?
				1.33959	0.96800					
1 COMP=	NA	0.11859	*			0.03010	0.03005	OK	0.32682	No
2 COMP=	0.05300	0.05249	OK	P-FACTOR	C-ZERO					
				1.75900	0.03918					

9575-13	9575-13	0.87600	20.00000	39.23000	0.52050	1.04910	-0.01121	0.79470	70.94719	960.61479	0.07085	56.38176	0.05638	44.80661
B017Q9	B017Q9	6.06100	24.00000	29.63000	0.64560	1.03440	0.17004	0.20682	34.75162	774.47336	5.90934	7.18053	1.22101	1.48367
Plant Matter	Plant Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		DELTA=	852.68309					SUMS=	105.69881	1735.08815	5.98028	63.56229	1.27739	46.29028

Y @ MILK	REPORTED	CALCULATED		PRODUCT	NBS CORR.	REPORTED RESULTS	CALCULATED RESULTS		Calculated MDA	Reported Results > MDA ?
				1.32506	0.96800					
1 COMP=	NA	0.02760	*			-0.16622	-0.16639	OK	0.32876	No
2 COMP=	-0.28700	-0.28745	OK	P-FACTOR	C-ZERO					

		ET	GROSS CTB	COUNT TIME	BKG CPM	SF	NET CPM	X	Ws	Wb	WY	WX	WXY	WX^2
						1.75900		-0.21594						
9575-14	9575-14	0.87600	23.00000	39.23000	0.57960	1.07070	0.00716	0.79470	61.79943	862.66391	0.44240	49.11204	0.35158	39.02936
B017P1	B017P1	6.08900	17.00000	25.93000	0.72460	1.00910	-0.06962	0.20517	37.27199	690.03588	0.03727	7.64698	0.00765	1.56891
Plant Matter	Plant Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		DELTA=	600.54160					SUMS=	99.07142	1552.69979	0.47968	56.75902	0.35923	40.59828

Y @ MILK	REPORTED	CALCULATED		PRODUCT	NBS CORR.	REPORTED RESULTS	CALCULATED RESULTS		Calculated MDA	Reported Results > MDA ?
				1.38715	0.96800					
1 COMP=	0.00800	0.00685	OK			0.00481	0.00489	OK	0.33478	No
2 COMP=	NA	0.01045	*	P-FACTOR	C-ZERO					
				1.75900	0.00636					

9575-15	9575-15	0.87600	30.00000	39.23000	0.64280	1.03810	0.12857	0.79470	47.82299	777.84692	8.05277	38.00495	4.81014	30.20255
B017S7	B017S7	6.28200	15.00000	25.23000	0.72630	1.01330	-0.13352	0.19514	39.84811	688.42076	0.03985	7.77545	0.00778	1.51728
Plant Matter	Plant Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		DELTA=	685.00391					SUMS=	87.66910	1466.26768	8.09261	45.78039	4.81791	31.71982

Y @ MILK	REPORTED	CALCULATED		PRODUCT	NBS CORR.	REPORTED RESULTS	CALCULATED RESULTS		Calculated MDA	Reported Results > MDA ?
				1.45849	0.96800					
1 COMP=	0.15200	0.15159	OK			0.07981	0.07988	OK	0.33017	No
2 COMP=	NA	0.20943	*	P-FACTOR	C-ZERO					
				1.75900	0.10414					

9575-16	9575-16	2.05000	19.00000	25.28000	0.64280	1.03600	0.11270	0.58618	32.10994	777.84692	3.61674	18.82161	2.12117	11.03250
B017P9	B017P9	6.28200	12.00000	25.23000	0.58220	1.07800	-0.11489	0.19514	49.83347	858.81141	0.04985	9.72436	0.00972	1.89758
PLant Matter	PLant Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		DELTA=	244.66332					SUMS=	81.94340	1636.65832	3.66857	28.54596	2.13089	12.93008

Y @ MILK	REPORTED	CALCULATED		PRODUCT	NBS CORR.	REPORTED RESULTS	CALCULATED RESULTS		Calculated MDA	Reported Results > MDA ?
				1.01165	0.96800					

		ET	GROSS CTS	COUNT TIME	BKG CPM	SF	NET CPM	X	Ws	Wb	WY	WX	WXY	WX^2
		1 COMP=	0.16400	0.16480	OK					0.12471	0.12494	OK	0.59238	No
		2 COMP=	NA	0.28566	*	P-FACTOR		C-ZERO						
						1.75900		0.16290						
9575-20	9575-20	0.91000	22.00000	35.12000	0.54450	0.96110	0.07874	0.78788	52.59295	916.27365	4.14100	41.43712	3.26263	32.64763
B01305	B01305	6.30200	16.00000	25.44000	0.72630	1.01330	-0.09866	0.19412	38.07533	886.42076	0.03808	7.39130	0.00739	1.43482
Plant Matter	Plant Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		DELTA=	705.98257					SUMS=	90.66828	1606.69441	4.17908	48.82842	3.27002	34.08245
						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
		Y @ MILK	REPORTED	CALCULATED		1.50523		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
		1 COMP=	0.09500	0.09594	OK					0.04863	0.04889	OK	0.28943	No
		2 COMP=	NA	0.13092	*	P-FACTOR		C-ZERO						
						1.75900		0.06374						
9575-21	9575-21	1.55000	19.00000	25.02000	0.72630	1.01450	0.03357	0.66751	31.31481	888.42076	1.05131	20.90306	0.70176	13.95307
B017R1	B017R1	5.28400	11.00000	24.97000	0.54620	1.00500	-0.10620	0.25293	53.25273	915.41560	0.05325	13.46896	0.01347	3.40865
Plant Matter	Plant Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		DELTA=	286.63197					SUMS=	84.56754	1803.83836	1.10456	34.37204	0.71523	17.35972
						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
		Y @ MILK	REPORTED	CALCULATED		1.33424		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
		1 COMP=	0.04200	0.04120	OK					0.02391	0.02368	OK	0.47490	No
		2 COMP=	NA	0.07857	*	P-FACTOR		C-ZERO						
						1.75900		0.03088						
9575-22	9575-22	1.55000	18.00000	25.02000	0.71760	1.01030	0.00184	0.66751	32.99717	896.78700	0.08082	22.02805	0.04060	14.70269
B017R5	B017R5	5.27700	18.00000	29.63000	0.58220	1.07800	0.02727	0.25332	45.97691	858.81141	1.25357	11.64699	0.31756	2.95044
Plant Matter	Plant Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		DELTA=	280.28612					SUMS=	78.97408	1555.57841	1.31439	33.67304	0.35816	17.65313

		ET	GROSS CTS	COUNT TIME	BKG CPM	SF	NET CPM	X	Ws	Wb	WY	WX	WXY	WX^2
						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
		Y @ MILK	REPORTED	CALCULATED		1.33292		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
		1 COMP=	NA	0.02029	*					-0.03622	-0.03532	OK	0.47154	No
		2 COMP=	-0.06300	-0.06135	OK	P-FACTOR		C-ZERO						
						1.75900		-0.04605						
9575-23	9575-23	1.55000	8.00000	25.02000	0.45030	0.98780	-0.12898	0.66751	72.97583	1110.37086	0.07298	48.71242	0.04871	32.51619
B017R7	B017R7	5.30500	19.00000	25.93000	0.72630	1.01330	0.00553	0.25154	33.52120	686.42076	0.21882	8.43179	0.05504	2.12090
Plant Matter	Plant Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		DELTA=	423.29080					SUMS=	106.49713	1796.79183	0.29179	57.14420	0.10375	34.63709
						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
		Y @ MILK	REPORTED	CALCULATED		1.48219		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
		1 COMP=	NA	0.00300	*					-0.00726	-0.00688	OK	0.33215	No
		2 COMP=	-0.01400	-0.01329	OK	P-FACTOR		C-ZERO						
						1.75900		-0.00897						
9575-25	9575-25	1.55000	7.00000	25.02000	0.54930	1.00330	-0.27041	0.66751	81.31196	910.24941	0.06131	54.27683	0.05428	36.23051
B017V5	B017V5	5.49800	11.00000	25.23000	0.71180	1.01780	-0.28072	0.23924	53.34203	702.44451	0.05334	12.76149	0.01276	3.05305
Plant Matter	Plant Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		DELTA=	795.55147					SUMS=	134.65399	1612.69392	0.13465	67.03832	0.06704	39.28356
						PRODUCT		NBS CORR.		REPORTED	CALCULATED			
		Y @ MILK	REPORTED	CALCULATED		1.36462		0.96800		RESULTS	RESULTS			
		1 COMP=	NA	0.00171	*					0.00000	-0.00000	*		
		2 COMP=	0.00000	-0.00000	*	P-FACTOR		C-ZERO						
						1.75900		-0.00000						
9575-27	9575-27	1.55000	10.00000	25.02000	0.54950	1.00780	-0.15099	0.66751	58.44749	909.91811	0.05845	39.01449	0.03901	26.04269
B017W1	B017W1	5.51800	6.00000	25.44000	0.54130	0.98670	-0.29526	0.23800	98.47005	923.70220	0.09847	22.95948	0.02296	5.46426
Plant Matter	Plant Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

		ET	GROSS CTS	COUNT TIME	BKG CPM	SF	NET CPM	X	Ws	Wb	WY	WX	WXY	WX^2
		DELTA=	1040.20774					SUMS=	154.91754	1833.62031	0.15492	61.97597	0.06197	31.50696
		Y @ MILK	REPORTED	CALCULATED		PRODUCT 1.40425	NBS CORR. 0.96800		REPORTED RESULTS	CALCULATED RESULTS		Calculated MDA	Reported Results > MDA ?	
		1 COMP=	NA	0.00197	*				-0.00000	-0.00000	*	0.39118	No	
		2 COMP=	0.00000	-0.00000	*	P-FACTOR 1.75900	C-ZERO -0.00000							
9575-29	9575-29	1.58000	17.00000	25.20000	0.71760	1.01030	-0.04344	0.66232	35.32625	696.76700	0.03533	23.39737	0.02340	15.49661
B017V7	B017V7	4.26200	18.00000	32.07000	0.56220	1.07730	-0.02255	0.32804	53.37104	858.81141	0.05337	17.50778	0.01751	5.74323
Plant Matter	Plant Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		DELTA=	210.68502					SUMS=	88.69729	1555.57841	0.08870	40.90515	0.04091	21.23984
		Y @ MILK	REPORTED	CALCULATED		PRODUCT 1.33159	NBS CORR. 0.96800		REPORTED RESULTS	CALCULATED RESULTS		Calculated MDA	Reported Results > MDA ?	
		1 COMP=	NA	0.00193	*				0.00000	-0.00000	*	0.47032	No	
		2 COMP=	0.00000	-0.00000	*	P-FACTOR 1.75900	C-ZERO -0.00000							
9575-30	9575-30	1.58000	14.00000	25.20000	0.45030	0.98780	0.10397	0.66232	43.44623	1110.37086	4.51737	28.77674	2.99196	19.05949
B017W5	B017W5	5.51800	16.00000	25.44000	0.54620	1.00500	0.08314	0.23800	38.50479	915.41560	3.20977	9.18778	0.76391	2.18866
Plant Matter	Plant Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		DELTA=	302.00483					SUMS=	82.05301	2025.78646	7.72715	37.96453	3.75587	21.24814
		Y @ MILK	REPORTED	CALCULATED		PRODUCT 1.36594	NBS CORR. 0.96800		REPORTED RESULTS	CALCULATED RESULTS		Calculated MDA	Reported Results > MDA ?	
		1 COMP=	NA	0.17876	*				0.02775	0.02756	OK	0.35913	No	
		2 COMP=	0.04900	0.04908	OK	P-FACTOR 1.75900	C-ZERO 0.03593							
9575-36	9575-36	1.28700	16.00000	25.20000	0.54950	1.00780	0.08609	0.71473	37.90037	909.91811	3.26273	27.08850	2.33196	19.36093
B012M7	B012M7	5.24700	16.00000	25.51000	0.71180	1.01780	-0.06810	0.25536	38.51602	702.44451	0.03832	9.75446	0.00978	2.49856
Plant Matter	Plant Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

		ET	GROSS CTS	COUNT TIME	BKG CPM	SF	NET CPM	X	Ws	Wb	WY	WX	WXY	WX^2
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		DELTA=	306.43839					SUMS=	76.21639	1612.36261	3.30104	36.87298	2.34175	21.85951

Y @ MILK	REPORTED	CALCULATED		PRODUCT	NBS CORR.	REPORTED RESULTS	CALCULATED RESULTS		Calculated MDA	Reported Results > MDA ?
1 COMP=	0.10800	0.10713	OK	1.57112	0.96800	0.05263	0.05230	OK	0.34838	No
2 COMP=	NA	0.18523	*	P-FACTOR	C-ZERO					
				1.75900	0.06819					

9575-38	9575-38	1.98200	39.00000	25.12000	0.71760	1.01000	0.84330	0.59662	15.87621	896.78700	13.22139	9.35391	7.88812	5.58071
B01258	B01258	5.93700	34.00000	26.97000	0.54130	0.96730	0.69554	0.21542	20.75411	929.70220	14.44147	4.42899	3.06213	0.94533
PLant Matter	PLant Matter	6.90600	23.00000	26.18000	0.58220	1.07970	0.31995	0.16591	28.65701	858.81141	9.16884	4.75461	1.52124	0.78888
		8.02300	16.00000	25.74000	0.54620	1.00380	0.07569	0.12411	39.48115	915.41580	2.98822	4.90010	0.37067	0.60616
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		DELTA=	279.17818					SUMS=	104.57047	3394.69620	39.81992	23.43801	12.88237	7.92308

Y @ MILK	REPORTED	CALCULATED		PRODUCT	NBS CORR.	REPORTED RESULTS	CALCULATED RESULTS		Calculated MDA	Reported Results > MDA ?
1 COMP=	NA	1.62341	*	1.62969	0.96800	0.69406	0.69408	OK	0.38464	Yes
2 COMP=	1.47500	1.47477	OK	P-FACTOR	C-ZERO					
				1.75900	0.90494					

9575-48	9575-48	1.27400	26.00000	25.12000	0.64260	1.03740	0.40990	0.71715	23.40289	777.84892	9.52258	16.78326	6.82913	12.03813
B01343	B01343	4.53900	14.00000	25.51000	0.64560	1.03440	0.10015	0.30695	43.72108	774.47336	0.04572	13.42028	0.01342	4.11938
Plant Matter	Plant Matter	5.25000	14.00000	24.99000	0.44680	0.96620	0.11186	0.25517	42.76767	1119.06893	4.76394	10.91304	1.22072	2.78468
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		DELTA=	390.79265					SUMS=	109.89142	2671.38921	14.35025	41.11658	8.06327	18.94020

Y @ MILK	REPORTED	CALCULATED		PRODUCT	NBS CORR.	REPORTED RESULTS	CALCULATED RESULTS		Calculated MDA	Reported Results > MDA ?
1 COMP=	0.42500	0.42572	OK	1.45303	0.96800	0.22447	0.22472	OK	0.41402	No
2 COMP=	NA	0.75757	*	P-FACTOR	C-ZERO					
				1.75900	0.28299					

Sample #	9575-1		9575-11		9575-13		9575-14		9575-15		9575-18		9575-20		9575-21		9575-22		9575-23	
Cust. I.D. #	B017P3		B017Q5		B017Q9		B017P1		B017S7		B017P9		B01305		B017R1		B017R5		B017R7	
Type	Plant Matter		Plant Matter		Plant Matter		Plant Matter		Plant Matter		PLant Matter		Plant Matter		Plant Matter		Plant Matter		PLant Matter	
Final Result (ug/l)	1.01100		0.18100		0.27700		0.08000		0.68200		0.19100		1.24800		0.97300		1.25200		1.27700	
Prep Volume (l)	0.02000		0.02000		0.02000		0.02000		0.02000		0.02000		0.02000		0.02000		0.02000		0.02000	
Aliquot (g or l)	0.25000		0.25000		0.25000		0.25000		0.25000		0.25000		0.25000		0.25000		0.25000		0.25000	
Reported Results (ug/unit aliquot)	0.08100		0.01400		0.02200		0.00600		0.05500		0.01500		0.10000		0.07800		0.10000		0.10200	
Calculated Results (ug/unit aliquot	0.08088	OK	0.01448	OK	0.02216	OK	0.00640	OK	0.05456	OK	0.01528	OK	0.09984	OK	0.07784	OK	0.10016	OK	0.10216	OK
MDA	0.03700		0.03700		0.03700		0.03700		0.03700		0.03700		0.03700		0.03700		0.03700		0.03700	
Results > MDA ?	YES		NO		NO		NO		YES		NO		YES		YES		YES		YES	

Sample #	9575-25		9575-27		9575-29		9575-30		9575-38		9575-39		9575-48	
Cust. I.D. #	B017V5		B017W1		B017V7		B017W5		B012M7		B01258		B01343	
Type	Plant Matter		Plant Matter		Plant Matter		Plant Matter		Plant Matter		PLant Matter		Plant Matter	
Final Result (ug/l)	0.31000		0.81700		0.57200		0.65700		0.21600		0.37000		3.32800	
Prep Volume (l)	0.02000		0.02000		0.02000		0.02000		0.02000		0.02000		0.02000	
Aliquot (g or l)	0.25000		0.25000		0.25000		0.25000		0.25000		0.25000		0.25000	
Reported Results (ug/unit aliquot)	0.02500		0.06500		0.04600		0.05300		0.01700		0.03000		0.26600	
Calculated Results (ug/unit aliquot	0.02480	OK	0.08536	OK	0.04576	OK	0.05256	OK	0.01728	OK	0.02960	OK	0.26624	OK
MDA	0.03700		0.03700		0.03700		0.03700		0.03700		0.03700		0.03700	
Results > MDA ?	NO		YES		YES		YES		NO		NO		YES	

Sample #	9575-1		9575-11		9575-13		9575-14		9575-15		9575-18		9575-20		9575-21		9575-22		9575-23		9575-25	
Cust. I.D. #	B017P3		B017Q5		B017Q9		B017P1		B017S7		B017P9		B01305		B017R1		B017R5		B017R7		B017V5	
Type	Plant Matter		Plant Matter		Plant Matter		Plant Matter		Plant Matter		PLant Matte		Plant Matte		Plant Matte		Plant Matte		PLant Matte		Plant Matter	
Detector	G-1 JR		G-3 JR		G-1 JR		G-1 JR		G-2 JR		G-5 JR		G-3 JR		G-1 JR		G-5 JR		G-1 JR		G-3 JR	
Aliquot (g)	57.20000		61.87000		55.06000		52.90000		48.07000		55.80000		45.81000		50.51000		48.96000		55.59000		56.65000	
Counting Time (min)	129.27000		101.12000		1181.78000		112.70000		112.83000		388.45000		325.38000		548.53000		548.70000		100.65000		100.88000	
[Cobalt 60; CO-60]																						
Background CTS	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
Background CPM	0.03170		0.02110		0.03170		0.03170		0.07970		0.01170		0.02110		0.03170		0.01170		0.03170		0.02110	
Net CPM	0.14000		0.20900		0.05300		0.18400		0.15900		0.06100		0.07300		0.06800		0.04900		0.17600		0.17100	
Branch Fraction	1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000	
Efficiency	0.00388		0.00408		0.00388		0.00388		0.00324		0.00362		0.00408		0.00388		0.00362		0.00388		0.00408	
Reported Results (pCi/g)	<	*	<	*	<	*	<	*	<	*	<	*	<	*	<	*	<	*	<	*	<	*
Calculated Results	0.28415		0.37295		0.11175		0.40381		0.45986		0.13603		0.17593		0.15830		0.12984		0.36758		0.33328	
Reported MDA	0.31090	OK	0.40790	OK	0.12190	OK	0.44170	OK	0.50300	OK	0.14920	OK	0.19410	*	0.17100	OK	0.14100	OK	0.40330	OK	0.36470	OK
Calculated MDA	0.14811		0.12012		0.05133		0.17152		0.35820		0.05703		0.09044		0.08142		0.05702		0.17271		0.13134	
	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES
Results > MDA?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
[Cesium 137; Cs-137]																						
Background CTS	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
Background CPM	0.02830		0.03210		0.02830		0.02830		0.02700		0.00000		0.03210		0.02830		0.00000		0.02830		0.03210	
Net CPM	0.26300		0.22000		0.08200		0.26200		0.17600		0.08400		0.11600		0.11700		0.07200		0.30800		0.22500	
Branch Fraction	0.85100		0.85100		0.85100		0.85100		0.85100		0.85100		0.85100		0.85100		0.85100		0.85100		0.85100	
Efficiency	0.00794		0.00831		0.00794		0.00794		0.00664		0.00718		0.00831		0.00794		0.00718		0.00794		0.00831	
Reported Results (pCi/g)	<	*	<	*	<	*	<	*	<	*	<	*	<	*	<	*	<	*	<	*	<	*
Calculated Results	0.30652		0.22650		0.09928		0.33017		0.29187		0.11098		0.16129		0.15442		0.11303		0.38938		0.25299	
Reported MDA	0.31130	OK	0.22950	OK	0.10100	OK	0.33590	OK	0.29580	OK	0.11300	OK	0.16330	OK	0.15620	OK	0.11460	OK	0.37560	OK	0.25630	OK
Calculated MDA	0.08038		0.08548		0.02785		0.09308		0.11954		0.00000		0.06436		0.04418		0.00000		0.09371		0.09347	
	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES
Results > MDA?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	YES	YES	NO	NO	YES	YES	YES	YES
[Thorium 228; Th-228]																						
Background CTS	0.00000		0.00000		0.00000		0.00000		49.00000		224.00000		312.00000		721.00000		321.00000		0.00000		0.00000	
Background CPM	0.22680		0.19640		0.22680		0.23860		0.14470		0.27610		0.19220		0.23860		0.27610		0.23860		0.19220	
Net CPM	0.48500		0.37400		0.15400		0.54400		0.33900		0.19900		0.24100		0.21900		0.10800		0.54800		0.40500	
Branch Fraction	0.44800		0.44600		0.44800		0.44800		0.44800		0.44800		0.44800		0.44800		0.44800		0.44800		0.44800	
Efficiency	0.02269		0.02354		0.02269		0.02269		0.01844		0.01928		0.02354		0.02269		0.01928		0.02269		0.02354	
Reported Results (pCi/g)	<	*	<	*	<	*	<	*	<	*	<	*	<	*	<	*	0.15390	*	<	*	<	*
Calculated Results	0.37573		0.25820		0.12394		0.45570		0.38453		0.18599		0.22471		0.19213		0.11994		0.43524		0.30536	
Reported MDA	0.48140	*	0.33080	*	0.15840	*	0.58500	*	0.49400	*	0.23880	*	0.28820	*	0.24690	*	NA	*	0.55920	*	0.39180	*
Calculated MDA	0.15122		0.14178		0.05240		0.17661		0.37885		0.20406		0.25843		0.21754		0.20501		0.18086		0.15338	
	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	NO	NON DET	NO	NON DET	NO	DETECT	NO	NON DET	YES	NON DET	YES
Results > MDA?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES

Sample #	9575-27		9575-29		9575-30		9575-36		9575-38		9575-48	
Cust. I.D. #	B017W1		B017V7		B017W5		B012M7		B012S6		B01343	
Type	Plant Matter		Plant Matter		Plant Matte		Plant Matte		PLant Matt		Plant Matter	
Detector	G-1 JR		G-3 JR		G-5 JR		G-2 JR		G-5 JR		G-5 JR	
Aliquot (g)	56.78000		65.07000		65.72000		67.30000		76.51000		67.72000	
Counting Time (min)	100.98000		101.22000		101.35000		108.45000		108.68000		101.35000	
[Cobalt 60; CO-60]												
Background CTS	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
Background CPM	0.03170		0.02110		0.01170		0.07970		0.01170		0.01170	
Net CPM	0.19800		0.13800		0.14600		0.14300		0.16600		0.16200	
Branch Fraction	1.00000		1.00000		1.00000		1.00000		1.00000		1.00000	
Efficiency	0.00388		0.00408		0.00362		0.00324		0.00362		0.00362	
Reported Results (pCi/g)	<	*	<	*	<	*	<	*	<	*	<	*
Calculated Results	0.40484		0.23415		0.27844		0.29541		0.26998		0.29767	
Reported MDA	0.44370	OK	0.25590	OK	0.30340	OK	0.32350	OK	0.29560	OK	0.32580	OK
Calculated MDA	0.16882		0.11418		0.09480		0.26097		0.07864		0.09200	
	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES
Results > MDA?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
[Cesium 137; Cs-137]												
Background CTS	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
Background CPM	0.02830		0.03210		0.00000		0.02700		0.00000		0.00000	
Net CPM	0.27200		0.21300		0.20000		0.16100		0.16300		0.18300	
Branch Fraction	0.85100		0.85100		0.85100		0.85100		0.85100		0.85100	
Efficiency	0.00794		0.00831		0.00718		0.00664		0.00718		0.00718	
Reported Results (pCi/g)	<	*	<	*	<	*	<	*	<	*	<	*
Calculated Results	0.31935		0.20850		0.22435		0.19070		0.15706		0.19922	
Reported MDA	0.32420	OK	0.21160	OK	0.22820	OK	0.19340	OK	0.15930	OK	0.20260	OK
Calculated MDA	0.09159		0.06123		0.00000		0.08709		0.00000		0.00000	
	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES
Results > MDA?	YES	YES	YES	YES	NO	NO	YES	YES	NO	NO	NO	NO
[Thorium 228; Th-228]												
Background CTS	0.00000		94.00000		45.00000		0.00000		75.00000		38.00000	
Background CPM	0.23860		0.19220		0.27610		0.14470		0.27610		0.27610	
Net CPM	0.53600		0.71800		0.39500		0.32400		0.38400		0.27900	
Branch Fraction	0.44800		0.44800		0.44800		0.44800		0.44800		0.44800	
Efficiency	0.02269		0.02354		0.01928		0.01844		0.01928		0.01928	
Reported Results (pCi/g)	<	*	0.60530	*	<	*	<	*	0.33620	*	0.27610	*
Calculated Results	0.41832		0.47131		0.31345		0.26251		0.26174		0.21488	
Reported MDA	0.53760	*	NA	*	0.40260	*	0.33710	*	NA	*	NA	*
Calculated MDA	0.17676		0.32189		0.31170		0.13791		0.29949		0.28762	
	NON DET	YES	DETECT	YES	NON DET	YES	NON DET	YES	DETECT	NO	DETECT	NO
Results > MDA?	YES	YES	YES	NO	YES	YES	YES	YES	NO	NO	NO	YES

TMA/Norcal N1-12-057-9575

Biota Samples

Strontium 90

0.30 | MDA 1.000 | 2xMDA 2.000 | 5xMDA 5.000 | 0.60 | 1.50

Customer I.D. #	Original S	Duplicate D	RPD	Q
9575-59	0.150	0.220	37.838	
9575-60	0.160	0.090	56.000	
9575-61	0.020	-0.220	-240.000	
9575-62	0.380	0.170	76.364	
9575-63	-0.010	0.150	228.571	

Jor UJ

Total Uranium

0.037 | .074 | 0.185

MDA 1.000	2xMDA 2.000	5xMDA 5.000

Customer I.D. #	Original S	Duplicate D	RPD	Q
9575-70	0.081	0.089	9.412	ok
9575-71	0.022	0.012	58.824	
9575-72	0.037	0.037	0.000	

Gamma Spec

Colbolt 60

0.12 | MDA 0.010 | 2xMDA 0.020 | 5xMDA 0.050 | 0.24 | 0.60

Customer I.D. #	Original S	Duplicate D	RPD	Q
9575-79	0.311	0.305	2.046	
9575-80	0.347	0.539	43.404	ok
9575-81	0.250	0.239	4.505	

.539
.347
.192

Cesium 137

0.10 | MDA 0.010 | 2xMDA 0.020 | 5xMDA 0.050 | 0.20 | 0.50

Customer I.D. #	Original S	Duplicate D	RPD	Q
9575-79	0.311	-0.201	930.972	
9575-80	1.920	0.464	122.215	
9575-81	0.185	0.196	5.870	

ok

Thorium 228

0.16 | MDA 0.010 | 2xMDA 0.020 | 5xMDA 0.050 | 0.32 | 0.80

Customer I.D. #	Original S	Duplicate D	RPD	Q
9575-79	0.481	0.762	45.109	
9575-80	0.311	0.694	76.280	ok
9575-81	0.333	0.500	39.971	

.762
.481
.281

.694
.311
.383

LAB SAMPLE NUMBER:	9575-1	9575-11	9575-13	9575-14	9575-15	9575-18	9575-20
WHC SAMPLE NUMBER:	B017P3	B017Q5	B017Q9	B017P1	B017S7	B017P9	B01305
SAMPLE TYPE:	plant matter	plant matter	plant matter	plant matter	plant matter	plant matter	plant matter
COLLECTION DATE:	09/10/91	09/10/91	09/10/91	09/10/91	09/10/91	09/10/91	09/10/91
CHAIN OF CUSTODY:	11/26/91	11/26/91	11/26/91	11/26/91	11/26/91	11/26/91	11/26/91
STRONTIUM 90:							
DATE RUN:	05/14/92	05/14/92	05/14/92	05/15/92	05/14/92	05/16/92	05/16/92
TOTAL URANIUM:							
DATE RUN:	06/09/92	06/09/92	06/09/92	06/09/92	06/09/92	06/09/92	06/09/92
GAMMA SCAN							
DATE RUN:	05/16/92	05/16/92	05/16/92	05/18/92	05/18/92	05/18/92	05/18/92
COBALT 60:							
CESIUM 137:							
THORIUM 228:							

LAB SAMPLE NUMBER:	9575-21	9575-22	9575-23	9575-25	9575-27	9575-29	9575-30
WHC SAMPLE NUMBER:	B017R1	B017R5	B017R7	B017V5	BO17W1	B017V7	BO17W5
SAMPLE TYPE:	plant matter	plant matter	plant matter	plant matter	plant matter	plant matter	plant matter
COLLECTION DATE:	09/10/91	09/10/91	09/10/91	09/10/91	09/10/91	09/10/91	09/10/91
CHAIN OF CUSTODY:	11/26/91	11/26/91	11/26/91	11/26/91	11/26/91	11/26/91	11/26/91
STRONTIUM 90:							
DATE RUN:	05/16/92	05/16/92	05/16/92	05/16/92	05/16/92	05/16/92	05/16/92
TOTAL URANIUM:							
DATE RUN:	06/09/92	06/10/92	06/09/92	06/10/92	06/09/92	06/09/92	06/10/92
GAMMA SCAN							
DATE RUN:	05/19/92	05/19/92	05/19/92	05/19/92	05/19/92	05/19/92	05/19/92
COBALT 60:							
CESIUM 137:							
THORIUM 228:							

LAB SAMPLE NUMBER:	9575-36	9575-38	9575-48	9575-49	9575-50	9575-51	9575-52	9575-53
WHC SAMPLE NUMBER:	B012M7	B012S6	B01343	QC 7406	QC 7407	QC 7408	QC 7409	QC 7410
SAMPLE TYPE:	plant matter	plant matter	plant matter	Spike	Spike	Spike	Spike	Spike
COLLECTION DATE:	09/10/91	09/10/91	09/10/91					
CHAIN OF CUSTODY:	11/26/91	11/26/91	11/26/91					
STRONTIUM 90:								
DATE RUN:	05/16/92	05/16/92	05/16/92	05/14/92	05/14/92	05/16/92	05/16/92	05/16/92
TOTAL URANIUM:								
DATE RUN:	06/09/92	06/10/92	06/15/92					
GAMMA SCAN								
DATE RUN:	05/19/92	05/19/92	05/20/92					
COBALT 60:								
CESIUM 137:								
THORIUM 228:								

LAB SAMPLE NUMBER:	9575-54	9575-55	9575-56	9575-57	9575-58	9575-59	9575-60
WHC SAMPLE NUMBER:	QC 7411	QC 7412	QC 7413	QC 7414	QC 7415	QC 7416	QC 7417
SAMPLE TYPE:	Blank	Blank	Blank	Blank	Blank	Duplicate of 9575-1	Duplicate of 9575-2
COLLECTION DATE:							
CHAIN OF CUSTODY:							
STRONTIUM 90:							
DATE RUN:	05/14/92	05/14/92	05/16/92	05/16/92	05/16/92	05/14/92	05/14/92
TOTAL URANIUM:							
DATE RUN:							
GAMMA SCAN							
DATE RUN:							
COBALT 60:							
CESIUM 137:							
THORIUM 228:							

9613500.2185

LAB SAMPLE NUMBER:	9575-61	9575-62	9575-63	9575-64	9575-65	9575-66
WHC SAMPLE NUMBER:	QC 7418	QC 74719	QC 7420	QC 7421	QC 7422	QC 7423
SAMPLE TYPE:	Duplicate of 9575-3	Duplicate of 9575-4	Duplicate of 9575-5	Spike	Spike	Spike
COLLECTION DATE:						
CHAIN OF CUSTODY:						
STRONTIUM 90:						
DATE RUN:	05/16/92	05/16/92	05/16/92			
TOTAL URANIUM:						
DATE RUN:				06/11/92	06/11/92	06/11/92
GAMMA SCAN						
DATE RUN:						
COBALT 60:						
CESIUM 137:						
THORIUM 228:						

LAB SAMPLE NUMBER:	9575-67	9575-68	9575-69	9575-70	9575-71	9575-72
WHC SAMPLE NUMBER:	QC 7424	QC 7425	QC 7426	QC 7427	QC 7428	QC 7429
SAMPLE TYPE:	Blank	Blank	Blank	Duplicate of 9575-1	Duplicate of 9575-2	Duplicate of 9575-3
COLLECTION DATE:						
CHAIN OF CUSTODY:						
STRONTIUM 90:						
DATE RUN:						
TOTAL URANIUM:						
DATE RUN:	06/11/92	06/11/92	06/11/92	06/11/92	06/11/92	06/11/92
GAMMA SCAN						
DATE RUN:						
COBALT 60:						
CESIUM 137:						
THORIUM 228:						

LAB SAMPLE NUMBER:	9575-73	9575-74	9575-75	9575-76	9575-77	9575-78	9575-79
WHC SAMPLE NUMBER:	QC 7430	QC 7431	QC 7432	QC 7433	QC 7434	QC 7435	QC 7436
SAMPLE TYPE:	Spike	Spike	Spike	Blank	Blank	Blank	Duplicate of 9575-1
COLLECTION DATE:							
CHAIN OF CUSTODY:							
STRONTIUM 90:							
DATE RUN:							
TOTAL URANIUM:							
DATE RUN:							
GAMMA SCAN							
DATE RUN:	05/20/92	05/20/92	05/20/92	05/20/92	05/21/92	05/21/92	05/20/92
COBALT 60:							
CESIUM 137:							
THORIUM 228:							

COLLECTION DATE:		
CHAIN OF CUSTODY:		
STRONTIUM 90:		
DATE RUN:		
TOTAL URANIUM:		
DATE RUN:		
GAMMA SCAN		
DATE RUN:	05/20/92	05/20/92
COBALT 60:		
CESIUM 137:		
THORIUM 228:		

BEST AVAILABLE COPY

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e 6-53445

Date 9/10/91

book No. BNW 53573 + 52960

operty No. PNL92-219

SD-90 Total Gamma Scan

(Sign and Print Names)

ne:

6-91 1130

ne:

me:

me:

me:

A-6000-407 (12/90)

Westinghouse Hanford Company 9615600.2190

CHAIN OF CUSTODY

6 of 6

Custody Form Initiator NA. CADORET

Company Contact C.A. BRANDT Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7 Collection Date 9/10/91

Ice Chest No. CAB-1 Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 248 521 7592 Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED, 2130.0 samples for SR-90 TOTAL U Gamma Scan.

Sample Identification

B017R1

B017R5

B017R7

B017M2

☐ Field Transfer of Custody

CHAIN OF POSSESSION

(Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
NA CADORET	Kermit Blum	11-26-91 1130
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:

A-6000-407 (12/90)

Westinghouse Hanford Company 615500 2191

CHAIN OF CUSTODY

607

Custody Form Initiator NA. CADORET

Company Contact C.A. BRANDT

Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7

Collection Date 9/10/91

Ice Chest No. CAB-3

Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 2485217592

Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED; ~1300g samples for TCLP, SD-90 + Gamma Scan analysis.

Sample Identification

B017V5	B01364
B017W9	B012M7
B017W1	B012L5
B017V9	B012S6
B017V7	B012N4
B017W5	B012T0
B012S4	B01367
B012T6	B012M1
B012R8	B012N2
B012L7	B012M0

☐ Field Transfer of Custody

CHAIN OF POSSESSION

(Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
NA CADORET	Kermit Blum	11-26-91 1130
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:

A-6000-407 (12/90)

Westinghouse Hanford Company 9615500.2192

CHAIN OF CUSTODY

7087

Custody Form Initiator NA. CADORET

Company Contact C.A. BRANDT

Telephone 6-5345

Project Designation/Sampling Locations 300-FF-5 TASK 7

Collection Date 9/10/91

Ice Chest No. CAB-3

Field Logbook No. BNW 53573 + 52960

Bill of Lading/Airbill No. 2485217592

Offsite Property No. PNL92-219

Method of Shipment AIR

Shipped to TMA/NORCAL

Possible Sample Hazards/Remarks NONE DETECTED, ~1300 samples for Gamma Scan, Total U, SR-90 analysis.

Sample Identification

B012M5

B01365

B01340 *

B01343

☐ Field Transfer of Custody

CHAIN OF POSSESSION

(Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
NA CADORET	Hermit Blum	11-26-91 1130
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: * B01340 received broken.

A-6000-407 (12/90)

9413500.2195

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

4085

PART I: FIELD SECTION

Collector N. CADORET Date Sampled 9-10/91 Time N/A hours

Company Contact CA BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01333	1 - glass ~20 g	plant matter	ICP metal
B01326	9 sample		
B01337			
B01329			
B01249			
B01310			
B017R1	1 - glass ~130 g samples	plant matter	Gamma Scan, Sr-90, Total U
B017R5			
B017R7			
B017M2			

Field Information** from 300-FF-5 TASK 7

Special Handling and/or Storage N/A.

Possible Sample Hazards none detected.

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 11-26-91

Analysis Required

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

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

A-6000-406 (05/90)

9613500.2199

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

5985

PART I: FIELD SECTION

Collector N. CADORET Date Sampled 9-10/91 Time N/A hours

Company Contact C A BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B017P3	1 - glass, 20g. samples	plant matter	Gamma Scan, Total U, Sr-90.
B01362			
B017X1			
B012V8			
B012M6			
B012N9			
B01301			
B017Q3			
B017T7			
B017R3			
B01705			
B012X7			
1769			
B017P1			
B017S7			
B012V9			
B017Q7			
B017P9			
B017R9			
B01305			

Field Information** From 300-FF-5 Table 7

Special Handling and/or Storage N/A

Possible Sample Hazards none detected.

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 11-26-91

Analysis Required

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

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

A-6000-406 (05/90)

9613600.2195

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

686

PART I: FIELD SECTION

Collector N. CADORET Date Sampled 9-10/91 Time NA hours

Company Contact CA BRANDT Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B017V5	1 glass - 130g samples	plant matter	Total U, Sr-90, gamma scan
B017W3			
B017W1			
B017V9			
B017V7			
B017W5			
B012S4			
B012T6			
B012R7			
B012L7			
B01364			
B012M7			
1215			
B012S6			
B012N4			
B012T0			
B01367			
B012M1			
B012N2			
B012M0			

Field Information** From 300' EF-5, Tank 7

Special Handling and/or Storage NA.

Possible Sample Hazards none detected.

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 11-26-91

Analysis Required

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

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

A-6000-406 (05/90)

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST - FORM A-6

PROJECT: Westinghouse	REVIEWER: EH	DATE: 11-5-92
LABORATORY: TMA	CASE: N2-02-086	SDG: N2-02-086
SAMPLE/MATRIX: ~~B017Z8, B017~~ ~~xx~~ B1d2 4 samples		
~~B017Y0, B017Y1, B017Y2, B017Y3 xx~~		
B017X7, B017X8, B017X9, B017Y0		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	☑	☐	☐
Cover Page	☑	☐	☐
Traffic Reports	☑	☐	☐
Sample Data			
Inorganic Analysis Data Sheets	☑	☐	☐
Standards Data			
Initial and Continuing Calibration Verification	☑	☐	☐
CRDL Standard for AA and ICP	☑	☐	☐
QC Summary			
Blanks	☑	☐	☐
ICP Interference Check Summary	☑	☐	☐
Spike Sample Recovery	☑	☐	☐
Post-Digestion Spike Sample Recovery	☐	☐	☑
Duplicate	☑	☐	☐
Laboratory Control Sample	☑	☐	☐
Standard Addition Results	☑	☐	☐
ICP Serial Dilutions	☑	☐	☐
Instrument Detection Limits	☑	☐	☐
ICP Interelement Correction Factors	☑	☐	☐
ICP Linear Ranges	☑	☐	☐
Preparation Log	☑	☐	☐
Analysis Run Log	☑	☐	☐
Raw Data			
ICP Raw Data	☑	☐	☐
Furnace AA Raw Data	☐	☐	☑
Mercury Raw Data	☐	☐	☑
Cyanide Raw Data	☐	☐	☑
Additional Data			
Internal laboratory chain-of-custody	☑	☑	☐
Laboratory Sample Preparation Records	☑	☐	☐

Data Package Item	Present?: Yes	No	N/A
Percent Solids Analysis Records	☑	☐	☐
Reduction Formulae	☐	☑	☐
Instrument Run Logs	☐	☑	☐
Chemist notebook pages	☑	☐	☐

2. HOLDING TIMES (Form B-1)

Have all samples been analyzed within holding times? (Yes) No N/A

ACTION: If any holding times have been exceeded qualify all affected results as estimated (J for detects and UJ for nondetects).

3. INITIAL CALIBRATIONS (Form B-2)

Were all instruments calibrated daily, each set-up time and was the proper number of standards used? Yes No N/A

Are the correlation coefficients ≥0.995? Unknown Yes No N/A

Was a midrange cyanide standard distilled? Yes No (N/A)

ACTION: Qualify all data as unusable if reported from an analysis in which an instrument was not calibrated or was calibrated with less than the minimum number of standards. Qualify associated sample results >IDL as estimated (J) and results <IDL as estimated (UJ), if the correlation coefficient is <0.0995 or the laboratory did not distill the midrange cyanide standard.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION (Form B-2)

Are ICV and CCV percent recoveries within control limits? (Yes) No N/A

Are there calculation errors? Yes (No) N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

5. ICP INTERFERENCE CHECK SAMPLE (Form B-2)

Has an ICS sample been analyzed at the proper frequency? (Yes) No N/A

Are the AB solution %R values within control? (Yes) No N/A

Are there calculation errors? Yes (No) N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

6. LABORATORY BLANKS (Form B-3)

Are target compounds present in the blanks? Yes No N/A

ACTION: Qualify all associated positive results for any analyte <5 times the amount in any laboratory blank as nondetected (U). If analyte concentrations in the blank are >CRDL or below the negative CRDL, verify the laboratory has redigested and reanalyzed associated samples with analyte concentrations <10 times the blank concentration. If the laboratory has not redigested and reanalyzed the samples, note in the validation narrative.

7. FIELD BLANKS (Form B-3) No field blanks.

Are target analytes present in the field blanks? Yes No N/A

ACTION: Qualify all sample results for any analyte <5 times the amount in any field blank as nondetected (U).

8. MATRIX SPIKE SAMPLE ANALYSIS (Form B-4)

Are spike recoveries within the control limits? Yes No N/A

ACTION: Qualify the affected sample data according to the following requirements:

If spike recovery is >125% and sample results are <IDL no qualification is required. If spike recovery is >125% or <75% qualify all positive results as estimated (J). If spike recovery is 30% to 74% qualify all nondetects as estimated (UJ). If spike recovery is <30%, reject all nondetects (R). If the field blank has been used for spike analysis, note in the validation narrative.

9. LABORATORY CONTROL SAMPLE (Form B-4)

Are percent recoveries within the acceptance limits? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify the sample data according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results >IDL, for which the LCS %R falls within the range 50-79% or >120%. Qualify as estimated (UJ), all sample results <IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R <50%.

SOLID LCS - Qualify as estimated (J), all sample results >IDL for which the LCS result is outside the established control limits. Qualify as estimated (UJ), all sample results <IDL for which the LCS %R are lower than the established control limits.

10. PERFORMANCE AUDIT ANALYSIS

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample analysis in the data validation narrative.

11. DUPLICATE SAMPLE ANALYSIS (Form B-5)

Are RPD values acceptable? Yes No N/A

ACTION: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD results fall outside the appropriate control limits. If field blanks were used for laboratory duplicates, note in the validation narrative.

12. ICP SERIAL DILUTION (Form B-6)

Are the serial dilution results acceptable? Yes No N/A

Is there evidence of negative interference? Yes No N/A

ACTION: Qualify the associated data as estimated (J) for those analytes in which the %D is outside the control limits. If evidence of negative interference is found, use professional judgement to qualify the data.

13. FIELD DUPLICATE SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field duplicate samples in the validation narrative.

14. FIELD SPLIT SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field split samples in the validation narrative.

15/16. FURNACE ATOMIC ABSORPTION QUALITY CONTROL (Form B-6)

Do all applicable analyses have duplicate injections? Yes No N/A

Are applicable duplicate injection RSD values within control limits? Yes No N/A

If no, were samples rerun once as required? Yes No N/A

Does the RSD for the rerun fall within the control limits? Yes No N/A

Were analytical spike recoveries within the control limits? Yes No N/A

If no, were MSA analyses performed when required?	Yes	No	N/A
Are MSA correlation coefficients ≥0.995?	Yes	No	N/A
If no, was a second MSA analysis performed?	Yes	No	N/A

ACTION: If duplicate injections are outside the acceptance limits and the sample has not been reanalyzed or the reanalysis is outside the acceptance limits, qualify the associated data as estimated (J for detects and UJ for nondetects). If the analytical spike recovery is <40% qualify detects as estimated (J). If the analytical spike recovery is ≥10% but <40%, qualify all nondetects as estimated (UJ) and if the analytical spike recovery is <10%, reject all nondetects (R). If the sample absorbance is <50% of the analytical spike absorbance and the analytical spike recovery is <85% or >115%, qualify all results as estimated (J for detects and UJ for nondetects). If method of standard additions (MSA) was required but was not performed, the MSA samples were spiked incorrectly, or the MSA correlation coefficient was <0.995, qualify the associated detected results as estimated (J).

17. ANALYTE QUANTITATION AND DETECTION LIMITS (Form B-6)

Have results been reported and calculated correctly?	Yes	No	N/A
Are results within the calibration range of the instruments and within the linear range of the ICP?	Yes	No	N/A
Are all detection limits below the CRQL?	Yes	No	N/A

ACTION: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

18. OVERALL ASSESSMENT AND SUMMARY (Form B-7)

Have the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

1. Correlation coefficient calculations for ICP not available. Qualify all results as "J" or "UJ" as appropriate.

2

HOLDING TIME SUMMARY - FORM B-1

SDG: B017X7	REVIEWER: D. Anderson			DATE: 11/23/92		PAGE___OF___	
COMMENTS: Case No. N2-02-086							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B017X7	ICP METALS	9/10/91	2/27/92	3/9/92		~~180~~ 140	NONE
B017X8							
B017X9							
B017X0							
B017X1							
B017X2							
B017X3							

CALIBRATION DATA SUMMARY - FORM B-2

SDG: B017X7	REVIEWER: D. Anderson	DATE: 11/23/92		PAGE____OF____	
COMMENTS: Cas No. N2-02-86		All initial and Continuing Calibrations are acceptable			
CALIB. TYPE: (INITIAL) ~~CONTINUING~~		INSTRUMENT: ICP			
CALIB. DATE	COMPOUND	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER
3/9/92	All No MEA Correlation	Coefficients provided		All	J

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG: B017~~X~~7 REVIEWER: Dr. Anderson DATE: 11/23/92 PAGE___OF___

COMMENTS: Cas No. N2-02-086

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
	Calcium	14.69	B		ug/L	73.45	146.90	none	none
	Iron	4.22	B		ug/L	21.10	42.20	none	non
	Nickel	0.89	B		ug/L	4.45	8.90	none	none
	Sodium	24.26	B		ug/L	121.30	242.60	none	none
	Zinc	2.79	B		ug/L	13.95	27.90	none	none

ACCURACY DATA SUMMARY - FORM B-4

SDG: B017X7	REVIEWER: D. Anderson	DATE: 11/23/92	PAGE____OF____	
COMMENTS: Case No. N2-02-086				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B017X8S	Antimony	88.5	None	None
	Barium	96.4		
	Beryllium	97.9		
	Cadmium	93.7		
	Chromium	92.7		
	Cobalt	94.2		
	Copper	96.3		
	Manganese	93.4		
	Nickel	93.0		
	Silver	~~103.0~~ 103.3 DO 11/23/92		
	Vanadium	95.3		
	Zinc	92.0		

PRECISION DATA SUMMARY - FORM B-5

SDG: B017X7 | REVIEWER D. Anderson | DATE: 11/23/92 | PAGE___OF___

COMMENTS: Cas No. N2-02-086

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Aluminum	B017X7D	B017X7	9.4	none	none
Barium			1.6		
Calcium			2.7		
Chromium			25.0		
Copper			9.3		
Iron			2.4		
Magnesium			2.5		
Manganese			1.9		
Nickel			10.5		
Potassium			1.8		
Sodium			2.6		
Vanadium			16.6		
Zinc			5.2		

CALCULATION SUMMARY - FORM B-6

SDG:	REVIEWER:	DATE:	PAGE___OF___
COMMENTS:			

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: B017X7	REVIEWER: DA	DATE: 11/23/92	PAGE___OF___
COMMENTS: Cas No. N2-02-086			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Qualify all results as "J" or "UJ" as appropriate			Correlation coefficient NOT Available.

TELEPHONE CONTACT SUMMARY - FORM B-8

REVIEWER:	DATE:	TIME:	PAGE___OF ___
COMPANY:			
ADDRESS:			
PERSON CONTACTED:			
TELEPHONE:		FAX:	
PROJECT/CASE/SDG:			
REMARKS:			
ACTION:			

HC...-WHC/9306-1-92-110 E-93-06/2978-50 Tr. # X01326

9613508.2010

WESTINGHOUSE HANFORD COMPANY
300-FF-5 RI DATA VALIDATION
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Project Files (1=Adm; 2=Corres; 3=Source Information; 4=Technical Data & Products)

1.1 File Index		2.1 Incoming Correspondence		4.4.5 Biota/Small Mammals	X
1.2 Distribution Lists		2.2 Outgoing Correspondence	X	4.4.6 Surface Water Sediments	
1.3 Project Procedures		2.3 Internal Correspondence		4.5 Data Val. & Qual. Summary Rpts.	
1.4 Project Modifications				4.5.1 Round 1 Groundwater	
1.5.1 Staff Resumes		3.1 Task Order		4.5.1.1 Internal Drafts/Comments/Resol.	
1.5.2 Staff Training		3.2 Sample Lists		4.5.1.2 WHC Review Draft/Comments/Resol.	
1.5.3 Auth.-Former Site Employee		3.3 Data Validation Procedures		4.5.1.3 Final Report	
1.6.1 QA Manual		3.4 Original Chemical Data		4.5.2 Round 2 Groundater	
1.6.2 QA Imolementation		3.5 Original Radiochem Data		4.5.2.1 Internal Drafts/Comments/Resol.	
1.6.3.1 QA Audits-Deliverables				4.5.2.2 WHC Review Draft/Comments/Resol.	
1.6.3.2 QA Audits-Files		4.1 Task Plan		4.5.2.3 Final Report	
1.6.4.1 Audit Resps-Deliverables		4.2 Data Pkg. Completeness Verif.		4.5.3 Round 3 Groundwater	
1.6.4.2 Audit Resps-Files		4.2.1 Checklists - Round 1 GW		4.5.3.1 Internal Drafts/Comments/Resol.	
1.6.5 Training		4.2.2 Checklists - Round 2 GW		4.5.3.2 WHC Review Draft/Comments/Resol.	
1.6.6.1 QA Manual Doc Log		4.2.3 Checklists - Round 3 GW		4.5.3.3 Final Report	
1.6.6.2 Procedures Doc Log		4.2.4 Checklists - Round 4 GW		4.5.4 Round 4 Groundwater	
1.6.6.3 Plans Document Log		4.2.5 Checklists - Biota/Small Mam.		4.5.4.1 Internal Drafts/Comments/Resol.	
1.6.6.4 Deliverables Doc Log		4.2.6 Checklists - Surface Wtr./Sed.		4.5.4.2 WHC Review Draft/Comments/Resol.	
1.7.1 Downloads		4.3 Data Val. Calcs./Annotated DP		4.5.4.3 Final Report	
1.7.2 M-113s		4.3.1 Round 1 Groundwater		4.5.5 Biota/Small Mammals	
1.7.3 A-208s		4.3.2 Round 2 Groundwater		4.5.5.1 Internal Drafts/Comments/Resol.	
1.7.4 Budget Status		4.3.3 Round 3 Groundwater		4.5.5.2 WHC Review Draft/Comments/Resol.	
1.7.5 Invoices		4.3.4 Round 4 Groundwater		4.5.5.3 Final Report	
1.8.1 Requisitions		4.3.5 Biota/Small Mammals		4.5.6 Surface Water/Sediments	
1.9 Meeting Minutes		4.3.6 Surface Water/Sediments		4.5.6.1 Internal Drafts/Comments/Resol.	
1.10 Record of Telecons		4.4 Preliminary QA Records		4.5.6.2 WHC Review Draft/Comments/Resol.	
1.11 Progress Reports		4.4.1 Round 1 Groundwater		4.5.6.3 Final Report	
1.12 Subcontractor (HC)		4.4.2 Round 2 Groundwater	[redacted]	4.6 Weekly Status Reports	
		4.4.3 Round 3 Groundwater		4.7 Weekly Management Reports	
		4.4.4 Round 4 Groundwater			

9613500.2211

HARTCROWSER

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1201 Jadwin Avenue, Suite 204
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FAX 509.946.4203
509.946.4344

Earth and Environmental Technologies

2978-50

December 17, 1992

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

Subject: WHC Order No. MLW-SVV-037106
Task Order No. E-93-06
Preliminary Quality Assurance Record - 300-FF-5 RI/FS
TMA Case Number N1-12-032-9571

Dear Mr. Hulstrom:

Ebasco and Hart Crowser are pleased to provide you with the attached results of our review and validation of the subject data from the 300-FF-5 Operable Unit Remedial Investigation/Feasibility Study (RI/FS). The attached results are provided to you in partial fulfillment of Subtask 03 of our task plan dated November 6, 1992. The subject data package consisted of 33 biota (vegetation) samples submitted for the following radiochemical analyses: strontium 90, total uranium, and gamma scan. The samples were analyzed by Thermo Analytical, Inc. according to requirements specified in the Analytical Laboratory Statement of Work issued by WHC. Six of the analytical results were selected for validation as being representative of the entire package. These results, together with the data qualifiers assigned are provided in Attachment 4. The results of all samples in this package and any qualifiers assigned as a result of our review will be presented in the summary report.

DATA QUALITY OBJECTIVES SUMMARY

Data quality objectives for these analyses were generally not met. The contract required detection limits (CRDLs) for two analytes of interest, cobalt 60 and cesium 137, were not met. Holding times for all samples exceeded the maximum time (six months). In addition, a review of the sample QA/QC samples identified poor precision in every case.

9615500.2212

MAJOR DEFICIENCIES (REJECTED DATA)

All gamma scan results were rejected because the reported minimum detectable activities (MDAs) were higher than the CRDLs listed in the 300 FF-5 RI/FS Work Plan. For the two analytes of concern evaluated, cobalt 60 and cesium 137, the difference is nearly an order of magnitude. This discrepancy could result in unacceptable risk projection errors due to improper classification of activity results.

MINOR DEFICIENCIES (OTHER QUALIFIED DATA)

The following general trends resulting in the qualification of data from multiple samples have been noted. All qualified data are discussed in Attachments 3 and 5.

Method precision for all analyses failed to meet requirements. This trend resulted from the use of replicate samples containing nondetectable levels of analyte. Poor or undetermined precision resulted in qualifying all results, not otherwise rejected, as estimated (J or UJ).

Holding times for all samples exceeded the maximum time of 6 months. The average holdings time was seven to eight months. This deficiency resulted in qualifying all results, not otherwise rejected, as estimated. All blank results were acceptable.

Although not used as a factor for qualifying data, it should be noted that the minimum number of QA/QC duplicate samples required in the Data Validation Procedure for Radiological Analysis, WHC-SD-EN-SPP-001, were not analyzed in all cases. For thirty three samples, the data validation procedure requires three duplicate samples. In this data package, strontium 90 analysis included three duplicates. All of the others contained two.

9613500.2213

We trust that these preliminary results meet your needs. Our qualifier assignments will be finalized at the time the summary report for this sampling round is published. The final qualifiers may vary from those presented here, reflecting any trends in data quality or laboratory performance observed over the course of the 300-FF-5 RI/FS. Please contact me if you have any questions with regard to our activities.

Sincerely,

HART CROWSER, INC.

D. MARK GERBOTH, P.E.
Project Manager
HC#130:RL1550.DOC

Attachments

cc: Mark Gerboth (w/o attachments)
Jeff Grover (w/o attachments)
Westinghouse EDMC
Project File - HCRL-WHC/9306-L-92-061

THIS APPENDIX CONSISTS OF FIVE ATTACHMENTS

Attachment 1 - Glossary of Data Qualifiers

This attachment provides a glossary explaining all data qualifiers applied as a result of the validation.

Attachment 2 - As Received Laboratory Sample Concentration Reports

This attachment provides a copy of the as-received sample concentration reports. This may be a tabular summary similar to that provided in Attachment 4, or may be a copy of the laboratory reports.

Attachment 3 - Summary of Data Qualifications

This attachment provides a complete summary of all qualifications applied as a result of the validation.

Attachment 4 - As Qualified Data Summary

This attachment provides a tabular data summary of all data qualified from the validation.

Attachment 5 - Data Review Supporting Documentation

This attachment provides copies of the data validation checklists, data summary forms, telephone contact memoranda and other documentation completed as a result of the data validation.

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ATTACHMENT 1

Glossary of Data Qualifiers

9613500.2216

ATTACHMENT 1

Glossary of Data Qualifiers

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

UJ - Indicates the compound or analyte was analyzed for and not detected. Due to quality control deficiencies identified during data validation the value reported may not accurately reflect the sample quantitation limit.

J - Indicates the compound or analyte was analyzed for and detected. The associated value is estimated but the data are useable for decision making processes.

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

9613500.2217

ATTACHMENT 2

As Received Laboratory Sample Concentration Reports

ATTACHMENT 1 DATA TABLE

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012X6 (Plant Matter)	1	^{90}Sr	(-2 ± 4)	E-01
		Total Uranium	0.032 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.056 ± 0.242)	E+01
		^{51}Cr	<2.964	E+02
		^{60}Co	<2.194	E-01
		^{65}Zn	<7.035	E-01
		^{134}Cs	<2.381	E-01
		^{137}Cs	<1.739	E-01
		^{226}Ra	<3.287	E-01
		^{228}Th	<3.908	E-01
		^{232}Th	<7.594	E-01
B012Z0 (Plant Matter)	2	^{90}Sr	(1.4 ± 0.6) E+00	
		Total Uranium	0.031 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.055 ± 0.308)	E+01
		^{51}Cr	<3.606	E+02
		^{60}Co	<2.430	E-01
		^{65}Zn	<8.902	E-01
		^{134}Cs	<2.187	E-01
		^{137}Cs	<1.434	E-01
		^{226}Ra	<3.419	E-01
		^{228}Th	<3.022	E-01
		^{232}Th	<8.842	E-01
B012Z2 (Plant Matter)	3	^{90}Sr	(0.5 ± 1)	E-01
		Total Uranium	0.196 ± 0.032 (1)	
		Gamma Scan:		
		^{40}K	(1.222 ± 0.492)	E+01
		^{51}Cr	<7.633	E+02
		^{60}Co	<4.732	E-01
		^{65}Zn	<1.808	E-01
		^{134}Cs	<5.075	E-01
		^{137}Cs	<4.447	E-01
		^{226}Ra	<8.148	E-01
		^{228}Th	<6.845	E-01
		^{232}Th	<1.633	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012Y8 (Plant Matter)	4	^{90}Sr	(2 ± 7)	E-01
		Total Uranium	0.031 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.067 ± 0.334)	E+01
		^{51}Cr	<2.809	E+02
		^{60}Co	<2.916	E-01
		^{65}Zn	<9.990	E-01
		^{134}Cs	<2.786	E-01
		^{137}Cs	<2.004	E-01
		^{226}Ra	<3.928	E-01
		^{228}Th	<2.653	E-01
		^{232}Th	<9.354	E-01
B012Y1 (Plant Matter)	5	^{90}Sr	(-0.1 ± 0.1)	E+00
		Total Uranium	0.041 ± 0.008 (1)	
		Gamma Scan:		
		^{40}K	(1.149 ± 0.449)	E+01
		^{51}Cr	<7.220	E+02
		^{60}Co	<3.706	E-01
		^{65}Zn	<1.609	E+00
		^{134}Cs	<4.791	E-01
		^{137}Cs	<3.375	E-01
		^{226}Ra	<7.008	E-01
		^{228}Th	<6.271	E-01
		^{232}Th	<1.458	E-01
B012Y3 (Plant Matter)	6	^{90}Sr	(0.02 ± 2)	E-01
		Total Uranium	0.029 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.095 ± 0.288)	E+01
		^{51}Cr	<3.658	E+02
		^{60}Co	<3.205	E-01
		^{65}Zn	<1.085	E+00
		^{134}Cs	<2.178	E-01
		^{137}Cs	<1.623	E-01
		^{226}Ra	<2.662	E-01
		^{228}Th	<2.636	E-01
		^{232}Th	<8.171	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012Y0 (Plant Matter)	7	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.133 ± 0.022 (1)	
		Gamma Scan:		
		^{40}K	(1.585 ± 0.412)	E+01
		^{51}Cr	<5.717	E+02
		^{60}Co	<3.748	E-01
		^{65}Zn	<1.310	E+00
		^{134}Cs	<2.870	E-01
		^{137}Cs	<2.072	E-01
		^{226}Ra	<4.896	E-01
		^{228}Th	<4.364	E-01
		^{232}Th	<1.229	E-01
B012N8 (Plant Matter)	8	^{90}Sr	(0 ± 1)	E+00
		Total Uranium	0.029 ± 0.005 (1)	
		Gamma Scan:		
		^{40}K	(1.307 ± 0.375)	E+01
		^{51}Cr	<4.589	E+02
		^{60}Co	<2.331	E-01
		^{65}Zn	<9.359	E-01
		^{134}Cs	<2.363	E-01
		^{137}Cs	<2.050	E-01
		^{226}Ra	<5.060	E-01
		^{228}Th	<4.439	E-01
		^{232}Th	<1.024	E+00
B012X9 (Plant Matter)	9	^{90}Sr	(0 ± 1)	E+00
		Total Uranium	0.028 ± 0.005 (1)	
		Gamma Scan:		
		^{40}K	(1.028 ± 0.311)	E+01
		^{51}Cr	<3.503	E+02
		^{60}Co	<3.273	E-01
		^{65}Zn	<8.059	E-01
		^{134}Cs	<3.334	E-01
		^{137}Cs	<1.721	E-01
		^{226}Ra	<2.499	E-01
		^{228}Th	<2.725	E-01
		^{232}Th	<6.670	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page four)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012Y6	10	^{90}Sr	(-2 ± 3)	E-01
(Plant Matter)		Total Uranium	0.027 ± 0.005 (1)	
		Gamma Scan:		
		^{40}K	(1.330 ± 0.343)	E+01
		^{51}Cr	<4.210	E+02
		^{60}Co	<2.031	E-01
		^{65}Zn	<8.333	E-01
		^{134}Cs	<2.324	E-01
		^{137}Cs	<2.146	E-01
		^{226}Ra	<3.670	E-01
		^{228}Th	<3.299	E-01
		^{232}Th	<9.509	E-01
B012Y2	11	^{90}Sr	(-0.4 ± 2)	E+00
(Plant Matter)		Total Uranium	0.033 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.216 ± 0.291)	E+01
		^{51}Cr	<3.139	E+02
		^{60}Co	<2.164	E-01
		^{65}Zn	<9.908	E-01
		^{134}Cs	<2.268	E-01
		^{137}Cs	<1.375	E-01
		^{226}Ra	<3.932	E-01
		^{228}Th	<3.333	E-01
		^{232}Th	<8.473	E-01
B017X6	12	^{90}Sr	(1 ± 2)	E-01
(Plant Matter)		Total Uranium	0.031 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.046 ± 0.293)	E+01
		^{51}Cr	<3.672	E+02
		^{60}Co	<2.279	E-01
		^{65}Zn	<8.911	E-01
		^{134}Cs	<2.671	E-01
		^{137}Cs	<1.953	E-01
		^{226}Ra	<3.740	E-01
		^{228}Th	<2.853	E-01
		^{232}Th	<9.588	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page five)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012L6 (Plant Matter)	13	^{90}Sr	(-3 ± 5)	E-01
		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	<3.544	E+00
		^{51}Cr	<3.804	E+02
		^{60}Co	<3.745	E-01
		^{65}Zn	<9.799	E-01
		^{134}Cs	<2.109	E-01
		^{137}Cs	<1.936	E-01
		^{226}Ra	<3.698	E-01
		^{228}Th	<3.452	E-01
		^{232}Th	<6.296	E-01
B012W5 (Plant Matter)	14	^{90}Sr	(2 ± 2)	E-01
		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	(1.243 ± 0.333)	E+01
		^{51}Cr	<3.760	E+02
		^{60}Co	<2.580	E-01
		^{65}Zn	<1.030	E+00
		^{134}Cs	<2.495	E-01
		^{137}Cs	<1.980	E-01
		^{226}Ra	<3.804	E-01
		^{228}Th	<3.372	E-01
		^{232}Th	<9.269	E-01
B012Z9 (Plant Matter)	15	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.031 ± 0.005 (1)	
		Gamma Scan:		
		^{40}K	(7.723 ± 2.330)	E+00
		^{51}Cr	<3.422	E+02
		^{60}Co	<1.457	E-01
		^{65}Zn	<6.063	E-01
		^{134}Cs	<2.527	E-01
		^{137}Cs	<1.729	E-01
		^{226}Ra	<3.131	E-01
		^{228}Th	<3.729	E-01
		^{232}Th	<7.232	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page six)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012W0 (Plant Matter)	16	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.041 ± 0.007 (1)	
		Gamma Scan:		
		^{40}K	(1.256 ± 0.441)	E+01
		^{51}Cr	<5.598	E+02
		^{60}Co	<3.825	E-01
		^{65}Zn	<1.246	E+00
		^{134}Cs	<3.619	E-01
		^{137}Cs	<2.543	E-01
		^{226}Ra	<5.993	E-01
		^{228}Th	<3.738	E-01
		^{232}Th	<1.168	E+00
B01346 (Plant Matter)	17	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.330 ± 0.055 (1)	
		Gamma Scan:		
		^{40}K	(8.644 ± 3.969)	E+00
		^{51}Cr	<5.475	E+02
		^{60}Co	<5.577	E-01
		^{65}Zn	<1.680	E+00
		^{134}Cs	<3.852	E-01
		^{137}Cs	<2.931	E-01
		^{226}Ra	<5.952	E-01
		^{228}Th	<4.476	E-01
		^{232}Th	<1.365	E+00
B01357 (Plant Matter)	18	^{90}Sr	(2 ± 2)	E-01
		Total Uranium	0.280 ± 0.047 (1)	
		Gamma Scan:		
		^{40}K	(1.116 ± 0.342)	E+01
		^{51}Cr	<3.718	E+02
		^{60}Co	<2.411	E-01
		^{65}Zn	<7.321	E-01
		^{134}Cs	<2.234	E-01
		^{137}Cs	<2.115	E-01
		^{226}Ra	<3.076	E-01
		^{228}Th	<3.153	E-01
		^{232}Th	<7.158	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page seven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B01329 (Plant Matter)	19	^{90}Sr	(0.4 ± 2)	E-01
		Total Uranium	0.063 ± 0.011 (1)	
		Gamma Scan:		
		^{40}K	(9.906 ± 3.266)	E+00
		^{51}Cr	<3.635	E+02
		^{60}Co	<2.593	E-01
		^{65}Zn	<9.114	E-01
		^{134}Cs	<2.459	E-01
		^{137}Cs	<2.159	E-01
		^{226}Ra	<3.837	E-01
		^{228}Th	<4.110	E-01
		^{232}Th	<1.008	E+00
B01351 (Plant Matter)	20	^{90}Sr	(1 ± 4)	E-01
		Total Uranium	0.021 ± 0.004 (1)	
		Gamma Scan:		
		^{40}K	(1.254 ± 0.316)	E+00
		^{51}Cr	<2.917	E+02
		^{60}Co	<2.635	E-01
		^{65}Zn	<8.972	E-01
		^{134}Cs	<1.638	E-01
		^{137}Cs	<1.472	E-01
		^{226}Ra	<3.609	E-01
		^{228}Th	<3.104	E-01
		^{232}Th	<8.572	E-01
B01353 (Plant Matter)	21	^{90}Sr	(2 ± 2)	E-01
		Total Uranium	0.233 ± 0.039 (1)	
		Gamma Scan:		
		^{40}K	(1.357 ± 0.345)	E+01
		^{51}Cr	<3.899	E+02
		^{60}Co	<2.269	E-01
		^{65}Zn	<1.040	E+00
		^{134}Cs	<2.823	E-01
		^{137}Cs	<2.061	E-01
		^{226}Ra	<3.353	E-01
		^{228}Th	<3.238	E-01
		^{232}Th	<9.507	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page eight)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B01334 (Plant Matter)	22	^{90}Sr	(0.04 ± 1)	E+00
		Total Uranium	0.240 ± 0.040 (1)	
		Gamma Scan:		
		^{40}K	(1.341 ± 0.433)	E+01
		^{51}Cr	<6.522	E+02
		^{60}Co	<3.860	E-01
		^{65}Zn	<1.117	E+00
		^{134}Cs	<3.893	E-01
		^{137}Cs	<3.826	E-01
		^{226}Ra	<6.166	E-01
		^{228}Th	<7.790	E-01
		^{232}Th	<1.268	E+00
B01356 (Plant Matter)	23	^{90}Sr	(6 ± 2)	E-01
		Total Uranium	0.330 ± 0.055 (1)	
		Gamma Scan:		
		^{40}K	(9.254 ± 3.422)	E+00
		^{51}Cr	<4.280	E+02
		^{60}Co	<3.475	E-01
		^{65}Zn	<1.211	E+00
		^{134}Cs	<3.128	E-01
		^{137}Cs	<1.960	E-01
		^{226}Ra	<4.145	E-01
		^{228}Th	<3.318	E-01
		^{232}Th	<1.095	E-01
B01341 (Plant Matter)	24	^{90}Sr	(2 ± 3)	E-01
		Total Uranium	0.067 ± 0.011 (1)	
		Gamma Scan:		
		^{40}K	(1.007 ± 0.270)	E+01
		^{51}Cr	<3.731	E+02
		^{60}Co	<1.664	E-01
		^{65}Zn	<7.745	E-01
		^{134}Cs	<3.235	E-01
		^{137}Cs	<1.943	E-01
		^{226}Ra	<3.892	E-01
		^{228}Th	<3.908	E-01
		^{232}Th	(7.472 ± 5.512)	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page nine)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B01310 (Plant Matter)	25	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.044 ± 0.007 (1)	
		Gamma Scan:		
		^{40}K	(1.587 ± 0.432)	E+01
		^{51}Cr	<4.947	E+02
		^{60}Co	<3.827	E-01
		^{65}Zn	<1.682	E+00
		^{134}Cs	<4.010	E-01
		^{137}Cs	<3.177	E-01
		^{226}Ra	<5.911	E-01
		^{228}Th	<4.049	E-01
		^{232}Th	<1.657	E+00
B01347 (Plant Matter)	26	^{90}Sr	(-0.1 ± 1)	E+00
		Total Uranium	0.017 ± 0.003 (1)	
		Gamma Scan:		
		^{40}K	(8.979 ± 3.634)	E+00
		^{51}Cr	<5.365	E+02
		^{60}Co	<3.678	E-01
		^{65}Zn	<9.285	E-01
		^{134}Cs	<3.023	E-01
		^{137}Cs	<2.413	E-01
		^{226}Ra	<4.246	E-01
		^{228}Th	<5.365	E-01
		^{232}Th	<1.102	E+00
B01328 (Plant Matter)	27	^{90}Sr	(1 ± 3)	E-01
		Total Uranium	0.065 ± 0.011 (1)	
		Gamma Scan:		
		^{40}K	(1.366 ± 0.419)	E+01
		^{51}Cr	<5.356	E+02
		^{60}Co	<3.765	E-01
		^{65}Zn	<1.332	E+00
		^{134}Cs	<3.495	E-01
		^{137}Cs	<2.510	E-01
		^{226}Ra	<3.546	E-01
		^{228}Th	<3.567	E-01
		^{232}Th	<1.279	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page ten)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B01331 (Plant Matter)	28	^{90}Sr	(3 ± 2)	E-01
		Total Uranium	0.050 ± 0.050 (1)	
		Gamma Scan:		
		^{40}K	(1.143 ± 0.400)	E+01
		^{51}Cr	<5.967	E+02
		^{60}Co	<3.682	E-01
		^{65}Zn	<9.956	E+00
		^{134}Cs	<3.524	E-01
		^{137}Cs	<2.704	E-01
		^{226}Ra	<4.638	E-01
		^{228}Th	<5.088	E-01
		^{232}Th	<1.251	E+00
B01306 (Plant Matter)	29	^{90}Sr	(0.002 ± 1)	E+00
		Total Uranium	0.033 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(8.100 ± 2.826)	E+00
		^{51}Cr	<4.551	E+02
		^{60}Co	<2.976	E-01
		^{65}Zn	<8.702	E-01
		^{134}Cs	<2.024	E-01
		^{137}Cs	<2.262	E-01
		^{226}Ra	<5.236	E-01
		^{228}Th	<6.205	E-01
		^{232}Th	<8.232	E-01
B01304 (Plant Matter)	30	^{90}Sr	(0.4 ± 2)	E-01
		Total Uranium	0.059 ± 0.010 (1)	
		Gamma Scan:		
		^{40}K	(1.026 ± 0.361)	E+01
		^{51}Cr	<7.969	E+02
		^{60}Co	<3.064	E-01
		^{65}Zn	<1.232	E+00
		^{134}Cs	<3.793	E-01
		^{137}Cs	<3.487	E-01
		^{226}Ra	<5.650	E-01
		^{228}Th	<5.380	E-01
		^{232}Th	<1.383	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page eleven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B017X9 (Plant Matter)	31	^{90}Sr	(0.4 ± 2)	E-01
		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	(4.663 ± 2.038)	E+00
		^{51}Cr	<4.072	E+02
		^{60}Co	<2.065	E-01
		^{65}Zn	<8.796	E-01
		^{134}Cs	<2.398	E-01
		^{137}Cs	<1.497	E-01
		^{226}Ra	<3.894	E-01
		^{228}Th	<4.070	E-01
		^{232}Th	<7.868	E-01
B017X7 (Plant Matter)	32	^{90}Sr	(0.6 ± 1)	E-01
		Total Uranium	0.071 ± 0.012 (1)	
		Gamma Scan:		
		^{40}K	(9.258 ± 3.701)	E+00
		^{51}Cr	<5.947	E+02
		^{60}Co	<3.028	E-01
		^{65}Zn	<1.071	E+00
		^{134}Cs	<2.978	E-01
		^{137}Cs	<2.405	E-01
		^{226}Ra	<3.829	E-01
		^{228}Th	<3.503	E-01
		^{232}Th	<1.003	E+00
B017X8 (Plant Matter)	33	^{90}Sr	(0.7 ± 2)	E-01
		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	(5.317 ± 2.772)	E+00
		^{51}Cr	<5.989	E+02
		^{60}Co	<2.698	E-01
		^{65}Zn	<9.602	E-01
		^{134}Cs	<3.323	E-01
		^{137}Cs	<2.252	E-01
		^{226}Ra	<4.747	E-01
		^{228}Th	<4.279	E-01
		^{232}Th	<8.908	E-01

(1) Units are μg/gram.

9613500.2229

ATTACHMENT 3

Summary of Data Qualifications

Strontium 90 (CRDL=1 pCi/g)

Customer I.D. #	Reported Results	Q
B012Z2	0.050	UJ
B012Y0	0.100	UJ
B01346	0.100	UJ
B01357	0.200	UJ
B01334	0.040	UJ
B017X8	0.070	UJ

Total Uraniu (CRDL=1ug/g)

Customer I.D. #	Reported Results	Q
B012Z2	0.196	J
B012Y0	0.133	J
B01346	0.330	J
B01357	0.280	J
B01334	0.240	J
B017X8	0.034	UJ

Gamma Spec

Cobalt 60 (CRDL=.05pCi/g)

Customer I.D. #	Reported Results	Q
B012Z2	0.473	R
B012Y0	0.375	R
B01346	0.558	R
B01357	0.241	R
B01334	0.386	R
B017X8	0.270	R

Cesium 137 (CRDL=.1pCi/g)

Customer I.D. #	Reported Results	Q
B012Z2	0.445	R
B012Y0	0.207	R
B01346	0.293	R
B01357	0.212	R
B01334	0.383	R
B017X8	0.225	R

Thorium 228 (CRDL=not reported)

Customer I.D. #	Reported Results	Q
B012Z2	0.685	R
B012Y0	0.436	R
B01346	0.448	R
B01357	0.315	R
B01334	0.779	R
B017X8	0.428	R

9613500.2231

ATTACHMENT 4

As Qualified Data Summary

9615900.2236

TMA

"J" spike - Gamma Scan - poor accuracy.
Blanks - OK

ATTACHMENT 1 DATA TABLE

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012X6 (Plant Matter)	1	^{90}Sr	(-2 ± 4)	E-01
		Total Uranium	0.032 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.056 ± 0.242)	E+01
		^{51}Cr	<2.964	E+02
		^{60}Co	<2.194	E-01
		^{65}Zn	<7.035	E-01
		^{134}Cs	<2.381	E-01
		^{137}Cs	<1.739	E-01
		^{226}Ra	<3.287	E-01
		^{228}Th	<3.908	E-01
		^{232}Th	<7.594	E-01
B012Z0 (Plant Matter)	2	^{90}Sr	(1.4 ± 0.6)	E+00
		Total Uranium	0.031 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.055 ± 0.308)	E+01
		^{51}Cr	<3.606	E+02
		^{60}Co	<2.430	E-01
		^{65}Zn	<8.902	E-01
		^{134}Cs	<2.187	E-01
		^{137}Cs	<1.434	E-01
		^{226}Ra	<3.419	E-01
		^{228}Th	<3.022	E-01
		^{232}Th	<8.842	E-01
B012Z2 (Plant Matter)	3	^{90}Sr	(0.5 ± 1)	E-01
		(1) Total Uranium	0.196 ± 0.032 (1)	
		Gamma Scan:		
		^{40}K	(1.222 ± 0.492)	E+01
		^{51}Cr	<7.633	E+02
		^{60}Co	<4.732	E-01
		^{65}Zn	<1.808	E-01
		^{134}Cs	<5.075	E-01
		^{137}Cs	<4.447	E-01
		^{226}Ra	<8.148	E-01
		^{228}Th	<6.845	E-01
		^{232}Th	<1.633	E+00

Request COC
SR90
TOTAL U
GAMMA

Check Eff. & Blank Prob

(1) Total Uranium - not enough info to recalculate MDA - reported MDA's used.

(2) Co^{60} & Cs^{137} compared to RDL's 0.05 & 0.1 pCi/g respectively when reported as "<". Th^{232} compared to raw data and computed MDA's when "<". Minimum detectable Results for Co^{60} & Cs^{137} > RDL's. Minimum Detectable Activities in Raw Data for Co^{60} & Cs^{137} also > RDL's. As a result, all data "R" for Gamma Scan.

(3) Note: Although 33 samples, only 2 QC samples for Total U, and Gamma Spec

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012Y8 (Plant Matter)	4	^{90}Sr	(2 ± 7)	E-01
		Total Uranium	0.031 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.067 ± 0.334)	E+01
		^{51}Cr	<2.809	E+02
		^{60}Co	<2.916	E-01
		^{65}Zn	<9.990	E-01
		^{134}Cs	<2.786	E-01
		^{137}Cs	<2.004	E-01
		^{226}Ra	<3.928	E-01
		^{228}Th	<2.653	E-01
		^{232}Th	<9.354	E-01
B012Y1 (Plant Matter)	5	^{90}Sr	(-0.1 ± 0.1)	E+00
		Total Uranium	0.041 ± 0.008 (1)	
		Gamma Scan:		
		^{40}K	(1.149 ± 0.449)	E+01
		^{51}Cr	<7.220	E+02
		^{60}Co	<3.706	E-01
		^{65}Zn	<1.609	E+00
		^{134}Cs	<4.791	E-01
		^{137}Cs	<3.375	E-01
		^{226}Ra	<7.008	E-01
		^{228}Th	<6.271	E-01
		^{232}Th	<1.458	E-01
B012Y3 (Plant Matter)	6	^{90}Sr	(0.02 ± 2)	E-01
		Total Uranium	0.029 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.095 ± 0.288)	E+01
		^{51}Cr	<3.658	E+02
		^{60}Co	<3.205	E-01
		^{65}Zn	<1.085	E+00
		^{134}Cs	<2.178	E-01
		^{137}Cs	<1.623	E-01
		^{226}Ra	<2.662	E-01
		^{228}Th	<2.636	E-01
		^{232}Th	<8.171	E-01

TTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012Y0 (Plant Matter)	7	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.133 ± 0.022 (1)	
		Gamma Scan:		
		^{40}K	(1.585 ± 0.412)	E+01
		^{51}Cr	<5.717	E+02
		^{60}Co	<3.748	E-01
		^{65}Zn	<1.310	E+00
		^{134}Cs	<2.870	E-01
		^{137}Cs	<2.072	E-01
		^{226}Ra	<4.896	E-01
		^{228}Th	<4.364	E-01
		^{232}Th	<1.229	E-01
B012N8 (Plant Matter)	8	^{90}Sr	(0 ± 1)	E+00
		Total Uranium	0.029 ± 0.005 (1)	
		Gamma Scan:		
		^{40}K	(1.307 ± 0.375)	E+01
		^{51}Cr	<4.589	E+02
		^{60}Co	<2.331	E-01
		^{65}Zn	<9.359	E-01
		^{134}Cs	<2.363	E-01
		^{137}Cs	<2.050	E-01
		^{226}Ra	<5.060	E-01
		^{228}Th	<4.439	E-01
		^{232}Th	<1.024	E+00
B012X9 (Plant Matter)	9	^{90}Sr	(0 ± 1)	E+00
		Total Uranium	0.028 ± 0.005 (1)	
		Gamma Scan:		
		^{40}K	(1.028 ± 0.311)	E+01
		^{51}Cr	<3.503	E+02
		^{60}Co	<3.273	E-01
		^{65}Zn	<8.059	E-01
		^{134}Cs	<3.334	E-01
		^{137}Cs	<1.721	E-01
		^{226}Ra	<2.499	E-01
		^{228}Th	<2.725	E-01
		^{232}Th	<6.670	E-01

TTACHMENT 1 DATA TABLE (cont'd, page four)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012Y6 (Plant Matter)	10	^{90}Sr	(-2 ± 3)	E-01
		Total Uranium	0.027 ± 0.005 (1)	
		Gamma Scan:		
		^{40}K	(1.330 ± 0.343)	E+01
		^{51}Cr	<4.210	E+02
		^{60}Co	<2.031	E-01
		^{65}Zn	<8.333	E-01
		^{134}Cs	<2.324	E-01
		^{137}Cs	<2.146	E-01
		^{226}Ra	<3.670	E-01
		^{228}Th	<3.299	E-01
		^{232}Th	<9.509	E-01
B012Y2 (Plant Matter)	11	^{90}Sr	(-0.4 ± 2)	E+00
		Total Uranium	0.033 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.216 ± 0.291)	E+01
		^{51}Cr	<3.139	E+02
		^{60}Co	<2.164	E-01
		^{65}Zn	<9.908	E-01
		^{134}Cs	<2.268	E-01
		^{137}Cs	<1.375	E-01
		^{226}Ra	<3.932	E-01
		^{228}Th	<3.333	E-01
		^{232}Th	<8.473	E-01
B017X6 (Plant Matter)	12	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.031 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.046 ± 0.293)	E+01
		^{51}Cr	<3.672	E+02
		^{60}Co	<2.279	E-01
		^{65}Zn	<8.911	E-01
		^{134}Cs	<2.671	E-01
		^{137}Cs	<1.953	E-01
		^{226}Ra	<3.740	E-01
		^{228}Th	<2.853	E-01
		^{232}Th	<9.588	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page five)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012L6 (Plant Matter)	13	^{90}Sr	(-3 ± 5)	E-01
		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	<3.544	E+00
		^{51}Cr	<3.804	E+02
		^{60}Co	<3.745	E-01
		^{65}Zn	<9.799	E-01
		^{134}Cs	<2.109	E-01
		^{137}Cs	<1.936	E-01
		^{226}Ra	<3.698	E-01
		^{228}Th	<3.452	E-01
		^{232}Th	<6.296	E-01
B012W5 (Plant Matter)	14	^{90}Sr	(2 ± 2)	E-01
		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	(1.243 ± 0.333)	E+01
		^{51}Cr	<3.760	E+02
		^{60}Co	<2.580	E-01
		^{65}Zn	<1.030	E+00
		^{134}Cs	<2.495	E-01
		^{137}Cs	<1.980	E-01
		^{226}Ra	<3.804	E-01
		^{228}Th	<3.372	E-01
		^{232}Th	<9.269	E-01
B012Z9 (Plant Matter)	15	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.031 ± 0.005 (1)	
		Gamma Scan:		
		^{40}K	(7.723 ± 2.330)	E+00
		^{51}Cr	<3.422	E+02
		^{60}Co	<1.457	E-01
		^{65}Zn	<6.063	E-01
		^{134}Cs	<2.527	E-01
		^{137}Cs	<1.729	E-01
		^{226}Ra	<3.131	E-01
		^{228}Th	<3.729	E-01
		^{232}Th	<7.232	E-01

TTACHMENT 1 DATA TABLE (cont'd, page six)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012W0 (Plant Matter)	16	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.041 ± 0.007 (1)	
		Gamma Scan:		
		^{40}K	(1.256 ± 0.441)	E+01
		^{51}Cr	<5.598	E+02
		^{60}Co	<3.825	E-01
		^{65}Zn	<1.246	E+00
		^{134}Cs	<3.619	E-01
		^{137}Cs	<2.543	E-01
		^{226}Ra	<5.993	E-01
		^{228}Th	<3.738	E-01
		^{232}Th	<1.168	E+00
B01346 (Plant Matter)	17	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.330 ± 0.055 (1)	
		Gamma Scan:		
		^{40}K	(8.644 ± 3.969)	E+00
		^{51}Cr	<5.475	E+02
		^{60}Co	<5.577	E-01
		^{65}Zn	<1.680	E+00
		^{134}Cs	<3.852	E-01
		^{137}Cs	<2.931	E-01
		^{226}Ra	<5.952	E-01
		^{228}Th	<4.476	E-01
		^{232}Th	<1.365	E+00
B01357 (Plant Matter)	18	^{90}Sr	(2 ± 2)	E-01
		Total Uranium	0.280 ± 0.047 (1)	
		Gamma Scan:		
		^{40}K	(1.116 ± 0.342)	E+01
		^{51}Cr	<3.718	E+02
		^{60}Co	<2.411	E-01
		^{65}Zn	<7.321	E-01
		^{134}Cs	<2.234	E-01
		^{137}Cs	<2.115	E-01
		^{226}Ra	<3.076	E-01
		^{228}Th	<3.153	E-01
		^{232}Th	<7.158	E-01

ITACHMENT 1 DATA TABLE (cont'd, page seven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B01329 (Plant Matter)	19	^{90}Sr	(0.4 ± 2)	E-01
		Total Uranium	0.063 ± 0.011 (1)	
		Gamma Scan:		
		^{40}K	(9.906 ± 3.266)	E+00
		^{51}Cr	<3.635	E+02
		^{60}Co	<2.593	E-01
		^{65}Zn	<9.114	E-01
		^{134}Cs	<2.459	E-01
		^{137}Cs	<2.159	E-01
		^{226}Ra	<3.837	E-01
		^{228}Th	<4.110	E-01
		^{232}Th	<1.008	E+00
B01351 (Plant Matter)	20	^{90}Sr	(1 ± 4)	E-01
		Total Uranium	0.021 ± 0.004 (1)	
		Gamma Scan:		
		^{40}K	(1.254 ± 0.316)	E+00
		^{51}Cr	<2.917	E+02
		^{60}Co	<2.635	E-01
		^{65}Zn	<8.972	E-01
		^{134}Cs	<1.638	E-01
		^{137}Cs	<1.472	E-01
		^{226}Ra	<3.609	E-01
		^{228}Th	<3.104	E-01
		^{232}Th	<8.572	E-01
B01353 (Plant Matter)	21	^{90}Sr	(2 ± 2)	E-01
		Total Uranium	0.233 ± 0.039 (1)	
		Gamma Scan:		
		^{40}K	(1.357 ± 0.345)	E+01
		^{51}Cr	<3.899	E+02
		^{60}Co	<2.269	E-01
		^{65}Zn	<1.040	E+00
		^{134}Cs	<2.823	E-01
		^{137}Cs	<2.061	E-01
		^{226}Ra	<3.353	E-01
		^{228}Th	<3.238	E-01
		^{232}Th	<9.507	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page eight)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B01334 (Plant Matter)	22	^{90}Sr	(0.04 ± 1)	E+00
		Total Uranium	0.240 ± 0.040 (1)	
		Gamma Scan:		
		^{40}K	(1.341 ± 0.433)	E+01
		^{51}Cr	<6.522	E+02
		^{60}Co	<3.860	E-01
		^{65}Zn	<1.117	E+00
		^{134}Cs	<3.893	E-01
		^{137}Cs	<3.826	E-01
		^{226}Ra	<6.166	E-01
		^{228}Th	<7.790	E-01
		^{232}Th	<1.268	E+00
B01356 (Plant Matter)	23	^{90}Sr	(6 ± 2)	E-01
		Total Uranium	0.330 ± 0.055 (1)	
		Gamma Scan:		
		^{40}K	(9.254 ± 3.422)	E+00
		^{51}Cr	<4.280	E+02
		^{60}Co	<3.475	E-01
		^{65}Zn	<1.211	E+00
		^{134}Cs	<3.128	E-01
		^{137}Cs	<1.960	E-01
		^{226}Ra	<4.145	E-01
		^{228}Th	<3.318	E-01
		^{232}Th	<1.095	E-01
B01341 (Plant Matter)	24	^{90}Sr	(2 ± 3)	E-01
		Total Uranium	0.067 ± 0.011 (1)	
		Gamma Scan:		
		^{40}K	(1.007 ± 0.270)	E+01
		^{51}Cr	<3.731	E+02
		^{60}Co	<1.664	E-01
		^{65}Zn	<7.745	E-01
		^{134}Cs	<3.235	E-01
		^{137}Cs	<1.943	E-01
		^{226}Ra	<3.892	E-01
		^{228}Th	<3.908	E-01
		^{232}Th	(7.472 ± 5.512)	E-01

TTACHMENT 1 DATA TABLE (cont'd, page nine)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B01310 (Plant Matter)	25	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.044 ± 0.007 (1)	
		Gamma Scan:		
		^{40}K	(1.587 ± 0.432)	E+01
		^{51}Cr	<4.947	E+02
		^{60}Co	<3.827	E-01
		^{65}Zn	<1.682	E+00
		^{134}Cs	<4.010	E-01
		^{137}Cs	<3.177	E-01
		^{226}Ra	<5.911	E-01
		^{228}Th	<4.049	E-01
		^{232}Th	<1.657	E+00
B01347 (Plant Matter)	26	^{90}Sr	(-0.1 ± 1)	E+00
		Total Uranium	0.017 ± 0.003 (1)	
		Gamma Scan:		
		^{40}K	(8.979 ± 3.634)	E+00
		^{51}Cr	<5.365	E+02
		^{60}Co	<3.678	E-01
		^{65}Zn	<9.285	E-01
		^{134}Cs	<3.023	E-01
		^{137}Cs	<2.413	E-01
		^{226}Ra	<4.246	E-01
		^{228}Th	<5.365	E-01
		^{232}Th	<1.102	E+00
B01328 (Plant Matter)	27	^{90}Sr	(1 ± 3)	E-01
		Total Uranium	0.065 ± 0.011 (1)	
		Gamma Scan:		
		^{40}K	(1.366 ± 0.419)	E+01
		^{51}Cr	<5.356	E+02
		^{60}Co	<3.765	E-01
		^{65}Zn	<1.332	E+00
		^{134}Cs	<3.495	E-01
		^{137}Cs	<2.510	E-01
		^{226}Ra	<3.546	E-01
		^{228}Th	<3.567	E-01
		^{232}Th	<1.279	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page ten)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B01331 (Plant Matter)	28	^{90}Sr	(3 ± 2)	E-01
		Total Uranium	0.050 ± 0.050 (1)	
		Gamma Scan:		
		^{40}K	(1.143 ± 0.400)	E+01
		^{51}Cr	<5.967	E+02
		^{60}Co	<3.682	E-01
		^{65}Zn	<9.956	E+00
		^{134}Cs	<3.524	E-01
		^{137}Cs	<2.704	E-01
		^{226}Ra	<4.638	E-01
		^{228}Th	<5.088	E-01
		^{232}Th	<1.251	E+00
B01306 (Plant Matter)	29	^{90}Sr	(0.002 ± 1)	E+00
		Total Uranium	0.033 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(8.100 ± 2.826)	E+00
		^{51}Cr	<4.551	E+02
		^{60}Co	<2.976	E-01
		^{65}Zn	<8.702	E-01
		^{134}Cs	<2.024	E-01
		^{137}Cs	<2.262	E-01
		^{226}Ra	<5.236	E-01
		^{228}Th	<6.205	E-01
		^{232}Th	<8.232	E-01
B01304 (Plant Matter)	30	^{90}Sr	(0.4 ± 2)	E-01
		Total Uranium	0.059 ± 0.010 (1)	
		Gamma Scan:		
		^{40}K	(1.026 ± 0.361)	E+01
		^{51}Cr	<7.969	E+02
		^{60}Co	<3.064	E-01
		^{65}Zn	<1.232	E+00
		^{134}Cs	<3.793	E-01
		^{137}Cs	<3.487	E-01
		^{226}Ra	<5.650	E-01
		^{228}Th	<5.380	E-01
		^{232}Th	<1.383	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page eleven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B017X9 (Plant Matter)	31	^{90}Sr	(0.4 ± 2)	E-01
		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	(4.663 ± 2.038)	E+00
		^{51}Cr	<4.072	E+02
		^{60}Co	<2.065	E-01
		^{65}Zn	<8.796	E-01
		^{134}Cs	<2.398	E-01
		^{137}Cs	<1.497	E-01
		^{226}Ra	<3.894	E-01
		^{228}Th	<4.070	E-01
		^{232}Th	<7.868	E-01
B017X7 (Plant Matter)	32	^{90}Sr	(0.6 ± 1)	E-01
		Total Uranium	0.071 ± 0.012 (1)	
		Gamma Scan:		
		^{40}K	(9.258 ± 3.701)	E+00
		^{51}Cr	<5.947	E+02
		^{60}Co	<3.028	E-01
		^{65}Zn	<1.071	E+00
		^{134}Cs	<2.978	E-01
		^{137}Cs	<2.405	E-01
		^{226}Ra	<3.829	E-01
		^{228}Th	<3.503	E-01
		^{232}Th	<1.003	E+00
B017X8 (Plant Matter)	33	^{90}Sr	(0.7 ± 2)	E-01
		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	(5.317 ± 2.772)	E+00
		^{51}Cr	<5.989	E+02
		^{60}Co	<2.698	E-01
		^{65}Zn	<9.602	E-01
		^{134}Cs	<3.323	E-01
		^{137}Cs	<2.252	E-01
		^{226}Ra	<4.747	E-01
		^{228}Th	<4.279	E-01
		^{232}Th	<8.908	E-01

(1) Units are μg/gram.

9613500.2243

ATTACHMENT 5

Data Review Supporting Documentation

9613500.2244

TMA/NORCAL NL-12-032-9571

Data Package Completeness Checklists

B012Z2
B012Y0
B01346
B01357
B01334
B017X8

SR-90

Supplemental Requirements for Analyses Using Gas Proportional Counters

A.0 Completeness Checklist

Analysis Results

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Counting Logs, Printouts, Notebook Pages)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification
- ✓ Analysis Date and Initials of Analyst
- ✓ Amounts of Samples Prepared or Counted
- ✓ Weights of Solids Counted

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
- ✓ Amount of (Check) Standard Used
- ✓ Raw Data including Counts and Count Duration for Standards
- ✓ Weights of Preparations
- ✓ Efficiencies
- ✓ Weights of Carriers Added, If Applicable
- ✓ Results of Statistical Tests Used to Evaluate Instrument Reliability and Efficiency Checks
- ✓ Raw Data of Background Counts and Count Duration
- ✓ Results of Statistical Test Used to Evaluate Instrument Background
- NA Control Limits for Check Source and Background Counts

Blanks

- ✓ Detector Identification
- ✓ Date of Analysis
- NO MDA of Method will calculate
- ✓ Amounts of Reagents Used in Blank

Supplemental Requirements for Analyses Using Gas Proportional Counters (Cont.)

Radiometric and Gravimetric Yields

✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
✓ Weights of Precipitates or Solids Counted
✓ Calculated Recoveries

Duplicates

✓ Detector Identification
✓ Date of Analysis
✓ Aliquots of Samples
✓ Weights of Solids Counted
✓ Count Durations
✓ Sample Identifications
✓ Calculated Precision

Laboratory Control Samples

✓ Detector Identification
✓ Date of Analysis
✓ Calculation of Recoveries
✓ Results of Analyses

9613500.2247

Supplemental Requirements for Analyses Using
Gamma Spectroscopy

Gamma

C.0 Completeness Checklist

Analysis Results

✓ Results Report for Sample Analyses and Reanalyses
✓ Raw Data (Spectra, Printouts of Counts per Channel, Notebook Pages)
✓ Calculation Sheets
✓ Sample Identifications
✓ Detector Identification and Counting Position
✓ Analysis Date and Initials of Analyst
✓ Amounts of Samples Counted

Initial and Continuing Calibration

✓ Detector Identification
✓ Calibration Date(s) and Initials of Analyst
✓ Identification of Calibration and Check Standards including Radionuclides, Certification, Expiration Date, and Activity
NA Amount of (Check) Standard Used
✓ Raw Data including Counts and Count Duration for Standards
✓ Efficiencies and/or Geometry and Matrix Factors
✓ Raw Data of Background Counts, Count Dates, and Duration of Counts
✓ Kev/Channel
✓ FWHM

Blanks

✓ Detector Identification
✓ Date of Analysis
No MDA of Method will calculate
✓ Amounts of Reagents Used in Blank
✓ Raw Data

Supplemental Requirements for Analyses Using Gamma Spectroscopy (Cont.)

Duplicates

✓ Detector Identification
✓ Date of Analysis
✓ Amounts of Samples
✓ Count Durations
✓ Sample Identifications
✓ Results of Analyses and Calculated Precision
✓ Raw Data

Radiometric and Gravimetric Yields

_____ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
_____ Weights of Precipitates or Solids Counted
_____ Calculated Recoveries

Laboratory Control Samples

✓ Detector Identification
✓ Date of Analysis
✓ Calculation of Recoveries
✓ Results of Analyses

9615500.2249

Total Uranium by kPA

Supplemental Requirements for Analyses Using kPA for Total Uranium

Analysis Results

- ✓ Results Reported for Sample Analyses
- ✓ Raw Data (including Prep Volume, Aliquot Volume, kPA output)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification
- ✓ Analysis Date and Initials of Analyst

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
- ✓ Amount of Standard Used
- ✓ Raw count/Activity data
- ✓ Determination of Calibration Equation

Blanks/Backgrounds

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ MDA of Method
- ✓ Amount of Reagent Used (Prep Volume)
- ✓ Count Durations

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Amounts of Samples
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Results of Analysis and Calculated Precision
- ✓ Raw Data

Matrix Spikes

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Amounts of Samples
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Results of Analysis and Calculated Precision
- ✓ Identification of Matrix Spike Radionuclide, Certification, Expiration Date, and Activity
- ✓ Amount of Matrix Spike Used
- ✓ Raw Data
- ✓ Results of Analysis and Comparison to Amount Added

9613500.2251

TMA
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
P.O. Box 4040
Richmond, CA 94804-0040
(415) 235-2633 Fax No. (415) 235-0438

JUN 1992
RECEIVED
OSM DMO

June 11, 1992

SENT BY FEDERAL EXPRESS

Ref. TMA/Norcal N1-12-032-9571 ~~Sent~~ Bista-Vey

Mr. John Bourgeault
Westinghouse Hanford Company
2355 Stevens Drive
Richland, WA 99352

Dear Mr. Bourgeault:

Enclosed on Attachment 1, are the ^{90}Sr, total uranium, and gamma scan results for the plant samples from 300-FF-5 Area, we received 4 December 1991.

Please call if you have any questions concerning this data.

Sincerely,

D.P. Kharkar

Dinkar P. Kharkar, Ph.D.
Manager, Nuclear Programs

Envlosures: Section 1 through 9
Appendices

INDEX OF DOCUMENTS

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SECTION 2	Case Narrative
SECTION 3	QC Summary
SECTION 4	Chains-of-Custody Copies
SECTION 5	Analytical Methods Used
SECTION 6	Aliquot Information
SECTION 7	Raw Data for ^{90}Sr
SECTION 8	Raw Data for Total Uranium
SECTION 9	Raw Data for Gamma Scan

SEE NEXT PAGE FOR APPENDICES TO BE INCLUDED IN THE DATA PACKAGE

9613500.2253

SECTION 2 Case Narrative

9615500.2254

CASE NARRATIVE

1. Project 300-FF-5, Task 7, Plant Material (TMA/Norcal Group No. 9571) were processed together and the results of the analyses are reported. The sample ID's are:

Customer Sample ID	TMA/Norcal Group No.	Customer Sample ID	TMA/Norcal Group No.
B012X6 (Plant Material)	9571-1	B01346 (Plant Material)	9571-17
B012Z0 (Plant Material)	9571-2	B01357 (Plant Material)	9571-18
B012Z2 (Plant Material)	9571-3	B01329 (Plant Material)	9571-19
B012Y8 (Plant Material)	9571-4	B01351 (Plant Material)	9571-10
B012Y1 (Plant Material)	9571-5	B01353 (Plant Material)	9571-21
B012Y3 (Plant Material)	9571-6	B01334 (Plant Material)	9571-22
B012Y0 (Plant Material)	9571-7	B01356 (Plant Material)	9571-23
B012N8 (Plant Material)	9571-8	B01341 (Plant Material)	9571-24
B012X9 (Plant Material)	9571-9	B01310 (Plant Material)	9571-25
B012Y6 (Plant Material)	9571-10	B01347 (Plant Material)	9571-26
B012Y2 (Plant Material)	9571-11	B01328 (Plant Material)	9571-27
B017X6 (Plant Material)	9571-12	B01331 (Plant Material)	9571-28
B012L6 (Plant Material)	9571-13	B01306 (Plant Material)	9571-29
B012W5 (Plant Material)	9571-14	B01304 (Plant Material)	9571-30
B012Z9 (Plant Material)	9571-15	B017X9 (Plant Material)	9571-31
B012W0 (Plant Material)	9571-16	B017X7 (Plant Material)	9571-32
		B017X8 (Plant Material)	9571-33

2. The analyses reported are:

PLANT MATERIAL	
Analyte	Group # & Sample #
^{90}Sr	9571-1 through 33
Total U	9571-1 through 33
Gamma Scan	9571-1 through 33

3. Results are reported pCi/gram dry material with 2 σ errors, except for total uranium which arreported μgm/gram dry material with 2 σ errors.

4. Strontium-90 analyses were processed in three batches, with ^{90}Sr QCs with each batch.

5. The QC samples consisting of a spike, a lab control sample, and a replicate were processed with this batch as shown on Table 1.

TABLE 1

Preparation Batch Samples Processed	Data Package
9571-1 through 33	- PLANT MATERIAL

QC SAMPLES PROCESSED:

Sample I.D.	Type	Analyses	Reported with Data Package
9571-34 (QC 7280)	Spike	^{90}Sr	X
9571-35 (QC 7281)	Spike	^{90}Sr	X
9571-36 (QC 7282)	Spike	^{90}Sr	X
9571-37 (QC 7283)	LCS	^{90}Sr	X
9571-38 (QC 7284)	LCS	^{90}Sr	X
9571-39 (QC 7285)	LCS	^{90}Sr	X
9571-40 (QC 7286)	Replicate	^{90}Sr	X
9571-41 (QC 7287)	Replicate	^{90}Sr	X
9571-42 (QC 7288)	Replicate	^{90}Sr	X
9571-43 (QC 7289)	Spike	Total U	X
9571-44 (QC 7290)	Spike	Total U	X
9571-45 (QC 7291)	LCS	Total U	X
9571-46 (QC 7292)	LCS	Total U	X
9571-47 (QC 7293)	Replicate	Total U	X
9571-48 (QC 7294)	Replicate	Total U	X
9571-49 (QC 7295)	Spike	Gamma Scan	X
9571-50 (QC 7296)	Spike	Gamma Scan	X
9571-51 (QC 7297)	LCS	Gamma Scan	X
9571-52 (QC 7298)	LCS	Gamma Scan	X
9571-53 (QC 7299)	Replicate	Gamma Scan	X
9571-54 (QC 7300)	Replicate	Gamma Scan	X

6. Analyses, reanalyses, and reworks, etc.

Strontium Analyses (Plant Material): The average yield for 33 analyses was 74%. The lowest yield was 20% and the highest was 90%. No abnormalities were encountered. The results of the spike, the Laboratory Control Sample, and the replicate were satisfactory.

Gamma Scan Analyses (Plant Material): The spike samples processed had only ^{60}Co and ^{137}Cs activity and the found/added ratio of the spikes look good. The results of the spike, the laboratory control sample, and the replicate were satisfactory.

Total Uranium Analyses (Plant Material): No abnormalities were encountered. The results of the spike, the Laboratory Control Sample, and the replicate were satisfactory.

SECTION 3: QC SUMMARY

QUALITY CONTROL SUMMARY

Attachment 2, 3, and 4 gives the results of the QC samples. The recovery ratios were determined by the QC Officer based upon the final data obtained for each. The laboratory control samples were calculated with an aliquot of 1.00 and, therefore, the presented data cannot be compared directly with the sample data. To compare them directly, the laboratory control sample data would need to be divided by sample aliquots.

The results of the spike, the laboratory control and the replicate for ^{90}Sr, total uranium, and gamma scan were satisfactory.

D. P. Kharkar

Dinkar P. Kharkar, Ph.D.
TMA/Norcal Program Manager

ATTACHMENT 2 QUALITY CONTROL SAMPLE RESULTS, SPIKES AND BLANKS

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found	Added	Recovery Ratio Found/Added ± 2 σ
Spikes for Plant Material:				
9571-34 QC-7280	^{90}Sr	4.81 ± 1.15	5.99 ± 0.24	0.80 ± 0.19
9571-35 QC-7281	^{90}Sr	3.41 ± 0.49	4.28 ± 0.17	0.80 ± 0.12
9571-36 QC-7282	^{90}Sr	4.30 ± 0.79	5.13 ± 0.21	0.84 ± 0.16
9571-43 QC-7289	Total U	44.40 ± 6.57 (1)	40.67 ± 1.63 (1)	1.09 ± 0.16
9571-44 QC-7290	Total U	50.60 ± 7.49 (1)	48.80 ± 1.95 (1)	1.04 ± 0.16
9571-49 QC-7295	Gamma Scan:			
	^{60}Co	52 ± 17	54 ± 2	0.97 ± 0.33
	^{137}Cs	64 ± 18	84 ± 3	0.76 ± 0.22
9571-50 QC-7296	Gamma Scan:			
	^{60}Co	35 ± 19	54 ± 2	0.64 ± 0.35
	^{137}Cs	47 ± 19	63 ± 3	0.74 ± 0.30

(1) Units are μg/sample.

ATTACHMENT 3 QUALITY CONTROL SAMPLE RESULTS, ~~LABORATORY CONTROL~~ SAMPLES

TMA

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found		Added	Recovery Ratio Found/Added ± 2 σ
Laboratory Control Samples (Plant Material)					
9571-37 QC-7283	^{90}Sr	(0 ± 2.4)		0	Satisfactory
9571-38 QC-7284	^{90}Sr	0.04 ± 0.3		0	Satisfactory
9571-39 QC-7285	^{90}Sr	-0.2 ± 0.4		0	Satisfactory
9571-45 QC-7291	Total U	<0.008 (1)		0	Satisfactory
9571-46 QC-7292	Total U	<0.008 (1)		0	Satisfactory
9571-51 QC-7297	Gamma Scan:				
	^{40}K	<3.181	E+02	0	Satisfactory
	^{51}Cr	<1.072	E+02	0	Satisfactory
	^{60}Co	<2.051	E+01	0	Satisfactory
	^{65}Zn	<4.261	E+01	0	Satisfactory
	^{134}Cs	<1.983	E+01	0	Satisfactory
	^{137}Cs	<2.044	E+01	0	Satisfactory
	^{226}Ra	<3.129	E+01	0	Satisfactory
	^{228}Th	<2.510	E+01	0	Satisfactory
	^{232}Th	<8.260	E+01	0	Satisfactory
9571-52 QC-7298	Gamma Scan:				
	^{40}K	<2.227	E+02	0	Satisfactory
	^{51}Cr	<7.688	E+01	0	Satisfactory
	^{60}Co	<1.135	E+01	0	Satisfactory
	^{65}Zn	<2.853	E+01	0	Satisfactory
	^{134}Cs	<1.560	E+01	0	Satisfactory
	^{137}Cs	<1.092	E+01	0	Satisfactory
	^{226}Ra	<2.175	E+01	0	Satisfactory
	^{228}Th	<2.150	E+01	0	Satisfactory
	^{232}Th	<6.504	E+01	0	Satisfactory

Used blank per SDG.

OK

ATTACHMENT 4 QUALITY CONTROL RESULTS, REPLICATES

TMA

Nuclide	Results			
	pCi/g ± error 2 σ			
	No. 9571-40 Replicate		No. 9571-1 Original	
QC 7286				
^{90}Sr	(0.08 ± 2) E+00		(-2 ± 4) E-01	
	No. 9571-41 Replicate		No. 9571-2 Original	
QC 7287				
^{90}Sr	(1.5 ± 0.2) E+00		(1.4 ± 0.6) E+00	
	No. 9571-42 Replicate		No. 9571-3 Original	
QC 7288				
^{90}Sr	(0.8 ± 1.6) E-01		(0.5 ± 1.4) E-01	
	No. 9571-47 Replicate		No. 9571-1 Original	
QC-7293				
Total U	0.027 ± 0.005 (1)		0.032 ± 0.006 (1)	
	No. 9571-48 Replicate		No. 9571-2 Original	
QC-7294				
Total U	0.029 ± 0.005 (1)		0.031 ± 0.006 (1)	
	No. 9571-53 Replicate		No. 9571-1 Original	
QC-7299				
Gamma Scan:				
^{40}K	(1.533 ± 0.721)	E+01	(1.056 ± 0.242)	E+01
^{51}Cr	<1.628	E+03	<2.964	E+02
^{60}Co	<5.362	E-01	<2.194	E-01
^{65}Zn	<2.433	E+00	<7.035	E-01
^{134}Cs	<7.989	E-01	<2.381	E-01
^{137}Cs	<5.042	E-01	<1.739	E-01
^{226}Ra	<1.036	E+00	<3.287	E-01
^{228}Th	<9.102	E-01	<3.908	E-01
^{232}Th	<2.522	E+00	<7.594	E-01
	No. 9571-54 Replicate		No. 9571-2 Original	
QC-7300				
Gamma Scan:				
^{40}K	(8.764 ± 5.053)	E+00	(1.055 ± 0.308)	E+01
^{51}Cr	<1.078	E+03	<3.606	E+02
^{60}Co	<7.423	E-01	<2.430	E-01
^{65}Zn	<1.999	E+00	<8.902	E-01
^{134}Cs	<4.778	E-01	<2.187	E-01
^{137}Cs	<4.518	E-01	<1.434	E-01
^{226}Ra	<8.026	E-01	<3.419	E-01
^{228}Th	<1.346	E+00	<3.022	E-01
^{232}Th	<2.078	E+00	<8.842	E-01

(1) Units are μg/gram.

reviewed on separate sheet

SECTION 4 Chains-of-Custody Copies

9613500.2262

TSB Container C204

Westinghouse Hanford Company

CHAIN OF CUSTODY

1 of 2

Custody Form Initiator: CA Brandt

Company Contact: CA Brandt

Telephone: 376-5345

Project Designation/Sampling Locations: 300-FF-5 TASK 7

Collection Date: 9-10/91

Ice Chest No.: CAB-4

Field Logbook No.: BNW 53573

Bill of Lading/Airbill No.: 2485217625

Offsite Property No.: PNL-92-272

Method of Shipment: Air

Shipped to: TMA / NORCAL

Possible Sample Hazards/Remarks: onsite samples <50 pCi/g; offsite samples no hazard.

U/gamma splits			Sample Identification	ICP splits
B012X6	B012X6	B01356		B017X9
B012Z0	B012Z6	B01341		B017X8
B012Z2	B012W5	B01310		B017X7
B012Y8	B012Z9	B01347		
B012Y1	B012W0	B01328		
B012Y3	B01346	B01331		
B012Y0	B01357	B01306		
B012N8	B01329	B01304		
B012X9	B01351	B017X9		
B012Y6	B01353	B017X7		
B012Y2	B01334	B017X8		

] Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
R Fellows		12/2/91 10:00 am
Relinquished by:	Received by: Kermit Blum	Date/Time: 12-4-91 1100
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90)

9613500.2263

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector CA Brandt Date Sampled 9-10/91 Time N/A hours

Company Contact CA Brandt Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01353	1, ~150g glass	Plant matter	gamma scan, Sr^{90}, total U
B01334			
B01356			
B01341			
B01310			
B01347			
B01328			
B01331	Ibid.	Ibid.	Ibid.
B01306			
B01304			
B017X9			
B017X7			
017X8			

Field Information** From 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards none detected.

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-4-91

Analysis Required

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

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

A-6000-406 (05/90)

9613500.2264

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector CA Brandt Date Sampled 9-10/91 Time N/A hours

Company Contact CA Brandt Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B012X6	1, ~150g glass	Plant matter	gamma scan, Sr^{90}, total U
B012Z0			
B012Z2			
B012Y8			
B012Y1			
B012Y3			
B012Y0			
B012N8			
B012X9			
B012Y6			
B012Y2			
B017X6			
B012L6			
B012W5	Ibid.	Ibid.	Ibid.
B012Z9			
B012W0			
B01346			
B01357			
B01329			
B01351			

Field Information** from 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards None detected.

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-4-91

Analysis Required

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

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

A-6000-406 (05/90)

9613500.2265

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector CA Brandt Date Sampled 9-10/91 Time NA hours

Company Contact CA Brandt Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B017X7	1, ~20g in glass	plant matter	ICP metals
B017X8	"	"	"
B017X9	"	"	"

Field Information** from 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards none detected

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-4-91

Analysis Required

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

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

A-6000-406 (05/90)

9613500.2266

SECTION 5 Analytical Methods Used

ANALYTICAL METHODS USED - SOIL AND VEGETATION

1. Gross Alpha and Gross Beta: Approximately a 0.200 gram was uniformly deposited on a stainless steel planchet and counted on a low background proportional counter for gross alpha and gross beta determination.

2. Strontium-90: ^{90}Sr was determined on a 1 gram aliquot. Approximately 3 gram dry soil was dissolved completely by $HF-HNO_3-HCl$ treatment and made to a known volume. One gram aliquot was taken for ^{90}Sr determination. Yttrium carrier was added Yttrium was extracted by HDEHP extraction. Yttrium was converted to yttrium oxide and beta counted.

3. Isotopic Uranium: Uranium was determined on a 1 gram aliquot. Approximately 3 gram dry soil was dissolved completely by $HF-HNO_3-HCl$ treatment and made to a known volume. A one gram aliquot was taken for isotopic uranium determination. An appropriate uranium tracer was added and uranium purified by selective ion exchange procedures. The purified extract was electroplated on a stainless steel disc for alpha pulse analysis.

4. Technetium-99: Approximately 2 gram was ashed at 500°C with ^{99m}Tc tracer and ammonia. The ash was leached with H_2SO_4 and $K_2S_2O_8$. The leached sample is filtered. H_2SO4 and $K_2S_2O_8$ was added to a 10 mL aliquot of water. The water and the leached samaple of soil was extracted with TBP and purified by coprecipitation and anion exchange procedure. The purified Tc was electroplated on a stainless steel disc and counted on a gamma detector to determine yield. After decay of ^{99m}Tc, the disc was counted on a low background beta counter.

5. Gamma-Scan: Approximately 200 to 750 gram dry soil was placed in an appropriate geometry and counted on a Ge(Li) detector.

6. Total Uranium: 0.250 gram dry material was dissolved in 20 mL 1N HNO_3. An aliquot was taken for laser phosphorometric determination of uranium.

7. Tritium: Tritium was azeotropically distilled from ≈ 20 gram vegetation and the distillate was counted by liquid scintillation.

SR90	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2														
3			GROSS	COUNT	BKG		NET							
4		ET	CTS	TIME	CPM	SF	CPM	X	Ws	Wb	WY	WX	WXY	WX^2
5	9571-3	1 29000	19 00000	25 83000	0 55110	1 01970	0.18811	0.71415	33.66818	907.27636	6.33342	24.04405	4.52300	17.17101
6	B012Z2	2.32100	8 00000	27 33000	0 45480	0 98460	-0.15959	0.54624	85.91506	1099.38434	0.08592	46.92994	0.04693	25.63484
7	Plant Matter	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000
9		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
10		0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11		0.00000	0.00000	0 00000	0.00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12		DELTA=	81.55461					SUMS=	119.58324	2006.66070	6.41934	70.97399	4.56993	42.80585
13														
14						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
15		Y @ MILK	REPORTED	CALCULATED		1 72968		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
16		1 COMP=	0.10700	0.10676	OK					0 04739	0.04734	OK	0.31486	No
17		2 COMP=	NA	1.11436	*	P-FACTOR		C-ZERO						
18						1.75900		0.06172						
19														
20	9571-7	1 33100	26 00000	26 21000	0 72560	1.02450	0.27291	0.70656	25.30346	689 08490	6.90567	17.87850	4.87930	12.63230
21	B012Y0	2 32100	16 00000	27 33000	0 51710	1 04990	0.07175	0.54624	44.38061	966.93096	3.18419	24.24230	1.73932	13.24203
22	Plant Matter	2.91800	18 00000	25 01000	0.72560	1 02420	-0.00603	0.46779	32.95466	689.08490	0.03295	15.41582	0.01542	7.21135
23		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0 00000	0.00000	0.00000	0 00000	0.00000	0.00000
24		0 00000	0.00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
25		0.00000	0.00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
26		0.00000	0.00000	0.00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
27		DELTA=	85.40830					SUMS=	102.63873	2345.10075	10.12282	57.53663	6.63403	33.08568
28														
29						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
30		Y @ MILK	REPORTED	CALCULATED		1 61260		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
31		1 COMP=	0.20000	0.20051	OK					0.09535	0.09537	OK	0.38561	No
32		2 COMP=	NA	1.15300	*	P-FACTOR		C-ZERO						
33						1.75900		0.12434						
34														
35	9571-17	0 51700	22 00000	25.13000	0.51710	1 04790	0.37551	0.67308	27.74433	966.93096	10.41834	24.22310	9.09808	21.14877
36	B01346	1 52200	18 00000	25 32000	0 72560	1 02600	-0.01508	0.67238	33.73643	689.08490	0.03374	22.68363	0.02268	15.25197
37	Plant Matter	2 23900	38 00000	27 30000	0 71130	1 01550	0.69119	0 55800	18 92312	702.93828	13.07950	10.55917	7.29841	5.89205
38		3 57500	21 00000	26 17000	0 72560	1 02440	0.07872	0 39433	30 99921	689 08490	2.44028	12.22408	0.96229	4.82037
39		6 35400	91 00000	36 57000	0 71760	1 00930	1.78725	0 19140	14.10981	698 76700	25.21772	2.70065	4.82872	0.51691
40		0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0 00000	0.00000	0.00000	0.00000
41		0 00000	0.00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
42		DELTA=	737.78901					SUMS=	125.51291	3744.80603	51.18957	72.39061	22.20618	47.63007
43														
44						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
45		Y @ MILK	REPORTED	CALCULATED		1 23765		0 96800		RESULTS	RESULTS		MDA	Results > MDA ?
46		1 COMP=	0 24500	0.46622	*					0 15159	0.28892	*	0.43808	No

SR90	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2														
3			GROSS	COUNT	BKG		NET							
4		ET	CTS	TIME	CPM	SF	CPM	X	Ws	Wb	WY	WX	WXY	WX^2
47		2 COMP=	NA	-1.24491	*	P-FACTOR		C-ZERO						
48						1.75900		0.37670						
49														
50	9571-18	0.51700	34.00000	25.13000	0.57980	1.07710	0.83278	0.87308	18.04728	862.36633	15.02931	15.75875	13.12183	13.75694
51	B01357	1.52200	12.00000	25.32000	0.55110	1.01930	-0.07866	0.57238	50.32587	907.27636	0.05033	33.83800	0.03384	22.75192
52	Plant Matter	2.14300	17.00000	25.11000	0.54110	1.00450	0.13653	0.57217	35.52708	924.04361	4.85061	20.32749	2.77537	11.63075
53		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
54		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
55		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
56		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
57		DELTA=	112.59753					SUMS=	103.90021	2693.68630	19.93025	69.92223	15.93104	48.13982
58														
59						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
60		Y @ MILK	REPORTED	CALCULATED		1.39322		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
61		1 COMP=	0.33100	0.33093	OK					0.18220	0.18218	OK	0.41778	No
62		2 COMP=	NA	2.32395	*	P-FACTOR		C-ZERO						
63						1.75900		0.23753						
64														
65	9571-22	0.53700	14.00000	25.12000	0.72560	1.02450	-0.17240	0.86856	42.18059	689.08490	0.04218	36.63623	0.03664	31.82064
66	B01334	1.52200	15.00000	25.32000	0.57980	1.07620	0.01358	0.57238	40.59139	862.36633	0.55117	27.29276	0.37059	18.35105
67	Plant Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
68		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
69		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
71		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
72		DELTA=	65.89472					SUMS=	82.77199	1551.45123	0.59335	63.92899	0.40723	50.17169
73														
74						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
75		Y @ MILK	REPORTED	CALCULATED		1.30337		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
76		1 COMP=	NA	0.00812	*					-0.03714	-0.03773	OK	0.48733	No
77		2 COMP=	-0.06300	-0.06412	OK	P-FACTOR		C-ZERO						
78						1.75900		-0.04919						
79														
80	9571-33	0.97400	24.00000	29.42000	0.64210	1.04030	0.18067	0.77513	34.29073	778.69491	6.19532	26.57960	4.80215	20.60252
81	B017X8	1.88700	18.00000	25.29000	0.75260	1.02420	-0.04184	0.61153	33.59936	664.36354	0.03360	20.54691	0.02055	12.56498
82	Plant Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
83		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
84		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
85		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
86		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
87		DELTA=	30.83655					SUMS=	67.89009	1443.05845	6.22892	47.12651	4.82270	33.16750
88														

SR90	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2														
3			GROSS	COUNT	BKG		NET							
4		ET	CTS	TIME	CPM	SF	CPM	X	Ws	Wb	WY	WX	WXY	WX^2
89						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
90		Y @ MILK	REPORTED	CALCULATED		1.51497		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
91		1 COMP=	0.14500	0.14540	OK					0.07362	0.07361	OK	0.36724	No
92		2 COMP=	NA	1.09824	*	P-FACTOR		C-ZERO						
93						1.75900		0.09598						
94														

96 5100 2270

TotalU	A	B	C	D	E	F	G	H	I	J	K	L	M
2	Sample #	9571-3		9571-7		9571-17		9571-18		9571-22		9571-33	
3	Cust I.D. #	B012Z2		B012Y0		B01346		B01357		B01334		B017X8	
4	Type	Plant Matter		Plant Matter		Plant Matter		Plant Matter		Plant Matter		Plant Matter	
5	Final Result (ug/l)	2 44700		1 65700		4 12300		3 49700		2 99500		0 42000	
6	Prep Volume (l)	0 02000		0 02000		0 02000		0 02000		0 02000		0.02000	
7	Aliquot (g or l)	0 25000		0 25000		0.25000		0 25000		0 25000		0 25000	
8	Reported Results (ug/unit aliquot)	0 19600		0 13300		0.33000		0.28000		0 24000		0.03400	
9	Calclulated Results (ug/unit aliquot	0.19576	OK	0 13256	OK	0.32984	OK	0.27976	OK	0.23960	OK	0.03360	OK
10	MDA	0.04200		0 04200		0.04200		0.04200		0.04200		0.04200	
11	Results > MDA ?	YES		YES		YES		YES		YES		NO	

Gamma	A	B	C	D	E	F	G	H	I	J	K	L	M
2	Sample #	9571-3		9571-7		9571-17		9571-18		9571-22		9571-33	
3	Cust I.D #	B012Z2		B012Y0		B01346		B01357		B01334		B017X8	
4	Type	Plant Matter		Plant Matter		Plant Matter		Plant Matter		Plant Matter		Plant Matter	
5	Detector	G-1 JR		G-3 JR		G-2 JR		G-3 JR		G-5 JR		G-3 JR	
6	Aliquot (g)	44.92000		53.63000		47.15000		74.34000		43.57000		54.95000	
7	Counting Time (min)	102.18000		107.70000		109.50000		110.52000		103.17000		113.43000	
8	[Cobalt 60; C0-60]												
9	Background CTS	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
10	Background CPM	0.03390		0.02110		0.08220		0.02110		0.01170		0.02110	
11	Net CPM	0.16900		0.16700		0.17400		0.14900		0.12400		0.12300	
12	Branch Fraction	1.00000		1.00000		1.00000		1.00000		1.00000		1.00000	
13	Efficiency	0.00388		0.00408		0.00324		0.00408		0.00362		0.00408	
14	Reported Results (pCi/g)	<	*	<	*	<	*	<	*	<	*	<	*
15	Calculated Results	0.43678		0.34379		0.51306		0.22128		0.35414		0.24713	
16	Reported MDA	0.47320	OK	0.37480	OK	0.55770	OK	0.24110	OK	0.38600	OK	0.26980	OK
17	Calculated MDA	0.21937		0.13428		0.37647		0.09562		0.14173		0.12770	
18		NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES
19	Results > MDA?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
20	[Cesium 137; Cs-137]												
21	Background CTS	0.00000		0.00000		0.00000		15.00000		0.00000		0.00000	
22	Background CPM	0.02830		0.02420		0.02700		0.02420		0.00000		0.03210	
23	Net CPM	0.29500		0.17200		0.17100		0.24300		0.22300		0.19100	
24	Branch Fraction	0.85100		0.85100		0.85100		0.85100		0.85100		0.85100	
25	Efficiency	0.00794		0.00831		0.00664		0.00831		0.00718		0.00831	
26	Reported Results (pCi/g)	<	*	<	*	<	*	<	*	<	*	<	*
27	Calculated Results	0.43780		0.20429		0.28911		0.20821		0.37732		0.22140	
28	Reported MDA	0.44480	OK	0.20720	OK	0.29310	OK	0.21150	OK	0.38260	OK	0.22520	OK
29	Calculated MDA	0.11509		0.08296		0.12372		0.15188		0.00000		0.09087	
30		NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES
31	Results > MDA?	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES
32	[Thorium 228; Th-228]												
33	Background CTS	0.00000		0.00000		0.00000		0.00000		47.00000		0.00000	
34	Background CPM	0.19500		0.19570		0.12960		0.19570		0.25620		0.19640	
35	Net CPM	0.55300		0.43500		0.30700		0.43500		0.24600		0.43100	
36	Branch Fraction	0.44800		0.44800		0.44800		0.44800		0.44800		0.44800	
37	Efficiency	0.02269		0.02354		0.01844		0.02354		0.01928		0.02354	
38	Reported Results (pCi/g)	<	*	<	*		*		*	0.37150	*		*
39	Calculated Results	0.54553		0.34645		0.35503		0.24994		0.29445		0.33502	
40	Reported MDA	0.68450	*	0.43640	*	0.44760	*	0.31530	*	NA	*	0.42790	*
41	Calculated MDA	0.20082		0.15821		0.18540		0.11267		0.46329		0.15073	
42		NON DET	YES	NON DET	YES	DETECT	YES	DETECT	YES	DETECT	NO	DETECT	YES
43	Results > MDA?	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES

TMA/Norcal N1-12-032-9571

Biota Samples

Strontium 90

Customer I.D. #	Original S	Duplicate D	RPD	Q
9571-40	-0.200	0.080	-466.667	
9571-41	1.400	1.500	6.897	
9571-42	0.050	0.080	46.154	

Total Uranium

Customer I.D. #	Original S	Duplicate D	RPD	Q
9571-47	0.032	0.027	16.949	
9571-48	0.031	0.029	6.667	

Gamma Spec
Colbolt 60

Customer I.D. #	Original S	Duplicate D	RPD	Q
9571-53	0.219	0.536	83.854	
9571-54	0.243	0.742	101.350	

Cesium 137

Customer I.D. #	Original S	Duplicate D	RPD	Q
9571-53	0.174	0.504	97.419	
9571-54	0.143	0.452	103.629	

Thorium 228

Customer I.D. #	Original S	Duplicate D	RPD	Q
9571-53	0.391	0.910	79.846	
9571-54	0.302	1.346	126.659	

Data will be
Reduced to MDA/RDL comparison

SAMPLE NUMBER:	9571-3	9571-7	9571-17	9571-18	9571-22	9571-33	9571-34
CUST ID NUMBER:	B012Z2	B012Y0	B01346	B01357	B01334	B017X8	QC7280
SAMPLE TYPE:	Plant Material	Plant Material	Plant Material	Plant Material	Plant Material	Plant Material	Spike
COLLECTION DATE:	09/10/91	09/10/91	09/10/91	09/10/91	09/10/91	09/10/91	
CHAIN OF CUSTODY:	12/02/91	12/02/91	12/02/91	12/02/91	12/02/91	12/02/91	
STRONTIUM 90:							
DATE RUN:	05/06/92	05/06/92	05/06/92	05/06/92	05/06/92	05/06/92	05/06/92
TOTAL URANIUM:							
DATE RUN:	06/02/92	06/02/92	06/02/92	06/02/92	06/02/92	06/02/92	
GAMMA SCAN							
DATE RUN:	04/25/92	04/29/92	04/30/92	04/30/92	04/30/92	05/03/92	
COBALT 60:							
CESIUM 137:							
THORIUM 228:							

9309227.4

SAMPLE NUMBER:	9571-35	9571-36	9571-37	9571-38	9571-39	9571-40	9571-41	9571-42	9571-43
CUST ID NUMBER:	QC7281	QC7282	QC7283	QC7284	QC7285	QC7286	QC7287	QC7288	QC7289
SAMPLE TYPE:	Spike	Spike	Blank	Blank	Blank	Replicate	Replicate	Replicate	Spike
COLLECTION DATE:									
CHAIN OF CUSTODY:									
STRONTIUM 90:									
DATE RUN:	05/06/92	05/06/92	05/06/92	05/06/92	05/07/92	05/06/92	05/06/92	05/07/92	
TOTAL URANIUM:									
DATE RUN:									06/02/92
GAMMA SCAN									
DATE RUN:									
COBALT 60:									
CESIUM 137:									
THORIUM 228:									

SAMPLE NUMBER:	9571-44	9571-45	9571-46	9571-47	9571-48	9571-49	9571-50	9571-51	9571-52
CUST ID NUMBER:	QC7290	QC7291	QC7292	QC7293	QC7294	QC7295	QC7296	QC7297	QC7298
SAMPLE TYPE:	Spike	Blank	Blank	Replicate	Replicate	Spike	Spike	Blank	Blank
COLLECTION DATE:									
CHAIN OF CUSTODY:									
STRONTIUM 90:									
DATE RUN:									
TOTAL URANIUM:									
DATE RUN:	06/02/92	06/02/92	06/02/92	06/02/92	06/02/92				
GAMMA SCAN									
DATE RUN:						05/15/92	05/15/92	05/15/92	05/15/92
COBALT 60:									
CESIUM 137:									
THORIUM 228:									

96150227

SAMPLE NUMBER:	9571-53	9571-54
CUST ID NUMBER:	QC7299	QC7300
SAMPLE TYPE:	Duplicate	Duplicate
COLLECTION DATE:		
CHAIN OF CUSTODY:		
STRONTIUM 90:		
DATE RUN:		
TOTAL URANIUM:		
DATE RUN:		
GAMMA SCAN		
DATE RUN:	05/15/92	05/15/92
COBALT 60:		
CESIUM 137:		
THORIUM 228:		

9615500.2278

HARTCROWSER

Hart Crowser, Inc.
1201 Jadwin Avenue, Suite 204
Richland, Washington 99352
FAX 509 946 4203
509 946 4344

Earth and Environmental Technologies

J-2978-50

July 22, 1993

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

Re: WHC Order No. MLW-SVV-037106
Task Order No. E-93-06
Return of Original Data for 300-FF-5 RI Samples

Dear Ms. Duncan:

Enclosed please find the 300-FF-5 Operable Unit Remedial Investigations (RI), Final Quality Assurance Reports (FQARs) listed on the attachment. Please contact me if you have any questions with regard to the materials being returned to you.

Sincerely,

HART CROWSER, INC.

D. MARK GERBOTH, P.E.
Task Manager

RECEIVED
JUL 22 1993
VALIDATION DOCUMENTATION
SDLA

cc: L. Hulstrom, Westinghouse Hanford
300-FF-5 Project File (HCRL-WHC/9306-L-93-148)
Attachment - Data Returned to Westinghouse Hanford, July 22, 1993

Data Returned to Westinghouse Hanford								
July 22, 1993								
			Work Completed		Data Included with this transmittal:			
Sample Delivery Group Number	Case Numbers	Project	Verified	Validated	ODP	VCL	PQAR	FQAR
B01842-TMA-299	N2-10--044-7100	300-FF-5	X	X				X
B07G70-TMA-300	N2-10-042-7098	300-FF-5	X	X				X
B012N5-TMA-115	N1-12-057-9575	300-FF-5	X	X				X
B012P5-TMA-114	N1-12-032-9571	300-FF-5	X	X				X
B01DT7-TMA-073	N1-12-031-9572	300-FF-5	X	X				X
B012N5-TMA-115	N1-12-056-9574	300-FF-5	X	X				X
B017X7-TMA-119	N2-01-111-7024	300-FF-5	X	X				X
B017Z1-TMA-236	N2-07-076-7058	300-FF-5	X	X				X
B01818-TMA-181	N2-05-029-7036	300-FF-5	X	X				X
B01370-TMA-149	N1-10-010-9546	300-FF-5	X	X				X
Notes:								
ODP = Original Data Package								
VCL = Verification Checklist								
PQAR = Preliminary Quality Assurance Report								
FQAR = Final Quality Assurance Record								

RECEIVED
JUL 22 1993
VALIDATION DOCUMENTATION
SDLA

WESTINGHOUSE HANFORD COMPANY
BCD-FFS RI DATA VALIDATION
DISTRIBUTION FORM

Originals

ent Title: Prelim. QA Records Trip Case. # N1-12-032-9571

ent Number: HCRL-WHC/EPRI--L-92-06 / Date: 12/17/92

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ect Files (1=Adm; 2=Corres; 3=Source Information; 4=Technical Data & Products)

File Index		2.1 Incoming Correspondence		4.4.5 Biota/Small Mammals	X
Distribution Lists		2.2 Outgoing Correspondence	X	4.4.6 Surface Water/Sediments	
Project Procedures		2.3 Internal Correspondence		4.5 Data Val. & Qual. Summary Rpts.	
Project Modifications				4.5.1 Round 1 Groundwater	
Staff Resumes		3.1 Task Order		4.5.1.1 Internal Drafts/Comments/Resol.	
Staff Training		3.2 Sample Lists		4.5.1.2 WHC Review Draft/Comments/Resol.	
Auth./Former Site Employee		3.3 Data Validation Procedures		4.5.1.3 Final Report	
QA Manual		3.4 Original Chemical Data		4.5.2 Round 2 Groundwater	
QA Implementation		3.5 Original Radiochem Data		4.5.2.1 Internal Drafts/Comments/Resol.	
1 QA Audits-Deliverables				4.5.2.2 WHC Review Draft/Comments/Resol.	
2 QA Audits-Files		4.1 Task Plan		4.5.2.3 Final Report	
1 Audit Resps-Deliverables		4.2 Data Pkg. Completeness Verif.		4.5.3 Round 3 Groundwater	
2 Audit Resps-Files		4.2.1 Checklists - Round 1 GW		4.5.3.1 Internal Drafts/Comments/Resol.	
Training		4.2.2 Checklists - Round 2 GW		4.5.3.2 WHC Review Draft/Comments/Resol.	
1 QA Manual Doc Log		4.2.3 Checklists - Round 3 GW		4.5.3.3 Final Report	
2 Procedures Doc Log		4.2.4 Checklists - Round 4 GW		4.5.4 Round 4 Groundwater	
3 Plans Document Log		4.2.5 Checklists - Biota/Small Mam.		4.5.4.1 Internal Drafts/Comments/Resol.	
4 Deliverables Doc Log		4.2.6 Checklists - Surface Wtr./Sed.		4.5.4.2 WHC Review Draft/Comments/Resol.	
Downloads		4.3 Data Val. Calcs./Annotated CP		4.5.4.3 Final Report	
M-113s		4.3.1 Round 1 Groundwater		4.5.5 Biota/Small Mammals	
A-208s		4.3.2 Round 2 Groundwater		4.5.5.1 Internal Drafts/Comments/Resol.	
Budget Status		4.3.3 Round 3 Groundwater		4.5.5.2 WHC Review Draft/Comments/Resol.	
Invoices		4.3.4 Round 4 Groundwater		4.5.5.3 Final Report	
Requisitions		4.3.5 Biota/Small Mammals		4.5.6 Surface Water/Sediments	
Meeting Minutes		4.3.6 Surface Water/Sediments		4.5.6.1 Internal Drafts/Comments/Resol.	
Record of Telecons		4.4 Preliminary QA Records		4.5.6.2 WHC Review Draft/Comments/Resol.	
Progress Reports		4.4.1 Round 1 Groundwater		4.5.6.3 Final Report	
Subcontractor (HCI)		4.4.2 Round 2 Groundwater		4.6 Weekly Status Reports	
		4.4.3 Round 3 Groundwater		4.7 Weekly Management Reports	
		4.4.4 Round 4 Groundwater			

11/13/92

9613500.2281

HARTCROWSER

Hart Crowser, Inc.
1201 Jadwin Avenue, Suite 204
Richland, WA 99352
FAX 509.946.4203
509.946.4344

Earth and Environmental Technologies

2978-50

December 17, 1992

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

Subject: WHC Order No. MLW-SVV-037106
Task Order No. E-93-06
Preliminary Quality Assurance Record - 300-FF-5 RI/FS
TMA Case Number N1-12-032-9571

Dear Mr. Hulstrom:

Ebasco and Hart Crowser are pleased to provide you with the attached results of our review and validation of the subject data from the 300-FF-5 Operable Unit Remedial Investigation/Feasibility Study (RI/FS). The attached results are provided to you in partial fulfillment of Subtask 03 of our task plan dated November 6, 1992. The subject data package consisted of 33 biota (vegetation) samples submitted for the following radiochemical analyses: strontium 90, total uranium, and gamma scan. The samples were analyzed by Thermo Analytical, Inc. according to requirements specified in the Analytical Laboratory Statement of Work issued by WHC. Six of the analytical results were selected for validation as being representative of the entire package. These results, together with the data qualifiers assigned are provided in Attachment 4. The results of all samples in this package and any qualifiers assigned as a result of our review will be presented in the summary report.

DATA QUALITY OBJECTIVES SUMMARY

Data quality objectives for these analyses were generally not met. The contract required detection limits (CRDLs) for two analytes of interest, cobalt 60 and cesium 137, were not met. Holding times for all samples exceeded the maximum time (six months). In addition, a review of the sample QA/QC samples identified poor precision in every case.

9513500.2282

MAJOR DEFICIENCIES (REJECTED DATA)

All gamma scan results were rejected because the reported minimum detectable activities (MDAs) were higher than the CRDLs listed in the 300 FF-5 RI/FS Work Plan. For the two analytes of concern evaluated, cobalt 60 and cesium 137, the difference is nearly an order of magnitude. This discrepancy could result in unacceptable risk projection errors due to improper classification of activity results.

MINOR DEFICIENCIES (OTHER QUALIFIED DATA)

The following general trends resulting in the qualification of data from multiple samples have been noted. All qualified data are discussed in Attachments 3 and 5.

Method precision for all analyses failed to meet requirements. This trend resulted from the use of replicate samples containing nondetectable levels of analyte. Poor or undetermined precision resulted in qualifying all results, not otherwise rejected, as estimated (J or UJ).

Holding times for all samples exceeded the maximum time of 6 months. The average holdings time was seven to eight months. This deficiency resulted in qualifying all results, not otherwise rejected, as estimated. All blank results were acceptable.

Although not used as a factor for qualifying data, it should be noted that the minimum number of QA/QC duplicate samples required in the Data Validation Procedure for Radiological Analysis, WHC-SD-EN-SPP-001, were not analyzed in all cases. For thirty three samples, the data validation procedure requires three duplicate samples. In this data package, strontium 90 analysis included three duplicates. All of the others contained two.

9613500.2285

We trust that these preliminary results meet your needs. Our qualifier assignments will be finalized at the time the summary report for this sampling round is published. The final qualifiers may vary from those presented here. reflecting any trends in data quality or laboratory performance observed over the course of the 300-FF-5 RI/FS. Please contact me if you have any questions with regard to our activities.

Sincerely,

HART CROWSER, INC.

D. MARK GERBOTH, P.E.
Project Manager
HC#130:RL1550.DOC

Attachments

cc: Mark Gerboth (w/o attachments)
Jeff Grover (w/o attachments)
Westinghouse EDMC
Project File - HCRL-WHC/9306-L-92-061

9613500.2284

THIS APPENDIX CONSISTS OF FIVE ATTACHMENTS

Attachment 1 - Glossary of Data Qualifiers

This attachment provides a glossary explaining all data qualifiers applied as a result of the validation.

Attachment 2 - As Received Laboratory Sample Concentration Reports

This attachment provides a copy of the as-received sample concentration reports. This may be a tabular summary similar to that provided in Attachment 4, or may be a copy of the laboratory reports.

Attachment 3 - Summary of Data Qualifications

This attachment provides a complete summary of all qualifications applied as a result of the validation.

Attachment 4 - As Qualified Data Summary

This attachment provides a tabular data summary of all data qualified from the validation.

Attachment 5 - Data Review Supporting Documentation

This attachment provides copies of the data validation checklists, data summary forms, telephone contact memoranda and other documentation completed as a result of the data validation.

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ATTACHMENT 1

Glossary of Data Qualifiers

9613500.2286

ATTACHMENT 1

Glossary of Data Qualifiers

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

UJ - Indicates the compound or analyte was analyzed for and not detected. Due to quality control deficiencies identified during data validation the value reported may not accurately reflect the sample quantitation limit.

J - Indicates the compound or analyte was analyzed for and detected. The associated value is estimated but the data are useable for decision making processes.

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

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ATTACHMENT 2

As Received Laboratory Sample Concentration Reports

ATTACHMENT 1 DATA TABLE

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012X6 (Plant Matter)	1	^{90}Sr	(-2 ± 4)	E-01
		Total Uranium	0.032 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.056 ± 0.242)	E+01
		^{51}Cr	<2.964	E+02
		^{60}Co	<2.194	E-01
		^{65}Zn	<7.035	E-01
		^{134}Cs	<2.381	E-01
		^{137}Cs	<1.739	E-01
		^{226}Ra	<3.287	E-01
		^{228}Th	<3.908	E-01
		^{232}Th	<7.594	E-01
B012Z0 (Plant Matter)	2	^{90}Sr	(1.4 ± 0.6) E+00	
		Total Uranium	0.031 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.055 ± 0.308)	E+01
		^{51}Cr	<3.606	E+02
		^{60}Co	<2.430	E-01
		^{65}Zn	<8.902	E-01
		^{134}Cs	<2.187	E-01
		^{137}Cs	<1.434	E-01
		^{226}Ra	<3.419	E-01
		^{228}Th	<3.022	E-01
		^{232}Th	<8.842	E-01
B012Z2 (Plant Matter)	3	^{90}Sr	(0.5 ± 1)	E-01
		Total Uranium	0.196 ± 0.032 (1)	
		Gamma Scan:		
		^{40}K	(1.222 ± 0.492)	E+01
		^{51}Cr	<7.633	E+02
		^{60}Co	<4.732	E-01
		^{65}Zn	<1.808	E-01
		^{134}Cs	<5.075	E-01
		^{137}Cs	<4.447	E-01
		^{226}Ra	<8.148	E-01
		^{228}Th	<6.845	E-01
		^{232}Th	<1.633	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012Y8 (Plant Matter)	4	^{90}Sr	(2 ± 7)	E-01
		Total Uranium	0.031 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.067 ± 0.334)	E+01
		^{51}Cr	<2.809	E+02
		^{60}Co	<2.916	E-01
		^{65}Zn	<9.990	E-01
		^{134}Cs	<2.786	E-01
		^{137}Cs	<2.004	E-01
		^{226}Ra	<3.928	E-01
		^{228}Th	<2.653	E-01
		^{232}Th	<9.354	E-01
B012Y1 (Plant Matter)	5	^{90}Sr	(-0.1 ± 0.1)	E+00
		Total Uranium	0.041 ± 0.008 (1)	
		Gamma Scan:		
		^{40}K	(1.149 ± 0.449)	E+01
		^{51}Cr	<7.220	E+02
		^{60}Co	<3.706	E-01
		^{65}Zn	<1.609	E+00
		^{134}Cs	<4.791	E-01
		^{137}Cs	<3.375	E-01
		^{226}Ra	<7.008	E-01
		^{228}Th	<6.271	E-01
		^{232}Th	<1.458	E-01
B012Y3 (Plant Matter)	6	^{90}Sr	(0.02 ± 2)	E-01
		Total Uranium	0.029 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.095 ± 0.288)	E+01
		^{51}Cr	<3.658	E+02
		^{60}Co	<3.205	E-01
		^{65}Zn	<1.085	E+00
		^{134}Cs	<2.178	E-01
		^{137}Cs	<1.623	E-01
		^{226}Ra	<2.662	E-01
		^{228}Th	<2.636	E-01
		^{232}Th	<8.171	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012Y0 (Plant Matter)	7	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.133 ± 0.022 (1)	
		Gamma Scan:		
		^{40}K	(1.585 ± 0.412)	E+01
		^{51}Cr	<5.717	E+02
		^{60}Co	<3.748	E-01
		^{65}Zn	<1.310	E+00
		^{134}Cs	<2.870	E-01
		^{137}Cs	<2.072	E-01
		^{226}Ra	<4.896	E-01
		^{228}Th	<4.364	E-01
		^{232}Th	<1.229	E-01
B012N8 (Plant Matter)	8	^{90}Sr	(0 ± 1)	E+00
		Total Uranium	0.029 ± 0.005 (1)	
		Gamma Scan:		
		^{40}K	(1.307 ± 0.375)	E+01
		^{51}Cr	<4.589	E+02
		^{60}Co	<2.331	E-01
		^{65}Zn	<9.359	E-01
		^{134}Cs	<2.363	E-01
		^{137}Cs	<2.050	E-01
		^{226}Ra	<5.060	E-01
		^{228}Th	<4.439	E-01
		^{232}Th	<1.024	E+00
B012X9 (Plant Matter)	9	^{90}Sr	(0 ± 1)	E+00
		Total Uranium	0.028 ± 0.005 (1)	
		Gamma Scan:		
		^{40}K	(1.028 ± 0.311)	E+01
		^{51}Cr	<3.503	E+02
		^{60}Co	<3.273	E-01
		^{65}Zn	<8.059	E-01
		^{134}Cs	<3.334	E-01
		^{137}Cs	<1.721	E-01
		^{226}Ra	<2.499	E-01
		^{228}Th	<2.725	E-01
		^{232}Th	<6.670	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page four)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012Y6	10	^{90}Sr	(-2 ± 3)	E-01
(Plant Matter)		Total Uranium	0.027 ± 0.005 (1)	
		Gamma Scan:		
		^{40}K	(1.330 ± 0.343)	E+01
		^{51}Cr	<4.210	E+02
		^{60}Co	<2.031	E-01
		^{65}Zn	<8.333	E-01
		^{134}Cs	<2.324	E-01
		^{137}Cs	<2.146	E-01
		^{226}Ra	<3.670	E-01
		^{228}Th	<3.299	E-01
		^{232}Th	<9.509	E-01
B012Y2	11	^{90}Sr	(-0.4 ± 2)	E+00
(Plant Matter)		Total Uranium	0.033 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.216 ± 0.291)	E+01
		^{51}Cr	<3.139	E+02
		^{60}Co	<2.164	E-01
		^{65}Zn	<9.908	E-01
		^{134}Cs	<2.268	E-01
		^{137}Cs	<1.375	E-01
		^{226}Ra	<3.932	E-01
		^{228}Th	<3.333	E-01
		^{232}Th	<8.473	E-01
B017X6	12	^{90}Sr	(1 ± 2)	E-01
(Plant Matter)		Total Uranium	0.031 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.046 ± 0.293)	E+01
		^{51}Cr	<3.672	E+02
		^{60}Co	<2.279	E-01
		^{65}Zn	<8.911	E-01
		^{134}Cs	<2.671	E-01
		^{137}Cs	<1.953	E-01
		^{226}Ra	<3.740	E-01
		^{228}Th	<2.853	E-01
		^{232}Th	<9.588	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page five)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012L6 (Plant Matter)	13	^{90}Sr	(-3 ± 5)	E-01
		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	<3.544	E+00
		^{51}Cr	<3.804	E+02
		^{60}Co	<3.745	E-01
		^{65}Zn	<9.799	E-01
		^{134}Cs	<2.109	E-01
		^{137}Cs	<1.936	E-01
		^{226}Ra	<3.698	E-01
		^{228}Th	<3.452	E-01
		^{232}Th	<6.296	E-01
B012W5 (Plant Matter)	14	^{90}Sr	(2 ± 2)	E-01
		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	(1.243 ± 0.333)	E+01
		^{51}Cr	<3.760	E+02
		^{60}Co	<2.580	E-01
		^{65}Zn	<1.030	E+00
		^{134}Cs	<2.495	E-01
		^{137}Cs	<1.980	E-01
		^{226}Ra	<3.804	E-01
		^{228}Th	<3.372	E-01
		^{232}Th	<9.269	E-01
B012Z9 (Plant Matter)	15	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.031 ± 0.005 (1)	
		Gamma Scan:		
		^{40}K	(7.723 ± 2.330)	E+00
		^{51}Cr	<3.422	E+02
		^{60}Co	<1.457	E-01
		^{65}Zn	<6.063	E-01
		^{134}Cs	<2.527	E-01
		^{137}Cs	<1.729	E-01
		^{226}Ra	<3.131	E-01
		^{228}Th	<3.729	E-01
		^{232}Th	<7.232	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page six)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012W0 (Plant Matter)	16	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.041 ± 0.007 (1)	
		Gamma Scan:		
		^{40}K	(1.256 ± 0.441)	E+01
		^{51}Cr	<5.598	E+02
		^{60}Co	<3.825	E-01
		^{65}Zn	<1.246	E+00
		^{134}Cs	<3.619	E-01
		^{137}Cs	<2.543	E-01
		^{226}Ra	<5.993	E-01
		^{228}Th	<3.738	E-01
		^{232}Th	<1.168	E+00
B01346 (Plant Matter)	17	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.330 ± 0.055 (1)	
		Gamma Scan:		
		^{40}K	(8.644 ± 3.969)	E+00
		^{51}Cr	<5.475	E+02
		^{60}Co	<5.577	E-01
		^{65}Zn	<1.680	E+00
		^{134}Cs	<3.852	E-01
		^{137}Cs	<2.931	E-01
		^{226}Ra	<5.952	E-01
		^{228}Th	<4.476	E-01
		^{232}Th	<1.365	E+00
B01357 (Plant Matter)	18	^{90}Sr	(2 ± 2)	E-01
		Total Uranium	0.280 ± 0.047 (1)	
		Gamma Scan:		
		^{40}K	(1.116 ± 0.342)	E+01
		^{51}Cr	<3.718	E+02
		^{60}Co	<2.411	E-01
		^{65}Zn	<7.321	E-01
		^{134}Cs	<2.234	E-01
		^{137}Cs	<2.115	E-01
		^{226}Ra	<3.076	E-01
		^{228}Th	<3.153	E-01
		^{232}Th	<7.158	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page seven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B01329 (Plant Matter)	19	^{90}Sr	(0.4 ± 2)	E-01
		Total Uranium	0.063 ± 0.011 (1)	
		Gamma Scan:		
		^{40}K	(9.906 ± 3.266)	E+00
		^{51}Cr	<3.635	E+02
		^{60}Co	<2.593	E-01
		^{65}Zn	<9.114	E-01
		^{134}Cs	<2.459	E-01
		^{137}Cs	<2.159	E-01
		^{226}Ra	<3.837	E-01
		^{228}Th	<4.110	E-01
		^{232}Th	<1.008	E+00
B01351 (Plant Matter)	20	^{90}Sr	(1 ± 4)	E-01
		Total Uranium	0.021 ± 0.004 (1)	
		Gamma Scan:		
		^{40}K	(1.254 ± 0.316)	E+00
		^{51}Cr	<2.917	E+02
		^{60}Co	<2.635	E-01
		^{65}Zn	<8.972	E-01
		^{134}Cs	<1.638	E-01
		^{137}Cs	<1.472	E-01
		^{226}Ra	<3.609	E-01
		^{228}Th	<3.104	E-01
		^{232}Th	<8.572	E-01
B01353 (Plant Matter)	21	^{90}Sr	(2 ± 2)	E-01
		Total Uranium	0.233 ± 0.039 (1)	
		Gamma Scan:		
		^{40}K	(1.357 ± 0.345)	E+01
		^{51}Cr	<3.899	E+02
		^{60}Co	<2.269	E-01
		^{65}Zn	<1.040	E+00
		^{134}Cs	<2.823	E-01
		^{137}Cs	<2.061	E-01
		^{226}Ra	<3.353	E-01
		^{228}Th	<3.238	E-01
		^{232}Th	<9.507	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page eight)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B01334 (Plant Matter)	22	^{90}Sr	(0.04 ± 1)	E+00
		Total Uranium	0.240 ± 0.040 (1)	
		Gamma Scan:		
		^{40}K	(1.341 ± 0.433)	E+01
		^{51}Cr	<6.522	E+02
		^{60}Co	<3.860	E-01
		^{65}Zn	<1.117	E+00
		^{134}Cs	<3.893	E-01
		^{137}Cs	<3.826	E-01
		^{226}Ra	<6.166	E-01
		^{228}Th	<7.790	E-01
		^{232}Th	<1.268	E+00
B01356 (Plant Matter)	23	^{90}Sr	(6 ± 2)	E-01
		Total Uranium	0.330 ± 0.055 (1)	
		Gamma Scan:		
		^{40}K	(9.254 ± 3.422)	E+00
		^{51}Cr	<4.280	E+02
		^{60}Co	<3.475	E-01
		^{65}Zn	<1.211	E+00
		^{134}Cs	<3.128	E-01
		^{137}Cs	<1.960	E-01
		^{226}Ra	<4.145	E-01
		^{228}Th	<3.318	E-01
		^{232}Th	<1.095	E-01
B01341 (Plant Matter)	24	^{90}Sr	(2 ± 3)	E-01
		Total Uranium	0.067 ± 0.011 (1)	
		Gamma Scan:		
		^{40}K	(1.007 ± 0.270)	E+01
		^{51}Cr	<3.731	E+02
		^{60}Co	<1.664	E-01
		^{65}Zn	<7.745	E-01
		^{134}Cs	<3.235	E-01
		^{137}Cs	<1.943	E-01
		^{226}Ra	<3.892	E-01
		^{228}Th	<3.908	E-01
		^{232}Th	(7.472 ± 5.512)	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page nine)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B01310 (Plant Matter)	25	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.044 ± 0.007 (1)	
		Gamma Scan:		
		^{40}K	(1.587 ± 0.432)	E+01
		^{51}Cr	<4.947	E+02
		^{60}Co	<3.827	E-01
		^{65}Zn	<1.682	E+00
		^{134}Cs	<4.010	E-01
		^{137}Cs	<3.177	E-01
		^{226}Ra	<5.911	E-01
		^{228}Th	<4.049	E-01
		^{232}Th	<1.657	E+00
B01347 (Plant Matter)	26	^{90}Sr	(-0.1 ± 1)	E+00
		Total Uranium	0.017 ± 0.003 (1)	
		Gamma Scan:		
		^{40}K	(8.979 ± 3.634)	E+00
		^{51}Cr	<5.365	E+02
		^{60}Co	<3.678	E-01
		^{65}Zn	<9.285	E-01
		^{134}Cs	<3.023	E-01
		^{137}Cs	<2.413	E-01
		^{226}Ra	<4.246	E-01
		^{228}Th	<5.365	E-01
		^{232}Th	<1.102	E+00
B01328 (Plant Matter)	27	^{90}Sr	(1 ± 3)	E-01
		Total Uranium	0.065 ± 0.011 (1)	
		Gamma Scan:		
		^{40}K	(1.366 ± 0.419)	E+01
		^{51}Cr	<5.356	E+02
		^{60}Co	<3.765	E-01
		^{65}Zn	<1.332	E+00
		^{134}Cs	<3.495	E-01
		^{137}Cs	<2.510	E-01
		^{226}Ra	<3.546	E-01
		^{228}Th	<3.567	E-01
		^{232}Th	<1.279	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page ten)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B01331 (Plant Matter)	28	^{90}Sr	(3 ± 2)	E-01
		Total Uranium	0.050 ± 0.050 (1)	
		Gamma Scan:		
		^{40}K	(1.143 ± 0.400)	E+01
		^{51}Cr	<5.967	E+02
		^{60}Co	<3.682	E-01
		^{65}Zn	<9.956	E+00
		^{134}Cs	<3.524	E-01
		^{137}Cs	<2.704	E-01
		^{226}Ra	<4.638	E-01
		^{228}Th	<5.088	E-01
		^{232}Th	<1.251	E+00
B01306 (Plant Matter)	29	^{90}Sr	(0.002 ± 1)	E+00
		Total Uranium	0.033 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(8.100 ± 2.826)	E+00
		^{51}Cr	<4.551	E+02
		^{60}Co	<2.976	E-01
		^{65}Zn	<8.702	E-01
		^{134}Cs	<2.024	E-01
		^{137}Cs	<2.262	E-01
		^{226}Ra	<5.236	E-01
		^{228}Th	<6.205	E-01
		^{232}Th	<8.232	E-01
B01304 (Plant Matter)	30	^{90}Sr	(0.4 ± 2)	E-01
		Total Uranium	0.059 ± 0.010 (1)	
		Gamma Scan:		
		^{40}K	(1.026 ± 0.361)	E+01
		^{51}Cr	<7.969	E+02
		^{60}Co	<3.064	E-01
		^{65}Zn	<1.232	E+00
		^{134}Cs	<3.793	E-01
		^{137}Cs	<3.487	E-01
		^{226}Ra	<5.650	E-01
		^{228}Th	<5.380	E-01
		^{232}Th	<1.383	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page eleven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B017X9 (Plant Matter)	31	^{90}Sr	(0.4 ± 2)	E-01
		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	(4.663 ± 2.038)	E+00
		^{51}Cr	<4.072	E+02
		^{60}Co	<2.065	E-01
		^{65}Zn	<8.796	E-01
		^{134}Cs	<2.398	E-01
		^{137}Cs	<1.497	E-01
		^{226}Ra	<3.894	E-01
		^{228}Th	<4.070	E-01
		^{232}Th	<7.868	E-01
B017X7 (Plant Matter)	32	^{90}Sr	(0.6 ± 1)	E-01
		Total Uranium	0.071 ± 0.012 (1)	
		Gamma Scan:		
		^{40}K	(9.258 ± 3.701)	E+00
		^{51}Cr	<5.947	E+02
		^{60}Co	<3.028	E-01
		^{65}Zn	<1.071	E+00
		^{134}Cs	<2.978	E-01
		^{137}Cs	<2.405	E-01
		^{226}Ra	<3.829	E-01
		^{228}Th	<3.503	E-01
		^{232}Th	<1.003	E+00
B017X8 (Plant Matter)	33	^{90}Sr	(0.7 ± 2)	E-01
		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	(5.317 ± 2.772)	E+00
		^{51}Cr	<5.989	E+02
		^{60}Co	<2.698	E-01
		^{65}Zn	<9.602	E-01
		^{134}Cs	<3.323	E-01
		^{137}Cs	<2.252	E-01
		^{226}Ra	<4.747	E-01
		^{228}Th	<4.279	E-01
		^{232}Th	<8.908	E-01

(1) Units are μg/gram.

9613500.2299

ATTACHMENT 3

Summary of Data Qualifications

Strontium 90 (CRDL=1 pCi/g)

Customer I.D. #	Reported Results	Q
B012Z2	0.050	UJ
B012Y0	0.100	UJ
B01346	0.100	UJ
B01357	0.200	UJ
B01334	0.040	UJ
B017X8	0.070	UJ

Total Uraniu (CRDL=1ug/g)

Customer I.D. #	Reported Results	Q
B012Z2	0.196	J
B012Y0	0.133	J
B01346	0.330	J
B01357	0.280	J
B01334	0.240	J
B017X8	0.034	UJ

Gamma Spec

Cobalt 60 (CRDL=.05pCi/g)

Customer I.D. #	Reported Results	Q
B012Z2	0.473	R
B012Y0	0.375	R
B01346	0.558	R
B01357	0.241	R
B01334	0.386	R
B017X8	0.270	R

Cesium 137 (CRDL=.1pCi/g)

Customer I.D. #	Reported Results	Q
B012Z2	0.445	R
B012Y0	0.207	R
B01346	0.293	R
B01357	0.212	R
B01334	0.383	R
B017X8	0.225	R

Thorium 228 (CRDL=not reported)

Customer I.D. #	Reported Results	Q
B012Z2	0.685	R
B012Y0	0.436	R
B01346	0.448	R
B01357	0.315	R
B01334	0.779	R
B017X8	0.428	R

9613500.2301

ATTACHMENT 4

As Qualified Data Summary

"J" All due to holding times > 6 months
"J" All due to provide precision numbers that are > MDA and meet precision criteria
"J" spikes - Gamma Scan - poor accuracy.
Blanks - OK

TMA

ITACHMENT 1 DATA TABLE

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012X6 (Plant Matter)	1	^{90}Sr	(-2 ± 4)	E-01
		Total Uranium	0.032 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.056 ± 0.242)	E+01
		^{51}Cr	<2.964	E+02
		^{60}Co	<2.194	E-01
		^{65}Zn	<7.035	E-01
		^{134}Cs	<2.381	E-01
		^{137}Cs	<1.739	E-01
		^{226}Ra	<3.287	E-01
		^{228}Th	<3.908	E-01
		^{232}Th	<7.594	E-01
B012Z0 (Plant Matter)	2	^{90}Sr	(1.4 ± 0.6) E+00	
		Total Uranium	0.031 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.055 ± 0.308)	E+01
		^{51}Cr	<3.606	E+02
		^{60}Co	<2.430	E-01
		^{65}Zn	<8.902	E-01
		^{134}Cs	<2.187	E-01
		^{137}Cs	<1.434	E-01
		^{226}Ra	<3.419	E-01
		^{228}Th	<3.022	E-01
		^{232}Th	<8.842	E-01
B012Z2 (Plant Matter)	3	^{90}Sr - U5	(0.5 ± 1)	E-01
		(1) Total Uranium - 6 - 2-92	0.196 ± 0.032 (1)	
		Gamma Scan:		
		^{40}K	(1.222 ± 0.492)	E+01
		^{51}Cr	<7.633	E+02
		^{60}Co - OR	>RDL - <4.732	E-01
		^{65}Zn <1.808 E00	<1.808	E-01
		^{134}Cs <5.060 E0	>RDL <5.075	E-01
		^{137}Cs - OR	<4.447	E-01
		^{226}Ra	<8.148	E-01
		^{228}Th - OR	<6.845	E-01
		^{232}Th	<1.633	E+00

Request SR90 TOTAL U GAMMA / OK

COC

Check Eff. & Branch Frac

zero 253.292 21 yield time 25.842 9

116.177 92

(1) Total Uranium - not enough info to recalculate MDA - reported MDA's used.

(2) Co^{60} & Cs^{137} compared to RDL's 0.05 & 0.1 pCi/g respectively when reported as "<". Th^{232} compared to raw data and computed MDA's when "<". Minimum Detectable Results for Co^{60} & Cs^{137} > RDL's. Minimum Detectable Activities in Raw Data for Co^{60} & Cs^{137} also > RDL's. As a result, all data "R" for Gamma Scan.

(3) Note: Although 33 samples, only 2 QC samples for Total U, and Gamma Spec

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012Y8 (Plant Matter)	4	^{90}Sr	(2 ± 7)	E-01
		Total Uranium	0.031 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.067 ± 0.334)	E+01
		^{51}Cr	<2.809	E+02
		^{60}Co	<2.916	E-01
		^{65}Zn	<9.990	E-01
		^{134}Cs	<2.786	E-01
		^{137}Cs	<2.004	E-01
		^{226}Ra	<3.928	E-01
		^{228}Th	<2.653	E-01
		^{232}Th	<9.354	E-01
B012Y1 (Plant Matter)	5	^{90}Sr	(-0.1 ± 0.1)	E+00
		Total Uranium	0.041 ± 0.008 (1)	
		Gamma Scan:		
		^{40}K	(1.149 ± 0.449)	E+01
		^{51}Cr	<7.220	E+02
		^{60}Co	<3.706	E-01
		^{65}Zn	<1.609	E+00
		^{134}Cs	<4.791	E-01
		^{137}Cs	<3.375	E-01
		^{226}Ra	<7.008	E-01
		^{228}Th	<6.271	E-01
		^{232}Th	<1.458	E-01
B012Y3 (Plant Matter)	6	^{90}Sr	(0.02 ± 2)	E-01
		Total Uranium	0.029 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.095 ± 0.288)	E+01
		^{51}Cr	<3.658	E+02
		^{60}Co	<3.205	E-01
		^{65}Zn	<1.085	E+00
		^{134}Cs	<2.178	E-01
		^{137}Cs	<1.623	E-01
		^{226}Ra	<2.662	E-01
		^{228}Th	<2.636	E-01
		^{232}Th	<8.171	E-01

TTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012Y0 (Plant Matter)	7	^{90}Sr ~~Zero~~ time 253.292 91 J / milk time 125.841 92	(1 ± 2)	E-01
		Total Uranium 6-2-92 J	0.133 ± 0.022 (1)	
		Gamma Scan:		
		^{40}K	(1.585 ± 0.412)	E+01
		^{51}Cr	<5.717	E+02
		^{60}Co	<3.748	E-01
		^{65}Zn	<1.310	E+00
		^{134}Cs (2.975E-1 ~~2.975~~)	<2.870	E-01
		^{137}Cs	<2.072	E-01
		^{226}Ra	<4.896	E-01
		^{228}Th	<4.364	E-01
		^{232}Th (1.229E00)	<1.229	E-01
B012N8 (Plant Matter)	8	^{90}Sr	(0 ± 1)	E+00
		Total Uranium	0.029 ± 0.005 (1)	
		Gamma Scan:		
		^{40}K	(1.307 ± 0.375)	E+01
		^{51}Cr	<4.589	E+02
		^{60}Co	<2.331	E-01
		^{65}Zn	<9.359	E-01
		^{134}Cs	<2.363	E-01
		^{137}Cs	<2.050	E-01
		^{226}Ra	<5.060	E-01
		^{228}Th	<4.439	E-01
		^{232}Th	<1.024	E+00
B012X9 (Plant Matter)	9	^{90}Sr	(0 ± 1)	E+00
		Total Uranium	0.028 ± 0.005 (1)	
		Gamma Scan:		
		^{40}K	(1.028 ± 0.311)	E+01
		^{51}Cr	<3.503	E+02
		^{60}Co	<3.273	E-01
		^{65}Zn	<8.059	E-01
		^{134}Cs	<3.334	E-01
		^{137}Cs	<1.721	E-01
		^{226}Ra	<2.499	E-01
		^{228}Th	<2.725	E-01
		^{232}Th	<6.670	E-01

REQUEST COC
GAMMA SR90 TOTAL U
B/L

>RDL >RDL

12 0.862 92

ATTACHMENT 1 DATA TABLE (cont'd, page four)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012Y6 (Plant Matter)	10	^{90}Sr	(-2 ± 3)	E-01
		Total Uranium	0.027 ± 0.005 (1)	
		Gamma Scan:		
		^{40}K	(1.330 ± 0.343)	E+01
		^{51}Cr	<4.210	E+02
		^{60}Co	<2.031	E-01
		^{65}Zn	<8.333	E-01
		^{134}Cs	<2.324	E-01
		^{137}Cs	<2.146	E-01
		^{226}Ra	<3.670	E-01
		^{228}Th	<3.299	E-01
		^{232}Th	<9.509	E-01
B012Y2 (Plant Matter)	11	^{90}Sr	(-0.4 ± 2)	E+00
		Total Uranium	0.033 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.216 ± 0.291)	E+01
		^{51}Cr	<3.139	E+02
		^{60}Co	<2.164	E-01
		^{65}Zn	<9.908	E-01
		^{134}Cs	<2.268	E-01
		^{137}Cs	<1.375	E-01
		^{226}Ra	<3.932	E-01
		^{228}Th	<3.333	E-01
		^{232}Th	<8.473	E-01
B017X6 (Plant Matter)	12	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.031 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(1.046 ± 0.293)	E+01
		^{51}Cr	<3.672	E+02
		^{60}Co	<2.279	E-01
		^{65}Zn	<8.911	E-01
		^{134}Cs	<2.671	E-01
		^{137}Cs	<1.953	E-01
		^{226}Ra	<3.740	E-01
		^{228}Th	<2.853	E-01
		^{232}Th	<9.588	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page five)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012L6	13	^{90}Sr	(-3 ± 5)	E-01
(Plant Matter)		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	<3.544	E+00
		^{51}Cr	<3.804	E+02
		^{60}Co	<3.745	E-01
		^{65}Zn	<9.799	E-01
		^{134}Cs	<2.109	E-01
		^{137}Cs	<1.936	E-01
		^{226}Ra	<3.698	E-01
		^{228}Th	<3.452	E-01
		^{232}Th	<6.296	E-01
B012W5	14	^{90}Sr	(2 ± 2)	E-01
(Plant Matter)		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	(1.243 ± 0.333)	E+01
		^{51}Cr	<3.760	E+02
		^{60}Co	<2.580	E-01
		^{65}Zn	<1.030	E+00
		^{134}Cs	<2.495	E-01
		^{137}Cs	<1.980	E-01
		^{226}Ra	<3.804	E-01
		^{228}Th	<3.372	E-01
		^{232}Th	<9.269	E-01
B012Z9	15	^{90}Sr	(1 ± 2)	E-01
(Plant Matter)		Total Uranium	0.031 ± 0.005 (1)	
		Gamma Scan:		
		^{40}K	(7.723 ± 2.330)	E+00
		^{51}Cr	<3.422	E+02
		^{60}Co	<1.457	E-01
		^{65}Zn	<6.063	E-01
		^{134}Cs	<2.527	E-01
		^{137}Cs	<1.729	E-01
		^{226}Ra	<3.131	E-01
		^{228}Th	<3.729	E-01
		^{232}Th	<7.232	E-01

TTACHMENT 1 DATA TABLE (cont'd, page six)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B012W0 (Plant Matter)	16	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.041 ± 0.007 (1)	
		Gamma Scan:		
		^{40}K	(1.256 ± 0.441)	E+01
		^{51}Cr	<5.598	E+02
		^{60}Co	<3.825	E-01
		^{65}Zn	<1.246	E+00
		^{134}Cs	<3.619	E-01
		^{137}Cs	<2.543	E-01
		^{226}Ra	<5.993	E-01
		^{228}Th	<3.738	E-01
		^{232}Th	<1.168	E+00
B01346 (Plant Matter)	17	^{90}Sr	(1 ± 2) closer to 2 (1.516E-1)	E-01
		Total Uranium	0.330 ± 0.055 (1)	
		Gamma Scan:		
		^{40}K	(8.644 ± 3.969)	E+00
		^{51}Cr	<5.475	E+02
		^{60}Co	<5.577	E-01
		^{65}Zn	<1.680	E+00
		^{134}Cs	<3.852 (2.554E-1)	E-01
		^{137}Cs	<2.931	E-01
		^{226}Ra	<5.952	E-01
		^{228}Th	<4.476	E-01
		^{232}Th	<1.365	E+00
B01357 (Plant Matter)	18	^{90}Sr	(2 ± 2)	E-01
		Total Uranium	0.280 ± 0.047 (1)	
		Gamma Scan:		
		^{40}K	(1.116 ± 0.342)	E+01
		^{51}Cr	<3.718	E+02
		^{60}Co	<2.411	E-01
		^{65}Zn	<7.321	E-01
		^{134}Cs	<2.234	E-01
		^{137}Cs	<2.115	E-01
		^{226}Ra	<3.076	E-01
		^{228}Th	<3.153	E-01
		^{232}Th	<7.158	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page seven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B01329 (Plant Matter)	19	^{90}Sr	(0.4 ± 2)	E-01
		Total Uranium	0.063 ± 0.011 (1)	
		Gamma Scan:		
		^{40}K	(9.906 ± 3.266)	E+00
		^{51}Cr	<3.635	E+02
		^{60}Co	<2.593	E-01
		^{65}Zn	<9.114	E-01
		^{134}Cs	<2.459	E-01
		^{137}Cs	<2.159	E-01
		^{226}Ra	<3.837	E-01
		^{228}Th	<4.110	E-01
		^{232}Th	<1.008	E+00
B01351 (Plant Matter)	20	^{90}Sr	(1 ± 4)	E-01
		Total Uranium	0.021 ± 0.004 (1)	
		Gamma Scan:		
		^{40}K	(1.254 ± 0.316)	E+00
		^{51}Cr	<2.917	E+02
		^{60}Co	<2.635	E-01
		^{65}Zn	<8.972	E-01
		^{134}Cs	<1.638	E-01
		^{137}Cs	<1.472	E-01
		^{226}Ra	<3.609	E-01
		^{228}Th	<3.104	E-01
		^{232}Th	<8.572	E-01
B01353 (Plant Matter)	21	^{90}Sr	(2 ± 2)	E-01
		Total Uranium	0.233 ± 0.039 (1)	
		Gamma Scan:		
		^{40}K	(1.357 ± 0.345)	E+01
		^{51}Cr	<3.899	E+02
		^{60}Co	<2.269	E-01
		^{65}Zn	<1.040	E+00
		^{134}Cs	<2.823	E-01
		^{137}Cs	<2.061	E-01
		^{226}Ra	<3.353	E-01
		^{228}Th	<3.238	E-01
		^{232}Th	<9.507	E-01

ATTACHMENT 1 DATA TABLE (cont'd, page eight)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B01334 (Plant Matter)	22	^{90}Sr	(0.04 ± 1)	E+00
		Total Uranium	0.240 ± 0.040 (1)	
		Gamma Scan:		
		^{40}K	(1.341 ± 0.433)	E+01
		^{51}Cr	<6.522	E+02
		^{60}Co	<3.860	E-01
		^{65}Zn	<1.117	E+00
		^{134}Cs	<3.893	E-01
		^{137}Cs	<3.826	E-01
		^{226}Ra	<6.166	E-01
		^{228}Th	<7.790	E-01
		^{232}Th	<1.268	E+00
B01356 (Plant Matter)	23	^{90}Sr	(6 ± 2)	E-01
		Total Uranium	0.330 ± 0.055 (1)	
		Gamma Scan:		
		^{40}K	(9.254 ± 3.422)	E+00
		^{51}Cr	<4.280	E+02
		^{60}Co	<3.475	E-01
		^{65}Zn	<1.211	E+00
		^{134}Cs	<3.128	E-01
		^{137}Cs	<1.960	E-01
		^{226}Ra	<4.145	E-01
		^{228}Th	<3.318	E-01
		^{232}Th	<1.095	E-01
B01341 (Plant Matter)	24	^{90}Sr	(2 ± 3)	E-01
		Total Uranium	0.067 ± 0.011 (1)	
		Gamma Scan:		
		^{40}K	(1.007 ± 0.270)	E+01
		^{51}Cr	<3.731	E+02
		^{60}Co	<1.664	E-01
		^{65}Zn	<7.745	E-01
		^{134}Cs	<3.235	E-01
		^{137}Cs	<1.943	E-01
		^{226}Ra	<3.892	E-01
		^{228}Th	<3.908	E-01
		^{232}Th	(7.472 ± 5.512)	E-01

TTACHMENT 1 DATA TABLE (cont'd, page nine)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B01310 (Plant Matter)	25	^{90}Sr	(1 ± 2)	E-01
		Total Uranium	0.044 ± 0.007 (1)	
		Gamma Scan:		
		^{40}K	(1.587 ± 0.432)	E+01
		^{51}Cr	<4.947	E+02
		^{60}Co	<3.827	E-01
		^{65}Zn	<1.682	E+00
		^{134}Cs	<4.010	E-01
		^{137}Cs	<3.177	E-01
		^{226}Ra	<5.911	E-01
		^{228}Th	<4.049	E-01
		^{232}Th	<1.657	E+00
B01347 (Plant Matter)	26	^{90}Sr	(-0.1 ± 1)	E+00
		Total Uranium	0.017 ± 0.003 (1)	
		Gamma Scan:		
		^{40}K	(8.979 ± 3.634)	E+00
		^{51}Cr	<5.365	E+02
		^{60}Co	<3.678	E-01
		^{65}Zn	<9.285	E-01
		^{134}Cs	<3.023	E-01
		^{137}Cs	<2.413	E-01
		^{226}Ra	<4.246	E-01
		^{228}Th	<5.365	E-01
		^{232}Th	<1.102	E+00
B01328 (Plant Matter)	27	^{90}Sr	(1 ± 3)	E-01
		Total Uranium	0.065 ± 0.011 (1)	
		Gamma Scan:		
		^{40}K	(1.366 ± 0.419)	E+01
		^{51}Cr	<5.356	E+02
		^{60}Co	<3.765	E-01
		^{65}Zn	<1.332	E+00
		^{134}Cs	<3.495	E-01
		^{137}Cs	<2.510	E-01
		^{226}Ra	<3.546	E-01
		^{228}Th	<3.567	E-01
		^{232}Th	<1.279	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page ten)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B01331 (Plant Matter)	28	^{90}Sr	(3 ± 2)	E-01
		Total Uranium	0.050 ± 0.050 (1)	
		Gamma Scan:		
		^{40}K	(1.143 ± 0.400)	E+01
		^{51}Cr	<5.967	E+02
		^{60}Co	<3.682	E-01
		^{65}Zn	<9.956	E+00
		^{134}Cs	<3.524	E-01
		^{137}Cs	<2.704	E-01
		^{226}Ra	<4.638	E-01
		^{228}Th	<5.088	E-01
		^{232}Th	<1.251	E+00
B01306 (Plant Matter)	29	^{90}Sr	(0.002 ± 1)	E+00
		Total Uranium	0.033 ± 0.006 (1)	
		Gamma Scan:		
		^{40}K	(8.100 ± 2.826)	E+00
		^{51}Cr	<4.551	E+02
		^{60}Co	<2.976	E-01
		^{65}Zn	<8.702	E-01
		^{134}Cs	<2.024	E-01
		^{137}Cs	<2.262	E-01
		^{226}Ra	<5.236	E-01
		^{228}Th	<6.205	E-01
		^{232}Th	<8.232	E-01
B01304 (Plant Matter)	30	^{90}Sr	(0.4 ± 2)	E-01
		Total Uranium	0.059 ± 0.010 (1)	
		Gamma Scan:		
		^{40}K	(1.026 ± 0.361)	E+01
		^{51}Cr	<7.969	E+02
		^{60}Co	<3.064	E-01
		^{65}Zn	<1.232	E+00
		^{134}Cs	<3.793	E-01
		^{137}Cs	<3.487	E-01
		^{226}Ra	<5.650	E-01
		^{228}Th	<5.380	E-01
		^{232}Th	<1.383	E+00

ATTACHMENT 1 DATA TABLE (cont'd, page eleven)

Collection date: 9/10/91

Customer I.D.	TMA/Norcal Group No. 9571	Analysis	Results pCi/g ± 2 σ	
B017X9 (Plant Matter)	31	^{90}Sr	(0.4 ± 2)	E-01
		Total Uranium	<0.034 (1)	
		Gamma Scan:		
		^{40}K	(4.663 ± 2.038)	E+00
		^{51}Cr	<4.072	E+02
		^{60}Co	<2.065	E-01
		^{65}Zn	<8.796	E-01
		^{134}Cs	<2.398	E-01
		^{137}Cs	<1.497	E-01
		^{226}Ra	<3.894	E-01
		^{228}Th	<4.070	E-01
		^{232}Th	<7.868	E-01
B017X7 (Plant Matter)	32	^{90}Sr	(0.6 ± 1)	E-01
		Total Uranium	0.071 ± 0.012 (1)	
		Gamma Scan:		
		^{40}K	(9.258 ± 3.701)	E+00
		^{51}Cr	<5.947	E+02
		^{60}Co	<3.028	E-01
		^{65}Zn	<1.071	E+00
		^{134}Cs	<2.978	E-01
		^{137}Cs	<2.405	E-01
		^{226}Ra	<3.829	E-01
		^{228}Th	<3.503	E-01
		^{232}Th	<1.003	E+00
B017X8 (Plant Matter)	33	^{90}Sr zero time 253.292 91 milk time 126.989 92 6-2-92	(0.7 ± 2)	E-01
		Total Uranium	<0.034 (1)	
GAMMA, SR90, TOTAL U/6LK COCV		Gamma Scan:		
		^{40}K	(5.317 ± 2.772)	E+00
		^{51}Cr	<5.989	E+02
		^{60}Co	<2.698	E-01
		^{65}Zn	<9.602	E-01
		^{134}Cs	<3.323	E-01
		^{137}Cs	<2.252	E-01
		^{226}Ra	<4.747	E-01
		^{228}Th	<4.279	E-01
		^{232}Th	<8.908	E-01

check branch fract. <2.559E-17 RDL RDL 134, 234

(1) Units are μg/gram.

9613500.2313

ATTACHMENT 5

Data Review Supporting Documentation

9613500.2314

TMA/NORCAL N1-12-032-9571

Data Package Completeness Checklists

B012Z2
B012Y0
B01346
B01357
B01334
B017X8

SR-90

Supplemental Requirements for Analyses Using Gas Proportional Counters

A.0 Completeness Checklist

Analysis Results

✓ Results Report for Sample Analyses and Reanalyses
✓ Raw Data (Counting Logs, Printouts, Notebook Pages)
✓ Calculation Sheets
✓ Sample Identifications
✓ Detector Identification
✓ Analysis Date and Initials of Analyst
✓ Amounts of Samples Prepared or Counted
✓ Weights of Solids Counted

Initial and Continuing Calibration

✓ Detector Identification
✓ Calibration Date(s) and Initials of Analyst
✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
✓ Amount of (Check) Standard Used
✓ Raw Data including Counts and Count Duration for Standards
✓ Weights of Preparations
✓ Efficiencies
✓ Weights of Carriers Added, If Applicable
✓ Results of Statistical Tests Used to Evaluate Instrument Reliability and Efficiency Checks
✓ Raw Data of Background Counts and Count Duration
✓ Results of Statistical Test Used to Evaluate Instrument Background
NA Control Limits for Check Source and Background Counts

Blanks

✓ Detector Identification
✓ Date of Analysis
NO MDA of Method will calculate
✓ Amounts of Reagents Used in Blank

Supplemental Requirements for Analyses Using Gas Proportional Counters (Cont.)

Radiometric and Gravimetric Yields

✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
✓ Weights of Precipitates or Solids Counted
✓ Calculated Recoveries

Duplicates

✓ Detector Identification
✓ Date of Analysis
✓ Aliquots of Samples
✓ Weights of Solids Counted
✓ Count Durations
✓ Sample Identifications
✓ Calculated Precision

Laboratory Control Samples

✓ Detector Identification
✓ Date of Analysis
✓ Calculation of Recoveries
✓ Results of Analyses

9613500L2517

Supplemental Requirements for Analyses Using Gamma Spectroscopy

C.0 Completeness Checklist

Gamma

Analysis Results

✓ Results Report for Sample Analyses and Reanalyses
✓ Raw Data (Spectra, Printouts of Counts per Channel, Notebook Pages)
✓ Calculation Sheets
✓ Sample Identifications
✓ Detector Identification and Counting Position
✓ Analysis Date and Initials of Analyst
✓ Amounts of Samples Counted

Initial and Continuing Calibration

✓ Detector Identification
✓ Calibration Date(s) and Initials of Analyst
✓ Identification of Calibration and Check Standards including Radionuclides, Certification, Expiration Date, and Activity
NA Amount of (Check) Standard Used
✓ Raw Data including Counts and Count Duration for Standards
✓ Efficiencies and/or Geometry and Matrix Factors
✓ Raw Data of Background Counts, Count Dates, and Duration of Counts
✓ Kev/Channel
✓ FWHM

Blanks

✓ Detector Identification
✓ Date of Analysis
ND MDA of Method will calculate
✓ Amounts of Reagents Used in Blank
✓ Raw Data

Supplemental Requirements for Analyses Using Gamma Spectroscopy (Cont.)

Duplicates

✓ Detector Identification
✓ Date of Analysis
✓ Amounts of Samples
✓ Count Durations
✓ Sample Identifications
✓ Results of Analyses and Calculated Precision
✓ Raw Data

Radiometric and Gravimetric Yields

_____ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
_____ Weights of Precipitates or Solids Counted
_____ Calculated Recoveries

Laboratory Control Samples

✓ Detector Identification
✓ Date of Analysis
✓ Calculation of Recoveries
✓ Results of Analyses

9613500.2319

Total Uranium by kPA

Supplemental Requirements for Analyses Using kPA for Total Uranium

Analysis Results

- ✓ Results Reported for Sample Analyses
- ✓ Raw Data (including Prep Volume, Aliquot Volume, kPA output)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification
- ✓ Analysis Date and Initials of Analyst

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
- ✓ Amount of Standard Used
- ✓ Raw count/Activity data
- ✓ Determination of Calibration Equation

Blanks/Backgrounds

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ MDA of Method
- ✓ Amount of Reagent Used (Prep Volume)
- ✓ Count Durations

Duplicates

✓ Detector Identification
✓ Date of Analysis
✓ Amounts of Samples
✓ Count Durations
✓ Sample Identifications
✓ Results of Analysis and Calculated Precision
✓ Raw Data

Matrix Spikes

✓ Detector Identification
✓ Date of Analysis
✓ Amounts of Samples
✓ Count Durations
✓ Sample Identifications
✓ Results of Analysis and Calculated Precision
✓ Identification of Matrix Spike Radionuclide, Certification, Expiration Date, and Activity
✓ Amount of Matrix Spike Used
✓ Raw Data
✓ Results of Analysis and Comparison to Amount Added

9615500.2321

TMA
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
P.O. Box 4040
Richmond, CA 94804-0040
(415) 235-2633 Fax No. (415) 235-0438

JUN 1992
RECEIVED
OSM DMO

June 11, 1992

SENT BY FEDERAL EXPRESS

Ref. TMA/Norcal N1-12-032-9571 Biota-Veg

Mr. John Bourgeault
Westinghouse Hanford Company
2355 Stevens Drive
Richland, WA 99352

Dear Mr. Bourgeault:

Enclosed on Attachment 1, are the ^{90}Sr, total uranium, and gamma scan results for the plant samples from 300-FF-5 Area, we received 4 December 1991.

Please call if you have any questions concerning this data.

Sincerely,

D.P. Kharkar

Dinkar P. Kharkar, Ph.D.
Manager, Nuclear Programs

Envlosures: Section 1 through 9
Appendices

INDEX OF DOCUMENTS

SECTION 1	Data Report
SECTION 2	Case Narrative
SECTION 3	QC Summary
SECTION 4	Chains-of-Custody Copies 2 12-2-91 @ 10Am Released to 12-4-91 @ 11Am Received
SECTION 5	Analytical Methods Used
SECTION 6	Aliquot Information
SECTION 7	Raw Data for ^{90}Sr
SECTION 8	Raw Data for Total Uranium
SECTION 9	Raw Data for Gamma Scan

SEE NEXT PAGE FOR APPENDICES TO BE INCLUDED IN THE DATA PACKAGE

Note

A total of 33 samples run in this SDG.

Need 3 dups
1 Spike
1 Blank
1 LCS

9613500.2323

SECTION 2 Case Narrative

CASE NARRATIVE

1. Project 300-FF-5, Task 7, Plant Material (TMA/Norcal Group No. 9571) were processed together and the results of the analyses are reported. The sample ID's are:

Customer Sample ID	TMA/Norcal Group No.	Customer Sample ID	TMA/Norcal Group No.
B012X6 (Plant Material)	9571-1	B01346 (Plant Material)	9571-17
B012Z0 (Plant Material)	9571-2	B01357 (Plant Material)	9571-18
B012Z2 (Plant Material)	9571-3	B01329 (Plant Material)	9571-19
B012Y8 (Plant Material)	9571-4	B01351 (Plant Material)	9571-10
B012Y1 (Plant Material)	9571-5	B01353 (Plant Material)	9571-21
B012Y3 (Plant Material)	9571-6	B01334 (Plant Material)	9571-22
B012Y0 (Plant Material)	9571-7	B01356 (Plant Material)	9571-23
B012N8 (Plant Material)	9571-8	B01341 (Plant Material)	9571-24
B012X9 (Plant Material)	9571-9	B01310 (Plant Material)	9571-25
B012Y6 (Plant Material)	9571-10	B01347 (Plant Material)	9571-26
B012Y2 (Plant Material)	9571-11	B01328 (Plant Material)	9571-27
B017X6 (Plant Material)	9571-12	B01331 (Plant Material)	9571-28
B012L6 (Plant Material)	9571-13	B01306 (Plant Material)	9571-29
B012W5 (Plant Material)	9571-14	B01304 (Plant Material)	9571-30
B012Z9 (Plant Material)	9571-15	B017X9 (Plant Material)	9571-31
B012W0 (Plant Material)	9571-16	B017X7 (Plant Material)	9571-32
		B017X8 (Plant Material)	9571-33

2. The analyses reported are:

PLANT MATERIAL	
Analyte	Group # & Sample #
^{90}Sr	9571-1 through 33
Total U	9571-1 through 33
Gamma Scan	9571-1 through 33

3. Results are reported pCi/gram dry material with 2 σ errors, except for total uranium which arreported μgm/gram dry material with 2 σ errors.

4. Strontium-90 analyses were processed in three batches, with ^{90}Sr QCs with each batch.

5. The QC samples consisting of a spike, a lab control sample, and a replicate were processed with this batch as shown on Table 1.

TABLE 1

Preparation Batch Samples Processed	Data Package
9571-1 through 33	- PLANT MATERIAL

QC SAMPLES PROCESSED:

Sample I.D.	Type	Analyses	Reported with Data Package
9571-34 (QC 7280)	Spike	^{90}Sr	X
9571-35 (QC 7281)	Spike	^{90}Sr	X
9571-36 (QC 7282)	Spike	^{90}Sr	X
9571-37 (QC 7283)	LCS	^{90}Sr	X
9571-38 (QC 7284)	LCS	^{90}Sr	X
9571-39 (QC 7285)	LCS	^{90}Sr	X
9571-40 (QC 7286)	Replicate	^{90}Sr	X
9571-41 (QC 7287)	Replicate	^{90}Sr	X
9571-42 (QC 7288)	Replicate	^{90}Sr	X
9571-43 (QC 7289)	Spike	Total U	X
9571-44 (QC 7290)	Spike	Total U	X
9571-45 (QC 7291)	LCS	Total U	X
9571-46 (QC 7292)	LCS	Total U	X
9571-47 (QC 7293)	Replicate	Total U	X
9571-48 (QC 7294)	Replicate	Total U	X
9571-49 (QC 7295)	Spike	Gamma Scan	X
9571-50 (QC 7296)	Spike	Gamma Scan	X
9571-51 (QC 7297)	LCS	Gamma Scan	X
9571-52 (QC 7298)	LCS	Gamma Scan	X
9571-53 (QC 7299)	Replicate	Gamma Scan	X
9571-54 (QC 7300)	Replicate	Gamma Scan	X

BLANKS, not LCS's

6. Analyses, reanalyses, and reworks, etc.

Strontium Analyses (Plant Material): The average yield for 33 analyses was 74%. The lowest yield was 20% and the highest was 90%. No abnormalities were encountered. The results of the spike, the Laboratory Control Sample, and the replicate were satisfactory.

Gamma Scan Analyses (Plant Material): The spike samples processed had only ^{60}Co and ^{137}Cs activity and the found/added ratio of the spikes look good. The results of the spike, the laboratory control sample, and the replicate were satisfactory.

Total Uranium Analyses (Plant Material): No abnormalities were encountered. The results of the spike, the Laboratory Control Sample, and the replicate were satisfactory.

SECTION 3: QC SUMMARY

QUALITY CONTROL SUMMARY

Attachment 2, 3, and 4 gives the results of the QC samples. The recovery ratios were determined by the QC Officer based upon the final data obtained for each. The laboratory control samples were calculated with an aliquot of 1.00 and, therefore, the presented data cannot be compared directly with the sample data. To compare them directly, the laboratory control sample data would need to be divided by sample aliquots.

The results of the spike, the laboratory control and the replicate for ^{90}Sr, total uranium, and gamma scan were satisfactory.

D.P. Kharkar

Dinkar P. Kharkar, Ph.D.
TMA/Norcal Program Manager

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TMA

ATTACHMENT 2 QUALITY CONTROL SAMPLE RESULTS, SPIKES AND BLANKS

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found	Added	Recovery Ratio Found/Added ± 2 σ	
Spikes for Plant Material:					
9571-34 QC-7280	^{90}Sr	4.81 ± 1.15	5.99 ± 0.24	0.80 ± 0.19	OK
9571-35 QC-7281	^{90}Sr	3.41 ± 0.49	4.28 ± 0.17	0.80 ± 0.12	OK
9571-36 QC-7282	^{90}Sr	4.30 ± 0.79	5.13 ± 0.21	0.84 ± 0.16	OK
9571-43 QC-7289	Total U	44.40 ± 6.57 (1)	40.67 ± 1.63 (1)	1.09 ± 0.16	OK
9571-44 QC-7290	Total U	50.60 ± 7.49 (1)	48.80 ± 1.95 (1)	1.04 ± 0.16	OK
9571-49 QC-7295	Gamma Scan:				
	^{60}Co	52 ± 17	54 ± 2	0.97 ± 0.33	OK
	^{137}Cs	64 ± 18	84 ± 3	0.76 ± 0.22	J or US
9571-50 QC-7296	Gamma Scan:				
	^{60}Co	35 ± 19	54 ± 2	0.64 ± 0.35	J or US
	^{137}Cs	47 ± 19	63 ± 3	0.74 ± 0.30	

Can't verify

(1) Units are μg/sample.

Need 1 spike/SDG

OK

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9615900.2329

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ATTACHMENT 3 QUALITY CONTROL SAMPLE RESULTS, ~~LABORATORY CONTROL SAMPLES~~

TMA

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found	Added	Recovery Ratio Found/Added ± 2 σ	
Laboratory Control Samples (Plant Material)					
9571-37 QC-7283	^{90}Sr	(0 ± 2.4)	0	Satisfactory	OK
9571-38 QC-7284	^{90}Sr	0.04 ± 0.3	0	Satisfactory	
9571-39 QC-7285	^{90}Sr	-0.2 ± 0.4	0	Satisfactory	
9571-45 QC-7291	Total U	<0.008 (1)	0	Satisfactory	
9571-46 QC-7292	Total U	<0.008 (1)	0	Satisfactory	
9571-51 QC-7297	Gamma Scan:				
	^{40}K	<3.181 E+02	0	Satisfactory	
	^{51}Cr	<1.072 E+02	0	Satisfactory	
	^{60}Co	<2.051 E+01	0	Satisfactory	
	^{65}Zn	<4.261 E+01	0	Satisfactory	
	^{134}Cs	<1.983 E+01	0	Satisfactory	
	^{137}Cs	<2.044 E+01	0	Satisfactory	
	^{226}Ra	<3.129 E+01	0	Satisfactory	
	^{228}Th	<2.510 E+01	0	Satisfactory	
	^{232}Th	<8.260 E+01	0	Satisfactory	
9571-52 QC-7298	Gamma Scan:				
	^{40}K	<2.227 E+02	0	Satisfactory	
	^{51}Cr	<7.688 E+01	0	Satisfactory	
	^{60}Co	<1.135 E+01	0	Satisfactory	
	^{65}Zn	<2.853 E+01	0	Satisfactory	
	^{134}Cs	<1.560 E+01	0	Satisfactory	
	^{137}Cs	<1.092 E+01	0	Satisfactory	
	^{226}Ra	<2.175 E+01	0	Satisfactory	
	^{228}Th	<2.150 E+01	0	Satisfactory	
	^{232}Th	<6.504 E+01	0	Satisfactory	

0 Added, can't BC LCS

(Can't verify)

(Can't verify)

Need 1 BLANK per SDG.

OK

ATTACHMENT 4 QUALITY CONTROL RESULTS, REPLICATES

TMA

Nuclide	Results	
	pCi/g ± error 2 σ	
	No. 9571-40 Replicate	No. 9571-1 Original
QC 7286 ^{90}Sr	(0.08 ± 2) E+00	(-2 ± 4) E-01
	No. 9571-41 Replicate	No. 9571-2 Original
QC 7287 ^{90}Sr	(1.5 ± 0.2) E+00	(1.4 ± 0.6) E+00
	No. 9571-42 Replicate	No. 9571-3 Original
QC 7288 ^{90}Sr	(0.8 ± 1.6) E-01	(0.5 ± 1.4) E-01
	No. 9571-47 Replicate	No. 9571-1 Original
QC-7293 Total U	0.027 ± 0.005 (1)	0.032 ± 0.006 (1)
	No. 9571-48 Replicate	No. 9571-2 Original
QC-7294 Total U	0.029 ± 0.005 (1)	0.031 ± 0.006 (1)

	No. 9571-53 Replicate		No. 9571-1 Original	
QC-7299 Gamma Scan:	NOT EQUAL			
^{40}K	(1.533 ± 0.721)	E+01	(1.056 ± 0.242)	E+01
^{51}Cr	<1.628	E+03	<2.964	E+02
^{60}Co	<5.362	E-01	<2.194	E-01
^{65}Zn	<2.433	E+00	<7.035	E-01
^{134}Cs	<7.989	E-01	<2.381	E-01
^{137}Cs	<5.042	E-01	<1.739	E-01
^{226}Ra	<1.036	E+00	<3.287	E-01
^{228}Th	<9.102	E-01	<3.908	E-01
^{232}Th	<2.522	E+00	<7.594	E-01

	No. 9571-54 Replicate		No. 9571-2 Original	
QC-7300 Gamma Scan:				
^{40}K	(8.764 ± 5.053)	E+00	(1.055 ± 0.308)	E+01
^{51}Cr	<1.078	E+03	<3.606	E+02
^{60}Co	<7.423	E-01	<2.430	E-01
^{65}Zn	<1.999	E+00	<8.902	E-01
^{134}Cs	<4.778	E-01	<2.187	E-01
^{137}Cs	<4.518	E-01	<1.434	E-01
^{226}Ra	<8.026	E-01	<3.419	E-01
^{228}Th	<1.346	E+00	<3.022	E-01
^{232}Th	<2.078	E+00	<8.842	E-01

(1) Units are μg/gram. Need 1 Dup per 20 samples per SDG. (2) OK reviewed on separate sheet

SECTION 4 Chains-of-Custody Copies

786 Container CAB4

Westinghouse Hanford Company 9613608.2332

CHAIN OF CUSTODY

1 of 2

us' 'y Form Initiator: CA Brandt

ompany Contact: CA Brandt — Telephone: 376-5345

roject Designation/Sampling Locations: 300-FF-5 TASK 7 — Collection Date: 9-10/91

:e Chest No.: CAB-4 — Field Logbook No.: BNW 53573

ill of Lading/Airbill No.: 2485217625 — Offsite Property No.: PNL-92-277

Method of Shipment: Air

hipped to: TMA / NORCAL

ossible Sample Hazards/Remarks: onsite samples <50 pCi/g; offsite samples no hazard.

U/gamma splits			Sample Identification	ICP splits
B012X6	B012X6	B01356		B017X9
B012Z0	B012L6	B01341		B017X8
B012Z2	B012W5	B01310		B017X7
B012Y8	B012Z9	B01347		
B012Y1	B012W0	B01328		
B012Y3	B01346	B01331		
B012Y0	B01357	B01306		
B012N8	B01329	B01304		
B012X9	B01351	B017X9		
B012Y6	B01353	B017X7		
B012Y2	B01334	B017X8		

] Field Transfer of Custody — CHAIN OF POSSESSION — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
R1 Fellows		12/2/91 10:00 am
Relinquished by:	Received by: Kermit Blum	Date/Time: 12-4-91 1100
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90)

9615400.2336

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector CA Brandt Date Sampled 9-10/91 Time N/A hours

Company Contact CA Brandt Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01353	1, ~150g glass	Plant matter	gamma scan, Sr^{90}, total U
B01334			
B01356			
B01341			
B01310			
B01347			
B01328			
B01331	Ibid.	Ibid.	Ibid.
B01306			
B01304			
B017X9			
B017X7			
017X8			

Field Information** From 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards None detected.

PART II: LABORATORY SECTION

Received by Hermit Blum Title Sample Control Supervisor Date 12-4-91

Analysis Required

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

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

A-6000-406 (05/90)

9613500.2354

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector CA Brandt Date Sampled 9-10/91 Time N/A hours

Company Contact CA Brandt Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B012X6	1, ~150g glass	Plant matter	gamma scan, Sr^{90}, total U
B012Z0			
B012Z2			
B012Y8			
B012Y1			
B012Y3			
B012Y0			
B012N8			
B012X9			
B012Y6			
B012Y2			
B017X6			
B012L6			
B012W5	Ibid.	Ibid.	Ibid.
B012Z9			
B012W0			
B01346			
B01357			
B01329			
B01351			

Field Information** From 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards None detected.

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-4-91

Analysis Required

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

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

A-6000-406 (05/90)

9615500.2335

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector CA Brandt Date Sampled 9-10/91 Time NA hours

Company Contact CA Brandt Telephone (509) 376-5345

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B017X7	1, ~20g in glass	plant matter	ICP metals
B017X8	"	"	"
B017X9	"	"	"

Field Information** from 300-FF-5 Task 7

Special Handling and/or Storage N/A

Possible Sample Hazards none detected

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-4-91

Analysis Required

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

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

A-6000-406 (05/90)

SECTION 5 Analytical Methods Used

ANALYTICAL METHODS USED - SOIL AND VEGETATION

1. Gross Alpha and Gross Beta: Approximately a 0.200 gram was uniformly deposited on a stainless steel planchet and counted on a low background proportional counter for gross alpha and gross beta determination.

2. Strontium-90: ^{90}Sr was determined on a 1 gram aliquot. Approximately 3 gram dry soil was dissolved completely by $HF-HNO_3-HCl$ treatment and made to a known volume. One gram aliquot was taken for ^{90}Sr determination. Yttrium carrier was added Yttrium was extracted by HDEHP extraction. Yttrium was converted to yttrium oxide and beta counted.

3. Isotopic Uranium: Uranium was determined on a 1 gram aliquot. Approximately 3 gram dry soil was dissolved completely by $HF-HNO_3-HCl$ treatment and made to a known volume. A one gram aliquot was taken for isotopic uranium determination. An appropriate uranium tracer was added and uranium purified by selective ion exchange procedures. The purified extract was electroplated on a stainless steel disc for alpha pulse analysis.

4. Technetium-99: Approximately 2 gram was ashed at 500°C with ^{99m}Tc tracer and ammonia. The ash was leached with H_2SO_4 and $K_2S_2O_8$. The leached sample is filtered. H_2SO4 and $K_2S_2O_8$ was added to a 10 mL aliquot of water. The water and the leached samaple of soil was extracted with TBP and purified by coprecipitation and anion exchange procedure. The purified Tc was electroplated on a stainless steel disc and counted on a gamma detector to determine yield. After decay of ^{99m}Tc, the disc was counted on a low background beta counter.

5. Gamma-Scan: Approximately 200 to 750 gram dry soil was placed in an appropriate geometry and counted on a Ge(Li) detector.

6. Total Uranium: 0.250 gram dry material was dissolved in 20 mL 1N HNO_3. An aliquot was taken for laser phosphorometric determination of uranium.

7. Tritium: Tritium was azeotropically distilled from ≈ 20 gram vegetation and the distillate was counted by liquid scintillation.

SR90	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2														
3			GROSS	COUNT	BKG		NET							
4		ET	CTS	TIME	CPM	SF	CPM	X	Ws	Wb	WY	WX	WXY	WX^2
5	9571-3	1.29000	19.00000	25.83000	0.55110	1.01970	0.18811	0.71415	33.66818	907.27636	6.33342	24.04405	4.52300	17.17101
6	B012Z2	2.32100	8.00000	27.33000	0.45480	0.98460	-0.15959	0.54624	85.91506	1099.38434	0.08592	46.92994	0.04693	25.63484
7	Plant Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
9		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
10		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12		DELTA=	81.55461					SUMS=	119.58324	2006.66070	6.41934	70.97399	4.56993	42.80585
13														
14						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
15		Y @ MILK	REPORTED	CALCULATED		1.72968		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
16		1 COMP=	0.10700	0.10676	OK					0.04739	0.04734	OK	0.31486	No
17		2 COMP=	NA	1.11436	*	P-FACTOR		C-ZERO						
18						1.75900		0.06172						
19														
20	9571-7	1.33100	26.00000	26.21000	0.72560	1.02450	0.27291	0.70656	25.30346	689.08490	6.90567	17.87850	4.87930	12.63230
21	B012Y0	2.32100	16.00000	27.33000	0.51710	1.04990	0.07175	0.54624	44.38061	966.93096	3.18419	24.24230	1.73932	13.24203
22	Plant Matter	2.91800	18.00000	25.01000	0.72560	1.02420	-0.00603	0.46779	32.95466	689.08490	0.03295	15.41582	0.01542	7.21135
23		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
24		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
25		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
26		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
27		DELTA=	85.40830					SUMS=	102.63873	2345.10075	10.12282	57.53663	6.63403	33.08568
28														
29						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
30		Y @ MILK	REPORTED	CALCULATED		1.61260		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
31		1 COMP=	0.20000	0.20051	OK					0.09535	0.09537	OK	0.38561	No
32		2 COMP=	NA	1.15300	*	P-FACTOR		C-ZERO						
33						1.75900		0.12434						
34														
35	9571-17	0.51700	22.00000	25.13000	0.51710	1.04790	0.37551	0.87308	27.74433	966.93096	10.41834	24.22310	9.09608	21.14877
36	B01346	1.52200	18.00000	25.32000	0.72560	1.02600	-0.01508	0.67238	33.73643	689.08490	0.03374	22.68363	0.02268	15.25197
37	Plant Matter	2.23900	38.00000	27.30000	0.71130	1.01550	0.69119	0.55800	18.92312	702.93828	13.07950	10.55917	7.29841	5.89205
38		3.57500	21.00000	26.17000	0.72560	1.02440	0.07872	0.39433	30.99921	689.08490	2.44028	12.22406	0.96229	4.82037
39		6.35400	91.00000	36.57000	0.71760	1.00930	1.78725	0.19140	14.10981	696.76700	25.21772	2.70065	4.82672	0.51691
40		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
41		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
42		DELTA=	737.78901					SUMS=	125.51291	3744.80603	51.18957	72.39061	22.20618	47.63007
43														
44						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
45		Y @ MILK	REPORTED	CALCULATED		1.23765		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
46		1 COMP=	0.24500	0.46622	*					0.15159	0.28892	*	0.43808	No

SR90	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2														
3			GROSS	COUNT	BKG		NET							
4		ET	CTS	TIME	CPM	SF	CPM	X	Ws	Wb	WY	WX	WXY	WX^2
47		2 COMP=	NA	-1.24491	*	P-FACTOR		C-ZERO						
48						1.75900		0.37870						
49														
50	9571-18	0.51700	34.00000	25.13000	0.57980	1.07710	0.83276	0.87308	18.04726	862.36633	15.02931	15.75875	13.12183	13.75694
51	B01357	1.52200	12.00000	25.32000	0.55110	1.01930	-0.07866	0.67238	50.32587	907.27636	0.05033	33.83800	0.03384	22.75192
52	Plant Matter	2.14300	17.00000	25.11000	0.54110	1.00450	0.13653	0.57217	35.52708	924.04361	4.85061	20.32749	2.77537	11.63075
53		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
54		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
55		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
56		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
57		DELTA=	112.59753					SUMS=	103.90021	2693.68630	19.93025	69.92223	15.93104	48.13962
58														
59						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
60		Y @ MILK	REPORTED	CALCULATED		1.39322		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
61		1 COMP=	0.33100	0.33093	OK					0.18220	0.18218	OK	0.41778	No
62		2 COMP=	NA	2.32395	*	P-FACTOR		C-ZERO						
63						1.75900		0.23753						
64														
65	9571-22	0.53700	14.00000	25.12000	0.72560	1.02450	-0.17240	0.86856	42.18059	689.08490	0.04218	36.63623	0.03664	31.82064
66	B01334	1.52200	15.00000	25.32000	0.57980	1.07620	0.01358	0.67238	40.59139	862.36633	0.55117	27.29276	0.37059	18.35105
67	Plant Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
68		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
69		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
71		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
72		DELTA=	65.89472					SUMS=	82.77199	1551.45123	0.59335	63.92899	0.40723	50.17169
73														
74						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
75		Y @ MILK	REPORTED	CALCULATED		1.30337		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
76		1 COMP=	NA	0.00812	*					-0.03714	-0.03773	OK	0.48733	No
77		2 COMP=	-0.06300	-0.06412	OK	P-FACTOR		C-ZERO						
78						1.75900		-0.04919						
79														
80	9571-33	0.97400	24.00000	29.42000	0.64210	1.04030	0.18067	0.77513	34.29073	778.69491	6.19532	26.57960	4.80215	20.60252
81	B017X8	1.88700	18.00000	25.29000	0.75260	1.02420	-0.04184	0.61153	33.59936	664.36354	0.03380	20.54691	0.02055	12.56498
82	Plant Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
83		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
84		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
85		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
86		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
87		DELTA=	30.83655					SUMS=	67.89009	1443.05845	6.22892	47.12851	4.82270	33.16750
88														

SR90	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2														
3			GROSS	COUNT	BKG		NET							
4		ET	CTS	TIME	CPM	SF	CPM	X	Ws	Wb	WY	WX	WXY	WX^2
89						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
90		Y @ MILK	REPORTED	CALCULATED		1.51497		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
91		1 COMP=	0.14500	0.14540	OK					0.07362	0.07361	OK	0.36724	No
92		2 COMP=	NA	1.09824	*	P-FACTOR		C-ZERO						
93						1.75900		0.09598						
94														

TotalU	A	B	C	D	E	F	G	H	I	J	K	L	M
2	Sample #	9571-3		9571-7		9571-17		9571-18		9571-22		9571-33	
3	Cust. I.D. #	B012Z2		B012Y0		B01348		B01357		B01334		B017X8	
4	Type	Plant Matter		Plant Matter		Plant Matter		Plant Matter		Plant Matter		Plant Matter	
5	Final Result (ug/l)	2.44700		1.65700		4.12300		3.49700		2.99500		0.42000	
6	Prep Volume (l)	0.02000		0.02000		0.02000		0.02000		0.02000		0.02000	
7	Aliquot (g or l)	0.25000		0.25000		0.25000		0.25000		0.25000		0.25000	
8	Reported Results (ug/unit aliquot)	0.19600		0.13300		0.33000		0.28000		0.24000		0.03400	
9	Calculated Results (ug/unit aliquot	0.19578	OK	0.13256	OK	0.32984	OK	0.27978	OK	0.23960	OK	0.03360	OK
10	MDA	0.04200		0.04200		0.04200		0.04200		0.04200		0.04200	
11	Results > MDA ?	YES		YES		YES		YES		YES		NO	

Gamma	A	B	C	D	E	F	G	H	I	J	K	L	M
2	Sample #	9571-3		9571-7		9571-17		9571-18		9571-22		9571-33	
3	Cust. I.D. #	B01222		B012Y0		B01346		B01357		B01334		B017X8	
4	Type	Plant Matter		Plant Matter		Plant Matter		Plant Matter		Plant Matter		Plant Matter	
5	Detector	G-1 JR		G-3 JR		G-2 JR		G-3 JR		G-5 JR		G-3 JR	
6	Aliquot (g)	44.92000		53.63000		47.15000		74.34000		43.57000		54.95000	
7	Counting Time (min)	102.18000		107.70000		109.50000		110.52000		103.17000		113.43000	
8	[Cobalt 60; Co-60]												
9	Background CTS	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
10	Background CPM	0.03390		0.02110		0.08220		0.02110		0.01170		0.02110	
11	Net CPM	0.16900		0.16700		0.17400		0.14900		0.12400		0.12300	
12	Branch Fraction	1.00000		1.00000		1.00000		1.00000		1.00000		1.00000	
13	Efficiency	0.00388		0.00408		0.00324		0.00408		0.00362		0.00408	
14	Reported Results (pCi/g)	<	*	<	*	<	*	<	*	<	*	<	*
15	Calculated Results	0.43678		0.34379		0.51306		0.22128		0.35414		0.24713	
16	Reported MDA	0.47320	OK	0.37480	OK	0.55770	OK	0.24110	OK	0.38800	OK	0.26980	OK
17	Calculated MDA	0.21937		0.13428		0.37647		0.09562		0.14173		0.12770	
18		NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES
19	Results > MDA?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
20	[Cesium 137; Cs-137]												
21	Background CTS	0.00000		0.00000		0.00000		15.00000		0.00000		0.00000	
22	Background CPM	0.02830		0.02420		0.02700		0.02420		0.00000		0.03210	
23	Net CPM	0.29500		0.17200		0.17100		0.24300		0.22300		0.19100	
24	Branch Fraction	0.85100		0.85100		0.85100		0.85100		0.85100		0.85100	
25	Efficiency	0.00794		0.00831		0.00664		0.00831		0.00718		0.00831	
26	Reported Results (pCi/g)	<	*	<	*	<	*	<	*	<	*	<	*
27	Calculated Results	0.43780		0.20429		0.28911		0.20821		0.37732		0.22140	
28	Reported MDA	0.44480	OK	0.20720	OK	0.29310	OK	0.21150	OK	0.38260	OK	0.22520	OK
29	Calculated MDA	0.11509		0.08296		0.12372		0.15188		0.00000		0.09087	
30		NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES	NON DET	YES
31	Results > MDA?	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES
32	[Thorium 228; Th-228]												
33	Background CTS	0.00000		0.00000		0.00000		0.00000		47.00000		0.00000	
34	Background CPM	0.19500		0.19570		0.12960		0.19570		0.25620		0.19640	
35	Net CPM	0.55300		0.43500		0.30700		0.43500		0.24600		0.43100	
36	Branch Fraction	0.44800		0.44800		0.44800		0.44800		0.44800		0.44800	
37	Efficiency	0.02269		0.02354		0.01844		0.02354		0.01928		0.02354	
38	Reported Results (pCi/g)	<	*	<	*		*		*	0.37150	*		*
39	Calculated Results	0.54553		0.34645		0.35503		0.24994		0.29445		0.33502	
40	Reported MDA	0.68450	*	0.43640	*	0.44760	*	0.31530	*	NA	*	0.42790	*
41	Calculated MDA	0.20082		0.15821		0.18540		0.11287		0.46329		0.15073	
42		NON DET	YES	NON DET	YES	DETECT	YES	DETECT	YES	DETECT	NO	DETECT	YES
43	Results > MDA?	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES

TMA/Norcal N1-12-032-9571

Biota Samples

Strontium 90

	~~RDL~~ MDA	2x~~RDL~~ MDA	5x~~RDL~~ MDA
0.31	~~1.000~~	2.000	5.000

Customer I.D. #	Original S	Duplicate D	RPD	Q
9571-40	-0.200	0.080	-466.667	J
9571-41	1.400	1.500	6.897	J
9571-42	0.050	0.080	46.154	

Total Uranium

	~~RDL~~ MDA	2x~~RDL~~ MDA	5x~~RDL~~ MDA
0.042	~~1.000~~	0.084 ~~2.000~~	~~5.000~~

Customer I.D. #	Original S	Duplicate D	RPD	Q
9571-47	0.032	0.027	16.949	J
9571-48	0.031	0.029	6.667	J

Gamma Spec

Cobalt 60

	~~RDL~~ MDA	2xRDL ~~0.442~~ 0.252	5xRDL NA
0.241 0.241	~~0.010~~	~~0.020~~	~~0.050~~

Customer I.D. #	Original S	Duplicate D	RPD	Q
9571-53	0.219	0.536	83.854	J
9571-54	0.243	0.742	101.350	J

Cesium 137

	~~RDL~~ MDA	~~2xRDL~~ MDA	5x~~RDL~~ MDA NA
0.20	0.010	~~0.020~~	0.050

Customer I.D. #	Original S	Duplicate D	RPD	Q
9571-53	0.174	0.504	97.419	J
9571-54	0.143	0.452	103.629	J

Thorium 228

	~~RDL~~ MDA	2x~~RDL~~ MDA	5x~~RDL~~ MDA NA
0.31	~~0.010~~	~~0.020~~	~~0.050~~

Customer I.D. #	Original S	Duplicate D	RPD	Q
9571-53	0.391	0.910	79.846	J
9571-54	0.302	1.346	126.659	J

Data will be reduced to MDA/RDL comparison

SAMPLE NUMBER:	9571-3	9571-7	9571-17	9571-18	9571-22	9571-33	9571-34
CUST ID NUMBER:	B012Z2	B012Y0	B01346	B01357	B01334	B017X8	QC7280
SAMPLE TYPE:	Plant Material	Plant Material	Plant Material	Plant Material	Plant Material	Plant Material	Spike
COLLECTION DATE:	09/10/91	09/10/91	09/10/91	09/10/91	09/10/91	09/10/91	
CHAIN OF CUSTODY:	12/02/91	12/02/91	12/02/91	12/02/91	12/02/91	12/02/91	
STRONTIUM 90:							
DATE RUN:	05/06/92	05/06/92	05/06/92	05/06/92	05/06/92	05/06/92	05/06/92
TOTAL URANIUM:							
DATE RUN:	06/02/92	06/02/92	06/02/92	06/02/92	06/02/92	06/02/92	
GAMMA SCAN							
DATE RUN:	04/25/92	04/29/92	04/30/92	04/30/92	04/30/92	05/03/92	
COBALT 60:							
CESIUM 137:							
THORIUM 228:							

SAMPLE NUMBER:	9571-35	9571-36	9571-37	9571-38	9571-39	9571-40	9571-41	9571-42	9571-43
CUST ID NUMBER:	QC7281	QC7282	QC7283	QC7284	QC7285	QC7286	QC7287	QC7288	QC7289
SAMPLE TYPE:	Spike	Spike	Blank	Blank	Blank	Replicate	Replicate	Replicate	Spike
COLLECTION DATE:									
CHAIN OF CUSTODY:									
STRONTIUM 90:									
DATE RUN:	05/06/92	05/06/92	05/06/92	05/06/92	05/07/92	05/06/92	05/06/92	05/07/92	
TOTAL URANIUM:									
DATE RUN:									06/02/92
GAMMA SCAN									
DATE RUN:									
COBALT 60:									
CESIUM 137:									
THORIUM 228:									

SAMPLE NUMBER:	9571-44	9571-45	9571-46	9571-47	9571-48	9571-49	9571-50	9571-51	9571-52
CUST ID NUMBER:	QC7290	QC7291	QC7292	QC7293	QC7294	QC7295	QC7296	QC7297	QC7298
SAMPLE TYPE:	Spike	Blank	Blank	Replicate	Replicate	Spike	Spike	Blank	Blank
COLLECTION DATE:									
CHAIN OF CUSTODY:									
STRONTIUM 90:									
DATE RUN:									
TOTAL URANIUM:									
DATE RUN:	06/02/92	06/02/92	06/02/92	06/02/92	06/02/92				
GAMMA SCAN									
DATE RUN:						05/15/92	05/15/92	05/15/92	05/15/92
COBALT 60:									
CESIUM 137:									
THORIUM 228:									

SAMPLE NUMBER:	9571-53	9571-54
CUST ID NUMBER:	QC7299	QC7300
SAMPLE TYPE:	Duplicate	Duplicate
COLLECTION DATE:		
CHAIN OF CUSTODY:		
STRONTIUM 90:		
DATE RUN:		
TOTAL URANIUM:		
DATE RUN:		
GAMMA SCAN		
DATE RUN:	05/15/92	05/15/92
COBALT 60:		
CESIUM 137:		
THORIUM 228:		

9613500.2348

APPENDIX A1B
DATA VALIDATION DOCUMENTATION

Additional Biota Metals Analyses

Thermo Analytical Laboratories

Case Number N2-02-086

ATTACHMENT 1

Glossary of Data Qualifiers

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

UJ - Indicates that the compound or analyte was analyzed for and not detected. Due to quality control deficiencies identified during data validation the value may not accurately the sample quantitation limit.

J - Indicates that the compound or analyte was analyzed for and detected. The associated value is estimated but the data are useable for decision making processes.

R - Indicates that the compound or analyte was analyzed for and due to an identified quality control deficiency the data was unusable.

NJ - Indicates presumptive evidence of a compound at an estimated value.

N - Indicates presumptive evidence of a compound.

9613500.2350

ATTACHMENT 2

As Received Laboratory Sample Concentration Reports

9613500.2351

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017X7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-02-086SAS No.: SDG No.: B017X7

Matrix (soil/water): SOIL Lab Sample ID: 02148-01S

Level (low/med): LOW Date Received: 02/25/92

% Solids: 91.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	162.00			P
7440-36-0	Antimony	1.30	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	60.00		E	P
7440-41-7	Beryllium	0.16	U		P
7440-43-9	Cadmium	0.16	U		P
7440-70-2	Calcium	31100.00			P
7440-47-3	Chromium	0.94	B		P
7440-48-4	Cobalt	0.49	U		P
7440-50-8	Copper	3.90	B		P
7439-89-6	Iron	345.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2030.00			P
7439-96-5	Manganese	20.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.20	B		P
7440-09-7	Potassium	11300.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.33	U		P
7440-23-5	Sodium	91.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.55	B		P
7440-66-6	Zinc	12.80			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

002

9614500.2352

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017X8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-02-086SAS No.: SDG No.: B017X7

Matrix (soil/water): SOIL Lab Sample ID: 02148-02S

Level (low/med): LOW Date Received: 02/25/92

% Solids: 92.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	46.70			P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	35.00	B	E	P
7440-41-7	Beryllium	0.22	B		P
7440-43-9	Cadmium	0.21	U		P
7440-70-2	Calcium	6350.00			P
7440-47-3	Chromium	0.85	U		P
7440-48-4	Cobalt	0.64	U		P
7440-50-8	Copper	1.50	B		P
7439-89-6	Iron	102.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	2760.00			P
7439-96-5	Manganese	33.20			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.20	B		P
7440-09-7	Potassium	7820.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	46.50	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.42	U		P
7440-66-6	Zinc	90.40			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

003

9613500.2353

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017X9

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-02-086SAS No.: SDG No.: B017X7

Matrix (soil/water): SOIL Lab Sample ID: 02148-03S

Level (low/med): LOW Date Received: 02/25/92

% Solids: 92.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	36.80	B		P
7440-36-0	Antimony	1.70	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	24.10	B	E	P
7440-41-7	Beryllium	0.21	U		P
7440-43-9	Cadmium	7.40			P
7440-70-2	Calcium	10600.00			P
7440-47-3	Chromium	0.85	U		P
7440-48-4	Cobalt	0.93	B		P
7440-50-8	Copper	7.20			P
7439-89-6	Iron	81.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	3380.00			P
7439-96-5	Manganese	310.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.10	B		P
7440-09-7	Potassium	7300.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.42	U		P
7440-23-5	Sodium	70.90	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.42	U		P
7440-66-6	Zinc	390.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

004

9613500.2354

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017Y0

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-02-086SAS No.: SDG No.: B017X7

Matrix (soil/water): SOIL Lab Sample ID: 02148-04S

Level (low/med): LOW Date Received: 02/25/92

% Solids: 93.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	135.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	123.00		E	P
7440-41-7	Beryllium	0.30	B		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	15300.00			P
7440-47-3	Chromium	1.00	B		P
7440-48-4	Cobalt	0.59	U		P
7440-50-8	Copper	3.10	B		P
7439-89-6	Iron	186.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	4160.00			P
7439-96-5	Manganese	91.90			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.30	B		P
7440-09-7	Potassium	24700.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.39	U		P
7440-23-5	Sodium	44.70	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.39	U		P
7440-66-6	Zinc	19.50			P
	Cyanide				NR

Color Before: GREEN Clarity Before: Texture: FINE

Color After: GREEN Clarity After: Artifacts:

Comments:

9613500.2355

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017Y1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-02-086SAS No.: SDG No.: B017X7

Matrix (soil/water): SOIL Lab Sample ID: 02148-05S

Level (low/med): LOW Date Received: 02/25/92

% Solids: 92.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	428.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	6.60	B	E	P
7440-41-7	Beryllium	0.21	B		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	4070.00			P
7440-47-3	Chromium	2.50			P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	2.50	B		P
7439-89-6	Iron	130.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1100.00			P
7439-96-5	Manganese	648.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	3.10	B		P
7440-09-7	Potassium	3650.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.41	U		P
7440-23-5	Sodium	39.80	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.41	U		P
7440-66-6	Zinc	78.30			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

006

9615500.2356

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017Y2

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-02-086SAS No.: SDG No.: B017X7

Matrix (soil/water): SOIL Lab Sample ID: 02148-06S

Level (low/med): LOW Date Received: 02/25/92

% Solids: 92.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	113.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	123.00		E	P
7440-41-7	Beryllium	0.31	B		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	15500.00			P
7440-47-3	Chromium	1.20	B		P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	3.20	B		P
7439-89-6	Iron	180.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	4170.00			P
7439-96-5	Manganese	92.80			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.00	B		P
7440-09-7	Potassium	24700.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	39.40	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.40	U		P
7440-66-6	Zinc	19.80			P
	Cyanide				NR

Color Before: GREEN Clarity Before: Texture: FINE

Color After: GREEN Clarity After: Artifacts:

Comments:

007

9613500.2357

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B017Y3

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-02-086SAS No.: SDG No.: B017X7

Matrix (soil/water): SOIL Lab Sample ID: 02148-07S

Level (low/med): LOW Date Received: 02/25/92

% Solids: 92.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	425.00			P
7440-36-0	Antimony	1.60	U		P
7440-38-2	Arsenic				NR
7440-39-3	Barium	6.20	B	E	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.34	B		P
7440-70-2	Calcium	4210.00			P
7440-47-3	Chromium	2.60			P
7440-48-4	Cobalt	0.60	U		P
7440-50-8	Copper	2.40	B		P
7439-89-6	Iron	129.00			P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1120.00			P
7439-96-5	Manganese	664.00			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	2.80	B		P
7440-09-7	Potassium	3760.00			P
7782-49-2	Selenium				NR
7440-22-4	Silver	0.40	U		P
7440-23-5	Sodium	35.70	B		P
7440-28-0	Thallium				NR
7440-62-2	Vanadium	0.40	U		P
7440-66-6	Zinc	106.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

96135500.2358

ATTACHMENT 3

Summary of Data Qualifications

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: B017X7	REVIEWER: DA	DATE: 11/23/92	PAGE___OF___
COMMENTS: CAS No. N2-02-086			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Qualify all results as "J" or "UJ" as appropriate			Correlation coefficient NOT AVAILABLE.

9613500.2360

ATTACHMENT 4

As Qualified Data Summary

9613500.2361

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B017X7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-02-086SAS No.: SDG No.: B017X7

Matrix (soil/water): SOIL Lab Sample ID: 02148-01S

Level (low/med): LOW Date Received: 02/25/92

% Solids: 91.6

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

CAS No.	Analyte	Concentration	C	Q	M	Qualifier
7429-90-5	Aluminum	162.00			P	J
7440-36-0	Antimony	1.30	U		P	
7440-38-2	Arsenic				NR	
7440-39-3	Barium	60.00		E	P	
7440-41-7	Beryllium	0.16	U		P	
7440-43-9	Cadmium	0.16	U		P	
7440-70-2	Calcium	31100.00			P	
7440-47-3	Chromium	0.94	B		P	
7440-48-4	Cobalt	0.49	U		P	
7440-50-8	Copper	3.90	B		P	
7439-89-6	Iron	345.00			P	
7439-92-1	Lead				NR	
7439-95-4	Magnesium	2030.00			P	
7439-96-5	Manganese	20.90			P	
7439-97-6	Mercury				NR	
7440-02-0	Nickel	1.20	B		P	
7440-09-7	Potassium	11300.00			P	
7782-49-2	Selenium				NR	
7440-22-4	Silver	0.33	U		P	
7440-23-5	Sodium	91.80	B		P	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium	0.55	B		P	
7440-66-6	Zinc	12.80			P	
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

002

9613590.2362

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017X8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-02-086SAS No.: SDG No.: B017X7

Matrix (soil/water): SOIL Lab Sample ID: 02148-02S

Level (low/med): LOW Date Received: 02/25/92

% Solids: 92.4

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

CAS No.	Analyte	Concentration	C	Q	M	Qualifier
7429-90-5	Aluminum	46.70			P	J
7440-36-0	Antimony	1.70	U		P	
7440-38-2	Arsenic				NR	
7440-39-3	Barium	35.00	B	E	P	
7440-41-7	Beryllium	0.22	B		P	
7440-43-9	Cadmium	0.21	U		P	
7440-70-2	Calcium	6350.00			P	
7440-47-3	Chromium	0.85	U		P	
7440-48-4	Cobalt	0.64	U		P	
7440-50-8	Copper	1.50	B		P	
7439-89-6	Iron	102.00			P	
7439-92-1	Lead				NR	
7439-95-4	Magnesium	2760.00			P	
7439-96-5	Manganese	33.20			P	
7439-97-6	Mercury				NR	
7440-02-0	Nickel	1.20	B		P	
7440-09-7	Potassium	7820.00			P	
7782-49-2	Selenium				NR	
7440-22-4	Silver	0.42	U		P	
7440-23-5	Sodium	46.50	B		P	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium	0.42	U		P	
7440-66-6	Zinc	90.40			P	
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

003

9615500.2363

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017X9

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-02-086SAS No.: SDG No.: B017X7

Matrix (soil/water): SOIL Lab Sample ID: 02148-03S

Level (low/med): LOW Date Received: 02/25/92

% Solids: 92.8

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

CAS No.	Analyte	Concentration	C	Q	M	Qualifier
7429-90-5	Aluminum	36.80	B		P	J
7440-36-0	Antimony	1.70	U		P	
7440-38-2	Arsenic				NR	
7440-39-3	Barium	24.10	B	E	P	
7440-41-7	Beryllium	0.21	U		P	
7440-43-9	Cadmium	7.40			P	
7440-70-2	Calcium	10600.00			P	
7440-47-3	Chromium	0.85	U		P	
7440-48-4	Cobalt	0.93	B		P	
7440-50-8	Copper	7.20			P	
7439-89-6	Iron	81.00			P	
7439-92-1	Lead				NR	
7439-95-4	Magnesium	3380.00			P	
7439-96-5	Manganese	310.00			P	
7439-97-6	Mercury				NR	
7440-02-0	Nickel	1.10	B		P	
7440-09-7	Potassium	7300.00			P	
7782-49-2	Selenium				NR	
7440-22-4	Silver	0.42	U		P	
7440-23-5	Sodium	70.90	B		P	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium	0.42	U		P	
7440-66-6	Zinc	390.00			P	
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

004

9613500.2364

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017Y0

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-02-086SAS No.: SDG No.: B017X7

Matrix (soil/water): SOIL Lab Sample ID: 02148-04S

Level (low/med): LOW Date Received: 02/25/92

% Solids: 93.9

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

CAS No.	Analyte	Concentration	C	Q	M	Qualifier
7429-90-5	Aluminum	135.00			P	J
7440-36-0	Antimony	1.60	U		P	
7440-38-2	Arsenic				NR	
7440-39-3	Barium	123.00		E	P	
7440-41-7	Beryllium	0.30	B		P	
7440-43-9	Cadmium	0.20	U		P	
7440-70-2	Calcium	15300.00			P	
7440-47-3	Chromium	1.00	B		P	
7440-48-4	Cobalt	0.59	U		P	
7440-50-8	Copper	3.10	B		P	
7439-89-6	Iron	186.00			P	
7439-92-1	Lead				NR	
7439-95-4	Magnesium	4160.00			P	
7439-96-5	Manganese	91.90			P	
7439-97-6	Mercury				NR	
7440-02-0	Nickel	1.30	B		P	
7440-09-7	Potassium	24700.00			P	
7782-49-2	Selenium				NR	
7440-22-4	Silver	0.39	U		P	
7440-23-5	Sodium	44.70	B		P	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium	0.39	U		P	
7440-66-6	Zinc	19.50			P	
	Cyanide				NR	

Color Before: GREEN Clarity Before: Texture: FINE

Color After: GREEN Clarity After: Artifacts:

Comments:

9613500.2365

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017Y1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-02-086SAS No.: SDG No.: B017X7

Matrix (soil/water): SOIL Lab Sample ID: 02148-05S

Level (low/med): LOW Date Received: 02/25/92

% Solids: 92.9

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

CAS No.	Analyte	Concentration	C	Q	M	Qualifier
7429-90-5	Aluminum	428.00			P	J
7440-36-0	Antimony	1.60	U		P	
7440-38-2	Arsenic				NR	
7440-39-3	Barium	6.60	B	E	P	
7440-41-7	Beryllium	0.21	B		P	
7440-43-9	Cadmium	0.20	U		P	
7440-70-2	Calcium	4070.00			P	
7440-47-3	Chromium	2.50			P	
7440-48-4	Cobalt	0.61	U		P	
7440-50-8	Copper	2.50	B		P	
7439-89-6	Iron	130.00			P	
7439-92-1	Lead				NR	
7439-95-4	Magnesium	1100.00			P	
7439-96-5	Manganese	648.00			P	
7439-97-6	Mercury				NR	
7440-02-0	Nickel	3.10	B		P	
7440-09-7	Potassium	3650.00			P	
7782-49-2	Selenium				NR	
7440-22-4	Silver	0.41	U		P	
7440-23-5	Sodium	39.80	B		P	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium	0.41	U		P	
7440-66-6	Zinc	78.30			P	
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

006

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017Y2

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-02-086SAS No.: SDG No.: B017X7

Matrix (soil/water): SOIL Lab Sample ID: 02148-06S

Level (low/med): LOW Date Received: 02/25/92

% Solids: 92.7

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

CAS No.	Analyte	Concentration	C	Q	M	Qualifier
7429-90-5	Aluminum	113.00			P	J
7440-36-0	Antimony	1.60	U		P	
7440-38-2	Arsenic				NR	
7440-39-3	Barium	123.00		E	P	
7440-41-7	Beryllium	0.31	B		P	
7440-43-9	Cadmium	0.20	U		P	
7440-70-2	Calcium	15500.00			P	
7440-47-3	Chromium	1.20	B		P	
7440-48-4	Cobalt	0.60	U		P	
7440-50-8	Copper	3.20	B		P	
7439-89-6	Iron	180.00			P	
7439-92-1	Lead				NR	
7439-95-4	Magnesium	4170.00			P	
7439-96-5	Manganese	92.80			P	
7439-97-6	Mercury				NR	
7440-02-0	Nickel	1.00	B		P	
7440-09-7	Potassium	24700.00			P	
7782-49-2	Selenium				NR	
7440-22-4	Silver	0.40	U		P	
7440-23-5	Sodium	39.40	B		P	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium	0.40	U		P	
7440-66-6	Zinc	19.80			P	
	Cyanide				NR	

Color Before: GREEN Clarity Before: Texture: FINE

Color After: GREEN Clarity After: Artifacts:

Comments:

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WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B017Y3

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N2-02-086SAS No.: SDG No.: B017X7

Matrix (soil/water): SOIL Lab Sample ID: 02148-07S

Level (low/med): LOW Date Received: 02/25/92

% Solids: 92.9

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

CAS No.	Analyte	Concentration	C	Q	M	Qualifier
7429-90-5	Aluminum	425.00			P	J
7440-36-0	Antimony	1.60	U		P	
7440-38-2	Arsenic				NR	
7440-39-3	Barium	6.20	B	E	P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.34	B		P	
7440-70-2	Calcium	4210.00			P	
7440-47-3	Chromium	2.60			P	
7440-48-4	Cobalt	0.60	U		P	
7440-50-8	Copper	2.40	B		P	
7439-89-6	Iron	129.00			P	
7439-92-1	Lead				NR	
7439-95-4	Magnesium	1120.00			P	
7439-96-5	Manganese	664.00			P	
7439-97-6	Mercury				NR	
7440-02-0	Nickel	2.80	B		P	
7440-09-7	Potassium	3760.00			P	
7782-49-2	Selenium				NR	
7440-22-4	Silver	0.40	U		P	
7440-23-5	Sodium	35.70	B		P	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium	0.40	U		P	
7440-66-6	Zinc	106.00			P	
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

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ATTACHMENT 5

Data Review Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST - FORM A-6

PROJECT: Westinghouse	REVIEWER: EH	DATE: 11-5-92
LABORATORY: TMA	CASE: N2-02-086	SDG: N2-02-086
SAMPLE/MATRIX: ~~B017Z8, B017~~ ~~ver~~ Biota 4 samples		
~~B017Y0, B017Y1, B017Y2, B017Y3~~ ~~ver~~		
B017X7, B017X8, B017X9, B017Y0		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	☑	☐	☐
Cover Page	☑	☐	☐
Traffic Reports	☑	☐	☐
Sample Data			
Inorganic Analysis Data Sheets	☑	☐	☐
Standards Data			
Initial and Continuing Calibration Verification	☑	☐	☐
CRDL Standard for AA and ICP	☑	☐	☐
QC Summary			
Blanks	☑	☐	☐
ICP Interference Check Summary	☑	☐	☐
Spike Sample Recovery	☑	☐	☐
Post-Digestion Spike Sample Recovery	☐	☐	☑
Duplicate	☑	☐	☐
Laboratory Control Sample	☑	☐	☐
Standard Addition Results	☑	☐	☐
ICP Serial Dilutions	☑	☐	☐
Instrument Detection Limits	☑	☐	☐
ICP Interelement Correction Factors	☑	☐	☐
ICP Linear Ranges	☑	☐	☐
Preparation Log	☑	☐	☐
Analysis Run Log	☑	☐	☐
Raw Data			
ICP Raw Data	☑	☐	☐
Furnace AA Raw Data	☐	☐	☑
Mercury Raw Data	☐	☐	☑
Cyanide Raw Data	☐	☐	☑
Additional Data			
Internal laboratory chain-of-custody	☑	☑	☐
Laboratory Sample Preparation Records	☑	☐	☐

Data Package Item	Present?: Yes	No	N/A
Percent Solids Analysis Records	☑	☐	☐
Reduction Formulae	☐	☑	☐
Instrument Run Logs	☐	☑	☐
Chemist notebook pages	☑	☐	☐

2. HOLDING TIMES (Form B-1)

Have all samples been analyzed within holding times? (Yes) No N/A

ACTION: If any holding times have been exceeded qualify all affected results as estimated (J for\ detects and UJ for nondetects).

3. INITIAL CALIBRATIONS (Form B-2)

Were all instruments calibrated daily, each set-up time and was the proper number of standards used? Yes No N/A

Are the correlation coefficients ≥0.995? Unknown Yes No N/A

Was a midrange cyanide standard distilled? Yes No (N/A)

ACTION: Qualify all data as unusable if reported from an analysis in which an instrument was not calibrated or was calibrated with less than the minimum number of standards. Qualify associated sample results >IDL as estimated (J) and results <IDL as estimated (UJ), if the correlation coefficient is <0.0995 or the laboratory did not distill the midrange cyanide standard.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION (Form B-2)

Are ICV and CCV percent recoveries within control limits? (Yes) No N/A

Are there calculation errors? Yes (No) N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

5. ICP INTERFERENCE CHECK SAMPLE (Form B-2)

Has an ICS sample been analyzed at the proper frequency? (Yes) No N/A

Are the AB solution %R values within control? (Yes) No N/A

Are there calculation errors? Yes (No) N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

6. LABORATORY BLANKS (Form B-3)

Are target compounds present in the blanks? Yes No N/A

ACTION: Qualify all associated positive results for any analyte <5 times the amount in any laboratory blank as nondetected (U). If analyte concentrations in the blank are >CRDL or below the negative CRDL, verify the laboratory has redigested and reanalyzed associated samples with analyte concentrations <10 times the blank concentration. If the laboratory has not redigested and reanalyzed the samples, note in the validation narrative.

7. FIELD BLANKS (Form B-3) No field blanks.

Are target analytes present in the field blanks? Yes No N/A

ACTION: Qualify all sample results for any analyte <5 times the amount in any field blank as nondetected (U).

8. MATRIX SPIKE SAMPLE ANALYSIS (Form B-4)

Are spike recoveries within the control limits? Yes No N/A

ACTION: Qualify the affected sample data according to the following requirements:

If spike recovery is >125% and sample results are <IDL no qualification is required. If spike recovery is >125% or <75% qualify all positive results as estimated (J). If spike recovery is 30% to 74% qualify all nondetects as estimated (UJ). If spike recovery is <30%, reject all nondetects (R). If the field blank has been used for spike analysis, note in the validation narrative.

9. LABORATORY CONTROL SAMPLE (Form B-4)

Are percent recoveries within the acceptance limits? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify the sample data according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results >IDL, for which the LCS %R falls within the range 50-79% or >120%. Qualify as estimated (UJ), all sample results <IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R <50%.

SOLID LCS - Qualify as estimated (J), all sample results >IDL for which the LCS result is outside the established control limits. Qualify as estimated (UJ), all sample results <IDL for which the LCS %R are lower than the established control limits.

10. PERFORMANCE AUDIT ANALYSIS

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample analysis in the data validation narrative.

11. DUPLICATE SAMPLE ANALYSIS (Form B-5)

Are RPD values acceptable? Yes No N/A

ACTION: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD results fall outside the appropriate control limits. If field blanks were used for laboratory duplicates, note in the validation narrative.

12. ICP SERIAL DILUTION (Form B-6)

Are the serial dilution results acceptable? Yes No N/A

Is there evidence of negative interference? Yes No N/A

ACTION: Qualify the associated data as estimated (J) for those analytes in which the %D is outside the control limits. If evidence of negative interference is found, use professional judgement to qualify the data.

13. FIELD DUPLICATE SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field duplicate samples in the validation narrative.

14. FIELD SPLIT SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

ACTION: Note the results of the field split samples in the validation narrative.

15/16. FURNACE ATOMIC ABSORPTION QUALITY CONTROL (Form B-6)

Do all applicable analyses have duplicate injections? Yes No N/A

Are applicable duplicate injection RSD values within control limits? Yes No N/A

If no, were samples rerun once as required? Yes No N/A

Does the RSD for the rerun fall within the control limits? Yes No N/A

Were analytical spike recoveries within the control limits? Yes No N/A

If no, were MSA analyses performed when required?	Yes	No	(N/A)
Are MSA correlation coefficients ≥0.995?	Yes	No	(N/A)
If no, was a second MSA analysis performed?	Yes	No	(N/A)

ACTION: If duplicate injections are outside the acceptance limits and the sample has not been reanalyzed or the reanalysis is outside the acceptance limits, qualify the associated data as estimated (J for detects and UJ for nondetects). If the analytical spike recovery is <40% qualify detects as estimated (J). If the analytical spike recovery is ≥10% but <40%, qualify all nondetects as estimated (UJ) and if the analytical spike recovery is <10%, reject all nondetects (R). If the sample absorbance is <50% of the analytical spike absorbance and the analytical spike recovery is <85% or >115%, qualify all results as estimated (J for detects and UJ for nondetects). If method of standard additions (MSA) was required but was not performed, the MSA samples were spiked incorrectly, or the MSA correlation coefficient was <0.995, qualify the associated detected results as estimated (J).

17. ANALYTE QUANTITATION AND DETECTION LIMITS (Form B-6)

Have results been reported and calculated correctly?	(Yes)	No	N/A
Are results within the calibration range of the instruments and within the linear range of the ICP?	Yes	No	N/A
Are all detection limits below the CRQL?	(Yes)	No	N/A

ACTION: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

18. OVERALL ASSESSMENT AND SUMMARY (Form B-7)

Have the laboratory conducted the analysis in accordance with the analytical SOW?	(Yes)	No	N/A
Were project specific data quality objectives met for this analysis?	(Yes)	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

1. Correlation coefficient calculations for ICP not available. Qualify all results as "J" or "UJ" as appropriate.

2

HOLDING TIME SUMMARY - FORM B-1

SDG: B017X7	REVIEWER: D. Anderson			DATE: 11/23/92			PAGE___OF___
COMMENTS: Case No. NZ-02-086							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B017X7	ICP METALS	9/10/91	2/27/92	3/9/92		~~180~~ 140	NONE
B017X8							
B017X9							
B017X0							
B017X1							
B017X2							
B017X3							

CALIBRATION DATA SUMMARY - FORM B-2

SDG: B017X7	REVIEWER: D. Anderson	DATE: 11/23/92		PAGE____OF____	
COMMENTS:	Case No. N2-02-86	All initial and Continuing Calibrations are acceptable			
CALIB. TYPE:	INITIAL CONTINUING	INSTRUMENT: ICP			
CALIB. DATE	COMPOUND	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER
3/9/92	All No MSA Correlation	Coefficients provided		All	J

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG: B017~~X~~7	REVIEWER: D. Anderson	DATE: 11/23/92	PAGE___OF___
COMMENTS: Cas No. N2-02-086			

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
	Calcium	14.69	B		ug/L	73.45	146.90	none	none
	Iron	4.22	B		ug/L	21.10	42.20	none	non
	Nickel	0.89	B		ug/L	4.45	8.90	none	none
	Sodium	24.26	B		ug/L	121.30	242.60	none	none
	Zinc	2.79	B		ug/L	13.95	27.90	none	none

ACCURACY DATA SUMMARY - FORM B-4

SDG: B017X7	REVIEWER: D. Anderson	DATE: 11/23/92	PAGE____OF____	
COMMENTS: Case No. N2-02-086				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B017X8S	Antimony	88.5	None	None
	Barium	96.4		
	Beryllium	97.9		
	Cadmium	93.7		
	Chromium	92.7		
	Cobalt	94.2		
	Copper	96.3		
	Manganese	93.4		
	Nickel	93.0		
	Silver	~~103.0~~ 103.3 DA 11/23/92		
	Vanadium	95.3		
	Zinc	92.0		

PRECISION DATA SUMMARY - FORM B-5

SDG: B017X7	REVIEWER D. Anderson	DATE: 11/23/92	PAGE___OF___
COMMENTS: Cas No. N2-02-086			

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Aluminum	B017X7D	B017X7	9.4	none	none
Barium			1.4		
Calcium			2.7		
Chromium			25.0		
Copper			9.3		
Iron			2.4		
Magnesium			2.5		
Manganese			1.9		
Nickel			10.5		
Potassium			1.8		
Sodium			2.6		
Vanadium			16.6		
Zinc			5.2		

CALCULATION SUMMARY - FORM B-6

SDG:	REVIEWER:	DATE:	PAGE___OF___
COMMENTS:			

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: B017X7	REVIEWER: DA	DATE: 11/23/92	PAGE___OF___
COMMENTS: CAS No. N2-02-086			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Qualify all results as "J" or "UJ" as appropriate			Correlation coefficient NOT AVAILABLE.

TELEPHONE CONTACT SUMMARY - FORM B-8

REVIEWER:	DATE:	TIME:	PAGE___OF __
COMPANY:			
ADDRESS:			
PERSON CONTACTED:			
TELEPHONE:		FAX:	
PROJECT/CASE/SDG:			
REMARKS:			
ACTION:			