

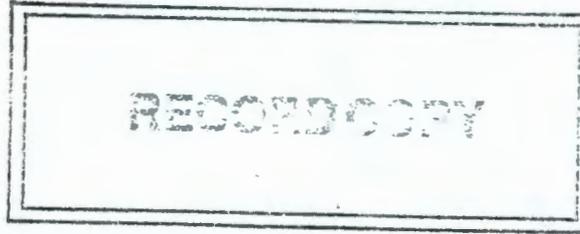
START

9713511.0415

3098Z1-TMA-63643

0046059

TMA



WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

NITRATE/NITRITE
Case No. N3-10-162
(TMA/Skinner & Sherman W.O. No. S3-11-011)

January 6, 1994



TMA Master Work Order N3-10-162

Amor 4/6/95

9713511.0416

Page 1

Skinner&Sherman

REPORT

Work Order # S3-11-011

Received: 11/01/93

12/15/93 14:35:17

REPORT TMA/NORCAL
TO 2030 Wright Avenue
Richmond, CA 94804

PREPARED TMA / Skinner & Sherman Labs.
BY 300 Second Avenue
P.O. Box 521
Waltham, MA 02254


CERTIFIED BY

ATTEN Dan Steurmer

ATTEN Client Services
PHONE (617) 890-7200

CONTACT DP

CLIENT HANFORD NOR SAMPLES 12
COMPANY TMA/NORCAL Hanford
FACILITY Richmond, CA

WORK ID N3-10-162
TAKEN By Client
TRANS Fedex
TYPE 11 Soils
P.O. # N3-10-162
INVOICE under separate cover

SAMPLE IDENTIFICATION

TEST CODES and NAMES used on this workorder

- 01 B09821
- 02 B09822
- 03 B09823
- 04 B09824
- 05 B09825
- 06 B09826
- 07 B09827
- 08 B09828
- 09 B09829
- 10 B09901
- 11 B09903
- 11 B09903D
- 11 B09903S
- 12 LCSS

NITR S Nitrate/Nitrite in Soils



Thermo Analytical Inc.

Skinner & Sherman Laboratories Inc.

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300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

Received: 11/01/93

Results by Sample

SAMPLE ID <u>B09821</u>	SAMPLE # <u>01</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>10/11/93</u> Category <u>SOIL</u>
NITR_S <u>12.3</u> mg N/kg	
SAMPLE ID <u>B09822</u>	SAMPLE # <u>02</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>10/12/93</u> Category <u>SOIL</u>
NITR_S <u>35.7</u> mg N/kg	
SAMPLE ID <u>B09823</u>	SAMPLE # <u>03</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>10/14/93</u> Category <u>SOIL</u>
NITR_S <u>55.3</u> mg N/kg	
SAMPLE ID <u>B09824</u>	SAMPLE # <u>04</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>10/15/93</u> Category <u>SOIL</u>
NITR_S <u>24.1</u> mg N/kg	
SAMPLE ID <u>B09825</u>	SAMPLE # <u>05</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>10/19/93</u> Category <u>SOIL</u>
NITR_S <u>117</u> mg N/kg	
SAMPLE ID <u>B09826</u>	SAMPLE # <u>06</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>10/21/93</u> Category <u>SOIL</u>
NITR_S <u><2.50</u> mg N/kg	
SAMPLE ID <u>B09827</u>	SAMPLE # <u>07</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>10/21/93</u> Category <u>SOIL</u>
NITR_S <u><2.49</u> mg N/kg	

TMA**Thermo Analytical Inc.****Skinner & Sherman Laboratories Inc.**

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300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4LAB TEST FAX (617) 890-3883

Received: 11/01/93

Results by Sample

SAMPLE ID <u>B09828</u>	SAMPLE # <u>08</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>10/22/93</u> Category <u>SOIL</u>
NITR_S <u><2.50</u> mg N/kg	
SAMPLE ID <u>B09829</u>	SAMPLE # <u>09</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>10/22/93</u> Category <u>SOIL</u>
NITR_S <u><2.49</u> mg N/kg	
SAMPLE ID <u>B09901</u>	SAMPLE # <u>10</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>10/25/93</u> Category <u>SOIL</u>
NITR_S <u><2.50</u> mg N/kg	
SAMPLE ID <u>B09903</u>	SAMPLE # <u>11</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>10/25/93</u> Category <u>SOIL</u>
NITR_S <u>86.4</u> mg N/kg	
SAMPLE ID <u>B09903D</u>	SAMPLE # <u>11</u> FRACTIONS: <u>B</u>
	Date & Time Collected <u>10/25/93</u> Category <u>SOIL</u>
NITR_S <u>89.4</u> mg N/kg	
SAMPLE ID <u>B09903S</u>	SAMPLE # <u>11</u> FRACTIONS: <u>C</u>
	Date & Time Collected <u>10/25/93</u> Category <u>SOIL</u>
NITR_S <u>109</u> mg N/kg	
SAMPLE ID <u>LCSS</u>	SAMPLE # <u>12</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>not specified</u> Category <u>SOIL</u>
NITR_S <u>2.00</u> mg N/L	

9713511.0419

Page 5

Skinner&Sherman

REPORT

Work Order # S3-11-011

Received: 11/01/93

Test Methodology

TEST CODE NITR S NAME Nitrate/Nitrite in Soils

The sample was extracted with deionized water and analyzed in accordance with Method for Chemical Analysis of Water and Wastes EPA-600/4-79-020, March 1979, Method 353.2 (modified)

TMA

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Skinner & Sherman Laboratories Inc.

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300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

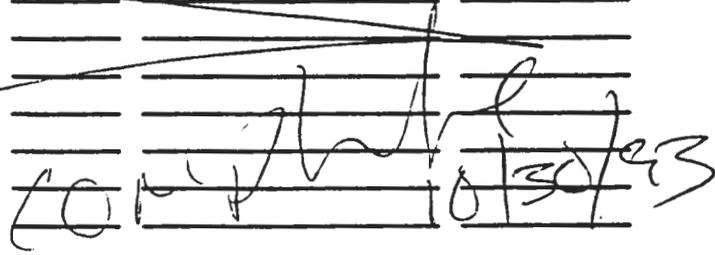
TMA/Skinner & Sherman Laboratories Sample Login Sheet

Workorder 5311011 Client Hanford-Nor Number/Type of Samples 11 soils
 Protocol SW546 Turnaround 33 days Cooler Temp: 6 °C or N/A Cooler Yes/No
 Custodian: Berney, A. Shipper & # FedEx SDG/Batch# N/A
 Custody Seal: Present/Absent/Intact/Not Client Case# N3-10-162
 Purchase Order/Contract# N3-10-162 Client Contact D. Sanchez
 Tag#: Present/Absent/NA (See COC) Chain of Custody: Present/Absent/NA, # -

Sample Containers Intact/Broken Comment: _____
 Client Comment? Yes/No _____
 Sample labels agree with Chain of Custody Information? Yes/No (Comment) _____
 Client paperwork agrees with samples and Chain of Custody? Yes/No (Comment) _____
 Shipment Dates: 10/30 _____
 List any date with paperwork/shipment problems & specify the problem: _____

N/A

Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1 <u>B09821</u>	<u>soil</u>	<u>10-30-93</u>	<u>N/A</u>	<u>NO3NO2</u>	
2 <u>2</u>					
3 <u>3</u>					
4 <u>4</u>					
5 <u>5</u>					
6 <u>6</u>					
7 <u>7</u>					
8 <u>8</u>					
9 <u>9</u>					
10 <u>B09901</u>					
11 <u>3</u>				<u>D.S</u>	
12					
13					
14					
15					
16					
17					
18					
19					
20					


 10/30/93

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

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

Reviewed _____ Date _____

* EPA/CLP required

9713511_0421

TMA/Norcal

CHAIN OF CUSTODY

ORD # N3-10-162

RCVD: 10/29/93 DUE: 12/03/93

10/29/93 14:08:57

KEEP: 12/03/94 DISP: 5

DASH	SAMPLE IDENTIFICATION	STORED	TESTS
01A-S	B09871	S&S	! WH233
02A-S	B09872	S&S	! WH233
03A-S	B09873	S&S	! WH233
04A-S	B09874	S&S	! WH233
05A-S	B09875	S&S	! WH233
06A-S	B09876	S&S	! WH233
07A-S	B09877	S&S	! WH233
08A-S	B09878	S&S	! WH233
09A-S	B09879	S&S	! WH233
10A-S	B09901	S&S	! WH233
11A-S	B09903	S&S	! WH233
11B-S	B09903 MS	S&S	! WH233
11C-S	B09903 DUP	S&S	! WH233
11D-S	L C S	S&S	! WH233

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
<u>Yamamoto</u>	<u>10/29/93</u>	<u>Skinner</u>	<u>10/29/93</u>	<u>ALB</u>	<u>10/30/93</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS
 Company Contact L E ROGERS Telephone 376-7690
 Project Designation/Sampling Locations 200-UP-2 Collection Date 10-11-93
 Ice Chest No. KENT Field Logbook No. EFL-1091
 Bill of Lading/Airbill No. _____ Offsite Property No. _____
 Method of Shipment OVERNIGHT AIR SERVICE
 Shipped to TMA
 Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

- 1) BOPOZ 1
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 2) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~
- 3) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~ PER 10-11-93

Field Transfer of Custody Chain of Possession (Sign and Print Names)

Relinquished by: <u>J. E. Rogers 10-28-93</u>	Received by: <u>[Signature]</u>	Date/Time: <u>10-29-93 10:20</u>
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:

9713511.0423

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST
Collector L E ROGERS	S.A.F. # 93-263
Company Contact: L E ROGERS	Date 10-11-93 Telephone (509) 376-7690

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B098Z1	S	10-11-93	1040	1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
			PAR 10-11-93	1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
				1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

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

Field Information TMA
 Special Handling and/or Storage Maintain at 4C ; (SOIL)
 Possible Sample Hazards **RADIOACTIVE**

026A

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS
 Company Contact L E ROGERS Telephone 376-7690
 Project Designation/Sampling Locations 200-UP-2 Collection Date 10-12-93
 Ice Chest No. KENT Field Logbook No. EFL-1091
 Bill of Lading/Airbill No. _____ Offsite Property No. _____
 Method of Shipment OVERNIGHT AIR SERVICE
 Shipped to TMA
 Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

- 1) BO9822
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 2) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~
- 3) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

JKR 10-12-93

<input type="checkbox"/> Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: <u>10-28-93</u> <u>Loren E. Rogers CR20</u>	Received by: <u>[Signature]</u>	Date/Time: <u>10-28-93 10:20</u>
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:

026 B

9713511.0425

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST
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Collector L E ROGERS Company Contact L E ROGERS	S.A.F. # 93-263	Date 10-12-93 Telephone (509) 376-7690
--	-----------------	---

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B098Z2	S	10-12-93	1400	1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

		SER 10-12-93		1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

				1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

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

Field Information TMA
 Special Handling and/or Storage Maintain at 4C ; (SOIL)
 Possible Sample Hazards **RADIOACTIVE**

026C

Westinghouse Hanford Company	CHAIN OF CUSTODY
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Custody Form Initiator L E ROGERS

Company Contact: L E ROGERS Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2 Collection Date 10-14-93

Ice Chest No: SML-349 Field Logbook No. EFL-1091

Bill of Lading/Airbill No. _____ Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

- 1) BO98Z3
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- ~~2) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~
- 3) SEP 10-14-93
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: <u>10-28-93</u> <u>Jane E. Rogers 0930</u>	Received by: <u>Francis TMA/HORCAL</u>	Date/Time: <u>10-29-93 12:35</u>
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: _____		

026 F

9715511.0427

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST		
Collector L E ROGERS	S.A.F. # 93-263	Date	
Company Contact L E ROGERS		Telephone (509) 376-7690	

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
809823	5	10-14-93	1340	1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
			10-14-93	1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
			10-14-93	1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

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

Field Information TMA

Special Handling and/or Storage Maintain at 4C ; (SOIL)

Possible Sample Hazards NONE NOTED

026 G

Westinghouse
Hanford Company

10-15-93

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS W.S. Thompson

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 10-15-93 TIME 1051

Ice Chest No. SM6-349

Field Logbook No. EFL-1091

Bill of Lading/Airbill No. _____

Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

- 1) B09824
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 2) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~
- 3) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

Field Transfer of Custody Chain of Possession (Sign and Print Names)

Relinquished by: <u>W.S. Thompson</u> <u>10-15-93 1130</u>	Received by: <u>Ray T. Glick</u> <u>10-15-93</u>	Date/Time: <u>10-15-93 1130</u>
Relinquished by: <u>Ray T. Glick</u> <u>10-28-93 0820</u>	Received by: <u>Lorene Rogers</u> <u>10-28-93</u>	Date/Time: <u>10-28-93 0820</u>
Relinquished by: <u>Lorene Rogers</u> <u>10-28-93 0930</u>	Received by: <u>Kenzie TMA/MURCAL</u>	Date/Time: <u>10-29-93 12:35</u>
Relinquished by: _____	Received by: _____	Date/Time: _____

Final Sample Disposition

Disposal Method: _____	Disposed by: _____	Date/Time: _____
Comments: _____		

026H

9713511.0429

Westinghouse Hanford Company	10-15-93	SAMPLE ANALYSIS REQUEST
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Collector, <u>L E ROGERS WS Thompson</u> S.A.F. # 93-263	Date <u>10-15-93</u>
Company Contact <u>L E ROGERS</u>	Telephone <u>(509) 376-7690</u>

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B07824	S	10-15-93	1051	1, 125ml P/G:Anions NO2,NO3 (EPA 353.2) 1, 1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
7/8/93 10-15-93				1, 125ml P/G:Anions NO2,NO3 (EPA 353.2) 1, 1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
7/8/93 10-15-93				1, 125ml P/G:Anions NO2,NO3 (EPA 353.2) 1, 1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

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

Field Information TMA

Special Handling and/or Storage Maintain at 4C ; (SOIL)

Possible Sample Hazards

026I

9713511.0430

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS
 Company Contact L E ROGERS Telephone 376-7690
 Project Designation/Sampling Locations 200-UP-2 Collection Date 10-19-93
 Ice Chest No. SML-349 Field Logbook No. EFL-1091
 Bill of Lading/Airbill No. _____ Offsite Property No. _____
 Method of Shipment OVERNIGHT AIR SERVICE
 Shipped to WESTON
 Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) NOISE NOTED

Sample Identification

- 1) BQRBZ5
 1, 120ml P/G: Anions NO2, NO3 (EPA 353.1)
 1, 1000ml P/G: Gross beta (PRO-032-15), U-235, U-234, U-238 (PRO-052-32) Tc-99 (PRO-032-78)
- 2) ~~1, 120ml P/G: Anions NO2, NO3 (EPA 353.1)
 1, 1000ml P/G: Gross beta (PRO-032-15), U-235, U-234, U-238 (PRO-052-32) Tc-99 (PRO-032-78)~~
- 3) PER 10-19-93
 1, 120ml P/G: Anions NO2, NO3 (EPA 353.1)
 1, 1000ml P/G: Gross beta (PRO-032-15), U-235, U-234, U-238 (PRO-052-32) Tc-99 (PRO-032-78)

Field Transfer of Custody		Chain of Possession		(Sign and Print Names)	
Relinquished by:	<u>10-28-93</u>	Received by:		Date/Time:	
<u>Loren Rogers</u>	<u>09:30</u>	<u>Patricia JMA/HORLAL</u>		<u>10-29-93</u>	<u>12:35</u>
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: _____

026J

9713511.0431

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST
Collector L E ROGERS	S.A.F. # 93-263
Company Contact L E ROGERS	Date <u>10-19-93</u> Telephone (509) 376-7690

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
809825	S	10-19-93	1016	1,120ml P/G:Anions NO2,NO3 (EPA 353.1) 1,1000ml P/G:Gross beta (PRO-032-15), U-235,U-234,U-238 (PRO-052-32) Tc-99 (PRO-032-78)
 	 	 10-19-93	 	 1,120ml P/G:Anions NO2,NO3 (EPA 353.1) 1,1000ml P/G:Gross beta (PRO-032-15), U-235,U-234,U-238 (PRO-052-32) Tc-99 (PRO-032-78)
 	 	 	 	 1,120ml P/G:Anions NO2,NO3 (EPA 353.1) 1,1000ml P/G:Gross beta (PRO-032-15), U-235,U-234,U-238 (PRO-052-32) Tc-99 (PRO-032-78)

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

Field Information **WESTON**
 Special Handling and/or Storage Maintain at 4C ; (SOIL)
 Possible Sample Hazards **NONE NOTED**

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9713511.0432

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS
 Company Contact L E ROGERS Telephone 376-7690
 Project Designation/Sampling Locations 200-UP-2 Collection Date 10-21-93
 Ice Chest No. SMH-413 Field Logbook No. EFL-1091
 Bill of Lading/Airbill No. _____ Offsite Property No. _____
 Method of Shipment OVERNIGHT AIR SERVICE
 Shipped to TMA
 Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

- 1) B09876
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 2) B09877
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- ~~3) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) for 10-21-93
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

<input type="checkbox"/> Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: <u>10-28-93</u> <u>L E ROGERS</u>	Received by: <u>TMA/NORCAL</u>	Date/Time: <u>10-29-93 12:35</u>
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:		

026L

9713511.0433

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST
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Collector L E ROGERS Company Contact L E ROGERS	S.A.F. # 93-263	Date Telephone (509) 376-7690
--	-----------------	----------------------------------

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09826	S	10-21-93	1035 1041 ER 10-21-93	1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
B09827	S	10-21-93	1400	1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
 	 	 	 ER 10-21-93	1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

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

Field Information TMA
 Special Handling and/or Storage Maintain at 4C ; (SOIL)
 Possible Sample Hazards NONE NOTED

026 M

9715511.0434

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2 Collection Date 10-22-93

Ice Chest No. SML-413 Field Logbook No. EFL-1091

Bill of Lading/Airbill No. _____ Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

- 1) B098Z8
 ✓ 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 ✓ 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 2) B098Z9
 ✓ 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 ✓ 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 3) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2) PER 10-22-93~~
~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

Field Transfer of Custody Chain of Possession (Sign and Print Names)

Relinquished by: <u>10-28-93</u> <u>Loren E. Rogers 0930</u>	Received by: <u>Thomas TMA/MORCAL</u>	Date/Time: <u>10-29-93 12:35</u>
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:		

026 N

9713541.0435

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST	
Collector L E ROGERS	S.A.F. # 93-263	Date 10-22-93
Company Contact L E ROGERS	Telephone (509) 376-7690	

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09828	S	10-22-93	1030	1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
B09829	S	10-22-93	1030	1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
			RR 10-22-93	1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
<p>*Type of Sample A = Air L = Liquid SE = Sediment T = Tissue X = Other DL = Drum Liquids O = Oil SL = Sludge W = Water DS = Drum Solids S = Soil SO = Solid WI = Wipe</p>				
Field Information TMA Special Handling and/or Storage Maintain at 4C ; (SOIL) Possible Sample Hazards NONE NOTED				

026"0"

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS
 Company Contact L E ROGERS Telephone 376-7690
 Project Designation/Sampling Locations 200-UP-2 Collection Date 10-25-93
 Ice Chest No. SML-415 Field Logbook No. EFL-1091
 Bill of Lading/Airbill No. _____ Offsite Property No. _____
 Method of Shipment OVERNIGHT AIR SERVICE
 Shipped to TMA
 Possible Sample Hazards/Remarks Keep samples at 4C (SOIL)

Sample Identification

- 1) BO9901
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 2) BO9903
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 3) BO9903
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

Field Transfer of Custody Chain of Possession (Sign and Print Names)

Relinquished by: <u>10-28-93</u> <u>Loene E. Rogers 0930</u>	Received by: <u>Francis TMA/NORCAL</u>	Date/Time: <u>10-29-93 12:35</u>
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:		

0267

9715511.0437

Westinghouse Hanford Company	SAMPLE ANALYSIS REQUEST
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Collector L E ROGERS Company Contact L E ROGERS	S.A.F. # 93-263	Date 10-25-93 Telephone (509) 376-7690
--	-----------------	---

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Required
B09901	S	10-25-93	1030	1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
B09903 B09902	S	10-25-93	1340	1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
			021 10-25-93	1,125ml P/G:Anions NO2,NO3 (EPA 353.2) 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

SR
095-93

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

Field Information TMA
 Special Handling and/or Storage Maintain at 4C ; (SOIL)
 Possible Sample Hazards NONE NOTED

026Q

TMA**Thermo Analytical Inc.**

9713511.0438

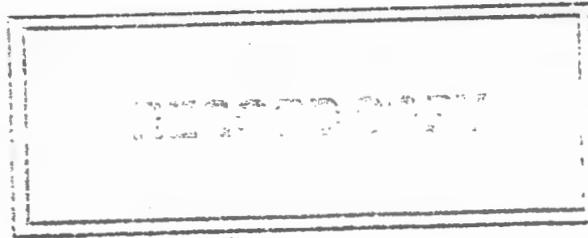
TMA/Norcal

2030 Wright Avenue

P. O. Box 4040

Richmond, CA 94804-0040

(510) 235-2633 Fax No. (510) 235-0438



December 30, 1993

Ref: TMA/Norcal N3-10-164-7285

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



Dear Ms. Colley:

Enclosed is the data report for the eleven soil samples received October 29, 1993 from location 200-UP-2. Results are given for gross alpha, gross beta, technetium-99, total uranium, and isotopic uranium. The data package is paginated 1 through 181-A and 182 through 341. Please be advised that page 133 is a blank page.

Please call if you have any questions concerning this data.

Sincerely,

Dinkar P. Kharkar, Ph.D.
Manager, Nuclear Programs

DPK/ss

Enclosure: Data Package

SDG: 7285
Contact: Dinkar Kharkar

TMA NORCAL
REPORTING GROUP 7285

Client: Westinghouse Hanford
Contract: MBH-SVV-069262

CASE NARRATIVE

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7285 is comprised of the samples listed on the Chain-of-Custody documents below. This sample group was processed under the Westinghouse Hanford Company Statement of Work P.O. MBH-SVV-069262.

1.1 Chains-of-Custody

This report includes data for the eleven soil samples from location 200-UP-2 delivered under Field Log Book No. EFL-1091. Chain-of-Custody numbers were not provided.

1.2 Sample Volume

One thousand mL plastic bottles containing the samples were received for the analyses.

1.3 Missing Samples

All samples listed on the Field Log Book documents were received.

1.4 Holding Times

The samples were collected on October 11 through October 25, 1993 and sample processing was initiated within 180 days of collection.

2.0 QUALITY CONTROL

The internal quality control consisted of one sample each of a laboratory control sample, a blank, and a replicate. All original analyses were performed with QC samples 7285-12 through 7285-14.

The QC samples were prepared by the Quality Control Department. Copies of the QC notebook pages are included in this data package.

2.1 Laboratory Control Samples

The LCS recoveries for all nuclides were acceptable. The MDA's of the results for all analyses met the RDL's.

2.2 Reagent Blanks

The results were satisfactory for all analyses. The MDA's of the results for all analyses met the RDL's.

SDG: 7285
Contact: Dinkar Kharkar

TMA NORCAL
REPORTING GROUP 7285

Client: Westinghouse Hanford
Contract: MBH-SVV-069262

2.0 QUALITY CONTROL (cont'd)

2.3 Duplicates

Results were satisfactory for all duplicate analyses.

3.0 ANALYSIS NOTES

3.1 Gross Alpha Analyses

The average MDA for gross alpha was (4 ± 1) pCi/g. Gross alpha activity above the RDL was found in sample BO9903.

3.2 Gross Beta Analyses

The average MDA for gross beta was (5 ± 0.9) pCi/g. Gross beta activity above the RDL was found in all of the samples.

3.3 Technetium-99 Analyses

The average yield for fourteen analyses was $(50 \pm 29)\%$. The lowest yield was 19% and the highest was 75%. The average MDA was (0.3 ± 0.3) pCi/g. Technetium-99 activity above the RDL was found in samples BO98Z2, BO98Z3, BO98Z4, and BO98Z5. The MDA of the result for sample BO98Z4 was higher than the RDL because of a low chemical yield.

3.4 Total Uranium Analyses

The average MDA was (0.03 ± 0.01) $\mu\text{g/g}$. Uranium activity ranging from (1.5 to 5.1) $\mu\text{g/g}$ was found in the samples.

3.5 Isotopic Uranium Analyses

The average yield for fourteen analyses was $(66 \pm 16)\%$. The lowest yield was 54% and the highest was 77%. The average MDA was (0.1 ± 0.1) pCi/g. Uranium-233/234 and uranium-238 activity above the RDL was found in all of the samples. Samples BO9901 and BO9903 were counted for less than the nominal count time of 150 minutes. MDA's met RDL's despite the slightly shortened count times.

9713511.0441

TMA NORCAL
REPORTING GROUP 7285

N310164-01

B098Z1

DATA SHEET

SDG 7285
Contact Dinkar Kharkar

Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N310164-01
Dept sample id 7285-001
Received 10/29/93
% moisture 2.6

Client sample id B098Z1
Location/Matrix 200-UP-2 SOLID
Collected 10/11/93
Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	Alpha	-2.5	4.7	5	10	U	80A
Gross Beta	Beta	460	14	5	10		80B
Technetium 99	14133-76-7	0.14	0.10	0.3	0.5	U	TC
Uranium 233/234		0.88	0.23	0.1	0.3		U
Uranium 235	15117-96-1	0.14	0.10	0.1	0.3	J	U
Uranium 238		1.0	0.23	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	2.9	0.52	0.03	0.1	X	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQOT	ANALYZED	REVIEWED	BY
N310164-01	80A/80	7285-001		0.100 g	12/08/93	12/09/93	DPK
N310164-01	80B/80	7285-001		0.100 g	12/08/93	12/09/93	DPK
N310164-01	TC	7285-001		2.00 g	12/08/93	12/13/93	DPK
N310164-01	U	7285-001		1.00 g	12/06/93	12/08/93	DPK
N310164-01	U_T	7285-001		0.250 g	12/15/93	12/21/93	DPK

9713511.0442

TMA NORCAL
REPORTING GROUP 7285

N310164-02

B098Z2

DATA SHEET

SDG 7285
 Contact Dinkar Kharkar

Client Westinghouse Hanford
 Contract MBH-SVV-069262

Lab sample id N310164-02
 Dept sample id 7285-002
 Received 10/29/93
 % moisture 4.7

Client sample id B098Z2
 Location/Matrix 200-UP-2 SOLID
 Collected 10/12/93
 Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	Alpha	8.2	4.8	4	10	J	80A
Gross Beta	Beta	170	9.1	5	10		80B
Technetium 99	14133-76-7	0.94	0.15	0.2	0.5		TC
Uranium 233/234		2.3	0.45	0.2	0.3		U
Uranium 235	15117-96-1	0.24	0.14	0.1	0.3	J	U
Uranium 238		2.2	0.44	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	5.1	0.93	0.03	0.1	X	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQOT	ANALYZED	REVIEWED	BY
N310164-02	80A/80	7285-002		0.100 g	12/08/93	12/09/93	DPK
N310164-02	80B/80	7285-002		0.100 g	12/08/93	12/09/93	DPK
N310164-02	TC	7285-002		2.00 g	12/14/93	12/15/93	DPK
N310164-02	U	7285-002		1.00 g	12/06/93	12/08/93	DPK
N310164-02	U_T	7285-002		0.250 g	12/15/93	12/21/93	DPK

DATA SHEETS

Page 2

SUMMARY DATA SECTION

Page 13

0 20

Lab id TMAN
 Protocol WHC-HASM
 Version Ver 1.0
 Form DVD-DS
 Version 2.27
 Report date 12/29/93

9713511.0443

T M A N O R C A L
REPORTING GROUP 7285

N310164-03

B098Z3

D A T A S H E E T

SDG 7285
Contact Dinkar KharkarClient Westinghouse Hanford
Contract MBH-SVV-069262Lab sample id N310164-03
Dept sample id 7285-003
Received 10/29/93
% moisture 3.6Client sample id B098Z3
Location/Matrix 200-UP-2 SOLID
Collected 10/14/93
Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	Alpha	2.1	3.1	4	10	U	80A
Gross Beta	Beta	23	4.7	6	10		80B
Technetium 99	14133-76-7	0.60	0.17	0.4	0.5		TC
Uranium 233/234		0.73	0.19	0.08	0.3		U
Uranium 235	15117-96-1	0.053	0.054	0.1	0.3	U	U
Uranium 238		0.68	0.19	0.08	0.3		U
Total Uranium (ug/g)	7440-61-1	2.1	0.37	0.03	0.1	X	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQOT	ANALYZED	REVIEWED	BY
N310164-03	80A/80	7285-003		0.100 g	12/08/93	12/09/93	DPK
N310164-03	80B/80	7285-003		0.100 g	12/08/93	12/09/93	DPK
N310164-03	TC	7285-003		2.00 g	12/14/93	12/15/93	DPK
N310164-03	U	7285-003		1.00 g	12/06/93	12/08/93	DPK
N310164-03	U_T	7285-003		0.250 g	12/15/93	12/21/93	DPK

9713511.0444

TMA NORCAL
REPORTING GROUP 7285

N310164-04

B098Z4

DATA SHEET

SDG <u>7285</u>	Client <u>Westinghouse Hanford</u>
Contact <u>Dinkar Kharkar</u>	Contract <u>MBH-SVV-069262</u>
Lab sample id <u>N310164-04</u>	Client sample id <u>B098Z4</u>
Dept sample id <u>7285-004</u>	Location/Matrix <u>200-UP-2</u> <u>SOLID</u>
Received <u>10/29/93</u>	Collected <u>10/15/93</u>
% moisture <u>2.4</u>	Chain of custody id <u>EFL-1091</u>

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	Alpha	7.2	4.1	4	10	J	80A
Gross Beta	Beta	30	4.7	5	10		80B
Technetium 99	14133-76-7	0.87	0.31	<u>0.7</u>	0.5		TC
Uranium 233/234		0.58	0.17	0.1	0.3		U
Uranium 235	15117-96-1	0.037	0.050	0.1	0.3	U	U
Uranium 238		0.62	0.18	0.08	0.3		U
Total Uranium (ug/g)	7440-61-1	1.5	0.27	0.03	0.1	X	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQOT	ANALYZED	REVIEWED	BY
N310164-04	80A/80	7285-004		0.100 g	12/09/93	12/13/93	DPK
N310164-04	80B/80	7285-004		0.100 g	12/09/93	12/13/93	DPK
N310164-04	TC	7285-004		2.00 g	12/14/93	12/15/93	DPK
N310164-04	U	7285-004		1.00 g	12/06/93	12/08/93	DPK
N310164-04	U_T	7285-004		0.250 g	12/15/93	12/21/93	DPK

DATA SHEETS
Page 4
SUMMARY DATA SECTION
Page 15

Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.27
Report date 12/29/93

9713511.0445

T M A N O R C A L
REPORTING GROUP 7285

N310164-05

B098Z5

D A T A S H E E T

SDG 7285
Contact Dinkar KharkarClient Westinghouse Hanford
Contract MBH-SVV-069262Lab sample id N310164-05
Dept sample id 7285-005
Received 10/29/93
% moisture 6.1Client sample id B098Z5
Location/Matrix 200-UP-2 SOLID
Collected 10/19/93
Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	Alpha	9.3	4.9	5	10	J	80A
Gross Beta	Beta	20	4.2	5	10		80B
Technetium 99	14133-76-7	0.58	0.16	0.3	0.5		TC
Uranium 233/234		0.38	0.15	0.1	0.3		U
Uranium 235	15117-96-1	0.025	0.050	0.1	0.3	U	U
Uranium 238		0.49	0.15	0.08	0.3		U

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQOT	ANALYZED	REVIEWED	BY
N310164-05	80A/80	7285-005		0.100 g	12/08/93	12/09/93	DPK
N310164-05	80B/80	7285-005		0.100 g	12/08/93	12/09/93	DPK
N310164-05	TC	7285-005		2.00 g	12/14/93	12/15/93	DPK
N310164-05	U	7285-005		1.00 g	12/08/93	12/13/93	DPK

9713511.0446

TMA NORCAL
REPORTING GROUP 7285

N310164-06

B098Z6

DATA SHEET

SDG 7285
Contact Dinkar KharkarClient Westinghouse Hanford
Contract MBH-SVV-069262Lab sample id N310164-06
Dept sample id 7285-006
Received 10/29/93
% moisture 5.2Client sample id B098Z6
Location/Matrix 200-UP-2 SOLID
Collected 10/21/93
Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	Alpha	2.2	3.5	5	10	U	80A
Gross Beta	Beta	23	4.5	5	10		80B
Technetium 99	14133-76-7	0.47	0.10	0.2	0.5	J	TC
Uranium 233/234		0.45	0.16	0.1	0.3		U
Uranium 235	15117-96-1	0.081	0.081	0.1	0.3	U	U
Uranium 238		0.50	0.16	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	1.5	0.27	0.03	0.1	X	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQOT	ANALYZED	REVIEWED	BY
N310164-06	80A/80	7285-006		0.100 g	12/08/93	12/09/93	DPK
N310164-06	80B/80	7285-006		0.100 g	12/08/93	12/09/93	DPK
N310164-06	TC	7285-006		2.00 g	12/14/93	12/15/93	DPK
N310164-06	U	7285-006		1.00 g	12/08/93	12/13/93	DPK
N310164-06	U_T	7285-006		0.250 g	12/15/93	12/21/93	DPK

DATA SHEETS

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Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.27
Report date 12/29/93

9713511_0447

TMA NORCAL
REPORTING GROUP 7285

N310164-07

B098Z7

DATA SHEET

SDG 7285
Contact Dinkar KharkarClient Westinghouse Hanford
Contract MBH-SVV-069262Lab sample id N310164-07
Dept sample id 7285-007
Received 10/29/93
% moisture 3.8Client sample id B098Z7
Location/Matrix 200-UP-2 SOLID
Collected 10/21/93
Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	Alpha	4.5	3.7	4	10	J	80A
Gross Beta	Beta	20	4.3	5	10		80B
Technetium 99	14133-76-7	0.23	0.065	0.1	0.5	J	TC
Uranium 233/234		0.56	0.16	0.08	0.3		U
Uranium 235	15117-96-1	0	0.026	0.1	0.3	U	U
Uranium 238		0.63	0.18	0.08	0.3		U
Total Uranium (ug/g)	7440-61-1	1.5	0.28	0.03	0.1	X	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQOT	ANALYZED	REVIEWED	BY
N310164-07	80A/80	7285-007		0.100 g	12/09/93	12/18/93	DPK
N310164-07	80B/80	7285-007		0.100 g	12/09/93	12/18/93	DPK
N310164-07	TC	7285-007		2.00 g	12/16/93	12/16/93	DPK
N310164-07	U	7285-007		1.00 g	12/08/93	12/18/93	DPK
N310164-07	U_T	7285-007		0.250 g	12/15/93	12/21/93	DPK

9713511.0148

TMA NORCAL
REPORTING GROUP 7285

N310164-08

B098Z8

DATA SHEET

SDG 7285
Contact Dinkar KharkarClient Westinghouse Hanford
Contract MBH-SVV-069262Lab sample id N310164-08
Dept sample id 7285-008
Received 10/29/93
% moisture 4.8Client sample id B098Z8
Location/Matrix 200-UP-2 SOLID
Collected 10/22/93
Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	Alpha	9.4	4.4	4	10	J	80A
Gross Beta	Beta	22	4.4	5	10		80B
Technetium 99	14133-76-7	0.23	0.089	0.2	0.5	J	TC
Uranium 233/234		0.56	0.18	0.1	0.3		U
Uranium 235	15117-96-1	0.038	0.051	0.1	0.3	U	U
Uranium 238		0.76	0.20	0.08	0.3		U
Total Uranium (ug/g)	7440-61-1	1.7	0.31	0.03	0.1	X	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-08	80A/80	7285-008		0.100 g	12/08/93	12/09/93	DPK
N310164-08	80B/80	7285-008		0.100 g	12/08/93	12/09/93	DPK
N310164-08	TC	7285-008		2.00 g	12/15/93	12/16/93	DPK
N310164-08	U	7285-008		1.00 g	12/08/93	12/18/93	DPK
N310164-08	U_T	7285-008		0.250 g	12/15/93	12/21/93	DPK

9713511.0449

TMA NORCAL
REPORTING GROUP 7285

N310164-09

B098Z9

DATA SHEET

SDG 7285
Contact Dinkar KharkarClient Westinghouse Hanford
Contract MBH-SVV-069262Lab sample id N310164-09
Dept sample id 7285-009
Received 10/29/93
% moisture 4.8Client sample id B098Z9
Location/Matrix 200-UP-2 SOLID
Collected 10/22/93
Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	Alpha	6.1	4.1	4	10	J	80A
Gross Beta	Beta	24	4.5	5	10		80B
Technetium 99	14133-76-7	0.26	0.11	0.3	0.5	U	TC
Uranium 233/234		0.30	0.16	0.1	0.3		U
Uranium 235	15117-96-1	0.037	0.037	0.1	0.3	U	U
Uranium 238		0.64	0.20	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	1.6	0.30	0.03	0.1	X	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQUOT	ANALYZED	REVIEWED	BY
N310164-09	80A/80	7285-009		0.100 g	12/08/93	12/09/93	DPK
N310164-09	80B/80	7285-009		0.100 g	12/08/93	12/09/93	DPK
N310164-09	TC	7285-009		2.00 g	12/15/93	12/20/93	DPK
N310164-09	U	7285-009		1.00 g	12/10/93	12/13/93	DPK
N310164-09	U_T	7285-009		0.250 g	12/15/93	12/21/93	DPK

9713511.0450

TMA NORCAL
REPORTING GROUP 7285

N310164-10

B09901

DATA SHEET

SDG 7285
Contact Dinkar KharkarClient Westinghouse Hanford
Contract MBH-SVV-069262Lab sample id N310164-10
Dept sample id 7285-010
Received 10/29/93
& moisture 9.5Client sample id B09901
Location/Matrix 200-UP-2 SOLID
Collected 10/25/93
Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	Alpha	6.8	3.9	4	10	J	80A
Gross Beta	Beta	17	4.4	6	10		80B
Technetium 99	14133-76-7	0.27	0.062	0.1	0.5	J	TC
Uranium 233/234		0.78	0.27	0.2	0.3		U
Uranium 235	15117-96-1	0.076	0.10	0.2	0.3	U	U
Uranium 238		0.84	0.28	0.2	0.3		U
Total Uranium (ug/g)	7440-61-1	1.9	0.34	0.03	0.1	X	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQOT	ANALYZED	REVIEWED	BY
N310164-10	80A/80	7285-010		0.100 g	12/08/93	12/09/93	DPK
N310164-10	80B/80	7285-010		0.100 g	12/08/93	12/09/93	DPK
N310164-10	TC	7285-010		2.00 g	12/13/93	12/16/93	DPK
N310164-10	U	7285-010		1.00 g	12/13/93	12/15/93	DPK
N310164-10	U_T	7285-010		0.250 g	12/15/93	12/21/93	DPK

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Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-DS
Version 2.27
Report date 12/29/93

9713511.0451

TMA NORCAL
REPORTING GROUP 7285

N310164-11

B09903

DATA SHEET

SDG <u>7285</u>	Client <u>Westinghouse Hanford</u>
Contact <u>Dinkar Kharkar</u>	Contract <u>MBH-SVV-069262</u>
Lab sample id <u>N310164-11</u>	Client sample id <u>B09903</u>
Dept sample id <u>7285-011</u>	Location/Matrix <u>200-UP-2</u> <u>SOLID</u>
Received <u>10/29/93</u>	Collected <u>10/25/93</u>
% moisture <u>7.5</u>	Chain of custody id <u>EFL-1091</u>

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	Alpha	11	4.7	4	10		80A
Gross Beta	Beta	15	4.2	5	10		80B
Technetium 99	14133-76-7	0.18	0.083	0.2	0.5	U	TC
Uranium 233/234		0.56	0.22	0.1	0.3		U
Uranium 235	15117-96-1	0.021	0.043	0.2	0.3	U	U
Uranium 238		0.61	0.22	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1	1.9	0.34	0.03	0.1	X	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQOT	ANALYZED	REVIEWED	BY
N310164-11	80A/80	7285-011		0.100 g	12/09/93	12/18/93	DPK
N310164-11	80B/80	7285-011		0.100 g	12/09/93	12/18/93	DPK
N310164-11	TC	7285-011		2.00 g	12/13/93	12/20/93	DPK
N310164-11	U	7285-011		1.00 g	12/13/93	12/15/93	DPK
N310164-11	U_T	7285-011		0.250 g	12/15/93	12/21/93	DPK

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Lab id TMAN
 Protocol WHC-HASM
 Version Ver 1.0
 Form DVD-DS
 Version 2.27
 Report date 12/29/93

0 29

Emergency Contact (508) 373-3800 ERG #61 Overnight Delivery Air Bill # 17886

SHIPPING INST.	SHIP TO Company <u>TMA/Norcal</u>	OFFSITE RADIOACTIVE SHIPMENT RECORD EXTERIOR INSPECTION PERMITTED		7886
	Address <u>2030 Wright Ave</u>	Contractor <input type="checkbox"/> PNL <input type="checkbox"/> KEH <input checked="" type="checkbox"/> WHC	Ship: <input checked="" type="checkbox"/> Prepaid <input type="checkbox"/> Collect <input type="checkbox"/> Via	
	City, State, Zip <u>Richmond, CA 94804</u>	Site Carrier <u>Loren Rogers</u>	<input type="checkbox"/> Motor-Rail <input checked="" type="checkbox"/> Air Psgr <input type="checkbox"/> Excl. Use <input checked="" type="checkbox"/> Air Cargo <input type="checkbox"/> DOE Veh. <input type="checkbox"/> Mail <input type="checkbox"/> UPS Sur. <input type="checkbox"/>	
	Attention <u>Delores Sanchez</u>	PR No. <u>84682</u> Veb. No.		

Proper Shipping Name: <u>Radioactive Material EXCEPTED PACKAGE -</u>	UN Number	Material Form: <input type="checkbox"/> Special (A1) <input checked="" type="checkbox"/> Normal (A2)	For Normal Form Identify: <u>Soil</u>
1. Empty Packages <input type="checkbox"/> UN 2908		Labels Applied	Physical Form
2. Low Specific Activity, n.o.s. <input type="checkbox"/> UN 2912		<input type="checkbox"/> Empty	<input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas
3. Limited quantity, n.o.s. <input checked="" type="checkbox"/> UN 2910		<input type="checkbox"/> Radioactive LSA	Chemical Form
4. N.O.S. MATERIAL <input type="checkbox"/> UN 2982		<input type="checkbox"/> White	<input type="checkbox"/> Metal <input type="checkbox"/> Oxide
5. Fissile n.o.s. <input type="checkbox"/> UN 2918		<input type="checkbox"/> Yellow II	<input checked="" type="checkbox"/> Elemental <input type="checkbox"/> Nitrate
6. Special Form, n.o.s. <input type="checkbox"/> UN 2974		<input type="checkbox"/> Yellow III	Other
7. Instruments & Articles <input type="checkbox"/> UN 2911		<input checked="" type="checkbox"/> None	
8. <input type="checkbox"/>		<input type="checkbox"/> Danger (Air Cargo)	
		<input type="checkbox"/> Secondary	
		Material Category	Controlled Quantity
		<input type="checkbox"/> Empty	
		<input type="checkbox"/> Low Specific Act. (LSA)	
		<input checked="" type="checkbox"/> Limited Quantity	
		<input type="checkbox"/> Type A Quantity	
		<input type="checkbox"/> Type B Quantity	
		<input type="checkbox"/> Highway Route	

SHIPMENT DESCRIPTION AND CERTIFICATION	TYPE PACKAGE	CONSTRUCTION	FISSILE CLASS	SNM	ACCOUNTABILITY/SECURITY CONTROL
	<input checked="" type="checkbox"/> Strong Tight <input type="checkbox"/> Type A <input type="checkbox"/> Type B <input type="checkbox"/> Type B (U) <input type="checkbox"/> Type B (M)	<input type="checkbox"/> Box, FB <input type="checkbox"/> Wood <input type="checkbox"/> Steel <input type="checkbox"/> Drum <input type="checkbox"/> Cask <input checked="" type="checkbox"/> Other <u>Poly Cooler</u>	<input checked="" type="checkbox"/> Non Fissile <input type="checkbox"/> Fissile Exempt <input type="checkbox"/> Fissile I <input type="checkbox"/> Fissile II <input type="checkbox"/> Fissile III Grams Fissile	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> <1 gr <input type="checkbox"/> Category I <input type="checkbox"/> Category II <input type="checkbox"/> Category III	<input type="checkbox"/> Classified <input checked="" type="checkbox"/> Unclassified Consignee authorized to receive this qty <input checked="" type="checkbox"/> Sig. Security Svc. Reg. <input type="checkbox"/> NA <input checked="" type="checkbox"/> Reg. Excl. > 1g <input type="checkbox"/> U/A NU, DU > 1kg <input checked="" type="checkbox"/> Security Escorts Req. <input type="checkbox"/> Not Req. <input checked="" type="checkbox"/> External Cask Temperature <input type="checkbox"/> N/A <input checked="" type="checkbox"/> (Max. 122°F LTL, 180°F Ex. Use)

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

Container examined: No evidence of deterioration or damage Yes
 QA inspection Current Yes N/A
 Shipping Doc. N/A 49 CFR Authorization No. N/A
 Seals required No Yes

No. Pkgs.	Model Package	COC/Spec. No.	Serial No.	Seal No.	Isotopes	Curies/Pkg	T.I.	Gr. Wt.
1	Strong Tight Cooler # KENT	N/A	N/A	N/A	Cs-137, Sr-90	0.545 Ci	N/A	43 lbs
Soil samples in glass bottles. Bottles are double-bagged and packed in wet ice surrounded by vermiculite absorbent. Sample # B098Z1, B098Z2								
(Shipper may describe package in detail on one of unused lines above)						TOTAL	0.545 Ci	43 lbs

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

Certifier's Signature: Loren Rogers Date: 10-28-93 Organization: EFS Complete Cost Code (inc. end function): B1710 PT2BM

AREA MONITOR	Surface Dose Rate of Package <input type="checkbox"/> ≤ 0.5 or ___ mrem/hr (N + BY)	Dose Rate at 1 Meter from Surface of Package <input type="checkbox"/> ≤ 0.5 or ___ mrem/hr (N + BY)	Smears of Outer Container <input type="checkbox"/> ≤ 22 dpm Bq/cm ² <input type="checkbox"/> ≤ 2.2 dpm α/cm ²	TRUCK LOAD OR EXCLUSIVE USE Surface: <input type="checkbox"/> ≤ 200 mrem/hr (N + BY) @ 6 feet: <input type="checkbox"/> ≤ 10 mrem/hr (N + BY) @ Cab: <input type="checkbox"/> ≤ 2.0 mrem/hr (N + BY) or Sleeper
	Additional Data and Instructions (inc. Readings on Internal Packaging)			
	Signature - Radiation Monitoring	Bldg. <u>2225</u>	Survey No. <u>167158</u>	Date <u>10-28-93</u>

AUTHORIZATION FOR SHIPMENT

AIR TRANSPORT CERTIFICATION	Cargo Only: <input type="checkbox"/> Danger Labels Applied	Passenger: <input checked="" type="checkbox"/> 1. Ltd. Qty. <input checked="" type="checkbox"/> 3. Research or Medical Diagnosis <input type="checkbox"/> 2. ≤ 3 T.I. <input type="checkbox"/> 4. Human Medical Research	Pkg. Dimensions
-----------------------------	--	---	-----------------

Traffic has inspected and verified preshipment compliance to DOT regulations.

Authorized Signature: E. R. Smith Printed Name: E. R. Smith Date: 28 Oct 93

APPROVED FOR OFFSITE SHIPMENT

TRAFFIC	B. L. No. <u>RMU 8305</u>	Date Shipped <u>10-28-93</u>	E. T. A. <u>10-29-93</u>	Routing <u>TRD, BXP</u>	<input type="checkbox"/> N/A	Placards <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Surveilled By <u>[Signature]</u>	Date <u>10-28-93</u>	Approved for Shipment <u>[Signature]</u>	Westinghouse Hanford Company	Date <u>10-28-93</u>	Route Plan <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

9713511.0453

Golder Associates Inc.

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



March 7, 1994

Our ref: 923-E418
S/O/2873

Westinghouse Hanford Company
Hanford Analytical Services Management
345 Hills MSIN H4-29
Richland, Washington 99352

ATTENTION: Ms. Jeanette Duncan

RE: TRANSMITTAL OF 200-UP-2 DATA VALIDATION PACKAGE,
TASK ORDER: S-94-18

Dear Ms. Duncan:

Enclosed is the data validation package for the 200-UP-2 project. The data package included in this shipment is as follows:

- B098Z1-TMA-636

Two copies of the validation documentation is located in the front of the data package folder. Please call if you have any questions.

Sincerely,

GOLDER ASSOCIATES INC.

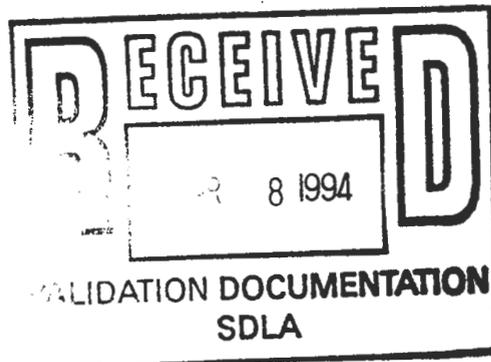
Kent M. Angelos
Project Manager



Enclosures

KMA/ah 2873.ltr whc-2

cc: P.K. Brockman, SAIC
C. Jensen



MEMORANDUM

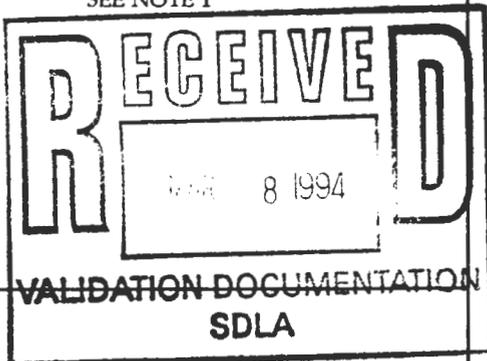


TO: 200 UP-2 Project QA Record

March 7, 1994

FR: Thomas Stapp, Golder Associates Inc. *TS*RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE
B098Z1-TMA-636 (923-E418 636GEN.UP2)**INTRODUCTION**

This memo presents the results of data validation on data package B098Z1-TMA-636 prepared by TMA laboratory. A list of samples validated along with the analyses reported and the methods of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSES
B098Z1	10/11/93	SOIL	SEE NOTE 1 
B098Z2	10/12/93	SOIL	
B098Z3	10/14/93	SOIL	
B098Z4	10/15/93	SOIL	
B098Z5	10/19/93	SOIL	
B098Z6	10/21/93	SOIL	
B098Z7	10/21/93	SOIL	
B098Z8	10/22/93	SOIL	
B098Z9	10/22/93	SOIL	
B09901	10/25/93	SOIL	
B09903	10/25/93	SOIL	
Notes:			
1. Indicates the samples were analyzed for Nitrate/Nitrite as N.			

Data validation was conducted in accordance with the WHC statement of work (WHC 1993a) and validation procedures (WHC 1993b). Attachments 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

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

Detection Limits. Detection limit goals were met.

Completeness. The data package was complete for all requested analyses. A total of eleven (11) samples were validated in this data package with a total of eleven determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets the work plan completeness objective of 90 percent.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

REFERENCES

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

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

9713511.0456

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

- B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.
- U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.
- UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.
- BJ - Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.
- J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.
- UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.
- R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

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ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

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ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B09821-TMA-636

Parameter	Samp#	B09821		B09822		B09823		B09824		B09825		B09826	
	Date	10-11-93		10-12-93		10-14-93		10-15-93		10-19-93		10-21-93	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
	Units	Result	Q										
NITRATE+NITRITE-N	MG-N/KG	12.300		35.700		55.300		24.100		117.000		2.500	U

9713511.0461

Verified *[Signature]* 3-7-94

Validated Data Summary, Data Package: B09821-TMA-636

Parameter	Samp#	B09827		B09828		B09829		B09901		B09903	
	Date	10-21-93		10-22-93		10-22-93		10-25-93		10-25-93	
	Location	---		---		---		---		---	
	Depth	---		---		---		---		---	
	Type	---		---		---		---		---	
	Comments	---		---		---		---		---	
	Units	Result	Q								
NITRATE+NITRITE-N	MG-N/KG	2.490	U	2.500	U	2.490	U	2.500	U	86.400	

Verified
[Signature]
 3-7-94

973511.0462

9713511.0463

Page 2
Received: 11/01/93

Skinner&Sherman
REPORT
Results by Sample

Work Order # S3-11-011

Q

SAMPLE ID <u>B09821</u>	SAMPLE # <u>01</u> FRACTIONS: <u>A</u>
Date & Time Collected <u>10/11/93</u>	Category <u>SOIL</u>
NITR_S <u>12.3</u>	
mg N/kg	

SAMPLE ID <u>B09822</u>	SAMPLE # <u>02</u> FRACTIONS: <u>A</u>
Date & Time Collected <u>10/12/93</u>	Category <u>SOIL</u>
NITR_S <u>35.7</u>	
mg N/kg	

SAMPLE ID <u>B09823</u>	SAMPLE # <u>03</u> FRACTIONS: <u>A</u>
Date & Time Collected <u>10/14/93</u>	Category <u>SOIL</u>
NITR_S <u>55.3</u>	
mg N/kg	

SAMPLE ID <u>B09824</u>	SAMPLE # <u>04</u> FRACTIONS: <u>A</u>
Date & Time Collected <u>10/15/93</u>	Category <u>SOIL</u>
NITR_S <u>24.1</u>	
mg N/kg	

SAMPLE ID <u>B09825</u>	SAMPLE # <u>05</u> FRACTIONS: <u>A</u>
Date & Time Collected <u>10/19/93</u>	Category <u>SOIL</u>
NITR_S <u>117</u>	
mg N/kg	

SAMPLE ID <u>B09826</u>	SAMPLE # <u>06</u> FRACTIONS: <u>A</u>
Date & Time Collected <u>10/21/93</u>	Category <u>SOIL</u>
NITR_S <u><2.50</u>	
mg N/kg	

u

SAMPLE ID <u>B09827</u>	SAMPLE # <u>07</u> FRACTIONS: <u>A</u>
Date & Time Collected <u>10/21/93</u>	Category <u>SOIL</u>
NITR_S <u><2.49</u>	
mg N/kg	

u

Verified *[Signature]* 3-7-94

TMA
Thermo Analytical Inc.

Skinner & Sherman Laboratories Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-41 AR TEST FAX (617) 890-3883

Q

SAMPLE ID B09828 SAMPLE # 08 FRACTIONS: A
Date & Time Collected 10/22/93 Category SOIL
NITR_S <2.50
mg N/kg

u

SAMPLE ID B09829 SAMPLE # 09 FRACTIONS: A
Date & Time Collected 10/22/93 Category SOIL
NITR_S <2.49
mg N/kg

u

SAMPLE ID B09901 SAMPLE # 10 FRACTIONS: A
Date & Time Collected 10/25/93 Category SOIL
NITR_S <2.50
mg N/kg

u

SAMPLE ID B09903 SAMPLE # 11 FRACTIONS: A
Date & Time Collected 10/25/93 Category SOIL
NITR_S 86.4
mg N/kg

SAMPLE ID B09903D SAMPLE # 11 FRACTIONS: B
Date & Time Collected 10/25/93 Category SOIL
NITR_S 89.4
mg N/kg

SAMPLE ID B09903S SAMPLE # 11 FRACTIONS: C
Date & Time Collected 10/25/93 Category SOIL
NITR_S 109
mg N/kg

SAMPLE ID LCSS SAMPLE # 12 FRACTIONS: A
Date & Time Collected not specified Category SOIL
NITR_S 2.00
mg N/L

Verified *[Signature]* 3-7-94



Thermo Analytical Inc.

Skinner & Sherman Laboratories Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4LAB TEST FAX (617) 890-3883

9713511.0465

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

9713511.0466

Page 5

Skinner&Sherman

REPORT

Work Order # S3-11-011

Received: 11/01/93

Test Methodology

TEST CODE NITR S NAME Nitrate/Nitrite in Soils

The sample was extracted with deionized water and analyzed in accordance with Method for Chemical Analysis of Water and Wastes EPA-600/4-79-020, March 1979, Method 353.2 (modified)

TMA
Thermo Analytical Inc.

Skinner & Sherman Laboratories Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1 800 414 8787 FAX (617) 890 3993

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS
 Company Contact L E ROGERS Telephone 376-7690
 Project Designation/Sampling Locations 200-UP-2 Collection Date 10-11-93
 Ice Chest No. KENT Field Logbook No. EFL-1091
 Bill of Lading/Airbill No. _____ Offsite Property No. _____
 Method of Shipment OVERNIGHT AIR SERVICE
 Shipped to TMA
 Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

- 1) BOBZI
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 2) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~
- 3) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~ PER 10-11-93

Field Transfer of Custody Chain of Possession (Sign and Print Names)

Relinquished by: <u>0920</u> <u>Loren E. Rogers 10-28-93</u>	Received by: <u>[Signature]</u>	Date/Time: <u>10-29-93 10:20</u>
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:		

026 [Signature] 3-7-94

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS
 Company Contact L E ROGERS Telephone 376-7690
 Project Designation/Sampling Locations 200-UP-2 Collection Date 10-12-93
 Ice Chest No. KENT Field Logbook No. EFL-1091
 Bill of Lading/Airbill No. _____ Offsite Property No. _____
 Method of Shipment OVERNIGHT AIR SERVICE
 Shipped to TMA
 Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

- 1) B09822
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 2) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~
- 3) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

<input type="checkbox"/> Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: <u>10-28-93</u> <u>Loren E. Rogers 0920</u>	Received by: <u>[Signature]</u>	Date/Time: <u>10-28-93 10:20</u>
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:		

026B 10-3-7-94

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS
 Company Contact L E ROGERS Telephone 376-7690
 Project Designation/Sampling Locations 200-UP-2 Collection Date 10-14-93
 Ice Chest No.: SML-349 Field Logbook No.: EFL-1091
 Bill of Lading/Airbill No. _____ Offsite Property No. _____
 Method of Shipment OVERNIGHT AIR SERVICE
 Shipped to TMA
 Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

- 1) BO9873
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- ~~2) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~
- 3) SEP 10-14-93
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

Field Transfer of Custody Chain of Possession (Sign and Print Names)

Relinquished by: <u>10-28-93</u> <u>Leanne Rogers 0930</u>	Received by:	Date/Time:
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: _____

026 D FC 3-7-94

Westinghouse Hanford Company	CHAIN OF CUSTODY
Custody Form Initiator <u>L E ROGERS</u>	
Company Contact: <u>L E ROGERS</u>	Telephone: <u>376-7690</u>
Project Designation/Sampling Locations <u>200-UP-2</u>	Collection Date <u>10-14-93</u>
Ice Chest No.: <u>SML-349</u>	Field Logbook No. <u>EFL-1091</u>
Bill of Lading/Airbill No.:	Offsite Property No.:
Method of Shipment <u>OVERNIGHT AIR SERVICE</u>	
Shipped to <u>TMA</u>	
Possible Sample Hazards/Remarks <u>Keep samples at 4C (SOIL) RADIOACTIVE</u>	

Sample Identification

- 1) 809873
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 2) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~
- 3) SEP 10-14-93
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

<input type="checkbox"/> Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: <u>10-28-93</u> <u>Loane E. Rogers</u> 0930	Received by: <u>Lucy TMA/NORCAL</u>	Date/Time: <u>10-29-93 12:35</u>
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:		

026F 3-7-94

Westinghouse Hanford Company	CHAIN OF CUSTODY	10-15-93
Custody Form Initiator	<u>LE ROGERS W.S. Thompson</u>	
Company Contact	<u>L E ROGERS</u>	Telephone <u>376-7690</u>
Project Designation/Sampling Locations	<u>200-UP-2</u>	Collection Date <u>10-15-93 TIME 1051</u>
Ice Chest No.	<u>SMH-349</u>	Field Logbook No. <u>EFL-1091</u>
Bill of Lading/Airbill No.		Offsite Property No. _____
Method of Shipment	<u>OVERNIGHT AIR SERVICE</u>	
Shipped to	<u>TMA</u>	
Possible Sample Hazards/Remarks	<u>Keep samples at 4C (SOIL) RADIOACTIVE</u>	

Sample Identification

- 1) B09874
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 2) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~
- 3) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

<input type="checkbox"/> Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: <u>W.S. Thompson</u> <u>W.S. Thompson</u>	Received by: <u>Ray T. Seidke</u> <u>Ray T. Seidke</u>	Date/Time: <u>10-15-93 1130</u>
Relinquished by: <u>10-28-93 0820</u> <u>Ray T. Seidke</u>	Received by: <u>10-28-93</u> <u>Lorene Rogers</u>	Date/Time: <u>10-20-93 0820</u>
Relinquished by: <u>10-28-93</u> <u>Lorene Rogers</u>	Received by: <u>Lorene Rogers</u>	Date/Time: <u>10-29-93 12:35</u>
Relinquished by: _____	Received by: _____	Date/Time: _____

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:
Comments:		

026H 3-7-94

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E. ROGERS
 Company Contact L E. ROGERS Telephone 376-7690
 Project Designation/Sampling Locations 200-UP-2 Collection Date 10-19-93
 Ice Chest No. SML-349 Field Logbook No. EFL-1091
 Bill of Lading/Airbill No. _____ Offsite Property No. _____
 Method of Shipment OVERNIGHT AIR SERVICE
 Shipped to WESTON
 Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

- 1) BQBZ5
 1, 120ml P/G: Anions NO2, NO3 (EPA 353.1)
 1, 1000ml P/G: Gross beta (PRO-032-15), U-235, U-234, U-238 (PRO-052-32) Tc-99 (PRO-032-78)
- 2) _____
 1, 120ml P/G: Anions NO2, NO3 (EPA 353.1)
 1, 1000ml P/G: Gross beta (PRO-032-15), U-235, U-234, U-238 (PRO-052-32) Tc-99 (PRO-032-78)
- 3) PER 10-19-93
 1, 120ml P/G: Anions NO2, NO3 (EPA 353.1)
 1, 1000ml P/G: Gross beta (PRO-032-15), U-235, U-234, U-238 (PRO-052-32) Tc-99 (PRO-032-78)

Field Transfer of Custody		Chain of Possession	(Sign and Print Names)	
Relinquished by: <u>10-28-93</u> <u>Jocelyn Rogers 0930</u>	Received by: <u>Quinn TMA/HORCAL</u>	Date/Time: <u>10-29-93</u>	<u>12:35</u>	
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:		

026J 3-7-94

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2 Collection Date 10-21-93

Ice Chest No. 5ML-413 Field Logbook No. EFL-1091

Bill of Lading/Airbill No. _____ Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

- 1) BOBZ6
 ✓ 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 ✓ 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 2) BOBZ7
 ✓ 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 ✓ 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- ~~3) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2) per 10-21-93
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

<input type="checkbox"/> Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: <u>10-28-93</u> <u>J. E. Rogers 0930</u>	Received by: <u>Relinquish TMA/NORCAL</u>	Date/Time: <u>10-29-93 12:35</u>
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:		

026L 10-3-7-94

9713511.0474

Westinghouse Hanford Company	<h2 style="margin: 0;">CHAIN OF CUSTODY</h2>
Custody Form Initiator <u>L E ROGERS</u>	
Company Contact <u>L E ROGERS</u>	Telephone <u>376-7690</u>
Project Designation/Sampling Locations <u>200-UP-2</u>	Collection Date <u>10-22-93</u>
Ice Chest No. <u>SML-413</u>	Field Logbook No. <u>EFL-1091</u>
Bill of Lading/Airbill No. _____	Offsite Property No. _____
Method of Shipment <u>OVERNIGHT AIR SERVICE</u>	
Shipped to <u>TMA</u>	
Possible Sample Hazards/Remarks <u>Keep samples at 4C (SOIL) NONE NOTED</u>	

Sample Identification

- 1) B098Z8
 1,125ml P/G: Anions NO2, NO3 (EPA 353.2)
 1,1000ml P/G: Gross beta (EP-10), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5), Tc-99 (RC-24, RC-604)
- 2) B098Z9
 1,125ml P/G: Anions NO2, NO3 (EPA 353.2)
 1,1000ml P/G: Gross beta (EP-10), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5), Tc-99 (RC-24, RC-604)
- 3) ~~1,125ml P/G: Anions NO2, NO3 (EPA 353.2) SEP 10-22-93~~
~~1,1000ml P/G: Gross beta (EP-10), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5), Tc-99 (RC-24, RC-604)~~

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: <u>10-28-93</u> <u>Loren E. Rogers 0930</u>	Received by: <u>Amis TMA/HORCAL</u>	Date/Time: <u>10-29-93 12:35</u>
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:		

026A F 3-7-94

Westinghouse Hanford Company	CHAIN OF CUSTODY
Custody Form Initiator <u>L E ROGERS</u>	Telephone <u>376-7690</u>
Company Contact <u>L E ROGERS</u>	Collection Date <u>10-25-93</u>
Project Designation/Sampling Locations <u>200-UP-2</u>	Field Logbook No. <u>EFL-1091</u>
Ice Chest No. <u>SML-415</u>	Offsite Property No. _____
Bill of Lading/Airbill No. _____	
Method of Shipment <u>OVERNIGHT AIR SERVICE</u>	
Shipped to <u>TMA</u>	
Possible Sample Hazards/Remarks <u>Keep samples at 4C (SOIL)</u>	

Sample Identification

- 1) BO9901
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 2) BO9903
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- ~~3) 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

<input type="checkbox"/> Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: <u>10-28-93</u> <u>Loene E. Rogers 0930</u>	Received by: <u>Francis TMA/NORCAL</u>	Date/Time: <u>10-29-93 12:35</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition		
Disposal Method:	Disposed by:	Date/Time:
Comments:		

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ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200 UP-2		DATA PACKAGE: B098Z1-TMA-636		
VALIDATOR:	T. Stapp	LAB: TMA/Skinner & Sh.		DATE: 3-3-94	
CASE:	N3-10-162		SDG: N3-10-162		
ANALYSES PERFORMED					
<input type="checkbox"/> Anions/IC	<input type="checkbox"/> TOC	<input type="checkbox"/> TOX	<input type="checkbox"/> TPH-418.1	Oil and Grease	Alkalinity
<input type="checkbox"/> Ammonia	<input type="checkbox"/> BOD/COD	<input type="checkbox"/> Chloride	<input type="checkbox"/> Chromium-VI	<input type="checkbox"/> pH	<input checked="" type="checkbox"/> NO ₃ /NO ₂
<input type="checkbox"/> Sulfate	<input type="checkbox"/> TDS	<input type="checkbox"/> TKN	<input type="checkbox"/> Phosphate	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX B098Z1 B098Z2 B098Z3 B098Z4					
B098Z5, B098Z6, B098Z7, B098Z8, B098Z9,					
B09901, B09903 / SOIL					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? Yes No N/A

Is a case narrative present? Yes No N/A

Comments: Performed by WHC

2. HOLDING TIMES

Are sample holding times acceptable? Yes No N/A

Comments: See HOLDING TIME SUMMARY on page A-26 of checklist. form B-1.

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

- Was initial calibration performed for all applicable analyses? Yes No N/A
- Are initial calibration results acceptable? Yes No N/A
- Was a calibration check performed for all applicable analyses? Yes No N/A
- Are calibration check results acceptable? Yes No N/A

Comments: _____

4. BLANKS

- Were laboratory blanks analyzed? Yes No N/A
- Are laboratory blank results acceptable? Yes No N/A
- Were field/trip blanks analyzed? Yes No N/A
- Are field/trip blank results acceptable? Yes No N/A

Comments: Field QC, including field/trip blanks, were not identified at the time of this review. Field QC identification has been requested and will be included at the time of final data summary.

5. ACCURACY

- Were spike samples analyzed at the required frequency? Yes No N/A
- Are spike recoveries acceptable? Yes No N/A
- Were LCS analyses performed at the required frequency? *See Note.* Yes No N/A
- Are LCS recoveries acceptable? Yes No N/A

Comments: Raw data is not available for LCS. All results are ~~qualified (I/US) estimated~~ No qualification has been applied. Reported results are acceptable.

6. PRECISION

- Were laboratory duplicate samples analyzed at the required frequency? Yes No N/A
- Are laboratory duplicate sample RPD values acceptable? . . . Yes No N/A
- Are field duplicate RPD values acceptable? Yes No N/A
- Are field split RPD values acceptable? Yes No N/A

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments: Field QC including field duplicates/splits were not identified at the time of this review. Field QC identification has been requested and will be included at the time of final data summary

7. ANALYTE QUANTITATION

Was analyte quantitation performed properly? Yes No N/A

Comments: _____

8. REPORTED RESULTS AND DETECTION LIMITS

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

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

Are results calculated properly? Yes No N/A

Do results meet the CRDLs? . ~~see note ①~~ Yes No N/A 3-7-94

Comments: _____

① The CRDL of 0.1 mg/L is not satisfied for soil samples analyzed. Equivalent CRDL = 0.1 mg/kg. No qualification applied.

JS
3-7-94

HOLDING TIME SUMMARY

SDG: B098Z1-TMA-636		VALIDATOR: Tom Stapp			DATE: 3-7-94	PAGE 1 OF 1	
COMMENTS: General Chemistry ff							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B098Z1	NO ₂ /NO ₃	10-11-93	11-2-93	11-3-93	22	23	NONE
Z2	}	10-12-93	}	}	21	22	}
Z3		10-14-93			19	20	
Z4		10-15-93			18	19	
Z5		10-19-93			14	15	
Z6		10-21-93			12	13	
Z7		10-21-93			12	13	
Z8		10-22-93			11	12	
Z9		10-22-93			11	12	
B09901		↓			10-25-93	↓	
B09903	10-25-93		8	9			

B-1

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

MEMORANDUM

TO: 200-UP-2 Project QA Record

FR: Susan Winter, Golder Associates Inc.

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE:
B098Z1-TMA-636 (923-E418, Filename B098Z1.RAD)

March 25, 1994



INTRODUCTION

This memo presents the results of data validation on data package B098Z1-TMA-636 prepared by the Thermo Analytical (TMA) laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B098Z1	10/11/93	SOIL	
B098Z2	10/12/93	SOIL	
B098Z3	10/14/93	SOIL	
B098Z4	10/15/93	SOIL	
B098Z5	10/19/93	SOIL	
B098Z6	10/21/93	SOIL	
B098Z7	10/21/93	SOIL	
B098Z8	10/22/93	SOIL	
B098Z9	10/22/93	SOIL	
B09901	10/25/93	SOIL	
B09903	10/25/93	SOIL	

Note 1. All samples were analyzed for gross alpha, gross beta, technetium-99, isotopic uranium, and total uranium.

Data validation was conducted in accordance with the WHC statement of work (WHC 1993a) and validation procedures (WHC 1993b). Attachments 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met with the exception of the deficiencies summarized below.

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

Data Package ID: B098Z1-TMA-636

Analysis: Radiochemistry

Detection Limits. Detection limit goals were met with the exception of the following:

SAMPLE ID	ANALYTE	MDA	RDL
B098Z4	TECHNETIUM-99	0.7 pCi/g	0.5 pCi/g

Completeness. The data package was complete for all requested analyses. A total of eleven samples were validated in this data package with a total of 77 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

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

Chemical Yield

- Technetium-99 chemical yield for sample B098Z4 was unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

REFERENCES

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

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

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ATTACHMENT 1
GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF RADIOCHEMISTRY DATA REPORTING QUALIFIERS

- U - Indicates the constituent was analyzed for, but was not detected at a concentration above the minimum detectable activity (MDA). The concentration reported is the MDA corrected for sample aliquot size, dilution factors and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.
- UJ - Indicates the constituent was analyzed for and was not detected at a concentration above the MDA. Due to a quality control deficiency identified during data validation, the concentration reported may not accurately reflect the sample MDA. The associated data should be considered usable for decision making purposes.
- J - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as estimated due to a quality control deficiency identified during data validation. The associated data should be considered usable for decision making purposes.
- UR - Indicates the constituent was analyzed for and not detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.
- R - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

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ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

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ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: B098Z1-TMA-636

Parameter	Samp#	B098Z1		B098Z2		B098Z3		B098Z4		B098Z5		B098Z6	
	Date	10-11-93		10-12-93		10-14-93		10-15-93		10-19-93		10-21-93	
	Location	---		---		---		---		---		---	
	Depth	---		---		---		---		---		---	
	Type	---		---		---		---		---		---	
	Comments	---		---		---		---		---		---	
	Units	Result	Q										
GROSS ALPHA	pCi/g	5.000	U	8.200		4.000	U	7.200		9.300		5.000	U
GROSS BETA	pCi/g	460.000		170.000		23.000		30.000		20.000		23.000	
TECHNETIUM-99	pCi/g	0.300	U	0.940		0.600		0.870	J	0.580		0.470	
URANIUM-233/234	pCi/g	0.880		2.300		0.730		0.580		0.380		0.450	
URANIUM-235	pCi/g	0.140		0.240		0.100	U	0.100	U	0.100	U	0.100	U
URANIUM-238	pCi/g	1.000		2.200		0.680		0.620		0.490		0.500	
TOTAL URANIUM	UG/G	2.900		5.100		2.100		1.500		NR		1.500	

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[Signature] 3/25/94

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Validated Data Summary, Data Package: B09821-TMA-636

Parameter	Samp#	B09827		B09828		B09829		B09901		B09903	
	Date	10-21-93		10-22-93		10-22-93		10-25-93		10-25-93	
	Location	---		---		---		---		---	
	Depth	---		---		---		---		---	
	Type	---		---		---		---		---	
	Comments	---		---		---		---		---	
	Units	Result	Q								
GROSS ALPHA	pCi/g	4.500		9.400		6.100		6.800		11.000	
GROSS BETA	pCi/g	20.000		22.000		24.000		17.000		15.000	
TECHNETIUM-99	pCi/g	0.230		0.230		0.300	U	0.270		0.200	U
URANIUM-233/234	pCi/g	0.560		0.560		0.300	U	0.780		0.560	U
URANIUM-235	pCi/g	0.100	U	0.100	U	0.100	U	0.200	U	0.200	U
URANIUM-238	pCi/g	0.630		0.760		0.640		0.840		0.610	
TOTAL URANIUM	UG/G	1.500		1.700		1.600		1.900		1.900	

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 [Signature] 3/25/94

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TMA NORCAL
REPORTING GROUP 7285

N310164-01

B098Z1

DATA SHEET

SDG 7285
Contact Dinkar KharkarClient Westinghouse Hanford
Contract MBH-SVV-069262Lab sample id N310164-01
Dept sample id 7285-001
Received 10/29/93
% moisture 2.6Client sample id B098Z1
Location/Matrix 200-UP-2 SOLID
Collected 10/11/93
Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha ✓	-2.5	4.7	5	10	U	80A
Gross Beta	Beta ✓	460	14	5	10		80B
Technetium 99 ✓	14133-76-7	0.14	0.10	0.3	0.5	U	TC
Uranium 233/234 ✓		0.88	0.23	0.1	0.3		U
Uranium 235 ✓	15117-96-1	0.14	0.10	0.1	0.3	✓	U
Uranium 238 ✓		1.0	0.23	0.1	0.3		U
Total Uranium (ug/g)	7440-61-1 ✓	2.9	0.52	0.03	0.1	X	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQOT	ANALYZED	REVIEWED	BY
N310164-01	80A/80	7285-001		0.100 g	12/08/93	12/09/93	DPK
N310164-01	80B/80	7285-001		0.100 g	12/08/93	12/09/93	DPK
N310164-01	TC	7285-001		2.00 g	12/08/93	12/13/93	DPK
N310164-01	U	7285-001		1.00 g	12/06/93	12/08/93	DPK
N310164-01	U_T	7285-001		0.250 g	12/15/93	12/21/93	DPK

DATA SHEETS

Page 1

SUMMARY DATA SECTION

Page 12

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Lab id	<u>TMAN</u>
Protocol	<u>WHC-HASM</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-DS</u>
Version	<u>2.27</u>
Report date	<u>12/29/93</u>

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TMA NORCAL
REPORTING GROUP 7285

N310164-02

B098Z2

DATA SHEET

SDG 7285
Contact Dinkar KharkarClient Westinghouse Hanford
Contract MBH-SVV-069262Lab sample id N310164-02
Dept sample id 7285-002
Received 10/29/93
% moisture 4.7Client sample id B098Z2
Location/Matrix 200-UP-2 SOLID
Collected 10/12/93
Chain of custody id EFL-1091

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS <u>2</u>	TEST
Gross Alpha	Alpha ✓	<u>8.2</u>	4.8	4	10	J	80A
Gross Beta	Beta ✓	<u>170</u>	9.1	5	10		80B
Technetium 99 ✓	14133-76-7	<u>0.94</u>	0.15	0.2	0.5		TC
Uranium 233/234 ✓		<u>2.3</u>	0.45	0.2	0.3		U
Uranium 235 ✓	15117-96-1	<u>0.24</u>	0.14	0.1	0.3	J	U
Uranium 238 ✓		<u>2.2</u>	0.44	0.1	0.3		U
Total Uranium (ug/g) ✓	7440-61-1 ✓	<u>5.1</u>	0.93	0.03	0.1	*	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQOT	ANALYZED	REVIEWED	BY
N310164-02	80A/80	7285-002		0.100 g	12/08/93	12/09/93	DPK
N310164-02	80B/80	7285-002		0.100 g	12/08/93	12/09/93	DPK
N310164-02	TC	7285-002		2.00 g	12/14/93	12/15/93	DPK
N310164-02	U	7285-002		1.00 g	12/06/93	12/08/93	DPK
N310164-02	U_T	7285-002		0.250 g	12/15/93	12/21/93	DPK

DATA SHEETS

Page 2

SUMMARY DATA SECTION

Page 13

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White 12/23/94

Lab id	<u>TMAN</u>
Protocol	<u>WHC-HASM</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-DS</u>
Version	<u>2.27</u>
Report date	<u>12/29/93</u>

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TMA NORCAL
REPORTING GROUP 7285

N310164-03

B098Z3

DATA SHEET

SDG <u>7285</u>	Client <u>Westinghouse Hanford</u>
Contact <u>Dinkar Kharkar</u>	Contract <u>MBH-SVV-069262</u>
Lab sample id <u>N310164-03</u>	Client sample id <u>B098Z3</u>
Dept sample id <u>7285-003</u>	Location/Matrix <u>200-UP-2</u> <u>SOLID</u>
Received <u>10/29/93</u>	Collected <u>10/14/93</u>
% moisture <u>3.6</u>	Chain of custody id <u>EFL-1091</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS <u>Q</u>	TEST
Gross Alpha	Alpha ✓	2.1	3.1	4	10	U	80A
Gross Beta	Beta ✓	23	4.7	6	10		80B
Technetium 99 ✓	14133-76-7	0.60	0.17	0.4	0.5		TC
Uranium 233/234 ✓		0.73	0.19	0.08	0.3		U
Uranium 235 ✓	15117-96-1	0.053	0.054	0.1	0.3	U	U
Uranium 238 ✓		0.68	0.19	0.08	0.3		U
Total Uranium (ug/g)	7440-61-1 ✓	2.1	0.37	0.03	0.1	X	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQOT	ANALYZED	REVIEWED	BY
N310164-03	80A/80	7285-003		0.100 g	12/08/93	12/09/93	DPK
N310164-03	80B/80	7285-003		0.100 g	12/08/93	12/09/93	DPK
N310164-03	TC	7285-003		2.00 g	12/14/93	12/15/93	DPK
N310164-03	U	7285-003		1.00 g	12/06/93	12/08/93	DPK
N310164-03	U_T	7285-003		0.250 g	12/15/93	12/21/93	DPK

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[Signature] 2/13/94

Lab id	<u>TMAN</u>
Protocol	<u>WHC-HASM</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-DS</u>
Version	<u>2.27</u>
Report date	<u>12/29/93</u>

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TMA NORCAL
REPORTING GROUP 7285

N310164-04

B09824

DATA SHEET

SDG <u>7285</u>	Client <u>Westinghouse Hanford</u>
Contact <u>Dinkar Kharkar</u>	Contract <u>MBH-SVV-069262</u>
Lab sample id <u>N310164-04</u>	Client sample id <u>B09824</u>
Dept sample id <u>7285-004</u>	Location/Matrix <u>200-UP-2</u> <u>SOLID</u>
Received <u>10/29/93</u>	Collected <u>10/15/93</u>
% moisture <u>2.4</u>	Chain of custody id <u>EFL-1091</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	Alpha ✓	<u>7.2</u>	4.1	4	10	S	80A
Gross Beta	Beta ✓	<u>30</u>	4.7	5	10		80B
Technetium 99 ✓	14133-76-7	<u>0.87</u>	0.31	<u>0.7</u>	0.5	— <u>S</u>	TC
Uranium 233/234 ✓		<u>0.58</u>	0.17	0.1	0.3		U
Uranium 235 ✓	15117-96-1	<u>0.037</u>	0.050	<u>0.1</u>	0.3	U	U
Uranium 238 ✓		<u>0.62</u>	0.18	0.08	0.3		U
Total Uranium (ug/g) ✓	7440-61-1 ✓	<u>1.5</u>	0.27	0.03	0.1	*	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQOT	ANALYZED	REVIEWED	BY
N310164-04	80A/80	7285-004		0.100 g	12/09/93	12/13/93	DPK
N310164-04	80B/80	7285-004		0.100 g	12/09/93	12/13/93	DPK
N310164-04	TC	7285-004		2.00 g	12/14/93	12/15/93	DPK
N310164-04	U	7285-004		1.00 g	12/06/93	12/08/93	DPK
N310164-04	U_T	7285-004		0.250 g	12/15/93	12/21/93	DPK

Handwritten signature
2/23/94

Verified

Lab id	<u>TMAN</u>
Protocol	<u>WHC-HASM</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-DS</u>
Version	<u>2.27</u>
Report date	<u>12/29/93</u>

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TMA NORCAL
REPORTING GROUP 7285

N310164-05

B098Z5

DATA SHEET

SDG <u>7285</u>	Client <u>Westinghouse Hanford</u>
Contact <u>Dinkar Kharkar</u>	Contract <u>MBH-SVV-069262</u>
Lab sample id <u>N310164-05</u>	Client sample id <u>B098Z5</u>
Dept sample id <u>7285-005</u>	Location/Matrix <u>200-UP-2</u> <u>SOLID</u>
Received <u>10/29/93</u>	Collected <u>10/19/93</u>
% moisture <u>6.1</u>	Chain of custody id <u>EFL-1091</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha ✓	<u>9.3</u>	4.9	5	10	J	80A
Gross Beta	Beta ✓	<u>20</u>	4.2	5	10		80B
Technetium 99 ✓	14133-76-7	<u>0.58</u>	0.16	0.3	0.5		TC
Uranium 233/234 ✓		<u>0.38</u>	0.15	0.1	0.3		U
Uranium 235 ✓	15117-96-1	<u>0.025</u>	0.050	<u>0.1</u>	0.3	U	U
Uranium 238 ✓		<u>0.49</u>	0.15	<u>0.08</u>	0.3		U

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQOT	ANALYZED	REVIEWED	BY
N310164-05	80A/80	7285-005		0.100 g	12/08/93	12/09/93	DPK
N310164-05	80B/80	7285-005		0.100 g	12/08/93	12/09/93	DPK
N310164-05	TC	7285-005		2.00 g	12/14/93	12/15/93	DPK
N310164-05	U	7285-005		1.00 g	12/08/93	12/13/93	DPK

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Lab id	<u>TMAN</u>
Protocol	<u>WHC-HASM</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-DS</u>
Version	<u>2.27</u>
Report date	<u>12/29/93</u>

9713511.0495

T M A N O R C A L
REPORTING GROUP 7285

N310164-06

B09826

D A T A S H E E T

SDG <u>7285</u>	Client <u>Westinghouse Hanford</u>
Contact <u>Dinkar Kharkar</u>	Contract <u>MBH-SVV-069262</u>
Lab sample id <u>N310164-06</u>	Client sample id <u>B09826</u>
Dept sample id <u>7285-006</u>	Location/Matrix <u>200-UP-2</u> <u>SOLID</u>
Received <u>10/29/93</u>	Collected <u>10/21/93</u>
% moisture <u>5.2</u>	Chain of custody id <u>EFL-1091</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	Alpha ✓	2.2	3.5	5	10	U	80A
Gross Beta	Beta ✓	23	4.5	5	10		80B
Technetium 99 ✓	14133-76-7	0.47	0.10	0.2	0.5	J	TC
Uranium 233/234 ✓		0.45	0.16	0.1	0.3		U
Uranium 235 ✓	15117-96-1	0.081	0.081	0.1	0.3	U	U
Uranium 238 ✓		0.50	0.16	0.1	0.3		U
Total Uranium (ug/g) ✓	7440-61-1 ✓	1.5	0.27	0.03	0.1	X	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQOT	ANALYZED	REVIEWED	BY
N310164-06	80A/80	7285-006		0.100 g	12/08/93	12/09/93	DPK
N310164-06	80B/80	7285-006		0.100 g	12/08/93	12/09/93	DPK
N310164-06	TC	7285-006		2.00 g	12/14/93	12/15/93	DPK
N310164-06	U	7285-006		1.00 g	12/08/93	12/13/93	DPK
N310164-06	U_T	7285-006		0.250 g	12/15/93	12/21/93	DPK

DATA SHEETS

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SUMMARY DATA SECTION

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DPK
12/31/94

Verified

Lab id	<u>TMAN</u>
Protocol	<u>WHC-HASM</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-DS</u>
Version	<u>2.27</u>
Report date	<u>12/29/93</u>

9713511.0496

TMA NORCAL
REPORTING GROUP 7285

N310164-07

B098Z7

DATA SHEET

SDG <u>7285</u>	Client <u>Westinghouse Hanford</u>
Contact <u>Dinkar Kharkar</u>	Contract <u>MBH-SVV-069262</u>
Lab sample id <u>N310164-07</u>	Client sample id <u>B098Z7</u>
Dept sample id <u>7285-007</u>	Location/Matrix <u>200-UP-2</u> <u>SOLID</u>
Received <u>10/29/93</u>	Collected <u>10/21/93</u>
% moisture <u>3.8</u>	Chain of custody id <u>EFL-1091</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha ✓	<u>4.5</u>	3.7	4	10	J	80A
Gross Beta	Beta ✓	<u>20</u>	4.3	5	10		80B
Technetium 99 ✓	14133-76-7	<u>0.23</u>	0.065	0.1	0.5	J	TC
Uranium 233/234 ✓		<u>0.56</u>	0.16	0.08	0.3		U
Uranium 235 ✓	15117-96-1	<u>0</u>	0.026	<u>0.1</u>	0.3	U	U
Uranium 238 ✓		<u>0.63</u>	0.18	0.08	0.3		U
Total Uranium (ug/g) ✓	7440-61-1 ✓	<u>1.5</u>	0.28	0.03	0.1	X	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQOT	ANALYZED	REVIEWED	BY
N310164-07	80A/80	7285-007		0.100 g	12/09/93	12/18/93	DPK
N310164-07	80B/80	7285-007		0.100 g	12/09/93	12/18/93	DPK
N310164-07	TC	7285-007		2.00 g	12/16/93	12/16/93	DPK
N310164-07	U	7285-007		1.00 g	12/08/93	12/18/93	DPK
N310164-07	U_T	7285-007		0.250 g	12/15/93	12/21/93	DPK

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2/23/94

Verified

Lab id <u>TMAN</u>
Protocol <u>WHC-HASM</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>2.27</u>
Report date <u>12/29/93</u>

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TMA NORCAL
REPORTING GROUP 7285

N310164-08

B098Z8

DATA SHEET

SDG <u>7285</u>	Client <u>Westinghouse Hanford</u>
Contact <u>Dinkar Kharkar</u>	Contract <u>MBH-SVV-069262</u>
Lab sample id <u>N310164-08</u>	Client sample id <u>B098Z8</u>
Dept sample id <u>7285-008</u>	Location/Matrix <u>200-UP-2</u> <u>SOLID</u>
Received <u>10/29/93</u>	Collected <u>10/22/93</u>
% moisture <u>4.8</u>	Chain of custody id <u>EFL-1091</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha ✓	<u>9.4</u>	4.4	4	10	S	80A
Gross Beta	Beta ✓	<u>22</u>	4.4	5	10		80B
Technetium 99 ✓	14133-76-7	<u>0.23</u>	0.089	0.2	0.5	S	TC
Uranium 233/234 ✓		<u>0.56</u>	0.18	0.1	0.3		U
Uranium 235 ✓	15117-96-1	<u>0.038</u>	0.051	<u>0.1</u>	0.3	U	U
Uranium 238 ✓		<u>0.76</u>	0.20	0.08	0.3		U
Total Uranium (ug/g) 7440-61-1 ✓		<u>1.7</u>	0.31	0.03	0.1	X	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQOT	ANALYZED	REVIEWED	BY
N310164-08	80A/80	7285-008		0.100 g	12/08/93	12/09/93	DPK
N310164-08	80B/80	7285-008		0.100 g	12/08/93	12/09/93	DPK
N310164-08	TC	7285-008		2.00 g	12/15/93	12/16/93	DPK
N310164-08	U	7285-008		1.00 g	12/08/93	12/18/93	DPK
N310164-08	U_T	7285-008		0.250 g	12/15/93	12/21/93	DPK

DATA SHEETS

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Lab id	<u>TMAN</u>
Protocol	<u>WHC-HASM</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-DS</u>
Version	<u>2.27</u>
Report date	<u>12/29/93</u>

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TMA NORCAL
REPORTING GROUP 7285

N310164-09

B098Z9

DATA SHEET

SDG <u>7285</u>	Client <u>Westinghouse Hanford</u>
Contact <u>Dinkar Kharkar</u>	Contract <u>MBH-SVV-069262</u>
Lab sample id <u>N310164-09</u>	Client sample id <u>B098Z9</u>
Dept sample id <u>7285-009</u>	Location/Matrix <u>200-UP-2</u> <u>SOLID</u>
Received <u>10/29/93</u>	Collected <u>10/22/93</u>
% moisture <u>4.8</u>	Chain of custody id <u>EFL-1091</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	Alpha ✓	<u>6.1</u>	4.1	4	10	S	80A
Gross Beta	Beta ✓	<u>24</u>	4.5	5	10		80B
Technetium 99 ✓	14133-76-7	<u>0.26</u>	0.11	<u>0.3</u>	0.5	U	TC
Uranium 233/234 ✓		<u>0.30</u>	0.16	<u>0.1</u>	0.3		U
Uranium 235 ✓	15117-96-1	<u>0.037</u>	0.037	<u>0.1</u>	0.3	U	U
Uranium 238 ✓		<u>0.64</u>	0.20	<u>0.1</u>	0.3		U
Total Uranium (ug/g) ✓	7440-61-1 ✓	<u>1.6</u>	0.30	0.03	0.1	X	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQOT	ANALYZED	REVIEWED	BY
N310164-09	80A/80	7285-009		0.100 g	12/08/93	12/09/93	DPK
N310164-09	80B/80	7285-009		0.100 g	12/08/93	12/09/93	DPK
N310164-09	TC	7285-009		2.00 g	12/15/93	12/20/93	DPK
N310164-09	U	7285-009		1.00 g	12/10/93	12/13/93	DPK
N310164-09	U_T	7285-009		0.250 g	12/15/93	12/21/93	DPK

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Lab id	<u>TMAN</u>
Protocol	<u>WHC-HASM</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-DS</u>
Version	<u>2.27</u>
Report date	<u>12/29/93</u>

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TMA NORCAL
REPORTING GROUP 7285

N310164-10

B09901

DATA SHEET

SDG <u>7285</u>	Client <u>Westinghouse Hanford</u>
Contact <u>Dinkar Kharkar</u>	Contract <u>MBH-SVV-069262</u>
Lab sample id <u>N310164-10</u>	Client sample id <u>B09901</u>
Dept sample id <u>7285-010</u>	Location/Matrix <u>200-UP-2</u> <u>SOLID</u>
Received <u>10/29/93</u>	Collected <u>10/25/93</u>
% moisture <u>9.5</u>	Chain of custody id <u>EFL-1091</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha ✓	<u>6.8</u>	3.9	4	10	S	80A
Gross Beta	Beta ✓	<u>17</u>	4.4	6	10		80B
Technetium 99 ✓	14133-76-7	<u>0.27</u>	0.062	0.1	0.5	S	TC
Uranium 233/234		<u>0.78</u>	0.27	0.2	0.3		U
Uranium 235	15117-96-1	<u>0.076</u>	0.10	<u>0.2</u>	0.3	U	U
Uranium 238		<u>0.84</u>	0.28	0.2	0.3		U
Total Uranium (ug/g)	7440-61-1 ✓	<u>1.9</u>	0.34	0.03	0.1	X	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQOT	ANALYZED	REVIEWED	BY
N310164-10	80A/80	7285-010		0.100 g	12/08/93	12/09/93	DPK
N310164-10	80B/80	7285-010		0.100 g	12/08/93	12/09/93	DPK
N310164-10	TC	7285-010		2.00 g	12/13/93	12/16/93	DPK
N310164-10	U	7285-010		1.00 g	12/13/93	12/15/93	DPK
N310164-10	U_T	7285-010		0.250 g	12/15/93	12/21/93	DPK

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Lab id	<u>TMAN</u>
Protocol	<u>WHC-HASM</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-DS</u>
Version	<u>2.27</u>
Report date	<u>12/29/93</u>

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TMA NORCAL
REPORTING GROUP 7285

N310164-11

B09903

DATA SHEET

SDG <u>7285</u>	Client <u>Westinghouse Hanford</u>
Contact <u>Dinkar Kharkar</u>	Contract <u>MBH-SVV-069262</u>
Lab sample id <u>N310164-11</u>	Client sample id <u>B09903</u>
Dept sample id <u>7285-011</u>	Location/Matrix <u>200-UP-2</u> <u>SOLID</u>
Received <u>10/29/93</u>	Collected <u>10/25/93</u>
% moisture <u>7.5</u>	Chain of custody id <u>EFL-1091</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	Alpha ✓	<u>11</u>	4.7	4	10		80A
Gross Beta	Beta ✓	<u>15</u>	4.2	5	10		80B
Technetium 99 ✓	14133-76-7	<u>0.18</u>	0.083	<u>0.2</u>	0.5	U	TC
Uranium 233/234 ✓		<u>0.56</u>	0.22	<u>0.1</u>	0.3		U
Uranium 235 ✓	15117-96-1	<u>0.021</u>	0.043	<u>0.2</u>	0.3	U	U
Uranium 238 ✓		<u>0.61</u>	0.22	<u>0.1</u>	0.3		U
Total Uranium (ug/g) ✓	7440-61-1 ✓	<u>1.9</u>	0.34	0.03	0.1	X	U_T

LAB SAMPLE	TEST	PLANCHET	SUFFIX	ALIQOT	ANALYZED	REVIEWED	BY
N310164-11	80A/80	7285-011		0.100 g	12/09/93	12/18/93	DPK
N310164-11	80B/80	7285-011		0.100 g	12/09/93	12/18/93	DPK
N310164-11	TC	7285-011		2.00 g	12/13/93	12/20/93	DPK
N310164-11	U	7285-011		1.00 g	12/13/93	12/15/93	DPK
N310164-11	U_T	7285-011		0.250 g	12/15/93	12/21/93	DPK

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Verified

Lab id	<u>TMAN</u>
Protocol	<u>WHC-HASM</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-DS</u>
Version	<u>2.27</u>
Report date	<u>12/29/93</u>

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9713511.0501

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

SDG: 7285
Contact: Dinkar Kharkar

TMA NORCAL
REPORTING GROUP 7285

Client: Westinghouse Hanford
Contract: MBH-SVV-069262

2.0 QUALITY CONTROL (cont'd)

2.3 Duplicates

Results were satisfactory for all duplicate analyses.

3.0 ANALYSIS NOTES

3.1 Gross Alpha Analyses

The average MDA for gross alpha was (4 ± 1) pCi/g. Gross alpha activity above the RDL was found in sample BO9903.

3.2 Gross Beta Analyses

The average MDA for gross beta was (5 ± 0.9) pCi/g. Gross beta activity above the RDL was found in all of the samples.

3.3 Technetium-99 Analyses

The average yield for fourteen analyses was $(50 \pm 29)\%$. The lowest yield was 19% and the highest was 75%. The average MDA was (0.3 ± 0.3) pCi/g. Technetium-99 activity above the RDL was found in samples BO98Z2, BO98Z3, BO98Z4, and BO98Z5. The MDA of the result for sample BO98Z4 was higher than the RDL because of a low chemical yield.

3.4 Total Uranium Analyses

The average MDA was (0.03 ± 0.01) $\mu\text{g/g}$. Uranium activity ranging from (1.5 to 5.1) $\mu\text{g/g}$ was found in the samples.

3.5 Isotopic Uranium Analyses

The average yield for fourteen analyses was $(66 \pm 16)\%$. The lowest yield was 54% and the highest was 77%. The average MDA was (0.1 ± 0.1) pCi/g. Uranium-233/234 and uranium-238 activity above the RDL was found in all of the samples. Samples BO9901 and BO9903 were counted for less than the nominal count time of 150 minutes. MDA's met RDL's despite the slightly shortened count times.

Westinghouse Hanford Company	CHAIN OF CUSTODY
Custody Form Initiator <u>L E ROGERS</u>	
Company Contact <u>L E ROGERS</u>	Telephone <u>376-7690</u>
Project Designation/Sampling Locations <u>200-UP-2</u>	Collection Date <u>10-11-93</u>
Ice Chest No. <u>KENT</u>	Field Logbook No. <u>EFL-1091</u>
Bill of Lading/Airbill No. _____	Offsite Property No. _____
Method of Shipment <u>OVERNIGHT AIR SERVICE</u>	
Shipped to <u>TMA</u>	
Possible Sample Hazards/Remarks <u>Keep samples at 4C (SOIL) RADIOACTIVE</u>	

Sample Identification

- 1) BOBZI
 ✓ 1,125ml P/G: Anions NO2, NO3 (EPA 353.2)
 ✓ 1,1000ml P/G: Gross beta (EP-10), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5), Tc-99 (RC-24, RC-604)
- 2) ~~1,125ml P/G: Anions NO2, NO3 (EPA 353.2)
 1,1000ml P/G: Gross beta (EP-10), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5), Tc-99 (RC-24, RC-604)~~
- 3) ~~1,125ml P/G: Anions NO2, NO3 (EPA 353.2)
 1,1000ml P/G: Gross beta (EP-10), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5), Tc-99 (RC-24, RC-604)~~ OK 10-11-93

<input type="checkbox"/> Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: <u>0920</u> <u>Loren E. Rogers 10-29-93</u>	Received by: <u>[Signature]</u>	Date/Time: <u>10-29-93 10:20</u>
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: _____		

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS
 Company Contact L E ROGERS Telephone 376-7690
 Project Designation/Sampling Locations 200-UP-2 Collection Date 10-12-93
 Ice Chest No. KENT Field Logbook No. EFL-1091
 Bill of Lading/Airbill No. _____ Offsite Property No. _____
 Method of Shipment OVERNIGHT AIR SERVICE
 Shipped to TMA

Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) RADIOACTIVE

Sample Identification

- 1) B09822
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 2) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~
- 3) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

SEE 10-12-93

Field Transfer of Custody Chain of Possession (Sign and Print Names)

Relinquished by: <u>10-28-93</u> <u>Lauren Rogers 0920</u>	Received by: <u>[Signature]</u>	Date/Time: <u>10-28-93 10:20</u>
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: _____

Westinghouse Hanford Company	CHAIN OF CUSTODY
Custody Form Initiator <u>L E ROGERS</u>	
Company Contact <u>L E ROGERS</u>	Telephone <u>376-7690</u>
Project Designation/Sampling Locations <u>200-UP-2</u>	Collection Date <u>10-14-93</u>
Ice Chest No. <u>SML-349</u>	Field Logbook No. <u>EFL-1091</u>
Bill of Lading/Airbill No. _____	Offsite Property No. _____
Method of Shipment <u>OVERNIGHT AIR SERVICE</u>	
Shipped to <u>TMA</u>	
Possible Sample Hazards/Remarks <u>Keep samples at 4C (SOIL) RADIOACTIVE</u>	

Sample Identification

- 1) BO98Z3
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 2) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~
- 3) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

<input type="checkbox"/> Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: <u>10-28-93</u> <u>Jane E. Rogers</u> <u>0930</u>	Received by: <u>Francis TMA/NORCAL</u>	Date/Time: <u>10-29-93 12:35</u>
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:		

Westinghouse Hanford Company	10-15-93	CHAIN OF CUSTODY
Custody Form Initiator	<u>L E ROGERS W.S. Thompson</u>	
Company Contact	<u>L E ROGERS</u>	Telephone <u>376-7690</u>
Project Designation/Sampling Locations	<u>200-UP-2</u>	Collection Date <u>10-15-93 TIMELOS</u>
Ice Chest No.	<u>SMH-349</u>	Field Logbook No. <u>EFL-1091</u>
Bill of Lading/Airbill No.	_____	Offsite Property No. _____
Method of Shipment	<u>OVERNIGHT AIR SERVICE</u>	
Shipped to	<u>TMA</u>	
Possible Sample Hazards/Remarks	<u>Keep samples at 4C (SOIL) RADIOACTIVE</u>	

Sample Identification

- 1) B09874
~~1, 125ml P/G: Anions NO2, NO3 (EPA 353.2)
 1, 1000ml P/G: Gross beta (EP-10), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5), Tc-99 (RC-24, RC-604)~~
- 2) ~~1, 125ml P/G: Anions NO2, NO3 (EPA 353.2)
 1, 1000ml P/G: Gross beta (EP-10), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5), Tc-99 (RC-24, RC-604)~~
- 3) ~~1, 125ml P/G: Anions NO2, NO3 (EPA 353.2)
 1, 1000ml P/G: Gross beta (EP-10), Total Uranium (EA-01C) U-235, U-234, U-238 (EP-70, EP-71, EP-5), Tc-99 (RC-24, RC-604)~~

Field Transfer of Custody Chain of Possession (Sign and Print Names)

Relinquished by: <u>W.S. Thompson</u> <u>W.S. Thompson</u> 10-15-93 1130	Received by: <u>ROY T SIDDLE</u> <u>ROY T SIDDLE</u>	Date/Time: <u>10-15-93 1130</u>
Relinquished by: <u>ROY T SIDDLE</u> <u>ROY T SIDDLE</u> 10-28-93 0820	Received by: <u>Jorene Rogers</u> <u>Jorene Rogers</u> 10-28-93 0820	Date/Time: <u>10-28-93 0820</u>
Relinquished by: <u>Jorene Rogers</u> <u>Jorene Rogers</u> 10-28-93 0930	Received by: <u>JENNIFER TMA/HORCAL</u> <u>JENNIFER TMA/HORCAL</u>	Date/Time: <u>10-29-93 1235</u>
Relinquished by: _____	Received by: _____	Date/Time: _____

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:
Comments:		

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS
 Company Contact L E ROGERS Telephone 376-7690
 Project Designation/Sampling Locations 200-UP-2 Collection Date 10-19-93
 Ice Chest No. SML-349 Field Logbook No. EFL-1091
 Bill of Lading/Airbill No. _____ Offsite Property No. _____
 Method of Shipment OVERNIGHT AIR SERVICE
 Shipped to WESTON
 Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) NOISE NOTED

Sample Identification

- 1) B09825
 1, 120ml P/G:Anions NO2,NO3 (EPA 353.1)
 1, 1000ml P/G:Gross beta (PRO-032-15), U-235,U-234,U-238 (PRO-052-32) Tc-99 (PRO-032-78)
- 2) _____
 1, 120ml P/G:Anions NO2,NO3 (EPA 353.1)
 1, 1000ml P/G:Gross beta (PRO-032-15), U-235,U-234,U-238 (PRO-052-32) Tc-99 (PRO-032-78)
- 3) PER 10-19-93
 1, 120ml P/G:Anions NO2,NO3 (EPA 353.1)
 1, 1000ml P/G:Gross beta (PRO-032-15), U-235,U-234,U-238 (PRO-052-32) Tc-99 (PRO-032-78)

Field Transfer of Custody		Chain of Possession		(Sign and Print Names)	
Relinquished by:	<u>10-28-93</u>	Received by:		Date/Time:	
<u>Jacene D. Rogers</u>	<u>09:30</u>	<u>Quincy TMA/HORCAL</u>		<u>10-29-93</u>	<u>12:35</u>
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:		

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS

Company Contact L E ROGERS

Telephone 376-7690

Project Designation/Sampling Locations 200-UP-2

Collection Date 10-21-93

Ice Chest No. SM-413

Field Logbook No. EFL-1091

Bill of Lading/Airbill No. _____

Offsite Property No. _____

Method of Shipment OVERNIGHT AIR SERVICE

Shipped to TMA

Possible Sample Hazards/Remarks: Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

- 1) ~~80982-7~~
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 2) ~~80982-7~~
1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 3) ~~80982-7~~
1,125ml P/G:Anions NO2,NO3 (EPA 353.2) REL 10-21-93
1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)

Field Transfer of Custody

Chain of Possession

(Sign and Print Names)

Relinquished by: <u>10-28-93</u> <u>James E. Rogers 0930</u>	Received by: <u>10-29-93</u> <u>Theresa TMA/NORCAL</u>	Date/Time: <u>10-29-93 12:35</u>
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:		

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS
 Company Contact L E ROGERS Telephone 376-7690
 Project Designation/Sampling Locations 200-UP-2 Collection Date 10-22-93
 Ice Chest No. SML-413 Field Logbook No. EFL-1091
 Bill of Lading/Airbill No. _____ Offsite Property No. _____
 Method of Shipment OVERNIGHT AIR SERVICE
 Shipped to TMA
 Possible Sample Hazards/Remarks Keep samples at 4C (SOIL) NONE NOTED

Sample Identification

- 1) B098Z8
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 2) B098Z9
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 3) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2) SEP 10-22-93~~
~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

<input type="checkbox"/> Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: <u>10-28-93</u> <u>Loren E. Rogers 0930</u>	Received by: <u>[Signature]</u> <u>Thomiss TMA/HORCAL</u>	Date/Time: <u>10-29-93 12:35</u>
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: _____

Westinghouse
Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator L E ROGERS
 Company Contact L E ROGERS Telephone 376-7690
 Project Designation/Sampling Locations 200-UP-2 Collection Date 10-25-93
 Ice Chest No. SML-415 Field Logbook No. EFL-1091
 Bill of Lading/Airbill No. _____ Offsite Property No. _____
 Method of Shipment OVERNIGHT AIR SERVICE
 Shipped to TMA
 Possible Sample Hazards/Remarks Keep samples at 4C (SOIL)

Sample Identification

- 1) BO9901
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 2) BO9902 BO9903
 1,125ml P/G:Anions NO2,NO3 (EPA 353.2)
 1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)
- 3) ~~1,125ml P/G:Anions NO2,NO3 (EPA 353.2)~~
~~1,1000ml P/G:Gross beta (EP-10), Total Uranium (EA-01C) U-235,U-234,U-238 (EP-70, EP-71, EP-5),Tc-99 (RC-24, RC-604)~~

Field Transfer of Custody Chain of Possession (Sign and Print Names)

Relinquished by: <u>10-28-93</u> <u>Loren E. Rogers 0930</u>	Received by: <u>Francis TMA/NORCAL</u>	Date/Time: <u>10-29-93 12:35</u>
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:

9713511.0512

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200-UP-2		DATA PACKAGE: B09821-TMA-636		
VALIDATOR:	<i>M. White</i>	LAB:	TMA	DATE: 02/23/94	
CASE:			SDG: B09821-TMA-636		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> Gross Alpha/Beta	<input type="checkbox"/> Strontium-90	<input checked="" type="checkbox"/> Technetium-99	<input checked="" type="checkbox"/> Alpha Spectroscopy	<input type="checkbox"/> Gamma Spectroscopy	
<input type="checkbox"/> Total Uranium	<input type="checkbox"/> Radium-22	<input type="checkbox"/> Tritium	<input type="checkbox"/>		
SAMPLES/MATRIX <i>Soils</i>					
<i>B09821</i>		<i>B09826</i>		<i>B09903</i>	
<i>B09822</i>		<i>B09827</i>			
<i>B09823</i>		<i>B09828</i>			
<i>B09824</i>		<i>B09829</i>			
<i>B09825</i>		<i>B09901</i>			

1. Completeness N/A

Technical verification forms present? **Yes** No N/A

Comments: _____

2. Initial Calibration N/A

Instruments/detectors calibrated within one year of sample analysis? Yes **No** N/A

Initial calibration acceptable? **Yes** No N/A

Standards NIST traceable? **Yes** No N/A

Standards Expired? Yes **No** N/A

Comments: *The initial calibration for the gas proportional counters used for gross alpha and gross beta analysis was performed more than a year from sample analysis. However, since the PCV criteria was met, no qualification is required.*

3. Continuing Calibration N/A

- Calibration checked within one week of sample analysis? . . . Yes No N/A
- Calibration check acceptable? Yes No N/A
- Calibration check standards NIST traceable? Yes No N/A
- Calibration check standards expired? Yes No N/A

Comments: The control limits for the LRG
detectors were submitted by the lab under
separate cover from the data package.
No qualifications were required

4. Blanks N/A

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

Comments: _____

5. Matrix Spikes N/A

- Matrix spike analyzed? Yes No N/A
- Spike recoveries acceptable? Yes No N/A
- Spike source traceable? Yes No N/A
- Spike source expired? Yes No N/A
- Transcription/Calculation Errors? Yes No N/A

Comments: _____

- 6. Laboratory Control Samples N/A
- LCS analyzed? Yes No N/A
- LCS recoveries acceptable? Yes No N/A
- LCS traceable? Yes No N/A
- Transcription/Calculation Errors? Yes No N/A

Comments: _____

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

Comments: All traces and chemical recoveries are acceptable with the exception of the chemical recovery for sample B09824 at 19% recovery. The TC-99 result has been qualified as estimated (D).

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

Comments: _____

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

Comments: The sample locations are not currently available. However, field duplicate and field split samples will be evaluated in the final summary report.

10. Holding Times

Are sample holding times acceptable? Yes No N/A

Comments: _____

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

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

Comments: The MDA does not meet the RDL for the following samples:

<u>Parameter</u>	<u>Sample ID</u>	<u>MDA</u>	<u>RDL</u>	<u>Units</u>
TC-99	B09874	0.7	0.5	pc/dg

The laboratory reported "J" and "X" qualifiers for all samples in this data pkg. These qualifiers have been crossed off the lab result forms for clarification purposes and are not considered appropriate for radiochemistry validation.

Revised Pluto 4/21/94

9713511.0517

TMA NORCAL
REPORTING GROUP 7285

SDG 7285
Contact Dinkar Kharkar

Client Westinghouse Hanford
Contract MBH-SVV-069262

WORK SUMMARY

CLIENT SAMPLE ID	MATRIX	LAB SAMPLE ID	PLANCHET	TEST	SUF-FIX	ANALYZED	# Days	REVIEWED BY	METHOD
B09821 200-UP-2 EFL-1091	SOLID	N310164-01	7285-001	80A/80		12/08/93	58	3/25/94	Gross Alpha in Soil
		10/11/93	7285-001	80B/80		12/08/93	58		Gross Beta in Soil
		10/29/93	7285-001	TC		12/08/93	58		Technetium 99 in Soil
			7285-001	U		12/06/93	56		Uranium, Isotopic in Soil
			7285-001	U_T		12/15/93	65	Uranium, Total in Soil	
B09822 200-UP-2 EFL-1091	SOLID	N310164-02	7285-002	80A/80		12/08/93	57	3/25/94	Gross Alpha in Soil
		10/12/93	7285-002	80B/80		12/08/93	57		Gross Beta in Soil
		10/29/93	7285-002	TC		12/14/93	63		Technetium 99 in Soil
			7285-002	U		12/06/93	55		Uranium, Isotopic in Soil
			7285-002	U_T		12/15/93	64	Uranium, Total in Soil	
B09823 200-UP-2 EFL-1091	SOLID	N310164-03	7285-003	80A/80		12/08/93	55	3/25/94	Gross Alpha in Soil
		10/14/93	7285-003	80B/80		12/08/93	55		Gross Beta in Soil
		10/29/93	7285-003	TC		12/14/93	61		Technetium 99 in Soil
			7285-003	U		12/06/93	53		Uranium, Isotopic in Soil
			7285-003	U_T		12/15/93	62	Uranium, Total in Soil	
B09824 200-UP-2 EFL-1091	SOLID	N310164-04	7285-004	80A/80		12/09/93	55	3/25/94	Gross Alpha in Soil
		10/15/93	7285-004	80B/80		12/09/93	55		Gross Beta in Soil
		10/29/93	7285-004	TC		12/14/93	60		Technetium 99 in Soil
			7285-004	U		12/06/93	52		Uranium, Isotopic in Soil
			7285-004	U_T		12/15/93	61	Uranium, Total in Soil	
B09825 200-UP-2 EFL-1091	SOLID	N310164-05	7285-005	80A/80		12/08/93	50	3/25/94	Gross Alpha in Soil
		10/19/93	7285-005	80B/80		12/08/93	50		Gross Beta in Soil
		10/29/93	7285-005	TC		12/14/93	56		Technetium 99 in Soil
			7285-005	U		12/08/93	50		Uranium, Isotopic in Soil
B09826 200-UP-2 EFL-1091	SOLID	N310164-06	7285-006	80A/80		12/08/93	48	3/25/94	Gross Alpha in Soil
		10/21/93	7285-006	80B/80		12/08/93	48		Gross Beta in Soil
		10/29/93	7285-006	TC		12/14/93	54		Technetium 99 in Soil
			7285-006	U		12/08/93	48		Uranium, Isotopic in Soil
			7285-006	U_T		12/15/93	55	Uranium, Total in Soil	

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Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-CWS
Version 2.27
Report date 12/29/93

10 13

9713511.0518

TMA NORCAL
REPORTING GROUP 7285

SDG 7285
Contact Dinkar Kharkar

Client Westinghouse Hanford
Contract MBH-SVV-069262

WORK SUMMARY, cont.

CLIENT SAMPLE ID	MATRIX	LAB SAMPLE ID	COLLECTED	TEST	SUF-FIX	ANALYZED	REVIEWED BY	METHOD
LOCATION	SAS NO	RECEIVED	PLANCHET					
B09827		N310164-07	7285-007	80A/80		12/09/93	49	Gross Alpha in Soil
200-UP-2	SOLID	10/21/93	7285-007	80B/80		12/09/93	49	Gross Beta in Soil
EFL-1091		10/29/93	7285-007	TC		12/16/93	56	Technetium 99 in Soil
			7285-007	U		12/08/93	48	Uranium, Isotopic in Soil
			7285-007	U_T		12/15/93	55	Uranium, Total in Soil
B09828		N310164-08	7285-008	80A/80		12/08/93	47	Gross Alpha in Soil
200-UP-2	SOLID	10/22/93	7285-008	80B/80		12/08/93	47	Gross Beta in Soil
EFL-1091		10/29/93	7285-008	TC		12/15/93	54	Technetium 99 in Soil
			7285-008	U		12/08/93	47	Uranium, Isotopic in Soil
			7285-008	U_T		12/15/93	54	Uranium, Total in Soil
B09829		N310164-09	7285-009	80A/80		12/08/93	47	Gross Alpha in Soil
200-UP-2	SOLID	10/22/93	7285-009	80B/80		12/08/93	47	Gross Beta in Soil
EFL-1091		10/29/93	7285-009	TC		12/15/93	54	Technetium 99 in Soil
			7285-009	U		12/10/93	49	Uranium, Isotopic in Soil
			7285-009	U_T		12/15/93	54	Uranium, Total in Soil
B09901		N310164-10	7285-010	80A/80		12/08/93	44	Gross Alpha in Soil
200-UP-2	SOLID	10/25/93	7285-010	80B/80		12/08/93	44	Gross Beta in Soil
EFL-1091		10/29/93	7285-010	TC		12/13/93	49	Technetium 99 in Soil
			7285-010	U		12/13/93	49	Uranium, Isotopic in Soil
			7285-010	U_T		12/15/93	51	Uranium, Total in Soil
B09903		N310164-11	7285-011	80A/80		12/09/93	45	Gross Alpha in Soil
200-UP-2	SOLID	10/25/93	7285-011	80B/80		12/09/93	45	Gross Beta in Soil
EFL-1091		10/29/93	7285-011	TC		12/13/93	49	Technetium 99 in Soil
			7285-011	U		12/13/93	49	Uranium, Isotopic in Soil
			7285-011	U_T		12/15/93	51	Uranium, Total in Soil
Reagent Blank	SOLID	N310164-13	7285-013	80A/80		12/09/93		Gross Alpha in Soil
			7285-013	80B/80		12/09/93		Gross Beta in Soil
			7285-013	TC		12/16/93		Technetium 99 in Soil
			7285-013	U		12/13/93		Uranium, Isotopic in Soil
			7285-013	U_T		12/15/93		Uranium, Total in Soil

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Lab id TMAN
Protocol WHC-HASM
Version Ver 1.0
Form DVD-CWS
Version 2.27
Report date 12/29/93

SAMPLE RESULT VERIFICATION, DATA PACKAGE B098Z1-TMA-838

B098Z1-TMA-838														
Gross Alpha/Beta														
Sample ID:	B098Z1	B098Z2	B098Z3	B098Z4	B098Z5	B098Z6	B098Z7	B098Z8	B098Z9	B09801	B09803	LCS	BLANK	B098Z2 DUP
Aliquot:	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Detector:	104	109	110	101	101	102	104	104	109	110	102	102	110	104
Count time:	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Alpha cpm:	0.27	0.38	0.14	0.34	0.36	0.16	0.2	0.37	0.23	0.28	0.37	6.06	0.04	0.38
Alpha, Bkgd:	0.072	0.057	0.064	0.092	0.091	0.086	0.064	0.072	0.057	0.064	0.082	0.086	0.051	0.072
Alpha, Xtalk:	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
Alpha, Eff:	0.113	0.124	0.132	0.143	0.125	0.126	0.125	0.137	0.117	0.135	0.125	0.106	0.106	0.11
Alpha Result Calc.:	-2.28	8.29	2.15	7.27	9.28	2.18	4.49	9.39	6.16	6.88	10.80	248.60	-0.48	9.16
Alpha Result Rptd.:	-2.50	8.21	2.13	7.24	9.30	2.17	4.47	9.40	6.11	6.83	10.70	24.80	-0.05	9.11
Alpha MDA Calc.:	4.98	4.04	4.02	4.45	5.07	4.89	4.25	4.11	4.28	3.93	4.18	5.81	4.47	5.12
Alpha MDA Rptd.:	4.98	4.06	4.05	4.44	5.09	4.88	4.24	4.10	4.27	3.93	4.19	0.58	0.45	5.10
Beta cpm:	43.53	16.89	3.44	3.86	2.92	3.31	2.94	3.13	3.25	2.94	2.59	23.5	1.29	15.11
Bkgd:	1.009	1.032	1.257	0.953	0.947	1.123	1.01	1.009	1.032	1.257	1.122	1.123	1.261	1.009
Xtalk:	0.282	0.277	0.271	0.264	0.276	0.275	0.276	0.268	0.28	0.269	0.276	0.291	0.291	0.283
Eff:	0.418	0.418	0.419	0.421	0.418	0.418	0.418	0.42	0.417	0.42	0.418	0.413	0.414	0.415
Beta Result Calc.:	459.82	169.93	23.25	30.40	20.46	23.35	20.39	21.89	23.44	17.43	14.90	225.07	0.35	152.11
Beta Result Rptd.:	461.00	170.00	23.30	30.40	20.50	23.40	20.40	21.90	23.50	17.50	14.90	22.50	0.04	152.00
Beta MDA Calc.:	5.07	5.10	5.62	4.87	4.89	5.32	5.05	5.02	5.11	5.60	5.32	5.39	5.69	5.08
Beta MDA rptd.:	5.08	5.10	5.61	4.87	4.89	5.32	5.05	5.02	5.12	5.60	5.32	0.54	0.57	5.08

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SAMPLE RESULT VERIFICATION, DATA PACKAGE B098Z1-TMA-636

B098Z1-TMA-636														
Technetium 99														
Sample ID:	B098Z1	B098Z2	B098Z3	B098Z4	B098Z5	B098Z6	B098Z7	B098Z8	B098Z9	B09901	B09803	LCS	BLANK	B098Z2 DUP
Detector:	LBG 14	LBG 9	LBG 10	LBG 11	LBG 12	LBG 13	LBG 11	LBG 11	LBG 12	LBG 11	LBG 12	LBG 13	LBG 9	LBG 12
Net, cpm:	0.17	1	0.42	0.31	0.42	0.55	0.25	0.33	0.27	0.28	0.14	13.49	0.08	1.27
Days:	58.971	57.971	55.971	57.547	53.547	51.547	51.547	50.547	54.619	49.856	49.856	0	0	65.619
Lambda:	8.9E-09													
Decay:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Yield:	0.6187	0.5607	0.3747	0.1887	0.3859	0.6138	0.574	0.7517	0.5674	0.5524	0.3915	0.3167	0.5386	0.5237
Aliquot:	2	2	2	2	2	2	2	2	2	2	2	2	2	2
P-Factor:	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340	2.340
Count, time:	103.6	195.7	195.7	195.7	195.7	195.7	504	136.4	136.4	761.6	761.6	761.6	183.8	504
Bkg., cpm:	0.49	0.54	0.55	0.5	0.55	0.45	0.5	0.5	0.55	0.5	0.55	0.45	0.54	0.55
Result, calc.:	0.14	0.94	0.59	0.87	0.57	0.47	0.23	0.23	0.25	0.27	0.19	22.45	0.08	1.28
Result, rptd.:	0.14	0.94	0.60	0.87	0.58	0.47	0.23	0.23	0.26	0.27	0.18	22.45	0.08	1.28
MDA, calc.:	0.27	0.23	0.35	0.66	0.34	0.19	0.13	0.20	0.27	0.11	0.17	0.19	0.25	0.15
MDA, rptd.:	0.30	0.25	0.38	0.70	0.35	0.21	0.14	0.21	0.29	0.12	0.17	0.20	0.27	0.16

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SAMPLE RESULT VERIFICATION, DATA PACKAGE B098Z1-TMA-636

B098Z1-TMA-636														
Uranium 233/4/5/8														
Sample ID:	B098Z1	B098Z2	B098Z3	B098Z4	B098Z5	B098Z6	B098Z7	B098Z8	B098Z9	B09901	B09803	LCS	BLANK	B098Z2 DUP
Detector:	SS-19	SS-20	SS-21	SS-24	SS-19	SS-20	SS-21	SS-26	SS-26	SS-20	SS-21	SS-23	SS-26	SS-20
Sample count time:	214.2	214.2	214.2	214.2	231.08	231.08	231.08	231.08	185.42	149.42	149.42	388.6	149.08	141.43
GMT count:	340.953	340.953	340.953	340.953	343.013	343.013	343.013	343.013	344.683	347.997	347.997	355.82	347.997	351
Zero time:	284.292	285.292	287.292	288.292	292.292	294.292	294.292	295.292	295.292	298.292	298.292	355.82	347.997	284.292
Corr. tracer dpm:	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49
Bkgd count time:	2666.37	2666.37	2666.37	2666.37	2666.37	2666.37	2666.37	2666.37	2666.37	2666.37	2383.07	1132.27	2383.07	2383.07
Net tracer counts:	445	330	429	457	457	423	435	451	310	225	269	917	242	219
Detector eff.:	0.261	0.2675	0.2479	0.3185	0.2647	0.2675	0.2476	0.2803	0.284	0.2671	0.2463	0.3121	0.2833	0.2654
Yield:	0.7599	0.5499	0.7715	0.6396	0.7135	0.6534	0.7261	0.6648	0.6302	0.5385	0.6981	0.7259	0.5472	0.5573
U-238, gross counts:	98	157	62	61	48	47	58	74	42	40	35	1120	4	128
U-238, bkgd counts:	2	2	0	1	1	2	0	1	0	0	0	62	0	1
U-238, Lambda:	4.23E-13													
U-238, Decay corr:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
U-235, gross counts:	12	15	5	4	3	7	1	3	2	3	1	614	0	10
U-235, bkgd counts:	1	1	1	1	1	1	1	0	0	0	0	2	0	0
U-235, Lambda:	2.67E-12													
U-235, Decay corr:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
U-235, branch ratio:	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.826
U-233/4, gross counts:	89	169	68	60	42	44	54	58	22	38	33	1030	7	112
U-233/4, bkgd counts:	5	5	2	4	5	4	2	4	2	1	1	72	2	2
U-233/4, Lambda:	1.17E-08													
U-233/4, Decay corr:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Allquot:	1	1	1	1	1	1	1	1	1	1	1	1	1	1
U-238, result calc.:	1.02	2.22	0.68	0.62	0.49	0.50	0.63	0.76	0.64	0.84	0.61	5.44	0.08	2.73
U-238, result rptd:	1.02	2.22	0.68	0.62	0.49	0.50	0.63	0.76	0.64	0.84	0.61	5.44	0.08	2.74
U-238 MDA calc.:	0.08	0.11	0.08	0.08	0.08	0.09	0.08	0.08	0.12	0.16	0.13	0.19	0.15	0.17
U-238, MDA rptd.:	0.08	0.11	0.08	0.08	0.08	0.09	0.08	0.08	0.12	0.16	0.13	0.19	0.15	0.17
U-235, result calc.:	0.14	0.24	0.05	0.04	0.02	0.08	0.00	0.04	0.04	0.08	0.02	3.81	0.00	0.26
U-235, result rptd.:	0.14	0.24	0.05	0.04	0.02	0.08	0.00	0.04	0.04	0.08	0.02	3.81	0.00	0.26
U-235, MDA calc.:	0.10	0.13	0.10	0.10	0.10	0.10	0.10	0.10	0.14	0.19	0.16	0.05	0.18	0.20
U-235, MDA rptd.:	0.10	0.13	0.10	0.10	0.10	0.10	0.10	0.10	0.14	0.19	0.16	0.05	0.18	0.20
U-233/4, result calc.:	0.89	2.34	0.73	0.58	0.38	0.45	0.56	0.56	0.30	0.78	0.56	4.93	0.10	2.37
U-233/4, result rptd.:	0.88	0.23	0.73	0.58	0.38	0.45	0.56	0.56	0.30	0.78	0.56	4.93	0.10	2.37
U-233/4, MDA calc.:	0.11	0.15	0.08	0.10	0.11	0.10	0.08	0.10	0.12	0.16	0.13	0.20	0.15	0.17
U-233/4, MDA rptd.:	0.14	0.18	0.08	0.11	0.13	0.12	0.08	0.12	0.15	0.16	0.13	0.22	0.19	0.21

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-041

SAMPLE RESULT VERIFICATION, DATA PACKAGE B098Z1-TMA-636

B098Z1-TMA-636											
Total Uranium											
Standard	Intensity	Sample ID	Intens.	ug/L	ug/L	Amount	Prep.		Calc		Rptd
0.049	534			Calc.	Rptd	of Smpl	Volume	Dilution	Result		Relt
0.158	1348	B098Z1	28475	3.281	3.58478	0.25	0.02	10	2.87		2.90
0.521	4480	B098Z2	50969	5.837	6.33276	0.25	0.02	10	5.07		5.09
0.978	8440	B098Z3	20939	2.398	2.57217	0.25	0.02	10	2.06		2.06
2.603	21956	B098Z4	15355	1.758	1.86486	0.25	0.02	10	1.49		1.49
4.881	41542	B098Z6	15286	1.750	1.8764	0.25	0.02	10	1.50		1.50
16.27	129728	B098Z7	16125	1.847	1.91936	0.25	0.02	10	1.54		1.54
		B098Z8	17565	2.011	2.14731	0.25	0.02	10	1.72		1.72
Slope:	1.1E-04	B098Z9	17066	1.954	2.05607	0.25	0.02	10	1.84		1.85
		B09901	19289	2.209	2.35082	0.25	0.02	10	1.88		1.88
		B09903	18409	2.108	2.32018	0.25	0.02	10	1.86		1.86
		LCS	33587	3.846	3.78175	0.25	0.02	10	3.03		3.02
		BLANK	-584	-0.087	0.036	0.25	0.02	1	0.003		0.003
		B098Z2 DUP	51139	5.856	6.57246	0.25	0.02	10	5.26		5.26

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