

**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B98-104
RFW# : 9808L338
SDG/SAF #: H0197/B98-104

W.O. #: 10985-001-001-9999-00
Date Received: 08-15-98

GC/MS VOLATILE

One (1) water sample was collected on 08-13-98.

The sample and its associated QC samples were analyzed according to criteria set forth in SW 846 Method 8260A for TCL Volatile target compounds on 08-19-98.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
2. The required holding time for analysis was met.
3. Non-target compounds were not detected in this sample.
4. All surrogate recoveries were within EPA QC limits.
5. All matrix spike recoveries were within EPA QC limits.
6. The method blank contained the common laboratory contaminants Methylene Chloride and Acetone at levels less than 2x the CRQL and the target compound 2-Butanone at a level less than the CRQL.



Chuck Stefanosky

Chuck Stefanosky
Laboratory Director
Lionville Analytical Laboratory

9-10-98

Date



mmz/voa/08-358v.cn

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.

GLOSSARY OF VOA DATA

DATA QUALIFIERS

- U** = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- J** = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E** = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D** = Identifies all compounds identified in an analysis at a secondary dilution factor.
- I** = Interference.
- NQ** = Result qualitatively confirmed but not able to quantify.
- N** = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- X** = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y** = Additional qualifiers used as required are explained in the case narrative.



GLOSSARY OF VOA DATA

ABBREVIATIONS

- BS** = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
- BSD** = Indicates blank spike duplicate.
- MS** = Indicates matrix spike.
- MSD** = Indicates matrix spike duplicate.
- DL** = Suffix added to sample number to indicate that results are from a diluted analysis.
- NA** = Not Applicable.
- DF** = Dilution Factor.
- NR** = Not Required.
- SP, Z** = Indicates Spiked Compound.



Cust ID: BOPM67 BOPM67 BOPM67 VBLKQU

RFW#: 001 001 MS 001 MSD 98LVX511-MB1

Chlorobenzene	5	U	88	%	90	%	5	U
Ethylbenzene	5	U	5	U	5	U	5	U
Styrene	5	U	5	U	5	U	5	U
Xylene (total)	5	U	5	U	5	U	5	U

*= Outside of EPA CLP QC limits.

005

Recra LabNet - Lionville Laboratory
VOA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B98-104

DATE RECEIVED: 08/15/98

RFW LOT # :9808L338

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOPM67	001	W	98LVX511	08/13/98	N/A	08/19/98
BOPM67	001 MS	W	98LVX511	08/13/98	N/A	08/19/98
BOPM67	001 MSD	W	98LVX511	08/13/98	N/A	08/19/98

LAB QC:

VBLKQU	MB1	W	98LVX511	N/A	N/A	08/19/98
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Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						B98-104-02		Page 1 of 1			
Collector <i>J. Beach / R. Fehlberg</i>		Company Contact T. Brown		Telephone No. 509-376-1547		Project Coordinator TRENT, SJ		Data Turnaround 15 Days					
Project Designation 276-S Hexone Storage Tank - Drums in Fenced Area		Sampling Location 276-S Fenced Storage Tank Area				SAF No. B98-104							
Ice Chest No.		Field Logbook No.				Method of Shipment <i>CO</i>							
Shipped To <i>RECRA LabNet Penn.</i>		Offsite Property No.				Bill of Lading/Air Bill No.							
Waste Designation Client determined no waste codes associated with this project.						COA							
POSSIBLE SAMPLE HAZARDS/REMARKS			Preservation		None	None	None	None	None	None	Cool 4C		
			Type of Container		P	P	P	P	P	P	P	aGs*	
Special Handling and/or Storage			No. of Container(s)		1	1	1	2	2	2	3		
			Volume		20mL	1000mL	1000mL	1000mL	1000mL	1000mL	1000mL	40mL	
SAMPLE ANALYSIS				Activity Scan	See item (1) in Special Instructions.	Technetium-99	Gross Alpha, Gross Beta	Isotopic Plutonium, Isotopic Uranium	Strontium-89,90 - Total Sr	VOA - 8268A (TCL)			
Sample No.	Matrix *	Sample Date	Sample Time										
BOPM67	Other Liquid	<i>8.13.98</i>	<i>0928</i>							<i>X</i>			<i>BOPM68</i>
BOPM69	Other Liquid	<i>8.14.98</i>											
CHAIN OF POSSESSION			Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *		
Relinquished By <i>R. Fehlberg</i>		Date/Time <i>8.14.98</i>		Received By <i>Fed Ex</i>		Date/Time <i>1300</i>		(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-159) <i>R.F. 8.14.98</i> <i>123579515923 - 6.8</i>				S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids T - Tissue W1 - Wipe L - Liquid V - Vegetation X - Other	
Relinquished By <i>Deeley</i>		Date/Time		Received By		Date/Time							
Relinquished By		Date/Time		Received By		Date/Time							
Relinquished By		Date/Time		Received By		Date/Time							
LABORATORY SECTION		Received By <i>Joder</i>		Title <i>Sample Custodian</i>		Date/Time <i>8/14/98</i>							
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time							

Case Narrative

1.0 GENERAL

Thermo Nutech Sample Delivery Group H0197 is comprised of a single liquid sample designated under SAF No. B98-104 with a Project Designation of : 276-S Hexone Storage Tank - Drums in Fenced Area.

The sample was received as stated on the Chain-of-Custody documents.

2.0 ANALYSIS NOTES

2.1 Gross Alpha/Gross Beta Analyses

Sample aliquots were reduced due to the nature of the samples. All sample MDA's were greater than the RDL due the reduced aliquots.

2.2 Total Strontium Analyses

No problems were encountered with the analyses. The aliquot for the analysis was decreased for ease of processing. All MDA's were less than the RDL despite the decreased analytical volume.

2.3 Technetium-99 Analyses

A combination of low yield for the analysis, only 17%, and a reduced sample aliquot due to the nature of the sample resulted in an MDA of 32 pCi/g. Positive Tc99 was not observed.

2.4 Isotopic Uranium Analyses

No problems were encountered with the analyses.

2.5 Isotopic Plutonium Analyses

No problems were encountered with the analyses.

2.6 Gamma Scan Analyses

No problems were encountered with the analyses.

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0197

SDG 7491
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0197

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 10/21/98

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0197

SDG 7491
Contact N. Joseph Verville

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0197

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

REPORT GUIDES

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 10/21/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0197

SAMPLE SUMMARY

SDG 7491
Contact N. Joseph Verville

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0197

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB		CHAIN OF CUSTODY	COLLECTED
				SAMPLE ID	SAF NO		
B0PM67	276-S Fenced Storage Trk	LIQUID		N808083-01	B98-104	B98-104-02	08/13/98 09:28
Method Blank		LIQUID		N808083-03	B98-104		
Lab Control Sample		LIQUID		N808083-02	B98-104		
Duplicate (N808083-01)	276-S Fenced Storage Trk	LIQUID		N808083-04	B98-104		08/13/98 09:28

SAMPLE SUMMARY

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
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Version 3.06
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0197

QC SUMMARY

SDG 7491
 Contact N. Joseph Verville

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0197

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	DEPARTMENT SAMPLE ID
7491	B98-104-02	B0PM67	LIQUID				08/18/98 5	N808083-01	7491-001
		Method Blank	LIQUID					N808083-03	7491-003
		Lab Control Sample	LIQUID					N808083-02	7491-002
		Duplicate (N808083-01)	LIQUID				08/18/98 5	N808083-04	7491-004

QC SUMMARY

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SUMMARY DATA SECTION

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Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-QS
 Version 3.06
 Report date 10/21/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0197

SDG 7491
 Contact N. Joseph Verville

PREP BATCH SUMMARY

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0197

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI- FIERS	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS
Alpha Spectroscopy										
PU	LIQUID	Plutonium-238,239/240, Liquid	2785-116	5.0	1			1	1	1/1
U	LIQUID	Uranium in Liquid	2785-116	5.0	1			1	1	1/1
Beta Counting										
SR	LIQUID	Total Strontium in Liquids	2785-116	10.0	1			1	1	1/1
TC	LIQUID	Technetium-99 in Liquid	2785-116	10.0	1			1	1	1/1
Gas Proportional Counting										
80A	LIQUID	Gross Alpha in Liquid Samples	2785-116	10.0	1			1	1	1/1
80B	LIQUID	Gross Beta in Liquid Samples	2785-116	10.0	1			1	1	1/1
Gamma Spectroscopy										
GAM	LIQUID	Gamma Scan in Liquid	2785-116	10.0	1			1	1	1/1

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
 Blank and LCS plachets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-PBS
 Version 3.06
 Report date 10/21/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0197

WORK SUMMARY

SDG 7491
 Contact N. Joseph Verville

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0197

CLIENT SAMPLE ID	LAB SAMPLE ID	LOCATION	MATRIX	COLLECTED	PLANCHET	TEST	SUF-	FIX	ANALYZED	REVIEWED	BY	METHOD
CUSTODY	SAF No	RECEIVED										
B0PM67		N808083-01		08/13/98	7491-001	80A/80		08/26/98	09/04/98	NJV		Gross Alpha in Liquid Samples
276-S Fenced Storage Trk			LIQUID		7491-001	80B/80		08/26/98	09/04/98	NJV		Gross Beta in Liquid Samples
B98-104-02	B98-104			08/18/98	7491-001	GAM		08/26/98	09/04/98	NJV		Gamma Scan in Liquid
					7491-001	PU		08/27/98	09/04/98	NJV		Plutonium-238,239/240, Liquid
					7491-001	SR		08/27/98	09/04/98	NJV		Total Strontium in Liquids
					7491-001	TC		08/31/98	09/04/98	NJV		Technetium-99 in Liquid
					7491-001	U		08/25/98	09/04/98	NJV		Uranium in Liquid
Method Blank		N808083-03			7491-003	80A/80		08/26/98	09/04/98	NJV		Gross Alpha in Liquid Samples
			LIQUID		7491-003	80B/80		08/26/98	09/04/98	NJV		Gross Beta in Liquid Samples
	B98-104				7491-003	GAM		08/26/98	09/04/98	NJV		Gamma Scan in Liquid
					7491-003	PU		08/26/98	09/04/98	NJV		Plutonium-238,239/240, Liquid
					7491-003	SR		08/27/98	09/04/98	NJV		Total Strontium in Liquids
					7491-003	TC		08/31/98	09/04/98	NJV		Technetium-99 in Liquid
					7491-003	U		08/25/98	09/04/98	NJV		Uranium in Liquid
Lab Control Sample		N808083-02			7491-002	80A/80		08/26/98	09/04/98	NJV		Gross Alpha in Liquid Samples
			LIQUID		7491-002	80B/80		08/26/98	09/04/98	NJV		Gross Beta in Liquid Samples
	B98-104				7491-002	GAM		08/26/98	09/04/98	NJV		Gamma Scan in Liquid
					7491-002	PU		08/26/98	09/04/98	NJV		Plutonium-238,239/240, Liquid
					7491-002	SR		08/27/98	09/04/98	NJV		Total Strontium in Liquids
					7491-002	TC		08/30/98	09/04/98	NJV		Technetium-99 in Liquid
					7491-002	U		08/25/98	09/04/98	NJV		Uranium in Liquid
Duplicate (N808083-01)		N808083-04			7491-004	80A/80		08/26/98	09/04/98	NJV		Gross Alpha in Liquid Samples
276-S Fenced Storage Trk			LIQUID	08/13/98	7491-004	80B/80		08/26/98	09/04/98	NJV		Gross Beta in Liquid Samples
B98-104				08/18/98	7491-004	GAM		08/27/98	09/04/98	NJV		Gamma Scan in Liquid
					7491-004	PU		08/26/98	09/04/98	NJV		Plutonium-238,239/240, Liquid
					7491-004	SR		08/27/98	09/04/98	NJV		Total Strontium in Liquids
					7491-004	TC		08/31/98	09/04/98	NJV		Technetium-99 in Liquid
					7491-004	U		08/25/98	09/04/98	NJV		Uranium in Liquid

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CWS
 Version 3.06
 Report date 10/21/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0197

SDG 7491
 Contact N. Joseph Verville

WORK SUMMARY, cont.

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0197

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
ACA 80	B98-104	Gross Alpha in Liquid Samples	EPA900.0	1			1	1	1	4
ACB 80	B98-104	Gross Beta in Liquid Samples	EPA900.0	1			1	1	1	4
GAM	B98-104	Gamma Scan in Liquid	GAMMAHI	1			1	1	1	4
PU	B98-104	Plutonium-238,239/240, Liquid	PUPLATE	1			1	1	1	4
SR	B98-104	Total Strontium in Liquids	SR-RAD	1			1	1	1	4
TC	B98-104	Technetium-99 in Liquid	TC99TRLSC	1			1	1	1	4
U	B98-104	Uranium in Liquid		1			1	1	1	4
TOTALS				7			7	7	7	28

Version 3.06

WORK SUMMARY

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0197

N808083-03

Method Blank

METHOD BLANK

SDG 7491 Client/Case no Hanford SDG H0197
 Contact N. Joseph Verville Case no TRB-SBB-207925
 Lab sample id N808083-03 Client sample id Method Blank
 Dept sample id 7491-003 Material/Matrix LIQUID
 SAF No B98-104

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	0.30	1.9	<u>3.8</u>	3.0	U	80A
Gross Beta	12587-47-2	-0.48	3.3	<u>5.8</u>	4.0	U	80B
Technetium 99	14133-76-7	-0.080	0.34	0.78	15	U	TC
Uranium 233/234	U-233/234	-0.003	0.005	0.021	1.0	U	U
Uranium 235	15117-96-1	0	0.007	0.025	1.0	U	U
Uranium 238	U-238	0	0.005	0.021	1.0	U	U
Plutonium 238	13981-16-3	0.011	0.043	0.082	1.0	U	PU
Plutonium 239/240	PU-239/240	0.011	0.021	0.082	1.0	U	PU
Strontium Total	SR-RAD	-0.024	0.17	0.22	2.0	U	SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	U		0.38		U	GAM
Cobalt 60	10198-40-0	U		0.033	25	U	GAM
Cesium 137	10045-97-3	U		0.026	15	U	GAM
Europium 152	14683-23-9	U		0.080	50	U	GAM
Europium 154	15585-10-1	U		0.082	50	U	GAM
Europium 155	14391-16-3	U		0.072	50	U	GAM

276-S Hexone Storage Tank - Drums

QC-BLANK 28918

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-DS
 Version 3.06
 Report date 10/21/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0197

N808083-02

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7491</u>	Client/Case no <u>Hanford</u>	SDG <u>H0197</u>
Contact <u>N. Joseph Verville</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N808083-02</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7491-002</u>	Material/Matrix <u>LIQUID</u>	
	SAP No <u>B98-104</u>	

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMITS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	210	15	2.9	3.0		80A	216	8.6	97	68-122	80-120
Gross Beta	220	11	7.3	4.0		80B	224	9.0	98	76-124	80-120
Technetium 99	51	1.6	0.56	15		TC	54.6	3.2	93	84-116	80-120
Uranium 233/234	4.8	0.33	0.15	1.0		U	4.75	0.19	101	86-114	80-120
Uranium 235	3.8	0.28	0.030	1.0		U	3.89	0.16	98	85-115	80-120
Uranium 238	4.9	0.33	0.14	1.0		U	4.90	0.20	100	86-114	80-120
Plutonium 238	11	1.3	0.076	1.0		PU	11.4	0.46	96	80-120	80-120
Plutonium 239/240	9.1	1.1	0.076	1.0		PU	9.26	0.37	98	80-120	80-120
Strontium Total	9.3	0.39	0.18	2.0		SR	8.98	0.36	104	82-118	
GAMMA SCAN ANALYTES	U										
Cobalt 60	2.5	0.19	0.098	25	J	GAM	2.49	0.10	100	80-120	80-120
Cesium 137	2.4	0.17	0.14	15	J	GAM	2.38	0.095	101	80-120	80-120

276-S Hexone Storage Tank - Drums

QC-LCS 28917

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>EVD-LCS</u>
Version <u>1.06</u>
Report date <u>10/21/98</u>

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0197

N808083-04

B0PM67

DUPLICATE

SDG <u>7491</u>	Client/Case no <u>Hanford</u>	SDG <u>H0197</u>
Contact <u>N. Joseph Verville</u>	Case no <u>TRB-SBB-207925</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>N808083-04</u>	Lab sample id <u>N808083-01</u>	Client sample id <u>B0PM67</u>
Dept sample id <u>7491-004</u>	Dept sample id <u>7491-001</u>	Location/Matrix <u>276-S Fenced Storage Tnk LIQUID</u>
	Received <u>08/18/98</u>	Collected <u>08/13/98 09:28</u>
		Custody/SAF No <u>B98-104-02</u> <u>B98-104</u>

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
Gross Alpha	23	16	<u>20</u>	3.0		80A	19	15	<u>20</u>	U	19	162	
Gross Beta	2.3	31	<u>51</u>	4.0	U	80B	15	24	<u>39</u>	U	-		
Technetium 99	0.49	6.9	11	15	U	TC	<u>5.1</u>	15	<u>32</u>	U	-		
Uranium 233/234	0.018	0.024	0.046	1.0	U	U	0.12	0.055	0.061	J	<u>148</u>	131	
Uranium 235	0.007	0.014	0.055	1.0	U	U	0.047	0.040	0.051	U	-		
Uranium 238	0.018	0.024	0.046	1.0	U	U	0.011	0.022	0.042	U	-		
Plutonium 238	2.1	0.47	0.13	1.0		PU	1.6	0.24	0.047		27	44	
Plutonium 239/240	2.5	0.53	0.13	1.0		PU	1.8	0.26	0.047		33	43	
Strontium Total	7.8	0.54	0.36	2.0		SR	7.9	0.52	0.32		1	26	
GAMMA SCAN ANALYTES	U						U						
Potassium 40	U		84		U	GAM	U		170	U	-		
Cobalt 60	U		7.4	25	U	GAM	U		18	U	-		
Cesium 137	U		9.6	15	U	GAM	U		15	U	-		
Europium 152	U		17	50	U	GAM	U		37	U	-		
Europium 154	U		19	50	U	GAM	U		41	U	-		
Europium 155	U		17	50	U	GAM	U		27	U	-		

276-S Hexone Storage Tank - Drums

QC-DUP#1 28919

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0197

N808083-01

B0PM67

DATA SHEET

SDG <u>7491</u>	Client/Case no <u>Hanford</u>	SDG <u>H0197</u>
Contact <u>N. Joseph Verville</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N808083-01</u>	Client sample id <u>B0PM67</u>	
Dept sample id <u>7491-001</u>	Location/Matrix <u>276-S Fenced Storage Tnk LIQUID</u>	
Received <u>08/19/98</u>	Collected <u>08/13/98 09:28</u>	
	Custody/SAF No <u>B98-104-02</u> <u>B98-104</u>	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	19	15	20	3.0	U	80A
Gross Beta	12587-47-2	15	24	39	4.0	U	80B
Technetium 99	14133-76-7	5.1	15	32	15	U	TC
Uranium 233/234	U-233/234	0.12	0.055	0.061	1.0	J	U
Uranium 235	15117-96-1	0.047	0.040	0.051	1.0	U	U
Uranium 238	U-238	0.011	0.022	0.042	1.0	U	U
Plutonium 238	13981-16-3	1.6	0.24	0.047	1.0		PU
Plutonium 239/240	PU-239/240	1.8	0.26	0.047	1.0		PU
Strontium Total	SR-RAD	7.9	0.52	0.32	2.0		SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	U		170		U	GAM
Cobalt 60	10198-40-0	U		18	25	U	GAM
Cesium 137	10045-97-3	U		15	15	U	GAM
Europium 152	14683-23-9	U		37	50	U	GAM
Europium 154	15585-10-1	U		41	50	U	GAM
Europium 155	14391-16-3	U		27	50	U	GAM

276-S Hexone Storage Tank - Drums

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/21/98</u>

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0197

METHOD SUMMARY

PLUTONIUM-238,239/240, LIQUID
ALPHA SPECTROSCOPY

Test FJ Matrix LIQUID
SDG 7491
Contact N. Joseph Verville

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0197

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	Plutonium 238	Plutonium 239/240
------------------	------------------	-------------	-------------	------------------	----------------------

Preparation batch 2785-116

BOPM67	N808083-01		7491-001	1.6	1.8
BLK (QC ID=28918)	N808083-03		7491-003	U	U
LCS (QC ID=28917)	N808083-02		7491-002	ok	ok
Duplicate (N808083-01)	N808083-04		7491-004	ok	ok

Nominal values and limits from method RDLs (pCi/L) 1.0 1.0
276-S Hexone Storage Tank - Drums

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX MDA pCi/L	ALIQ L	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
------------------	------------------	-------------	-------------	------------------	-----------	-------------	---------------	------------	----------	--------------	-------------	--------------	--------------	---------------	----------

Preparation batch 2785-116 2σ prep error 5.0 % Reference Lab Notebook #2785 pg. 112

BOPM67	N808083-01			0.047	0.500			65	<u>589</u>				14	08/26/98	08/27	SS-004
BLK (QC ID=28918)	N808083-03			0.082	0.500			71	<u>433</u>					08/26/98	08/26	SS-052
LCS (QC ID=28917)	N808083-02			0.076	0.500			73	<u>433</u>					08/26/98	08/26	SS-051
Duplicate (N808083-01) (QC ID=28919)	N808083-04			0.13	0.500			52	<u>433</u>				13	08/26/98	08/26	SS-053

Nominal values and limits from method 1.0 0.500 700 180

PROCEDURES	REFERENCE	PUPLATE
RP-070		Sample Dissolution - HF Method, rev 0
RP-941		Plutonium Purification - Small Aliquot, rev 0

AVERAGES ± 2 SD	MDA	<u>0.084</u> + <u>0.069</u>
FOR 4 SAMPLES	YIELD	<u>65</u> + <u>19</u>

METHOD SUMMARIES

Page 1

SUMMARY DATA SECTION

Page 12

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 10/21/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0197

METHOD SUMMARY

URANIUM IN LIQUID
ALPHA SPECTROSCOPY

Test U Matrix LIQUID
SDG 7491
Contact N. Joseph Verville

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0197

RESULTS

CLIENT SAMPLE ID	LAB	RAW	SUF-	1: Uranium	2: Uranium	3: Uranium	RESULT RATIOS (%)				
	SAMPLE ID	TEST	FIX	PLANCHET	233/234	235	238	1+3	2σ	2+3	2σ
Preparation batch 2785-116											
BOPM67	N808083-01	7491-001			0.12 J	U	U				
BLK (QC ID=28918)	N808083-03	7491-003			U	U	U				
LCS (QC ID=28917)	N808083-02	7491-002			ok	ok	ok				
Duplicate (N808083-01)	N808083-04	7491-004			<u>OUT</u> U	-	-	-	U		
Nominal values and limits from method				RDLs (pCi/L)	1.0	1.0	1.0	Averages			
276-S Hexone Storage Tank - Drums											

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB	RAW	SUF-	MAX MDA	ALIQ	PREP	DILU-	YIELD	EPF	COUNT	FWHM	DRIFT	DAYS	ANAL-			
	SAMPLE ID	TEST	FIX	pCi/L	mL	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR	
Preparation batch 2785-116												2σ prep error 5.0 %		Reference Lab		Notebook #2785 pg. 112	
BOPM67	N808083-01			0.061	<u>0.500</u>			94		<u>444</u>			12	08/24/98	08/25	SS-042	
BLK (QC ID=28918)	N808083-03			0.025	1.00			94		<u>445</u>				08/24/98	08/25	SS-048	
LCS (QC ID=28917)	N808083-02			0.15	1.00			98		<u>445</u>				08/24/98	08/25	SS-044	
Duplicate (N808083-01)	N808083-04			0.055	<u>0.500</u>			87		<u>444</u>			12	08/24/98	08/25	SS-049	
(QC ID=28919)																	
Nominal values and limits from method				1.0	1.00					700		180					

PROCEDURES RP-070 Sample Dissolution - HF Method, rev 0
RP-911 Uranium Purification - Small Aliquot, rev 0

AVERAGES + 2 SD MDA 0.073 ± 0.11
FOR 4 SAMPLES YIELD 93 ± 9

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 10/21/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0197

METHOD SUMMARY

TOTAL STRONTIUM IN LIQUIDS
BETA COUNTING

Test SR Matrix LIQUID
SDG 7491
Contact N. Joseph Verville

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0197

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUP-FIX	PLANCHET	Strontium Total
Preparation batch 2785-116					
BOPM67	N808083-01			7491-001	7.9
BLK (QC ID=28918)	N808083-03			7491-003	U
LCS (QC ID=28917)	N808083-02			7491-002	ok
Duplicate (N808083-01)	N808083-04			7491-004	ok

Nominal values and limits from method RDLs (pCi/L) 2.0
276-S Hexone Storage Tank - Drums

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUP-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 2785-116 2σ prep error 10.0 % Reference Lab Notebook #2785 pg. 112															
BOPM67	N808083-01			0.32	0.500			83	200				14	08/27/98	08/27 GRB-205
BLK (QC ID=28918)	N808083-03			0.22	1.00			79	400					08/27/98	08/27 GRB-219
LCS (QC ID=28917)	N808083-02			0.15	1.00			80	200					08/27/98	08/27 GRB-218
Duplicate (N808083-01)	N808083-04			0.36	0.500			82	200				14	08/27/98	08/27 GRB-206
	(QC ID=28919)														

Nominal values and limits from method 2.0 1.00 100 180

PROCEDURES	REFERENCE	SR-RAD
	RP-500	Strontium - Initial Separation, rev 0
	RP-519	Strontium-89.90 Demounting and Yttrium Purification, rev 0

AVERAGES ± 2 SD	MDA	0.27	+	0.17
FOR 4 SAMPLES	YIELD	81	+	4

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
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Form DVD-CMS
Version 3.06
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0197

METHOD SUMMARY

TECHNETIUM-99 IN LIQUID
BETA COUNTING

Test TC Matrix LIQUID
SDG 7491
Contact N. Joseph Verville

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0197

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	Technetium PLANCHET	99
Preparation batch 2785-116					
BOPM67	N808083-01			7491-001	U
BLK (QC ID=28918)	N808083-03			7491-003	U
LCS (QC ID=28917)	N808083-02			7491-002	ok
Duplicate (N808083-01)	N808083-04			7491-004	- U

Nominal values and limits from method RDLs (pCi/L) 15
276-S Hexone Storage Tank - Drums

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/L	ALIQ mL	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 2785-116 2σ prep error 10.0 % Reference Lab Notebook #2785 pg. 112															
BOPM67	N808083-01			32	0.0500			17	200				18	08/27/98	08/31 GRB-230
BLK (QC ID=28918)	N808083-03			0.78	1.00			36	200				3	8/27/98	08/31 GRB-231
LCS (QC ID=28917)	N808083-02			0.56	1.00			63	201				8	8/27/98	08/30 GRB-202
Duplicate (N808083-01)	N808083-04			11	1.0500			51	200				18	8/27/98	08/31 GRB-232
	(QC ID=28919)														

Nominal values and limits from method 15 1.00 100 180

PROCEDURES	REFERENCE	TC99TRLSC
RP-020	Sample Leach for Technetium, rev 1	
RP-540	Technetium Purification, rev 0	

AVERAGES ± 2 SD	MDA 11 ± 30
FOR 4 SAMPLES	YIELD 42 ± 40

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id TMANC
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0197

METHOD SUMMARY

GROSS ALPHA IN LIQUID SAMPLES
GAS PROPORTIONAL COUNTING

Test 80A Matrix LIQUID
SDG 7491
Contact N. Joseph Verville

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0197

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUP- TEST FIX	SUF- PLANCHET	1: Gross Alpha	2: Sum, Alpha Emitters	RESULT RATIO (%)
						2+1 2σ
Preparation batch 2785-116						
BOPM67	N808083-01	80	7491-001	19	U 3.5	
BLK (QC ID=28918)	N808083-03	80	7491-003	U		
LCS (QC ID=28917)	N808083-02	80	7491-002	ok		
Duplicate (N808083-01)	N808083-04	80	7491-004	ok	4.6	20 29

Nominal values and limits from method RDLs (pCi/L) 3.0
276-S Hexone Storage Tank - Drums Average 20

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUP- TEST FIX	MDA pCi/L	ALIQ l.	PREP FAC	DILU- TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 2785-116 2σ prep error 20.0 % Reference Lab Notebook #2785 pg. 112															
BOPM67	N808083-01	80	<u>20</u>	<u>0.0150</u>			36	100			13	08/25/98	08/26	GRB-113	
BLK (QC ID=28918)	N808083-03	80	<u>3.8</u>	<u>0.100</u>			31	100				08/25/98	08/26	GRB-115	
LCS (QC ID=28917)	N808083-02	80	<u>2.9</u>	<u>0.100</u>			30	100				08/25/98	08/26	GRB-114	
Duplicate (N808083-01)	N808083-04	80	<u>20</u>	<u>0.0150</u>			36	100			13	08/25/98	08/26	GRB-116	
	(QC ID=28919)														

Nominal values and limits from method 3.0 0.100 5-150 100 180

PROCEDURES REFERENCE EPA900.0
EP-120 Gross Alpha and Gross Beta in Environmental Water, rev 2

AVERAGES ± 2 SD MDA 12 ± 19
FOR 4 SAMPLES RESIDUE 33 ± 6

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0197

Test 80B Matrix LIQUID
 SDG 7491
 Contact N. Joseph Verville

METHOD SUMMARY

GROSS BETA IN LIQUID SAMPLES
 GAS PROPORTIONAL COUNTING

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0197

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	1: Gross Beta	2: Sum, Beta Emitters	RESULT RATIO (%)
							2-1 2σ
Preparation batch 2785-116							
BOPM67	N808083-01	80		7491-001	15	U	
BLK (QC ID=28918)	N808083-03	80		7491-003		U	
LCS (QC ID=28917)	N808083-02	80		7491-002	ok		
Duplicate (N808083-01)	N808083-04	80		7491-004	-	U	

Nominal values and limits from method RDLs (pCi/L) 4.0
 276-S Hexone Storage Tank - Drums Average

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/L	ALIQ ml	PREP PAC	DILU- TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 2785-116 2σ prep error 15.0 % Reference Lab Notebook #2785 pg. 112																
BOPM67	N808083-01	80		<u>39</u>	<u>0.0150</u>			36	100			13	08/25/98	08/26	GRB-113	
BLK (QC ID=28918)	N808083-03	80		<u>5.8</u>	0.100			31	100				08/25/98	08/26	GRB-115	
LCS (QC ID=28917)	N808083-02	80		<u>7.3</u>	0.100			30	100				08/25/98	08/26	GRB-114	
Duplicate (N808083-01)	N808083-04	80		<u>51</u>	<u>0.0150</u>			36	100			13	08/25/98	08/26	GRB-116	
	(QC ID=28919)															

Nominal values and limits from method 4.0 0.100 5-150 100 180

PROCEDURES REFERENCE EPA900.0
 EP-120 Gross Alpha and Gross Beta in Environmental Water, rev 2

AVERAGES ± 2 SD MDA 26 ± 45
 FOR 4 SAMPLES RESIDUE 33 ± 6

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0197

METHOD SUMMARY

GAMMA SCAN IN LIQUID

GAMMA SPECTROSCOPY

Test RAM Matrix LIQUID
 SDG 7491
 Contact N. Joseph Verville

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0197

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Cobalt 60	Cesium 137
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Preparation batch 2785-116

BOPM67	N808083-01	7491-001			U	U
BLK (QC ID=28918)	N808083-03	7491-003			U	U
LCS (QC ID=28917)	N808083-02	7491-002			ok J	ok J
Duplicate (N808083-01)	N808083-04	7491-004			- U	- U

Nominal values and limits from method RDLs (pCi/L) 25 15
 276-S Hexone Storage Tank - Drums

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX MDA pCi/L	ALIQ L	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
------------------	---------------	----------	----------	---------------	--------	----------	------------	---------	-------	-----------	----------	-----------	-----------	------------	----------

Preparation batch 2785-116 2σ prep error 10.0 % Reference Lab Notebook #2785 pg. 112

BOPM67	N808083-01			15	0.500					490			13	08/26/98	08/26	01,01,00
BLK (QC ID=28918)	N808083-03			0.026	100					478				09/26/98	08/26	01,04,00
LCS (QC ID=28917)	N808083-02			0.14	100					478				08/26/98	08/26	01,03,00
Duplicate (N808083-01)	N808083-04			9.6	0.500					402			14	08/26/98	08/27	01,04,00
	(QC ID=28919)															

Nominal values and limits from method 15 0.500 5 180

PROCEDURES	REFERENCE	GAMMAHI
RP-070		Sample Dissolution - HF Method, rev 0
RP-100		Ge(Li) Preparation for Reactor Waste Samples, rev 0

AVERAGES + 2 SD	MDA <u>6.2</u> ± <u>15</u>
FOR 4 SAMPLES	YIELD _____ ± _____

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0197

SDG 7491
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0197

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

- * LAB SAMPLE ID is the lab's primary identification for a sample.
- * DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- * CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- * QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

- * All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 10/21/98

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0197

SDG 7491
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0197

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- * The preparation batches are shown in the same order as the Method Summary Reports are printed.
- * Only analyses of planchets relevant to the SDG are included.
- * Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- * The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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TMA/RICHMOND
SAMPLE DELIVERY GROUP H0197

SDG 7491
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0197

WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

- * TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- * SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- * The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- * PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- * For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- * The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 10/21/98

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0197

SDG 7491
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0197

DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- * TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- * The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

- * ERRORS can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- * A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- * When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

- U The RESULT is less than the MDA (Minimum Detectable Activity).

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If the MDA is blank, the ERROR is used as the limit.

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
- B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.
- Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.
- For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.
- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
- H Similar to 'L' except the recovery was high.
- P The RESULT is 'preliminary'.
- X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
- 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

- * An MDA is underlined if it is bigger than its RDL.

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- * An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- * A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- * When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- * An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 1. The error of RESULT, including that introduced by rounding the result prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
 2. The error of ADDED.
 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits for the recovery.
- * The recovery is underlined if it is outside either of these ranges.

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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTS divided by their average expressed as a percent.

If both RESULTS are less than their MDAs, no RPD is computed and a '-' is printed.

For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

- * The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTS prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTS. If labeled CNT, it does not.

This value reported for this limit is at most 999.

- * The second limit for the RPD is the larger of:
 1. A fixed percentage specified in the protocol.

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2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

- * The RPD is underlined if it is greater than either limit.
- * If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

- * The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

- * The first, computed limits for the recovery reflect:

1. The errors of the two RESULTS, including those introduced by rounding them prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

2. The error of ADDED.

3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

- * The second limits are protocol defined upper and lower QC limits

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MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

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METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

- * Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

- * The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

- * If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

The J and X flags are as on the data sheet.

- * Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- * Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

- * Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
 - * If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.
- MDAs are underlined if greater than the printed RDL.
- * Aliquots are underlined if less than the nominal value specified for the method.
 - * Preparation factors are underlined if greater than the nominal value specified for the method.
 - * Dilution factors are underlined if greater than the nominal value specified for the method.
 - * Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
 - * Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
 - * Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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- * Count times are underlined if less than the nominal value specified for the method.
- * Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- * Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- * Days Held are underlined if greater than the holding time specified in the protocol.
- * Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1-3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

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results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

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Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						B98-104-02	Page 1 of 1			
Collector <i>J. Beach / R. Fahlberg</i>		Company Contact T. Brown		Telephone No. 509-376-1547		Project Coordinator TRENT, SJ		Data Turnaround 15 Days				
Project Designation 276-S Hexone Storage Tank - Drums in Fenced Area		Sampling Location 276-S Fenced Storage Tank Area		SAF No. B98-104								
Ice Chest No.		Field Logbook No.		Method of Shipment								
Shipped To <i>RR TMA/RECRA Thermo Nutech Cal.</i>		Offsite Property No.		Bill of Lading/Air Bill No.								
Waste Designation Client determined no waste codes associated with this project.				COA								
POSSIBLE SAMPLE HAZARDS/REMARKS <div style="text-align: center; font-size: 1.2em;">SDG#0197</div> Special Handling and/or Storage			Preservation		None	None	None	None	None	None	Cool 4C	
			Type of Container		P	P	P	P	P	P	aGs*	
			No. of Container(s)		1	1	1	2	2	2	3	
			Volume		20mL	1000mL	1000mL	1000mL	1000mL	1000mL	40mL	
SAMPLE ANALYSIS				Activity Scan	See item (1) in Special Instructions.	Technetium-99	Gross Alpha; Gross Beta	Isotopic Plutonium; Isotopic Uranium	Strontium-89,90 - Total Sr	VOA - 8260A (TCL)		
Sample No.	Matrix *	Sample Date	Sample Time									
BOPM67	Other Liquid	8-13-98	0928		X	X	X	X	X		BOPM68	
BOPM68	Other Liquid	RIN 8/13/98										
CHAIN OF POSSESSION			Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By <i>R. Fahlberg</i>		Date/Time <i>8-14-98 1300</i>		Received By <i>Fed Ex</i>		Date/Time <i>1300</i>		(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)				S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids T - Tissue W1 - Wipe L - Liquid V - Vegetation X - Other
Relinquished By <i>R. Fahlberg</i>		Date/Time		Received By <i>C. SANGALANCI</i>		Date/Time <i>8/13/98/0900</i>						
Relinquished By		Date/Time		Received By		Date/Time						
Relinquished By		Date/Time		Received By		Date/Time						
LABORATORY SECTION	Received By			Title				Date/Time				
FINAL SAMPLE DISPOSITION	Disposal Method			Disposed By				Date/Time				