

Thermo Nutech
W.O. No. N9-10-013-7227

RECEIVED
JAN 18 2000

0052184
Bechtel Hanford Inc.
SDG H0554

Case Narrative

EDMC

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0554 is composed of one solid sample designated under SAF No. B99-088 with a Project Designation of: 300-FF-1 TS-Geosafe Project-Other Solid.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the TNU Sample Receipt Checklist. The results were transmitted to BHI via facsimile on October 18, 1999.

2.0 ANALYSIS NOTES

2.1 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.



TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0554

SDG 7227
 Contact Kevin C. Johnson

SAMPLE SUMMARY

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0554

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0WKN7	300 Area	SOLID		N910013-01	B99-088	B99-088-03	09/29/99 10:00
Method Blank		SOLID		N910013-03	B99-088		
Lab Control Sample		SOLID		N910013-02	B99-088		
Duplicate (N910013-01)	300 Area	SOLID		N910013-04	B99-088		09/29/99 10:00

SAMPLE SUMMARY

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Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CS
 Version 3.06
 Report date 10/18/99

TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0554

SDG 7227
 Contact Kevin C. Johnson

QC SUMMARY

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0554

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	DEPARTMENT SAMPLE ID
7227	B99-088-03	BOWKN7	SOLID				10/01/99 2	N910013-01	7227-001
		Method Blank	SOLID					N910013-03	7227-003
		Lab Control Sample	SOLID					N910013-02	7227-002
		Duplicate (N910013-01)	SOLID				10/01/99 2	N910013-04	7227-004

QC SUMMARY

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Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-QS
 Version 3.06
 Report date 10/18/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0554

SDG 7227
Contact Kevin C. Johnson

PREP BATCH SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0554

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED			QUALI-	
			BATCH	2σ %	CLIENT	MORE	RE		BLANK
Alpha Spectroscopy									
U	SOLID	Uranium, Isotopic in Soil	6904-063	5.0	1		1	1	1/1

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets 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
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TMA/RICHMOND
SAMPLE DELIVERY GROUP H0554

SDG 7227
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0554

WORK SUMMARY

CLIENT SAMPLE ID	LAB SAMPLE ID									
LOCATION	MATRIX	COLLECTED	PLANCHET	TEST	SUF-	ANALYZED	REVIEWED	BY	METHOD	
CUSTODY	SAF No	RECEIVED			FIX					
BOWKN7		N910013-01	7227-001	U		10/14/99	10/18/99	NJV	Uranium, Isotopic in Soil	
300 Area	SOLID	09/29/99								
B99-088-03	B99-088	10/01/99								
Method Blank		N910013-03	7227-003	U		10/14/99	10/18/99	NJV	Uranium, Isotopic in Soil	
	SOLID									
	B99-088									
Lab Control Sample		N910013-02	7227-002	U		10/14/99	10/18/99	NJV	Uranium, Isotopic in Soil	
	SOLID									
	B99-088									
Duplicate (N910013-01)		N910013-04	7227-004	U		10/14/99	10/18/99	NJV	Uranium, Isotopic in Soil	
300 Area	SOLID	09/29/99								
	B99-088	10/01/99								

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
U	B99-088	Uranium, Isotopic in Soil	UPLATE	1			1	1	1		4
TOTALS				1			1	1	1		4

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Form DVD-CWS
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0554

N910013-02

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7227</u>	Client/Case no <u>Hanford</u>	<u>SDG H0554</u>
Contact <u>Kevin C. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N910013-02</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7227-002</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B99-088</u>	

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Uranium 233/234	23.1	1.3	0.58	1.0	U	23.2	0.93	100	87-113	80-120
Uranium 235	18.3	1.1	0.078	1.0	U	18.8	0.75	97	87-113	80-120
Uranium 238	26.0	1.4	0.55	1.0	U	25.2	1.0	103	87-113	80-120

300-FF-1 TS-Geosafe Prjt-Other Solid

QC-LCS 31959

LAB CONTROL SAMPLES

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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>10/18/99</u>

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0554

N910013-04

B0WK7

DUPLICATE

SDG <u>7227</u> Contact <u>Kevin C. Johnson</u> Lab sample id <u>N910013-04</u> Dept sample id <u>7227-004</u>	Client/Case no <u>Hanford</u> <u>SDG H0554</u> Case no <u>TRB-SBB-207925</u> Lab sample id <u>N910013-01</u> ORIGINAL Dept sample id <u>7227-001</u> Received <u>10/01/99</u> Client sample id <u>B0WK7</u> Location/Matrix <u>300 Area</u> <u>SOLID</u> Collected <u>09/29/99 10:00</u> Custody/SAF No <u>B99-088-03</u> <u>B99-088</u>
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ANALYTE	DUPLICATE		2σ ERR		MDA	RDL	QUALI-	ORIGINAL	2σ ERR		MDA	QUALI-	RPD	3σ	PROT
	pCi/g	(COUNT)	pCi/g	pCi/g	pCi/g	pCi/g	FIERS		TEST	pCi/g	(COUNT)	pCi/g	FIERS	%	TOT
Uranium 233/234	2.68	0.81	0.47	1.0				2.25	0.67	0.35			17	65	
Uranium 235	0	0.12	0.45	1.0		U	U	0.056	0.11	0.43	U		-		
Uranium 238	2.68	0.72	0.37	1.0			U	1.84	0.57	0.35			37	62	

300-FF-1 TS-Geosafe Prjt-Other Solid

QC-DUP#1 31961

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>10/18/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0554

N910013-01

B0WKN7

DATA SHEET

SDG <u>7227</u>	Client/Case no <u>Hanford</u>	SDG <u>H0554</u>
Contact <u>Kevin C. Johnson</u>	Contract <u>TRB-SBB-207925</u>	
Lab sample id <u>N910013-01</u>	Client sample id <u>B0WKN7</u>	
Dept sample id <u>7227-001</u>	Location/Matrix <u>300 Area</u>	<u>SOLID</u>
Received <u>10/01/99</u>	Collected <u>09/29/99 10:00</u>	
	Custody/SAF No <u>B99-088-03</u>	<u>B99-088</u>

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	2.25	0.67	0.35	1.0		U
Uranium 235	15117-96-1	0.056	0.11	0.43	1.0	U	U
Uranium 238	U-238	1.84	0.57	0.35	1.0		U

300-FF-1 TS-Geosafe Prjt-Other Solid

DATA SHEETS

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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>10/18/99</u>

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0554

Test U Matrix SOLID
SDG 7227
Contact Kevin C. Johnson

METHOD SUMMARY
URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0554

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	1: Uranium	2: Uranium	3: Uranium	RESULT RATIOS (%)						
					233/234	235	238	1+3	2σ	2+3	2σ			
Preparation batch 6904-063														
BOWKN7	N910013-01			7227-001	2.25	U	1.84	122	53	3	6			
BLK (QC ID=31960)	N910013-03			7227-003	U	U	U							
LCS (QC ID=31959)	N910013-02			7227-002	ok	ok	ok							
Duplicate (N910013-01)	N910013-04			7227-004	ok	- U	ok	100	40	0	4			
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0	100				4		
300-FF-1 TS-Geosafe Prjt-Other Solid								Averages		111		2		

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EPF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL-				
														PREPARED	YZED	DETECTOR		
Preparation batch 6904-063															2σ prep error	5.0 %	Reference Lab Notebook	6904 pg. 023
BOWKN7	N910013-01			0.43	0.200			82	155			15	10/13/99	10/14	SS-034			
BLK (QC ID=31960)	N910013-03			0.50	0.200			70	155				10/13/99	10/14	SS-035			
LCS (QC ID=31959)	N910013-02			0.58	0.200			99	706				10/13/99	10/14	SS-033			
Duplicate (N910013-01)	N910013-04			0.47	0.200			79	155			15	10/13/99	10/14	SS-036			
(QC ID=31961)																		
Nominal values and limits from method				1.0	0.200			30-105	150	100		180						

PROCEDURES	REFERENCE	UPLATE
EP-060		Soil Preparation, rev 0
EP-070		Soil Dissolution, rev 0
EP-910		Uranium Purification, rev 0
EP-008		Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD	MDA	<u>0.50</u> ± <u>0.13</u>
FOR 4 SAMPLES	YIELD	<u>82</u> ± <u>24</u>

METHOD SUMMARIES

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Form DVD-CMS
Version 3.06
Report date 10/18/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0554

SDG 7227
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0554

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.

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0554

SDG 7227
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
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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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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 10/18/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0554

SDG 7227
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0554

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.

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REPORT GUIDE

Client Hanford
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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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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0554

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GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0554

DATA SHEET

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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DATA SHEET

- * 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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REPORT GUIDE

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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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REPORT GUIDE

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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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DUPLICATE

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

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 10/18/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0554

SDG 7227
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0554

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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METHOD SUMMARY

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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METHOD SUMMARY

- * 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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METHOD SUMMARY

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. Page 1 of 1
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST B99-088-03
 Price Code 9K Data Turnaround 15 Days

Collector: Jeff Gale
 Project Designation: 300-FE-1 TS - Geosafe Project - Other Solid
 Ice Chest No. ERC 76-065
 Shipped To: TMA/REGRA JAS 9/24/99

Company Contact: Jeff Lerch Telephone No. 373-5904
 Project Coordinator: TREN, SJ
 SAF No. B99-088
 Method of Shipment: Federal Express

Field Logbook No. EL-1435
 Offsite Property No. A99 0284
 Bill of Lading/Air Bill No. 4235 7953 0039
 COA NH09MNY15P

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	None	Special Handling and/or Storage	
						Type of Container	No. of Container(s)
B0WK7	Other Solid	9-29-99	10:00	aG	250g	Isotopic Uranium	
SAMPLE ANALYSIS							
POSSIBLE SAMPLE HAZARDS/REMARKS None							

CHAIN OF POSSESSION

Relinquished By: DWG/ALM	Date/Time: 9/29/99 11:15	Received By: REF 1 B	Date/Time: 9/29/99 11:15
Relinquished By: REF 1 B	Date/Time: 9/30/99 1000	Received By: CHIC	Date/Time: 9/30/99 1000
Relinquished By: CHIC	Date/Time: 9/30/99	Received By: FEDEX	Date/Time: 9-30-99
Relinquished By: FedEx	Date/Time: 10-1-99 9:50	Received By: TNU H. Goldenberg	Date/Time: 10-1-99 9:30

SPECIAL INSTRUCTIONS
 COLLECTOR UNAVAILABLE TO SIGN
 COC

Matrix *
 Soil
 Water
 Vapor
 Other Solid
 Other Liquid

LABORATORY SECTION Received By: Title
FINAL SAMPLE DISPOSITION Disposal Method: Date/Time

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Inc Date/Time received 10-1-99 9:30
CoC No. B99-088-03
Container I.D. No. ERC-96-065 Requested TAT (Days) 15 P.O. Received Yes [] No []

INSPECTION

1. Custody seals on shipping container intact? Yes [] No [] N/A []
2. Custody seals on shipping container dated & signed? Yes [] No [] N/A []
3. Custody seals on sample containers intact? Yes [] No [] N/A []
4. Custody seals on sample containers dated & signed? Yes [] No [] N/A []
5. Cooler Temperature: _____ Packing material is: Wet [] Dry []
6. Number of samples in shipping container: 1
7. Number of containers per sample: 1 (Or see CoC _____)
8. Paperwork agrees with samples? Yes [] No []
9. Samples have: Tape [] Hazard labels [] Rad labels [] Appropriate sample labels []
10. Samples are: In good condition [] Leaking [] Broken Container [] Missing []
11. Describe any anomalies: _____

13. Was P.M. notified of any anomalies? Yes [] No [] Date 10-1-99
14. Received by M. Goldenberg Date: 10-1-99 Time: 9:30

LOGIN

TNU W.O. No. _____ Group No. _____ Client W.O. No. _____

PROGRAM MANAGER

Sample holding times exceeded? Yes [] No []
Client Notified: Name _____ Date/time _____