CASE NARRATIVE

RECEIVED
JAN 09 2000
EDMC

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, Washington 99352

October 20, 2000

Attention: Joan Kessner

RECEIVED
OCT 2000

Project Number	:	38683
SAF	:	B00-075
SDG	:	W03323
Number of Samples	:	one (1)
Sample Matrix	:	water
Data Deliverable	:	Summary
Date SDG Closed	:	October 12, 2000

II. Introduction

On September 28, 2000, one (1) "water" sample was received by STL-Richland and transferred to STL-St. Louis for chemical analysis. The samples were received at the St. Louis lab on 9/29/00 at a temperature of 2 degrees C. See the attached Sample Summary form for the Lab ID's and corresponding Client Ids.

III. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits.

Analyses requested:
Alkalinity – 310.1
IC Anions – 300.0
ICP Metals – 6010 TAL + add ons

Deviation from Request: There were none.

IV. Definitions

The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:

QCBLK- Quality Control Blank, Method Blank
QCLCS- Quality Control Laboratory Control Sample, Blank Spike
MS- Matrix Spike.
DUP- Matrix Duplicate
MSD- Matrix Spike Duplicate.

V. Comments

General: The term "Detection Limit" used in the analytical data reports refers to either the lab's standard reporting limits or contractually required reporting limits, whichever is applicable.

Please refer to the attached cross-reference table for the standard preparation methods used at Quanterra, St. Louis.

Metals: A Laboratory Control Sample, Method Blank, Matrix Spike and Matrix Spike Duplicate were analyzed with each preparation batch per the protocol for this analysis.

There were no comments or non-conformances associated with this data.

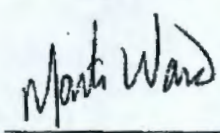
Wet Chemistry: A Laboratory Control Sample, Method Blank, Matrix Spike and Matrix Duplicate were analyzed with each preparation batch per the protocol for this analysis.

The anions were received at the lab outside of holding time. An e-mail was sent on 9/29/00 as notification.

The MS recovery for Nitrate and Nitrite were below the QC limits. The spike data was flagged with an "N" qualifier. LCS recoveries for these compounds met criteria.

I certify that this Summary is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:



Marti Ward
St. Louis Project Manager

SAMPLE SUMMARY

F0I290188

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DL9CP	001	B108D8	09/26/00	13:30

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

METHODS SUMMARY

F0I290188

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Alkalinity	MCAWW 310.1	MCAWW 310.1
Chloride	MCAWW 300.0A	MCAWW 300.0A
Fluoride	MCAWW 300.0A	MCAWW 300.0A
Inductively Coupled Plasma (ICP) Metals	SW846 6010B	SW846 3010A
Nitrate as N	MCAWW 300.0A	MCAWW 300.0A
Nitrite as N	MCAWW 300.0A	MCAWW 300.0A
Sulfate	MCAWW 300.0A	MCAWW 300.0A

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

PSL20300 SEVERN TRENT LABORATORIES, INC Run Date: 9/29/00
Page 1 CLIENT ANALYSIS SUMMARY Time: 11:54:07
STL St. Louis User Id.: CLARKEJ

CLIENT: 127642 BECHTEL HANFORD, INC. QUOTE/SAR #: 38683
PROJECT MANAGER: MARTI WARD LAB ID: F-0I290188-001
PROJECT #: 100 NR 1 TSD WORK ORDER: DL9CP
REPORT TO: Joan Kessner RECEIVING DATE: 9/29/00
P.O. NUMBER: MRC-SBB-A-19981 SAMPLING DATE: 9/26/00
SITE: B00-054 ANALYTICAL DUE DATE: 10/18/00N
AMOUNT REC"D: 2X125P,500P REPORT DUE DATE: 10/20/00
STORAGE LOC: T4B PRIORITY: 19
LOT COMMENTS: SAMPLING TIME: 13:30
MATRIX: WATER RECEIVING TIME: 9:15
SAMPLE ID: B108D8
QC PACKAGE: Special Report - see checklist SDG# : W03323
SAMPLE COMMENTS:
DUPLICATE REQUIRED FOR ANIONS AND ALKALINITY
Beginning Depth: .00 **Ending Depth:** .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Inductively Coupled Plasma (6010B)	06	9/29/00	0/00/00	3/25/01
METALS, TOTAL - Waters				
M6010_L AG,AS,BA,BE,CD,CR,CU,MG,NI,PB,SB,SR				
(I-05-QO-5I) DL9CP Protocol: A QC Program: CLIENT: HANFORD				
Chloride (300.0, Ion Chromatography)	06	9/29/00	0/00/00	10/24/00
NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION				
(I-88-CX-5I) DL9CP-1-0E Protocol: A QC Program: CLIENT: HANFORD				
Fluoride (300.0, Ion Chromatography)	06	9/29/00	0/00/00	10/24/00
NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION				
(I-88-C8-5I) DL9CP-1-0F Protocol: A QC Program: CLIENT: HANFORD				
Nitrate as N (300.0, Ion Chromatography)	06	9/29/00	0/00/00	9/28/00
NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION				
(I-88-C9-5I) DL9CP-1-0G Protocol: A QC Program: CLIENT: HANFORD				
Nitrite as N (300.0, Ion Chromatography)	06	9/29/00	0/00/00	9/28/00
NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION				
(I-88-GO-5I) DL9CP-1-0H Protocol: A QC Program: CLIENT: HANFORD				
Sulfate (300.0, Ion Chromatography)	06	9/29/00	0/00/00	10/24/00
NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION				
(I-88-CY-5I) DL9CP-1-0J Protocol: A QC Program: CLIENT: HANFORD				
Alkalinity, Total (310.1)	06	9/29/00	0/00/00	10/10/00
NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION				
(I-88-VC-5I) DL9CP-1-0K Protocol: A QC Program: CLIENT: HANFORD				

PSL20300 SEVERN TRENT LABORATORIES, INC Run Date: 9/29/00
Page 1 CLIENT ANALYSIS SUMMARY Time: 11:54:07
STL St. Louis User Id.: CLARKEJ

CLIENT: 127642 BECHTEL HANFORD, INC. QUOTE/SAR #: 38683
PROJECT MANAGER: MARTI WARD LAB ID: F-0I290188-001-D
PROJECT #: 100 NR 1 TSD WORK ORDER: DL9CP MSD
REPORT TO: Joan Kessner RECEIVING DATE: 9/29/00
P.O. NUMBER: MRC-SBB-A-19981 SAMPLING DATE: 9/26/00
SITE: B00-054 ANALYTICAL DUE DATE: 10/18/00N
AMOUNT REC'D: 2X125P,500P REPORT DUE DATE: 10/20/00
STORAGE LOC: T4B PRIORITY: 19
LOT COMMENTS: SAMPLING TIME: 13:30
MATRIX: WATER RECEIVING TIME: 9:15
SAMPLE ID: B108D8
QC PACKAGE: Special Report - see checklist SDG# : W03323
SAMPLE COMMENTS:
DUPLICATE REQUIRED FOR ANIONS AND ALKALINITY
Beginning Depth: .00 **Ending Depth:** .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Inductively Coupled Plasma (6010B)	06	9/29/00	0/00/00	3/25/01
METALS, TOTAL - Waters				
M6010_L AG,AS,BA,BE,CD,CR,CU,MG,NI,PB,SB,SR				
(I-05-QO-5I) DL9CP Protocol: A QC Program: CLIENT: HANFORD				

PSL20300 SEVERN TRENT LABORATORIES, INC Run Date: 9/29/00
Page 1 CLIENT ANALYSIS SUMMARY Time: 11:54:07
STL St. Louis User Id.: CLARKEJ

CLIENT: 127642 BECHTEL HANFORD, INC. QUOTE/SAR #: 38683
PROJECT MANAGER: MARTI WARD LAB ID: P-0I290188-001-S
PROJECT #: 100 NR 1 TSD WORK ORDER: DL9CP MS
REPORT TO: Joan Kessner RECEIVING DATE: 9/29/00
P.O. NUMBER: MRC-SBB-A-19981 SAMPLING DATE: 9/26/00
SITE: B00-054 ANALYTICAL DUE DATE: 10/18/00N
AMOUNT REC'D: 2X125P,500P REPORT DUE DATE: 10/20/00
STORAGE LOC: T4B PRIORITY: 19
LOT COMMENTS: SAMPLING TIME: 13:30
MATRIX: WATER RECEIVING TIME: 9:15
SAMPLE ID: B108D8
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Beginning Depth: .00 **Ending Depth:** .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Inductively Coupled Plasma (6010B)	06	9/29/00	0/00/00	3/25/01
METALS, TOTAL - Waters				
M6010_L AG,AS,BA,BE,CD,CR,CU,MG,NI,PB,SB,SR				
(I-05-QO-5I) DL9CP Protocol: A QC Program: CLIENT: HANFORD				
Chloride (300.0, Ion Chromatography)	06	9/29/00	0/00/00	10/24/00
NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION				
(I-88-CX-5I) DL9CP-1-1E Protocol: A QC Program: CLIENT: HANFORD				
Fluoride (300.0, Ion Chromatography)	06	9/29/00	0/00/00	10/24/00
NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION				
(I-88-C8-5I) DL9CP-1-1F Protocol: A QC Program: CLIENT: HANFORD				
Nitrate as N (300.0, Ion Chromatography)	06	9/29/00	0/00/00	9/28/00
NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION				
(I-88-C9-5I) DL9CP-1-1G Protocol: A QC Program: CLIENT: HANFORD				
Nitrite as N (300.0, Ion Chromatography)	06	9/29/00	0/00/00	9/28/00
NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION				
(I-88-GO-5I) DL9CP-1-1H Protocol: A QC Program: CLIENT: HANFORD				
Sulfate (300.0, Ion Chromatography)	06	9/29/00	0/00/00	10/24/00
NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION				
(I-88-CY-5I) DL9CP-1-1J Protocol: A QC Program: CLIENT: HANFORD				

LDT #F01280188

Q-27023 cur 1058 2 x

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B00-075-002	Page 1 of 1
Collector: T.Johansen	Company Contact: S.Trent	Telephone No.: 372-9651	Project Coordinator: TRENT, SJ	Price Code: 7N; Air Quality ☐	Data Turnaround: 45 Days
Project Designation: 618-11 Burial Ground - Groundwater Sampling	Sampling Location: 618-11		SAF No.: B00-075	
Ice Chest No.: ERC 96-082	Field Logbook No.: EL15116	COA: H618113510	Method of Shipment: ~~Fedex~~ GOV vehicle 9/26/00	
Shipped To: Severn Trent Incorporated	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS
H3 to 8,000,000 pCi/L
Sample originated from Non-RAD controlled area. <2000cpm. NO TA Required
Special Handling and/or Storage

SDG W03323

SAMPLE ANALYSIS JDI280186

Sample No.	Matrix*	Sample Date	Sample Time	Activity Scan	See item (1) in Special Instructions.	Tritium - H3	Alkalinity - 310.1	See item (2) in Special Instructions.
Preservation				None	Cool 4C	None	Cool 4C	HNO3 to pH <2
Type of Container				P	P	P	P	P
No. of Container(s)				1	1	1	1	1
Volume				20mL *	~~60mL~~ 125	~~60mL~~ 125 *	125mL	500mL
B108D8 DL75A	WATER	9-26-00	1330	X	X	X	X	X pH=1 SW 9-29-00

* = recvd. in STL-STL

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R.Thorne	9-26-00 1535	R.Thorne	9/26/00 1535
R.Thorne	9/26/00 1600	Stored in Ref 2C 3728	9/26/00 1600
Removed from Ref 2C 3728	9/28/00 0800	R.Thorne	9/26/00 0800
R.Thorne	9/28/00 1100	K.Saltenberger	9/28/00 1100
K.Saltenberger	9-28-00	[illegible] STL	09-29-00 0915
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
** There is the potential for radiological (H3) contamination as high as 8,000,000 pCi/L.
** In the event of limited sample material, sample collection and analysis will proceed on the order listed on page 4 of the Field Sampling Requirements.

(1) IC Anions - 300.0 {Chlotide, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate}
(2) ICP Metals - 6010A (TAL) {Antimony, Barium, Beryllium, Cadmium, Chromium, Copper, Magnesium, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Arsenic, Lead, Strontium (elemental)}

100 cpm

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

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

BHI-EE-011 (10/99)

STL St. Louis

6

LOT #F0129018B

Figure 1. Sample Check-in List

Date/Time Received: 9-28-00 11:00 SDG#: W03323

Work Order Number: JOI280186 SAF#: B00-075

Shipping Container ID: ~~9/28/00~~ ~~ERC96-002~~ Chain of Custody #: B00-075-002

ERC96-082

1. Outermost shipping container damaged? Yes [ ] No [✓]
2. Custody Seals on shipping container intact? Yes [✓] ~~No~~ [ ]
3. Custody Seals dated and signed? Yes [✓] ~~No~~ [ ]
4. Chain-of-Custody record present? Yes [✓] ~~No~~ [ ]
5. Chain-of-Custody includes the following information:
   - Client name — Yes [✓] ~~No~~ [ ]
   - Project name or number — Yes [ ] No [ ]
   - Sample date/time for each sample — Yes [ ] No [ ]
   - Container types, sizes and number of containers — Yes [ ] No [ ]
   - Short description of sample, i.e., matrix — Yes [ ] No [ ]
   - Analyses requested — Yes [ ] No [ ]
   - Preservation used or "none" or N/A if not applicable — Yes [ ] No [ ]
   - Date and time of relinquish and receipt — Yes [ ] No [ ]
   - Signatures of those persons relinquishing and receiving — Yes [ ] No [ ]
6. Sample numbers on chain of custody match those on sample containers? Yes [✓] ~~No~~ [ ]
7. Collection date and date of laboratory receipt are within project specific holding time requirements? Yes [✓] ~~No~~ [ ]
8. Cooler temperature: 4° C
9. Vermiculite/packing materials is: Wet [ ] Dry [✓]

10. Samples have: ✓ tape ____ hazard labels ✓ custody seals ____ appropriate sample labels

11. Samples are: ✓ in good condition ____ leaking ____ broken ____ have air bubbles

12. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
13. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: K. Ashenberg Date: 9-28-00

Telephone/Fax/E:mailed to: _____ On _____ By _____

STL St. Louis

STL St. Louis

STL
Committed to *Your* Success

Lot No.: F0I290188
W03323

Condition Upon Receipt Variance Report
St. Louis Laboratory

Client: Bechtel
Date: 09.29.00 Time: 0915
Quote No: 38683
Initiated by: Sue Hoo
Shipper/No: Airborne 0066635101 441
RFA/COC Numbers: B00-875-002

Condition/Variance (Check all that apply):

1. ☐ Sample received broken/leaking.
2. ☐ Sample received without proper preservative.
   - ☐ Cooler temperature not within 4°C ± 2°C
     Record temperature: _____
   - ☐ pH _____
   - ☐ other: _____
3. ☐ Sample received in improper container.
4. ☐ Sample received without proper paperwork. Explain: _____
5. ☐ Paperwork received without sample.
6. ☐ No sample ID on sample container.
7. ☐ Custody tape disturbed/broken/missing/not tamper evident type (circle all that apply).
8. ☐ Sample ID on container does not match sample ID on paperwork. Explain: _____
9. ☐ All coolers on airbill not received with shipment.
10. ☐ Sample volume insufficient for analysis
11. ☐ Other (explain below)

SH 09.29.00

☑ No variances were noted during sample receipt.

☐ **Cooler Temperature Upon Receipt in °C:** 2°

Temperature Variance Does Not Affect the Following Analyses: _____

Notes: Rec'd. anions out of hold time.

Corrective Action:

☒ Client's Name: Jackie Waddell/Joan Kegler Informed ~~verbally~~ email on: 9/29/00 By: MWard

☐ Client's Name: _____ Informed in writing on: _____ By: _____

☒ Sample(s) processed "as is".

☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: (or designate) Sue Hoo Date: 09.29.00

Project Management Review: MWard Date: 9.29.00

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE
THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED
IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY HIS/HER INITIALS AND THE DATE NEXT TO THAT ITEM

Form: SL-ADMIN-0004, Revised 6/21/00 SOP Reference: STL-QA-0006

LOT #F0I290188

BECHTEL HANFORD, INC.

Client Sample ID: B108D8

TOTAL Metals

Lot-Sample #...: F0I290188-001 **Matrix.....:** WATER
Date Sampled...: 09/26/00 **Date Received..:** 09/29/00

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0288150						
Antimony	ND	60.0	ug/L	SW846 6010B	10/14-10/17/00	DL9CP101
		Dilution Factor: 1		MDL.....: 39.1		
Arsenic	ND	300	ug/L	SW846 6010B	10/14-10/17/00	DL9CP102
		Dilution Factor: 1		MDL.....: 72.3		
Barium	**84.3 B**	**200**	**ug/L**	**SW846 6010B**	**10/14-10/17/00**	**DL9CP103**
		Dilution Factor: 1		MDL.....: 7.3		
Beryllium	ND	5.0	ug/L	SW846 6010B	10/14-10/17/00	DL9CP104
		Dilution Factor: 1		MDL.....: 0.60		
Cadmium	ND	5.0	ug/L	SW846 6010B	10/14-10/17/00	DL9CP105
		Dilution Factor: 1		MDL.....: 2.8		
Chromium	ND	10.0	ug/L	SW846 6010B	10/14-10/17/00	DL9CP106
		Dilution Factor: 1		MDL.....: 7.5		
Copper	ND	25.0	ug/L	SW846 6010B	10/14-10/17/00	DL9CP107
		Dilution Factor: 1		MDL.....: 6.4		
Lead	ND	100	ug/L	SW846 6010B	10/14-10/17/00	DL9CP108
		Dilution Factor: 1		MDL.....: 49.6		
Magnesium	**16800**	**5000**	**ug/L**	**SW846 6010B**	**10/14-10/17/00**	**DL9CP109**
		Dilution Factor: 1		MDL.....: 161		
Nickel	ND	40.0	ug/L	SW846 6010B	10/14-10/17/00	DL9CP10A
		Dilution Factor: 1		MDL.....: 13.3		
Silver	ND	10.0	ug/L	SW846 6010B	10/14-10/17/00	DL9CP10C
		Dilution Factor: 1		MDL.....: 7.4		
Strontium	**405**	**50.0**	**ug/L**	**SW846 6010B**	**10/14-10/17/00**	**DL9CP10D**
		Dilution Factor: 1		MDL.....: 1.8		

NOTE(S):

B Estimated result. Result is less than RL.

MATRIX SPIKE SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F0I290188 **Matrix.....:** WATER
Date Sampled...: 09/26/00 **Date Received..:** 09/29/00

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: F0I290188-001 **Prep Batch #...:** 0288150									
Antimony									
	ND	500	500	ug/L	100		SW846 6010B	10/14-10/17/00	DL9CP10L
	ND	500	495	ug/L	99	0.99	SW846 6010B	10/14-10/17/00	DL9CP10M
			Dilution Factor: 1						
Arsenic									
	ND	2000	2100	ug/L	105		SW846 6010B	10/14-10/17/00	DL9CP10N
	ND	2000	2090	ug/L	104	0.70	SW846 6010B	10/14-10/17/00	DL9CP10P
			Dilution Factor: 1						
Barium									
	84.3	2000	2140	ug/L	103		SW846 6010B	10/14-10/17/00	DL9CP10Q
	84.3	2000	2130	ug/L	102	0.62	SW846 6010B	10/14-10/17/00	DL9CP10R
			Dilution Factor: 1						
Beryllium									
	ND	50.0	54.6	ug/L	109		SW846 6010B	10/14-10/17/00	DL9CP10T
	ND	50.0	53.9	ug/L	108	1.2	SW846 6010B	10/14-10/17/00	DL9CP10U
			Dilution Factor: 1						
Cadmium									
	ND	50.0	48.5	ug/L	97		SW846 6010B	10/14-10/17/00	DL9CP10V
	ND	50.0	48.0	ug/L	96	1.1	SW846 6010B	10/14-10/17/00	DL9CP10W
			Dilution Factor: 1						
Chromium									
	ND	200	204	ug/L	102		SW846 6010B	10/14-10/17/00	DL9CP10X
	ND	200	202	ug/L	101	0.64	SW846 6010B	10/14-10/17/00	DL9CP110
			Dilution Factor: 1						
Copper									
	ND	250	272	ug/L	109		SW846 6010B	10/14-10/17/00	DL9CP111
	ND	250	265	ug/L	106	2.6	SW846 6010B	10/14-10/17/00	DL9CP112
			Dilution Factor: 1						
Lead									
	ND	500	465	ug/L	93		SW846 6010B	10/14-10/17/00	DL9CP113
	ND	500	463	ug/L	93	0.29	SW846 6010B	10/14-10/17/00	DL9CP114
			Dilution Factor: 1						
Magnesium									
	16800	50000	66200	ug/L	99		SW846 6010B	10/14-10/17/00	DL9CP115
	16800	50000	66300	ug/L	99	0.07	SW846 6010B	10/14-10/17/00	DL9CP116
			Dilution Factor: 1						

(Continued on next page)

MATRIX SPIKE SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F0I290188 **Matrix.....:** WATER
Date Sampled...: 09/26/00 **Date Received..:** 09/29/00

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Nickel									
	ND	500	483	ug/L	97		SW846 6010B	10/14-10/17/00	DL9CP117
	ND	500	482	ug/L	96	0.24	SW846 6010B	10/14-10/17/00	DL9CP118
			Dilution Factor: 1						
Silver									
	ND	50.0	52.0	ug/L	104		SW846 6010B	10/14-10/17/00	DL9CP119
	ND	50.0	50.5	ug/L	101	3.0	SW846 6010B	10/14-10/17/00	DL9CP11A
			Dilution Factor: 1						
Strontium									
	405	1000	1480	ug/L	107		SW846 6010B	10/14-10/17/00	DL9CP11C
	405	1000	1460	ug/L	105	1.1	SW846 6010B	10/14-10/17/00	DL9CP11D
			Dilution Factor: 1						

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: F0I290188 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: F0J140000-150 **Prep Batch #...:** 0288150						
Antimony	ND	60.0	ug/L	SW846 6010B	10/14-10/17/00	DM66V1A6
		Dilution Factor: 1				
Arsenic	ND	300	ug/L	SW846 6010B	10/14-10/17/00	DM66V1A7
		Dilution Factor: 1				
Barium	ND	200	ug/L	SW846 6010B	10/14-10/17/00	DM66V1A8
		Dilution Factor: 1				
Beryllium	ND	5.0	ug/L	SW846 6010B	10/14-10/17/00	DM66V1A9
		Dilution Factor: 1				
Cadmium	ND	5.0	ug/L	SW846 6010B	10/14-10/17/00	DM66V1CA
		Dilution Factor: 1				
Chromium	ND	10.0	ug/L	SW846 6010B	10/14-10/17/00	DM66V1CC
		Dilution Factor: 1				
Copper	ND	25.0	ug/L	SW846 6010B	10/14-10/17/00	DM66V1CD
		Dilution Factor: 1				
Lead	ND	100	ug/L	SW846 6010B	10/14-10/17/00	DM66V1CE
		Dilution Factor: 1				
Magnesium	ND	5000	ug/L	SW846 6010B	10/14-10/17/00	DM66V1CF
		Dilution Factor: 1				
Nickel	ND	40.0	ug/L	SW846 6010B	10/14-10/17/00	DM66V1A3
		Dilution Factor: 1				
Silver	ND	10.0	ug/L	SW846 6010B	10/14-10/17/00	DM66V1A4
		Dilution Factor: 1				
Strontium	ND	50.0	ug/L	SW846 6010B	10/14-10/17/00	DM66V1A5
		Dilution Factor: 1				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F0I290188 **Matrix.....:** WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
LCS Lot-Sample#: F0J140000-150 **Prep Batch #...:** 0288150							
Antimony	1000	1020	ug/L Dilution Factor: 1	102	SW846 6010B	10/14-10/17/00	DM66V1C7
Arsenic	1000	1050	ug/L Dilution Factor: 1	105	SW846 6010B	10/14-10/17/00	DM66V1C9
Barium	1000	1020	ug/L Dilution Factor: 1	102	SW846 6010B	10/14-10/17/00	DM66V1CG
Beryllium	1000	1080	ug/L Dilution Factor: 1	108	SW846 6010B	10/14-10/17/00	DM66V1CH
Cadmium	1000	1010	ug/L Dilution Factor: 1	101	SW846 6010B	10/14-10/17/00	DM66V1CJ
Chromium	1000	1000	ug/L Dilution Factor: 1	100	SW846 6010B	10/14-10/17/00	DM66V1CL
Copper	1000	1040	ug/L Dilution Factor: 1	104	SW846 6010B	10/14-10/17/00	DM66V1CN
Lead	1000	964	ug/L Dilution Factor: 1	96	SW846 6010B	10/14-10/17/00	DM66V1DA
Magnesium	20000	20400	ug/L Dilution Factor: 1	102	SW846 6010B	10/14-10/17/00	DM66V1CQ
Nickel	1000	994	ug/L Dilution Factor: 1	99	SW846 6010B	10/14-10/17/00	DM66V1CT
Silver	250	253	ug/L Dilution Factor: 1	101	SW846 6010B	10/14-10/17/00	DM66V1CV
Strontium	1000	1070	ug/L Dilution Factor: 1	107	SW846 6010B	10/14-10/17/00	DM66V1C8

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

BECHTEL HANFORD, INC.

Client Sample ID: B108D8

General Chemistry

Lot-Sample #...: F0I290188-001 Work Order #...: DL9CP Matrix.....: WATER
Date Sampled...: 09/26/00 Date Received..: 09/29/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	17.5 D	1.0	mg/L	MCAWW 300.0A	09/29/00	0277512
		Dilution Factor: 5		MDL.....: 0.17		
Fluoride	0.25	0.10	mg/L	MCAWW 300.0A	09/29/00	0277510
		Dilution Factor: 1		MDL.....: 0.010		
Nitrate	18.6 D	1.0	mg/L	MCAWW 300.0A	09/29/00	0277516
		Dilution Factor: 50		MDL.....: 0.53		
Nitrite	ND	0.020	mg/L	MCAWW 300.0A	09/29/00	0277514
		Dilution Factor: 1		MDL.....: 0.0074		
Sulfate	62.1 D	2.5	mg/L	MCAWW 300.0A	09/29/00	0277519
		Dilution Factor: 5		MDL.....: 0.54		
Total Alkalinity	139	5.0	mg/L	MCAWW 310.1	10/06/00	0280353
		Dilution Factor: 1		MDL.....: 2.2		

NOTE(S):

RL Reporting Limit

D Result was obtained from the analysis of a dilution.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: F0I290188 **Work Order #...:** DL9CP-SMP DL9CP-DUP **Matrix.....:** WATER

Date Sampled...: 09/26/00 **Date Received..:** 09/29/00

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride						SD Lot-Sample #: F0I290188-001		
	17.5 D	17.5 D	mg/L	0.14	(0-20)	MCAWW 300.0A	09/29/00	0277512
		Dilution Factor: 5						
Fluoride						SD Lot-Sample #: F0I290188-001		
	0.25	0.24	mg/L	1.1	(0-20)	MCAWW 300.0A	09/29/00	0277510
		Dilution Factor: 1						
Nitrate						SD Lot-Sample #: F0I290188-001		
	18.6 D	18.5 D	mg/L	0.52	(0-20)	MCAWW 300.0A	09/29/00	0277516
		Dilution Factor: 50						
Nitrite						SD Lot-Sample #: F0I290188-001		
	ND	ND	mg/L	0	(0-20)	MCAWW 300.0A	09/29/00	0277514
		Dilution Factor: 1						
Sulfate						SD Lot-Sample #: F0I290188-001		
	62.1 D	62.1	mg/L	0.087	(0-20)	MCAWW 300.0A	09/29/00	0277519
		Dilution Factor: 5						
Total Alkalinity						SD Lot-Sample #: F0I290188-001		
	139	138	mg/L	1.2	(0-20)	MCAWW 310.1	10/06/00	0280353
		Dilution Factor: 1						

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

D Result was obtained from the analysis of a dilution.

MATRIX SPIKE SAMPLE DATA REPORT

General Chemistry

Client Lot #...: F0I290188 **Matrix.....:** WATER
Date Sampled...: 09/26/00 **Date Received..:** 09/29/00

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride			Work Order #...: DL9CP11E			MS Lot-Sample #: F0I290188-001		
	17.5	20.0	37.7 D	mg/L	101	MCAWW 300.0A	09/29/00	0277512
			Dilution Factor: 10					
Fluoride			Work Order #...: DL9CP11F			MS Lot-Sample #: F0I290188-001		
	0.25	2.00	2.27	mg/L	101	MCAWW 300.0A	09/29/00	0277510
			Dilution Factor: 1					
Nitrate			Work Order #...: DL9CP11G			MS Lot-Sample #: F0I290188-001		
	18.6	2.00	19.7 N,D	mg/L	53	MCAWW 300.0A	09/29/00	0277516
			Dilution Factor: 50					
Nitrite			Work Order #...: DL9CP11H			MS Lot-Sample #: F0I290188-001		
	ND	2.00	1.22 N,D	mg/L	61	MCAWW 300.0A	09/29/00	0277514
			Dilution Factor: 10					
Sulfate			Work Order #...: DL9CP11J			MS Lot-Sample #: F0I290188-001		
	62.1	20.0	81.6 D	mg/L	97	MCAWW 300.0A	09/29/00	0277519
			Dilution Factor: 10					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

D Result was obtained from the analysis of a dilution.

N Spiked analyte recovery is outside stated control limits.

METHOD BLANK REPORT

General Chemistry

Client Lot #...: F0I290188 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride		Work Order #: DLGFL101		MB Lot-Sample #:	F0J030000-512	
	ND	0.20	mg/L	MCAWW 300.0A	09/29/00	0277512
		Dilution Factor: 1				
Fluoride		Work Order #: DLGFA101		MB Lot-Sample #:	F0J030000-510	
	ND	0.10	mg/L	MCAWW 300.0A	09/29/00	0277510
		Dilution Factor: 1				
Nitrate		Work Order #: DLGFX101		MB Lot-Sample #:	F0J030000-516	
	ND	0.020	mg/L	MCAWW 300.0A	09/29/00	0277516
		Dilution Factor: 1				
Nitrite		Work Order #: DLGFQ101		MB Lot-Sample #:	F0J030000-514	
	ND	0.020	mg/L	MCAWW 300.0A	09/29/00	0277514
		Dilution Factor: 1				
Sulfate		Work Order #: DLGG6101		MB Lot-Sample #:	F0J030000-519	
	ND	0.50	mg/L	MCAWW 300.0A	09/29/00	0277519
		Dilution Factor: 1				
Total Alkalinity		Work Order #: DLNQ1101		MB Lot-Sample #:	F0J060000-353	
	ND	5.0	mg/L	MCAWW 310.1	10/06/00	0280353
		Dilution Factor: 1				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Lot-Sample #...: F0I290188 **Matrix.....:** WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride		WO#:DLGFL102-LCS/DLGFL103-LCSD				LCS Lot-Sample#: F0J030000-512		
	1.00	0.992	mg/L	99		MCAWW 300.0A	09/29/00	0277512
	1.00	1.01	mg/L	101	1.4	MCAWW 300.0A	09/29/00	0277512
		Dilution Factor: 1						
Fluoride		WO#:DLGFA102-LCS/DLGFA103-LCSD				LCS Lot-Sample#: F0J030000-510		
	1.00	0.934	mg/L	93		MCAWW 300.0A	09/29/00	0277510
	1.00	0.958	mg/L	96	2.5	MCAWW 300.0A	09/29/00	0277510
		Dilution Factor: 1						
Nitrate		WO#:DLGFX102-LCS/DLGFX103-LCSD				LCS Lot-Sample#: F0J030000-516		
	0.200	0.198	mg/L	99		MCAWW 300.0A	09/29/00	0277516
	0.200	0.197	mg/L	99	0.04	MCAWW 300.0A	09/29/00	0277516
		Dilution Factor: 1						
Nitrite		WO#:DLGFQ102-LCS/DLGFQ103-LCSD				LCS Lot-Sample#: F0J030000-514		
	0.0800	0.0880	mg/L	110		MCAWW 300.0A	09/29/00	0277514
	0.0800	0.0840	mg/L	105	4.6	MCAWW 300.0A	09/29/00	0277514
		Dilution Factor: 1						
Sulfate		WO#:DLGG6102-LCS/DLGG6103-LCSD				LCS Lot-Sample#: F0J030000-519		
	4.00	3.75	mg/L	94		MCAWW 300.0A	09/29/00	0277519
	4.00	3.78	mg/L	94	0.86	MCAWW 300.0A	09/29/00	0277519
		Dilution Factor: 1						

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Client Lot #...: F0I290188 **Matrix.....:** WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Alkalinity	Work Order #: DLNQ1102 LCS Lot-Sample#: F0J060000-353						
	1000	954	mg/L	95	MCAWW 310.1	10/06/00	0280353
	Dilution Factor: 1						

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

SEVERN TRENT SERVICES

CERTIFICATE OF ANALYSIS

STL Richland
2800 George Washington Way
Richland, WA 99352-1613

Tel: 509 375 3131
Fax: 509 375 5590
www.stl-inc.com

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

November 3, 2000

Attention: Joan Kessner

SAF Number	:	B00-075
Date SDG Closed	:	October 12, 2000
Number of Samples	:	One (1)
Sample Type	:	Water
SDG Number	:	W03323
Data Deliverable	:	45-Day / Summary

I. Introduction

On September 28, 2000, one water sample was received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the sample was assigned the following laboratory ID number to correspond with the Bechtel Hanford, Inc. (BHI) specific ID:

STLR ID#	BHI ID#	MATRIX	DATE OF RECEIPT
9DL75A10	B108D8	WATER	9/28/00

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analysis was: **Liquid Scintillation Counting**
Tritium by method RICH-RC-5007

STL Richland is a part of Severn Trent Laboratories, Inc.

SEVERN TRENT SERVICES

STL Richland

III. Quality Control

The analytical results for each analysis performed under SDG W03323 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

Quality control sample results are reported in mg/L.

IV. Comments

Liquid Scintillation Counting

Tritium by method RICH-RC-5007:

The achieved MDAs for sample B108D8 and B108D8 duplicate do not meet the CRDL due to sample matrix effects. The detected activities exceed the achieved MDAs, therefore the data are accepted for reporting. Except as noted, the LCS, batch blank, sample and sample duplicate (B108D8) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Jackie Waddell

Jackie Waddell
Project Manager

Drinking Water Method Cross References

	DRINKING WATER METHOD CROSS REFERENCES	
Referenced Method	**Isotope(s)**	**STL Richland's SOP number**
EPA 901.1	Cs-134, I-131	RICH-RC-5017
EPA 900.0	Alpha & Beta	RICH-RC-5014
EPA 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr89/90	RICH-RC-5006
ASTM D2460-70	Total Radium	RICH-RC-5027
Standard Method 7500-U-C & ASTM D57174-91	Uranium	RICH-RC-5058
Tritium	Tritium	RICH-RC-5007
NOTE:		
The Gross Alpha LCS is prepared with Am-241 (unless otherwise specified in the case narrative)		
The Gross Beta LCS is prepared with Sr/Y-90 (unless otherwise specified in the case narrative)		

Uncertainty Estimation

STL Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, R = constants * f(x,y,z,...). The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties (u_i) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty (u_c) multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value (S/vn), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

SEVERN TRENT SERVICES

STL Richland

SAMPLE RESULTS

LAB NAME:	**STL Richland**		**SDG: /RPT GRP:**	W03323 / 11835
LOT,RPT DB ID:	J0I280186-1	9DL75A10	**MATRIX:**	WATER
CLIENT ID:	B108D8		**DATE RECEIVED:**	9/28/00 11:00:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	RPT UNIT	YIELD	METHOD NUMBER	WORK ORDE	BAT-CH
H-3	6.09E+06		1.5E+04	2.5E+05	5.24E+02	pCi/L	100.00%	RICHRC5007	DL75A1	0287194

Number of Results: 1

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

SEVERN TRENT SERVICES

STL Richland

DUPLICATE RESULTS

LAB NAME:	**STL Richland**		**SDG: /RPT GRP:**	W03323 / 11835
LOT,RPT DB ID:	J0I280186-1	DL75A12R	**MATRIX:**	WATER
CLIENT ID:	B108D8 DUP		**DATE RECEIVED:**	9/28/00 11:00:00 A
ORIG LAB ID:	9DL75A10			

ANALYTE	DUP RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
H-3	6.05E+06		1.5E+04	2.5E+05	5.20E+02	pCi/L	100.00%	RICHRC5007	6.09E+06	0.76%

Number of Results: 1

Result = IDL When Not Detecte

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL

Severn Trent Laboratories Richland
rptChemRadDup; v3.41

SEVERN TRENT SERVICES

STL Richland

BLANK RESULTS

LAB NAME: STL Richland **SDG /RPT GRP:** W03323 / 11835

LOT,RPT DB ID: J0J130000-194 DM4A91DB **MATRIX:** WATER

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	RPT UNIT	YIELD	METHOD NUMBER	WORK ORDE	BAT-CH
H-3	2.14E+02	U	2.5E+01	2.3E+02	3.44E+02	pCi/L	100.00%	RICHRC5007	DM4A9	0287194

Number of Results: 1

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL

SEVERN TRENT SERVICES

STL Richland

BLANK RESULTS

LAB NAME: STL Richland **SDG /RPT GRP:** W03323 / 11835

LOT,RPT DB ID: J0J130000-194 DM4A91FX **MATRIX:** WATER

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	RPT UNIT	YIELD	METHOD NUMBER	WORK ORDE	BAT-CH
H-3	8.68E+01	U	1.1E+01	2.2E+02	3.47E+02	pCi/L	100.00%	RICHRC5007	DM4A9	0287194

Number of Results: 1

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < IDL

SEVERN TRENT SERVICES

STL Richland

LABORATORY CONTROL SAMPLE

LAB NAME:	**STL Richland**	**SDG: /RPT GRP:**	W03323 / 11835
LAB SAMPLE ID:	DM4A91CS	**MATRIX:**	WATER

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
H-3	2.71E+03		1.9E+02	4.0E+02	3.45E+02	pCi/L	100.00%	2.73E+03	99.08%

Number of Results: 1

Result = IDL When Not Detecte

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL

SEVERN TRENT SERVICES

STL Richland

LABORATORY CONTROL SAMPLE

LAB NAME: STL Richland **SDG: /RPT GRP:** W03323 / 11835

LAB SAMPLE ID: DM4A91EM **MATRIX:** WATER

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
H-3	2.80E+03		1.9E+02	4.0E+02	3.44E+02	pCi/L	100.00%	2.73E+03	102.56%

Number of Results: 1

SEVERN TRENT SERVICES

Data Review Checklist
RADIOCHEMISTRY

Lot Number: JOI 280 186				
Client ID: BNI				
Due Date: 11-13-00				
QC Batch Number: 0287194			SDG Number: 3323	
Method Test Parameter: Tritium				
Matrix: Water				
Review Item	Yes (√)	No (√)	N/A (√)	2nd Level Review (√)
A. Calibration 1. Is the calibration documentation included where applicable?			✓	✓
B. Sample Analysis 1. Are the sample yields within acceptance criteria?			✓	
2. Were all sample holding times met?	✓			
3. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓			
C. QC Samples 1. Is the blank yield within acceptance criteria?			✓	
2. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓			
3. Does the blank result meet the Contract criteria?	✓			
4. Is the blank result < the Contract Detection Limit?	✓			
5. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓	
6. Is the LCS result within acceptance criteria?	✓			
7. Is the LCS yield within acceptance criteria?			✓	
8. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓			
9. Do the MS/MSD results and yields meet acceptance criteria?			✓	
10. Do the duplicate sample results and yields meet acceptance criteria?	✓			
D. Other 1. Are all Nonconformances included and noted?			✓	
2. Are all required forms filled out?	✓			
3. Was the correct methodology used?	✓			
4. Was transcription checked?	✓			
5. Were all calculations checked at a minimum frequency?	✓			
6. Were units checked?	✓			

Comments on any "No" response: DL75A101 results > MDA > CRDL

First Level Review: Pam Kenitzer Date: 10-26-00

Second Level Review: Jackie Waddell Date: 10/30/00

000011

CHAIN OF CUSTODY

Q-27023

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B00-075-002	Page 1 of 1
Collector: T.Johansen	Company Contact: S.Trent	Telephone No.: 372-9651	Project Coordinator: TRENT, SJ	Price Code: 7N; Data Turnaround: 45 Days
Project Designation: 618-11 Burial Ground - Groundwater Sampling	Sampling Location: 618-11		SAF No.: B00-075	Air Quality: ☐
Ice Chest No.: ERC 96-082	Field Logbook No.: EL 15116	COA: H618113510	Method of Shipment: ~~Fedex~~ Gov vehicle 9/26/00	
Shipped To: Severn Trent Incorporated	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

H3 to 8,000,000 pCi/L

Sample originated from Non-RAD Controlled area. <2000pCi/g. NO TA Required

Special Handling and/or Storage

SDG W03323

SAMPLE ANALYSIS JDI280186

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	None	Cool 4C	None	Cool 4C	HNO3 to pH <2					
				Type of Container	P	P	P	P	P					
				No. of Container(s)	1	1	1	1	1					
				Volume DWS 9/15/00	20mL *	~~60mL~~ 125	~~60mL~~ 125 *	125mL	500mL					
					Activity Scan	See item (1) in Special Instructions.	Tritium - H3	Alkalinity - 310.1	See item (2) in Special Instructions.					
B108D8 DL75A	WATER	9-26-00	1330		X	X	X	X	X					

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By	Date/Time	Received By	Date/Time
T.Johansen	9-26-00 1535	R.Thoren	9/26/00 1535
R.Thoren	9/26/00 1600	Stored in Ref 2C 3728	9/26/00 1600
Removed from Ref 2C 3728	9/28/00 0800	R.Thoren	9/26/00 0800
R.Thoren	9/28/00 1100	K.Achtenberg	9/28/00 1100

SPECIAL INSTRUCTIONS

** There is the potential for radiological (H3) contamination as high as 8,000,000 pCi/L.
** In the event of limited sample material, sample collection and analysis will proceed on the order listed on page 4 of the Field Sampling Requirements.

(1) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate}
(2) ICP Metals - 6010A (TAL) {Antimony, Barium, Beryllium, Cadmium, Chromium, Copper, Magnesium, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Arsenic, Lead, Strontium (elemental)}

10CC/pm

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

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

BHI-EE-011 (10/99)

T 13

Figure 1. Sample Check-in List

Date/Time Received: 9-28-00 11:00 SDG#: W03323

Work Order Number: JOI280186 SAF#: B00-075

Shipping Container ID: ~~9/28/00~~ ~~B00-075-002~~ Chain of Custody #: B00-075-002

ERC 96-082

1. Outermost shipping container damaged? Yes [ ] No [✓]
2. Custody Seals on shipping container intact? Yes [✓] No [ ]
3. Custody Seals dated and signed? Yes [✓] No [ ]
4. Chain-of-Custody record present? Yes [✓] No [ ]
5. Chain-of-Custody includes the following information:
   - Client name — Yes [✓] No [ ]
   - Project name or number — Yes [ ] No [ ]
   - Sample date/time for each sample — Yes [ ] No [ ]
   - Container types, sizes and number of containers — Yes [ ] No [ ]
   - Short description of sample, i.e., matrix — Yes [ ] No [ ]
   - Analyses requested — Yes [ ] No [ ]
   - Preservation used or "none" or N/A if not applicable — Yes [ ] No [ ]
   - Date and time of relinquish and receipt — Yes [ ] No [ ]
   - Signatures of those persons relinquishing and receiving — Yes [ ] No [ ]
6. Sample numbers on chain of custody match those on sample containers? Yes [✓] No [ ]
7. Collection date and date of laboratory receipt are within project specific holding time requirements? Yes [✓] No [ ]
8. Cooler temperature: 4 °C
9. Vermiculite/packing materials is: Wet [ ] Dry [✓]

10. Samples have:	✓ tape	____ hazard labels
	✓ custody seals	____ appropriate sample labels
11. Samples are:	✓ in good condition	____ leaking
	____ broken	____ have air bubbles

12. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
13. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: K. Ashenberg Date: 9-28-00

Telephone/Fax/E:mailed to: _____ On _____ By _____

Client Sample Screening Results

02-Oct-00

(B) 10/2/00

CLIENT CODE	ID	MATRIX	RECEIVED	DETECTOR	ACQ DATE	SAMPLE	MINUTES	CNTS A	NET CPM A	CNTS B	NET CPM B
BHI	B108D8DL75A		9/28/2000 3:59:00 PM	QUAD22A	10/2/2000 2:12:00 PM	B108D8DL75A	30	5	0.086666667	79	1.67666667
	DL75A	LIQUID		Bkg:	9/29/2000 2:01:52 AM	BKG	600	48	0.08	574	0.95666667

Anl Date: 10/2/00 Tot Sa, Alq: 2.50E-01 , 1.00E+01 Alp; (Dpm/ 2.11E-01 (uCi/ 2.38E-06 (pCi/ 9.50E+00 + 2.0E+01 CAT 2.6E+00 Lab

Ppt mg: 3.4 ✓ Units: L ✓ , ml ✓ Bet; Alq): 3.09E+00 Sa): 3.48E-05 L|g): 1.39E+02 + 2.5E+01 I ✓ 3.6E-01 Alq L|g

0.0015

RQC053

Parent Batch:
Associated Batches:
:
:
:
:

Severn Trent Laboratories, Inc.
Information Sheet Rad Prep

****
* *
* QC BATCH: 0287194 *
* *
****

W03323

S6: Tritium by Liquid Scint
AR: H-3 Prp/SepRC5007
5I: CLIENT: HANFORD

Run Date: 10/13/00
Time: 9:47:14

Analytical Due Date: 11/13/00

Project Manager: JW2

Lot# / Work Order	Client	Analyt Matrix	Due	Client Aliquot	Name / Geometry	Count Time	Mid/Ave Date/Time	Tracer ID / Spike ID	CRDL	Units	Screen Info - (Ci) Alpha	Beta	PM Bin
J0I280186-001 DL75A-1-01	WATER	11/13/00		Bechtel .0000	Hanford,	.000	9/26/00 13:30		400	pCi/L	**NYS 105-09/00	**NYS	JW2
Comments: WATER													
J0I280186-001 X DL75A-1-02	WATER	11/13/00		Bechtel .0000	Hanford,	.000	9/26/00 13:30		400	pCi/L	**NYS 105-09/00	**NYS	JW2
Comments: WATER													
J0J130000-194 B DM4A9-1-AA	WATER	11/13/00			Bechtel Hanford,		9/26/00 13:30		400	pCi/L	**NA	**NA	JW2
Comments:													
J0J130000-194 C DM4A9-1-AC	WATER	11/13/00			Bechtel Hanford,		9/26/00 13:30		400	pCi/L	**NA	**NA	JW2
Comments:													
J0J130000-194 B DM4A9-1-AD	WATER	11/13/00			Bechtel Hanford,		9/26/00 13:30		400	pCi/L	**NA	**NA	JW2
Comments:													
J0J130000-194 C DM4A9-1-AE	WATER	11/13/00			Bechtel Hanford,		9/26/00 13:30		400	pCi/L	**NA	**NA	JW2
Comments:													
J0J130000-194 B DM4A9-1-AF	WATER	11/13/00			Bechtel Hanford,		9/26/00 13:30		400	pCi/L	**NA	**NA	JW2
Comments:													
J0J130000-194 B DM4A9-1-AG	WATER	11/13/00			Bechtel Hanford,		9/26/00 13:30		400	pCi/L	**NA	**NA	JW2
Comments:													

2 PELLETS NAOH REQUIRED
FOR ALL SAMPLES.
M. J.
10/20/00

****
* QC BATCH: 0287194 *
****

Total Number of Samples In Batch: 00008

Batch Information: Dry Wt: N | Decay Correct: Y | Blank Sub: None | Call In:

Uncert: Both | Sigma: 1.960 | ODR: Target List + Other Detected

BLANK CRDL		Tracer Yield	Type	QC Control Limits
Tritium	400		RPD	

** NYS = Not Yet Screened
** NA = Not Applicable
** Other = Other than Gross Alpha or Gross Beta
++ Indicates that Batch Information has changed for this sample. Print worksheet for details.

L100