

COVER LETTER

Tuesday, August 26, 2008

Rick Beauheim
Sandia National Lab
4100 National Parks Hwy.
MS1395
Carlsbad, NM 88220

TEL: (505) 234-0006
FAX (505) 234-0061

RE: WIPP/USGS-4

Order No.: 0807447

Dear Rick Beauheim:

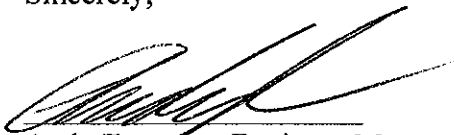
Hall Environmental Analysis Laboratory, Inc. received 1 sample(s) on 7/31/2008 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,



Andy Freeman, Business Manager
Nancy McDuffie, Laboratory Manager

NM Lab # NM9425
AZ license # AZ0682
ORELAP Lab # NM100001



Hall Environmental Analysis Laboratory, Inc.

Date: 26-Aug-08

CLIENT: Sandia National Lab
Lab Order: 0807447
Project: WIPP/USGS-4
Lab ID: 0807447-01

Client Sample ID: USGS-4 (C)-073008
Collection Date: 7/30/2008 12:15:00 PM
Date Received: 7/31/2008
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: SLB
Fluoride	2.3	1.0		mg/L	10	8/1/2008 10:11:03 AM
Chloride	1100	10		mg/L	100	7/31/2008 6:44:06 PM
Nitrogen, Nitrite (As N)	ND	1.0		mg/L	10	8/1/2008 10:11:03 AM
Bromide	ND	1.0		mg/L	10	8/1/2008 10:11:03 AM
Nitrogen, Nitrate (As N)	ND	1.0		mg/L	10	8/1/2008 10:11:03 AM
Phosphorus, Orthophosphate (As P)	ND	5.0		mg/L	10	8/1/2008 10:11:03 AM
Sulfate	1400	50		mg/L	100	7/31/2008 6:44:06 PM
EPA METHOD 6010B: DISSOLVED METALS						Analyst: TES
Calcium	600	50		mg/L	50	8/15/2008 1:13:06 PM
Magnesium	120	5.0		mg/L	5	8/15/2008 2:50:55 PM
Potassium	15	5.0		mg/L	5	8/15/2008 2:50:55 PM
Sodium	650	50		mg/L	50	8/15/2008 1:13:06 PM
Strontium	5.8	0.30		mg/L	50	8/23/2008 12:36:10 PM
SM 2320B: ALKALINITY						Analyst: TAF
Alkalinity, Total (As CaCO3)	31	20		mg/L CaCO3	1	8/6/2008
Carbonate	ND	2.0		mg/L CaCO3	1	8/6/2008
Bicarbonate	31	20		mg/L CaCO3	1	8/6/2008
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: KMS
Specific Conductance	5100	0.010		µmhos/cm	1	8/4/2008
SM4500-H+B: PH						Analyst: KMS
pH	6.36	0.1		pH units	1	8/1/2008
SM 2540C TOTAL DISSOLVED SOLIDS						Analyst: KMS
Total Dissolved Solids	4100	100		mg/L	1	8/4/2008

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

CATION/ANION BALANCE SHEET FOR WATER ANALYSES

HEAL LAB NUMBER	USGS-4 (C) -073008 0807447-1									
CATIONS	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L
Sodium	650	28.27								
Potassium	15	0.38								
Calcium	600	29.94								
Magnesium	120	9.88								
Total Cations		68.47								
ANIONS	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L
Sulfate	1400	29.15								
Chloride	1100	31.03								
Bicarbonate (CaCO3)	31	0.62								
Carbonate (CaCO3)	ND	*								
Phosphate (P)	ND	*								
Nitrite (N)	ND	*								
Nitrate (N)	ND	*								
Fluoride	2.3	0.12								
Bromide	ND	*								
Total Anions		60.92								
Elect. Cond. (µMhos/cm)	5100									
CATION/ANION RATIO		1.12								
% Difference		6								
TOTAL DISSOLVED SOLIDS RATIOS										
TDS (measured)	4100									
TDS (calculated)	3906									
Ratio meas TDS:calc TDS		1.0								
Ratio Meas. TDS:EC		0.80								
Ratio Calc. TDS:EC		0.77								
Ratio of anion sum:EC		1.2								
Ratio of cation sum:EC		1.3								

* Analyte not detected (below method detection limit).

** Values below 0.55 can be obtained in waters containing appreciable concentrations of free acid or alkalinity, or not within pH 6 to 9. Values much higher than 0.7 are possible in highly saline waters.

GENERALLY ACCEPTED RANGES

Cation/Anion balance: 0-3 meq/L- 0.2 meq/L, 3-10 meq/L- 2%, >10 meq/L - 5%

Ratio measured TDS:calculated TDS -- 1.0-1.2. Ratio Calculated TDS:EC -- 0.55-0.7. Ratio Measured TDS:EC--0.55-0.7. Ratio of anion sum:EC -- 0.9-1.1.

Ratio of cation sum:EC -- 0.9-1.1

QA/QC SUMMARY REPORT

Client: Sandia National Lab
Project: WIPP/USGS-4

Work Order: 0807447

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
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Method: EPA Method 300.0: Anions

Sample ID: MB		MBLK			Batch ID: R29675	Analysis Date: 7/31/2008 9:44:27 AM
Fluoride	ND	mg/L	0.10			
Chloride	ND	mg/L	0.10			
Nitrogen, Nitrite (As N)	ND	mg/L	0.10			
Bromide	ND	mg/L	0.10			
Nitrogen, Nitrate (As N)	ND	mg/L	0.10			
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50			
Sulfate	ND	mg/L	0.50			

Sample ID: MB		MBLK			Batch ID: R29597	Analysis Date: 8/1/2008 9:18:48 AM
Fluoride	ND	mg/L	0.10			
Chloride	ND	mg/L	0.10			
Nitrogen, Nitrite (As N)	ND	mg/L	0.10			
Bromide	ND	mg/L	0.10			
Nitrogen, Nitrate (As N)	ND	mg/L	0.10			
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50			
Sulfate	ND	mg/L	0.50			

Sample ID: LCS		LCS			Batch ID: R29575	Analysis Date: 7/31/2008 10:01:52 AM
Fluoride	0.5480	mg/L	0.10	110	90	110
Chloride	5.003	mg/L	0.10	100	90	110
Nitrogen, Nitrite (As N)	1.059	mg/L	0.10	106	90	110
Bromide	2.614	mg/L	0.10	105	90	110
Nitrogen, Nitrate (As N)	2.508	mg/L	0.10	100	90	110
Phosphorus, Orthophosphate (As P)	5.142	mg/L	0.50	103	90	110
Sulfate	10.30	mg/L	0.50	103	90	110

Sample ID: LCS		LCS			Batch ID: R29597	Analysis Date: 8/1/2008 9:36:13 AM
Fluoride	0.5057	mg/L	0.10	101	90	110
Chloride	5.033	mg/L	0.10	101	90	110
Nitrogen, Nitrite (As N)	0.9635	mg/L	0.10	96.3	90	110
Bromide	2.497	mg/L	0.10	99.9	90	110
Nitrogen, Nitrate (As N)	2.617	mg/L	0.10	105	90	110
Phosphorus, Orthophosphate (As P)	4.861	mg/L	0.50	97.2	90	110
Sulfate	10.09	mg/L	0.50	101	90	110

Method: SM 2320B: Alkalinity

Sample ID: MB		MBLK			Batch ID: R29640	Analysis Date: 8/6/2008
Alkalinity, Total (As CaCO3)	ND	mg/L CaC	20			
Carbonate	ND	mg/L CaC	2.0			
Bicarbonate	ND	mg/L CaC	20			

Sample ID: LCS		LCS			Batch ID: R29640	Analysis Date: 8/6/2008
Alkalinity, Total (As CaCO3)	81.00	mg/L CaC	20	98.8	80	120

Qualifiers:

E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	S	Spike recovery outside accepted recovery limits

QA/QC SUMMARY REPORT

Client: Sandia National Lab

Project: WIPP/USGS-4

Work Order: 0807447

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 6010B: Dissolved Metals									
Sample ID: MB		<i>MBLK</i>							
Calcium	ND	mg/L	1.0						
Magnesium	ND	mg/L	1.0						
Potassium	ND	mg/L	1.0						
Sodium	ND	mg/L	1.0						
Sample ID: MB		<i>MBLK</i>							
Strontium	ND	mg/L	0.0060						
Sample ID: LCS		<i>LCS</i>							
Calcium	50.57	mg/L	1.0	100	80	120			
Magnesium	51.11	mg/L	1.0	101	80	120			
Potassium	53.87	mg/L	1.0	97.9	80	120			
Sodium	54.06	mg/L	1.0	107	80	120			
Sample ID: LCS		<i>LCS</i>							
Strontium	0.09873	mg/L	0.0060	98.7	80	120			

Method: SM 2540C Total Dissolved Solids

Sample ID: MB-16678		<i>MBLK</i>							
Total Dissolved Solids	ND	mg/L	20						
Sample ID: LCS-16678		<i>LCS</i>							
Total Dissolved Solids	1018	mg/L	20	102	80	120			

Qualifiers:

- E Value above quantitation range
- J Analyte detected below quantitation limits
- R RPD outside accepted recovery limits
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name SANDIA CARLSBAD

Date Received:

7/31/2008

Work Order Number 0807447

Received by:

ARS

Checklist completed by:

[Signature]
Signature

7/31/08
Date

Sample ID labels checked by:

AT
Initials

Matrix:

Carrier name FedEx

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present Not Shipped
- Custody seals intact on sample bottles? Yes No N/A
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Water - VOA vials have zero headspace? No VOA vials submitted Yes No
- Water - Preservation labels on bottle and cap match? Yes No N/A
- Water - pH acceptable upon receipt? Yes No N/A

1° <6° C Acceptable
If given sufficient time to cool.

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: *210 RB cations + Sr for metals analysis pH 7/31/08*

added .25 mLs HNO3 to 2 x 125 mL HNO3 bottles for acceptable pH

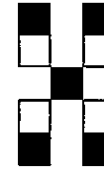
Corrective Action _____

CHAIN-OF-CUSTODY RECORD

Accreditation Applied:

NELAC USACE

Other: _____



HALL ENVIRONMENTAL ANALYSIS LABORATORY

4901 Hawkins NE, Suite D
Albuquerque, New Mexico 87109
Tel. 505.345.3975 Fax 505.345.4107
www.hallenvironmental.com

Client: *Sandus National Laboratories*

Project Name: *WIPP / USGS-4*

Address: *4100 Nat'l Parks Hwy
Carlsbad, NM 88220*

Project #: *98806 / 1.4.2.3*

Project Manager: *Richard Beauchien*

Phone #: *(575) 234-0026*

Sampler: *Michael Hillshim (mlh)*

Fax #: *(575) 234-0061*

Sample Temperature: *1°*

ANALYSIS REQUEST

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative			HEAL No.
					HCl ₂	HNO ₃	H ₂ SO ₄	
<i>07/30/08</i>	<i>1215</i>	<i>H₂O</i>	<i>USGS-4(L)-073007</i>	<i>1 / 500 mL</i>	<i>X</i>			<i>0807447</i>
<i>07/30/08</i>	<i>1215</i>	<i>H₂O</i>	<i>USGS-4(C)-073008</i>	<i>2 / 125 mL</i>			<i>X</i>	<i>-1</i>
<i>07/30/08</i>	<i>1215</i>	<i>H₂O</i>	<i>USGS-4(C)-073009</i>	<i>3 / 125 mL</i>		<i>X</i>		<i>-1</i>
<i>07/30/08</i>	<i>1215</i>	<i>H₂O</i>	<i>USGS-4(C)-073010</i>	<i>4 / 125 mL</i>	<i>X</i>			<i>-1</i>
<i>— last sample collected —</i>								

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B MDD (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	EDC (Method 802.1)	8310 (PNA or PAH)	RCRA 8 Metals	Cations (Na, K, Ca, Mg) / Metals	Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	8081 Pesticides / PCB's (8082)	8260 (VOA)	8270 (Semi-VOA)	<i>pH, cond, alk., TDS</i>	<i>NO₂ + NO₃</i>	<i>Stream flow</i>	Air Bubbles or Headspace (Y or N)
									<i>X</i>				<i>X</i>			
														<i>X</i>		
							<i>X</i>									
																<i>X</i>

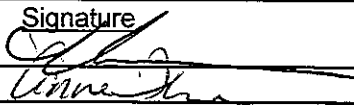

Date: *7/30/08* Time: *2:46 pm* Relinquished By: (Signature) *[Signature]*

Remarks: *[Signature] 8:50 7/31/08*

Remarks: *• Samples #344 are filtered
• samples may contain high salts
• 48-hr hold time for P*

Appendix A

0807447

ACTIVITY/ PROJECT SPECIFIC PROCEDURE <small>Sandia National Laboratories</small>		<h1>Chain of Custody</h1>				Form Number: SP 13-1-1	
1. Initial Sample Custodian <u>Michael B. Hillesheim</u> <small>Printed Name</small>		Organization: <u>6712</u>		Date: <u>07/30/08</u>		Page <u>1</u> of <u>1</u> <small>Attach more forms as needed</small>	
2. Sample Collection or Creation Information		Scientific Notebook ID: <u>LTM#3</u>			Sample Team Members/Organization.		
Test Plan ID: <u>TP 03-01</u>		Field Log ID: <u>N/A</u>			<u>Michael B. Hillesheim/ SNL-6712</u>		
Sample Location: <u>Gnome Site well USGS-4</u> <small>i.e. borehole/core no./lab bldg. no./etc...</small>					<u>N/A</u> <small>enter n/a if none</small>		
3. Sample Identification	Date Collected	Container Type	Volume	Preservative	Analysis Request	Sample Description	
USGS-4(C) 073008	07/30/08	PE Bottle	500 ml	None	Anions, pH, TDS, Cond., Alk.	USGS-4 Culebra water unpreserved	
USGS-4(C) 073008	07/30/08	PE Bottle	125 ml	H2SO4	NO2+NO3	USGS-4 Culebra water preserved w/ sulfuric acid	
USGS-4(C) 073008	07/30/08	PE Bottle	125 ml	HNO3	Cations, Metals	USGS-4 Culebra water filtered & preserved w/ nitric acid	
USGS-4(C) 073008	07/30/08	PE Bottle	125 ml	HNO3	Strontium	USGS-4 Culebra water filtered & preserved w/ nitric acid	
--End of Sample List--							
<small>enter n/a if none</small>							
4. Sample Requirements							
Handling: <u>Keep sealed until use</u>							
Storage & Preservation: <u>Keep chilled/refrigerated</u>							
Shipping: <u>Hand carry/Fed Ex</u>							
Archive: <u>N/A</u>							
Disposition: <u>Discard samples upon completion of testing</u>							
Expiration Date: <u>12/01/06</u>							
5. Custody Transfer		Printed Name		Signature		Organization/Company	
a. Relinquished by:		<u>Michael B. Hillesheim</u>				<u>SNL/6712</u>	
a. Received by:		<u>Anne Thorne</u>				<u>HEAL</u>	
b. Relinquished by:							
b. Received by:							
c. Relinquished by:							
c. Received by:							
Upon sample receipt, note condition. This form (copy for your records) shall follow samples through its life, until final disposition, then send original to WIPP Records Center. For samples that are potentially hazardous & require packaging and shipping, contact Center 6800 ES&H Coordinator or see SNL ES&H Manual, Chpt. 12.							