

April 14, 2006



DuPont Engineering 325 West Main Street Suite 1202 Louisville, KY 40202 502-569-7093 Tel 502-569-7898 Fax

Mr. Christopher Saari Hydrogeologist Northern Region Remediation and Redevelopment State of Wisconsin Department of Natural Resources (WDNR) Ashland Service Center, 2501 Golf Course Road Ashland, Wisconsin 54806

INITIAL PERCHLORATE GROUNDWATER SAMPLING RESULTS

October 2005 Groundwater Sampling Event Former DuPont Barksdale Works Site Barksdale, Wisconsin (BRRTS #02-04-000156)

Dear Mr. Saari:

Attached to this letter report are the final analytical results from an on-site groundwater sampling event conducted at the Former DuPont Barksdale Works site in October 2005. The purpose of this sampling event was to determine if the perchlorate anion is present in groundwater beneath the site. This sampling was conducted voluntarily by E.I. du Pont de Nemours and Company (DuPont) after historical site documentation was discovered that indicated Chilean sodium nitrate may have been used as a raw material for nitric acid production at the facility. The wells sampled during this event were chosen as representing potential perchlorate sources (nitric acid production lines and off-specification product/waste disposal sites) indicated by historic plant documentation. Figure 1 shows the locations of the wells selected for sampling.

Background

DuPont's research of historical plant documents was the basis for evaluating the perchlorate anion in the groundwater. A letter from the early 1900s between a former DuPont manager and a Chilean chemist provides indication of a possible connection between the Former DuPont Barksdale Works and Chilean sodium nitrate. Chilean sodium nitrate deposits have been found to contain naturally-occuring perchlorate and have been reportedly imported into the United States since at least the late 1800s for wide-spread use as fertilizer, for saltpeter used in gunpowder, and as a feedstock to making nitric acid, explosives, fireworks, and additional end products.

Field Sampling Procedures

Ten groundwater monitoring wells and two potable wells on the Former Barksdale Works were sampled for perchlorate. Samples were collected using low flow sampling techniques with dedicated bladder pump systems. Purge water was passed through a flow cell and field quality parameters were measured with a Horiba U-22 multiparameter water quality monitoring system. A summary of the field quality parameters at sampling time is available in Table 1. During fieldwork it was noted that the dissolved oxygen (DO) sensor probe was not functioning properly; therefore, the reported values may not be representative of actual DO concentrations at the time the samples were collected.

Mr. Christopher Saari WDNR April 14, 2006 Page 2 of 2

Thirteen groundwater samples were collected, which consisted of a single sample from each of the 12 wells and a single quality assurance/quality control (QA/QC) field duplicate sample. The samples were shipped overnight to Severn Trent Laboratories (STL) in Denver, Colorado where they were analyzed for perchlorate concentrations using USEPA SW-846 method 8321A (liquid chromatography/tandem mass spectrometry). A summary of the analytical results is in Table 2. The laboratory data deliverables were evaluated using DuPont's in-house data review protocol. No significant QC exceptions or analytical problems were noted during the review process. A summary of the QA review and the STL data reports are presented in Appendix A.

Results

The perchlorate anion was detected in seven of the 12 wells sampled at concentrations ranging from 0.033 micrograms per liter (μ g/L) or parts per billion to 150 μ g/L (Table 2). However, perchlorate was not detected in either of the potable wells sampled (Clubhouse and PZ-16). Concentrations of perchlorate were reported as estimated values (J qualified) by the laboratory in samples from monitoring wells PZ-20D, PZ-26D, PZ-26S, and PZ-44S because the results fell between the laboratory method detection limit and practical quantitation (i.e., reporting) limit.

Summary and Conclusions

Results of the October 2005 sampling indicate that the perchlorate anion is present in groundwater beneath the site. However, whether the presence of perchlorate in groundwater is attributable to former plant operations can not be determined from this sampling event. Irrespective of its source, perchlorate was only detected in monitoring wells that are not used as sources of potable water. Hence, there is no exposure to the perchlorate in the site groundwater, and thus no associated health risk.

DuPont will conduct further sampling as part of the planned 2006 investigation activities that will address the potential source of perchlorate detected in groundwater. If you have any questions regarding this letter report, please call either me (502-217-1531) or Mr. Cary Pooler (502-217-1534).

Sincerely, & Rooler Ark:

Bradley S. Nave Project Director DuPont Corporate Remediation Group

Enclosures:	
Table 1	Summary of Field Measured Water Quality Parameters - October 2005
Table 2	Summary of Results - Perchlorate October 2005 Sampling Event
Figure 1	Initial Perchlorate Sampling Locations - October 2005
Appendix A	Barksdale Works - October 2005 Initial Perchlorate Sampling Event

cc: P. Bretting, C.G. Bretting Mfg., Inc. H. Nehls-Lowe, Wisconsin DHFS
A. Lindsey, Bayfield County Health Dept. C. Pooler, J. Hammerberg, - URSD Project #7553 TABLES

Table 1 Summary of Field Measured Water Quality Parameters at Sample Time INITIAL PERCHLORATE GROUNDWATER SAMPLING RESULTS October 2005 Groundwater Sampling Event Former DuPont Barksdale Works Site Barksdale, Wisconsin

	LOCATION										
	PZ-10-O	PZ-10-D	PZ-20-O	PZ-20-D	PZ-26-O	PZ-26-D	PZ-39-D	PZ-41-0	PZ-44-0	PZ-45-0	
MEASUREMENT											
Date Collected	10/13/2005	10/14/2005	10/14/2005	10/14/2005	10/14/2005	10/14/2005	10/13/2005	10/14/2005	10/14/2005	10/14/2005	
Time Collected	18:20	13:15	1118	11:50	15:00	14:25	16:50	12:30	10:32	9:43	
VOCs (ppm)	NIR	NIR	NIR	NIR	NIR	NIR	NIR	NIR	NIR	NIR	
Water Level (ft) Top of Riser	10.24	34.9	31.7	46.91	41.3	39.76	26.41	23.46	23.71	43.58	
Water Level at Stabilization (ft) Top of Riser	23:24	36.2	32.11	47.39	42.6	39.93	27.24	31	24.07	46.24	
Purge Rate (mL/min)	300	250	225	350	400	300	200	325	250	200	
Purge Time (min)	30	20	25	20	20	20	20	20	25	40	
pH (SU)	7.4	8.04	7.43	7.73	7.46	7.88	6	7.37	7.22	7.29	
Temp (C)	9.3	8.7	9.8	9.7	8.9	9.4	8.8	9.6	10.5	9	
Conductivity (mS/cm)	0.87	0.25	149	0.16	0.77	0.2	2.7	1.8	1.2	1.1	
Dissolved Oxygen	0.00*	0.00*	4.31*	0.00*	5.27*	4.03*	0.00*	0.00*	4.55*	0.00*	
Redox Potential (mV)	-61	59	149	-109	142	100	166	21	138	-140	
Turbidity (NTU)	680	110	35	0	150	30	18	150	9	74	
Color	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	
Odor	None	None	None	None	None	None	None	None	None	None	
QA/QC		MS/MSD				DUP					
COC Number	50484	50485 50488	50483	50484	50485	50483 50487	50484	50483	50483	50484	

* During fieldwork it was noted that the dissolved oxygen (DO) sensor probe was not functioning properly therefore the reported values may not be representative.

NIR-No Instrument Response PPM-Parts Per Million Ft-Feet ml/min-Milliliters Per Minute SU–Standard Units C–Degrees Celcius mS/cm–Milli-siemens Per Centimeter mg/L–Milligrams Per Liter or PPM mV-Millivolts NTU-Nephelometric Turbidity Unit

4/14/2006

Table 2

Summary of Results INITIAL PERCHLORATE GROUNDWATER SAMPLING RESULTS October 2005 Groundwater Sampling Event Former DuPont Barksdale Works Site Barksdale, Wisconsin

Sample Location	Date	Units	Result
PZ-10D	10/14/05	μg/l	< 0.033
PZ-10S	10/13/05	μg/l	<0.033 U
PZ-20D	10/14/05	μg/l	0.063 J
PZ-20S	10/14/05	μg/l	1.4
PZ-26D	10/14/05	μg/1	0.035 J
PZ-26D-duplicate	10/14/05	μg/l	< 0.033
PZ-26S	10/14/05	μg/l	0.033 J
PZ-39D	10/13/05	μg/l	150
PZ-41S	10/14/05	μg/l	19
PZ-44S	10/14/05	μg/l	0.055 J
PZ-45S	10/14/05	μg/l	<0.033
CLUBHOUSE-INFLOW ⁽¹⁾	11/15/05	μg/l	<0.0022
PZ-16-POT-INFLOW ⁽¹⁾	11/15/05	μg/l	<0.0022

Samples analyzed on total basis using EPA protocol SW-846 8321A

(1) = Well is used for potable water supply

 $\mu g/l = micrograms$ per liter or parts per billion

< = Analyte not detected at stated detection limit

U = Analyte not detected at specified reporting limit

J = Estimated value (results fell between the laboratory method detection limit and practical quantitation) Bold– Analyte detected

FIGURES



APPENDIX A Laboratory Reports

Memorandum

DATE: JANUARY 26, 2006

TO: Cary A. Pooler, URS Diamond

FROM: Sharon A. Nordstrom

RE: FORMER BARKSDALE WORKS- PERCHLORATES SAMPLING 10/05

Enclosed is the data report for the well samples collected on October 13-14, 2005 for the analyses listed below. The samples were submitted to Severn Trent Laboratories (STL) in Denver, CO for the analyses listed below:

Matrix	Laboratory	Analysis	Analytical Method
Groundwater	STL- Denver	Perchlorates	SW 846 8321A

Sample Arrival and Receipt

All samples were received at the laboratory within temperature and holding time requirements. No sample breakage was reported upon sample receipt.

QC Findings and Comments

The STL-Denver data deliverables included both a hard-copy report and an electronic data file. All electronic data was reviewed via the automated DuPont Data Review (DDR) process. No significant QC exceptions were noted during the review process. All QC spikes were recovered within the acceptance windows. No field or equipment blank samples were submitted with the sample set, however the laboratory method blanks analyzed with the samples had no perchlorates detected above the reporting limit. Several samples required dilutions to bring the perchlorate concentration within the calibration range of the instrument. The reporting limit for these samples was adjusted accordingly.

Positive results between the MDL and PQL were qualified with a J and should be considered estimated values.

Please do not hesitate to contact me if you have any questions regarding this report.

BARKSDALE WORKS PERCHLORATES SAMPLING 10/05

January 26, 2006

Prepared for

Cary A. Pooler (URS Diamond-Louisville)

Prepared by

URS Diamond Laboratory Services – Sharon A. Nordstrom Barley Mill Plaza, Building 27 Wilmington, DE 19805

DuPont In-House Review (DDR)

The DDR is an automated internal review process used by the ADQM group to determine if the data is usable. The data is run through this automated program where a series of checks are performed on the data. The data is evaluated against hold time criteria, checked for blank contamination, assessed against matrix spike(MS)/matrix spike duplicate (MSD) recoveries, assessed against relative percent differences (RPDs) between these samples, assessed against laboratory control sample(LCS)/control sample duplicate (LCSD) recoveries, assessed against RPDs between these samples, assessed against surrogate spike recoveries. The DDR applies the following data qualifiers to analysis results, as warranted:

Qualifier	Definition
В	Not detected substantially above the level reported in the laboratory or field blanks.
R	Unusable result. Analyte may or may not be present in the sample.
J	Analyte present. Reported value may not be accurate or precise.
UJ	Not detected. Reporting limit may not be accurate or precise.

Laboratory Qualifiers

The laboratory may have applied one or more of the following data qualifiers to analysis results, as warranted:

DIL	The concentration is estimated or not reported due to dilution or to the presence of interfering analytes.
NC	The recovery and or RPD were not calculated.
J	Estimated value; result falls between method detection limit (mdl)
	and practical quantitation limit (pql).
U	Analyte was not detected at the specified reporting limit
В	Analyte concentration is not significantly greater than that detected in
	an associated method blank.
J	Estimated value; result falls between method detection limit (mdl)
	and practical quantitation limit (pql).
*	Surrogate recovery is outside stated control limits.
J	Method blank contamination. The associated method blank contains
	the target analyte at a reportable level.
В	Estimated result. Result is less than reporting limit (RL)
Q	Elevated reporting limit. The reporting limit is elevated because
	sample dilution was required to bring target compounds within
	calibration range of the analytical system.
G	Elevated reporting limit. The reporting limit is elevated because
	sample dilution was required for analysis due to matrix interference.

These lab qualifiers are applied independent of DuPont In-House Data Review (DDR) qualifiers.

Corporate Environmental Database DDR Narrative Report

Site: BAR - BARKSDALE WORKS Project: PERCHLORATE SAMPLING 10/05 Reporting Limit: MDL DDR Standards LABSTATS 1/26/2006 15:23:31 Page 1 of 1

The reported result is greater than/equal to the MDL and less than the PQL; it should be considered an estimated value.

Sample ID	Date Sampled	Lab ID	Method Code	Analyte	Result	Units	MDL	PQL	Qual
BAR-G-PZ-20D	10/14/2005	HMT3R1-AA F	8321A	PERCHLORATE	0.063	UG/L	0.033	0.20	J
BAR-G-PZ-26D	10/14/2005	HMT3X1-AA FS	8321A	PERCHLORATE	0.035	UG/L	0.033	0.20	J
BAR-G-PZ-26S	10/14/2005	HMT381-AA FS	8321A	PERCHLORATE	0.033	UG/L	0.033	0.20	J
BAR-G-PZ-44S	10/14/2005	HMT321-AA FS	8321A	PERCHLORATE	0.055	UG/L	0.033	0.20	J

Corporate Environmental Database Lab Analysis Report Summary of Positive Results with In-House Qualifier and Review

Site: BAR - BARKSDALE WORKS Project: PERCHLORATE SAMPLING 10/05 Reporting Limit: MDL

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Analyte/Paramete	r	Result	In- Lab house Re- Qual Qual view	Unit	MDL	PQL	Method
Sampling Point: Date sampled:	PZ-20D Oct 14, 2005	Sampleno: Sample type:	BAR-G-PZ-20D Groundwater				
PERCHLORATE		0.063	J - J	UG/L	0.033	0.20	8321A
Sampling Point: Date sampled:	PZ-20S Oct 14, 2005	Sampleno: Sample type:	BAR-G-PZ-20S Groundwater				
PERCHLORATE		1.4		UG/L	0.033	0.20	8321A
Sampling Point: Date sampled:	PZ-26D Oct 14, 2005	Sampleno: Sample type:	BAR-G-PZ-26D Groundwater				
PERCHLORATE		0.035	JJ	UG/L	0.033	0.20	8321A
Sampling Point: Date sampled:	PZ-26S Oct 14, 2005	Sampleno: Sample type:	BAR-G-PZ-26S Groundwater				
PERCHLORATE		0.033	J J	UG/L	0.033	0.20	8321A
Sampling Point: Date sampled:	PZ-39D Oct 13, 2005	Sampleno: Sample type:	BAR-G-PZ-39D Groundwater	,			
PERCHLORATE		150		UG/L	3.3	20	8321A
Sampling Point: Date sampled:	PZ-41S Oct 14, 2005	Sampleno: Sample type:	BAR-G-PZ-41S Groundwater				
PERCHLORATE		19		UG/L	0.33	2.0	8321A
Sampling Point: Date sampled:	PZ-44S Oct 14, 2005	Sampleno: Sample type:	BAR-G-PZ-44S Groundwater				
PERCHLORATE		0.055	ך ך 	UG/L	0.033	0.20	8321A

Site: BARKSDALE WORKS Project: PERCHLORATE SAMPLING 10/05 Reporting Limit: MDL

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Location: Date Sampled: Lab Sample ID:	CLUBHOUSE-INFLOW 11/15/2005 08:20:00 HP98E1	Field Sample ID: BAR-G-CLUBHOUSE-INFLOW Sample Type: Groundwater							
Analysis Method:	8321A	Prep Metho	d: MET	HOD					
					Inho	use			Date
Analyte/Parameter		Dilution	Result	Qual	Qual	Unit	MDL	PQL	Analyzed
<u>Analytes</u>									
PERCHLORATE		1	< 0.0022			UG/L	0.0022	0.010	Nov 16, 2005
Location:	PZ-10D			Field Samp	le ID:	BAR-G-PZ-10D			
Date Sampled: Lab Sample ID:	10/14/2005 13:15:00 HMT361			Sample ⁻	Гуре:	Groundwater			
Analysis Method:	8321A	Prep Metho	d: METH	HOD					
					Inho	use			Date
Analyte/Parameter		Dilution	Result	Qual	Quai	Unit	MDL	PQL	Analyzed
<u>Analytes</u>									
PERCHLORATE		1	< 0.033			UG/L	0.033	0.20	Oct 21, 2005
Location:	PZ-10S			Field Samp	le ID:	BAR-G-PZ-10S			
Date Sampled:	10/13/2005 18:20:00			Sample	Туре:	Groundwater			
Lab Sample ID:	HMT3N1								
Analysis Method:	8321A	Prep Metho	od: METI	HOD					
					Inho	use			Date
Analyte/Parameter		Dilution	Result	Quai	Qual	Unit	MDL	PQL	Analyzed
Analytes									
PERCHLORATE		1	< 0.033	,		UG/L	0.033	0.20	Oct 22, 2005

Site: BARKSDALE WORKS Project: PERCHLORATE SAMPLING 10/05 Reporting Limit: MDL

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Location: Date Sampled: Lab Sample ID:	PZ-16-POT-INFLOW 11/15/2005 08:40:00 HP97R1	Field Sample ID: BAR-G-PZ-16-POT-INFLOW Sample Type: Groundwater							
Analysis Method:	8321A	Prep Metho	d: METH	HOD					
		-			Inho	use			Date
Analyte/Parameter		Dilution	Result	Qual	Qual	Unit	MDL	PQL	Analyzed
<u>Analytes</u> PERCHLORATE		1 <	0.0022			UG/L	0.0022	0.010	Nov 16, 2005
Location: Date Sampled:	PZ-20D 10/14/2005 11:50:00			Field Samp Sample ⁻	le ID: Type:	BAR-G-PZ-20D Groundwater			
Lab Sample ID:	HMT3R1								
Analysis Method:	8321A	Prep Metho	d: METH	HOD					
					Inho	use			Date
Analyte/Parameter		Dilution	Result	Qual	Qual	Unit	MDL	PQL	Analyzed
<u>Analytes</u>									
PERCHLORATE		1	0.063	ſ	J	UG/L	0.033	0.20	Oct 21, 2005
Location:	PZ-20S			Field Samp	le ID:	BAR-G-PZ-20S			
Date Sampled:	10/14/2005 11:18:00			Sample	Гуре:	Groundwater			
Lab Sample ID:	HMT3V1								
Analysis Method:	8321A	Prep Metho	d: MET	HOD					
					Inho	use			Date
Analyte/Parameter		Dilution	Result	Qual	Qual	Unit	MDL	PQL	Analyzed
<u>Analytes</u>									
PERCHLORATE		1	1.4			UG/L	0.033	0.20	Oct 21, 2005

Site: BARKSDALE WORKS Project: PERCHLORATE SAMPLING 10/05 Reporting Limit: MDL

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Location: Date Sampled: Lab Sample ID:	PZ-26D 10/14/2005 14:25:00 HMT331	Field Sample ID: BAR-G-PZ-26D-DUP Sample Type: Groundwater							
Analysis Method:	8321A	Prep Metho	d: METH	OD					
					Inho	use			Date
Analyte/Parameter		Dilution	Result	Qual	Qual	Unit	MDL	PQL	Analyzed
<u>Analytes</u>									
PERCHLORATE		1 <	< 0.033			UG/L	0.033	0.20	Oct 21, 2005
Location:	PZ-26D			Field Samp	le ID:	BAR-G-PZ-26D			
Date Sampled:	10/14/2005 14:25:00			Sample [·]	Гуре:	Groundwater			
Lab Sample ID:	HMT3X1								
Analysis Method:	8321A	Prep Metho	d: METH	OD					
					Inho	use			Date
Analyte/Parameter		Dilution	Result	Qual	Qual	Unit	MDL	PQL	Analyzed
<u>Analytes</u>									
PERCHLORATE									
		1	0.035	J	J	UG/L	0.033	0.20	Oct 21, 2005
Location:	PZ-26S	1	0.035	J Field Samp	J le ID:	UG/L BAR-G-PZ-26S	0.033	0.20	Oct 21, 2005
Location: Date Sampled:	PZ-26S 10/14/2005 15:00:00	1	0.035	J Field Samp Sample	J le ID: Type:	UG/L BAR-G-PZ-26S Groundwater	0.033	0.20	Oct 21, 2005
Location: Date Sampled: Lab Sample ID:	PZ-26S 10/14/2005 15:00:00 HMT381		0.035	J Field Samp Sample	J le ID: Type:	UG/L BAR-G-PZ-26S Groundwater	0.033	0.20	Oct 21, 2005
Location: Date Sampled: Lab Sample ID: Analysis Method:	PZ-26S 10/14/2005 15:00:00 HMT381 8321A	1 Prep Metho	0.035	J Field Samp Sample	J le ID: Type:	UG/L BAR-G-PZ-26S Groundwater	0.033	0.20	Oct 21, 2005
Location: Date Sampled: Lab Sample ID: Analysis Method:	PZ-26S 10/14/2005 15:00:00 HMT381 8321A	1 Prep Metho	0.035	J Field Samp Sample	J le ID: Type: Inho	UG/L BAR-G-PZ-26S Groundwater	0.033	0.20	Oct 21, 2005
Location: Date Sampled: Lab Sample ID: Analysis Method: Analyte/Parameter	PZ-26S 10/14/2005 15:00:00 HMT381 8321A	1 Prep Metho Dilution	0.035 od: METH Result	J Field Samp Sample OD Qual	J le ID: Type: Inho Qual	UG/L BAR-G-PZ-26S Groundwater use Unit	0.033	0.20 PQL	Oct 21, 2005
Location: Date Sampled: Lab Sample ID: Analysis Method: Analyte/Parameter <u>Analytes</u>	PZ-26S 10/14/2005 15:00:00 HMT381 8321A	1 Prep Metho Dilution	o.o35 od: METH Result	J Field Samp Sample OD Qual	J le ID: Type: Inho Qual	UG/L BAR-G-PZ-26S Groundwater use Unit	0.033 MDL	0.20	Oct 21, 2005

Site: BARKSDALE WORKS Project: PERCHLORATE SAMPLING 10/05 Reporting Limit: MDL

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Location:	PZ-39D			Field Samp	le ID:	BAR-G-PZ-39	Ð		
Date Sampled:	10/13/2005 16:50:00			Sample ⁻	Гуре:	Groundwater			
Lab Sample ID:	HMT3L1								
Analysis Method:	8321A	Prep Metho	d: METH	IOD					
		Inhouse							Date
Analyte/Parameter		Dilution	Result	Qual	Qual	Unit	MDL	PQL	Analyzed
Analytes									
PERCHLORATE		100	150			UG/L	3.3	20	Oct 22, 2005
Location:	PZ-41S			Field Samp	le ID:	BAR-G-PZ-41	IS		
Date Sampled:	10/14/2005 12:30:00			Sample	Туре:	Groundwater			
Lab Sample ID:	HMT301								
Analysis Method:	8321A	Prep Metho	d: METH	HOD					
		-			Inho	use			Date
Analyte/Parameter		Dilution	Result	Qual	Qual	Unit	MDL	PQL	Analyzed
Analytes									
PERCHLORATE		10	19			UG/L	0.33	2.0	Oct 22, 2005
Location:	PZ-44S			Field Samp	le ID:	BAR-G-PZ-44	IS		
Date Sampled:	10/14/2005 10:32:00			Sample	Type:	Groundwater			
Lab Sample ID:	HMT321				•••				
Analysis Method:	8321A	Prep Metho	d: METH	HOD					
		•			Inho	use			Date
Analyte/Parameter		Dilution	Result	Qual	Qual	Unit	MDL	PQL	Analyzed
Analytes									
PERCHLORATE		1	0.055	J	J	UG/L	0.033	0.20	Oct 22, 2005

Site: BARKSDALE WORKS Project: PERCHLORATE SAMPLING 10/05 Reporting Limit: MDL

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Location:	PZ-45S		Fi	eld Samp	le ID:	BAR-G-PZ-	45S		
Date Sampled:	10/14/2005 09:43:00			Sample 1	Гуре:	Groundwate	er		
Lab Sample ID:	HMT3H1								
Analysis Method:	8321A	Prep Meth	od: METHO)					
					Inhou	ISE			Date
Analyte/Parameter		Dilutio	n Result	Qual	Qual	Unit	MDL	PQL	Analyzed
Analytes									
PERCHLORATE		1	< 0.033			UG/L	0.033	0.20	Oct 21, 2005

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Corporate Environmental Database Lab Analysis QAQC Report

Site: BARKSDALE WORKS Project: PERCHLORATE SAMPLING 10/05

METHOD 8321A 21-OCT-05 5294138 LCMS1 Batch Identifier 158548 Method Number: 8321A Prep Method: METHOD Pre-prep: Batch Start Date: 10/21/2005 Intrument: LCMS1 Batch Number: RPD RPR Limits Analyte/Parameter MDL PQL RPR RPD Result Unit Min Max Max Sample Type LCS Lab Sample ID: HM9JR1-AC LCS Lab: QES-DEN PERCHLORATE 78 1.06 UG/L 0.033 NS 106 118 Sample Type MB Lab Sample ID: HM9JR1-AA MB Lab: QES-DEN PERCHLORATE 0.033 < 0.033 UG/L 0.20 Sample Type MS Lab Sample ID: HMT361-AC MS Lab: QES-DEN PERCHLORATE 138 1.15 UG/L 0.033 NS 115 65 Sample Type MSD Lab Sample ID: HMT361-AD MSD Lab: QES-DEN PERCHLORATE UG/L NS 1.16 0.033 116 65 138 1.2 29 The following field samples are included in this batch: Sampleno Datesmpl Lab Id Lab BAR-G-PZ-10D 10/14/2005 HMT361-AA FS QES-DEN BAR-G-PZ-10S 10/13/2005 HMT3N1-AA FS **QES-DEN** BAR-G-PZ-20D 10/14/2005 HMT3R1-AA FS **QES-DEN** HMT3V1-AA FS BAR-G-PZ-20S 10/14/2005 **QES-DEN** BAR-G-PZ-26D 10/14/2005 HMT3X1-AA FS **QES-DEN** BAR-G-PZ-26D-DUP 10/14/2005 HMT331-AA FS **QES-DEN** BAR-G-PZ-26S 10/14/2005 HMT381-AA FS **QES-DEN** BAR-G-PZ-39D 10/13/2005 HMT3L1-AA FS QES-DEN HMT301-AA FS QES-DEN BAR-G-PZ-41S 10/14/2005 BAR-G-PZ-44S 10/14/2005 HMT321-AA FS **QES-DEN** BAR-G-PZ-45S 10/14/2005 HMT3H1-AA FS **QES-DEN** METHOD 8321A 16-NOV-05 5320330 LCMS1 Batch Identifier 159715 Method Number: 8321A Prep Method: METHOD Pre-prep: Batch Start Date: 11/16/2005 Intrument: LCMS1 Batch Number: **RPR Limits** RPD PQL Analyte/Parameter Result Unit MDL RPR Min Max RPD Max Sample Type LCS Lab Sample ID: HQAAP1-AC LCS Lab: QES-DEN PERCHLORATE 0.0925 UG/L 0.0022 NS 92 70 140 Lab Sample ID: HQAAP1-AA MB Lab: QES-DEN Sample Type MB PERCHLORATE < 0.0022 UG/L 0.0022 0.010 Sample Type Lab: QES-DEN MS Lab Sample ID: HP97R1-AC MS PERCHLORATE 0.0022 0.0908 UG/L NS 91 59 140 Sample Type MSD Lab Sample ID: HP97R1-AD MSD Lab: QES-DEN PERCHLORATE 0.0907 UG/L 0.0022 NS 91 59 140 0.13 20 The following field samples are included in this batch:

SamplenoDatesmplLab IdLabBAR-G-CLUBHOUSE-INFLOW11/15/2005HP98E1-AA FSQES-DENBAR-G-PZ-16-POT-INFLOW11/15/2005HP97R1-AA FSQES-DEN

1/27/2006 Page 1 of 1

SEVERN TRENT STL

STL Denver 4955 Yarrow Street Arvada, CO 80002

Tel: 303 736 0100 Fax: 303 431 7171 www.stl-inc.com

ANALYTICAL REPORT

E. I. DuPont Project: Barksdale Site Perchlorate Sampling 10/05 7035-507553-772000 LBIO-65332

Release No. STL17175

Lot #: D5J150185

Attn: ADQM URS-Diamond Barley Mill Plaza, Building 27 Lancaster Pike & Route 141 Wilmington, DE 19805

Severn Trent Laboratories, Inc./STL Denver

Gail DeRuzzo Project Manager

October 28, 2005

Table Of Contents

Standard Deliverables with Supporting Documentation

Report Contents

Number of Pages

Standard Deliverables

(The Cover Letter and the Report Cover page are considered integral parts of this Standard Deliverable package. This report is incomplete unless all pages indicated in this Table of Contents are included.)

- Table of Contents
- Case Narrative
- Executive Summary Detection Highlights
- Methods Summary
- Method/Analyst Summary
- Lot Sample Summary
- Analytical Results
- QC Data Association Summary
- Chain-of-Custody

Supporting Documentation

(Note: A one-page "Description of Supporting Documentation" is provided at the beginning of this section.).

- Volatile GC/MS
- Semivolatile GC/MS
- Volatile GC
- Semivolatile GC
- LC/MS or HPLC
- Metals
- General Chemistry
- Subcontracted Data

Check below when supporting documentation is present.

Case Narrative D5J150185

The following report contains the analytical results for eleven solid samples received at STL Denver on October 15, 2005, according to documented sample acceptance procedures.

Dilution factors and footnotes have been provided on each datasheet to assist in the interpretation of the results.

STL Denver utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated. A summary of QC data for these analyses is included at the rear of the report.

The results included in this report have been reviewed for compliance with the Laboratory Quality Manual. All results have been found to meet all requirements of NELAC and any exceptions are noted below. STL Denver's State of Wisconsin certification number is 999615430.

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SUPPLEMENTAL QC INFORMATION

Sample Arrival and Receipt

The samples presented in this report were received at a temperature of 2.9°C. All sample containers were received in an acceptable condition.

The one water sample listed on the chain of custody was transferred to a different lot for reporting.

Perchlorate - Method 8321A

Samples BAR-S-PZ-39D and BAR-S-PZ-41S were analyzed at dilutions to obtain the target analyte within the calibration range of the instrument. The reporting limits were adjusted accordingly.

There were no anomalies noted.

EXECUTIVE SUMMARY - Detection Highlights

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D5J150185

PARAMETER		RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
BAR-G-PZ-39D 10/13/05 16:50	002				
Perchlorate		150	20	ug/L	SW846 8321A
BAR-G-PZ-20D 10/14/05 11:50	004				
Perchlorate		0.063 J	0.20	ug/L	SW846 8321A
BAR-G-PZ-20S 10/14/05 11:18	005				
Perchlorate		1.4	0.20	ug/L	SW846 8321A
BAR-G-PZ-26D 10/14/05 14:25	006				
Perchlorate		0.035 J	0.20	ug/L	SW846 8321A
BAR-G-PZ-41S 10/14/05 12:30	007				
Perchlorate		19	2.0	ug/L	SW846 8321A
BAR-G-PZ-44S 10/14/05 10:32	008				
Perchlorate		0.055 J	0.20	ug/L	SW846 8321A
BAR-G-PZ-26S 10/14/05 15:00	011				
Perchlorate		0.033 J	0.20	ug/L	SW846 8321A

METHODS SUMMARY

D5J150185

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD	
LCMS by 8321A	SW846 8321A	SW846 8321A	
References:			

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

METHOD / ANALYST SUMMARY

D5J150185

ANALYTICAL		ANALYST
METHOD	ANALYST	<u>ID</u>
SW846 8321A	Steve Cowling	008738
References:		

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

SAMPLE SUMMARY

D5J150185

			SAMPLED	SAMP
<u>wo </u> #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
HMT3H	001	BAR-G-PZ-45S	10/14/05	09:43
HMT3L	002	BAR-G-PZ-39D	10/13/05	16:50
HMT3N	003	BAR-G-PZ-10S	10/13/05	18:20
HMT3R	004	BAR-G-PZ-20D	10/14/05	11:50
HMT3V	005	BAR-G-PZ-20S	10/14/05	11:18
нмтзх	006	BAR-G-PZ-26D	10/14/05	14:25
HMT30	007	BAR-G-PZ-41S	10/14/05	12:30
HMT32	008	BAR-G-PZ-44S	10/14/05	10:32
HMT33	009	BAR-G-PZ-26D-DUP	10/14/05	14:25
HMT36	010	BAR-G-PZ-10D	10/14/05	13:15
HMT38	011	BAR-G-PZ-26S	10/14/05	15:00

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.

Client Sample ID: BAR-G-PZ-45S

Lot-Sample #:	D5J150185-001	Work Order #:	HMT3H1AA	Matrix		WATER
Date Sampled:	10/14/05 09:43	Date Received:	10/15/05			
Prep Date:	10/21/05	Analysis Date:	10/21/05			
Prep Batch #:	5294138	Analysis Time:	13:01			
Dilution Factor:	1					
		Method:	SW846 83212	7		
			REPORTING			
PARAMETER		RESULT	LIMIT	UNITS	MDL	
Perchlorate		ND	0.20	ug/L	0.033	

Client Sample ID: BAR-G-PZ-39D

Lot-Sample #: I	D5J150185-002	Work Order #:	HMT3L1AA	Matrix	. .	WATER
Date Sampled:	10/13/05 16:50	Date Received:	10/15/05			
Prep Date:	10/21/05	Analysis Date	10/22/05			
Prep Batch #: 5	5294138	Analysis Time. :	07:14			
Dilution Factor: 3	100					
		Method:	SW846 83212	Ŧ		
			REPORTING			
PARAMETER		RESULT	LIMIT	UNITS	MDL	
Perchlorate		150	20	ug/L	3.3	

Client Sample ID: BAR-G-PZ-10S

Lot-Sample #:	D5J150185-003	Work Order #:	HMT3N1AA	Matrix		WATER
Date Sampled:	10/13/05 18:20	Date Received:	10/15/05			
Prep Date:	10/21/05	Analysis Date:	10/22/05			
Prep Batch #:	5294138	Analysis Time:	07:30			
Dilution Factor:	1					
		Method	SW846 8321	đ		
			REPORTING			
PARAMETER		RESULT	LIMIT	UNITS	MDL	
Perchlorate		ND	0.20	ug/L	0.033	

Client Sample ID: BAR-G-PZ-20D

HPLC

Lot-Sample #:	D5J150185-004	Work Order #:	HMT3R1AA	Matrix	<i></i> :	WATER
Date Sampled:	10/14/05 11:50	Date Received:	10/15/05			
Prep Date:	10/21/05	Analysis Date:	10/21/05			
Prep Batch #:	5294138	Analysis Time:	13:49			
Dilution Factor:	l					
		Method	SW846 83212	Ą		
			REPORTING			
PARAMETER		RESULT	LIMIT	UNITS	MDL	
Perchlorate		0.063 J	0.20	ug/L	0.033	

NOTE(S):

J Estimated result. Result is less than RL.

Client Sample ID: BAR-G-PZ-20S

 \mathbf{HPLC}

Lot-Sample #:	D5J150185-005	Work Order #:	HMT3V1AA	Matrix		WATER
Date Sampled:	10/14/05 11:18	Date Received:	10/15/05			
Prep Date:	10/21/05	Analysis Date:	10/21/05			
Prep Batch #:	5294138	Analysis Time:	14:05			
Dilution Factor:	1					
		Method:	SW846 8321	A		
			REPORTING			
PARAMETER		RESULT	LIMIT	UNITS	MDL	
Perchlorate		1,4	0.20	ug/L	0.033	

Client Sample ID: BAR-G-PZ-26D

HPLC

Lot-Sample #:	D5J150185-006	Work Order #:	HMT3X1AA	Matrix		WATER
Date Sampled:	10/14/05 14:25	Date Received:	10/15/05			
Prep Date:	10/21/05	Analysis Date:	10/21/05			
Prep Batch #:	5294138	Analysis Time:	14:21			
Dilution Factor:	1					
		Method:	SW846 83212	A		
			REPORTING			
PARAMETER		RESULT	LIMIT	UNITS	MDL	
Perchlorate		0.035 J	0.20	ug/L	0.033	

NOTE(S):

J Estimated result. Result is less than RL.

Client Sample ID: BAR-G-PZ-41S

HPLC

Lot-Sample #:	D5J150185-007	Work Order #:	HMT301AA	Matrix		WATER
Date Sampled:	10/14/05 12:30	Date Received:	10/15/05			
Prep Date:	10/21/05	Analysis Date:	10/22/05			
Prep Batch #:	5294138	Analysis Time:	07:46			
Dilution Factor:	10					
		Method:	SW846 8321	A		
			REPORTING			
PARAMETER		RESULT	LIMIT	UNITS	MDL	
Perchlorate		19	2.0	ug/L	0.33	

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Client Sample ID: BAR-G-PZ-44S

HPLC

Lot-Sample #:	D5J150185-008	Work Order #:	HMT321AA	Matrix.		WATER
Date Sampled:	10/14/05 10:32	Date Received:	10/15/05			
Prep Date:	10/21/05	Analysis Date:	10/22/05			
Prep Batch #:	5294138	Analysis Time:	08:02			
Dilution Factor:	1					
		Method:	SW846 83217	7		
			REPORTING			
PARAMETER		RESULT	LIMIT	UNITS	MDL	
Perchlorate		0.055 J	0.20	ug/L	0.033	

NOTE (S):

J Estimated result. Result is less than RL.

Client Sample ID: BAR-G-PZ-26D-DUP

Lot-Sample #:	D5J150185-009	Work Order #:	HMT331AA	Matrix		WATER
Date Sampled:	10/14/05 14:25	Date Received:	10/15/05			
Prep Date:	10/21/05	Analysis Date:	10/21/05			
Prep Batch #:	5294138	Analysis Time:	15:26			
Dilution Factor:	1					
		Method:	SW846 83212	ŕ		
			REPORTING			
PARAMETER		RESULT	LIMIT	UNITS	MDL	······································
Perchlorate		ND	0.20	ug/L	0.033	

Client Sample ID: BAR-G-PZ-10D

Lot-Sample #:	D5J150185-010	Work Order #:	HMT361AA	Ma	trix:	WATER
Date Sampled:	10/14/05 13:15	Date Received:	10/15/05			
Prep Date:	10/21/05	Analysis Date:	10/21/05			
Prep Batch #:	5294138	Analysis Time:	15:42			4
Dilution Factor:	1					
		Method:	SW846 8321	A		
			REPORTING			
PARAMETER		RESULT	LIMIT	UNITS	MDL	
Perchlorate		ND	0.20	ug/L	0.033	

Client Sample ID: BAR-G-PZ-26S

HPLC

Lot-Sample #:	D5J150185-011	Work Order #:	HMT381AA	Matrix		WATER
Date Sampled:	10/14/05 15:00	Date Received:	10/15/05			
Prep Date:	10/21/05	Analysis Date:	10/21/05			
Prep Batch #:	5294138	Analysis Time:	16:30			
Dilution Factor:	1					
		Method:	SW846 83212	Ŧ		
			REPORTING			
PARAMETER	· · · · · · · · · · · · · · · · · · ·	RESULT	LIMIT	UNITS	MDL	
Perchlorate		0.033 J	0.20	ug/L	0.033	

NOTE(S):

J Estimated result. Result is less than RL.

QC DATA ASSOCIATION SUMMARY

D5J150185

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WATER	SW846 8321A		5294138	5294083
002	WATER	SW846 8321A		5294138	5294083
003	WATER	SW846 8321A		5294138	5294083
004	WATER	SW846 8321A		5294138	5294083
005	WATER	SW846 8321A		5294138	5294083
006	WATER	SW846 8321A		5294138	5294083
007	WATER	SW846 8321A		5294138	5294083
008	WATER	SW846 8321A		5294138	5294083
009	WATER	SW846 8321A		5294138	5294083
010	WATER	SW846 8321A		5294138	5294083
011	WATER	SW846 8321A		5294138	5294083

METHOD BLANK REPORT

HPLC

Client Lot #: MB Lot-Sample #:	D5J150185 R5J210000-138	Work Order #	.: HM9JR1A	Ŧ	Matr	ix	:	WATER
_		Prep Date	: 10/21/0	A Matrix: WATER 5 Analysis Time: 12:29 UNITS METHOD UQ/L SW846 8321A				
Analysis Date: Dilution Factor:	10/21/05 1	Prep Batch #	: 5294138			_		
			REPÓRTING					
PARAMETER		RESULT	LIMIT	UNITS	·]	METHOD		
Perchlorate		ND	0.20	ug/L		SW846 8	321A	

NOTE(S):

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

LABORATORY CONTROL SAMPLE EVALUATION REPORT

HPLC

Client Lot #: LCS Lot-Sample#:	D5J150185 R5J210000-138	Work Order	#: HM9JR1AC	Matrix	WATER
Prep Date: Prep Batch #: Dilution Easter:	10/21/05 5294138	Analysis Da Analysis Ti	te: 10/21/05 me: 12:45		
PARAMETER	1	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	
Perchlorate		106	(78 - 118)	SW846 8321A	

NOTE(S):

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

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Bold print denotes control parameters

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LABORATORY CONTROL SAMPLE DATA REPORT

HPLC

Client Lot #: LCS Lot-Sample#:	D5J150185 R5J210000-138	Work Order	#: HM9JR1AC	Matr	i x	: WATER
Prep Date:	10/21/05	Analysis Da	te: 10/21/05			
Prep Batch #:	5294138	Analysis Ti	me: 12:45			
Dilution Factor:	1	ала Г				
		SPIKE	MEASURED		PERCENT	
PARAMETER		AMOUNT	AMOUNT	UNITS	RECOVERY	METHOD
Perchlorate		1.00	1.06	ug/L	106	SW846 8321A

NOTE(S):

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

MATRIX SPIKE SAMPLE EVALUATION REPORT

HPLC

 Client Lot #...:
 D5J150185
 Work Order #...:
 HMT361AC-MS
 Matrix.....:
 WATER

 MS Lot-Sample #:
 D5J150185-010
 HMT361AD-MSD
 HMT361AD-MSD
 Date Sampled...:
 10/14/05
 13:15
 Date Received..:
 10/15/05
 Prep Date....:
 10/21/05
 Analysis Date..:
 10/21/05
 Prep Batch #...:
 5294138
 Analysis Time..:
 15:58
 Dilution Factor:
 1

	PERCENT	RECOVERI		RED		
PARAMETER	RECOVERY	LIMITS	RPD	LIMITS	METHÓD	
Perchlorate	115	(65 - 138)			SW846 8321A	
	116	(65 - 138)	1.2	(0-29)	SW846 8321A	

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results. Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

HPLC

Client Lot #: MS Lot-Sample #-	D5J150185	Work Orde	er #:	HMT361AC-MS HMT361AD-MSD	Matrix.	: WATER
Date Sampled: Prep Date: Prep Batch #:	10/14/05 13:15 10/21/05 5294138	Date Rece Analysis Analysis	Date: Time:	10/15/05 10/21/05 15:58		
Dilution Factor:	1					
PARAMETER	SAMPL AMOUN	E SPIKE T <u>AMT</u>	MEASRD AMOUNT	UNITS	PERCNT RECVRY RPD	METHOD
Perchlorate	ND ND	1.00	1.15 1.16	ug/L ug/L	115 116 1.2	SW846 8321A SW846 8321A

NOTE(S):

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

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STL Denver 4955 Yarrow Street Arvada, CO 80002

Tel: 303 736 0100 Fax: 303 431 7171 www.stl-inc.com

ANALYTICAL REPORT

E. I. DuPont Project: Barksdale Site Perchlorate Sampling 10/05 7035-507553-772000 LBIO-65332

Release No. STL17175

Lot #: D5K160186

Attn: ADQM URS-Diamond Barley Mill Plaza, Building 27 Lancaster Pike & Route 141 Wilmington, DE 19805

Severn Trent Laboratories, Inc./STL Denver

Gail DeRuzzo Project Manager

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November 17, 2005

Leaders in Environmental Testing

Severn Trent Laboratories, Inc.

Table Of Contents

Standard Deliverables with Supporting Documentation

Report Contents

Number of Pages

Standard Deliverables

(The Cover Letter and the Report Cover page are considered integral parts of this Standard Deliverable package. This report is incomplete unless all pages indicated in this Table of Contents are included.)

- Table of Contents
- Case Narrative
- Executive Summary Detection Highlights
- Methods Summary
- Method/Analyst Summary
- Lot Sample Summary
- Analytical Results
- QC Data Association Summary
- Chain-of-Custody

Supporting Documentation

(Note: A one-page "Description of Supporting Documentation" is provided at the beginning of this section.).

- Volatile GC/MS
- Semivolatile GC/MS
- Volatile GC
- Semivolatile GC
- LC/MS or HPLC
- Metals
- General Chemistry
- Subcontracted Data

Check below when supporting documentation is present.





Case Narrative D5K160186

The following report contains the analytical results for two water samples received at STL Denver on November 16, 2005, according to documented sample acceptance procedures.

Dilution factors and footnotes have been provided on each datasheet to assist in the interpretation of the results.

STL Denver utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated. A summary of QC data for these analyses is included at the rear of the report.

The results included in this report have been reviewed for compliance with the Laboratory Quality Manual. All results have been found to meet all requirements of NELAC and any exceptions are noted below. STL Denver's State of Wisconsin certification number is 999615430.

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SUPPLEMENTAL QC INFORMATION

Sample Arrival and Receipt

The samples presented in this report were received at a temperature of 1.3°C. All sample containers were received in an acceptable condition.

Samples BAR-G-PZ-16-POT-EFFLUENT and BAR-G-CLUBHOUSE-EFFLUENT were canceled by the client after sample receipt.

Perchlorate – Method 8321A – IC/MS/MS

There were no anomalies noted.

EXECUTIVE SUMMARY - Detection Highlights

D5K160186

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METHODS SUMMARY

D5K160186

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
8321A Perchlorate ICMSMS	SW846 8321A	SW846 8321A
References.		

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

ead a

METHOD / ANALYST SUMMARY

D5K160186

ANALYTICAL		ANALYST
METHOD	ANALYST	<u>ID</u>
SW846 8321A	Steve Cowling	008738
Deferences.		

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

SAMPLE SUMMARY

D5K160186

<u>wo #</u>	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
HP97R	001	BAR-G-PZ-16-POT-INFLOW	11/15/05	08:40
HP98E	003	BAR-G-CLUBHOUSE-INFLOW	11/15/05	08:20

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.

Client Sample ID: BAR-G-PZ-16-POT-INFLOW

Lot-Sample #:	D5K160186-001	Work Order #:	HP97R1AA	Matrix		WATER
Date Sampled:	11/15/05 08:40	Date Received:	11/16/05			
Prep Date:	11/16/05	Analysis Date:	11/16/05			
Prep Batch #:	5320330	Analysis Time:	12:39			
Dilution Factor:	1					
		Method:	SW846 8321A	L		
		v	REPORTING			
PARAMETER		RESULT	LIMIT	UNITS	MDL	
Perchlorate		ND	0.010	ug/L	0.0022	

Client Sample ID: BAR-G-CLUBHOUSE-INFLOW

Lot-Sample #:	D5K160186-003	Work Order #:	HP98E1AA	Matrix:	WATER
Date Sampled:	11/15/05 08:20	Date Received:	11/16/05		
Prep Date:	11/16/05	Analysis Date:	11/16/05		
Prep Batch #:	5320330	Analysis Time:	13:47		
Dilution Factor:	1				
		Method:	SW846 8321A		

		REPORTING		
PARAMETER	RESULT	LIMIT	UNITS	MDL
Perchlorate	ND	0.010	ug/L	0.0022

QC DATA ASSOCIATION SUMMARY

D5K160186

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WATER	SW846 8321A		5320330	5320186
003	WATER	SW846 8321A		5320330	5320186

METHOD BLANK REPORT

HPLC

Client Lot #: MB Lot-Sample #.	D5K160186	Work Order #	.: HQAAP1A	A	Matrix	WATER
Analysis Date .	11/16/05	Prep Date Prep Batch #	.: 11/16/0	5	Analysis Time:	11:54
Dilution Factor:	1		1. 5526556			
			REPORTING			
PARAMETER		RESULT	LIMIT	UNITS	METHOD	
Perchlorate		ND	0.010	uq/L	SW846 8321A	

NOTE (S):

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

LABORATORY CONTROL SAMPLE EVALUATION REPORT

......

HPLC

Client Lot #:	D5K160186	Work Order	: HQAAP1AC	Matrix:	WATER
LCS Lot-Sample#:	R5K160000-330				
Prep Date:	11/16/05	Analysis Dat	ce: 11/16/05		
Prep Batch #:	5320330	Analysis Tir	ne: 12:16		
Dilution Factor:	1				
		PERCENT	RECOVERY		
PARAMETER		RECOVERY	LIMITS	METHOD	
Perchlorate		92	(70 - 140)	SW846 8321A	

NOTE(S):

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

LABORATORY CONTROL SAMPLE DATA REPORT

HPLC

Client Lot #: LCS Lot-Sample#:	D5K160186 R5K160000-330	Work Order	#: HQAAP1AC	Matr	ix	: WATER
Prep Date:	11/16/05	Analysis D	ate: 11/16/05			
Prep Batch #:	5320330	Analysis T	ime: 12:16			
Dilution Factor:	1					
		SPIKE	MEASURED		PERCENT	•
PARAMETER		AMOUNT	AMOUNT	UNITS	RECOVERY	METHOD
Perchlorate		0.100	0.0925	ug/L	92	SW846 8321A

NOTE (S).:

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

MATRIX SPIKE SAMPLE EVALUATION REPORT

HPLC

 Client Lot #...: D5K160186
 Work Order #...: HP97R1AC-MS
 Matrix..... WATER

 MS Lot-Sample #: D5K160186-001
 HP97R1AD-MSD

 Date Sampled...: 11/15/05 08:40
 Date Received..: 11/16/05

 Prep Date.....: 11/16/05
 Analysis Date..: 11/16/05

 Prep Batch #...: 5320330
 Analysis Time..: 13:02

 Dilution Factor: 1
 1

	PERCENT	RECOVERY		RPD	
PARAMETER	RECOVERY	LIMITS	RPD	LIMITS	METHOD
Perchlorate	91	(59 - 140)			SW846 8321A
	91	(59 - 140)	0.13	(0-20)	SW846 8321A

NOTE (S) :

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

MATRIX SPIKE SAMPLE DATA REPORT

HPLC

Client Lot #: MS Lot-Sample #:	D5K160186 D5K160186	5 W	ork Orde	r #:	HP97R1AC-MS HP97R1AD-MSI	Mat:	rix		WATER
Date Sampled:	11/15/05	08:40 D	ate Rece	ived:	11/16/05				
Prep Date:	11/16/05	A	nalysis	Date:	11/16/05				
Prep Batch #:	5320330	A	nalysis	Time:	13:02				
Dilution Factor:	1								
		SAMPLE	SPIKE	MEASRD		PERCNT			
PARAMETER		AMOUNT	AMT	AMOUNT	UNITS	RECVRY	RPD	METHOD	
Perchlorate		ND	0.100	0.0908	ug/L	91		SW846 8	321A
		ND	0.100	0.0907	ug/L	91	0.13	SW846 8	321A

NOTE(S):

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

Chain of Custody Record

1.3 MD	
4KK	IRI
11/16/05	
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SEVERN TRENT STL Severn Trent Laboratories, Inc.

STL Denver 4955 Yarrow Street Arvada, CO 80002

STL-4124 (0901)				· · · · · · · · · · · · · · · · · · ·	
	Project I	Manager		Date	Chain of Custody Number
Address	Telepho	ne Number (Area Coo	e)/Fax Number	Lab Number	
72315 HWY 13		1		Denver	Page of
Gity ASh (ward IS) 54806	Site Cor Marci	ntact is Dudley	Lab Contact GDeluzzo	Analysis (Attach list if more space is needed)	
Project Name and Location (State) Brever V.S. dale. Perrhlarate	CarrierA	Waybill Number	ž		Special Instructional
Contract/Purchase Order/Quote No. 39097-5		Matrix	Containers & 9 Preservatives		Conditions of Receipt
Sample I.D. No. and Description (Containers for each sample may be combined on one line) Date	Time	Air Iqueous Sect. Soil	Lipres. Lipres. HNO3 HACH VaCH VaCH VaCH		
BAR-G-PZ-16-POT-INFLOW 11/15/05	0540	X	X		
BAR-G-PZ-16-POF-EFFLUENT	05840				
BAR-G-CLUBHOUSE-INFLOW	0580	X	XIIIX		
BAR-G-CLUB HOUSE - EFFLUENT V	0820				
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·					
·					
Posofala Hazard Idantification					
Non-Hazard I Flammable Skin Irritant Poison B] Unknown	Return To Clier	nt 🕅 Disposal By Lab 🔲 Archive For	(A fee may be as Months longer lhan 1 mo	sessed if samples are retained
Turn Around Time Required		Sen P.O.	QC Requirements (Specify)		
24 Hours 48 Hours 17 Days 14 Days 21 Days 1. Religguished By	Date	Time	- 1. Received By	1	Date Time
2. Relingysped By		Time	2. Received By	SM/	Date Time 11/10/05 0900
3. Relinquished By	Date	Time	3. Received By	mj	Date Time
Comments					
DISTRIBUTION: WHITE - Returned to Client with Report: CANARY - Stays with	th the Samp	e; PINK - Field Copy			