Frontier Chemical - Pendleton Site
Order on Consent (#B9-0270-89-05)

September 1999
Semi-Annual Report #5

Prepared by Pendleton PRP Group

Table of Contents
Semi-Annual Report #5
September 1999

Introduction

Background

Discussion

Conclusion

Attachments

Attachment A – Quarry Lake Level Plot versus Time

Attachment B – Niagara County Sewer District #1 Submittals, Niagara County Sewer District Discharge Permit, and Operation, Maintenance and Monitoring Activities

Attachment C – Frontier Chemical – Pendleton Site; Semi-Annual Ground Water Monitoring Report; September 1999; Frontier Chemical - Pendleton Site; Town of Pendleton, Niagara County, NY, Water Samples Volume 1 of 3 August 11, 12, and 13, 1999.

Attachment D – Field Observation Reports

Attachment E – Y2K Reports

Introduction

This fifth semi-annual report is submitted on behalf of the Frontier Chemical - Pendleton Site PRP Group (PRP Group) for the Frontier Chemical - Pendleton Site located in Pendleton, New York. This report summarizes the activities performed since March 1999 for Post-Closure Operation, Maintenance, and Monitoring of the Closure Components at the subject site.

Background

The Frontier Chemical-Pendleton Site is located on Town Line Road in the Town of Pendleton, Niagara County, New York. The total site comprises approximately 22 acres of the 75-acre Frontier Chemical property. Prior to remediation activities, Quarry Lake, a flooded quarry that resulted from the excavation of clay for use in clay brick and tile manufacturing at an on-site facility, occupied 15 acres of the 22-acre site. The remaining 7 acres, identified as the former Process Area, were utilized by Frontier Chemical Waste Process, Inc. (Frontier) when the site was operated as an industrial waste treatment facility from 1958 to 1974. Plating wastes, pickle liquors and other liquid acid wastes from plating and metal finishing industries were treated at the site, with residuals from the waste treatment process being discharged into Quarry Lake. Much of the former Process Area was filled and graded following termination of waste treatment operations.

The site remediation project with remedial designed by O'Brien & Gere Engineers, Inc. and remedial action by Sevenson Environmental Services, Inc. included the following major components:

1. Dewatering Quarry Lake to allow drying and consolidation of sediments;
2. Excavation and relocation of sediments from Quarry Lake after dewatering operations to within the limits of the capped area;
3. Excavation and relocation of surface soils, fill or debris to within the limits of the capped area;
4. Capping of consolidated sediments, previously dredged materials, and surface soils with a low-permeability cap;
5. Installation, in conjunction with a cap, of a low-permeability barrier to ground water flow;
6. Construction of a ground water collection trench along the eastern shore of Quarry Lake and the southern portion of the capped area;
7. Reconstruction of the berm around Quarry Lake and installation of a new outlet structure;
8. Construction of a ground water pumping station consisting of a wet well and dry vault;
9. Installation of a ground water pre-treatment system within the dry vault;
10. Conveyance of collected and pre-treated ground water to the local Publicly Owned Treatment Works (POTW);
11. Creation of new wetlands at the site;
12. Construction of a surface water swale adjacent to the cap access road to direct surface water away from the capped area;
13. Installation of piezometers inside and outside the capped area and a standpipe within the ground water collection trench; and
14. Installation of a chain link fence around the capped area and pump station to limit access.

Discussion

Post-closure operation, maintenance, and monitoring of the closure components of the Frontier Chemical-Pendleton Site are the responsibility of the Pendleton PRP Group. Operation, maintenance, and monitoring activities performed by the Pendleton PRP Group during this reporting period includes the following five elements:

1. Routine inspection and maintenance of constructed features, including the capped area, ground water collection and conveyance system, surface water runoff facilities, constructed wetlands, access road, perimeter and containment berms, and outlet weir,

   The semi-annual site inspection was performed on August 4, 1999. The inspection report is included in this report as Attachment D.

   Relocated wetlands inside the perimeter berm will be inspected and reported in the next semiannual report. A formal wetlands inspection was requested by the PRP Group on September 24, 1999.

   The relocated wetlands inside the Quarry Lake levee have elevations of 574 feet for aquatic bed species (Zone A), 575 feet for non-persistent emergent species (Zone B), and 576 feet for persistent emergence species (Zone C). A water elevation chart is included as Attachment A-2. This water level chart shows the history of the lake elevation starting in April 1996 until present.

2. Operation and maintenance of the ground water pre-treatment system, as described in the Pre-Treatment System Operations Plan,

   Regarding Operation and maintenance of the ground water pre-treatment system, the monthly submittals to the Niagara Country Sewer District #1 detailing analytical and discharge flow data for this reporting period are included in Attachment B. Six months (April 1999 through September 1999) of submittals as shown in Table 2-1 are included with this report.

Table 2-1 Niagara County Sewer District #1 Submittals

Submittal Date	Sampling Date
April 12, 1999	March 4, 1999
May 10, 1999	April 1, 1999
June 9, 1999	May 7, 1999
July 20, 1999	June 3, 1999
August 29, 1999	July 1, 1999
September 10, 1999	August 3, 1999

   Also included in Attachment B is Table 2-2 which summarizing Operation, Maintenance, and Monitoring Activities for the site during this reporting period.

3. Performance of a ground water monitoring program to monitor site ground water conditions and to verify the inward hydraulic gradient within the capped area,

Regarding performance of a ground water monitoring program, the report "Frontier Chemical - Pendleton Site, Semi-Annual Ground Water Monitoring Report" dated March 1999 is included as Attachment C-2.

4. Evaluation of operation, maintenance, and monitoring activities and identification of proposed changes to the O&M Manual or site procedures and policies which would provide a safer and/or more cost-effective operation, and

   Regarding evaluation of operation, maintenance, and monitoring activities and identification of proposed changes, a letter detailing the status of the maintenance work completed in April 1998 is include in Attachment D-1.

5. Recordkeeping

   Records for site operation and maintenance activities are maintained at the site and Olin's Niagara Falls Plant. These records include daily and weekly logs and charts. Glynn Geotechnical provides assistance to the site caretaker and updates O&M documentation. O'Brien & Gere Engineers provide ground water level measurement, sampling, monitoring, and analytical field and office support. The PRP representative maintains analytical results and reports submitted to NCSD #1 and NYSDEC at the Olin's Charleston Plant. These records are available for your review and inspection.

6. Miscellaneous

   Site instruments that may potentially be affected by Year 2000 issues were reviewed. Each manufacturer was contacted to discuss and resolve the potential of Year 2000 computer issues at the site. After discussing the potential impact with each manufacturer, it was determined that the instruments used at the site are Year 2000 compliant.

   Enclosed in Attachment E are the responses from each letters manufacturer.

Conclusions

The work performed during this reporting period, April 1999 to September 1999 was reviewed and found to be in accordance with the approved O&M Manual for the Site.

Attachment A – Quarry Lake Level Plot versus Time
Quarry Lake Level – August 4, 1999

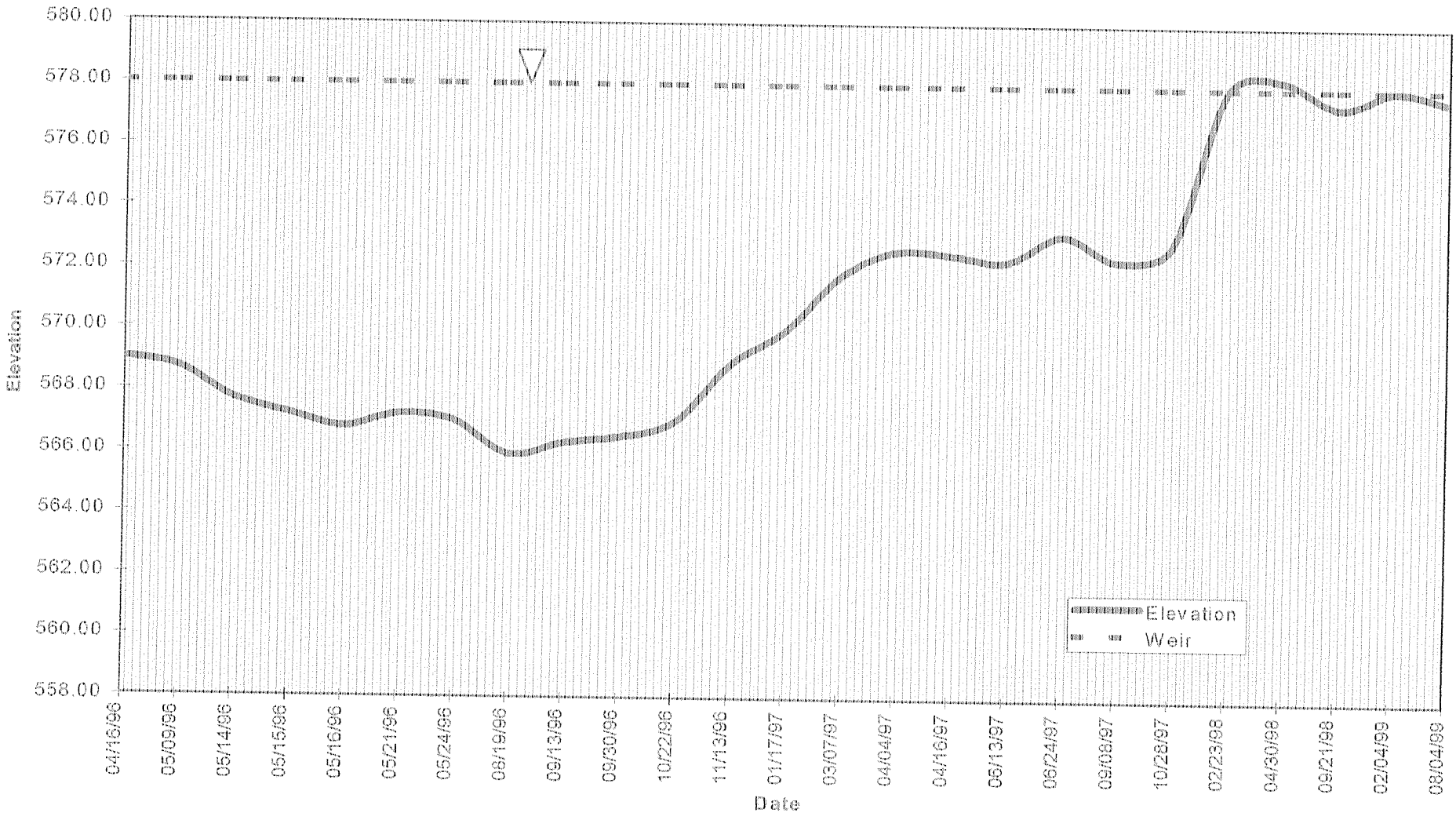
Quarry Lake Level – August 4, 1999

- Table A-1 Quarry Lake Level
- Chart A-1 Quarry Lake Water Elevations

TABLE A-1
Quarry Lake Level

Date	Elevation
4/16/96	569.00
5/9/96	568.70
5/14/96	567.70
5/15/96	567.20
5/16/96	566.80
5/21/96	567.20
5/24/96	567.00
8/19/96	565.92
9/13/96	566.30
9/30/96	566.50
10/22/96	567.00
11/13/96	568.90
1/17/97	570.00
3/7/97	571.80
4/4/97	572.60
4/16/97	572.50
6/13/97	572.30
6/24/97	573.15
9/8/97	572.34
10/28/97	572.88
2/23/98	578.00
4/30/98	578.26
9/21/98	577.42
2/4/99	577.97
8/4/99	577.60

CHART A-1
QUARRY LAKE WATER LEVELS



ATTACHMENT B –Niagara County Sewer District #1 Submittals and Operation, Maintenance and Monitoring Activities

B-1 Niagara County Sewer District #1 Submittals

B-2 Niagara County Sewer District #1 Discharge Permit

B-3 Operation, Maintenance and Monitoring Activities

B-1 Niagara County Sewer District #1 Submittals

TABLE B-1

Niagara County Sewer District #1 Submittals

Submittal Date	Sampling Date
April 12, 1999	March 4, 1999
May 10, 1999	April 1, 1999
June 9, 1999	May 7, 1999
July 20, 1999	June 3, 1999
August 29, 1999	July 1, 1999
September 10, 1999	August 3, 1999

FILE COPY

April 12, 1999

Mr. Frank Nerone
Chief Operator
Niagara County Sewer District #1
7346 Liberty Drive
Niagara Falls, NY 14304

Subject: Analytical Sampling Results (3/4/99 Sample)
Groundwater Discharge Through Pre-Treatment System
Pendleton (Frontier Chemical) Site

Dear Mr. Nerone:

Enclosed for your review are analytical results from the March 4, 1999, monthly sampling event for discharge of collected groundwater from the pre-treatment system at the Pendleton Site. Analytical results for this sampling event are compared against the Permit (#98-11) requirements on the attached Analytical Summary and Daily Flow sheets.

A review of the analytical and flow data shows that all permit parameters are significantly below the stated permit requirements.

This data is being provided for your review and concurrence that all permit parameters are well within their limits. If, following review of the enclosed information, you are not in agreement with the above stated conclusion, please contact me at 423-336-4057 as soon as possible so we may discuss any future monitoring requirements.

Sincerely,

John M. Burns

John M. Burns
for the Frontier Chemical - Pendleton Site PRP Group

Enclosures: as stated
cc: D. Kummer
Pendleton Site Technical Committee

DAILY FLOW DATA - PENDLETON SITE
MARCH 1999

DATE	TOTALIZER READING	DAILY FLOW	
3/1/99	314831	218	
3/2/99	315049	300	avg.
3/3/99		300	avg.
3/4/99		300	Sampled
3/5/99	315949	499	
3/6/99	316448	453	
3/7/99	316901	335	
3/8/99	317236	445	
3/9/99	317681	319	
3/10/99	318000	437	
3/11/99	318437	266	
3/12/99	318703	272	avg.
3/13/99		272	avg.
3/14/99		272	avg.
3/15/99	319518	251	
3/16/99	319769	275	
3/17/99	320044	475	
3/18/99	320519	497	
3/19/99	321016	725	avg.
3/20/99		725	avg.
3/21/99		725	avg.
3/22/99		725	avg.
3/23/99		725	avg.
3/24/99	324642	135	avg.
3/25/99		135	avg.
3/26/99		135	avg.
3/27/99		135	avg.
3/28/99		135	avg.
3/29/99	325316	108	
3/30/99	325424		
3/31/99			
AVERAGE DAILY FLOW IN GALLONS		365	

	= DRY VAULT GROUNDWATER RELIEF		
			gallons
			gallons
			gallons
			gallons
	TOTAL GALLONS	0	

avg =flow between data points divided by days of missing data
avg =(315949-314049)/3 or 300 gallons per day for data between 3/2/99 and 3/5/99

Frontier Chemical - Pendleton Site
Analytical Summary for WS 001
Permit # 98-11
Groundwater Discharge Point: D 002

307,206 Gallons Discharged Prior To 2/5/99
8,743 Gallons Since Last Report
312 Average Daily Flow Based on 28 days Between Samples

Parameters Treatment System Discharge	Permit Limit GPD	Detection Limits	2/5/99 Sample Results GPD
Discharge Rate(1)	662		
624 Analytes	ug/L	ug/L	ug/L
Toluene	10.0	1.0	
1,2-Dichloroethane	10.0	1.0	
4-Methyl-2-Pentanone	10.0	5.0	
Vinyl Chloride	10.0	2.0	
Methylene Chloride	10.0	2.8	
trans-1,2-Dichloroethene	10.0	1.0	
1,1,1-Trichloroethane	10.0	1.0	
Trichloroethene	10.0	1.0	
Benzene	10.0	1.0	
Chloromethane		2.0	
Bromomethane		2.0	
Chloroethane		2.0	
Chloroform		1.0	
Carbon Tetrachloride		1.0	
1,1-Dichloroethene		1.0	
Trichlorofluoromethane		2.0	
1,1-Dichloroethane		1.0	
1,2-Dichloropropane		1.0	
Bromodichloromethane		1.0	
2-Chloroethylvinyl ether		2.0	
cis-1,3-Dichloropropene		1.0	
trans-1,3-Dichloropropene		1.0	
1,1,2-Trichloroethane		1.0	
Tetrachloroethene		1.2	
Dibromochloromethane		1.0	
Chlorobenzene		1.0	
Ethylbenezene		1.0	
Bromoform		1.0	
1,1,2,2-Tetrachloroethane		1.0	
1,3-Dichlorobenzene		1.0	
1,4-Dichlorobezene		1.0	
1,2-Dichlorobenzene		1.0	
Sum of 624 Analytes		100.0	0.0
608 Pesticides(2)	ug/L	ug/L	ug/L
alpha BHC	10.0	0.003	
beta BHC	20.0	0.006	
delta BHC	10.0	0.010	
gamme BHC	10.0	0.003	
Heptachlor	8.0	0.022	
Aldrin	8.0	0.018	
Heptachlor Epoxide	9.0	0.009	
4,4-DDE	20.0	0.005	
Methoxychlor	18.0	0.007	
Metals	mg/L	mg/L	mg/L
Antimony	0.1	0.009	< 0.009
Boron	4.00	0.012	0.413
Chromium	5.33	0.005	< 0.005
Cyanide(T)	2.0	0.005	< 0.005
Other	mg/L	mg/L	mg/L
Total Phenolics	NA	0.005	< 0.005
TSS	300	4.000	< 4.000

Legend:
(1) Permit limit @ 662 GPD with maximum daily discharged @ 2500 GPD
(2) Discontinue per April 14, 1997 Letter from F. Narrone to PRP Group.
(a) Detected in blank
NA Not applicable

WASTE STREAM TECHNOLOGY, INC.

302 Grote Street
Buffalo, NY 14207
(716) 876-5290

Analytical Data Report

Report Date : 03/19/99
Group Number : 9901-319

Prepared For :
Mr. John Burns
Olin Corporation
P.O. Box 248
1186 Lower River Road NW
Charleston, TN 37310

Site : Frontier - Pendleton

Field and Laboratory Information

Client Id	WST Lab #	Matrix	Date Sampled	Date Received	Time
GAC II	WS50240	Aqueous	03/04/99	03/05/99	12:30
Sample Status Upon Receipt : No irregularities.					

Analytical Services

Analytical Parameters	Number of Samples	Turnaround Time
Total Metals	1	Standard
Cyanide	1	Standard
Phenol	1	Standard
Total Suspended Solids	1	Standard

Report Released By : Daniel W. Vollmer
Daniel Vollmer, Laboratory QA/QC Officer

ENVIRONMENTAL LABORATORY ACCREDITATION CERTIFICATION NUMBERS
NYSDOH ELAP #11179 NJDEPE #73977 CDHS ELAP #2189

WASTE STREAM TECHNOLOGY

METHODOLOGIES

The specific methodologies employed in obtaining the analytical data reported are indicated on each of the result forms. The method numbers shown refer to the following U.S. Environmental Protection Agency Reference:

Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020, March 1979, Revised 1983, U.S. Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268.

Federal Register, 40 CFR Part 136: Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act. Revised July 1992.

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. Third Edition, Revised December 1996, U.S. EPA SW-846.

Annual Book of ASTM Standards, Volume II. ASTM, 100 Harbor Drive, West Conshohocken, PA 19428-2959.

Standard Methods for the Examination of Water and Wastewater. (18th Edition). American Public Health Association, 1105 18th Street, NW, Washington, D.C. 20036.

Waste Stream Technology, Inc.
Metals Analysis Result Report

Site: Frontier - Pendelton
Date Sampled: 03/04/99
Date Received: 03/05/99

Group Number: 9901-319
Units: mg/L
Matrix: Aqueous

WST ID: WS50240
Client ID: GAC II
Digestion Date: 03/15/99

Analyte	Detection Limit	Result	Date Analyzed	Analysis Method
Antimony by GFAA	0.009	Not detected	03/19/99	EPA 200.9
Boron by ICP	0.012	0.413	03/15/99	EPA 200.7
Chromium by ICP	0.005	Not detected	03/15/99	EPA 200.7

WASTE STREAM TECHNOLOGY

Waste Stream Technology, Inc.
Metals Method Blank Analysis

Site: Frontier - Pendelton
Date Sampled: NA
Date Received: NA

Group Number: 9901-319
Units: mg/L

WST ID MB031599 HP1
Client ID: NA
Digestion Date: 03/15/99

Analyte	Detection Limit	Result	Date Analyzed	Analysis Method
B Method Blank	0.012	Not detected	03/15/99	EPA 200.7
Cr Method Blank	0.005	Not detected	03/15/99	EPA 200.7
Sb Method Blank	0.009	Not detected	03/19/99	EPA 200.9

MB denotes Method Blank
NA denotes Not Applicable

Waste Stream Technology, Inc.
Wet Chemistry Analyses

Site: Frontier - Pendelton
Date Sampled: 03/04/99
Date Received: 03/05/99

Group Number: 9901-319
Matrix: Aqueous

WST ID: WS50240
Client ID GAC II

Analysis	Method Reference	Detection Limit	Result	Units	Date Analyzed
Total Suspended Solids	EPA 160.2	4.0	Not detected	mg/L	03/05/99
Cyanide in Water	EPA 335.2	0.005	Not detected	mg/L	03/10/99
Total Recoverable Phenol	EPA 420.1	0.005	Not detected	mg/L	03/15/99

WASTE STREAM TECHNOLOGY

302 GROTE STREET
BUFFALO, NY 14207
(716) 876-5290

9201-319

CHAIN OF CUSTODY RECORD

PROJECT NO: E414 SITE NAME: Frontier Pendleton

SAMPLERS (SIGNATURE): Ben Brayley

SAMPLE NO.	DATE	TIME	COMP	GRAB	MATRIX	SAMPLE LOCATION	SIZE & NO. OF CONTAINERS	Br Cr Sb	Phenols	Cyanide	TSS				PRESERVATIVES	REMARKS
9C04 637	3/4/94	1145 AM	✓		H_2O	GAC II	1L								HNO_3	W550240
9C04 638	"	"	✓		"	"	1L								H_2SO_4	
9C04 639	"	"	✓		"	"	1L								NaOH	
9C04 640	"	"	✓		"	"	500mL								Ø 3°d	

RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)
Bill Brayley	3/5 10 40			3/8 12:30	
RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)

SPECIAL INSTRUCTIONS:

TURNAROUND TIME _____

LAB I FRIGERATOR # SHELF # GROUP #

AB

September 30, 1999 **VIA AIRBORNE EXPRESS**

Mr. Daniel King, P. E.
Division of Environmental Remediation
New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203-2999

Subject: Frontier Chemical - Pendleton Site, Pendleton, New York
Order on Consent (#B9-0270-89-05)
September 1999, Semi-Annual Report #5
Post Closure Operation, Maintenance, and Monitoring Activities,

Dear Mr. King:

In accordance with the approved Pendleton O & M Manual, enclosed are three copies of the Semi-Annual Report on the Post-Closure Operation, Maintenance, and Monitoring of the Closure Components for the Frontier Chemical-Pendleton Site by the Pendleton PRP Group

If you have any questions regarding the above submittals, please contact me by telephone at 423-336-4057, by facsimile at 423-336-4166 or by e-mail at jmburns@corp.olin.com.

Sincerely,
Pendleton PRP Group

John M. Burns

John M. Burns
Chairman - Technical Committee for
Pendleton PRP Group

Distribution:

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FILE COPY

May 10, 1999

Mr. Frank Nerone
Chief Operator
Niagara County Sewer District #1
7346 Liberty Drive
Niagara Falls, NY 14304

Subject: Analytical Sampling Results (4/1/99 Monthly Sample & 4/8/99 Semi-annual VOA Sample)
Groundwater Discharge through Pre-Treatment System
Pendleton (Frontier Chemical) Site

Dear Mr. Nerone:

Enclosed for your review are analytical results from the April 1, 1999 and April 8, 1999, monthly sampling event and the April8, 1999 semi-annual VOA sampling event for discharge of collected groundwater from the pre-treatment system at the Pendleton Site. Analytical results for these sampling events are compared against the Permit (#98-11) requirements on the attached Analytical Summary and Daily Flow sheets.

A review of the analytical and flow data shows that all permit parameters are significantly below the stated permit requirements.

This data is being provided for your review and concurrence that all permit parameters are well within their limits. If, following review of the enclosed information, you are not in agreement with the above stated conclusion, please contact me at 423-336-4057 as soon as possible so we may discuss any future monitoring requirements.

Sincerely,

John M. Burns

John M. Burns
for the Frontier Chemical - Pendleton Site PRP Group

Enclosures: as stated
cc: D. Kummer
Pendleton Site Technical Committee

DAILY FLOW DATA - PENDLETON SITE
APRIL 1999

DATE	TOTALIZER READING	DAILY FLOW	
4/1/99		98	avg.(Sampled)
4/2/99		98	avg.
4/3/99		98	avg.
4/4/99	325914	108	
4/5/99	326022	51	
4/6/99	326073	104	
4/7/99	326177	100	
4/8/99	326277	90	avg.(VOA)
4/9/99		90	avg.
4/10/99		90	avg.
4/11/99	326547	107	
4/12/99	326654	219	
4/13/99	326873	99	
4/14/99	326972	107	
4/15/99	327079	110	avg.
4/16/99		110	avg.
4/17/99		110	avg.
4/18/99	327408	109	
4/19/99	327517	108	
4/20/99	327625	104	
4/21/99	327729	161	
4/22/99	327890	219	avg.
4/23/99		219	avg.
4/24/99		219	avg.
4/25/99	328546	217	
4/26/99	328763	156	
4/27/99	328919	106	
4/28/99	329025	171	
4/29/99	329196	105	
4/30/99	329301		
AVERAGE DAILY FLOW IN GALLONS		127	

	= DRY VAULT GROUNDWATER RELIEF		
			gallons
			gallons
			gallons
			gallons
	TOTAL GALLONS	0	

avg =flow between data points divided by days of missing data
avg =(325914-325424)/5 or 98 gallons per day for data between 3/30/99 and 4/4/99

Frontier Chemical - Pendleton Site
Analytical Summary for WS 001
Permit # 98-11
Groundwater Discharge Point: D 002

315.949 Gallons Discharged Prior To 3/4/99
9.965 Gallons Since Last Report
332 Average Daily Flow Based on 30 days Between Samples

Parameters Treatment System Discharge	Permit Limit GPD	Detection Limits	4/1/99 & 4/8/99 Sample Results GPD	
Discharge Rate(1)	662			
624 Analytes	ug/L	ug/L	ug/L	
Toluene	10.0	1.0	1.0	U
1,2-Dichloroethane	10.0	1.0	1.0	U
4-Methyl-2-Pentanone	10.0	5.0	5.0	U
Vinyl Chloride	10.0	2.0	2.0	U
Methylene Chloride	10.0	2.8	B 3.6	
trans-1,2-Dichloroethene	10.0	1.0	1.0	U
1,1,1-Trichloroethane	10.0	1.0	1.0	U
Trichloroethene	10.0	1.0	1.0	U
Benzene	10.0	1.0	1.0	U
Chloromethane		2.0	2.0	U
Bromomethane		2.0	2.0	U
Chloroethane		2.0	2.0	U
Chloroform		1.0	1.0	U
Carbon Tetrachloride		1.0	1.0	U
1,1-Dichloroethene		1.0	1.0	U
Trichlorofluoromethane		2.0	2.0	U
1,1-Dichloroethane		1.0	1.0	U
1,2-Dichloropropane		1.0	1.0	U
Bromodichloromethane		1.0	1.0	U
2-Chloroethylvinyl ether		2.0	2.0	U
cis-1,3-Dichloropropene		1.0	1.0	U
trans-1,3-Dichloropropene		1.0	1.0	U
1,1,2-Trichloroethane		1.0	1.0	U
Tetrachloroethene		1.2	1.2	U
Dibromochloromethane		1.0	1.0	U
Chlorobenzene		1.0	1.0	U
Ethylbenezene		1.0	1.0	U
Bromoform		1.0	1.0	U
1,1,2,2-Tetrachloroethane		1.0	1.0	U
1,3-Dichlorobenzene		1.0	1.0	U
1,4-Dichlorobezene		1.0	1.0	U
1,2-Dichlorobenzene		1.0	1.0	U
Sum of 624 Analytes		100.0	44.8	
608 Pesticides(2)	ug/L	ug/L	ug/L	
alpha BHC	10.0	0.003		
beta BHC	20.0	0.006		
delta BHC	10.0	0.010		
gamme BHC	10.0	0.003		
Heptachlor	8.0	0.022		
Aldrin	8.0	0.018		
Heptachlor Epoxide	9.0	0.009		
4,4-DDE	20.0	0.005		
Methoxychlor	18.0	0.007		
Metals	mg/L	mg/L	mg/L	
Antimony	0.1	0.009	< 0.009	
Boron	4.00	0.012	0.482	
Chromium	5.33	0.005	< 0.005	
Cyanide(T)	2.0	0.005	< 0.005	
Other	mg/L	mg/L	mg/L	
Total Phenolics	NA	0.005	< 0.005	
TSS	300	4.000	< 4.000	

Legend:
(1) Permit limit @ 662 GPD with maximum daily discharged @ 2500 GPD
(2) Discontinue per April 14, 1997 Letter from F. Narrone to PRP Group.
(B) Detected in blank
NA Not applicable

WASTE STREAM TECHNOLOGY, INC.

302 Grote Street
Buffalo, NY 14207
(716) 876-5290

Analytical Data Report

Report Date : 04/22/99
Group Number : 9901-477

Prepared For :
Mr. John Burns
Olin Corporation
P.O. Box 248
1186 Lower River Road NW
Charleston, TN 37310

Site : Frontier - Pendleton

Field and Laboratory Information

Client Id	WST Lab #	Matrix	Date Sampled	Date Received	Time
GAC 2	WS51041	Aqueous	04/08/99	04/08/99	12:30
Trip Blank	WS51042	Aqueous	04/08/99	04/08/99	12:30
Sample Status Upon Receipt : No irregularities.					

Analytical Parameters	Analytical Services Number of Samples	Turnaround Time
624	2	Standard

Report Released By : Daniel W. Vollmer
Daniel Vollmer, Laboratory QA/QC Officer

ENVIRONMENTAL LABORATORY ACCREDITATION CERTIFICATION NUMBERS
NYSDOH ELAP #11179 NJDEPE #73977 CDHS ELAP #2189

WASTE STREAM TECHNOLOGY

METHODOLOGIES

The specific methodologies employed in obtaining the analytical data reported are indicated on each of the result forms. The method numbers shown refer to the following U.S. Environmental Protection Agency Reference:

Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020, March 1979, Revised 1983, U.S. Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268.

Federal Register, 40 CFR Part 136: Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act. Revised July 1992.

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. Third Edition, Revised December 1996, U.S. EPA SW-846.

Annual Book of ASTM Standards, Volume II. ASTM, 100 Harbor Drive, West Conshohocken, PA 19428-2959.

Standard Methods for the Examination of Water and Wastewater. (18th Edition). American Public Health Association, 1105 18th Street, NW, Washington, D.C. 20036.

ORGANIC DATA QUALIFIERS

U - Indicates compound was analyzed for but not detected.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicates the presence of a compound that meets identification criteria, but the result is less than the sample quantitation limit but greater than zero.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as the sample.

E - This flag identifies all compounds whose concentrations exceed the calibration range of the GC/MS instrument of that specific analysis.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

G - Matrix spike recovery is greater than the expected upper limit of analytical performance.

L - Matrix spike recovery is less than the expected lower limit of analytical performance.

- Indicates that a surrogate recovery was found to be outside the expected limits of analytical performance.

$ - Indicates that the surrogate compound was diluted out. The sample had to be diluted to obtain analytical results and a recovery could not be calculated.

(%) - Indicates that the compound is a surrogate and that the value reported for this compound is in percent recovery. The quality control recovery limits are indicated in the detection limit or QC limits column.

Case Narrative

The following comments and observations were made regarding the analysis of samples from the Frontier Pendleton site for Olin Corporation corresponding to the Waste Stream Technology sample group number 9901-477 and sample numbers WS51041 and WS51042 which were sampled and received on 4/8/99;

1.0 Method 624 Analysis

1.1 Sample numbers WS51041 and WS51042, corresponding to the site sample descriptions GAC 2 and Trip Blank, respectively, were initially analyzed on 4/14/99. The instrument blank associated with the 4/14/99 analyses contained the compound methylene chloride at 2.4 ug/L while the methylene chloride concentrations found for the GAC 2 and Trip Blank samples were 3.6 ug/L and 5.4 ug/L respectively. Although the level of methylene chloride was below the site discharge limit, both samples were re-analyzed on 4/22/99 with an instrument blank that did not contain methylene chloride, but the methylene chloride concentrations found for the GAC 2 and Trip Blank samples were 3.1 ug/L and 4.6 ug/L. The consistency of the results from the 2 analyses indicates that methylene chloride is present in the samples. However, the presence of methylene chloride in the Trip Blank sample indicates that the methylene chloride in the GAC 2 sample is due to contamination. The results from both days of analysis are included in the report.

Daniel W. Vollmer

Date 4/27/99

Daniel W. Vollmer
QA/QC Officer

Waste Stream Technology, Inc.

40 CFR Part 136 Method 624

EPA 624

Site: Frontier - Pendelton
Date Sampled: 04/08/99
Date Received: 04/08/99

Group Number: 9901-477
Units: ug/L
Matrix: Aqueous

WST ID: WS51041 ✓
Client ID: GAC 2
Extraction Date: NA
Date Analyzed: 04/14/99

Compound	Detection Limit	Result	QC Limits (%)	Qualifier
chloromethane	2.0	Not detected		U
vinyl chloride	2.0	Not detected		U
bromomethane	2.0	Not detected		U
chloroethane	2.0	Not detected		U
Trichlorofluoromethane	2.0	Not detected		U
1,1-dichloroethene	1.0	Not detected		U
methylene chloride	2.8	3.6		B
trans-1,2-dichloroethene	1.0	Not detected		U
1,1-dichloroethane	1.0	Not detected		U
chloroform	1.0	Not detected		U
1,1,1-trichloroethane	1.0	Not detected		U
carbon tetrachloride	1.0	Not detected		U
benzene	1.0	Not detected		U
1,2-dichloroethane	1.0	Not detected		U
trichloroethene	1.0	Not detected		U
1,2-dichloropropane	1.0	Not detected		U
bromodichloromethane	1.0	Not detected		U
2-chloroethylvinyl ether	2.0	Not detected		U
cis-1,3-dichloropropene	1.0	Not detected		U
toluene	1.0	Not detected		U
trans-1,3-dichloropropene	1.0	Not detected		U
1,1,2-trichloroethane	1.0	Not detected		U
tetrachloroethene	1.2	Not detected		U
dibromochloromethane	1.0	Not detected		U
chlorobenzene	1.0	Not detected		U
ethylbenzene	1.0	Not detected		U
bromoform	1.0	Not detected		U
1,1,2,2-tetrachloroethane	1.0	Not detected		U
1,3-dichlorobenzene	1.0	Not detected		U
1,4-dichlorobenzene	1.0	Not detected		U
1,2-dichlorobenzene	1.0	Not detected		U
1,2-Dichloroethane-d4 (%)		95	76-114	
Toluene-d8 (%)		102	88-110	
Bromofluorobenzene (%)		96	86-115	
Dilution Factor	1			

WASTE STREAM TECHNOLOGY

Waste Stream Technology, Inc.

40 CFR Part 136 Method 624

EPA 624

Site: Frontier - Pendelton
Date Sampled: 04/08/99
Date Received: 04/08/99

Group Number: 9901-477
Units: ug/L
Matrix: Aqueous

WST ID: WS51042 ✓
Client ID: Trip Blank
Extraction Date: NA
Date Analyzed: 04/14/99

Compound	Detection Limit	Result	QC Limits (%)	Qualifier
chloromethane	2.0	Not detected		U
vinyl chloride	2.0	Not detected		U
bromomethane	2.0	Not detected		U
chloroethane	2.0	Not detected		U
Trichlorofluoromethane	2.0	Not detected		U
1,1-dichloroethene	1.0	Not detected		U
methylene chloride	2.8	5.4		B
trans-1,2-dichloroethene	1.0	Not detected		U
1,1-dichloroethane	1.0	Not detected		U
chloroform	1.0	Not detected		U
1,1,1-trichloroethane	1.0	Not detected		U
carbon tetrachloride	1.0	Not detected		U
benzene	1.0	Not detected		U
1,2-dichloroethane	1.0	Not detected		U
trichloroethene	1.0	Not detected		U
1,2-dichloropropane	1.0	Not detected		U
bromodichloromethane	1.0	Not detected		U
2-chloroethylvinyl ether	2.0	Not detected		U
cis-1,3-dichloropropene	1.0	Not detected		U
toluene	1.0	Not detected		U
trans-1,3-dichloropropene	1.0	Not detected		U
1,1,2-trichloroethane	1.0	Not detected		U
tetrachloroethene	1.2	Not detected		U
dibromochloromethane	1.0	Not detected		U
chlorobenzene	1.0	Not detected		U
ethylbenzene	1.0	Not detected		U
bromoform	1.0	Not detected		U
1,1,2,2-tetrachloroethane	1.0	Not detected		U
1,3-dichlorobenzene	1.0	Not detected		U
1,4-dichlorobenzene	1.0	Not detected		U
1,2-dichlorobenzene	1.0	Not detected		U
1,2-Dichloroethane-d4 (%)		97	76-114	
Toluene-d8 (%)		100	88-110	
Bromofluorobenzene (%)		97	86-115	
Dilution Factor	1			

Waste Stream Technology, Inc.

40 CFR Part 136 Method 624

EPA 624

Site: Frontier - Pendelton
Date Sampled: 04/08/99
Date Received: 04/08/99

Group Number: 9901-477
Units: ug/L
Matrix: Aqueous

WST ID: WS51042
Client ID: Trip Blank
Extraction Date: NA
Date Analyzed: 04/22/99

Compound	Detection Limit	Result	QC Limits (%)	Qualifier
chloromethane	2.0	Not detected		U
vinyl chloride	2.0	Not detected		U
bromomethane	2.0	Not detected		U
chloroethane	2.0	Not detected		U
Trichlorofluoromethane	2.0	Not detected		U
1,1-dichloroethene	1.0	Not detected		U
methylene chloride	2.8	4.6		
trans-1,2-dichloroethene	1.0	Not detected		U
1,1-dichloroethane	1.0	Not detected		U
chloroform	1.0	Not detected		U
1,1,1-trichloroethane	1.0	Not detected		U
carbon tetrachloride	1.0	Not detected		U
benzene	1.0	Not detected		U
1,2-dichloroethane	1.0	Not detected		U
trichloroethene	1.0	Not detected		U
1,2-dichloropropane	1.0	Not detected		U
bromodichloromethane	1.0	Not detected		U
2-chloroethylvinyl ether	2.0	Not detected		U
cis-1,3-dichloropropene	1.0	Not detected		U
toluene	1.0	Not detected		U
trans-1,3-dichloropropene	1.0	Not detected		U
1,1,2-trichloroethane	1.0	Not detected		U
tetrachloroethene	1.2	Not detected		U
dibromochloromethane	1.0	Not detected		U
chlorobenzene	1.0	Not detected		U
ethylbenzene	1.0	Not detected		U
bromoform	1.0	Not detected		U
1,1,2,2-tetrachloroethane	1.0	Not detected		U
1,3-dichlorobenzene	1.0	Not detected		U
1,4-dichlorobenzene	1.0	Not detected		U
1,2-dichlorobenzene	1.0	Not detected		U
4-methyl-2-pentanone	5.0	Not detected		U
1,2-Dichloroethane-d4 (%)		107	76-114	
Toluene-d8 (%)		108	88-110	
Bromofluorobenzene (%)		97	86-115	

Dilution Factor 1

Waste Stream Technology, Inc.

Method 624 Method Blank Results

EPA 624

Site: Frontier - Pendelton
Date Sampled: NA
Date Received: NA

Group Number: 9901-477
Units: ug/L

WST ID: IB041499
Client ID: NA
Extraction Date: NA
Date Analyzed: 04/14/99

Compound	Detection Limit	Result	QC Limits (%)	Qualifier
chloromethane	2.0	Not detected		U
vinyl chloride	2.0	Not detected		U
bromomethane	2.0	Not detected		U
chloroethane	2.0	Not detected		U
trichlorofluoromethane	2.0	Not detected		U
1,1-dichloroethene	1.0	Not detected		U
methylene chloride	2.8	2.4		J
trans-1,2-dichloroethene	1.0	Not detected		U
1,1-dichloroethane	1.0	Not detected		U
chloroform	1.0	Not detected		U
1,1,1,-trichloroethane	1.0	Not detected		U
carbon tetrachloride	1.0	Not detected		U
benzene	1.0	Not detected		U
1,2-dichloroethane	1.0	Not detected		U
trichloroethene	1.0	Not detected		U
1,2-dichloropropane	1.0	Not detected		U
bromodichloromethane	1.0	Not detected		U
2-chloroethylvinyl ether	2.0	Not detected		U
cis-1,3-dichloropropene	1.0	Not detected		U
toluene	1.0	Not detected		U
trans-1,3-dichloropropene	1.0	Not detected		U
1,1,2-trichloroethane	1.0	Not detected		U
tetrachloroethene	1.2	Not detected		U
dibromochloromethane	1.0	Not detected		U
chlorobenzene	1.0	Not detected		U
ethylbenzene	1.0	Not detected		U
bromoform	1.0	Not detected		U
1,1,2,2-tetrachloroethane	1.0	Not detected		U
1.3-dichlorobenzene	1.0	Not detected		U
1,4-dichlorobenzene	1.0	Not detected		U
1,2-dichlorobenzene	1.0	Not detected		U
4-methyl-2-pentanone	5.0	Not detected		U
1,2-Dichloroethane-d4 (%)		98	76-114	
Toluene-d8 (%)		104	88-110	
Bromofluorobenzene (%)		99	86-115	

Dilution Factor 1

IB denotes Instrument Blank
NA denotes Not Applicable

WASTE STREAM TECHNOLOGY

Waste Stream Technology, Inc.

40 CFR Part 136 Method 624

EPA 624

Site: Frontier - Pendelton
Date Sampled: 04/08/99
Date Received: 04/08/99

Group Number: 9901-477
Units: ug/L
Matrix: Aqueous

WST ID: WS51041
Client ID: GAC 2
Extraction Date: NA
Date Analyzed: 04/22/99

Compound	Detection Limit	Result	QC Limits (%)	Qualifier
chloromethane	2.0	Not detected		U
vinyl chloride	2.0	Not detected		U
bromomethane	2.0	Not detected		U
chloroethane	2.0	Not detected		U
Trichlorofluoromethane	2.0	Not detected		U
,! dichloroethene	1.0	Not detected		U
methylene chloride	2.8	3.1		
trans-1,2-dichloroethene	1.0	Not detected		U
1,1-dichloroethane	1.0	Not detected		U
chloroform	1.0	Not detected		U
1,1,1-trichloroethane	1.0	Not detected		U
carbon tetrachloride	1.0	Not detected		U
benzene	1.0	Not detected		U
1,2-dichloroethane	1.0	Not detected		U
trichloroethene	1.0	Not detected		U
1,2-dichloropropane	1.0	Not detected		U
bromodichloromethane	1.0	Not detected		U
2-chloroethylvinyl ether	2.0	Not detected		U
cis-1,3-dichloropropene	1.0	Not detected		U
toluene	1.0	Not detected		U
trans-1,3-dichloropropene	1.0	Not detected		U
1,1,2-trichloroethane	1.0	Not detected		U
tetrachloroethene	1.2	Not detected		U
dibromochloromethane	1.0	Not detected		U
chlorobenzene	1.0	Not detected		U
ethylbenzene	1.0	Not detected		U
bromoform	1.0	Not detected		U
1,1,2,2-tetrachloroethane	1.0	Not detected		U
1,3-dichlorobenzene	1.0	Not detected		U
1,4-dichlorobenzene	1.0	Not detected		U
1,2-dichlorobenzene	1.0	Not detected		U
4-methyl-2-pentanone	5.0	Not detected		U
1,2-Dichloroethane-d4 (%)		104	76-114	
Toluene-d8 (%)		110	88-110	
Bromofluorobenzene (%)		94	86-115	

Dilution Factor 1

Waste Stream Technology, Inc.

Method 624 Method Blank Results

EPA 624

Site: Frontier - Pendelton
Date Sampled: NA
Date Received: NA

Group Number: 9901-477
Units: ug/L

WST ID: IB042299
Client ID: NA
Extraction Date: NA
Date Analyzed: 04/22/99

Compound	Detection Limit	Result	QC Limits (%)	Qualifier
chloromethane	2.0	Not detected		U
vinyl chloride	2.0	Not detected		U
bromomethane	2.0	Not detected		U
chloroethane	2.0	Not detected		U
trichlorofluoromethane	2.0	Not detected		U
1,1-dichloroethene	1.0	Not detected		U
methylene chloride	2.8	Not detected		U
trans-1,2-dichloroethene	1.0	Not detected		U
1,1-dichloroethane	1.0	Not detected		U
chloroform	1.0	Not detected		U
1,1,1,-trichloroethane	1.0	Not detected		U
carbon tetrachloride	1.0	Not detected		U
benzene	1.0	Not detected		U
1,2-dichloroethane	1.0	Not detected		U
trichloroethene	1.0	Not detected		U
1,2-dichloropropane	1.0	Not detected		U
bromodichloromethane	1.0	Not detected		U
2-chloroethylvinyl ether	2.0	Not detected		U
cis-1,3-dichloropropene	1.0	Not detected		U
toluene	1.0	Not detected		U
trans-1,3-dichloropropene	1.0	Not detected		U
1,1,2-trichloroethane	1.0	Not detected		U
tetrachloroethene	1.2	Not detected		U
dibromochloromethane	1.0	Not detected		U
chlorobenzene	1.0	Not detected		U
ethylbenzene	1.0	Not detected		U
bromoform	1.0	Not detected		U
1,1,2,2-tetrachloroethane	1.0	Not detected		U
1,3-dichlorobenzene	1.0	Not detected		U
1,4-dichlorobenzene	1.0	Not detected		U
1,2-dichlorobenzene	1.0	Not detected		U
4-methyl-2-pentanone	5.0	Not detected		U
1,2-Dichloroethane-d4 (%)		105	76-114	
Toluene-d8 (%)		106	88-110	
Bromofluorobenzene (%)		93	86-115	

Dilution Factor 1

IB denotes Instrument Blank
NA denotes Not Applicable

WASTE STREAM TECHNOLOGY

WASTE STREAM TECHNOLOGY

302 GROTE STREET
BUFFALO, NY 14207
(716) 876-5290

9901-477

CHAIN OF CUSTODY RECORD

PROJECT NO:

SITE NAME: FRONTIER PENDLETON

SAMPLERS (SIGNATURE): B H Brayley

SAMPLE NO.	DATE	TIME	COMP	GRAB	MATRIX	SAMPLE LOCATION	SIZE & NO. OF CONTAINERS	VOA	VOA	Trip Blank				PRESERVATIVES	REMARKS
9008 645	4-8 99	10am	✓		H_2O	GAC 2	40ML	1						HCL	WS 9041
9008 646	4-8 99	"	✓		"	"	40ML		1					HCL	
9008 647	4-5 99	"	"		"	"	40mL			1				HCL	TB 042

RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)
[signature]	4/8 10:40	[signature]	[signature]	4/8/99 [illegible]:20	[signature]
RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)

SPECIAL INSTRUCTIONS:

TURNAROUND TIME ____________

WASTE STREAM TECHNOLOGY, INC.

302 Grote Street
Buffalo, NY 14207
(716) 876-5290

Analytical Data Report
Report Date : 04/16/99
Group Number : 9901-457

Prepared For :
Mr. John Burns
Olin Corporation
P.O. Box 248
1186 Lower River Road NW
Charleston, TN 37310

Site : Frontier - Pendleton

Field and Laboratory Information

Client Id	WST Lab #	Matrix	Date Sampled	Date Received	Time
GAC 2 Sample Port	WS50932	Aqueous	04/01/99	04/02/99	11:53
Sample Status Upon Receipt : No irregularities.					

Analytical Services

Analytical Parameters	Number of Samples	Turnaround Time
Metals	1	Standard
Cyanide	1	Standard
Phenol	1	Standard
Total Suspended Solids	1	Standard

Report Released By : Daniel W. Voll
Daniel Vollmer, Laboratory QA/QC Officer

ENVIRONMENTAL LABORATORY ACCREDITATION CERTIFICATION NUMBERS
NYSDOH ELAP #11179 NJDEPE #73977 CDHS ELAP #2189

WASTE STREAM TECHNOLOGY

METHODOLOGIES

The specific methodologies employed in obtaining the analytical data reported are indicated on each of the result forms. The method numbers shown refer to the following U.S. Environmental Protection Agency Reference:

Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020, March 1979, Revised 1983, U.S. Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268.

Federal Register, 40 CFR Part 136: Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act. Revised July 1992.

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. Third Edition, Revised December 1996, U.S. EPA SW-846.

Annual Book of ASTM Standards, Volume II. ASTM, 100 Harbor Drive, West Conshohocken, PA 19428-2959.

Standard Methods for the Examination of Water and Wastewater. (20th Edition). American Public Health Association, 1105 18th Street, NW, Washington, D.C. 20036.

Waste Stream Technology, Inc.
Metals Analysis Result Report

Site: Frontier - Pendelton
Date Sampled: 04/01/99
Date Received: 04/02/99

Group Number: 9901-457
Units: mg/L
Matrix: Aqueous

WST ID: WS50932
Client ID: GAC 2 Sample Port
Digestion Date: 04/12/99

Analyte	Detection Limit	Result	Date Analyzed	Analysis Method
Antimony by GFAA	0.009	Not detected	04/15/99	EPA 200.9
Boron by ICP	0.012	0.482	04/13/99	EPA 200.7
Chromium by ICP	0.005	Not detected	04/13/99	EPA 200.7

WASTE STREAM TECHNOLOGY

Waste Stream Technology, Inc.
Wet Chemistry Analyses

Site: Frontier - Pendelton
Date Sampled: 04/01/99
Date Received: 04/02/99

Group Number: 9901-457
Matrix: Aqueous

WST ID: WS50932
Client ID GAC 2 Sample Port

Analysis	Method Reference	Detection Limit	Result	Units	Date Analyzed
Total Suspended Solids	EPA 160.2	4.0	Not detected	mg/L	04/08/99
Cyanide in Water	EPA 335.2	0.005	Not detected	mg/L	04/06/99
Total Recoverable Phenol	EPA 420.1	0.005	Not detected	mg/L	04/08/99

WASTE STREAM TECHNOLOGY

WASTE STREAM TECHNOLOGY
302 GROTE STREET
BUFFALO, NY 14207
(716) 876-5290

9901-457

CHAIN OF CUSTODY RECORD

PROJECT NO.: E414
SITE NAME: FRONTIER Pendleton
SAMPLERS (SIGNATURE): Bill [signature]

SAMPLE NO.	DATE	TIME	COMP	GRAB	MATRIX	SAMPLE LOCATION	SIZE & NO. OF CONTAINERS	BrCrSb	Phenols	Cyanide	TSS				PRESERVATIVES	REMARKS
9D01 641	4-1 99	9Am	✓		H_2O	GAC 2 Sample Post	1 L	1							HNO_3	WS5D932
9D01 642	"	"	✓		H_2O	" " "	1 L		1						H_2SO_4	
9D01 643	"	"	✓		H_2O	" " "	1 L			1					NaOH	
9D01 644	"	"	✓		H_2O	" " "	500 mL				1				⊖	

RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)
[signature]	4/1/99 [illegible]	[signature]	[signature]	4/2/99 11:53	[signature]
RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)

SPECIAL INSTRUCTIONS:

TURNAROUND TIME ______

LAB REFRIGERATOR #

FILE COPY

June 9, 1999

Mr. Frank Nerone
Chief Operator
Niagara County Sewer District #1
7346 Liberty Drive
Niagara Falls, NY 14304

Subject: Analytical Sampling Results (5/7/99 Sample)
Groundwater Discharge Through Pre-Treatment System
Pendleton (Frontier Chemical) Site

Dear Mr. Nerone:

Enclosed for your review are analytical results from the May 7, 1999, monthly sampling event for discharge of collected groundwater from the pre-treatment system at the Pendleton Site. Analytical results for this sampling event are compared against the Permit (#98-11) requirements on the attached Analytical Summary and Daily Flow sheets.

A review of the analytical and flow data shows that all permit parameters are significantly below the stated permit requirements.

This data is being provided for your review and concurrence that all permit parameters are well within their limits. If, following review of the enclosed information, you are not in agreement with the above stated conclusion, please contact me at 423-336-4057 as soon as possible so we may discuss any future monitoring requirements.

Sincerely,

John M. Burns
for the Frontier Chemical - Pendleton Site PRP Group

Enclosures: as stated
cc: D. Kummer
Pendleton Site Technical Committee

DAILY FLOW DATA - PENDLETON SITE
MAY 1999

DATE	TOTALIZER READING	DAILY FLOW	
5/1/99	329449	120	
5/2/99	329569	156	
5/3/99	329725	103	
5/4/99	329828	53	
5/5/99	329881	140	avg.
5/6/99		140	avg.
5/7/99		140	avg.(Sampled)
5/8/99		140	avg.
5/9/99	330441	106	
5/10/99	330547	105	
5/11/99	330652	109	
5/12/99	330761	106	avg.
5/13/99		106	avg.
5/14/99		106	avg.
5/15/99		106	avg.
5/16/99	331183	104	
5/17/99	331287	104	
5/18/99	331391	158	
5/19/99	331549	106	
5/20/99	331655	122	avg.
5/21/99		122	avg.
5/22/99		122	avg.
5/23/99	332022	106	
5/24/99	332128	160	
5/25/99	332288	162	
5/26/99	332450	158	
5/27/99	332608	133	avg.
5/28/99		133	avg.
5/29/99		133	avg.
5/30/99		133	avg.
5/31/99	333140		
AVERAGE DAILY FLOW IN GALLONS		123	

	= DRY VAULT GROUNDWATER RELIEF		
			gallons
			gallons
			gallons
			gallons
	TOTAL GALLONS	0	

avg =flow between data points divided by days of missing data
avg =(330441-329881)/4 or 140 gallons per day for data between 5/5/99 and 5/9/99

Frontier Chemical - Pendleton Site
Analytical Summary for WS 001
Permit # 98-11
Groundwater Discharge Point: D 002

325,914 Gallons Discharged Prior To 4/1/99
4,527 Gallons Since Last Report
129 Average Daily Flow Based on 35 days Between Samples

Parameters Treatment System Discharge	Permit Limit GPD	Detection Limits	4/1/99 & 4/8/99 Sample Results GPD
Discharge Rate(1)	662		129
624 Analytes	ug/L	ug/L	ug/L
Toluene	10.0	1.0	
1,2-Dichloroethane	10.0	1.0	
4-Methyl-2-Pentanone	10.0	5.0	
Vinyl Chloride	10.0	2.0	
Methylene Chloride	10.0	2.8	
trans-1,2-Dichloroethene	10.0	1.0	
1,1,1-Trichloroethane	10.0	1.0	
Trichloroethene	10.0	1.0	
Benzene	10.0	1.0	
Chloromethane		2.0	
Bromomethane		2.0	
Chloroethane		2.0	
Chloroform		1.0	
Carbon Tetrachloride		1.0	
1,1-Dichloroethene		1.0	
Trichlorofluoromethane		2.0	
1,1-Dichloroethane		1.0	
1,2-Dichloropropane		1.0	
Bromodichloromethane		1.0	
2-Chloroethylvinyl ether		2.0	
cis-1,3-Dichloropropene		1.0	
trans-1,3-Dichloropropene		1.0	
1,1,2-Trichloroethane		1.0	
Tetrachloroethene		1.2	
Dibromochloromethane		1.0	
Chlorobenzene		1.0	
Ethylbenezene		1.0	
Bromoform		1.0	
1,1,2,2-Tetrachloroethane		1.0	
1,3-Dichlorobenzene		1.0	
1,4-Dichlorobezene		1.0	
1,2-Dichlorobenzene		1.0	
Sum of 624 Analytes		100.0	
608 Pesticides(2)	ug/L	ug/L	ug/L
alpha BHC	10.0	0.003	
beta BHC	20.0	0.006	
delta BHC	10.0	0.010	
gamme BHC	10.0	0.003	
Heptachlor	8.0	0.022	
Aldrin	8.0	0.018	
Heptachlor Epoxide	9.0	0.009	
4,4-DDE	20.0	0.005	
Methoxychlor	18.0	0.007	
Metals	mg/L	mg/L	mg/L
Antimony	0.1	0.009	< 0.009
Boron	4.00	0.012	0.609
Chromium	5.33	0.005	< 0.005
Cyanide(T)	2.0	0.005	< 0.005
Other	mg/L	mg/L	mg/L
Total Phenolics	NA	0.005	0.007
TSS	300	4.000	< 4.000

Legend:
(1) Permit limit @ 662 GPD with maximum daily discharged @ 2500 GPD
(2) Discontinue per April 14, 1997 Letter from F. Narrone to PRP Group.
(B) Detected in blank
NA Not applicable

WASTE STREAM TECHNOLOGY, INC.

302 Grote Street
Buffalo, NY 14207
(716) 876-5290

Analytical Data Report

Report Date : 05/21/99
Group Number : 9901-655

Prepared For :
Mr. John Burns
Olin Corporation
P.O. Box 248
1186 Lower River Road NW
Charleston, TN 37310

Site : Frontier - Pendelton

Field and Laboratory Information

Client Id	WST Lab #	Matrix	Date Sampled	Date Received	Time
GAC 2 Sample Port	WS52322	Aqueous	05/07/99	05/07/99	14:00
Sample Status Upon Receipt : No irregularities.					

Analytical Services

Analytical Parameters	Number of Samples	Turnaround Time
Metals	1	Standard
Cyanide	1	Standard
Phenol	1	Standard
Total Suspended Solids	1	Standard

Report Released By : Daniel W. Vollmer
Daniel Vollmer, Laboratory QA/QC Officer

ENVIRONMENTAL LABORATORY ACCREDITATION CERTIFICATION NUMBERS
NYSDOH ELAP #11179 NJDEPE #73977 CDHS ELAP #2189

WASTE STREAM TECHNOLOGY

METHODOLOGIES

The specific methodologies employed in obtaining the analytical data reported are indicated on each of the result forms. The method numbers shown refer to the following U.S. Environmental Protection Agency Reference:

Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020, March 1979, Revised 1983, U.S. Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268.

Federal Register, 40 CFR Part 136: Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act. Revised July 1992.

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. Third Edition, Revised December 1996, U.S. EPA SW-846.

Annual Book of ASTM Standards, Volume II. ASTM, 100 Harbor Drive, West Conshohocken, PA 19428-2959.

Standard Methods for the Examination of Water and Wastewater. (20th Edition). American Public Health Association, 1105 18th Street, NW, Washington, D.C. 20036.

Waste Stream Technology, Inc.
Metals Analysis Result Report

Site: Frontier - Pendelton
Date Sampled: 05/07/99
Date Received: 05/07/99

Group Number: 9901-655
Units: mg/L
Matrix: Aqueous

WST ID: WS52322
Client ID: GAC 2 Sample Port
Digestion Date: 05/17/99

Analyte	Detection Limit	Result	Date Analyzed	Analysis Method
Antimony by GFAA	0.009	Not detected	05/20/99	EPA 200.9
Boron by ICP	0.012	0.609	05/17/99	EPA 200.7
Chromium by ICP	0.005	Not detected	05/17/99	EPA 200.7

Waste Stream Technology, Inc.
Wet Chemistry Analyses

Site: Frontier - Pendelton
Date Sampled: 05/07/99
Date Received: 05/07/99

Group Number: 9901-655
Matrix: Aqueous

WST ID: WS52322
Client ID GAC 2 Sample Port

Analysis	Method Reference	Detection Limit	Result	Units	Date Analyzed
Total Suspended Solids	EPA 160.2	4.0	Not detected	mg/L	05/11/99
Cyanide in Water	EPA 335.2	0.005	Not detected	mg/L	05/13/99
Total Recoverable Phenol	EPA 420.1	0.005	0.007	mg/L	05/10/99

WASTE STREAM TECHNOLOGY

302 GROTE STREET
BUFFALO, NY 14207
(716) 876-5290

9901-655 (85)

CHAIN OF CUSTODY RECORD

PROJECT NO: E414 SITE NAME: Frontier Pendleton

SAMPLERS (SIGNATURE): Bill Brayley

SAMPLE NO.	DATE	TIME	COMP	GRAB	MATRIX	SAMPLE LOCATION	SIZE & NO. OF CONTAINERS	Br, Cr, SG	Phenols	Cyanide	TSS				PRESERVATIVES	REMARKS
9E07 648	5-7 99	1200 Noon	✓		H_2O	GAC2 Sample Port	1L	1							HNO_3	WS52322
9E07 649	5-7 99	12 Noon	✓		H_2O	" " "	1L		1						H_2SO_4	
9E07 650	5-7 99	12 Noon	✓		H_2O	" " "	1L			1					NaOH	
9E07 651	5-7 99	12 Noon	✓		H_2O	" " "	500ML				1				Ø	

RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)
Bill Brayley	5/7/99 1256 PM	C. Fantauzzo	C. Fantauzzo	5-7-99 14:00	
RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)

SPECIAL INSTRUCTIONS:

TURNAROUND TIME _____

LA[illegible] REFRIGERATOR [illegible]

DUE DATE

FILE COPY

July 20, 1999

Mr. Frank Nerone
Chief Operator
Niagara County Sewer District #1
7346 Liberty Drive
Niagara Falls, NY 14304

Subject: Analytical Sampling Results (6/3/99 Sample)
Groundwater Discharge Through Pre-Treatment System
Pendleton (Frontier Chemical) Site

Dear Mr. Nerone:

Enclosed for your review are analytical results from the June 3, 1999, monthly sampling event for discharge of collected groundwater from the pre-treatment system at the Pendleton Site. Analytical results for this sampling event are compared against the Permit (#98-11) requirements on the attached Analytical Summary and Daily Flow sheets.

A review of the analytical and flow data shows that all permit parameters are significantly below the stated permit requirements. There was an error in the May 1999 flow submittal due to a computing error. A revised May 1999 sheet is also included for your files.

This data is being provided for your review and concurrence that all permit parameters are well within their limits. If, following review of the enclosed information, you are not in agreement with the above stated conclusion, please contact me at 423-336-4057 as soon as possible so we may discuss any future monitoring requirements.

Sincerely,

John M. Burns

John M. Burns
for the Frontier Chemical - Pendleton Site PRP Group

Enclosures: as stated
cc: D. Kummer
Pendleton Site Technical Committee

Frontier Chemical - Pendleton Site
Analytical Summary for WS 001
Permit # 98-11
Groundwater Discharge Point: D 002

330,432 Gallons Discharged Prior To 5/9/99
3,367 Gallons Since Last Report
120 Average Daily Flow Based on 28 days Between Samples

Parameters Treatment System Discharge	Permit Limit GPD	Detection Limits	6/3/99 Sample Results GPD
Discharge Rate(1)	662		
624 Analytes	**ug/L**	**ug/L**	**ug/L**
Toluene	10.0	1.0	
1,2-Dichloroethane	10.0	1.0	
4-Methyl-2-Pentanone	10.0	5.0	
Vinyl Chloride	10.0	2.0	
Methylene Chloride	10.0	2.8	
trans-1,2-Dichloroethene	10.0	1.0	
1,1,1-Trichloroethane	10.0	1.0	
Trichloroethene	10.0	1.0	
Benzene	10.0	1.0	
Chloromethane		2.0	
Bromomethane		2.0	
Chloroethane		2.0	
Chloroform		1.0	
Carbon Tetrachloride		1.0	
1,1-Dichloroethene		1.0	
Trichlorofluoromethane		2.0	
1,1-Dichloroethane		1.0	
1,2-Dichloropropane		1.0	
Bromodichloromethane		1.0	
2-Chloroethylvinyl ether		2.0	
cis-1,3-Dichloropropene		1.0	
trans-1,3-Dichloropropene		1.0	
1,1,2-Trichloroethane		1.0	
Tetrachloroethene		1.2	
Dibromochloromethane		1.0	
Chlorobenzene		1.0	
Ethylbenezene		1.0	
Bromoform		1.0	
1,1,2,2-Tetrachloroethane		1.0	
1,3-Dichlorobenzene		1.0	
1,4-Dichlorobezene		1.0	
1,2-Dichlorobenzene		1.0	
Sum of 624 Analytes		100.0	
608 Pesticides(2)	**ug/L**	**ug/L**	**ug/L**
alpha BHC	10.0	0.003	
beta BHC	20.0	0.006	
delta BHC	10.0	0.010	
gamme BHC	10.0	0.003	
Heptachlor	8.0	0.022	
Aldrin	8.0	0.018	
Heptachlor Epoxide	9.0	0.009	
4,4-DDE	20.0	0.005	
Methoxychlor	18.0	0.007	
Metals	**mg/L**	**mg/L**	**mg/L**
Antimony	0.1	0.009	< 0.009
Boron	4.00	0.012	0.659
Chromium	5.33	0.005	< 0.005
Cyanide(T)	2.0	0.005	0.005
Other	**mg/L**	**mg/L**	**mg/L**
Total Phenolics	NA	0.005	0.007
TSS	300	4.000	< 4.000

Legend:
(1) Permit limit @ 662 GPD with maximum daily discharged @ 2500 GPD
(2) Discontinue per April 14, 1997 Letter from F. Narrone to PRP Group.
(B) Detected in blank
NA Not applicable

DAILY FLOW DATA - PENDLETON SITE
JUNE 1999

DATE	TOTALIZER READING	DAILY FLOW	
6/1/99	333160	164	avg.
6/2/99		164	avg.
6/3/99	333487	104	avg.(Sampled)
6/4/99		104	avg.
6/5/99		104	avg.
6/6/99	333799	129	avg.
6/7/99		129	avg.
6/8/99	334057	102	
6/9/99	334159	104	
6/10/99	334263	121	avg.
6/11/99		121	avg.
6/12/99		121	avg.
6/13/99	334625	104	
6/14/99	334729	105	
6/15/99	334834	103	
6/16/99	334937	107	
6/17/99	335044	102	avg.
6/18/99		102	avg.
6/19/99		102	avg.
6/20/99	335351	108	
6/21/99	335459	102	
6/22/99	335561	102	
6/23/99	335663	101	
6/24/99	335764	104	avg.
6/25/99		104	avg.
6/26/99		104	avg.
6/27/99	336075	150	
6/28/99	336225	159	
6/29/99	336384	156	
6/30/99	336540		
AVERAGE DAILY FLOW IN GALLONS		117	

	= DRY VAULT GROUNDWATER RELIEF		
			gallons
			gallons
			gallons
			gallons
	TOTAL GALLONS	0	

avg =flow between data points divided by days of missing data
avg =(333487-333160)/2 or 164 gallons per day for data between 6/1/99/ and 6/3/99

DAILY FLOW DATA - PENDLETON SITE
MAY 1999 REVISED

DATE	TOTALIZER READING	DAILY FLOW	
5/1/99	329448	119	
5/2/99	329567	155	
5/3/99	329722	102	
5/4/99	329824	52	
5/5/99	329876	139	avg.
5/6/99		139	avg.
5/7/99		139	avg.(Sampled)
5/8/99		139	avg.
5/9/99	330432	105	
5/10/99	330537	104	
5/11/99	330641	108	
5/12/99	330749	105	avg.
5/13/99		105	avg.
5/14/99		105	avg.
5/15/99		105	avg.
5/16/99	331167	103	
5/17/99	331270	103	
5/18/99	331373	157	
5/19/99	331530	105	
5/20/99	331635	121	avg.
5/21/99		121	avg.
5/22/99		121	avg.
5/23/99	331999	105	
5/24/99	332104	159	
5/25/99	332263	161	
5/26/99	332424	157	
5/27/99	332581	132	avg.
5/28/99		132	avg.
5/29/99		132	avg.
5/30/99		132	avg.
5/31/99	333109		
AVERAGE DAILY FLOW IN GALLONS		122	

	= DRY VAULT GROUNDWATER RELIEF		
			gallons
			gallons
			gallons
			gallons
	TOTAL GALLONS	0	

avg =flow between data points divided by days of missing data
avg =(330432-329876)/4 or 139 gallons per day for data between 5/5/99 and 5/9/99

WASTE STREAM TECHNOLOGY, INC.

302 Grote Street
Buffalo, NY 14207
(716) 876-5290

Analytical Data Report

Report Date : 06/18/99
Group Number : 9901-803

Prepared For :
Mr. John Burns
Olin Corporation
P.O. Box 248
1186 Lower River Road NW
Charleston, TN 37310

Site : Frontier - Pendleton

Field and Laboratory Information

Client Id	WST Lab #	Matrix	Date Sampled	Date Received	Time
GAC 2 Sample Port	WS53404	Aqueous	06/03/99	06/04/99	11:00
Sample Status Upon Receipt : No irregularities.					

Analytical Services

Analytical Parameters	Number of Samples	Turnaround Time
Metals	1	Standard
Cyanide	1	Standard
Phenol	1	Standard
Total Suspended Solids	1	Standard

Report Released By : Daniel W. Voll
Daniel Vollmer, Laboratory QA/QC Officer

ENVIRONMENTAL LABORATORY ACCREDITATION CERTIFICATION NUMBERS
NYSDOH ELAP #11179 NJDEPE #73977 CDHS ELAP #2189

WASTE STREAM TECHNOLOGY

METHODOLOGIES

The specific methodologies employed in obtaining the analytical data reported are indicated on each of the result forms. The method numbers shown refer to the following U.S. Environmental Protection Agency Reference:

Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020, March 1979, Revised 1983, U.S. Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268.

Federal Register, 40 CFR Part 136: Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act. Revised July 1992.

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. Third Edition, Revised December 1996, U.S. EPA SW-846.

Annual Book of ASTM Standards, Volume II. ASTM, 100 Harbor Drive, West Conshohocken, PA 19428-2959.

Standard Methods for the Examination of Water and Wastewater. (20th Edition). American Public Health Association, 1105 18th Street, NW. Washington, D.C. 20036.

Waste Stream Technology, Inc.
Wet Chemistry Analyses

Site: Frontier - Pendelton
Date Sampled: 06/03/99
Date Received: 06/04/99

Group Number: 9901-803
Matrix: Aqueous

WST ID: WS53404
Client ID GAC 2 SAMPLE PORT

Analysis	Method Reference	Detection Limit	Result	Units	Date Analyzed
Total Suspended Solids	EPA 160.2	4.0	Not detected	mg/L	06/08/99
Cyanide in Water	EPA 335.2	0.005	0.005	mg/L	06/14/99
Total Recoverable Phenol	EPA 420.1	0.005	Not detected	mg/L	06/08/99

WASTE STREAM TECHNOLOGY

Waste Stream Technology, Inc.
Metals Analysis Result Report

Site: Frontier - Pendelton
Date Sampled: 06/03/99
Date Received: 06/04/99

Group Number: 9901-803
Units: mg/L
Matrix: Aqueous

WST ID: WS53404
Client ID: GAC 2 SAMPLE PORT
Digestion Date: 06/15/99

Analyte	Detection Limit	Result	Date Analyzed	Analysis Method
Antimony by GFAA	0.009	Not detected	06/16/99	EPA 200.9
Boron by ICP	0.012	0.659	06/15/99	EPA 200.7
Chromium by ICP	0.005	Not detected	06/15/99	EPA 200.7

WASTE STREAM TECHNOLOGY

Waste Stream Technology, Inc.
Metals Method Blank Analysis

Site: Frontier - Pendelton
Date Sampled: NA
Date Received: NA

Group Number: 9901-803
Units: mg/L

WST ID MB061599-HP1
Client ID: NA
Digestion Date: 06/15/99

Analyte	Detection Limit	Result	Date Analyzed	Analysis Method
B Method Blank	0.012	Not detected	06/15/99	EPA 200.7
Cr Method Blank	0.005	Not detected	06/15/99	EPA 200.7
Sb Method Blank	0.009	Not detected	06/16/99	EPA 200.9

MB denotes Method Blank
NA denotes Not Applicable

Olin
WASTE STREAM TECHNOLOGY

302 GROTE STREET
BUFFALO, NY 14207
(716) 876-5290

9901-803

CHAIN OF CUSTODY RECORD

PROJECT NO: E414 SITE NAME: Frontier Pendleton

SAMPLERS (SIGNATURE): [signature] Bill Brayley

SAMPLE NO.	DATE	TIME	COMP	GRAB	MATRIX	SAMPLE LOCATION	SIZE & NO. OF CONTAINERS	Be, Cr, Sb	Phenols	Cyanide	TSS				PRESERVATIVES	REMARKS
9F03 652	6-03-99	1245 PM	✓		H_2O	GAC2 Sample Port	1L	1							HNO_3	WS53404
9F03 653	6-03-99	1245 PM	✓		H_2O	" " "	1L		1						H_2SO_4	
9F03 654	6-03-99	1245 PM	✓		H_2O	" " "	1L			1					NAOH	
9F03 655	6-03-99	1245 PM	✓		H_2O	" " "	500 ML				1				Ø	

RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)
[signature] Bill Brayley	6/4 / 11[illegible]	[signature]	[signature]	6/4/99 1100	[signature]
RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)

SPECIAL INSTRUCTIONS:

TURNAROUND TIME 10 [illegible]

FILE COPY

August 29, 1999

Mr. Frank Nerone
Chief Operator
Niagara County Sewer District #1
7346 Liberty Drive
Niagara Falls, NY 14304

Subject: Analytical Sampling Results (7/1/99 Monthly Sample)
Groundwater Discharge Through Pre-Treatment System
Pendleton (Frontier Chemical) Site

Dear Mr. Nerone:

Enclosed for your review are analytical results from the July 1, 1999 sampling event for discharge of collected groundwater from the pre-treatment system at the Pendleton Site. Analytical results for this sampling event are compared against the Permit (#98-11) requirements on the attached Analytical Summary and Daily Flow sheets.

A review of the analytical and flow data shows that all permit parameters are significantly below the stated permit requirements.

This data is being provided for your review and concurrence that all permit parameters are well within their limits. If, following review of the enclosed information, you are not in agreement with the above stated conclusion, please contact me at 423-336-4057 as soon as possible so we may discuss any future monitoring requirements.

Sincerely,

John M. Burns

John M. Burns
for the Frontier Chemical - Pendleton Site PRP Group

Enclosures: as stated
cc: D. Kummer
Pendleton Site Technical Committee

DAILY FLOW DATA - PENDLETON SITE
JULY 1999

DATE	TOTALIZER READING	DAILY FLOW	
6/1/98	276235	161	
6/2/98	276396	159	
6/3/98	276555	166	
6/4/98	276721	166	
6/5/98	276887	215	
6/6/98	277102	106	
6/7/98	277208	168	
6/8/98	277376	159	
6/9/98	277535	143	avg.
6/10/98		143	avg.
6/11/98	277821	159	
6/12/98	277980	160	avg.
6/13/98		160	avg.
6/14/98	278300	159	
6/15/98	278459	161	
6/16/98	278620	158	
6/17/98	278778	157	
6/18/98	278935	157	
6/19/98	279092	213	
6/20/98	279305	157	
6/21/98	279462	104	
6/22/98	279566	157	
6/23/98	279723	164	
6/24/98	279887	186	
6/25/98	280073	189	
6/26/98	280262	217	
6/27/98	280479	215	
6/28/98	280694	160	
6/29/98	280854	217	
6/30/98	281071		
AVERAGE DAILY FLOW IN GALLONS		167	

	= DRY VAULT GROUNDWATER RELIEF		
			gallons
			gallons
			gallons
			gallons
	TOTAL GALLONS	0	

avg =flow between data points divided by days of missing data
avg =(277821-277535)/2 or 142 gallons per day for data between 6/9/98 and 6/11/98

Frontier Chemical - Pendleton Site
Analytical Summary for WS 001
Permit # 98-11
Groundwater Discharge Point: D 002

333,799 Gallons Discharged Prior To 6/3/99
3,211 Gallons Since Last Report
115 Average Daily Flow Based on 28 days Between Samples

Parameters Treatment System Discharge	Permit Limit GPD	Detection Limits	7/1/99 Sample Results GPD
Discharge Rate(1)	662		
624 Analytes	ug/L	ug/L	ug/L
Toluene	10.0	1.0	
1,2-Dichloroethane	10.0	1.0	
4-Methyl-2-Pentanone	10.0	5.0	
Vinyl Chloride	10.0	2.0	
Methylene Chloride	10.0	2.8	
trans-1,2-Dichloroethene	10.0	1.0	
1,1,1-Trichloroethane	10.0	1.0	
Trichloroethene	10.0	1.0	
Benzene	10.0	1.0	
Chloromethane		2.0	
Bromomethane		2.0	
Chloroethane		2.0	
Chloroform		1.0	
Carbon Tetrachloride		1.0	
1,1-Dichloroethene		1.0	
Trichlorofluoromethane		2.0	
1,1-Dichloroethane		1.0	
1,2-Dichloropropane		1.0	
Bromodichloromethane		1.0	
2-Chloroethylvinyl ether		2.0	
cis-1,3-Dichloropropene		1.0	
trans-1,3-Dichloropropene		1.0	
1,1,2-Trichloroethane		1.0	
Tetrachloroethene		1.2	
Dibromochloromethane		1.0	
Chlorobenzene		1.0	
Ethylbenezene		1.0	
Bromoform		1.0	
1,1,2,2-Tetrachloroethane		1.0	
1,3-Dichlorobenzene		1.0	
1,4-Dichlorobezene		1.0	
1,2-Dichlorobenzene		1.0	
Sum of 624 Analytes		100.0	
608 Pesticides(2)	ug/L	ug/L	ug/L
alpha BHC	10.0	0.003	
beta BHC	20.0	0.006	
delta BHC	10.0	0.010	
gamme BHC	10.0	0.003	
Heptachlor	8.0	0.022	
Aldrin	8.0	0.018	
Heptachlor Epoxide	9.0	0.009	
4,4-DDE	20.0	0.005	
Methoxychlor	18.0	0.007	
Metals	mg/L	mg/L	mg/L
Antimony	0.1	0.009	< 0.009
Boron	4.00	0.012	0.813
Chromium	5.33	0.005	< 0.005
Cyanide(T)	2.0	0.005	0.006
Other	mg/L	mg/L	mg/L
Total Phenolics	NA	0.005	< 0.005
TSS	300	4.000	< 4.000

Legend:
(1) Permit limit @ 662 GPD with maximum daily discharged @ 2500 GPD
(2) Discontinue per April 14, 1997 Letter from F. Narrone to PRP Group.
(B) Detected in blank
NA Not applicable

WASTE STREAM TECHNOLOGY, INC.

302 Grote Street
Buffalo, NY 14207
(716) 876-5290

Analytical Data Report
Report Date : 07/19/99
Group Number : 9901-987

Prepared For :
Mr. John Burns
Olin Corporation
P.O. Box 248
1186 Lower River Road NW
Charleston, TN 37310

Site : Frontier - Pendleton

Field and Laboratory Information

Client Id	WST Lab #	Matrix	Date Sampled	Date Received	Time
GAC2 Sample Port	WS54362	Aqueous	07/01/99	07/02/99	12:30
Sample Status Upon Receipt : No irregularities.					

Analytical Services

Analytical Parameters	Number of Samples	Turnaround Time
Metals	1	Standard
Cyanide	1	Standard
Phenol	1	Standard
Total Suspended Solids	1	Standard

Report Released By : Daniel W. Vollmer
Daniel Vollmer, Laboratory QA/QC Officer

ENVIRONMENTAL LABORATORY ACCREDITATION CERTIFICATION NUMBERS
NYSDOH ELAP #11179 NJDEPE #73977 CDHS ELAP #2189

WASTE STREAM TECHNOLOGY

METHODOLOGIES

The specific methodologies employed in obtaining the analytical data reported are indicated on each of the result forms. The method numbers shown refer to the following U.S. Environmental Protection Agency Reference:

Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020, March 1979, Revised 1983, U.S. Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268.

Federal Register, 40 CFR Part 136: Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act. Revised July 1992.

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. Third Edition, Revised December 1996, U.S. EPA SW-846.

Annual Book of ASTM Standards, Volume II. ASTM, 100 Harbor Drive, West Conshohocken, PA 19428-2959.

Standard Methods for the Examination of Water and Wastewater. (20th Edition). American Public Health Association, 1105 18th Street, NW, Washington, D.C. 20036.

Waste Stream Technology, Inc.
Metals Analysis Result Report

Site: Frontier - Pendleton
Date Sampled: 07/01/99
Date Received: 07/02/99

Group Number: 9901-987
Units: mg/L
Matrix: Aqueous

WST ID: WS54362
Client ID: GAC2 Sample Port
Digestion Date: 07/09/99

Analyte	Detection Limit	Result	Date Analyzed	Analysis Method
Antimony by GFAA	0.009	Not detected	07/13/99	EPA 200.9
Boron by ICP	0.012	0.813	07/09/99	EPA 200.7
Chromium by ICP	0.005	Not detected	07/09/99	EPA 200.7

WASTE STREAM TECHNOLOGY

Waste Stream Technology, Inc.
Wet Chemistry Analyses

Site: Frontier - Pendleton
Date Sampled: 07/01/99
Date Received: 07/02/99

Group Number: 9901-987
Matrix: Aqueous

WST ID: WS54362
Client ID GAC2 Sample Port

Analysis	Method Reference	Detection Limit	Result	Units	Date Analyzed
Total Recoverable Phenol	EPA 420.1	0.005	Not detected	mg/L	07/13/99
Cyanide in Water	EPA 335.2	0.005	0.006	mg/L	07/07/99
Total Suspended Solids	EPA 160.2	4.0	Not detected	mg/L	07/06/99

WASTESTREAM TECHNOLOGY
302 GROTE STREET
BUFFALO, NY 14207
(716) 876-5290

9901-987

CHAIN OF CUSTODY RECORD

PROJECT NO: E414 SITE NAME: Frontier Pendleton

SAMPLERS (SIGNATURE): B.H. Bradley

SAMPLE NO.	DATE	TIME	COMP	GRAB	MATRIX	SAMPLE LOCATION	SIZE & NO. OF CONTAINERS	Ba, Cr, Sb	Phenols	Cyanide	TSS				PRESERVATIVES	REMARKS
9601 656	7-01 99	230 PM	✓		H2O	GAC2 Sample Port	1L	1							HNO3	WS54362
9601 657	7-01 99	230 PM	✓		H2O	" " "	1L	1							H2SO4	
9601 658	7-01 99	230 PM	✓		H2O	" " "	1L			1					NaOH	
9601 659	7-01 99	230 PM	✓		H2O	" " "	500mL				1				∅	

RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)
K.W. Moore	7/2 1130	P. Tomczyk	P. Tomczyk	7/3/99 12:30	Sandra L. Lutz
RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)

SPECIAL INSTRUCTIONS:

TURNAROUND TIME 10 BD for 7/2 199

LAB I REFRIGERATOR #_____ SHELF #_____ GROUP #_____ DUE DATE _____

FILE COPY

Olin

P.O. BOX 248, 1186 LOWER RIVER ROAD, NW, CHARLESTON, TN 37310-0248
(423) 336-4000 FAX: (423) 336-4183

September 10, 1999

VIA AIRBORNE EXPRESS

Mr. Frank Nerone
Chief Operator
Niagara County Sewer District #1
7346 Liberty Drive
Niagara Falls, NY 14304

Subject: Analytical Sampling Results (8/3/99 Monthly Sample)
Groundwater Discharge Through Pre-Treatment System
Pendleton (Frontier Chemical) Site

Dear Mr. Nerone:

Enclosed for your review are the analytical results from the August 3, 1999, sampling event for discharge of collected groundwater from the pre-treatment system at the Pendleton Site. Analytical results for this sampling event are compared against the Permit (#98-11) requirements on the attached Analytical Summary and Daily Flow sheets.

A review of the analytical and flow data shows that all permit parameters are significantly below the permit discharge requirements.

This data is being provided for your review and concurrence that all permit parameters are well within their limits. If, following review of the enclosed information, you are not in agreement with the above stated conclusion, please contact me at 423-336-4057 as soon as possible so we may discuss any future monitoring requirements.

Sincerely,

John M. Burns

John M. Burns
For the Frontier Chemical - Pendleton Site PRP Group

Enclosures: as stated

cc: D. Kummer
Pendleton Site Technical Committee

Frontier Chemical - Pendleton Site
August 1999 Analytical Summary for WS 001
Permit # 98-11

Groundwater Discharge Point: D 002

342,998 Gallons Discharged Prior To 7/5/99
5,882 Gallons Since Last Report
210 Average Daily Flow Based on 28 days Between Samples

Parameters / Treatment System Discharge	Permit Limit GPD	Detection Limits	8/3/99 Sample Results GPD	
Discharge Rate(1)	662			
624 Analytes	ug/L	ug/L	ug/L	
Toluene	10.0	1.0		
1,2-Dichloroethane	10.0	1.0		
4-Methyl-2-Pentanone	10.0	5.0		
Vinyl Chloride	10.0	2.0		
Methylene Chloride	10.0	2.8		
trans-1,2-Dichloroethene	10.0	1.0		
1,1,1-Trichloroethane	10.0	1.0		
Trichloroethene	10.0	1.0		
Benzene	10.0	1.0		
Chloromethane		2.0		
Bromomethane		2.0		
Chloroethane		2.0		
Chloroform		1.0		
Carbon Tetrachloride		1.0		
1,1-Dichloroethene		1.0		
Trichlorofluoromethane		2.0		
1,1-Dichloroethane		1.0		
1,2-Dichloropropane		1.0		
Bromodichloromethane		1.0		
2-Chloroethylvinyl ether		2.0		
cis-1,3-Dichloropropene		1.0		
trans-1,3-Dichloropropene		1.0		
1,1,2-Trichloroethane		1.0		
Tetrachloroethene		1.2		
Dibromochloromethane		1.0		
Chlorobenzene		1.0		
Ethylbenezene		1.0		
Bromoform		1.0		
1,1,2,2-Tetrachloroethane		1.0		
1,3-Dichlorobenzene		1.0		
1,4-Dichlorobezene		1.0		
1,2-Dichlorobenzene		1.0		
Sum of 624 Analytes		100.0		
608 Pesticides(2)	ug/L	ug/L	ug/L	
alpha BHC	10.0	0.003		
beta BHC	20.0	0.006		
delta BHC	10.0	0.010		
gamme BHC	10.0	0.003		
Heptachlor	8.0	0.022		
Aldrin	8.0	0.018		
Heptachlor Epoxide	9.0	0.009		
4,4-DDE	20.0	0.006		
Methoxychlor	18.0	0.007		
Metals	mg/L	mg/L	mg/L	
Antimony	0.1	0.009	< 0.009	
Boron	4.00	0.012	0.844	
Chromium	5.33	0.006	< 0.006	
Cyanide(T)	2.0	0.006	0.007	
Other	mg/L	mg/L	mg/L	
Total Phenolics	NA	0.006	< 0.006	
TSS	300	4.000	< 4.000	

Legend:

(1) Permit limit @ 662 GPD with maximum daily discharged @ 2500 GPD
(2) Discontinue per April 14, 1997 Letter from F. Narrone to PRP Group.
(B) Detected in blank
NA Not applicable

FRONTIER CHEMICAL PENDLETON
DAILY FLOW DATA
AUGUST 1999

DATE	TOTALIZER READING	DAILY FLOW	COMMENTS
8/1/99	340001	86	
8/2/99	340104	103	
8/3/99	340217	113	Sampling
8/4/99	340217	115	avg. flow
8/5/99		115	avg. flow
8/6/99		115	avg. flow
8/7/99		115	avg. flow
8/8/99	340790	115	avg. flow
8/9/99	340893	103	
8/10/99	340997	104	
8/11/99	341100	103	
8/12/99	341253	153	
8/13/99		103	avg. flow
8/14/99		103	avg. flow
8/15/99		103	avg. flow
8/16/99	341663	103	avg. flow
8/17/99	341765	102	
8/18/99	341867	102	
8/19/99	341918	51	
8/20/99		105	avg. flow
8/21/99		105	avg. flow
8/22/99	342233	105	avg. flow
8/23/99	342335	102	
8/24/99	342437	102	
8/25/99	342539	102	
8/26/99	342590	51	
8/27/99		85	avg. flow
8/28/99		85	avg. flow
8/29/99	342845	85	avg. flow
8/30/99	342948	103	
8/31/99	342998	50	

Avg. Daily Flow (gal). **99.6**

	= DRY VAULT GROUNDWATER RELIEF		
			gallons
			gallons
			gallons
			gallons

TOTAL GALLONS **0.0**

Avg. Flow = flow between data points divided by days of missing data

WASTE STREAM TECHNOLOGY, INC.

302 Grote Street
Buffalo, NY 14207
(716) 876-5290

Analytical Data Report

Report Date : 08/23/99
Group Number : 9901-1192

Prepared For :
Mr. John Burns
Olin Corporation
P.O. Box 248
1186 Lower River Road NW
Charleston, TN 37310

Site : Frontier - Pendleton

Field and Laboratory Information

Client Id	WST Lab #	Matrix	Date Sampled	Date Received	Time
9H06 660 Gac2 Sample Port	WS55454	Aqueous	08/06/99	08/09/99	11:30
9H06 661 Gac2 Sample Port	WS55455	Aqueous	08/06/99	08/09/99	11:30
9H06 662 Gac2 Sample Port	WS55456	Aqueous	08/06/99	08/09/99	11:30
9H06 663 Gac2 Sample Port	WS55457	Aqueous	08/06/99	08/09/99	11:30
Sample Status Upon Receipt : No irregularities.					

Analytical Services

Analytical Parameters	Number of Samples	Turnaround Time
Metals	1	Standard
Cyanide	1	Standard
Phenol	1	Standard
Total Suspended Solids	1	Standard

Report Released By : Daniel W. Voe
Daniel Vollmer, Laboratory QA/QC Officer

ENVIRONMENTAL LABORATORY ACCREDITATION CERTIFICATION NUMBERS
NYSDOH ELAP #11179 NJDEPE #73977 CDHS ELAP #2189

METHODOLOGIES

The specific methodologies employed in obtaining the analytical data reported are indicated on each of the result forms. The method numbers shown refer to the following U.S. Environmental Protection Agency Reference:

Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020, March 1979, Revised 1983, U.S. Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268.

Federal Register, 40 CFR Part 136: Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act. Revised July 1992.

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. Third Edition, Revised December 1996, U.S. EPA SW-846.

Annual Book of ASTM Standards, Volume II. ASTM, 100 Harbor Drive, West Conshohocken, PA 19428-2959.

Standard Methods for the Examination of Water and Wastewater. (20th Edition). American Public Health Association, 1105 18th Street, NW, Washington, D.C. 20036.

Waste Stream Technology, Inc.
Metals Analysis Result Report

Site: Frontier - Pendleton
Date Sampled: 08/06/99
Date Received: 08/09/99

Group Number: 9901-1192
Units: mg/L
Matrix: Aqueous

WST ID: WS55454
Client ID: 9H06 660 GAC2 Sample Port
Digestion Date: 08/10/99

Analyte	Detection Limit	Result	Date Analyzed	Analysis Method
Antimony by GFAA	0.009	Not detected	08/13/99	EPA 200.9
Boron by ICP	0.012	0.844	08/10/99	EPA 200.7
Chromium by ICP	0.005	Not detected	08/10/99	EPA 200.7

Waste Stream Technology, Inc.

Total Recoverable Phenol

EPA 420.1

Site: Frontier - Pendleton
Date Sampled: 08/06/99
Date Received: 08/09/99

Group Number: 9901-1192
Matrix: Aqueous
Units: mg/L

WST ID	Client ID	Detection Limit	Result	Date Analyzed
WS55455	9H06 661 GAC2 Sample Port	0.005	Not detected	08/13/99

WASTE STREAM TECHNOLOGY

Waste Stream Technology, Inc.

Cyanide in Water

EPA 335.2

Site: Frontier - Pendleton
ate Sampled: 08/06/99
Date Received: 08/09/99

Group Number: 9901-1192
Matrix: Aqueous
Units: mg/L

WST ID	Client ID	Detection Limit	Result	Date Analyzed
WS55456	9H06 662 GAC2 Sample Port	0.005	0.007	08/19/99

Waste Stream Technology, Inc.

Total Suspended Solids

EPA 160.2

Site: Frontier - Pendleton
Date Sampled: 08/06/99
Date Received: 08/09/99

Group Number: 9901-1192
Matrix: Aqueous
Units: mg/L

WST ID	Client ID	Detection Limit	Result	Date Analyzed
WS55457	9H06 663 GAC2 Sample Port	4.0	Not detected	08/10/99

WASTE STREAM TECHNOLOGY
302 GROTE STREET
BUFFALO, NY 14207
(716) 876-5290

9901-1192

CHAIN OF CUSTODY RECORD

PROJECT NO: E414

SITE NAME: Frontier Pendleton

SAMPLERS (SIGNATURE): Bill Baagley

SAMPLE NO.	DATE	TIME	COMP	GRAB	MATRIX	SAMPLE LOCATION	SIZE & NO. OF CONTAINERS	Be, Cr, Sb	Phenols	Cyanide	TSS				PRESERVATIVES	REMARKS
9H06 660	8/06 99		✓		H2O	6AC2 Sample Port	1L	1							HNO3	WS554/54
9H06 661	8/06 99		✓		H2O	" " "	1L		1						H2SO4	55
9H06 662	8/06 99		✓		H2O	" " "	1L			1					NaOH	56
9H06 663	8/06 99		✓		H2O	" " "	500ML				1				Ø 3	57

RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)
[signature]	8/9/99 10:16	[signature]	[signature]	8/9 11:30	[signature]
RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)

SPECIAL INSTRUCTIONS:

TURNAROUND TIME ______

LA' . REFRIGERATOR # ______ SHELF # ______ GROUP # ______ DUE DATE. ______

B-2 Niagara County Sewer District #1 Permit

Niagara County Sewer District #1

Industrial Waste Permit

Industrial User: Pendleton Site PRP Group
(Permittee)

Division Name (if Applicable): c/o Olin Corporation

Mailing Address: P.O. Box 248
Street or P.O. Box

Charleston, TN 37310-0248
City, State and Zip Code

Site Address: Pendleton Site Townline Road
Street Address

Pendleton, New York
City, State

The above Industrial User is authorized to discharge contaminated groundwater to the Niagara County Sewer District #1 sewer system in compliance with the District's Sewer Use Law, Local Law No.1, Resolution No. 7-94, any applicable provisions of Federal or State law or regulation, and in accordance with discharge points(s), effluent limitations, monitoriing requirements, and other conditions set forth herein.

Effective Date: August 28, 1998

Expiration Date: August 28, 2000

(Application for renewal shall be submitted 90 days prior to expiration)

District Permit No. 98-11

Date: 1/11/99 Signed: _____
(Authorized Signature)

B-3 Operation, Maintenance and Monitoring Activities

Operation, Maintenance, and Monitoring Activities

Table B-3

Date	Event	Action Taken
March 4, 1999	NCSD Monthly Sampling; Pressure Problems GAC #2 relief valve leaking	Completed; Changed filter bag Replaced BFI influent gauge Replaced valve
March 18, 1999	Pressure Problems Pinhole leak in Carbon Vessel #1	Changed filter bags and replaced pressure gauges
March 26, 1999	Pinhole leak in GAC #1	Repaired vessel
August 4, 1999	NYSDEC Site Inspection	
	Mid-joint of vault roof leaking	Evaluating alternatives for corrective action
	Small rodent hole at east end of cap	Evaluating alternatives to repair rodent hole
August 24, 1999	Pressure Problems	Changed filter bags

ATTACHMENT C

ATTACHMENT C – Groundwater Data

C-1 Frontier Chemical – Pendleton Site
Semi-Annual Ground Water Monitoring Report
O'Brien & Gere
September 1999

C-2 Frontier Chemical – Pendleton Site
Town of Pendleton, Niagara County, NY Water Samples
Volume 1 of 3
O'Brien & Gere
August 11, 12, and 13, 1999

C-1 Frontier Chemical – Pendleton Site
Semi-Annual Ground Water Monitoring Report
O'Brien & Gere
September 1999

REPORT

Frontier Chemical - Pendleton Site Semi-Annual Ground Water Monitoring Report

Pendleton Site PRP Group

September 1999

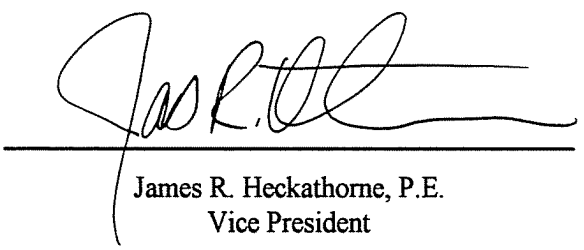
O'BRIEN & GERE
ENGINEERS, INC.

5829/24532

REPORT

Frontier Chemical - Pendleton Site Semi-Annual Ground Water Monitoring Report

Pendleton Site PRP Group



James R. Heckathorne, P.E.
Vice President

September 1999

O'BRIEN & GERE ENGINEERS, INC.

5000 Brittonfield Parkway
Syracuse, NY 13221

Contents

1. Introduction 1
1.1. Piezometer/monitoring well inspection 1
1.2. Hydraulic evaluation of capped area and collection trench ... 2
1.3. Ground water sampling and chemistry 4

2. Conclusions 9

References 11

List of Tables

1-1 Ground water analytical methods 4
1-2 Results of the t-test analysis 6

Tables located at end of report

1 Piezometer ground water elevation summary table
2 Monitoring well ground water elevation summary table
3 Quarry Lake surface water elevation summary table
4 Summary of ground water analytical data

List of Figures

1 Hydraulic potential map

List of Appendices

A Piezometer/monitoring well inspection forms
B Ground water sampling logs
C Data validation report (Volume 1 of 3 of the validated analytical data - separately bound)

1. Introduction

This document is the first 1999/2000 Semi-Annual Ground Water Monitoring Report for the Frontier Chemical - Pendleton Site (Site), located on Town Line Road in the Town of Pendleton, Niagara County, New York. This report is prepared based on the New York State Department of Environmental Conservation (NYSDEC)-approved Operation & Maintenance (O&M) Manual (O'Brien & Gere Engineers, 1997) for the Site, which addresses, among other items, long-term ground water monitoring at the Site. This Semi-Annual Ground Water Monitoring Report presents a discussion of the following:

- Piezometer/monitoring well inspection
- Hydraulic evaluation of the capped area and collection trench
- Evaluation of ground water chemistry in the intermediate and deep ground water zones.

These items are described in the following sections.

1.1. Piezometer/monitoring well inspection

The piezometer/monitoring well inspection was conducted on August 11, 1999, and included the piezometers (P-1 through P-8), standpipe (SP-1), and ground water monitoring wells (85-5R, URS-5D, 85-7R, URS-7D, URS-9I, URS-9D, 88-12C, 88-12D, URS-14I, and URS-14D) identified as the Site monitoring network in the O&M Manual for the Site.

Results of the inspection indicated that each piezometer and monitoring well was in an acceptable condition for collecting water elevation measurements and sampling. Similar maintenance issues to those identified in previous inspection reports were noted at the Site:

- Piezometer P-6 is currently angled 20 to 30 degrees from vertical.
- Monitoring wells URS-14I and URS-14D should have fill material installed around the concrete pads.

In addition, the following maintenance issue was identified during the August 11, 1999 inspection event:

- Standing water was observed in the annular space of monitoring well URS-14I.

It should be noted that, at this time, these issues are not affecting the integrity of the piezometers or monitoring wells. August 1999 inspection forms are included in Appendix A.

1.2. Hydraulic evaluation of capped area and collection trench

In accordance with the O&M Manual, a complete round of static ground water elevations was collected from the piezometers (P-1 through P-8), standpipe (SP-1), and ground water monitoring wells (85-5R, URS-5D, 85-7R, URS-7D, URS-9I, URS-9D, 88-12C, 88-12D, URS-14I, and URS-14D). The ground water elevation measurements were collected on August 11, 1999. The surface water elevation of Quarry Lake was measured on August 4, 1999, by Glynn Geotechnical Engineering, Inc. The ground water elevations measured in the piezometers and standpipe, and in the monitoring wells, are summarized on Tables 1 and 2, respectively. Quarry Lake surface water elevations are summarized on Table 3. As shown on Table 3, the August 4, 1999 surface water elevation of Quarry Lake is slightly below the outlet weir elevation of 578.0 ft.

The water level measurements collected on August 11, 1999 are illustrated on Figure 1. These measurements are the seventh round collected since remedial construction was substantially completed in August 1996. The water elevation data was used to evaluate the following:

- Whether an inward hydraulic gradient exists at the site by comparing water level measurements within the capped area (P-2, P-3, P-4, P-6, and P-7) to those measured outside the capped area (P-1, P-5, P-8, SP-1, and Quarry Lake)

- The ground water flow potential inside the capped area
- Whether the ground water collection trench is effectively controlling ground water migration away from the capped area.

The data indicates that a slight outward hydraulic gradient exists in the eastern and southern portions of the capped area. The ground water elevations in piezometers P-2 and P-6 located inside the capped area are higher than the ground water elevations at piezometers P-1 and P-5, respectively, installed outside the capped area. An inward hydraulic gradient exists in the northern portion of the capped area, as the ground water elevation inside the capped area (P-7) is less than the ground water elevation outside the capped area (P-8). Along the western portion of the site, the ground water elevation at P-4 is higher than the elevation in the ground water collection trench (SP-1). The ground water elevation in piezometer P-3, installed within the center of the capped area, is greater than ground water elevations measured in piezometers P-1, P-5, and P-8, installed outside the capped area.

Although the data indicates a slight outward hydraulic gradient within the eastern and southern portions of the capped area, the ground water elevations collected in the piezometers installed within the capped area (P-2, P-3, P-4, P-6, and P-7) are lower than originally measured in June 1997. The slight fluctuations in water elevations in the piezometers located within the capped area (P-2, P-3, P-4, P-6, and P-7) may be attributed to differences in: barometric pressure during sampling events; the movement of water within the capped area; and/or the low permeability of the materials. The fluctuations in water elevations in the piezometers located outside the capped area (P-1, P-5, and P-8) may be attributed to seasonal variations.

The contrasting fluctuations of ground water levels within and outside the capped area demonstrate that ground water within the capped area has been isolated. In addition, the ground water elevation in the standpipe (SP-1) in the ground water collection trench is less than the surface water elevation of Quarry Lake, indicating that Quarry Lake is isolated from the capped area.

Ground water elevations of piezometers installed within the capped area along the northern (P-7), western (P-4), eastern (P-2), and southern (P-6) portions of the Site are higher than the invert elevations (bottom) of the ground water collection trench. The invert elevations of the ground water collection trench vary from 568.80 ft to 563.37 ft. This information indicates that the overall hydraulic gradient is to the west toward the ground water collection trench. In summary, the data indicates that the ground water

collection trench is effectively removing shallow ground water from within the capped area.

As discussed in the March 1998 monitoring report (O'Brien & Gere Engineers, 1998), based on an average daily flow rate to the ground water collection trench of 170 gallons/day and a hydraulic conductivity adjacent to the ground water collection trench of 3.3×10^{-6} cm/sec, it is estimated that approximately 110 years will be required to dewater the containment area. However, the amount of water present within the capped area and the time to dewater beneath the capped area has minimal impact on the effectiveness of the containment, since hydraulic isolation within the capped area has been established and ground water beneath the capped area is migrating towards the ground water collection trench.

1.3. Ground water sampling and chemistry

Between August 11 and 13, 1999, the fifth round of post-closure ground water samples was collected in accordance with the protocols presented in the O&M Manual. Ground water samples were obtained from the ten ground water monitoring wells identified for sampling in the O&M Manual (85-5R, URS-5D, 85-7R, URS-7D, URS-9I, URS-9D, 88-12C, 88-12D, URS-14I, and URS-14D).

Following sample collection, the ground water samples were submitted to O'Brien & Gere Laboratories, Inc., for analysis of the parameters shown in Table 1-1.

Table 1-1. *Ground water analytical methods.*

Parameter	Method
VOCs	USEPA Method 8260
Inorganics	USEPA Methods 6010/7470/7841
Cyanide	USEPA Method 9010

Source: O'Brien & Gere Engineers

Ground water sampling logs and chain of custody forms are included in Appendix B.

In accordance with the O&M Manual and as approved by the NYSDEC, sampling and analysis for target compound list (TCL) semi-volatile organic compounds (SVOCs) and polychlorinated biphenyls (PCBs)/pesticides were discontinued for the second through fifth years of monitoring. In accordance with the O&M Manual, sampling is to be continued semi-annually for TCL volatile organic compounds (VOCs) and target analyte list (TAL) metals during the second through fifth years of monitoring. In accordance with the NYSDEC-approved O&M Manual, the required sampling frequency will be re-evaluated after the fifth year of monitoring.

Purge water generated during sampling was contained, passed through a 25-micron bag filter, and discharged to manhole MH-3. The water in manhole MH-3 was conveyed through the pre-treatment system prior to discharge to the Niagara County Sewer District (NCSD) interceptor system at manhole MH-16.

The laboratory analytical data was validated by Data Validation Services of North Creek, New York. The validation was performed in accordance with guidance from the most current editions of the United States Environmental Protection Agency (USEPA) Contract Laboratory Procedures (CLP) National Functional Guidelines for Organic and Inorganic Data Review, and the USEPA Standard Operating Procedures (SOPs) HW-2 and HW-6. Results of the validation indicated that the samples were processed and analyzed in compliance with protocol requirements, and with adherence to quality criteria. All of the analytical results are useable, although minor qualifications are needed for some of the results. A copy of the data validation report is included in Appendix C.

Results of the ground water analyses, along with a comparison of the results with New York State Class GA Standards, are summarized on Table 4. The New York State Class GA Standards presented on Table 4 have been revised to reflect revisions to the New York State water quality standards (NYSDEC, 1999). In general, the August 1999 ground water chemistry is similar to previous sampling events.

Detected constituents exceeding New York State Class GA Standards included sodium at ten locations (85-5R, URS-5D, 85-7R, URS-7D, URS-9I, URS-9D, 88-12C, 88-12D, URS-14I, and URS-14D). Concentrations of sodium have been detected above the New York State Class GA Standards in background wells URS-14I and URS-14D. It is likely that the elevated concentrations of sodium are naturally occurring and are not related to previous site activities. VOCs were not detected above the New York State Class GA Standards. The data base will be updated with data from future

sampling events, and ground water standards will be reviewed annually to evaluate whether standards have been revised.

As specified in the O&M Manual, statistical analyses of the ground water chemistry data have been completed. A preliminary exploratory data analysis, using univariate statistics in SAS®, was performed for fifteen analytes that have been detected a total of nine or more times in various monitoring wells since the initial post-construction sampling event in July 1997. Based on the results of the preliminary exploratory data analysis, concentrations for fourteen analytes (at $\alpha = 0.10$) do not appear to be normally distributed. Magnesium appears to be normally distributed.

The August 1999 data represents the results of the fifth baseline data collection effort. A t-test analysis was conducted based on the data collected from the post-construction sampling events, between June 1997 and August 1999, to evaluate whether downgradient concentrations exceed upgradient concentrations, based on a comparison of downgradient wells with the appropriate upgradient wells, URS-14I or URS-14D. Table 1-2 presents a summary of locations where constituent concentrations in downgradient wells exceeded concentrations at the appropriate upgradient comparison well, at a confidence level (α) equal to 0.05.

Table 1-2. *Results of the t-test analysis.*

Monitoring Well	Analytes with Higher Concentrations than in Upgradient Wells
85-5R	Calcium, Magnesium
URS-5D	Calcium, Manganese, Sodium
85-7R	Calcium, Magnesium, Sodium
URS-7D	Calcium, Magnesium, Manganese, Sodium
URS-9I	Calcium, Magnesium
88-12C	Calcium, Magnesium
88-12D	Calcium, Magnesium, Manganese, Potassium, Sodium

Source: O'Brien & Gere Engineers

It should be noted that there are currently no New York State Class GA Standards for calcium, magnesium, or potassium. Concentrations of manganese have not been detected above the New York State Class GA Standards during the post-construction sampling. In addition, it is likely that

elevated concentrations of calcium, magnesium, manganese, potassium, and sodium are naturally occurring and are not related to previous site activities.

Results of the t-test analysis also indicate that barium concentrations are greater in upgradient well URS-14I than in URS-9I and 88-12C, at a confidence level at the statistical significance threshold of α=0.05. Concentrations of barium in URS-14I, URS-9I, and 88-12C are below the New York State Class GA Standard.

2. Conclusions

Based on the data contained in this semi-annual report, the following conclusions are presented:

- The isolation of ground water within the capped area has been established.
- The ground water elevation data indicates that ground water within the capped area is migrating to the west toward the ground water collection trench.
- The ground water elevation data indicates that the ground water collection trench is effectively removing shallow ground water from within the capped area.
- The August 1999 ground water chemistry is similar to previous sampling events.
- Results of the t-test analysis indicate that concentrations of calcium (85-5R, URS-5D, 85-7R, URS-7D, URS-9I, 88-12C, and 88-12D), magnesium (85-5R, 85-7R, URS-7D, URS-9I, 88-12C, and 88-12D), manganese (URS-5D, URS-7D, and 88-12D), potassium (88-12D), and sodium (URS-5D, 85-7R, URS-7D, and 88-12D) exceed upgradient concentrations, based on a comparison of downgradient wells with the appropriate upgradient wells, URS-14I or URS-14D. There are currently no New York State Class GA Standards for calcium, magnesium, or potassium. Concentrations of manganese have not been detected above the New York State Class GA Standards during the post-construction sampling. It is likely that elevated concentrations of calcium, magnesium, manganese, potassium, and sodium are naturally occurring and are not related to previous site activities.
- Results of the t-test analysis indicate that barium concentrations are greater in upgradient well URS-14I than in URS-9I and 88-12C, at a confidence level at the statistical significance threshold of α=0.05. Concentrations of barium in URS-14I, URS-9I, and 88-12C are below the New York State Class GA Standard.

- Sodium was detected in ten monitoring wells at concentrations above New York State Class GA Standards. It is likely that this element is naturally occurring and is not related to previous site activities.

References

New York State Department of Environmental Conservation, 1999. *Title 6, Chapter X, Subchapter A, Article 2, Part 703.5, Table 1, Water Quality Standards Surface Waters and Groundwater*, April 1999.

O'Brien & Gere Engineers, 1997. *Operation and Maintenance Manual, Frontier Chemical - Pendleton Site, Town of Pendleton, Niagara County, New York,* Pendleton Site PRP Group, March 1997.

O'Brien & Gere Engineers, 1998. *Frontier Chemical - Pendleton Site, Semi-Annual Ground Water Monitoring Report*, Pendleton Site PRP Group, March 1998.

Table 1

Frontier Chemical - Pendleton Site

Piezometer Ground Water Elevation Summary T

Piezometer		Location	Top of Riser Elev. (ft)	Top of Cover Elev. (ft)	Depth (ft below riser)	Screened Elev. (ft)	Ground water elevation (ft)						
							6/24/97	9 97	2/23/98	4/28/98	9/17/98	2/3/99	8/11/99
P-1	(O	Eastern portion	583.21	583.30	16.4	576.8 - 566.8	579.54	57. 09	579.25	579.60	575.62	572.97	575.83
P-2	(I)	of capped area	582.90	583.20	15.7	577.2 - 567.2	579.60	579.24	578.20	578.37	578.76	576.96	578.27
P-3	(I)	Center of capped area	606.33	606.64	39.7	586.6 - 566.6	580.36	580.38	580.06	579.94	579.80	579.96	579.38
P-4	(I)	Adjacent to	582.31	583.85	15.6	576.7 - 566.7	577.15	577.43	576.70	575.11	575.96	574.58	575.56
SP-1	(T)	Quarry Lake	579.86	580.07	15.0	bop = 564.9	<564.9	<564.9	<564.9	<564.9	<564.9	<564.9	<564.9
P-5	(O	Southern portion	583.05	583.55	15.5	577.6 - 567.6	576.87	577.25	578.57	579.31	576.13	574.70	576.48
P-6	(I)	of capped area	584.45	584.60	16.2	578.3 - 568.3	578.77	579.17	578.14	578.20	578.63	577.94	578.28
P-7	(I)	Northern portion	580.97	582.00	15.9	575.0 - 565.0	578.33	578.62	576.45	576.17	577.15	574.43	575.55
P-8	(O	of capped area	582.83	583.00	17.3	575.5 - 565.5	577.76	578.87	578.75	579.61	576.90	574.72	576.15

Notes:

1. Elevation based on USGS Datum.
2. bop = bottom of pipe.
3. O = piezometer located outside of capped area.
4. I = piezometer located inside capped area.
5. T = standpipe located within the ground water collection trench.
6. The top of riser of piezometer P-4 was modified on 4/28/98 from 583.68 ft to 582.31 ft to allow clearance for the installation of a locking expansion plug beneath the flush-mounted cover.
7. The top of riser of piezometer P-7 was modified on 4/28/98 from 581.84 ft to 580.97 ft to allow clearance for the installation of a locking expansion plug beneath the flush-mounted cover.

Table 2

Frontier Chemical - Pendleton Site

Monitoring Well Ground Water Elevation Summary Table

Monitoring Well	Location	Top of Riser Elev. (ft)	Ground Elev. (ft)	Depth (ft below riser)	Screened Elev. (ft)	Ground water elevation (ft)						
						6/24/97	9/30/97	2/23/98	4/28/98	9/17/98	2/3/99	8/11/99
URS-14I	Upgradient well nest	581.14	580.84	31.0	550.1 - 555.1	577.15	578.77	580.24	580.14	574.76	577.35	575.42
URS-14D	in church parking lot	580.71	580.85	41.5	539.2 - 544.2	575.50	574.28	575.87	576.05	573.94	572.89	571.92
URS-9I	Southern well nest	581.68	579.90	46.0	535.6 - 540.6	575.38	574.22	575.69	575.91	573.76	572.67	571.82
URS-9D	along Town Line Road	580.80	579.00	46.5	534.3 - 539.3	575.36	574.21	575.68	575.89	573.64	572.66	571.24
85-5R	Middle well nest	580.84	578.70	40.0	540.9 - 542.9	574.70	573.97	575.39	575.70	574.98	572.78	571.92
URS-5D	along Town Line Road	580.60	578.00	49.9	530.8 - 535.8	574.73	574.02	575.42	575.74	573.80	572.12	571.97
85-7R	North well nest	577.90	576.60	27.8	550.2 - 552.2	575.09	574.21	575.53	575.87	573.74	572.30	572.04
URS-7D	along Town Line Road	579.35	576.50	39.9	539.5 - 544.5	575.15	574.35	575.60	575.99	573.75	572.40	571.99
88-12C	Well nest outside northeast	583.12	583.70	31.3	551.8 - 553.8	576.60	574.03	576.53	577.06	572.79	571.72	571.26
88-12D	portion of capped area	582.87	583.28	54.5	528.4 - 533.4	575.72	574.54	576.17	576.33	574.00	572.97	572.36

Notes:

1. Elevation based on USGS Datum.

Table 3
Frontier Chemical - Pendleton Site
Quarry Lake Surface Water Elevation Summary Table

Date	Quarry Lake Surface Water Elevation (ft)
9/8/97	572.3
2/23/98	578.0
4/30/98	578.26
9/21/98	577.42
2/4/99	577.97
8/4/99	577.60

Notes:
1. Elevation based on USGS Datum.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
August 1999

Parameter	Standard ug/L (ppb)	85-5R 7/86	8/90	2/91	10/92	6/97	2/98	9/98	2/99	8/99
VOCs (ppb)										
Acetone	—	NA	R	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	15	ND	ND	ND	0.34 J	ND	ND	0.10 J
2-Butanone	—	NA	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	—	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	—	NA	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	5	ND	NA	NA	NA	ND	0.28 J	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	—	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene	5	NA	ND	ND	ND	ND	ND	ND	ND	0.17 J
Ethylbenzene	5	ND	ND	ND	ND	ND	0.24 J	ND	ND	ND
Methylene Chloride	5	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	—	NA	2J	ND	ND	ND	ND	ND	ND	ND
1,1,2,2,-Tetrachloroethane	5	ND	2J	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ND	ND	ND	ND	ND	0.14 J	ND	ND	ND
Total Xylenes	5	NA	ND	ND	ND	ND	0.96	ND	ND	ND
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	2	ND	ND	ND	ND	ND	ND	ND	ND	ND
Metals (ppb)										
Aluminum	—	1,060	214	37.8B	153	ND	300	ND	ND	ND
Antimony	3	NA	ND	42.4B	ND	ND	ND	ND	ND	ND
Arsenic	25	NA	1B	ND	ND	ND	ND	ND	ND	ND
Barium	1000	20	73.5B	23.4B	15	40	80	50J	ND	60
Beryllium	—	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	5	5	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	—	380,000	355,000	378,000	321,000	270,000	220,000	220,000	130,000	220,000
Chromium	50	40	7.5B	ND	ND	ND	30	10	ND	ND
Cobalt	—	20	ND	ND	ND	ND	ND	ND	ND	ND
Copper	200	10	ND	ND	11	ND	ND	ND	ND	ND
Cyanide	200	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	300	1,020	669	915	419	140	2,300	190	ND	100
Lead	25	150	ND	1.2B	ND	ND	ND	ND	ND	ND
Magnesium	—	179,000	106,000	170,000	139,000	130,000	85,000	110,000	59,000	99,000
Manganese	300	100	40	57.5	42	50	260	40	ND	80
Nickel	100	10	48.1	ND	ND	ND	ND	ND	ND	ND
Potassium	—	9,500	60,700	6,280	6,400	ND	ND	ND	ND	5,000
Selenium	10	NA	ND	ND	ND	ND	ND	ND	ND	ND
Silver	50	30	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	20,000	126,000	132,000	120,000	100,000	93,000 J	58,000	87,000	52,000	96,000
Thallium	—	NA	ND	ND	ND	ND	8	ND	ND	ND
Vanadium	—	35	4B	ND	ND	ND	ND	ND	ND	ND
Zinc	—	75	12.9B	17.6B	ND	ND	ND	ND	ND	10 J

Notes:

1. R = Indicates compound rejected due to blank contamination.
2. J = Indicates result is less than sample quantitation limit but greater than zero.
3. B = Indicates compound is less than quantitation limits but greater than or equal to instrument detection limits.
4. E = Estimated value due to interferences.
5. W = Post-digestion spike is out of control limits.
6. Sample data presented for 6/97, 2/98, 9/98, 2/99, and 8/99 sampling events is for cis-1,2-dichloroethene.
7. NA = Not analyzed; ND = Not detected; N = Tentative.
8. Data validation was performed in accordance with USEPA CLP National Functional Guidelines for Organic and Inorganic Data Review, and the USEPA SOPs HW-2 and HW-6.

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Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
August 1999

Parameter	Standard ug/L (ppb)	URS-5D 8/90	2/91	10/92	6/97	2/98	9/98	2/99	8/99
VOCs (ppb)									
Acetone	—	250	R	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	1	ND	0.25 J	0.11 J	ND	0.16 J
2-Butanone	—	ND	R	ND	ND	ND	ND	ND	ND
Bromodichloromethane	—	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	—	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	5	NA	NA	NA	ND	0.31 J	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	—	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	5	ND	ND	ND	ND	0.32 J	ND	ND	ND
Methylene Chloride	5	ND	R	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	—	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2,-Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ND	1J	ND	ND	0.19 J	ND	ND	ND
Total Xylenes	5	ND	0.5J	ND	ND	1.5	ND	ND	ND
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	2	ND	ND	ND	ND	ND	ND	ND	ND
Metals (ppb)									
Aluminum	—	ND	ND	ND	ND	ND	ND	ND	ND
Antimony	3	ND	31.5B	ND	ND	ND	ND	ND	ND
Arsenic	25	1.3B	1B	ND	ND	ND	ND	ND	ND
Barium	1000	224	71.7B	32	20	ND	ND	ND	20
Beryllium	—	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	5	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	—	378,000	407,000	387,000	440,000	300,000	490,000	510,000	490,000
Chromium	50	3B	ND	ND	ND	ND	ND	ND	ND
Cobalt	—	ND	ND	ND	ND	61	210	850	350
Copper	200	ND	ND	8	ND	ND	ND	ND	ND
Cyanide	200	ND	ND	ND	ND	ND	ND	ND	ND
Iron	300	188	143	25	ND	120	ND	ND	ND
Lead	25	ND	1.3B	12	ND	ND	ND	ND	ND
Magnesium	—	33,300	2450B	570,000	100,000	24,000	87,000	76,000	93,000
Manganese	300	8.8B	3.5B	ND	50	10	70	70	50
Nickel	100	11.4B	ND	ND	90	ND	180	90	80
Potassium	—	22,700	16,900	8,500	ND	ND	ND	5,000	ND
Selenium	10	ND	ND	ND	ND	ND	ND	ND	ND
Silver	50	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	20,000	192,000	194,000	114,000	88,000	93,000	94,000	120,000	110,000
Thallium	—	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	—	3.8B	ND	ND	ND	ND	ND	ND	ND
Zinc	—	19.9B	14.7B	ND	ND	10	ND	ND	10 J

Notes:
1. R = Indicates compound rejected due to blank contamination.
2. J = Indicates result is less than sample quantitation limit but greater than zero.
3. B = Indicates compound is less than quantitation limits but greater than or equal to instrument detection limits.
4. E = Estimated value due to interferences.
5. W = Post-digestion spike is out of control limits.
6. Sample data presented for 6/97, 2/98, 9/98, 2/99, and 8/99 sampling events is for cis-1,2-dichloroethene.
7. NA = Not analyzed; ND = Not detected; N = Tentative.
8. Data validation was performed in accordance with USEPA CLP National Functional Guidelines for Organic and Inorganic Data Review, and the USEPA SOPs HW-2 and HW-6.

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Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
August 1999

Parameter	Standard ug/L (ppb)	85-7R 7/86	8/90	2/91	10/92	6/97	2/98	9/98	2/99	8/99
VOCs (ppb)										
Acetone	---	NA	ND	R	ND	ND	ND	ND	ND	ND
Benzene	1	ND	6	ND	ND	ND	ND	ND	ND	ND
2-Butanone	---	NA	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	---	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	---	71	ND	ND	ND	ND	ND	ND	0.93 J	ND
Chlorobenzene	5	ND	NA	NA	NA	ND	ND	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	---	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene	5	NA	ND	ND	ND	0.14J	0.19 J	0.14 J	0.21 J	0.40 J
Ethylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	5	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	---	NA	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2,-Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ND	ND	1J	ND	ND	ND	ND	ND	ND
Total Xylenes	5	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	2	ND	ND	ND	ND	ND	ND	ND	ND	ND
Metals (ppb)										
Aluminum	---	1,200	277	265	249	ND	ND	ND	ND	ND
Antimony	3	NA	28.3B	ND	ND	ND	ND	ND	ND	ND
Arsenic	25	NA	1.4B	1.7B	ND	ND	ND	ND	ND	ND
Barium	1000	30	91B	143B	106	100	80	50J	ND	40
Beryllium	---	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	5	5	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	---	490,000	354,000	298,000	389,000	350,000	350,000	420,000	400,000	440,000
Chromium	50	20	ND	ND	ND	ND	ND	ND	10	ND
Cobalt	---	20	ND	ND	ND	ND	ND	ND	ND	ND
Copper	200	10	ND	ND	8	ND	ND	ND	ND	ND
Cyanide	200	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	300	920	586	820	435	190	310	270	170	90
Lead	25	120	ND	2.6B	ND	ND	ND	ND	ND	ND
Magnesium	---	131,000	119,000	42,600	124,000	120,000	120,000	140,000	140,000	130,000
Manganese	300	110	40.5	31.5	30	70	80	90	80	40
Nickel	100	ND	7.4B	ND	ND	ND	ND	ND	ND	ND
Potassium	---	28,000	5,540	5,770	6,700	5,000	5,000	6,000	6,000	7,000
Selenium	10	NA	ND	ND	ND	ND	ND	ND	ND	ND
Silver	50	10	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	20,000	107,000	67,900	38,900	73,100	66,000 J	67,000	75,000	74,000	85,000
Thallium	---	NA	ND	ND	ND	ND	6	ND	ND	ND
Vanadium	---	35	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	---	65	ND	21.5	ND	ND	ND	ND	ND	ND

Notes:

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8. Data validation was performed in accordance with USEPA CLP National Functional Guidelines for Organic and Inorganic Data Review, and the USEPA SOPs HW-2 and HW-6.

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Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
August 1999

Parameter	Standard ug/L (ppb)	URS-7D 8/90	2/91	10/92	6/97	2/98	9/98	2/99	8/99
VOCs (ppb)									
Acetone	---	120	R	ND	ND	ND	61	6.0 J	ND
Benzene	1	ND	ND	ND	ND	0.11 J	ND	ND	ND
2-Butanone	---	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	---	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	---	0.5J	ND	ND	ND	ND	ND	1.3 J	ND
Chlorobenzene	5	NA	NA	NA	ND	ND	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	---	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	5	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	---	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2,-Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ND	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	5	ND	ND	ND	ND	0.37 J	ND	ND	ND
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	2	ND	ND	ND	ND	ND	ND	ND	ND
Metals (ppb)									
Aluminum	---	167B	52.5B	ND	ND	ND	ND	ND	ND
Antimony	3	20.5B	36.3B	ND	ND	ND	ND	ND	ND
Arsenic	25	ND	ND	ND	ND	ND	ND	ND	ND
Barium	1000	20.3B	47.2B	29	30	40	ND	ND	30
Beryllium	---	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	5	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	---	277,000	333,000	403,000	360,000	300,000	480,000	400,000	470,000
Chromium	50	ND	ND	ND	ND	ND	10	10	ND
Cobalt	---	ND	ND	ND	ND	ND	ND	ND	ND
Copper	200	ND	ND	8	ND	ND	ND	ND	ND
Cyanide	200	ND	ND	ND	ND	ND	ND	ND	ND
Iron	300	387	283	63	ND	70	ND	100	ND
Lead	25	ND	ND	ND	ND	ND	ND	ND	ND
Magnesium	---	96,200	115,000	140,000	120,000	89,000	140,000	130,000	140,000
Manganese	300	71.2	140	86	40	30	40	50	50
Nickel	100	23.5B	ND	ND	ND	ND	ND	ND	ND
Potassium	---	5,990	8,550	8,300	5,000	ND	6,000	ND	6,000
Selenium	10	ND	ND	ND	ND	ND	ND	ND	ND
Silver	50	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	20,000	82,700	68,900	78,900	66,000 J	54,000	79,000	74,000	81,000
Thallium	---	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	---	4.2B	6.7B	ND	ND	ND	ND	ND	ND
Zinc	---	5.6B	12.2B	ND	ND	ND	ND	ND	ND

Notes:

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Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
August 1999

Parameter	Standard ug/L (ppb)	URS-9I 8/90	2/91	10/92	6/97	2/98	9/98	2/99	8/99
VOCs (ppb)									
Acetone	—	R	R	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	0.12J	0.29 J	ND	ND	ND
2-Butanone	—	ND	2J	ND	ND	ND	ND	ND	ND
Bromodichloromethane	—	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	—	ND	ND	ND	ND	ND	0.13 J	ND	ND
Chlorobenzene	5	NA	NA	NA	ND	0.20 J	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	—	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	5	ND	ND	ND	ND	0.14 J	ND	ND	ND
Methylene Chloride	5	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	—	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2,-Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	0.7J	ND	ND	ND	0.11 J	ND	ND	0.16 J
Total Xylenes	5	ND	ND	ND	0.29J	0.54	ND	ND	ND
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	2	ND	ND	ND	ND	ND	ND	ND	ND
Metals (ppb)									
Aluminum	—	221	197	110	ND	ND	ND	200	ND
Antimony	3	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	25	1.7B	ND	ND	ND	ND	ND	ND	ND
Barium	1000	30.1B	22.8B	14	30	ND	ND	ND	ND
Beryllium	—	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	5	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	—	106,000	143,000	123	170,000	150,000	160,000	160,000	160,000
Chromium	50	8.6B	10.1	ND	ND	ND	10	10	ND
Cobalt	—	ND	ND	ND	ND	ND	ND	ND	ND
Copper	200	12.7B	ND	ND	ND	ND	ND	ND	ND
Cyanide	200	ND	ND	ND	ND	ND	ND	ND	ND
Iron	300	1,020	1,170	808	460	440	290	590	240
Lead	25	ND	1B	ND	ND	ND	ND	ND	ND
Magnesium	—	54,500	71,300	63,500	70,000	69,000	77,000	70,000	75,000
Manganese	300	67.5	80	75	50	30	40	50	40
Nickel	100	7.6B	ND	ND	ND	ND	ND	ND	ND
Potassium	—	3,910B	4,250B	2,900	ND	ND	ND	ND	ND
Selenium	10	ND	ND	ND	ND	ND	ND	ND	ND
Silver	50	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	20,000	34,500	54,000	52,400	43,000 J	45,000	49,000	39,000	54,000
Thallium	—	ND	ND	ND	ND	11	ND	ND	ND
Vanadium	—	ND	9.6B	ND	ND	ND	ND	ND	ND
Zinc	—	19.3B	34.6	ND	ND	ND	20	ND	10 J

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Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
August 1999

Parameter	Standard ug/L (ppb)	URS-9D 8/90	2/91	10/92	6/97	2/98	9/98	2/99	8/99
VOCs (ppb)									
Acetone	—	R	R	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	1.9	ND	ND	ND
2-Butanone	—	ND	6J	ND	ND	ND	ND	ND	ND
Bromodichloromethane	—	4J	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	—	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	5	NA	NA	NA	ND	0.79	ND	ND	ND
Chloroform	7	8	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	—	1J	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	0.7	0.37J	0.34 J	0.17 J	0.16 JN	0.15 J
1,2-Dichloroethene	5	ND	ND	1	0.66	0.59	0.33 J	0.35 J	0.29 J
Ethylbenzene	5	ND	ND	ND	ND	0.44 J	ND	ND	ND
Methylene Chloride	5	ND	ND	2	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	—	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2,-Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	0.6J	ND	ND	ND	0.51	ND	ND	ND
Total Xylenes	5	ND	ND	ND	ND	1.8	ND	ND	ND
Trichloroethene	5	ND	ND	0.6	0.36J	0.24 J	0.20 J	0.21 J	0.14 J
Vinyl Chloride	2	ND	ND	ND	0.26J	0.44 J	0.11 JN	ND	ND
Metals (ppb)									
Aluminum	—	128	64.2B	ND	ND	ND	ND	ND	ND
Antimony	3	ND	28B	ND	ND	ND	ND	ND	ND
Arsenic	25	1.6B	ND	ND	ND	ND	ND	ND	ND
Barium	1000	110B	38.2B	23	ND	ND	ND	ND	ND
Beryllium	—	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	5	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	—	56,500	146,000	120,000	200,000	190,000	190,000	200,000	210,000
Chromium	50	ND	ND	ND	ND	ND	10	ND	ND
Cobalt	—	ND	ND	ND	ND	ND	ND	ND	ND
Copper	200	5.2B	ND	ND	ND	ND	ND	ND	ND
Cyanide	200	ND	11.1B	ND	ND	ND	ND	ND	ND
Iron	300	127	506	252	ND	70	80	70	60
Lead	25	ND	ND	ND	ND	ND	ND	ND	ND
Magnesium	—	29,900	70,200	60,000	58,000	73,000	71,000	72,000	77,000
Manganese	300	20.1	25.5	9	ND	ND	10	10	10
Nickel	100	15.3B	ND	ND	ND	ND	ND	ND	ND
Potassium	—	9,880	4,170B	3,600	ND	ND	ND	ND	ND
Selenium	10	ND	ND	ND	ND	ND	ND	ND	ND
Silver	50	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	20,000	27,400	37,000	42,800	48,000 J	52,000	41,000	38,000	52,000
Thallium	—	ND	ND	ND	ND	14	ND	ND	ND
Vanadium	—	10.7B	ND	ND	ND	ND	ND	ND	ND
Zinc	—	50.5	16.7B	ND	ND	ND	ND	ND	ND

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Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
August 1999

Parameter	Standard ug/L (ppb)	88-12C 8/90	2/91	10/92	6/97	2/98	9/98	2/99	8/99
VOCs (ppb)									
Acetone	—	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	—	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	—	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	—	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	5	NA	NA	NA	ND	ND	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	—	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	5	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	—	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2,-Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ND	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	5	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	2	ND	ND	ND	ND	ND	ND	ND	ND
Metals (ppb)									
Aluminum	—	481	187B	453	ND	900	ND	600	ND
Antimony	3	19.2B	28B	ND	ND	ND	ND	ND	ND
Arsenic	25	10	12.3B	14	9	7	10	12	11 J
Barium	1000	11.4B	17.3	14	ND	ND	ND	ND	ND
Beryllium	—	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	5	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	—	62,600	68,500	68,900	73,000	70,000	71,000	76,000	80,000
Chromium	50	21	4.6B	ND	ND	10	10	20	ND
Cobalt	—	ND	ND	ND	ND	ND	ND	ND	ND
Copper	200	4.2B	ND	5	ND	ND	ND	ND	ND
Cyanide	200	ND	ND	ND	ND	ND	ND	ND	ND
Iron	300	1,530	1,040	1,560	ND	2,200	330	1,600	100
Lead	25	1.5B	1.2B	ND	ND	ND	ND	ND	ND
Magnesium	—	88,500	103,000	92,500	110,000	98,000	110,000	100,000	110,000
Manganese	300	45.4	37.8	54	10	70	10	40	20
Nickel	100	14.6B	ND	ND	ND	ND	ND	ND	ND
Potassium	—	2,520B	3,200B	3,000	ND	ND	ND	ND	ND
Selenium	10	ND	ND	ND	ND	ND	ND	ND	ND
Silver	50	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	20,000	34,600	41,100	41,300	47,000 J	43,000	40,000	42,000	50,000
Thallium	—	ND	ND	ND	ND	13	ND	ND	ND
Vanadium	—	22.1B	10B	ND	ND	ND	ND	ND	ND
Zinc	—	10.1B	15.7B	ND	20	20	ND	ND	20 J

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Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
August 1999

Parameter	Standard ug/L (ppb)	88-12D 8/90	2/91	6/97	2/98	9/98	2/99	8/99
VOCs (ppb)								
Acetone	---	ND	ND	ND	ND	ND	ND	ND
Benzene	1	1J	0.9J	ND	0.13 J	0.13 J	ND	0.16 J
2-Butanone	---	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	---	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	---	ND	6	ND	ND	0.56	0.70 J	ND
Chlorobenzene	5	ND	ND	ND	ND	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	---	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene	5	ND	2J	ND	ND	ND	ND	ND
Ethylbenzene	5	ND	ND	ND	0.11 J	ND	ND	ND
Methylene Chloride	5	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	---	ND	ND	ND	ND	ND	ND	ND
1,1,2,2,-Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND
Toluene	5	R	13	ND	ND	ND	ND	ND
Total Xylenes	5	ND	ND	ND	0.48 J	ND	ND	ND
Trichloroethene	5	ND	6	ND	ND	ND	ND	ND
Vinyl Chloride	2	ND	ND	ND	ND	ND	ND	ND
Metals (ppb)								
Aluminum	---	ND	172B	ND	ND	ND	ND	ND
Antimony	3	50.7B	56.1B	ND	ND	ND	ND	ND
Arsenic	25	ND	1.3BW	ND	ND	ND	ND	ND
Barium	1000	2.9B	7.9B	ND	ND	ND	ND	ND
Beryllium	---	ND	ND	ND	ND	ND	ND	ND
Cadmium	5	ND	ND	ND	ND	ND	ND	ND
Calcium	---	464,000	623,000E	490,000	480,000	630,000	630,000	670,000
Chromium	50	7.6B	27.8E	10	30	30	90	ND
Cobalt	---	ND	ND	ND	ND	ND	ND	ND
Copper	200	ND	ND	ND	ND	ND	ND	ND
Cyanide	200	ND	ND	ND	ND	ND	ND	12
Iron	300	168	250	180	480	110	650	90
Lead	25	ND	1.8BW	ND	ND	ND	ND	ND
Magnesium	---	109,000	199,000E	130,000	110,000	180,000	160,000	180,000
Manganese	300	33.9	696	90	60	40	50	30
Nickel	100	11.5B	25.5B	ND	ND	ND	70	ND
Potassium	---	5,310	12,000E	600	6,000	10,000	9,000	9,000
Selenium	10	ND	ND	ND	ND	6	ND	ND
Silver	50	ND	ND	ND	ND	ND	ND	ND
Sodium	20,000	66,400	474,000	140,000 J	100,000	330,000	250,000	330,000
Thallium	---	ND	ND	ND	ND	ND	ND	ND
Vanadium	---	51.6	2.4B	ND	ND	ND	ND	ND
Zinc	---	7.9B	ND	ND	10	ND	ND	10 J

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4. E = Estimated value due to interferences.
5. W = Post-digestion spike is out of control limits.
6. Sample data presented for 6/97, 2/98, 9/98, 2/99, and 8/99 sampling events is for cis-1,2-dichloroethene.
7. NA = Not analyzed; ND = Not detected; N = Tentative.
8. Data validation was performed in accordance with USEPA CLP National Functional Guidelines for Organic and Inorganic Data Review, and the USEPA SOPs HW-2 and HW-6.

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Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
August 1999

Parameter	Standard ug/L (ppb)	URS-14I 2/91	10/92	6/97	2/98	9/98	2/99	8/99
VOCs (ppb)								
Acetone	—	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	1	ND	ND	ND
2-Butanone	—	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	—	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	—	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	5	NA	NA	ND	0.81	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	—	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	5	ND	ND	ND	0.13 J	ND	ND	ND
Methylene Chloride	5	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	—	ND	ND	ND	ND	ND	ND	ND
1,1,2,2,-Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ND	ND	ND	0.15 J	ND	ND	ND
Total Xylenes	5	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	2	ND	ND	ND	ND	ND	ND	ND
Metals (ppb)								
Aluminum	—	7,140	1,170	1300	400	ND	300	ND
Antimony	3	ND	ND	ND	ND	ND	ND	ND
Arsenic	25	7.2B	ND	ND	ND	ND	5	ND
Barium	1000	115B	47	50	40	40J	40	50
Beryllium	—	1.2B	ND	ND	ND	ND	ND	ND
Cadmium	5	ND	ND	ND	1	ND	ND	ND
Calcium	—	73,900	35,200	28,000 J	21,000	23,000	26,000	30,000
Chromium	50	30.9	ND	ND	160	ND	ND	ND
Cobalt	—	5.8B	ND	ND	ND	ND	ND	ND
Copper	200	18.5B	8	ND	10	ND	ND	ND
Cyanide	200	ND	ND	ND	ND	ND	ND	ND
Iron	300	10,400	2,060	1,800	2,300	ND	320	ND
Lead	25	7.5	ND	ND	ND	ND	ND	ND
Magnesium	—	32,800	22,300	21,000	17,000	21,000	23,000	25,000
Manganese	300	484	145	70	60	ND	ND	ND
Nickel	100	30.4B	ND	ND	170	ND	ND	ND
Potassium	—	17,100	5,500	ND	25,000	8,000	6,000	6,000
Selenium	10	ND	ND	ND	ND	ND	ND	ND
Silver	50	ND	ND	ND	ND	ND	ND	ND
Sodium	20,000	44,700	42,500	58,000 J	48,000	48,000	54,000	62,000
Thallium	—	ND	ND	ND	6	ND	ND	ND
Vanadium	—	16.1B	ND	ND	ND	ND	ND	ND
Zinc	—	52.3	ND	10	30	ND	ND	30 J

Notes:

1. R = Indicates compound rejected due to blank contamination.
2. J = Indicates result is less than sample quantitation limit but greater than zero.
3. B = Indicates compound is less than quantitation limits but greater than or equal to instrument detection limits.
4. E = Estimated value due to interferences.
5. W = Post-digestion spike is out of control limits.
6. Sample data presented for 6/97, 2/98, 9/98, 2/99, and 8/99 sampling events is for cis-1,2-dichloroethene.
7. NA = Not analyzed; ND = Not detected; N = Tentative.
8. Data validation was performed in accordance with USEPA CLP National Functional Guidelines for Organic and Inorganic Data Review, and the USEPA SOPs HW-2 and HW-6.

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Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
August 1999

Parameter	Standard ug/L (ppb)	URS-14D 2/91	10/92	6/97	2/98	9/98	2/99	8/99
VOCs (ppb)								
Acetone	—	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	ND	ND
2-Butanone	—	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	—	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	—	ND	ND	ND	ND	0.47 J	1.1 J	ND
Chlorobenzene	5	NA	NA	ND	ND	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	—	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	5	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	5	R	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	—	ND	ND	ND	ND	ND	ND	ND
1,1,2,2,-Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	5	ND	ND	0.11J	0.21 J	ND	ND	ND
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	2	ND	ND	ND	ND	ND	ND	ND
Metals (ppb)								
Aluminum	—	99.8	ND	ND	ND	ND	ND	ND
Antimony	3	32.1B	ND	ND	ND	ND	ND	ND
Arsenic	25	2B	ND	ND	ND	ND	ND	ND
Barium	1000	25.5B	23	20	ND	ND	40	30
Beryllium	—	ND	ND	ND	ND	ND	ND	ND
Cadmium	5	ND	ND	ND	ND	ND	ND	ND
Calcium	—	255,000	292,000	210,000	250,000	310,000	280,000	360,000
Chromium	50	10.3	7	ND	ND	10	ND	ND
Cobalt	—	ND	ND	ND	ND	ND	ND	ND
Copper	200	ND	8	ND	ND	ND	ND	ND
Cyanide	200	ND	ND	ND	10	10	ND	ND
Iron	300	357	193	ND	ND	ND	80	ND
Lead	25	1.1B	ND	ND	ND	ND	ND	ND
Magnesium	—	75,200	78,000	61,000	66,000	81,000	71,000	91,000
Manganese	300	30.8	27	ND	ND	ND	ND	10
Nickel	100	ND	ND	ND	ND	ND	ND	ND
Potassium	—	4,250B	3,700	ND	ND	ND	ND	ND
Selenium	10	ND	ND	ND	ND	ND	ND	ND
Silver	50	ND	ND	ND	ND	ND	ND	ND
Sodium	20,000	40,700	38,700	52,000 J	49,000	50,000	48,000	58,000
Thallium	—	ND	ND	ND	ND	ND	ND	ND
Vanadium	—	ND	ND	ND	ND	ND	ND	ND
Zinc	—	26.8	ND	ND	10	10	ND	ND

Notes:
1. R = Indicates compound rejected due to blank contamination.
2. J = Indicates result is less than sample quantitation limit but greater than zero.
3. B = Indicates compound is less than quantitation limits but greater than or equal to instrument detection limits.
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7. NA = Not analyzed; ND = Not detected; N = Tentative.
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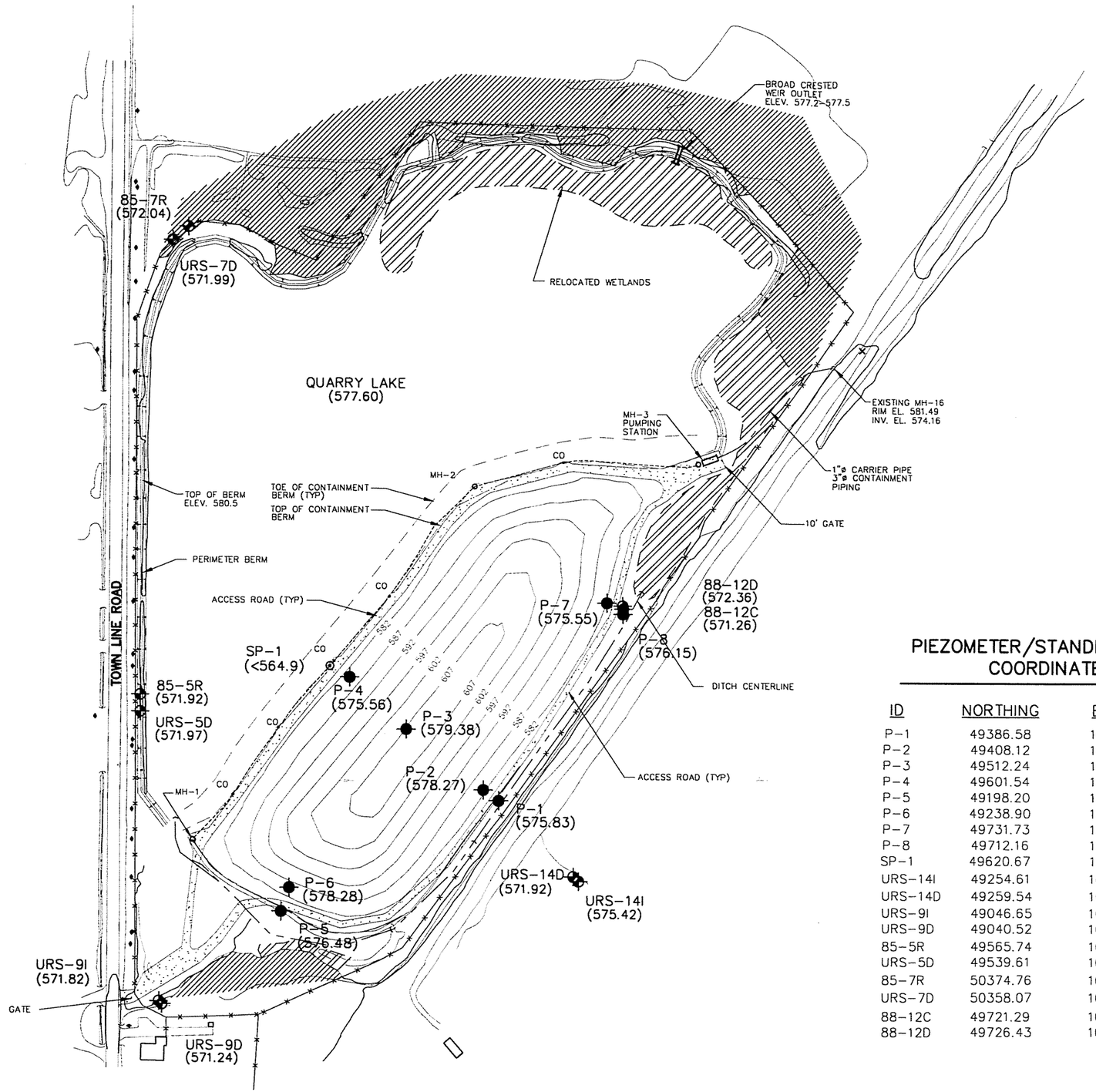

PIEZOMETER/STANDPIPE AND MONITORING WELL COORDINATES AND ELEVATIONS

ID	NORTHING	EASTING	RISER	COVER
P-1	49386.58	100656.87	583.21	583.30
P-2	49408.12	100630.30	582.90	583.20
P-3	49512.24	100496.39	606.33	606.64
P-4	49601.54	100399.33	583.68	583.85
P-5	49198.20	100282.65	583.05	583.55
P-6	49238.90	100296.52	584.45	584.60
P-7	49731.73	100842.30	581.84	582.00
P-8	49712.16	100869.82	582.83	583.00
SP-1	49620.67	100365.59	579.86	580.07
URS-14I	49254.61	100794.43	581.14	580.84
URS-14D	49259.54	100789.09	580.71	580.85
URS-9I	49046.65	100075.10	581.68	579.90
URS-9D	49040.52	100076.81	580.80	579.00
85-5R	49565.74	100036.14	580.84	578.70
URS-5D	49539.61	100035.69	580.60	578.00
85-7R	50374.76	100115.55	577.90	576.60
URS-7D	50358.07	100095.40	579.35	576.50
88-12C	49721.29	100870.45	583.12	583.70
88-12D	49726.43	100869.13	582.87	583.28

REV DATE: 9/24/99

FIGURE 1

LEGEND

- URS-7D — MONITORING WELL
- P-1 — PIEZOMETER
- (580.24) — WATER ELEVATION
- CREATED WETLAND AREA
- EXISTING WETLAND AREA
- 6' HIGH CHAIN LINK FENCE
- 580 — GRADE ELEVATION CONTOUR
- CO — GROUND WATER COLLECTION TRENCH & CLEAN OUT
- STANDPIPE
- UTILITY POLE

FRONTIER CHEMICAL
PENDLETON SITE
TOWN OF PENDLETON,
NIAGARA COUNTY, NY

HYDRAULIC POTENTIAL MAP (AUGUST 11, 1999)

200 0 200

SCALE IN FEET

DATE: SEPTEMBER 1999

FILE NO. 5829.24532.001

O'BRIEN & GERE ENGINEERS, INC.

Appendix A

Piezometer/monitoring well inspection forms

Monitoring Well Integrity Checklist

Site Name: Frontier Chemical **Well Identification:** P-1

Personnel: Tim Prawel **Date:** 8/11/99

WELL SPECIFICATIONS

Protective Casings	**Above Ground**	**Flush Mounted**
Well Construction	**PVC**	**Stainless Steel**
Well Diameter	**2-inch**	**4- inch**
Depth to Ground Water	7.38	
Well Depth	16.28	

WELL INTEGRITY

1. Well identification clearly marked?	**Yes**	**No**
2. Well covers and locks in good condition and secure?	**Yes**	**No**
3. Is the well stand pipe vertically aligned and secure?	**Yes**	**No**
4. Is the concrete pad and surface seal in good condition?	**Yes**	**No**
5. Are soils surrounding the well pad eroded?	**Yes**	**No**
6. Is the well casing in good condition?	**Yes**	**No**
7. Is the measuring point on casing well marked?	**Yes**	**No**
8. Is there standing water in the annular space?	**Yes**	**No**
9. Is the standpipe vented at the base to allow drainage?	**Yes**	**No**

Comments:

Monitoring Well Integrity Checklist

Site Name: Frontier Chemical **Well Identification:** P-2

Personnel: Tim Prawel **Date:** 8/11/99

WELL SPECIFICATIONS

Protective Casings	**Above Ground**	**Flush Mounted**
Well Construction	**PVC**	**Stainless Steel**
Well Diameter	**2-inch**	**4- inch**
Depth to Ground Water	4.63'	
Well Depth	15.78	

WELL INTEGRITY

1. Well identification clearly marked?	**Yes**	**No**
2. Well covers and locks in good condition and secure?	**Yes**	**No**
3. Is the well stand pipe vertically aligned and secure?	**Yes**	**No**
4. Is the concrete pad and surface seal in good condition?	**Yes**	**No**
5. Are soils surrounding the well pad eroded?	**Yes**	**No**
6. Is the well casing in good condition?	**Yes**	**No**
7. Is the measuring point on casing well marked?	**Yes**	**No**
8. Is there standing water in the annular space?	**Yes**	**No**
9. Is the standpipe vented at the base to allow drainage?	**Yes**	**No** N/A

Comments:

Monitoring Well Integrity Checklist

Site Name: Frontier Chemical **Well Identification:** P-3

Personnel: Tim Prawel **Date:** 8/11/99

WELL SPECIFICATIONS

Protective Casings	**Above Ground**	**Flush Mounted**
Well Construction	**PVC**	**Stainless Steel**
Well Diameter	**2-inch**	**4- inch**
Depth to Ground Water	26.95'	
Well Depth	39.96	

WELL INTEGRITY

1. **Well identification clearly marked?**	**Yes**	**No**	
2. **Well covers and locks in good condition and secure?**	**Yes**	**No**	
3. **Is the well stand pipe vertically aligned and secure?**	**Yes**	**No**	
4. **Is the concrete pad and surface seal in good condition?**	**Yes**	**No**	
5. **Are soils surrounding the well pad eroded?**	**Yes**	**No**	
6. **Is the well casing in good condition?**	**Yes**	**No**	
7. **Is the measuring point on casing well marked?**	**Yes**	**No**	
8. **Is there standing water in the annular space?**	**Yes**	**No**	
9. **Is the standpipe vented at the base to allow drainage?**	**Yes**	**No**	N/A

Comments:

Monitoring Well Integrity Checklist

Site Name: Frontier Chemical **Well Identification:** P-4

Personnel: Tim Prawel **Date:** 8/11 /99

WELL SPECIFICATIONS

Protective Casings	**Above Ground**	**Flush Mounted**
Well Construction	**PVC**	**Stainless Steel**
Well Diameter	**2-inch**	**4- inch**
Depth to Ground Water	6.75'	
Well Depth	16.98'	

WELL INTEGRITY

1. Well identification clearly marked?	**Yes**	**No**
2. Well covers and locks in good condition and secure?	**Yes**	**No**
3. Is the well stand pipe vertically aligned and secure?	**Yes**	**No**
4. Is the concrete pad and surface seal in good condition?	**Yes**	**No**
5. Are soils surrounding the well pad eroded?	**Yes**	**No**
6. Is the well casing in good condition?	**Yes**	**No**
7. Is the measuring point on casing well marked?	**Yes**	**No**
8. Is there standing water in the annular space?	**Yes**	**No**
9. Is the standpipe vented at the base to allow drainage?	**Yes**	**No** N/A

Comments:

Monitoring Well Integrity Checklist

Site Name: Frontier Chemical **Well Identification:** P-5

Personnel: Tim Prawel **Date:** 8/11 /99

WELL SPECIFICATIONS

Protective Casings	**Above Ground**	**Flush Mounted**
Well Construction	**PVC**	**Stainless Steel**
Well Diameter	**2-inch**	**4- inch**
Depth to Ground Water	6.57'	
Well Depth	15.68	

WELL INTEGRITY

1. Well identification clearly marked?	**Yes**	**No**
2. Well covers and locks in good condition and secure?	**Yes**	**No**
3. Is the well stand pipe vertically aligned and secure?	**Yes**	**No**
4. Is the concrete pad and surface seal in good condition?	**Yes**	**No**
5. Are soils surrounding the well pad eroded?	**Yes**	**No**
6. Is the well casing in good condition?	**Yes**	**No**
7. Is the measuring point on casing well marked?	**Yes**	**No**
8. Is there standing water in the annular space?	**Yes**	**No**
9. Is the standpipe vented at the base to allow drainage?	**Yes**	**No**

Comments:

Monitoring Well Integrity Checklist

Site Name: Frontier Chemical **Well Identification:** P-6

Personnel: Tim Prawel **Date:** 8/11 /99

WELL SPECIFICATIONS

Protective Casings	**Above Ground**	**Flush Mounted**
Well Construction	**PVC**	**Stainless Steel**
Well Diameter	**2-inch**	**4- inch**
Depth to Ground Water	6.17'	
Well Depth	16.23'	

WELL INTEGRITY

1. Well identification clearly marked?	Yes	No	
2. Well covers and locks in good condition and secure?	Yes	No	
3. Is the well stand pipe vertically aligned and secure?	Yes	No	
4. Is the concrete pad and surface seal in good condition?	Yes	No	
5. Are soils surrounding the well pad eroded?	Yes	No	
6. Is the well casing in good condition?	Yes	No	
7. Is the measuring point on casing well marked?	Yes	No	
8. Is there standing water in the annular space?	Yes	No	
9. Is the standpipe vented at the base to allow drainage?	Yes	No	N/A

Comments: Standpipe leaning 20°-30° at Surface

Monitoring Well Integrity Checklist

Site Name: Frontier Chemical **Well Identification:** P-7

Personnel: Tim Prawel **Date:** 8/ 11/99

WELL SPECIFICATIONS

Protective Casings	**Above Ground**	**Flush Mounted**
Well Construction	**PVC**	**Stainless Steel**
Well Diameter	**2-inch**	**4- inch**
Depth to Ground Water	5.42'	
Well Depth	16.70'	

WELL INTEGRITY

1. Well identification clearly marked?	Yes	No
2. Well covers and locks in good condition and secure?	Yes	No
3. Is the well stand pipe vertically aligned and secure?	Yes	No
4. Is the concrete pad and surface seal in good condition?	Yes	No
5. Are soils surrounding the well pad eroded?	Yes	No
6. Is the well casing in good condition?	Yes	No
7. Is the measuring point on casing well marked?	Yes	No
8. Is there standing water in the annular space?	Yes	No
9. Is the standpipe vented at the base to allow drainage?	Yes	No N/A

Comments:

Monitoring Well Integrity Checklist

Site Name: Frontier Chemical **Well Identification:** P-8

Personnel: Tim Prawel **Date:** 8/11/99

WELL SPECIFICATIONS

Protective Casings	**Above Ground**	**Flush Mounted**
Well Construction	**PVC**	**Stainless Steel**
Well Diameter	**2-inch**	**4- inch**
Depth to Ground Water	6.68'	
Well Depth	17.28'	

WELL INTEGRITY

1. Well identification clearly marked?	**Yes**	**No**
2. Well covers and locks in good condition and secure?	**Yes**	**No**
3. Is the well stand pipe vertically aligned and secure?	**Yes**	**No**
4. Is the concrete pad and surface seal in good condition?	**Yes**	**No**
5. Are soils surrounding the well pad eroded?	**Yes**	**No**
6. Is the well casing in good condition?	**Yes**	**No**
7. Is the measuring point on casing well marked?	**Yes**	**No**
8. Is there standing water in the annular space?	**Yes**	**No**
9. Is the standpipe vented at the base to allow drainage?	**Yes**	**No**

Comments:

Monitoring Well Integrity Checklist

Site Name: Frontier Chemical **Well Identification:** SP-1

Personnel: Tim Prawel **Date:** 8/ 11/99

WELL SPECIFICATIONS

Protective Casings	**Above Ground**	**Flush Mounted**
Well Construction	**PVC** HDPE	**Stainless Steel**
Well Diameter	**2-inch**	**4- inch** 6-inch
Depth to Ground Water	DRY	
Well Depth	15.38'	

WELL INTEGRITY

1. Well identification clearly marked?	**Yes**	**No**
2. Well covers and locks in good condition and secure?	**Yes**	**No**
3. Is the well stand pipe vertically aligned and secure?	**Yes**	**No**
4. Is the concrete pad and surface seal in good condition?	**Yes**	**No**
5. Are soils surrounding the well pad eroded?	**Yes**	**No**
6. Is the well casing in good condition?	**Yes**	**No**
7. Is the measuring point on casing well marked?	**Yes**	**No**
8. Is there standing water in the annular space?	**Yes**	**No**
9. Is the standpipe vented at the base to allow drainage?	**Yes**	**No** N/A

Comments:

Monitoring Well Integrity Checklist

Site Name: Frontier Chemical **Well Identification:** 85-5R

Personnel: Tim Prawel **Date:** 8/11/99

WELL SPECIFICATIONS

Protective Casings	**(Above Ground)**	**Flush Mounted**
Well Construction	**(PVC)**	**Stainless Steel**
Well Diameter	**(2-inch)**	**4- inch**
Depth to Ground Water	8.92'	
Well Depth	38.05'	

WELL INTEGRITY

1. Well identification clearly marked?	**(Yes)**	**No**
2. Well covers and locks in good condition and secure?	**(Yes)**	**No**
3. Is the well stand pipe vertically aligned and secure?	**(Yes)**	**No**
4. Is the concrete pad and surface seal in good condition?	**(Yes)**	**No**
5. Are soils surrounding the well pad eroded?	**Yes**	**(No)**
6. Is the well casing in good condition?	**(Yes)**	**No**
7. Is the measuring point on casing well marked?	**(Yes)**	**No**
8. Is there standing water in the annular space?	**Yes**	**(No)**
9. Is the standpipe vented at the base to allow drainage?	**(Yes)**	**No**

Comments:

Monitoring Well Integrity Checklist

Site Name: Frontier Chemical **Well Identification:** ~~MW-5R~~ MW-5D

Personnel: Tim Prawel **Date:** 8/11 /99

WELL SPECIFICATIONS

Protective Casings	**Above Ground**	**Flush Mounted**
Well Construction	~~PVC~~	**Stainless Steel**
Well Diameter	**2-inch**	**4- inch**
Depth to Ground Water	8.63'	
Well Depth	49.93	

WELL INTEGRITY

1. Well identification clearly marked?	~~Yes~~	**No**
2. Well covers and locks in good condition and secure?	**Yes**	**No**
3. Is the well stand pipe vertically aligned and secure?	**Yes**	**No**
4. Is the concrete pad and surface seal in good condition?	~~Yes~~	**No**
5. Are soils surrounding the well pad eroded?	**Yes**	**No**
6. Is the well casing in good condition?	**Yes**	**No**
7. Is the measuring point on casing well marked?	**Yes**	**No**
8. Is there standing water in the annular space?	**Yes**	**No**
9. Is the standpipe vented at the base to allow drainage?	**Yes**	**No**

Comments:

Monitoring Well Integrity Checklist

Site Name: Frontier Chemical **Well Identification:** 85-7R

Personnel: Tim Prawel **Date:** 8/11/99

WELL SPECIFICATIONS

Protective Casings	**Above Ground**	**Flush Mounted**
Well Construction	**PVC**	**Stainless Steel**
Well Diameter	**2-inch**	**4- inch**
Depth to Ground Water	5.86	
Well Depth	27.78	

WELL INTEGRITY

1. Well identification clearly marked?	**Yes**	**No**
2. Well covers and locks in good condition and secure?	**Yes**	**No**
3. Is the well stand pipe vertically aligned and secure?	**Yes**	**No**
4. Is the concrete pad and surface seal in good condition?	**Yes**	**No**
5. Are soils surrounding the well pad eroded?	**Yes**	**No**
6. Is the well casing in good condition?	**Yes**	**No**
7. Is the measuring point on casing well marked?	**Yes**	**No**
8. Is there standing water in the annular space?	**Yes**	**No**
9. Is the standpipe vented at the base to allow drainage?	**Yes**	**No**

Comments:

Monitoring Well Integrity Checklist

Site Name: Frontier Chemical **Well Identification:** URS-7D

Personnel: Tim Prawel **Date:** 8/11/99

WELL SPECIFICATIONS

Protective Casings	**Above Ground**	**Flush Mounted**
Well Construction	**PVC**	**Stainless Steel**
Well Diameter	**2-inch**	**4- inch**
Depth to Ground Water	7.36'	
Well Depth	39.89	

WELL INTEGRITY

1. Well identification clearly marked?	**Yes**	**No**
2. Well covers and locks in good condition and secure?	**Yes**	**No**
3. Is the well stand pipe vertically aligned and secure?	**Yes**	**No**
4. Is the concrete pad and surface seal in good condition?	**Yes**	**No**
5. Are soils surrounding the well pad eroded?	**Yes**	**No**
6. Is the well casing in good condition?	**Yes**	**No**
7. Is the measuring point on casing well marked?	**Yes**	**No**
8. Is there standing water in the annular space?	**Yes**	**No**
9. Is the standpipe vented at the base to allow drainage?	**Yes**	**No**

Comments:

Monitoring Well Integrity Checklist

Site Name: Frontier Chemical **Well Identification:** URS-9I

Personnel: Tim Prawel **Date:** 8/11/99

WELL SPECIFICATIONS

Protective Casings	**Above Ground**	**Flush Mounted**
Well Construction	**PVC**	**Stainless Steel**
Well Diameter	**2-inch**	**4- inch**
Depth to Ground Water	9.86	
Well Depth	46.40	

WELL INTEGRITY

1. Well identification clearly marked?	**Yes**	**No**
2. Well covers and locks in good condition and secure?	**Yes**	**No**
3. Is the well stand pipe vertically aligned and secure?	**Yes**	**No**
4. Is the concrete pad and surface seal in good condition?	**Yes**	**No**
5. Are soils surrounding the well pad eroded?	**Yes**	**No**
6. Is the well casing in good condition?	**Yes**	**No**
7. Is the measuring point on casing well marked?	**Yes**	**No**
8. Is there standing water in the annular space?	**Yes**	**No**
9. Is the standpipe vented at the base to allow drainage?	**Yes**	**No**

Comments:

Monitoring Well Integrity Checklist

Site Name: Frontier Chemical **Well Identification:** URS-9D

Personnel: Tim Prawel **Date:** 8/ 11/99

WELL SPECIFICATIONS

Protective Casings	**Above Ground**	**Flush Mounted**
Well Construction	**PVC**	**Stainless Steel**
Well Diameter	**2-inch**	**4- inch**
Depth to Ground Water	~~5.31~~ 9.56	
Well Depth	50.99	

WELL INTEGRITY

1. Well identification clearly marked?	**Yes**	**No**
2. Well covers and locks in good condition and secure?	**Yes**	**No**
3. Is the well stand pipe vertically aligned and secure?	**Yes**	**No**
4. Is the concrete pad and surface seal in good condition?	**Yes**	**No**
5. Are soils surrounding the well pad eroded?	**Yes**	**No**
6. Is the well casing in good condition?	**Yes**	**No**
7. Is the measuring point on casing well marked?	**Yes**	**No**
8. Is there standing water in the annular space?	**Yes**	**No**
9. Is the standpipe vented at the base to allow drainage?	**Yes**	**No**

Comments:

Monitoring Well Integrity Checklist

Site Name: Frontier Chemical **Well Identification:** 88-12C

Personnel: Tim Prawel **Date:** 8/11/99

WELL SPECIFICATIONS

Protective Casings	**Above Ground**	**Flush Mounted**
Well Construction	**PVC**	**Stainless Steel**
Well Diameter	**2-inch**	**4- inch**
Depth to Ground Water	11.86'	
Well Depth	31.37'	

WELL INTEGRITY

1. **Well identification clearly marked?**	**Yes**	**No**
2. **Well covers and locks in good condition and secure?**	**Yes**	**No**
3. **Is the well stand pipe vertically aligned and secure?**	**Yes**	**No**
4. **Is the concrete pad and surface seal in good condition?**	**Yes**	**No**
5. **Are soils surrounding the well pad eroded?**	**Yes**	**No**
6. **Is the well casing in good condition?**	**Yes**	**No**
7. **Is the measuring point on casing well marked?**	**Yes**	**No**
8. **Is there standing water in the annular space?**	**Yes**	**No**
9. **Is the standpipe vented at the base to allow drainage?**	**Yes**	**No**

Comments: Concrete Pad Under gravel

Monitoring Well Integrity Checklist

Site Name: Frontier Chemical **Well Identification:** 88-12D

Personnel: Tim Prawel **Date:** 8/11/99

WELL SPECIFICATIONS

Protective Casings	**Above Ground**	**Flush Mounted**
Well Construction	**PVC**	**Stainless Steel**
Well Diameter	~~2-inch~~	**4- inch**
Depth to Ground Water	10.51'	
Well Depth	~~53.36~~'	

WELL INTEGRITY

1. Well identification clearly marked?	**Yes**	**No**
2. Well covers and locks in good condition and secure?	**Yes**	**No**
3. Is the well stand pipe vertically aligned and secure?	**Yes**	**No**
4. Is the concrete pad and surface seal in good condition?	**Yes**	**No**
5. Are soils surrounding the well pad eroded?	**Yes**	**No**
6. Is the well casing in good condition?	**Yes**	**No**
7. Is the measuring point on casing well marked?	**Yes**	**No**
8. Is there standing water in the annular space?	**Yes**	**No**
9. Is the standpipe vented at the base to allow drainage?	**Yes**	**No**

Comments: Concrete Pad Under Gravel

Monitoring Well Integrity Checklist

Site Name: Frontier Chemical **Well Identification:** VRS 14 I

Personnel: Tim Prawel **Date:** 8/11/99

WELL SPECIFICATIONS

Protective Casings	**Above Ground**	**Flush Mounted**
Well Construction	**PVC**	**Stainless Steel**
Well Diameter	**2-inch**	**4- inch**
Depth to Ground Water	5.72	
Well Depth	31.18	

WELL INTEGRITY

1. Well identification clearly marked?	**Yes**	**No**
2. Well covers and locks in good condition and secure?	**Yes**	**No**
3. Is the well stand pipe vertically aligned and secure?	**Yes**	**No**
4. Is the concrete pad and surface seal in good condition?	**Yes**	**No**
5. Are soils surrounding the well pad eroded?	**Yes**	**No**
6. Is the well casing in good condition?	**Yes**	**No**
7. Is the measuring point on casing well marked?	**Yes**	**No**
8. Is there standing water in the annular space?	**Yes**	**No**
9. Is the standpipe vented at the base to allow drainage?	**Yes**	**No** NA

Comments:

Monitoring Well Integrity Checklist

Site Name: Frontier Chemical **Well Identification:** URS 14-D

Personnel: Tim Prawel **Date:** 8/11/99

WELL SPECIFICATIONS

Protective Casings	**Above Ground**	**Flush Mounted**
Well Construction	**PVC**	**Stainless Steel**
Well Diameter	**2-inch**	**4- inch**
Depth to Ground Water	8.79'	
Well Depth	41.68	

WELL INTEGRITY

1. Well identification clearly marked?	**Yes**	**No**
2. Well covers and locks in good condition and secure?	**Yes**	**No**
3. Is the well stand pipe vertically aligned and secure?	**Yes**	**No**
4. Is the concrete pad and surface seal in good condition?	**Yes**	**No**
5. Are soils surrounding the well pad eroded?	**Yes**	**No**
6. Is the well casing in good condition?	**Yes**	**No**
7. Is the measuring point on casing well marked?	**Yes**	**No**
8. Is there standing water in the annular space?	**Yes**	**No**
9. Is the standpipe vented at the base to allow drainage?	**Yes**	**No** N/A

Comments:

Appendix B

Ground water sampling logs

O'Brien & Gere Engineers, Inc. — Standard Ground Water Sampling Log

Date: Aug 13, 1999
Site Name: Pendleton
Location: Frontier Chemical
Project No.: 24532
Personnel: TPP/DEL

Weather: Overcast 63°F
Well #: 95-5R
Evacuation Method: Hand Bail
Sampling Method: S.S. Bailer

Well Information:

Depth of Well *	38.05	ft.
Depth to Water *	8.92	ft.
Length of Water Column	29.13	ft.
Volume of Water in Well	4.75	gal.(s)
3X Volume of Water in Well	14.2	gal.(s)

Water Volume /ft. for:
- X 2" Diameter Well = 0.163 X LWC
- ___ 4" Diameter Well = 0.653 X LWC
- ___ 6" Diameter Well = 1.469 X LWC

Volume removed before sampling: 15 gal.(s)
Did well go dry? yes

* Measurements taken from: [x] Well Casing [ ] Protective Casing [ ] (Other, Specify)

Instrument Calibration:

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard		84 S Standard	
7.0 Standard		1413 S Standard	
10.0 Standard			

Water parameters:

	Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings uS/cm
initial	0.5	15.6	11.88 (?)	1450
	5	12.4	9.14	1727
	15	13.2	8.61	1556

Water Sample:
Time Collected: 950

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Lt Sandy Brown	Color	
Odor	None	Odor	
Turbidity (> 100 NTU)	>100	Turbidity (> 100 NTU)	
Sheen/Free Product	None	Sheen/Free Product	

Samples collected:

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40ml	Glass	2	NO	1:1HCL	<2
1 liter	plastic	1	Yes	HNO_3	<2
1 liter	plastic	1	No	Na_2SO_4	>10

Notes:
Dry @ 8 gal.

O'Brien & Gere Engineers, Inc. — **Standard Ground Water Sampling Log**

Date: Aug 13, 1999
Site Name: Pendleton
Location: Frontier Chemical
Project No.: 24532
Personnel: TPP/DEL

Weather: Overcast 63°± am
Well #: VRS-5D
Evacuation Method: Hand Bail
Sampling Method: S.S. Bailer

Well Information:

Depth of Well *	49.93	ft.
Depth to Water *	8.63	ft.
Length of Water Column	41.3	ft.
Volume of Water in Well	6.73	gal.(s)
3X Volume of Water in Well	20.2	gal.(s)

Water Volume /ft. for:
- X 2" Diameter Well = 0.163 X LWC
- ___ 4" Diameter Well = 0.653 X LWC
- ___ 6" Diameter Well = 1.469 X LWC

Volume removed before sampling: 14 gal.(s)
Did well go dry? yes

* Measurements taken from: [x] Well Casing [ ] Protective Casing [ ] (Other, Specify)

Instrument Calibration:

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard		84 S Standard	
7.0 Standard		1413 S Standard	
10.0 Standard			

Water parameters:

Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings uS/cm
initial 0.5	initial 14.3	initial	initial 3220
7	12.4	8.59 ?	3200
12	12.7	8.11	3380
14	12.8	8.10	3310

Water Sample:
Time Collected: 1000

Physical Appearance at Start		Physical Appearance at Sampling	
Color	clear	Color	
Odor	None	Odor	
Turbidity (> 100 NTU)	7100	Turbidity (> 100 NTU)	
Sheen/Free Product	None	Sheen/Free Product	

Samples collected:

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40ml	Glass	2	NO	1:1HCL	<2
1 Liter	plastic	1	Yes	HNO_3	<2
1 Liter	plastic	1	NO	Na_2SO_4	>10

Notes:

O'Brien & Gere Engineers, Inc. — **Standard Ground Water Sampling Log**

Date: 8/12/99
Site Name: Frontier Chemical
Location: Pendleton NY
Project No.: 2453.2
Personnel: TPP, DEC

Weather: Partly Cloudy 80°
Well #: 85-7R
Evacuation Method: Hand Bail
Sampling Method: SS Bailer

Well Information:

Depth of Well *	27.78	ft.
Depth to Water *	5.86	ft.
Length of Water Column	21.92	ft.
Volume of Water in Well	3.6	gal.(s)
3X Volume of Water in Well	10.7	gal.(s)

Water Volume /ft. for:
- X 2" Diameter Well = 0.163 X LWC
- ___ 4" Diameter Well = 0.653 X LWC
- ___ 6" Diameter Well = 1.469 X LWC

Volume removed before sampling: 11 gal.(s)
Did well go dry? No

* Measurements taken from: [x] Well Casing [ ] Protective Casing [ ] (Other, Specify)

Instrument Calibration:

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard		84 S Standard	
7.0 Standard		1413 S Standard	
10.0 Standard			

Water parameters:

Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings uS/cm
initial	initial	initial	initial
			Broken
None Taken Instrument			

Water Sample:
Time Collected: 1445

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Lt Silty Gray	Color	Lt Silty Gray
Odor	None	Odor	None
Turbidity (> 100 NTU)	>100	Turbidity (> 100 NTU)	>100
Sheen/Free Product	None	Sheen/Free Product	None

Samples collected:

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40ml	Glass	2	NO	1:1HCL	<2
1 liter	Plastic	1	Yes	HNO_3	<2
1 liter	Plastic	1	NO	Na_2SO_4	>10

Notes:

O'Brien & Gere Engineers, Inc. — **Standard Ground Water Sampling Log**

Date 3/12/99
Site Name Frontier Chemical
Location Pendleton, NY
Project No. 24532
Personnel TPP/DEC

Weather Partly Cloudy 80
Well # URS-7D
Evacuation Method Hand Bail
Sampling Method SS Bailer

Well Information:

Depth of Well *	39.89	ft.
Depth to Water *	7.36	ft.
Length of Water Column	32.53	ft.
Volume of Water in Well	5.30	gal.(s)
3X Volume of Water in Well	15.9	gal.(s)

Water Volume /ft. for:
- X 2" Diameter Well = 0.163 X LWC
- ___ 4" Diameter Well = 0.653 X LWC
- ___ 6" Diameter Well = 1.469 X LWC

Volume removed before sampling: 15 gal.(s)
Did well go dry? NO

* Measurements taken from: [x] Well Casing [ ] Protective Casing [ ] (Other, Specify)

Instrument Calibration:

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard		84 S Standard	
7.0 Standard		1413 S Standard	
10.0 Standard			

Water parameters:

Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings uS/cm
initial	initial	initial	initial
None taken Instrument Broken			
			TPP

Water Sample:
Time Collected 1505

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Clear	Color	Clear
Odor	slight sulfur	Odor	slight sulfur
Turbidity (> 100 NTU)	< 100	Turbidity (> 100 NTU)	< 100
Sheen/Free Product	NONE	Sheen/Free Product	NONE

Samples collected:

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40ml	Glass	2	NO	1:1HCL	<2
1 liter	Plastic	1	Yes	HNO_3	<2
1 liter	Plastic	1	NO	Na_2SO_4	>10

Notes:

O'Brien & Gere Engineers, Inc. — Standard Ground Water Sampling Log

Date: 8/12/99
Site Name: Frontier Chemical
Location: Pendleton NY
Project No.: 24532
Personnel: TPP/DEC

Weather: Partly Cloudy 75
Well #: MW5-9I
Evacuation Method: Hand Bail
Sampling Method: SS Bailer

Well Information:

Depth of Well *	46.40	ft.
Depth to Water *	9.86'	ft.
Length of Water Column	36.54	ft.
Volume of Water in Well	5.96	gal.(s)
3X Volume of Water in Well	17.9	gal.(s)

Water Volume /ft. for:
- X 2" Diameter Well = 0.163 X LWC
- 4" Diameter Well = 0.653 X LWC
- 6" Diameter Well = 1.469 X LWC

Volume removed before sampling: 18 gal.(s)
Did well go dry? NO

* Measurements taken from: [x] Well Casing [ ] Protective Casing [ ] (Other, Specify)

Instrument Calibration:

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard		84 S Standard	
7.0 Standard		1413 S Standard	
10.0 Standard			

Water parameters:

Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings uS/cm
initial 1.0	initial 13.2	initial	initial
1.2	14.2		
		Broken	

Water Sample:
Time Collected: 1200

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Cloudy brown	Color	Cloudy brown
Odor	Slight	Odor	Slight
Turbidity (> 100 NTU)	> 100	Turbidity (> 100 NTU)	> 100
Sheen/Free Product	NONE	Sheen/Free Product	NONE

Samples collected:

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40ml	Glass	2	NO	1:1HCL	<2
1 liter	Plastic	1	Yes	HNO_3	<2
1 liter	Plastic	1	NO	Na_2SO_4	>10

Notes:

O'Brien & Gere Engineers, Inc. — **Standard Ground Water Sampling Log**

Date: 8/12/99
Site Name: Frontier Chemical
Location: Pendleton, NY
Project No.: 24532
Personnel: TPP, DGC

Weather: Partly Cloudy 75
Well #: URS-9D
Evacuation Method: Hand Bail
Sampling Method: SS Bailer

Well Information:

Depth of Well *	50.99	ft.
Depth to Water *	9.56	ft.
Length of Water Column	41.43	ft.
Volume of Water in Well	6.75	gal.(s)
3X Volume of Water in Well	20.3	gal.(s)

Water Volume /ft. for:
- X 2" Diameter Well = 0.163 X LWC
- ___ 4" Diameter Well = 0.653 X LWC
- ___ 6" Diameter Well = 1.469 X LWC

Volume removed before sampling: 20 gal.(s)
Did well go dry? No

* Measurements taken from: [x] Well Casing [ ] Protective Casing [ ] (Other, Specify)

Instrument Calibration:

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard		84 S Standard	
7.0 Standard		1413 S Standard	
10.0 Standard			

Water parameters:

Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings uS/cm
initial 0	initial 164	initial 1.56	initial 1456
20		broken	

Water Sample:
Time Collected: 1110

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Clear	Color	Clear
Odor	Slight Sulphur	Odor	Slight
Turbidity (> 100 NTU)	>100	Turbidity (> 100 NTU)	<100
Sheen/Free Product	None	Sheen/Free Product	None

Samples collected:

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40ml	Glass	2	NO	1:1HCL	<2
1 liter	Plastic	1	Yes	HNO_3	<2
1 liter	Plastic	1	NO	Na_2SO_4	>10

Notes: * Collect X-1

O'Brien & Gere Engineers, Inc. — **Standard Ground Water Sampling Log**

Date: 8/11/99
Site Name: Frontier Chemical
Location: ~~88-12C~~ Pendleton, NY
Project No.: 24532
Personnel: TPP, DEC

Weather: Overcast, 75°
Well #: 88-12C
Evacuation Method: Hand Bail
Sampling Method: SS Bailer

Well Information:

Depth of Well *	31.37	ft.
Depth to Water *	11.86	ft.
Length of Water Column	19.51	ft.
Volume of Water in Well	3.18	gal.(s)
3X Volume of Water in Well	9.54	gal.(s)

Water Volume /ft. for:
- X 2" Diameter Well = 0.163 X LWC
- ___ 4" Diameter Well = 0.653 X LWC
- ___ 6" Diameter Well = 1.469 X LWC

Volume removed before sampling: 10 gal.(s)
Did well go dry? No

* Measurements taken from: [x] Well Casing [ ] Protective Casing [ ] (Other, Specify)

Instrument Calibration:

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard	4.0	84 S Standard	
7.0 Standard	7.0	1413 S Standard	
10.0 Standard			

Water parameters:

Gallons Removed	Temperature Readings °C	pH Readings	Conductivity Readings uS/cm
initial 0	initial 15.9	initial 6.31	initial 1291
3	14.6	6.94	1233
6	13.2	7.13	1241
10	12.6	7.18	1220

Water Sample:
Time Collected: 1515

Physical Appearance at Start		Physical Appearance at Sampling	
Color	lt silty Brown	Color	lt Silty Brown
Odor	None	Odor	None
Turbidity (> 100 NTU)	>100	Turbidity (> 100 NTU)	>100
Sheen/Free Product	None	Sheen/Free Product	None

Samples collected:

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40ml	Glass	2	NO	1:1HCL	<2
1 liter	Plastic	1	Yes	HNO_3	<2
1 liter	Plastic	1	NO	Na_2SO_4	7-10

Notes:

O'Brien & Gere Engineers, Inc. — **Standard Ground Water Sampling Log**

Date: 8/11/99
Site Name: Frontier Chemical
Location: Pendleton, NY
Project No.: 24532
Personnel: TPP, DEC

Weather: Overcast, 75
Well #: 88-12D
Evacuation Method: Hand Bail
Sampling Method: SS Bailer

Well Information:

Depth of Well *	53.36	ft.
Depth to Water *	10.51	ft.
Length of Water Column	42.85	ft.
Volume of Water in Well	6.99	gal.(s)
3X Volume of Water in Well	21	gal.(s)

Water Volume /ft. for:
- X 2" Diameter Well = 0.163 X LWC
- ____ 4" Diameter Well = 0.653 X LWC
- ____ 6" Diameter Well = 1.469 X LWC

Volume removed before sampling: 21 gal.(s)
Did well go dry? No

* Measurements taken from: [x] Well Casing [ ] Protective Casing [ ] (Other, Specify)

Instrument Calibration:

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard	4.0	84 S Standard	
7.0 Standard	7.0	1413 S Standard	
10.0 Standard			

Water parameters:

	Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings uS/cm
initial	.5	13.8	6.0	4830
	7	12.4	5.70	6280
	14	14.0	6.09	6590
	21	14.1	5.89	8670

Water Sample:
Time Collected: 1635

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Clear	Color	Dk Gray
Odor	slight sulphur	Odor	yes sulphur
Turbidity (> 100 NTU)	< 100	Turbidity (> 100 NTU)	> 100
Sheen/Free Product	None	Sheen/Free Product	None

Samples collected:

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40ml	Glass	2	NO	1:1HCL	<2
1 liter	Plastic	1	Yes	HNO_3	<2
1 liter	Plastic	1	No	Na_2SO_4	>10

Notes:

O'Brien & Gere Engineers, Inc. — **Standard Ground Water Sampling Log**

Date: 8/12/99
Site Name: Frontier Chemical
Location: Pendleton, NY
Project No.: 24532
Personnel: TPP, DEC

Weather: Partly Cloudy 75°
Well #: URS-14I
Evacuation Method: Hand Bail
Sampling Method: SS Bailer

Well Information:

Depth of Well *	31.18	ft.
Depth to Water *	5.72	ft.
Length of Water Column	25.46	ft.
Volume of Water in Well	4.15	gal.(s)
3X Volume of Water in Well	12.5	gal.(s)

Water Volume /ft. for:
- X 2" Diameter Well = 0.163 X LWC
- ___ 4" Diameter Well = 0.653 X LWC
- ___ 6" Diameter Well = 1.469 X LWC

Volume removed before sampling: 8.5 gal.(s)
Did well go dry? yes

* Measurements taken from: [x] Well Casing [ ] Protective Casing [ ] (Other, Specify)

Instrument Calibration:

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard		84 S Standard	
7.0 Standard		1413 S Standard	
10.0 Standard			

Water parameters:

Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings uS/cm
initial 0.5	initial 13.2	initial 8.85	initial 690
4.5	12.2	8.02	768
8.5	13.2	8.07	762
10			

Water Sample:
Time Collected: * 1100 / 8/13/99

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Cloudy Red	Color	Cloudy Red
Odor	NONE	Odor	NONE
Turbidity (> 100 NTU)	> 100	Turbidity (> 100 NTU)	> 100
Sheen/Free Product	NONE	Sheen/Free Product	NONE

Samples collected:

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40ml	Glass	2	NO	1:1HCL	<2
1 liter	Plastic	1	Yes	HNO_3	<2
1 liter	Plastic	1	NO	Na_2SO_4	7/0

Notes:

O'Brien & Gere Engineers, Inc. — **Standard Ground Water Sampling Log**

Date: 8/12/99
Site Name: Frontier Chemical
Location: Pendleton, NY
Project No.: 4532
Personnel: TPP, DEC

Weather: Partly Cloudy, 75°
Well #: URS-14D
Evacuation Method: Hand Bail
Sampling Method: SS Bailer

Well Information:

Depth of Well *	41.68	ft.
Depth to Water *	8.79	ft.
Length of Water Column	32.89	ft.
Volume of Water in Well	5.36	gal.(s)
3X Volume of Water in Well	16	gal.(s)

Water Volume /ft. for:
- X 2" Diameter Well = 0.163 X LWC
- ___ 4" Diameter Well = 0.653 X LWC
- ___ 6" Diameter Well = 1.469 X LWC

Volume removed before sampling: 16 gal.(s)
Did well go dry? No

* Measurements taken from: [x] Well Casing [ ] Protective Casing [ ] (Other, Specify)

Instrument Calibration:

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard		84 S Standard	
7.0 Standard		1413 S Standard	
10.0 Standard			

Water parameters:

	Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings uS/cm
initial	.5	13.4	7.75	1226
	5	11.9	6.58	2030
	10	11.4	5.87	2610
	16	11.8	5.93	2540

Water Sample:
Time Collected: 900

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Clear	Color	Clear
Odor	Sulpher	Odor	~~None~~ Sulpher
Turbidity (> 100 NTU)	<100	Turbidity (> 100 NTU)	<100
Sheen/Free Product	None	Sheen/Free Product	None

Samples collected:

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40ml	Glass	2	NO	1:1HCL	<2
1 liter	plastic	1	Yes	HNO_3	<2
1 liter	plastic	1	No	Na_2SO_4	710

Notes:
* MS/MSD

East Syracuse, New York 13057
(315) 437-0200

Client: ARQUITER CHEMICAL

Project: PENDLETON NY # 24532

Sampled by: T. Prawel

Client Contact: J. BURNS Phone #

Analysis/Method

Sample Description

Sample Location	Date Collected	Time Collected	Sample Matrix	Comp. or Grab	No. of Containers	VOC's EPA 8260	TAL METALS EPA 6010/7470	CN - EPA 9010	Comments
88-12C	8/11/99	1515	Water	Grab	5	3	1	1	
88-12D	/99	1635	Water	Grab	5	3	1	1	
URS-14D	8/12/99	900	Water	Grab	5	3	1	1	
URS-14D MS/MSD	8/12/99	900	Water	Grab	10	6	2	2	
URS-9D	8/12/99	1110	Water	Grab	5	3	1	1	
URS-9I	8/12/99	1200	Water	Grab	5	3	1	1	
85-7R	8/12/99	1415	Water	Grab	5	3	1	1	
URS-7D	8/12/99	1505	Water	Grab	5	3	1	1	
X-1	—	—	Water	Grab	5	3	1	1	
Trip Blanks	8/11/99		Wat	←	2	2			

Relinquished by: [signature] Date: 8/12/99 Time: 1635 Received by: Date: Time:

Relinquished by: Date: Time: Received by: Date: Time:

Relinquished by: Date: Time: Received by Lab: Mark F. Jackson Date: 8/13/99 Time: 09:20

Shipment Method: FED-EX Airbill Number: 808963124642
808963124653

Turnaround Time Required:
Routine
Rush (Specify)

Comments: * Metals - Field Filtered

Cooler Temperature: 4°C

Original-Laboratory Copy-Client

O'Brien & Gere Laboratories, Inc.

5000 Brittonfield Parkway
East Syracuse, New York 13057
(315) 437-0200

Chain of Custody

Client: Frontier Chemical
Project: Pendleton, New York
Sampled by: T. Prawel, D. Canestrari
Client Contact: John Burns Phone #

Sample Description

Sample Location	Date Collected	Time Collected	Sample Matrix	Comp. or Grab	No. of Containers	Analysis/Method: VOCs EPA 8260	TAL Metals 6010/7470	CN 9010					Comments
85-SR	8/13/99	950	Water	Grab	5	3	1*	1					
URS-5D	8/13/99	1000	Water	Grab	5	3	1	1					
URS-14I	8/13/99	1035	Water	Grab	5	3	1	1					
Equipment Blank	8/13/99	1100	Wat	Grab	5	3	1	1					
Trip Blank	8/13/99	—	Wat	Grab	2	2							

Relinquished by:	Date: 8/13/99	Time: 1250	Received by:	Date: Time:
Relinquished by:	Date:	Time:	Received by:	Date: Time:
Relinquished by:	Date:	Time:	Received by Lab:	Date: Time:
Shipment Method: FED-Ex.			Airbill Number: 808963124631	

Turnaround Time Required:
Routine_____
Rush (Specify)_____

Comments: * Metals Field Filtered
* Equip. Blank CN, used organic Free H_2O

Cooler Temperature:_____

Original-Laboratory Copy-Client

Appendix C

Data validation report

Data Validation Services

120 Cobble Creek Road P. O. Box 208
North Creek, N. Y. 12853
Phone 518-251-4429
Facsimile 518-251-4428

September 25, 1999

Jennifer Smith
O'Brien & Gere Engineers
5000 Brittonfield Parkway
P. O. Box 4873
Syracuse, NY 13221

RE: Validation of Frontier Chemical Site Data Packages
OBG Labs Report for Samples Collected August 11-13, 1999

Dear Ms. Smith:

Review has been completed for the data package generated by OBG Laboratories, pertaining to samples collected at the Frontier Chemical Site on August 11 through August 13, 1999. Eleven aqueous samples were analysed for TCL volatiles and TAL filtered metals/cyanide parameters. Matrix spikes/duplicates, and equipment and trip blanks were also processed. Methodologies utilized are those of the USEPA SW846.

Data validation was performed with guidance from the most current editions of the USEPA CLP National Functional Guidelines for Organic and Inorganic Data Review and the USEPA SOPs HW-2 and HW-6. The following items were reviewed:

* Data Completeness
* Custody Documentation
* Holding Times
* Surrogate and Internal Standard Recoveries
* Matrix Spike Recoveries/Duplicate Correlations
* Preparation/Calibration Blanks
* Control Spike/Laboratory Control Samples
* Instrumental Tunes
* Calibration Standards
* Instrument IDLs
* Method Compliance
* Sample Result Verification

Those items showing deficiencies are discussed in the following sections of this report. All others were found to be acceptable as outlined in the above-mentioned validation procedures, and as applicable for the methodology. Unless noted specifically in the following text, reported results are substantiated by the raw data, and generated in compliance with protocol requirements.

In summary, sample processing was primarily conducted with compliance to protocol requirements and with adherance to quality criteria, and most reported results are usable with minor qualification. The exception is that, due for the most part to instrumental processing, volatile results for four samples are considered estimated in value. Certain edits to, and qualification of, reported results are indicated. These issues are discussed in the following analytical sections.

The laboratory summary data package, with recommended qualifiers applied in red ink to the sample result forms is attached to this narrative, and should be reviewed in conjunction with this text.

Data Completeness

The laboratory data packages were not directly in compliance with the required NYSDEC ASP Category B deliverables, but the information needed for validation of the data was present. Volatile summary forms 2, 4, and 5 were not present, the laboratory NYSDEC Sample Preparation and Analysis Summary Forms were not provided, and no verbatim certification statement was made in the case narrative. Metals Forms 2B were requested, and provided (attached).

Volatile Analyses

Due to instrumental functioning (blown filament), a trip blank was analysed 8/23/99, but processed (calculated) against standards from 8/24/99. The detected values for that trip blank are therefore not accurate, and are to be considered estimated. The variance is not expected to be great.

Just prior to the loss of the filament, project samples showed inconsistent responses for internal standards; this is typical of instrumental performance with a malfunctioning filament. However, when responses of internal standards vary (>200% or <50%) from those expected, data are qualified due to potential inaccuracies in detection limits or values. The laboratory submitted Forms 8, summarizing internal standard areas and acceptance ranges, should have shown lower limits of 50%, not 10%. Sample analyses should have been repeated. Due to low internal standard response, the results for all analytes in the following samples should be considered estimated : 88-12D, URS-19I, and 85-7R.

Sample 88-12C produced low recovery for surrogate d8-toluene (77%, below 84% limit) on repeated analysis. Therefore reported results for this sample (which should be derived from the initial analysis) are considered estimated, possibly biased low, due to possible matrix effect.

Methylene choride, acetone, carbon disulfide, and 2-butanone were detected in the method, trip, and field blanks at low levels. Due to possible contamination contribution, the reported results for those analytes in all project samples which reported **detection** should be edited to reflect nondetection at either the analyte CRDL, or the originally reported value, whichever is greater.

Due to low response factors in the calibration standards, results for bromomethane, acetone, 2-butanone, and 2-hexanone should be considered estimated in the project field samples and one of the trip blanks. Similarly, results for acetone, 2-butanone, and 2-hexanone are considered estimated in the other trip blank and the equipment blank. No corrective action was required of the laboratory.

Matrix spikes of URS-14D involved evaluation of recoveries of all target analytes. Carbon disulfide produced elevated recoveries of (282% and 432%). The sample result is considered contamination due to copresence in the associated blanks (see above). Some of the analytes produced recoveries very slightly below the recommended range, and duplicate correlations above the recommended range. Based upon evaluation of the system sensitivity and sample matrix, it is determined that those (nondetected) sample results are unaffected. However, the recoveries for the following analytes showed outlying responses to the degree which indicates qualification of reported results for USR14D:

trans-1,3-dichloropropene (55% and 57%, <84%) results for URS14D qualified as "J"
styrene (17% and 17%) results for URS14D edited to nondetection at 10 ug/L
(this elevated detection limit corresponds to the concentration of the matrix spikes, which showed detection. However, detection at concentrations below that level is not assured).

The Laboratory Control Sample (LCS) associated with the analysis of two trip blanks and the matrix spikes showed outlying recoveries that appear to be isolated to the matrix spiking of the sample. This is evident in part by the comparison of the responses of the surrogate d8-toluene with that of spike compound toluene, indicating a possible spiking error in the preparation of the LCS.

Field duplicate correlation of URS-9D and X-1 was acceptable.

All Tentatively Identified Compounds values should have been qualified as estimated ("J") by the laboratory. Those identified as sulfur dioxide should show the CAS number for that compound.

The laboratory should determine why response factors for surrogate compound d4-1,2-dichloroethane (0.044) vary so greatly from that of the nondeuterated target analyte 1,2-dichloroethane (0.246).

Metals/CN Analyses

Accuracy and precision evaluations for URS-14D were acceptable, with the exception of the recoveries of selenium, which were 65%. Therefore the sample selenium results should be considered estimated ("J").

Due to outlying recoveries in low concentration standards, results for arsenic (69% and 74%) and detected results for zinc (159% and 132%) should be considered estimated, biased low and high, respectively. No corrective action was required of the laboratory.

The serial dilution determinations for URS-14D produced acceptable correlations.

Field duplicate correlation between URS-9D and X-1 was acceptable.

Reported results are substantiated by the raw data.

Please do not hesitate to contact me if questions or comments arise during your review of this report.

Very truly yours,

Judy Harry

MT 9/23/99

PQL ~~CRL~~ RESULTS FOR ICP

22-SEP-99

Parameter	True Value	Run #1	%R	Run #2	%R	Run #3	%R	Run #4	%R	Contrl Limits	Units	Date Analyzed
Aluminum	100	111.8	111.8	100.7	100.7					50-150	ug/L	08/25/99
Antimony	60	58.88	98.1	59.82	99.7					50-150	ug/L	08/25/99
Arsenic	10	6.91	69.1	7.39	73.9					50-150	ug/L	08/25/99
Barium	100	101.68	101.7	100.49	100.5					50-150	ug/L	08/25/99
Beryllium	10	9.9	99.0	9.82	98.2					50-150	ug/L	08/25/99
Boron		-1.18		-2.5						50-150	ug/L	08/25/99
Cadmium	10	9.98	99.8	9.53	95.3					50-150	ug/L	08/25/99
Calcium	1000	1021	102.1	1005	100.5					50-150	ug/L	08/25/99
Chromium	10	10.09	100.9	8.85	88.5					50-150	ug/L	08/25/99
Cobalt	50	51.07	102.1	48.42	96.8					50-150	ug/L	08/25/99
Copper	10	10.21	102.1	10.51	105.1					50-150	ug/L	08/25/99
Iron	50	52.24	104.5	51.8	103.6					50-150	ug/L	08/25/99
Lead	5	4.68	93.6	4.44	88.8					50-150	ug/L	08/25/99
Magnesium	1000	965.7	96.6	933.6	93.4					50-150	ug/L	08/25/99
Manganese	50	50.43	100.9	49.73	99.5					50-150	ug/L	08/25/99
Molybdenum		-2.47		1.22						50-150	ug/L	08/25/99
Nickel	50	50.53	101.1	50.01	100.0					50-150	ug/L	08/25/99
Selenium	5	3.63	73.6	7.72 #	154.4					50-150	ug/L	08/25/99
Silver	10	9.97	99.7	9.82	98.2					50-150	ug/L	08/25/99
Sodium	1000	964	96.4	953.1	95.3					50-150	ug/L	08/25/99
Strontium		-.02		.05						50-150	ug/L	08/25/99
Thallium	10	.74	127.4	5.48	54.8					50-150	ug/L	08/25/99
Tin		1.2		-2.91						50-150	ug/L	08/25/99
Titanium		.01		-.05						50-150	ug/L	08/25/99
Vanadium	50	49.03	98.1	48.85	97.7					50-150	ug/L	08/25/99
Zinc	10	15.93 #	159.3	13.19	131.9							

Volume 1 of 3 of the validated analytical data - separately bound

C-2 Frontier Chemical – Pendleton Site
Town of Pendleton, Niagara County, NY Water Samples
Volume 1 of 3
O'Brien & Gere
August 11, 12, and 13, 1999

Laboratory Report

Frontier Chemical
Pendleton Site
Town of Pendleton
Niagara County, NY
Water Samples

Volume 1 of 3

August 11, 12 and 13, 1999

O'BRIEN & GERE
ENGINEERS, INC.

ANALYTICAL PACKAGE

for

Frontier Chemical
Pendleton Site
Town of Pendleton
Niagara County, NY

Samples collected: August 11, 12 and 13, 1999

Volume 1 of 3

Prepared for:

O'Brien & Gere Engineers, Inc.
5000 Brittonfield Parkway
P.O. Box 4873
Syracuse, NY 13221

Prepared by:

O'Brien & Gere Laboratories, Inc.
5000 Brittonfield Parkway
Suite 300, P.O. Box 4942
Syracuse, NY 13221

Authorized _____

Date 9.14.99

Reviewed _____

Date 9-15-99

TABLE OF CONTENTS

Volume 1 of 3		Page No.
SAMPLE DATA SUMMARY PACKAGE		
Narrative		1 - 5
Cross Reference Table		6 - 7
Analytical Results		8 - 67
Quality Control Results		68 - 96
Chain of Custody		
External Chain of Custody		97 - 103
Internal Chain of Custody		104 - 106
Volume 2 of 3		
SAMPLE DATA PACKAGE		
Narrative		107 - 111
Cross Reference Table		112 - 113
Section 1	GC/MS Volatile Organics Data	114 - 406
Volume 3 of 3		
Section 2	Trace Metals Data	407 - 713
Section 3	Wet Chemistry Data (Total Cyanide)	714 - 735

Sample Data Summary Package

NARRATIVE

INTRODUCTION/ANALYTICAL RESULTS

This report summarizes the laboratory results for samples from Frontier Chemical - Pendleton Site, Town of Pendleton, Niagara County, NY. Immediately following the narrative is the Cross Reference Table that lists the site descriptions, sample numbers, dates collected, dates received and package numbers.

CONDITION UPON RECEIPT/CHAIN OF CUSTODY

The coolers were received intact. When the coolers were received by the laboratory, the sample custodian(s) opened and inspected the shipments for damage, custody inconsistencies and proper preservation. The chain of custody forms documenting receipt are presented in the chain of custody section. Each sample was assigned a unique laboratory number and a custody file created. The samples were placed in a secured walk-in cooler and signed in and out by the chemists performing the tests. The sign out record, or lab chronicle, is presented in the chain of custody section.

No discrepancies were noted upon receipt. The cooler temperatures upon receipt were 3 and 4°C.

METHODOLOGY

The following methods were used to perform the analyses:

PARAMETER	METHOD	REFERENCE
Volatile Organics	8260B	1
ICP Metals	6010B	1
Mercury	7470A	1
Thallium	7841	1
Cyanide	9010B/9014	1

1) Test Methods for Evaluating Solid Wastes, SW-846 Third Edition, Final Update III, December 1996.

QUALITY CONTROL

The quality control for this program includes internal standards, surrogates, matrix spike (MS), matrix spike duplicate (MSD), laboratory duplicate (D), equipment blank, laboratory control sample (LCS), prep blank and QC trip blank samples. QA/QC results are summarized in the Sample Data Summary Package and are also included in the raw data.

Volatile Organics

The GC/MS Volatile instruments used a J&W DB-VRX, 60 m x 0.25 mm ID capillary column and a Vocarb 3000 trap.

Holding Times and Sample Preservation

All samples were prepared and analyzed within the method and/or QAPP specified holding time requirements. Samples had a pH of less than 2.

Laboratory Control Sample

The following compounds did not meet laboratory control sample recovery criteria:

LCS No.	Compound	Corrective Action
L082099W1	Chloromethane	1
L082499W1	Several	2

1. The percent recovery failed marginally. This compound was not detected in the associated samples. The LCS was setup for reanalysis but results were not obtained due to a blown instrument filament. The amount of sulfur in the samples may have contributed to the instrument failure. No further corrective action was taken.

2. The failed recoveries are attributed either to a spiking error or the sample may have not been sufficiently mixed prior to analysis. The associated samples were QC samples, QCTB [M9549], QCTB [M9704] and the MS/MSD of M9543. Due to matrix problems and the limited amount of sample available, no further corrective action was taken.

MS/MSD
The following compounds did not meet matrix spike/matrix spike duplicate percent recovery and/or RPD criteria:

Sample Description	Sample #	Compound	% REC	RPD	Corrective Action
URS-14D	M9543	Several	X	X	1

1. The failed recoveries and RPDs are attributed either to a spiking error or the sample may have not been sufficiently mixed prior to analysis. Sulfur interference may have also affected the samples. There were no compounds detected in the sample above the PQL. No further corrective action was taken.

Surrogate
The following sample did not meet surrogate recovery criteria:

Sample Description	Sample #	Surrogate	Corrective Action
88-12C	M9541	Toluene-d8	1

1. The sample was reanalyzed to confirm surrogate recovery. Both sets of data are included. No further corrective action was taken.

Internal Standards
All internal standard areas met method and/or project specific QC criteria.

Calibrations
The following initial calibration compounds exceeded method percent RSD and/or average RRF criteria:

Calibration Date	Instrument	Compound	RSD	RRF	Corrective Action
08/17/99	MS#3	Bromoform		X	1
08/23/99	MS#3	Several	X		2
08/24/99	MS#3	Bromomethane		X	1

1. The poor response for this compound is attributed to the ambient purge with a 25mL purge volume required by the QAPP. No corrective action taken.

2. The system was recalibrated on 08/24/99. Since there were no remaining unopened vials for QC trip blank [M9704], the 08/23/99 analysis was quantitated against the 08/24/99 calibration. Other samples were reanalyzed.

The following continuing calibration compounds exceeded method percent drift and/or RRF criteria:

Calibration Date	Instrument	Compound	%D	RRF	Corrective Action
08/20/99	MS#3	Bromoform		X	1
		Bromomethane	X		2
08/24/99	MS#3	Bromomethane		X	1

1. The poor response for this compound is attributed to the ambient purge with a 25mL purge volume required by the QAPP. No corrective action taken.

2. The system gained sensitivity for this compound. This compound was not detected in the associated samples. No corrective action was taken.

For calibration check standard compounds that had a linear regression performed, a percent drift was calculated between the true value of the calibration check standard and the calculated value. For compounds using an average response factor, the percent difference between the average response factor and the daily response factor was calculated. Summary sheets for both calculations are included in the raw data section.

Miscellaneous

The following compound was detected in the following equipment/trip/preparation blanks:

Sample Description	Sample #	Compound	Concentration	Corrective Action
QC Trip Blank	M9549	Carbon disulfide	1 ug/L	1
Equipment Blank	M9703	Carbon disulfide	0.78 ug/L	1
QC Trip Blank	M9704	Carbon disulfide	0.82 ug/L	1
Preparation Blank	PB082499W1	Carbon disulfide	0.65 ug/L	1

1. The high value is attributed to the analysis of high sulfur content samples associated with this project. No corrective action was taken.

The carbon disulfide detected in the samples may be a result of the high sulfur content in the samples and the volatile organic acid preservation.

Trace Metals

Holding Times

All samples were prepared and analyzed within the method and/or QAPP specified holding time requirements.

Laboratory Control Sample

All spike recoveries met method and/or project specific QC criteria.

D/MS/MSD

The following analytes did not meet matrix spike/matrix spike duplicate percent recovery and/or duplicate RPD criteria:

Sample Description	Sample #	Analyte	% REC	RPD	Corrective Action
URS-14D	M9552	Antimony	X		1
		Calcium	X		2
		Magnesium	X		2
		Selenium	X		1
		Silver	X		1
		Sodium	X		2

1. The failing matrix spike is likely due to matrix interference. A post-digestion spike was performed. No further corrective action was taken.

2. The concentration of the analyte in the sample was much greater than the concentration of the spike added. A post-digestion spike was performed. No further corrective action was taken.

ICP Serial Dilution

The following analyte did not meet ICP serial dilution recovery criteria:

Sample Description	Sample #	Analyte	Corrective Action
URS-14D	M9552	Sodium	1

1. Suspect matrix interference. No corrective action was required.

Calibrations

All calibrations and calibration verifications met method and/or project specific QC criteria.

Preparation Blanks

All preparation blanks met method and/or project specific QC criteria.

Wet Chemistry

There were no excursions to note. All QC results were within established control limits.

RAW DATA

The raw data is organized in a format similar to the US EPA Contract Laboratory Program order of data requirements.

CROSS REFERENCE TABLE

Site	Sample Number	Date Collected	Date Received	Package
88-12C	M9541	08/11/99	08/13/99	2892
88-12D	M9542	08/11/99	08/13/99	2892
URS-14D	M9543	08/12/99	08/13/99	2892
URS-14D	M9543MS	08/12/99	08/13/99	2892
URS-14D	M9543MSD	08/12/99	08/13/99	2892
URS-14D	M9543D	08/12/99	08/13/99	2892
URS-9D	M9544	08/12/99	08/13/99	2892
URS-9I	M9545	08/12/99	08/13/99	2892
85-7R	M9546	08/12/99	08/13/99	2892
URS-7D	M9547	08/12/99	08/13/99	2892
X-1	M9548	08/12/99	08/13/99	2892
QC Trip Blank	M9549	08/11/99	08/13/99	2892
88-12C (Field Filtered)	M9550	08/11/99	08/13/99	2892
88-12D (Field Filtered)	M9551	08/11/99	08/13/99	2892
URS-14D (Field Filtered)	M9552	08/12/99	08/13/99	2892
URS-14D (Field Filtered)	M9552MS	08/12/99	08/13/99	2892
URS-14D (Field Filtered)	M9552D	08/12/99	08/13/99	2892
URS-9D (Field Filtered)	M9553	08/12/99	08/13/99	2892
URS-9I (Field Filtered)	M9554	08/12/99	08/13/99	2892
85-7R (Field Filtered)	M9555	08/12/99	08/13/99	2892
URS-7D (Field Filtered)	M9556	08/12/99	08/13/99	2892
X-1 (Field Filtered)	M9557	08/12/99	08/13/99	2892
85-5R	M9700	08/13/99	08/14/99	2911
URS-5D	M9701	08/13/99	08/14/99	2911
URS-14I	M9702	08/13/99	08/14/99	2911
Equipment Blank	M9703	08/13/99	08/14/99	2911
QC Trip Blank	M9704	08/13/99	08/14/99	2911

CROSS REFERENCE TABLE

Site	Sample Number	Date Collected	Date Received	Package
85-5R (Field Filtered)	M9705	08/13/99	08/14/99	2911
URS-5D (Field Filtered)	M9706	08/13/99	08/14/99	2911
URS-14I (Field Filtered)	M9707	08/13/99	08/14/99	2911
Equipment Blank (Field Filtered)	M9708	08/13/99	08/14/99	2911

Analytical Results

O'Brien & Gere Laboratories,Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9541
Samp. Description: 88-12C
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/11/99
Received: 08/13/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chloromethane	<1.0		1	08/20/99	
Vinyl chloride	<1.0		1	08/20/99	
Bromomethane	<1.0		1	08/20/99	
Chloroethane	<1.0		1	08/20/99	
Acetone	<10.		1	08/20/99	
1,1-Dichloroethene	<.50		1	08/20/99	
Methylene chloride	<.50		1	08/20/99	
Carbon disulfide	~~.14~~ J < 0.50		1	08/20/99	
trans-1,2-Dichloroethene	<.50		1	08/20/99	
1,1-Dichloroethane	<.50		1	08/20/99	
2-Butanone	<10.		1	08/20/99	
cis-1,2-Dichloroethene	<.50		1	08/20/99	
Bromochloromethane	<.50		1	08/20/99	
Chloroform	<.50		1	08/20/99	
1,2-Dichloroethane	<.50		1	08/20/99	
1,1,1-Trichloroethane	<.50		1	08/20/99	
Carbon tetrachloride	<.50		1	08/20/99	
Benzene	<.50		1	08/20/99	
1,2-Dichloropropane	<.50		1	08/20/99	
Trichloroethene	<.50		1	08/20/99	
Bromodichloromethane	<.50		1	08/20/99	
cis-1,3-Dichloropropene	<.50		1	08/20/99	
4-Methyl-2-pentanone	<5.0		1	08/20/99	
trans-1,3-Dichloropropene	<.50		1	08/20/99	
1,1,2-Trichloroethane	<.50		1	08/20/99	
Toluene	<.50		1	08/20/99	
Dibromochloromethane	<.50		1	08/20/99	
2-Hexanone	<5.0		1	08/20/99	
Tetrachloroethene	<.50		1	08/20/99	

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27,1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9541
Samp. Description: 88-12C
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/11/99
Received: 08/13/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chlorobenzene	<.50		1	08/20/99	
Ethylbenzene	<.50		1	08/20/99	
Bromoform	<.50		1	08/20/99	
Xylene (total)	<.50		1	08/20/99	
Styrene	<.50		1	08/20/99	
1,1,2,2-Tetrachloroethane	<.50		1	08/20/99	
Dibromofluoromethane (surrogate)	93.%	61-136	1	08/20/99	
1,2-Dichloroethane-d4 (surrogate)	89.%	80-135	1	08/20/99	
Toluene-d8 (surrogate)	77.%	# 84-114	1	08/20/99	
Bromofluorobenzene (surrogate)	90.%	77-117	1	08/20/99	

Notes:

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

Tentatively Identified Compound (LSC) summary

Operator ID: MSV Date Acquired: 20 Aug 1999 9:09
Data File: C:\HPCHEM\1\DATA\J5383.D
Name: M9541
Misc: V4587
Method: C:\HPCHEM\1\METHODS\J817TCLW.M (RTE Integrator)
Title: VOC's w/J & W DB-VRX: 0.25 mm x 60 m
Library Searched: C:\DATABASE\NBS75K.L

TIC Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc

J5383.D J817TCLW.M Mon Aug 30 08:51:30 1999

None detected

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9541RE
Samp. Description: 88-12C
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/11/99
Received: 08/13/99
Prepared: 08/24/99

Matrix: Water
QC Batch: 082499W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chloromethane	<1.0		1	08/24/99	
Vinyl chloride	<1.0		1	08/24/99	
Bromomethane	<1.0		1	08/24/99	
Chloroethane	<1.0		1	08/24/99	
Acetone	<10.		1	08/24/99	
1,1-Dichloroethene	<.50		1	08/24/99	
Methylene chloride	~~J .28~~ <0.50		1	08/24/99	
Carbon disulfide	< .70		1	08/24/99	
trans-1,2-Dichloroethene	<.50		1	08/24/99	
1,1-Dichloroethane	<.50		1	08/24/99	
2-Butanone	~~J 1.0~~ <10		1	08/24/99	
cis-1,2-Dichloroethene	<.50		1	08/24/99	
Bromochloromethane	<.50		1	08/24/99	
Chloroform	<.50		1	08/24/99	
1,2-Dichloroethane	<.50		1	08/24/99	
1,1,1-Trichloroethane	<.50		1	08/24/99	
Carbon tetrachloride	<.50		1	08/24/99	
Benzene	<.50		1	08/24/99	
1,2-Dichloropropane	<.50		1	08/24/99	
Trichloroethene	<.50		1	08/24/99	
Bromodichloromethane	<.50		1	08/24/99	
cis-1,3-Dichloropropene	<.50		1	08/24/99	
4-Methyl-2-pentanone	<5.0		1	08/24/99	
trans-1,3-Dichloropropene	<.50		1	08/24/99	
1,1,2-Trichloroethane	<.50		1	08/24/99	
Toluene	<.50		1	08/24/99	
Dibromochloromethane	<.50		1	08/24/99	
2-Hexanone	<5.0		1	08/24/99	
Tetrachloroethene	<.50		1	08/24/99	

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27,1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories,Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9541RE
Samp. Description: 88-12C
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/11/99
Received: 08/13/99
Prepared: 08/24/99

Matrix: Water
QC Batch: 082499W1
%Solids:
Sample Size: 25 mL

Parameter	Result		Surrog Limits	Dilution	Analyzed	Notes
Chlorobenzene	<.50			1	08/24/99	
Ethylbenzene	<.50			1	08/24/99	
Bromoform	<.50			1	08/24/99	
Xylene (total)	<.50			1	08/24/99	
Styrene	<.50			1	08/24/99	
1,1,2,2-Tetrachloroethane	<.50			1	08/24/99	
Dibromofluoromethane (surrogate)	102.%		61-136	1	08/24/99	
1,2-Dichloroethane-d4 (surrogate)	98.%		80-135	1	08/24/99	
Toluene-d8 (surrogate)	73.%	#	84-114	1	08/24/99	
Bromofluorobenzene (surrogate)	87.%		77-117	1	08/24/99	

Notes:

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27,1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

Tentatively Identified Compound (LSC) summary

Operator ID: MSV Date Acquired: 24 Aug 1999 22:41
Data File: C:\HPCHEM\1\DATA\J5432.D
Name: M9541RE
Misc:
Method: C:\HPCHEM\1\METHODS\J824TCLW.M (RTE Integrator)
Title: VOC's w/J & W DB-VRX: 0.25 mm x 60 m
Library Searched: C:\DATABASE\NBS75K.L

TIC Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc
ulfur dioxide	5.49	1.9	ug/L	860457	ISTD01	14.36	4616800	10.0

J5432.D J824TCLW.M Mon Aug 30 09:15:18 1999

O'Brien & Gere Laboratories,Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9542
Samp. Description: 88-12D
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/11/99
Received: 08/13/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chloromethane	J <1.0		1	08/20/99	
Vinyl chloride	<1.0		1	08/20/99	
Bromomethane	<1.0		1	08/20/99	
Chloroethane	<1.0		1	08/20/99	
Acetone	<10.		1	08/20/99	
1,1-Dichloroethene	<.50		1	08/20/99	
Methylene chloride	<.50		1	08/20/99	
Carbon disulfide	< .68		1	08/20/99	
trans-1,2-Dichloroethene	<.50		1	08/20/99	
1,1-Dichloroethane	<.50		1	08/20/99	
2-Butanone	<10.		1	08/20/99	
cis-1,2-Dichloroethene	<.50		1	08/20/99	
Bromochloromethane	<.50		1	08/20/99	
Chloroform	<.50		1	08/20/99	
1,2-Dichloroethane	<.50		1	08/20/99	
1,1,1-Trichloroethane	<.50		1	08/20/99	
Carbon tetrachloride	9-27-99 <.50		1	08/20/99	
Benzene	~~<0.50 J .16~~	J 0.16	1	08/20/99	
1,2-Dichloropropane	J <.50		1	08/20/99	
Trichloroethene	<.50		1	08/20/99	
Bromodichloromethane	<.50		1	08/20/99	
cis-1,3-Dichloropropene	<.50		1	08/20/99	
4-Methyl-2-pentanone	<5.0		1	08/20/99	
trans-1,3-Dichloropropene	<.50		1	08/20/99	
1,1,2-Trichloroethane	<.50		1	08/20/99	
Toluene	<.50		1	08/20/99	
Dibromochloromethane	<.50		1	08/20/99	
2-Hexanone	<5.0		1	08/20/99	
Tetrachloroethene	<.50		1	08/20/99	

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27,1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9542
Samp. Description: 88-12D
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/11/99
Received: 08/13/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Sample Size: 25 mL

Parameter		Result	Surrog Limits	Dilution	Analyzed	Notes
Chlorobenzene	J	<.50		1	08/20/99	
Ethylbenzene		<.50		1	08/20/99	
Bromoform		<.50		1	08/20/99	
Xylene (total)		<.50		1	08/20/99	
Styrene		<.50		1	08/20/99	
1,1,2,2-Tetrachloroethane		<.50		1	08/20/99	
Dibromofluoromethane (surrogate)		100.%	61-136	1	08/20/99	
1,2-Dichloroethane-d4 (surrogate)		95.%	80-135	1	08/20/99	
Toluene-d8 (surrogate)		94.%	84-114	1	08/20/99	
Bromofluorobenzene (surrogate)		98.%	77-117	1	08/20/99	

Notes:

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

Tentatively Identified Compound (LSC) summary

Operator ID: MSV Date Acquired: 20 Aug 1999 9:46
Data File: C:\HPCHEM\1\DATA\J5384.D
Name: M9542
Misc: V4587
Method: C:\HPCHEM\1\METHODS\J817TCLW.M (RTE Integrator)
Title: VOC's w/J & W DB-VRX: 0.25 mm x 60 m
Library Searched: C:\DATABASE\NBS75K.L

TIC Top Hit name	RT		EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc
Sulfur dioxide	5.52	1	J 3.3	ug/L	J 343676	ISTD01	14.37	1029140	10.0
Isobutane	5.99	2	1.7	ug/L	178644	ISTD01	14.37	1029140	10.0
Butane	6.47	3	1.8	ug/L	188751	ISTD01	14.37	1029140	10.0
Benzeneacetic acid,	6.72	4	1.4	ug/L	138936	ISTD01	14.37	1029140	10.0

J5384.D J817TCLW.M Mon Aug 30 08:51:43 1999

1 unknown
2
3
4

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9543
Samp. Description: URS-14D
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/12/99
Received: 08/13/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chloromethane	<1.0		1	08/20/99	
Vinyl chloride	<1.0		1	08/20/99	
Bromomethane	J <1.0		1	08/20/99	
Chloroethane	<1.0		1	08/20/99	
Acetone	J <10.		1	08/20/99	
1,1-Dichloroethene	<.50		1	08/20/99	
Methylene chloride	<0.50 ~~J .17~~		1	08/20/99	
Carbon disulfide	< 0.50 ~~J .43~~		1	08/20/99	
trans-1,2-Dichloroethene	<.50		1	08/20/99	
1,1-Dichloroethane	<.50		1	08/20/99	
2-Butanone	J <10.		1	08/20/99	
cis-1,2-Dichloroethene	<.50		1	08/20/99	
Bromochloromethane	<.50		1	08/20/99	
Chloroform	<.50		1	08/20/99	
1,2-Dichloroethane	<.50		1	08/20/99	
1,1,1-Trichloroethane	<.50		1	08/20/99	
Carbon tetrachloride	<.50		1	08/20/99	
Benzene	<.50		1	08/20/99	
1,2-Dichloropropane	<.50		1	08/20/99	
Trichloroethene	<.50		1	08/20/99	
Bromodichloromethane	<.50		1	08/20/99	
cis-1,3-Dichloropropene	<.50		1	08/20/99	
4-Methyl-2-pentanone	<5.0		1	08/20/99	
trans-1,3-Dichloropropene	J <.50		1	08/20/99	
1,1,2-Trichloroethane	<.50		1	08/20/99	
Toluene	<.50		1	08/20/99	
Dibromochloromethane	<.50		1	08/20/99	
2-Hexanone	J <5.0		1	08/20/99	
Tetrachloroethene	<.50		1	08/20/99	

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9543
Samp. Description: URS-14D
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/12/99
Received: 08/13/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chlorobenzene	<.50		1	08/20/99	
Ethylbenzene	<.50		1	08/20/99	
Bromoform	<.50		1	08/20/99	
Xylene (total)	<.50		1	08/20/99	
Styrene	~~<.50~~ <10		1	08/20/99	
1,1,2,2-Tetrachloroethane	<.50		1	08/20/99	
Dibromofluoromethane (surrogate)	100.%	61-136	1	08/20/99	
1,2-Dichloroethane-d4 (surrogate)	96.%	80-135	1	08/20/99	
Toluene-d8 (surrogate)	95.%	84-114	1	08/20/99	
Bromofluorobenzene (surrogate)	95.%	77-117	1	08/20/99	

Notes:

' - Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

Tentatively Identified Compound (LSC) summary

Operator ID: MSV Date Acquired: 20 Aug 1999 10:23
Data File: C:\HPCHEM\1\DATA\J5385.D
Name: M9543
Misc: V4587
Method: C:\HPCHEM\1\METHODS\J817TCLW.M (RTE Integrator)
Title: VOC's w/J & W DB-VRX: 0.25 mm x 60 m
Library Searched: C:\DATABASE\NBS75K.L

TIC Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc
Sulfur dioxide	5.51	J	13.8	ug/L	1548370	ISTD01	14.37	1119190	10.0

J5385.D J817TCLW.M Mon Aug 30 08:51:50 1999

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9544
Samp. Description: URS-9D
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/12/99
Received: 08/13/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chloromethane	<1.0		1	08/20/99	
Vinyl chloride	<1.0		1	08/20/99	
Bromomethane	J <1.0		1	08/20/99	
Chloroethane	<1.0		1	08/20/99	
Acetone	J <10.		1	08/20/99	
1,1-Dichloroethene	<.50		1	08/20/99	
Methylene chloride	<0.50 ~~J .13~~		1	08/20/99	
Carbon disulfide	<0.50 ~~J .21~~		1	08/20/99	
trans-1,2-Dichloroethene	<.50		1	08/20/99	
1,1-Dichloroethane	J .15		1	08/20/99	
2-Butanone	J <10.		1	08/20/99	
cis-1,2-Dichloroethene	J .29		1	08/20/99	
Bromochloromethane	<.50		1	08/20/99	
Chloroform	<.50		1	08/20/99	
1,2-Dichloroethane	<.50		1	08/20/99	
1,1,1-Trichloroethane	<.50		1	08/20/99	
Carbon tetrachloride	<.50		1	08/20/99	
Benzene	<.50		1	08/20/99	
1,2-Dichloropropane	<.50		1	08/20/99	
Trichloroethene	J .14		1	08/20/99	
Bromodichloromethane	<.50		1	08/20/99	
cis-1,3-Dichloropropene	<.50		1	08/20/99	
4-Methyl-2-pentanone	J <5.0		1	08/20/99	
trans-1,3-Dichloropropene	<.50		1	08/20/99	
1,1,2-Trichloroethane	<.50		1	08/20/99	
Toluene	<.50		1	08/20/99	
Dibromochloromethane	<.50		1	08/20/99	
2-Hexanone	J <5.0		1	08/20/99	
Tetrachloroethene	<.50		1	08/20/99	

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27,1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories,Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9544
Samp. Description: URS-9D
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/12/99
Received: 08/13/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chlorobenzene	<.50		1	08/20/99	
Ethylbenzene	<.50		1	08/20/99	
Bromoform	<.50		1	08/20/99	
Xylene (total)	<.50		1	08/20/99	
Styrene	<.50		1	08/20/99	
1,1,2,2-Tetrachloroethane	<.50		1	08/20/99	
Dibromofluoromethane (surrogate)	99.%	61-136	1	08/20/99	
1,2-Dichloroethane-d4 (surrogate)	98.%	80-135	1	08/20/99	
Toluene-d8 (surrogate)	98.%	84-114	1	08/20/99	
Bromofluorobenzene (surrogate)	90.%	77-117	1	08/20/99	

Notes:

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27,1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

Tentatively Identified Compound (LSC) summary

)perator ID: MSV Date Acquired: 20 Aug 1999 11:00
)ata File: C:\HPCHEM\1\DATA\J5386.D
ame: M9544
isc:
lethod: C:\HPCHEM\1\METHODS\J817TCLW.M (RTE Integrator)
itle: VOC's w/J & W DB-VRX: 0.25 mm x 60 m
ibrary Searched: C:\DATABASE\NBS75K.L

TIC Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc
ılfur dioxide	5.49	13.7	ug/L	2348010	ISTD01	14.37	1709490	10.0

J5386.D J817TCLW.M Mon Aug 30 08:51:58 1999

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9545
Samp. Description: URS-9I
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/12/99
Received: 08/13/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Sample Size: 25 mL

Parameter		Result	Surrog Limits	Dilution	Analyzed	Notes
Chloromethane	J	<1.0		1	08/20/99	
Vinyl chloride		<1.0		1	08/20/99	
Bromomethane		<1.0		1	08/20/99	
Chloroethane		<1.0		1	08/20/99	
Acetone		<10.		1	08/20/99	
1,1-Dichloroethene		<.50		1	08/20/99	
Methylene chloride		< .55		1	08/20/99	
Carbon disulfide		< 6.3		1	08/20/99	
trans-1,2-Dichloroethene		<.50		1	08/20/99	
1,1-Dichloroethane		<.50		1	08/20/99	
2-Butanone		<10.		1	08/20/99	
cis-1,2-Dichloroethene		<.50		1	08/20/99	
Bromochloromethane		<.50		1	08/20/99	
Chloroform		<.50		1	08/20/99	
1,2-Dichloroethane		<.50		1	08/20/99	
1,1,1-Trichloroethane		<.50		1	08/20/99	
Carbon tetrachloride		<.50		1	08/20/99	
Benzene		<.50		1	08/20/99	
1,2-Dichloropropane		<.50		1	08/20/99	
Trichloroethene		<.50		1	08/20/99	
Bromodichloromethane		<.50		1	08/20/99	
cis-1,3-Dichloropropene		<.50		1	08/20/99	
4-Methyl-2-pentanone		<5.0		1	08/20/99	
trans-1,3-Dichloropropene		<.50		1	08/20/99	
1,1,2-Trichloroethane		<.50		1	08/20/99	
Toluene		J .16		1	08/20/99	
Dibromochloromethane		<.50		1	08/20/99	
2-Hexanone		<5.0		1	08/20/99	
Tetrachloroethene		<.50		1	08/20/99	

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9545
Samp. Description: URS-9I
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/12/99
Received: 08/13/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Sample Size: 25 mL

Parameter		Result	Surrog Limits	Dilution	Analyzed	Notes
Chlorobenzene	J	<.50		1	08/20/99	
Ethylbenzene		<.50		1	08/20/99	
Bromoform		<.50		1	08/20/99	
Xylene (total)		<.50		1	08/20/99	
Styrene		<.50		1	08/20/99	
1,1,2,2-Tetrachloroethane		<.50		1	08/20/99	
Dibromofluoromethane (surrogate)		103.%	61-136	1	08/20/99	
1,2-Dichloroethane-d4 (surrogate)		100.%	80-135	1	08/20/99	
Toluene-d8 (surrogate)		87.%	84-114	1	08/20/99	
Bromofluorobenzene (surrogate)		92.%	77-117	1	08/20/99	

Notes:

' - Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

Tentatively Identified Compound (LSC) summary

Operator ID: MSV Date Acquired: 20 Aug 1999 11:37
Data File: C:\HPCHEM\1\DATA\J5387.D
Name: M9545
Misc:
Method: C:\HPCHEM\1\METHODS\J817TCLW.M (RTE Integrator)
Title: VOC's w/J & W DB-VRX: 0.25 mm x 60 m
Library Searched: C:\DATABASE\NBS75K.L

TIC Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc
Sulfur dioxide	5.49 /	26.3	ug/L	1797180	ISTD01	14.37	682976	10.0

J5387.D J817TCLW.M Mon Aug 30 08:52:04 1999

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9546
Samp. Description: 85-7R
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/12/99
Received: 08/13/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chloromethane	<1.0		1	08/20/99	
Vinyl chloride	<1.0		1	08/20/99	
Bromomethane	<1.0		1	08/20/99	
Chloroethane	<1.0		1	08/20/99	
Acetone	<10.		1	08/20/99	
1,1-Dichloroethene	<.50		1	08/20/99	
Methylene chloride	<0.50 ~~J .27~~		1	08/20/99	
Carbon disulfide	< .64		1	08/20/99	
trans-1,2-Dichloroethene	<.50		1	08/20/99	
1,1-Dichloroethane	<.50		1	08/20/99	
2-Butanone	<10.		1	08/20/99	
cis-1,2-Dichloroethene	J .40		1	08/20/99	
Bromochloromethane	<.50		1	08/20/99	
Chloroform	<.50		1	08/20/99	
1,2-Dichloroethane	<.50		1	08/20/99	
1,1,1-Trichloroethane	<.50		1	08/20/99	
Carbon tetrachloride	<.50		1	08/20/99	
Benzene	<.50		1	08/20/99	
1,2-Dichloropropane	<.50		1	08/20/99	
Trichloroethene	<.50		1	08/20/99	
Bromodichloromethane	<.50		1	08/20/99	
cis-1,3-Dichloropropene	<.50		1	08/20/99	
4-Methyl-2-pentanone	<5.0		1	08/20/99	
trans-1,3-Dichloropropene	<.50		1	08/20/99	
1,1,2-Trichloroethane	<.50		1	08/20/99	
Toluene	<.50		1	08/20/99	
Dibromochloromethane	<.50		1	08/20/99	
2-Hexanone	<5.0		1	08/20/99	
Tetrachloroethene	<.50		1	08/20/99	

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9546
Samp. Description: 85-7R
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/12/99
Received: 08/13/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chlorobenzene	<.50		1	08/20/99	
Ethylbenzene	<.50		1	08/20/99	
Bromoform	<.50		1	08/20/99	
Xylene (total)	<.50		1	08/20/99	
Styrene	<.50		1	08/20/99	
1,1,2,2-Tetrachloroethane	<.50		1	08/20/99	
Dibromofluoromethane (surrogate)	105.%	61-136	1	08/20/99	
1,2-Dichloroethane-d4 (surrogate)	100.%	80-135	1	08/20/99	
Toluene-d8 (surrogate)	97.%	84-114	1	08/20/99	
Bromofluorobenzene (surrogate)	85.%	77-117	1	08/20/99	

Notes:

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

Tentatively Identified Compound (LSC) summary

Operator ID: MSV Date Acquired: 20 Aug 1999 12:15
Data File: C:\HPCHEM\1\DATA\J5388.D
Name: M9546
Misc:
Method: C:\HPCHEM\1\METHODS\J817TCLW.M (RTE Integrator)
Title: VOC's w/J & W DB-VRX: 0.25 mm x 60 m
Library Searched: C:\DATABASE\NBS75K.L

TIC Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc
Sulfur dioxide	5.49	22.3	ug/L	1706290	ISTD01	14.37	764830	10.0

J5388.D J817TCLW.M Mon Aug 30 08:52:11 1999

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9547
Samp. Description: URS-7D
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/12/99
Received: 08/13/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chloromethane	<1.0		1	08/20/99	
Vinyl chloride	<1.0		1	08/20/99	
Bromomethane	<1.0		1	08/20/99	
Chloroethane	<1.0		1	08/20/99	
Acetone	~~J 7.3~~		1	08/20/99	
1,1-Dichloroethene	<.50		1	08/20/99	
Methylene chloride	~~J .15~~		1	08/20/99	
Carbon disulfide	3.0		1	08/20/99	
trans-1,2-Dichloroethene	<.50		1	08/20/99	
1,1-Dichloroethane	<.50		1	08/20/99	
2-Butanone	~~J 2.0~~		1	08/20/99	
cis-1,2-Dichloroethene	<.50		1	08/20/99	
Bromochloromethane	<.50		1	08/20/99	
Chloroform	<.50		1	08/20/99	
1,2-Dichloroethane	<.50		1	08/20/99	
1,1,1-Trichloroethane	<.50		1	08/20/99	
Carbon tetrachloride	<.50		1	08/20/99	
Benzene	<.50		1	08/20/99	
1,2-Dichloropropane	<.50		1	08/20/99	
Trichloroethene	<.50		1	08/20/99	
Bromodichloromethane	<.50		1	08/20/99	
cis-1,3-Dichloropropene	<.50		1	08/20/99	
4-Methyl-2-pentanone	<5.0		1	08/20/99	
trans-1,3-Dichloropropene	<.50		1	08/20/99	
1,1,2-Trichloroethane	<.50		1	08/20/99	
Toluene	<.50		1	08/20/99	
Dibromochloromethane	<.50		1	08/20/99	
2-Hexanone	<5.0		1	08/20/99	
Tetrachloroethene	<.50		1	08/20/99	

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27, 1999

O'Brien & Gere Laboratories,Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9547
Samp. Description: URS-7D
nstrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/12/99
Received: 08/13/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chlorobenzene	<.50		1	08/20/99	
Ethylbenzene	<.50		1	08/20/99	
Bromoform	<.50		1	08/20/99	
Xylene (total)	<.50		1	08/20/99	
Styrene	<.50		1	08/20/99	
1,1,2,2-Tetrachloroethane	<.50		1	08/20/99	
Dibromofluoromethane (surrogate)	107.%	61-136	1	08/20/99	
1,2-Dichloroethane-d4 (surrogate)	105.%	80-135	1	08/20/99	
Toluene-d8 (surrogate)	102.%	84-114	1	08/20/99	
Bromofluorobenzene (surrogate)	89.%	77-117	1	08/20/99	

Notes:

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27,1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

Tentatively Identified Compound (LSC) summary

Operator ID: MSV Date Acquired: 20 Aug 1999 12:52
Data File: C:\HPCHEM\1\DATA\J5389.D
Name: M9547
Misc:
Method: C:\HPCHEM\1\METHODS\J817TCLW.M (RTE Integrator)
Title: VOC's w/J & W DB-VRX: 0.25 mm x 60 m
Library Searched: C:\DATABASE\NBS75K.L

TIC Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc
Sulfur dioxide	5.49	13.6	ug/L	1632530	ISTD01	14.38	1198730	10.0

J5389.D J817TCLW.M Mon Aug 30 08:52:18 1999

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9548
Samp. Description: X-1
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/12/99
Received: 08/13/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chloromethane	<1.0		1	08/20/99	
Vinyl chloride	<1.0		1	08/20/99	
Bromomethane	J <1.0		1	08/20/99	
Chloroethane	<1.0		1	08/20/99	
Acetone	J <10.		1	08/20/99	
1,1-Dichloroethene	<.50		1	08/20/99	
Methylene chloride	<0.50 ~~J .16~~		1	08/20/99	
Carbon disulfide	<0.50 ~~J .30~~		1	08/20/99	
trans-1,2-Dichloroethene	<.50		1	08/20/99	
1,1-Dichloroethane	J .21		1	08/20/99	
2-Butanone	J <10.		1	08/20/99	
cis-1,2-Dichloroethene	J .46		1	08/20/99	
Bromochloromethane	<.50		1	08/20/99	
Chloroform	<.50		1	08/20/99	
1,2-Dichloroethane	<.50		1	08/20/99	
1,1,1-Trichloroethane	<.50		1	08/20/99	
Carbon tetrachloride	<.50		1	08/20/99	
Benzene	<.50		1	08/20/99	
1,2-Dichloropropane	<.50		1	08/20/99	
Trichloroethene	J .20		1	08/20/99	
Bromodichloromethane	<.50		1	08/20/99	
cis-1,3-Dichloropropene	<.50		1	08/20/99	
4-Methyl-2-pentanone	<5.0		1	08/20/99	
trans-1,3-Dichloropropene	<.50		1	08/20/99	
1,1,2-Trichloroethane	<.50		1	08/20/99	
Toluene	<.50		1	08/20/99	
Dibromochloromethane	<.50		1	08/20/99	
2-Hexanone	J <5.0		1	08/20/99	
Tetrachloroethene	<.50		1	08/20/99	

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9548
Samp. Description: X-1
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/12/99
Received: 08/13/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chlorobenzene	<.50		1	08/20/99	
Ethylbenzene	<.50		1	08/20/99	
Bromoform	<.50		1	08/20/99	
Xylene (total)	<.50		1	08/20/99	
Styrene	<.50		1	08/20/99	
1,1,2,2-Tetrachloroethane	<.50		1	08/20/99	
Dibromofluoromethane (surrogate)	107.%	61-136	1	08/20/99	
1,2-Dichloroethane-d4 (surrogate)	106.%	80-135	1	08/20/99	
Toluene-d8 (surrogate)	100.%	84-114	1	08/20/99	
Bromofluorobenzene (surrogate)	85.%	77-117	1	08/20/99	

Notes:

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

Tentatively Identified Compound (LSC) summary

Operator ID: MSV Date Acquired: 20 Aug 1999 13:29
Data File: C:\HPCHEM\1\DATA\J5390.D
Name: M9548
Misc:
Method: C:\HPCHEM\1\METHODS\J817TCLW.M (RTE Integrator)
Title: VOC's w/J & W DB-VRX: 0.25 mm x 60 m
Library Searched: C:\DATABASE\NBS75K.L

TIC Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc
Sulfur dioxide	5.49	14.7	ug/L	1660560	ISTD01	14.37	1132440	10.0

J5390.D J817TCLW.M Mon Aug 30 08:52:25 1999

O'Brien & Gere Laboratories,Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9549
Samp. Description: QC Trip Blank
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/11/99
Received: 08/13/99
Prepared: 08/24/99

Matrix: Water
QC Batch: 082499W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chloromethane	<1.0		1	08/24/99	
Vinyl chloride	<1.0		1	08/24/99	
Bromomethane	<1.0		1	08/24/99	
Chloroethane	<1.0		1	08/24/99	
Acetone	J 2.7		1	08/24/99	
1,1-Dichloroethene	<.50		1	08/24/99	
Methylene chloride	J .22		1	08/24/99	
Carbon disulfide	1.0		1	08/24/99	
trans-1,2-Dichloroethene	<.50		1	08/24/99	
1,1-Dichloroethane	<.50		1	08/24/99	
2-Butanone	J 1.1		1	08/24/99	
cis-1,2-Dichloroethene	<.50		1	08/24/99	
Bromochloromethane	<.50		1	08/24/99	
Chloroform	<.50		1	08/24/99	
1,2-Dichloroethane	<.50		1	08/24/99	
1,1,1-Trichloroethane	<.50		1	08/24/99	
Carbon tetrachloride	<.50		1	08/24/99	
Benzene	<.50		1	08/24/99	
1,2-Dichloropropane	<.50		1	08/24/99	
Trichloroethene	<.50		1	08/24/99	
Bromodichloromethane	<.50		1	08/24/99	
cis-1,3-Dichloropropene	<.50		1	08/24/99	
4-Methyl-2-pentanone	<5.0		1	08/24/99	
trans-1,3-Dichloropropene	<.50		1	08/24/99	
1,1,2-Trichloroethane	<.50		1	08/24/99	
Toluene	<.50		1	08/24/99	
Dibromochloromethane	<.50		1	08/24/99	
2-Hexanone	<5.0		1	08/24/99	
Tetrachloroethene	<.50		1	08/24/99	

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27,1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9549
Samp. Description: QC Trip Blank
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/11/99
Received: 08/13/99
Prepared: 08/24/99

Matrix: Water
QC Batch: 082499W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chlorobenzene	<.50		1	08/24/99	
Ethylbenzene	<.50		1	08/24/99	
Bromoform	<.50		1	08/24/99	
Xylene (total)	<.50		1	08/24/99	
Styrene	<.50		1	08/24/99	
1,1,2,2-Tetrachloroethane	<.50		1	08/24/99	
Dibromofluoromethane (surrogate)	99.%	61-136	1	08/24/99	
1,2-Dichloroethane-d4 (surrogate)	95.%	80-135	1	08/24/99	
Toluene-d8 (surrogate)	103.%	84-114	1	08/24/99	
Bromofluorobenzene (surrogate)	94.%	77-117	1	08/24/99	

Notes:

≠ - Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27,1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

Tentatively Identified Compound (LSC) summary

)perator ID: MSV Date Acquired: 24 Aug 1999 21:27
)ata File: C:\HPCHEM\1\DATA\J5430.D
ame: M9549
isc:
1ethod: C:\HPCHEM\1\METHODS\J824TCLW.M (RTE Integrator)
itle: VOC's w/J & W DB-VRX: 0.25 mm x 60 m
ibrary Searched: C:\DATABASE\NBS75K.L

TIC Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc
ulfur dioxide	5.49	2.3	ug/L	1071620	ISTD01	14.37	4749490	10.0

J5430.D J824TCLW.M Mon Aug 30 09:15:03 1999

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9700
Samp. Description: 85-5R
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/13/99
Received: 08/14/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chloromethane	<1.0		1	08/20/99	
Vinyl chloride	<1.0		1	08/20/99	
Bromomethane	J <1.0		1	08/20/99	
Chloroethane	<1.0		1	08/20/99	
Acetone	J <10 ~~J 5.1~~		1	08/20/99	
1,1-Dichloroethene	<.50		1	08/20/99	
Methylene chloride	<0.50 ~~J .21~~		1	08/20/99	
Carbon disulfide	< .83		1	08/20/99	
trans-1,2-Dichloroethene	<.50		1	08/20/99	
1,1-Dichloroethane	<.50		1	08/20/99	
2-Butanone	J <10.		1	08/20/99	
cis-1,2-Dichloroethene	J .17		1	08/20/99	
Bromochloromethane	<.50		1	08/20/99	
Chloroform	<.50		1	08/20/99	
1,2-Dichloroethane	<.50		1	08/20/99	
1,1,1-Trichloroethane	<.50		1	08/20/99	
Carbon tetrachloride	<.50		1	08/20/99	
Benzene	J .10		1	08/20/99	
1,2-Dichloropropane	<.50		1	08/20/99	
Trichloroethene	<.50		1	08/20/99	
Bromodichloromethane	<.50		1	08/20/99	
cis-1,3-Dichloropropene	<.50		1	08/20/99	
4-Methyl-2-pentanone	<5.0		1	08/20/99	
trans-1,3-Dichloropropene	<.50		1	08/20/99	
1,1,2-Trichloroethane	<.50		1	08/20/99	
Toluene	<.50		1	08/20/99	
Dibromochloromethane	<.50		1	08/20/99	
2-Hexanone	J <5.0		1	08/20/99	
Tetrachloroethene	<.50		1	08/20/99	

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories,Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9700
Samp. Description: 85-5R
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/13/99
Received: 08/14/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chlorobenzene	<.50		1	08/20/99	
Ethylbenzene	<.50		1	08/20/99	
Bromoform	<.50		1	08/20/99	
Xylene (total)	<.50		1	08/20/99	
Styrene	<.50		1	08/20/99	
1,1,2,2-Tetrachloroethane	<.50		1	08/20/99	
Dibromofluoromethane (surrogate)	107.%	61-136	1	08/20/99	
1,2-Dichloroethane-d4 (surrogate)	103.%	80-135	1	08/20/99	
Toluene-d8 (surrogate)	100.%	84-114	1	08/20/99	
Bromofluorobenzene (surrogate)	87.%	77-117	1	08/20/99	

Notes:

* - Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27,1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

Tentatively Identified Compound (LSC) summary

Operator ID: MSV Date Acquired: 20 Aug 1999 14:06
Data File: C:\HPCHEM\1\DATA\J5391.D
Name: M9700
Misc:
Method: C:\HPCHEM\1\METHODS\J817TCLW.M (RTE Integrator)
Title: VOC's w/J & W DB-VRX: 0.25 mm x 60 m
Library Searched: C:\DATABASE\NBS75K.L

TIC Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc
Sulfur dioxide	5.49	11.0	ug/L	1452520	ISTD01	14.37	1317280	10.0

J5391.D J817TCLW.M Mon Aug 30 08:52:33 1999

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9701
Samp. Description: URS-5D
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/13/99
Received: 08/14/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chloromethane	<1.0		1	08/20/99	
Vinyl chloride	<1.0		1	08/20/99	
Bromomethane	J <1.0		1	08/20/99	
Chloroethane	<1.0		1	08/20/99	
Acetone	J <10 ~~J 6.1~~		1	08/20/99	
1,1-Dichloroethene	<.50		1	08/20/99	
Methylene chloride	<0.50 ~~J .20~~		1	08/20/99	
Carbon disulfide	< 2.1		1	08/20/99	
trans-1,2-Dichloroethene	<.50		1	08/20/99	
1,1-Dichloroethane	<.50		1	08/20/99	
2-Butanone	J <10 ~~J 1.6~~		1	08/20/99	
cis-1,2-Dichloroethene	<.50		1	08/20/99	
Bromochloromethane	<.50		1	08/20/99	
Chloroform	<.50		1	08/20/99	
1,2-Dichloroethane	<.50		1	08/20/99	
1,1,1-Trichloroethane	<.50		1	08/20/99	
Carbon tetrachloride	<.50		1	08/20/99	
Benzene	J .16		1	08/20/99	
1,2-Dichloropropane	<.50		1	08/20/99	
Trichloroethene	<.50		1	08/20/99	
Bromodichloromethane	<.50		1	08/20/99	
cis-1,3-Dichloropropene	<.50		1	08/20/99	
4-Methyl-2-pentanone	<5.0		1	08/20/99	
trans-1,3-Dichloropropene	<.50		1	08/20/99	
1,1,2-Trichloroethane	<.50		1	08/20/99	
Toluene	<.50		1	08/20/99	
Dibromochloromethane	<.50		1	08/20/99	
2-Hexanone	J <5.0		1	08/20/99	
Tetrachloroethene	<.50		1	08/20/99	

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9701
Samp. Description: URS-5D
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/13/99
Received: 08/14/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chlorobenzene	<.50		1	08/20/99	
Ethylbenzene	<.50		1	08/20/99	
Bromoform	<.50		1	08/20/99	
Xylene (total)	<.50		1	08/20/99	
Styrene	<.50		1	08/20/99	
1,1,2,2-Tetrachloroethane	<.50		1	08/20/99	
Dibromofluoromethane (surrogate)	108.%	61-136	1	08/20/99	
1,2-Dichloroethane-d4 (surrogate)	108.%	80-135	1	08/20/99	
Toluene-d8 (surrogate)	100.%	84-114	1	08/20/99	
Bromofluorobenzene (surrogate)	89.%	77-117	1	08/20/99	

Notes:

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

Tentatively Identified Compound (LSC) summary

perator ID: MSV Date Acquired: 20 Aug 1999 14:43
ata File: C:\HPCHEM\1\DATA\J5392.D
ame: M9701
isc:
ethod: C:\HPCHEM\1\METHODS\J817TCLW.M (RTE Integrator)
itle: VOC's w/J & W DB-VRX: 0.25 mm x 60 m
ibrary Searched: C:\DATABASE\NBS75K.L

TIC Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc
ulfur dioxide	5.51	/ 9.9	ug/L	1194750	ISTD01	14.39	1202470	10.0

J5392.D J817TCLW.M Mon Aug 30 08:52:40 1999

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9702
Samp. Description: URS-14I
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/13/99
Received: 08/14/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Purge volume: 25 mL

Parameter		Result	Surrog Limits	Dilution	Analyzed	Notes
Chloromethane		<1.0		1	08/20/99	
Vinyl chloride		<1.0		1	08/20/99	
Bromomethane	J	<1.0		1	08/20/99	
Chloroethane		<1.0		1	08/20/99	
Acetone	J <10	~~J 5.3~~		1	08/20/99	
1,1-Dichloroethene		<.50		1	08/20/99	
Methylene chloride	<0.50	~~J .14~~		1	08/20/99	
Carbon disulfide	<0.50	~~J .39~~		1	08/20/99	
trans-1,2-Dichloroethene		<.50		1	08/20/99	
1,1-Dichloroethane		<.50		1	08/20/99	
2-Butanone	J <10	~~J 4.1~~		1	08/20/99	
cis-1,2-Dichloroethene		<.50		1	08/20/99	
Bromochloromethane		<.50		1	08/20/99	
Chloroform		<.50		1	08/20/99	
1,2-Dichloroethane		<.50		1	08/20/99	
1,1,1-Trichloroethane		<.50		1	08/20/99	
Carbon tetrachloride		<.50		1	08/20/99	
Benzene		<.50		1	08/20/99	
1,2-Dichloropropane		<.50		1	08/20/99	
Trichloroethene		<.50		1	08/20/99	
Bromodichloromethane		<.50		1	08/20/99	
cis-1,3-Dichloropropene		<.50		1	08/20/99	
4-Methyl-2-pentanone		<5.0		1	08/20/99	
trans-1,3-Dichloropropene		<.50		1	08/20/99	
1,1,2-Trichloroethane		<.50		1	08/20/99	
Toluene		<.50		1	08/20/99	
Dibromochloromethane		<.50		1	08/20/99	
2-Hexanone	J	<5.0		1	08/20/99	
Tetrachloroethene		<.50		1	08/20/99	

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 30, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9702
Samp. Description: URS-14I
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/13/99
Received: 08/14/99
Prepared: 08/20/99

Matrix: Water
QC Batch: 082099W1
%Solids:
Purge volume: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chlorobenzene	<.50		1	08/20/99	
Ethylbenzene	<.50		1	08/20/99	
Bromoform	<.50		1	08/20/99	
Xylene (total)	<.50		1	08/20/99	
Styrene	<.50		1	08/20/99	
1,1,2,2-Tetrachloroethane	<.50		1	08/20/99	
Dibromofluoromethane (surrogate)	108.%	61-136	1	08/20/99	
1,2-Dichloroethane-d4 (surrogate)	110.%	80-135	1	08/20/99	
Toluene-d8 (surrogate)	102.%	84-114	1	08/20/99	
Bromofluorobenzene (surrogate)	86.%	77-117	1	08/20/99	

Notes:

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 30, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

Tentatively Identified Compound (LSC) summary

Operator ID: MSV Date Acquired: 20 Aug 1999 15:21
Data File: C:\HPCHEM\1\DATA\J5393.D
Name: M9702
Misc:
Method: C:\HPCHEM\1\METHODS\J817TCLW.M (RTE Integrator)
Title: VOC's w/J & W DB-VRX: 0.25 mm x 60 m
Library Searched: C:\DATABASE\NBS75K.L

TIC Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc
Sulfur dioxide	5.50	/ 8.7	ug/L	1189050	ISTD01	14.38	1369880	10.0

J5393.D J817TCLW.M Mon Aug 30 08:52:48 1999

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9703
Samp. Description: Equipment Blank
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/13/99
Received: 08/14/99
Prepared: 08/24/99

Matrix: Water
QC Batch: 082499W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chloromethane	<1.0		1	08/24/99	
Vinyl chloride	<1.0		1	08/24/99	
Bromomethane	<1.0		1	08/24/99	
Chloroethane	<1.0		1	08/24/99	
Acetone	J 2.1		1	08/24/99	
1,1-Dichloroethene	<.50		1	08/24/99	
Methylene chloride	J .11		1	08/24/99	
Carbon disulfide	.78		1	08/24/99	
trans-1,2-Dichloroethene	<.50		1	08/24/99	
1,1-Dichloroethane	<.50		1	08/24/99	
2-Butanone	J 1.0		1	08/24/99	
cis-1,2-Dichloroethene	<.50		1	08/24/99	
Bromochloromethane	<.50		1	08/24/99	
Chloroform	<.50		1	08/24/99	
1,2-Dichloroethane	<.50		1	08/24/99	
1,1,1-Trichloroethane	<.50		1	08/24/99	
Carbon tetrachloride	<.50		1	08/24/99	
Benzene	<.50		1	08/24/99	
1,2-Dichloropropane	<.50		1	08/24/99	
Trichloroethene	<.50		1	08/24/99	
Bromodichloromethane	<.50		1	08/24/99	
cis-1,3-Dichloropropene	<.50		1	08/24/99	
4-Methyl-2-pentanone	<5.0		1	08/24/99	
trans-1,3-Dichloropropene	<.50		1	08/24/99	
1,1,2-Trichloroethane	<.50		1	08/24/99	
Toluene	<.50		1	08/24/99	
Dibromochloromethane	<.50		1	08/24/99	
2-Hexanone	<5.0		1	08/24/99	
Tetrachloroethene	<.50		1	08/24/99	

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 27, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9703
Samp. Description: Equipment Blank
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/13/99
Received: 08/14/99
Prepared: 08/24/99

Matrix: Water
QC Batch: 082499W1
%Solids:
Sample Size: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chlorobenzene	<.50		1	08/24/99	
Ethylbenzene	<.50		1	08/24/99	
Bromoform	<.50		1	08/24/99	
Xylene (total)	<.50		1	08/24/99	
Styrene	<.50		1	08/24/99	
1,1,2,2-Tetrachloroethane	<.50		1	08/24/99	
Dibromofluoromethane (surrogate)	99.%	61-136	1	08/24/99	
1,2-Dichloroethane-d4 (surrogate)	94.%	80-135	1	08/24/99	
Toluene-d8 (surrogate)	103.%	84-114	1	08/24/99	
Bromofluorobenzene (surrogate)	92.%	77-117	1	08/24/99	

Notes:

- Outside control limits J-Estimated value

Authorized: _____
Date: August 27,1999 Thomas Alexander

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

Tentatively Identified Compound (LSC) summary

perator ID: MSV Date Acquired: 24 Aug 1999 22:04
)ata File: C:\HPCHEM\1\DATA\J5431.D
'ame: M9703
:isc:
Method: C:\HPCHEM\1\METHODS\J824TCLW.M (RTE Integrator)
Title: VOC's w/J & W DB-VRX: 0.25 mm x 60 m
ibrary Searched: C:\DATABASE\NBS75K.L

TIC Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc
ulfur dioxide	5.48	2.0	ug/L	995949	ISTD01	14.36	4904420	10.0

J5431.D J824TCLW.M Mon Aug 30 09:15:11 1999

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9704
Samp. Description: QC Trip Blank
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/13/99
Received: 08/14/99
Prepared: 08/23/99

Matrix: Water
QC Batch: 082499W1
%Solids:
Purge volume: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chloromethane	<1.0		1	08/23/99	
Vinyl chloride	<1.0		1	08/23/99	
Bromomethane	<1.0		1	08/23/99	
Chloroethane	<1.0		1	08/23/99	
Acetone	<10.		1	08/23/99	
1,1-Dichloroethene	<.50		1	08/23/99	
Methylene chloride	J .26		1	08/23/99	
Carbon disulfide	5 .82		1	08/23/99	
trans-1,2-Dichloroethene	<.50		1	08/23/99	
1,1-Dichloroethane	<.50		1	08/23/99	
2-Butanone	<10.		1	08/23/99	
cis-1,2-Dichloroethene	<.50		1	08/23/99	
Bromochloromethane	<.50		1	08/23/99	
Chloroform	<.50		1	08/23/99	
1,2-Dichloroethane	<.50		1	08/23/99	
1,1,1-Trichloroethane	<.50		1	08/23/99	
Carbon tetrachloride	<.50		1	08/23/99	
Benzene	<.50		1	08/23/99	
1,2-Dichloropropane	<.50		1	08/23/99	
Trichloroethene	<.50		1	08/23/99	
Bromodichloromethane	<.50		1	08/23/99	
cis-1,3-Dichloropropene	<.50		1	08/23/99	
4-Methyl-2-pentanone	<5.0		1	08/23/99	
trans-1,3-Dichloropropene	<.50		1	08/23/99	
1,1,2-Trichloroethane	<.50		1	08/23/99	
Toluene	<.50		1	08/23/99	
Dibromochloromethane	<.50		1	08/23/99	
2-Hexanone	<5.0		1	08/23/99	
Tetrachloroethene	<.50		1	08/23/99	

Edit only to carbon disulfide.
gm 9-27-99

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 30, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories, Inc.

Analytical Results Method: 8260

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9704
Samp. Description: QC Trip Blank
Instrument: HP5973 GCMS#3
Units: ug/L
Number of analytes: 39

Collected: 08/13/99
Received: 08/14/99
Prepared: 08/23/99

Matrix: Water
QC Batch: 082499W1
%Solids:
Purge volume: 25 mL

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Chlorobenzene	<.50		1	08/23/99	
Ethylbenzene	<.50		1	08/23/99	
Bromoform	<.50		1	08/23/99	
Xylene (total)	<.50		1	08/23/99	
Styrene	<.50		1	08/23/99	
1,1,2,2-Tetrachloroethane	<.50		1	08/23/99	
Dibromofluoromethane (surrogate)	103.%	61-136	1	08/23/99	
1,2-Dichloroethane-d4 (surrogate)	96.%	80-135	1	08/23/99	
Toluene-d8 (surrogate)	103.%	84-114	1	08/23/99	
Bromofluorobenzene (surrogate)	96.%	77-117	1	08/23/99	

gel 9-27-99

Notes: . Edit only to carbon disulfide gel 9-27-99

- Outside control limits J-Estimated value

Authorized: Thomas Alexander
Date: August 30, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

Tentatively Identified Compound (LSC) summary

perator ID: MSV Date Acquired: 23 Aug 1999 21:28
ata File: C:\HPCHEM\1\DATA\J5412.D
ame: M9704
isc:
ethod: C:\HPCHEM\1\METHODS\J824TCLW.M (RTE Integrator)
itle: VOC's w/J & W DB-VRX: 0.25 mm x 60 m
ibrary Searched: C:\DATABASE\NBS75K.L

TIC Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc
ulfur dioxide	5.50	2.5	ug/L	978991	ISTD01	14.37	3989840	10.0

J5412.D J824TCLW.M Mon Aug 30 10:19:37 1999

O'Brien & Gere Laboratories, Inc.

Analytical Results Trace Metals

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9550
Samp. Description: 88-12C (Field Filtered)
Units: mg/L

Collected: 08/11/99
Received: 08/13/99

Matrix: Water
%Solids:
Number of analytes: 23

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Aluminum, filtered	<.1	6010	08/19/99	08/25/99	081999W1	1	
Antimony, filtered	<.005	6010	08/19/99	08/25/99	081999W1	1	
Arsenic, filtered	J .011	6010	08/19/99	08/25/99	081999W1	1	
Barium, filtered	<.02	6010	08/19/99	08/25/99	081999W1	1	
Beryllium, filtered	<.003	6010	08/19/99	08/25/99	081999W1	1	
Cadmium, filtered	<.001	6010	08/19/99	08/25/99	081999W1	1	
Calcium, filtered	80.	6010	08/19/99	08/25/99	081999W1	1	
Chromium, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Cobalt, filtered	<.025	6010	08/19/99	08/25/99	081999W1	1	
Copper, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Iron, filtered	.10	6010	08/19/99	08/25/99	081999W1	1	
Lead, filtered	<.005	6010	08/19/99	08/25/99	081999W1	1	
Magnesium, filtered	110.	6010	08/19/99	08/25/99	081999W1	1	
Manganese, filtered	.02	6010	08/19/99	08/25/99	081999W1	1	
Mercury, filtered	<.0002	7470	08/20/99	08/20/99	082099W1	1	
Nickel, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Potassium, filtered	<5.	6010	08/19/99	08/30/99	081999W1	1	
Selenium, filtered	J <.005	6010	08/19/99	08/25/99	081999W1	1	
Silver, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Sodium, filtered	50.	6010	08/19/99	08/25/99	081999W1	1	
Thallium, filtered	<.005	7841	08/16/99	08/27/99	081699W1	1	
Vanadium, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Zinc, filtered	J .02	6010	08/19/99	08/25/99	081999W1	1	

Notes:

J-Estimated value

Authorized: Thomas Alexander
Date: September 2, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories, Inc.

Analytical Results Trace Metals

lient: Frontier Chemical
roject: Pendleton Site
roj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

ample: M9551
amp. Description: 88-12D (Field Filtered)
nits: mg/L

Collected: 08/11/99
Received: 08/13/99

Matrix: Water
%Solids:
Number of analytes: 23

Parameter		Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Aluminum, filtered		<.1	6010	08/19/99	08/25/99	081999W1	1	
Antimony, filtered		<.005	6010	08/19/99	08/25/99	081999W1	1	
Arsenic, filtered	J	<.005	6010	08/19/99	08/25/99	081999W1	1	
Barium, filtered		<.02	6010	08/19/99	08/25/99	081999W1	1	
Beryllium, filtered		<.003	6010	08/19/99	08/25/99	081999W1	1	
Cadmium, filtered		<.001	6010	08/19/99	08/25/99	081999W1	1	
Calcium, filtered		670.	6010	08/19/99	08/25/99	081999W1	1	
Chromium, filtered		<.01	6010	08/19/99	08/25/99	081999W1	1	
Cobalt, filtered		<.025	6010	08/19/99	08/25/99	081999W1	1	
Copper, filtered		<.01	6010	08/19/99	08/25/99	081999W1	1	
Iron, filtered		.09	6010	08/19/99	08/25/99	081999W1	1	
Lead, filtered		<.005	6010	08/19/99	08/25/99	081999W1	1	
Magnesium, filtered		180.	6010	08/19/99	08/25/99	081999W1	1	
Manganese, filtered		.03	6010	08/19/99	08/25/99	081999W1	1	
Mercury, filtered		<.0002	7470	08/20/99	08/20/99	082099W1	1	
Nickel, filtered		<.05	6010	08/19/99	08/25/99	081999W1	1	
Potassium, filtered		9.	6010	08/19/99	08/30/99	081999W1	1	
Selenium, filtered	J	<.005	6010	08/19/99	08/25/99	081999W1	1	
Silver, filtered		<.01	6010	08/19/99	08/25/99	081999W1	1	
Sodium, filtered		330.	6010	08/19/99	08/25/99	081999W1	1	
Thallium, filtered		<.005	7841	08/16/99	08/20/99	081699W1	1	
Vanadium, filtered		<.05	6010	08/19/99	08/25/99	081999W1	1	
Zinc, filtered	J	.01	6010	08/19/99	08/25/99	081999W1	1	

Notes:

-Estimated value

Authorized: Thomas Alexander
Date: September 2, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories, Inc.

Analytical Results Trace Metals

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9552
Samp. Description: URS-14D (Field Filtered)
Units: mg/L

Collected: 08/12/99
Received: 08/13/99

Matrix: Water
%Solids:
Number of analytes: 23

Parameter		Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Aluminum, filtered		<.1	6010	08/19/99	08/25/99	081999W1	1	
Antimony, filtered		<.005	6010	08/19/99	08/25/99	081999W1	1	
Arsenic, filtered	J	<.005	6010	08/19/99	08/25/99	081999W1	1	
Barium, filtered		.03	6010	08/19/99	08/25/99	081999W1	1	
Beryllium, filtered		<.003	6010	08/19/99	08/25/99	081999W1	1	
Cadmium, filtered		<.001	6010	08/19/99	08/25/99	081999W1	1	
Calcium, filtered		360.	6010	08/19/99	08/25/99	081999W1	1	
Chromium, filtered		<.01	6010	08/19/99	08/25/99	081999W1	1	
Cobalt, filtered		<.025	6010	08/19/99	08/25/99	081999W1	1	
Copper, filtered		<.01	6010	08/19/99	08/25/99	081999W1	1	
Iron, filtered		<.05	6010	08/19/99	08/25/99	081999W1	1	
Lead, filtered		<.005	6010	08/19/99	08/25/99	081999W1	1	
Magnesium, filtered		91.	6010	08/19/99	08/25/99	081999W1	1	
Manganese, filtered		.01	6010	08/19/99	08/25/99	081999W1	1	
Mercury, filtered		<.0002	7470	08/20/99	08/20/99	082099W1	1	
Nickel, filtered		<.05	6010	08/19/99	08/25/99	081999W1	1	
Potassium, filtered		<5.	6010	08/19/99	08/30/99	081999W1	1	
Selenium, filtered	J	<.005	6010	08/19/99	08/25/99	081999W1	1	
Silver, filtered		<.01	6010	08/19/99	08/25/99	081999W1	1	
Sodium, filtered		58.	6010	08/19/99	08/25/99	081999W1	1	
Thallium, filtered		<.005	7841	08/16/99	08/20/99	081699W1	1	
Vanadium, filtered		<.05	6010	08/19/99	08/25/99	081999W1	1	
Zinc, filtered		<.01	6010	08/19/99	08/25/99	081999W1	1	

Notes:

J Estimated value

Authorized: Thomas Alexander
Date: September 2, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories, Inc.

Analytical Results Trace Metals

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9553
Samp. Description: URS-9D (Field Filtered)
Units: mg/L

Collected: 08/12/99
Received: 08/13/99

Matrix: Water
%Solids:
Number of analytes: 23

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Aluminum, filtered	<.1	6010	08/19/99	08/25/99	081999W1	1	
Antimony, filtered	<.005	6010	08/19/99	08/25/99	081999W1	1	
Arsenic, filtered	J <.005	6010	08/19/99	08/25/99	081999W1	1	
Barium, filtered	<.02	6010	08/19/99	08/25/99	081999W1	1	
Beryllium, filtered	<.003	6010	08/19/99	08/25/99	081999W1	1	
Cadmium, filtered	<.001	6010	08/19/99	08/25/99	081999W1	1	
Calcium, filtered	210.	6010	08/19/99	08/25/99	081999W1	1	
Chromium, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Cobalt, filtered	<.025	6010	08/19/99	08/25/99	081999W1	1	
Copper, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Iron, filtered	.06	6010	08/19/99	08/25/99	081999W1	1	
Lead, filtered	<.005	6010	08/19/99	08/25/99	081999W1	1	
Magnesium, filtered	77.	6010	08/19/99	08/25/99	081999W1	1	
Manganese, filtered	.01	6010	08/19/99	08/25/99	081999W1	1	
Mercury, filtered	<.0002	7470	08/20/99	08/20/99	082099W1	1	
Nickel, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Potassium, filtered	<5.	6010	08/19/99	08/30/99	081999W1	1	
Selenium, filtered	J <.005	6010	08/19/99	08/25/99	081999W1	1	
Silver, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Sodium, filtered	52.	6010	08/19/99	08/25/99	081999W1	1	
Thallium, filtered	<.005	7841	08/16/99	08/20/99	081699W1	1	
Vanadium, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Zinc, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	

Notes:

J-Estimated value

Authorized: Thomas Alexander
Date: September 2, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories, Inc.

Analytical Results Trace Metals

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9554
Samp. Description: URS-9I (Field Filtered)
Units: mg/L

Collected: 08/12/99
Received: 08/13/99

Matrix: Water
%Solids:
Number of analytes: 23

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Aluminum, filtered	<.1	6010	08/19/99	08/25/99	081999W1	1	
Antimony, filtered	<.005	6010	08/19/99	08/25/99	081999W1	1	
Arsenic, filtered	J <.005	6010	08/19/99	08/25/99	081999W1	1	
Barium, filtered	<.02	6010	08/19/99	08/25/99	081999W1	1	
Beryllium, filtered	<.003	6010	08/19/99	08/25/99	081999W1	1	
Cadmium, filtered	<.001	6010	08/19/99	08/25/99	081999W1	1	
Calcium, filtered	160.	6010	08/19/99	08/25/99	081999W1	1	
Chromium, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Cobalt, filtered	<.025	6010	08/19/99	08/25/99	081999W1	1	
Copper, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Iron, filtered	.24	6010	08/19/99	08/25/99	081999W1	1	
Lead, filtered	<.005	6010	08/19/99	08/25/99	081999W1	1	
Magnesium, filtered	75.	6010	08/19/99	08/25/99	081999W1	1	
Manganese, filtered	.04	6010	08/19/99	08/25/99	081999W1	1	
Mercury, filtered	<.0002	7470	08/20/99	08/20/99	082099W1	1	
Nickel, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Potassium, filtered	<5.	6010	08/19/99	08/30/99	081999W1	1	
Selenium, filtered	J <.005	6010	08/19/99	08/25/99	081999W1	1	
Silver, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Sodium, filtered	54.	6010	08/19/99	08/25/99	081999W1	1	
Thallium, filtered	<.005	7841	08/16/99	08/20/99	081699W1	1	
Vanadium, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Zinc, filtered	J .01	6010	08/19/99	08/25/99	081999W1	1	

Notes:

J-Estimated value

Authorized: Thomas Alexander
Date: September 2, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories, Inc.

Analytical Results Trace Metals

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9555
Samp. Description: 85-7R (Field Filtered)
Units: mg/L

Collected: 08/12/99
Received: 08/13/99

Matrix: Water
%Solids:
Number of analytes: 23

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Aluminum, filtered	<.1	6010	08/19/99	08/25/99	081999W1	1	
Antimony, filtered	<.005	6010	08/19/99	08/25/99	081999W1	1	
Arsenic, filtered	J <.005	6010	08/19/99	08/25/99	081999W1	1	
Barium, filtered	.04	6010	08/19/99	08/25/99	081999W1	1	
Beryllium, filtered	<.003	6010	08/19/99	08/25/99	081999W1	1	
Cadmium, filtered	<.001	6010	08/19/99	08/25/99	081999W1	1	
Calcium, filtered	440.	6010	08/19/99	08/25/99	081999W1	1	
Chromium, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Cobalt, filtered	<.025	6010	08/19/99	08/25/99	081999W1	1	
Copper, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Iron, filtered	.09	6010	08/19/99	08/25/99	081999W1	1	
Lead, filtered	<.005	6010	08/19/99	08/25/99	081999W1	1	
Magnesium, filtered	130.	6010	08/19/99	08/25/99	081999W1	1	
Manganese, filtered	.04	6010	08/19/99	08/25/99	081999W1	1	
Mercury, filtered	<.0002	7470	08/20/99	08/20/99	082099W1	1	
Nickel, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Potassium, filtered	7.	6010	08/19/99	08/30/99	081999W1	1	
Selenium, filtered	J <.005	6010	08/19/99	08/25/99	081999W1	1	
Silver, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Sodium, filtered	85.	6010	08/19/99	08/25/99	081999W1	1	
Thallium, filtered	<.005	7841	08/16/99	08/20/99	081699W1	1	
Vanadium, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Zinc, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	

Notes:

J-Estimated value

Authorized: Thomas Alexander
Date: September 2, 1999

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O'Brien & Gere Laboratories, Inc.

Analytical Results
Trace Metals

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9556
Samp. Description: URS-7D (Field Filtered)
Units: mg/L

Collected: 08/12/99
Received: 08/13/99

Matrix: Water
%Solids:
Number of analytes: 23

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Aluminum, filtered	<.1	6010	08/19/99	08/25/99	081999W1	1	
Antimony, filtered	<.005	6010	08/19/99	08/25/99	081999W1	1	
Arsenic, filtered	J <.005	6010	08/19/99	08/25/99	081999W1	1	
Barium, filtered	.03	6010	08/19/99	08/25/99	081999W1	1	
Beryllium, filtered	<.003	6010	08/19/99	08/25/99	081999W1	1	
Cadmium, filtered	<.001	6010	08/19/99	08/25/99	081999W1	1	
Calcium, filtered	470.	6010	08/19/99	08/25/99	081999W1	1	
Chromium, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Cobalt, filtered	<.025	6010	08/19/99	08/25/99	081999W1	1	
Copper, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Iron, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Lead, filtered	<.005	6010	08/19/99	08/25/99	081999W1	1	
Magnesium, filtered	140.	6010	08/19/99	08/25/99	081999W1	1	
Manganese, filtered	.05	6010	08/19/99	08/25/99	081999W1	1	
Mercury, filtered	<.0002	7470	08/20/99	08/20/99	082099W1	1	
Nickel, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Potassium, filtered	6.	6010	08/19/99	08/30/99	081999W1	1	
Selenium, filtered	J <.005	6010	08/19/99	08/25/99	081999W1	1	
Silver, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Sodium, filtered	81.	6010	08/19/99	08/25/99	081999W1	1	
Thallium, filtered	<.005	7841	08/16/99	08/20/99	081699W1	1	
Vanadium, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Zinc, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	

Notes:

J-Estimated value

Authorized: Thomas Alexander
Date: September 2, 1999

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O'Brien & Gere Laboratories,Inc.

Analytical Results Trace Metals

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9557
Samp. Description: X-1 (Field Filtered)
Units: mg/L

Collected: 08/12/99
Received: 08/13/99

Matrix: Water
%Solids:
Number of analytes: 23

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Aluminum, filtered	<.1	6010	08/19/99	08/25/99	081999W1	1	
Antimony, filtered	<.005	6010	08/19/99	08/25/99	081999W1	1	
Arsenic, filtered	J <.005	6010	08/19/99	08/25/99	081999W1	1	
Barium, filtered	<.02	6010	08/19/99	08/25/99	081999W1	1	
Beryllium, filtered	<.003	6010	08/19/99	08/25/99	081999W1	1	
Cadmium, filtered	<.001	6010	08/19/99	08/25/99	081999W1	1	
Calcium, filtered	220.	6010	08/19/99	08/25/99	081999W1	1	
Chromium, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Cobalt, filtered	<.025	6010	08/19/99	08/25/99	081999W1	1	
Copper, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Iron, filtered	.07	6010	08/19/99	08/25/99	081999W1	1	
Lead, filtered	<.005	6010	08/19/99	08/25/99	081999W1	1	
Magnesium, filtered	80.	6010	08/19/99	08/25/99	081999W1	1	
Manganese, filtered	.01	6010	08/19/99	08/25/99	081999W1	1	
Mercury, filtered	<.0002	7470	08/20/99	08/20/99	082099W1	1	
Nickel, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Potassium, filtered	<5.	6010	08/19/99	08/30/99	081999W1	1	
Selenium, filtered	J <.005	6010	08/19/99	08/25/99	081999W1	1	
Silver, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Sodium, filtered	54.	6010	08/19/99	08/25/99	081999W1	1	
Thallium, filtered	<.005	7841	08/16/99	08/20/99	081699W1	1	
Vanadium, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Zinc, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	

Notes:

-Estimated value

Authorized: Thomas Alexander
Date: September 2,1999

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O'Brien & Gere Laboratories, Inc.

Analytical Results Trace Metals

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9705
Samp. Description: 85-5R (Field Filtered)
Units: mg/L

Collected: 08/13/99
Received: 08/14/99

Matrix: Water
%Solids:
Number of analytes: 23

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Aluminum, filtered	<.1	6010	08/19/99	08/25/99	081999W1	1	
Antimony, filtered	<.005	6010	08/19/99	08/25/99	081999W1	1	
Arsenic, filtered	J <.005	6010	08/19/99	08/25/99	081999W1	1	
Barium, filtered	.06	6010	08/19/99	08/25/99	081999W1	1	
Beryllium, filtered	<.003	6010	08/19/99	08/25/99	081999W1	1	
Cadmium, filtered	<.001	6010	08/19/99	08/25/99	081999W1	1	
Calcium, filtered	220.	6010	08/19/99	08/25/99	081999W1	1	
Chromium, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Cobalt, filtered	<.025	6010	08/19/99	08/25/99	081999W1	1	
Copper, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Iron, filtered	.10	6010	08/19/99	08/25/99	081999W1	1	
Lead, filtered	<.005	6010	08/19/99	08/25/99	081999W1	1	
Magnesium, filtered	99.	6010	08/19/99	08/25/99	081999W1	1	
Manganese, filtered	.08	6010	08/19/99	08/25/99	081999W1	1	
Mercury, filtered	<.0002	7470	08/20/99	08/20/99	082099W1	1	
Nickel, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Potassium, filtered	5.	6010	08/19/99	08/30/99	081999W1	1	
Selenium, filtered	J <.005	6010	08/19/99	08/25/99	081999W1	1	
Silver, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Sodium, filtered	96.	6010	08/19/99	08/25/99	081999W1	1	
Thallium, filtered	<.005	7841	08/19/99	08/20/99	081999W2	1	
Vanadium, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Zinc, filtered	J .01	6010	08/19/99	08/25/99	081999W1	1	

Notes:

J-Estimated value

Authorized: Thomas Alexander
Date: September 2, 1999

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O'Brien & Gere Laboratories, Inc.

Analytical Results Trace Metals

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9706
Samp. Description: URS-5D (Field Filtered)
Units: mg/L

Collected: 08/13/99
Received: 08/14/99

Matrix: Water
%Solids:
Number of analytes: 23

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Aluminum, filtered	<.1	6010	08/19/99	08/25/99	081999W1	1	
Antimony, filtered	<.005	6010	08/19/99	08/25/99	081999W1	1	
Arsenic, filtered	J <.005	6010	08/19/99	08/25/99	081999W1	1	
Barium, filtered	.02	6010	08/19/99	08/25/99	081999W1	1	
Beryllium, filtered	<.003	6010	08/19/99	08/25/99	081999W1	1	
Cadmium, filtered	<.001	6010	08/19/99	08/25/99	081999W1	1	
Calcium, filtered	490.	6010	08/19/99	08/25/99	081999W1	1	
Chromium, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Cobalt, filtered	.35	6010	08/19/99	08/25/99	081999W1	1	
Copper, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Iron, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Lead, filtered	<.005	6010	08/19/99	08/25/99	081999W1	1	
Magnesium, filtered	93.	6010	08/19/99	08/25/99	081999W1	1	
Manganese, filtered	.05	6010	08/19/99	08/25/99	081999W1	1	
Mercury, filtered	<.0002	7470	08/20/99	08/20/99	082099W1	1	
Nickel, filtered	.08	6010	08/19/99	08/25/99	081999W1	1	
Potassium, filtered	<5.	6010	08/19/99	08/30/99	081999W1	1	
Selenium, filtered	J <.005	6010	08/19/99	08/25/99	081999W1	1	
Silver, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Sodium, filtered	110.	6010	08/19/99	08/25/99	081999W1	1	
Thallium, filtered	<.005	7841	08/19/99	08/20/99	081999W2	1	
Vanadium, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Zinc, filtered	J .01	6010	08/19/99	08/25/99	081999W1	1	

Notes:

J-Estimated value

Authorized: Thomas Alexander
Date: September 2, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories, Inc.

Analytical Results
Trace Metals

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9707
Samp. Description: URS-14I (Field Filtered)
Units: mg/L

Collected: 08/13/99
Received: 08/14/99

Matrix: Water
%Solids:
Number of analytes: 23

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Aluminum, filtered	<.1	6010	08/19/99	08/25/99	081999W1	1	
Antimony, filtered	<.005	6010	08/19/99	08/25/99	081999W1	1	
Arsenic, filtered	J <.005	6010	08/19/99	08/25/99	081999W1	1	
Barium, filtered	.05	6010	08/19/99	08/25/99	081999W1	1	
Beryllium, filtered	<.003	6010	08/19/99	08/25/99	081999W1	1	
Cadmium, filtered	<.001	6010	08/19/99	08/25/99	081999W1	1	
Calcium, filtered	30.	6010	08/19/99	08/25/99	081999W1	1	
Chromium, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Cobalt, filtered	<.025	6010	08/19/99	08/25/99	081999W1	1	
Copper, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Iron, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Lead, filtered	<.005	6010	08/19/99	08/25/99	081999W1	1	
Magnesium, filtered	25.	6010	08/19/99	08/25/99	081999W1	1	
Manganese, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Mercury, filtered	<.0002	7470	08/20/99	08/20/99	082099W1	1	
Nickel, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Potassium, filtered	6.	6010	08/19/99	08/30/99	081999W1	1	
Selenium, filtered	J <.005	6010	08/19/99	08/25/99	081999W1	1	
Silver, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Sodium, filtered	62.	6010	08/19/99	08/25/99	081999W1	1	
Thallium, filtered	<.005	7841	08/19/99	08/20/99	081999W2	1	
Vanadium, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Zinc, filtered	J .03	6010	08/19/99	08/25/99	081999W1	1	

Notes:

J-Estimated value

Authorized: Thomas Alexander
Date: September 2, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories, Inc.

Analytical Results Trace Metals

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9708
Samp. Description: Equipment Blank (Field Filtered)
Units: mg/L

Collected: 08/13/99
Received: 08/14/99

Matrix: Water
%Solids:
Number of analytes: 23

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Aluminum, filtered	<.1	6010	08/19/99	08/25/99	081999W1	1	
Antimony, filtered	<.005	6010	08/19/99	08/25/99	081999W1	1	
Arsenic, filtered	J <.005	6010	08/19/99	08/25/99	081999W1	1	
Barium, filtered	<.02	6010	08/19/99	08/25/99	081999W1	1	
Beryllium, filtered	<.003	6010	08/19/99	08/25/99	081999W1	1	
Cadmium, filtered	<.001	6010	08/19/99	08/25/99	081999W1	1	
Calcium, filtered	<.1	6010	08/19/99	08/25/99	081999W1	1	
Chromium, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Cobalt, filtered	<.025	6010	08/19/99	08/25/99	081999W1	1	
Copper, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Iron, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Lead, filtered	<.005	6010	08/19/99	08/25/99	081999W1	1	
Magnesium, filtered	<.3	6010	08/19/99	08/25/99	081999W1	1	
Manganese, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Mercury, filtered	<.0002	7470	08/20/99	08/20/99	082099W1	1	
Nickel, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Potassium, filtered	<5.	6010	08/19/99	08/30/99	081999W1	1	
Selenium, filtered	J <.005	6010	08/19/99	08/25/99	081999W1	1	
Silver, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	
Sodium, filtered	<.3	6010	08/19/99	08/25/99	081999W1	1	
Thallium, filtered	<.005	7841	08/19/99	08/27/99	081999W2	1	
Vanadium, filtered	<.05	6010	08/19/99	08/25/99	081999W1	1	
Zinc, filtered	<.01	6010	08/19/99	08/25/99	081999W1	1	

Notes:

J -Estimated value

Authorized: Thomas Alexander
Date: September 2, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories,Inc.

Analytical Results Wet Chemistry

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9541
Samp. Description: 88-12C

Collected: 08/11/99
Received: 08/13/99 09:20

Matrix: Water

Parameter	Result	Units	Method	Prepared	Analyzed	QC Batch	Note
Total cyanide	<.01	mg/L	9010B/9014	08/24/99	08/24/99	082499W21	

Notes:

Sample: M9542
Samp. Description: 88-12D

Collected: 08/11/99
Received: 08/13/99 09:20

Matrix: Water

Parameter	Result	Units	Method	Prepared	Analyzed	QC Batch	Note
Total cyanide	.012	mg/L	9010B/9014	08/24/99	08/24/99	082499W21	

Notes:

Sample: M9543
Samp. Description: URS-14D

Collected: 08/12/99
Received: 08/13/99 09:20

Matrix: Water

Parameter	Result	Units	Method	Prepared	Analyzed	QC Batch	Note
Total cyanide	<.01	mg/L	9010B/9014	08/26/99	08/26/99	082699W21	

Notes:

-Estimated value

Authorized: Thomas Alexander
Date: August 30,1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories,Inc.

Analytical Results Wet Chemistry

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9544
Samp. Description: URS-9D

Collected: 08/12/99
Received: 08/13/99 09:20

Matrix: Water

Parameter	Result	Units	Method	Prepared	Analyzed	QC Batch	Note
Total cyanide	<.01	mg/L	9010B/9014	08/24/99	08/24/99	082499W21	

Notes:

Sample: M9545
Samp. Description: URS-9I

Collected: 08/12/99
Received: 08/13/99 09:20

Matrix: Water

Parameter	Result	Units	Method	Prepared	Analyzed	QC Batch	Note
Total cyanide	<.01	mg/L	9010B/9014	08/24/99	08/24/99	082499W21	

Notes:

Sample: M9546
Samp. Description: 85-7R

Collected: 08/12/99
Received: 08/13/99 09:20

Matrix: Water

Parameter	Result	Units	Method	Prepared	Analyzed	QC Batch	Note
Total cyanide	<.01	mg/L	9010B/9014	08/24/99	08/24/99	082499W21	

Notes:

J-Estimated value

Authorized: Thomas Alexander
Date: August 30,1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories, Inc.

Analytical Results Wet Chemistry

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9547
Samp. Description: URS-7D

Collected: 08/12/99
Received: 08/13/99 09:20

Matrix: Water

Parameter	Result	Units	Method	Prepared	Analyzed	QC Batch	Note
Total cyanide	<.01	mg/L	9010B/9014	08/24/99	08/24/99	082499W21	

Notes:

Sample: M9548
Samp. Description: X-1

Collected: 08/12/99
Received: 08/13/99 09:20

Matrix: Water

Parameter	Result	Units	Method	Prepared	Analyzed	QC Batch	Note
Total cyanide	<.01	mg/L	9010B/9014	08/24/99	08/24/99	082499W21	

Notes:

-Estimated value

Authorized: Thomas Alexander
Date: August 30, 1999

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories, Inc.

Analytical Results Wet Chemistry

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9700
Samp. Description: 85-5R

Collected: 08/13/99
Received: 08/14/99 09:45

Matrix: Water

Parameter	Result	Units	Method	Prepared	Analyzed	QC Batch	Note
Total cyanide	<.01	mg/L	9010B/9014	08/24/99	08/24/99	082499W21	

Notes:

Sample: M9701
Samp. Description: URS-5D

Collected: 08/13/99
Received: 08/14/99 09:45

Matrix: Water

Parameter	Result	Units	Method	Prepared	Analyzed	QC Batch	Note
Total cyanide	<.01	mg/L	9010B/9014	08/24/99	08/24/99	082499W21	

Notes:

Sample: M9702
Samp. Description: URS-14I

Collected: 08/13/99
Received: 08/14/99 09:45

Matrix: Water

Parameter	Result	Units	Method	Prepared	Analyzed	QC Batch	Note
Total cyanide	<.01	mg/L	9010B/9014	08/24/99	08/24/99	082499W21	

Notes:

-Estimated value

Authorized: _____
Date: August 30, 1999 Thomas Alexander

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories, Inc.

Analytical Results Wet Chemistry

Client: Frontier Chemical
Project: Pendleton Site
Proj. Desc: Niagara County, NY

Job No.: 5829.001.517
Certification NY No.: 10155

Sample: M9703
Samp. Description: Equipment Blank

Collected: 08/13/99
Received: 08/14/99 09:45

Matrix: Water

Parameter	Result	Units	Method	Prepared	Analyzed	QC Batch	Note
Total cyanide	<.01	mg/L	9010B/9014	08/24/99	08/24/99	082499W21	

Notes:

J-Estimated value

Authorized: _____
Date: August 30,1999 Thomas Alexander

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

Quality Control Results

O'Brien & Gere Laboratories,Inc.

Quality Control Summary
Matrix Spike/Matrix Spike Duplicate
Method: 8260

Sample: M9543
Samp. Description: URS-14D
Units: ug/L
Instrument: HP5973 GCMS#3

Matrix: Water

%Solids:
Number of analytes: 39

Parameter	Dilution	Result	Spike Added	MS Value	%R	MSD Value	%R	%R Limits		RPD	RPD Limits	Note
Chloromethane	1	<1	10	9.0724	91	13.1656 #	132	78-122	#	37	0-13	
Vinyl chloride	1	<1	10	10.1807	102	14.6128 #	146	85-123	#	36	0-13	
Bromomethane	1	<1	10	8.7331	87	14.2148 #	142	71-127	#	48	0-16	
Chloroethane	1	<1	10	10.6931	107	16.1163 #	161	88-121	#	40	0-13	
Acetone	1	<10	10	11.2032	112	J9.854	99	46-151		13	0-28	
1,1-Dichloroethene	1	<.5	10	7.7089 #	77	8.1874 #	82	85-124		6	0-10	
Methylene chloride	1	J.1716	10	9.1545	90	9.9303	98	81-116		8	0-10	
Carbon disulfide	1	J.4287	10	28.5875 #	282	43.6333 #	432	80-130	#	42	0-10	
trans-1,2-Dichloroethene	1	<.5	10	8.3937 #	84	9.0661	91	90-118		8	0-10	
1,1-Dichloroethane	1	<.5	10	9.2741	93	9.7533	98	91-120		5	0-11	
2-Butanone	1	<10	10	J9.0283	90	J7.6384 #	76	77-129		17	0-25	
cis-1,2-Dichloroethene	1	<.5	10	8.7595	88	9.4339	94	88-118		7	0-12	
Bromochloromethane	1	<.5	10	9.5291	95	10.2204	102	87-116		7	0-11	
Chloroform	1	<.5	10	9.5106	95	9.8457	98	87-116		3	0-10	
1,2-Dichloroethane	1	<.5	10	9.0401	90	9.4862	95	82-115		5	0-12	
1,1,1-Trichloroethane	1	<.5	10	9.2956	93	9.582	96	91-120		3	0-11	
Carbon tetrachloride	1	<.5	10	11.7059	117	12.28 #	123	93-120		5	0-10	
Benzene	1	<.5	10	9.1898	92	9.3929	94	89-118		2	0-10	
1,2-Dichloropropane	1	<.5	10	9.3221	93	9.5056	95	90-113		2	0-10	
Trichloroethene	1	<.5	10	8.6365	86	8.8633	89	84-120		3	0-11	
Bromodichloromethane	1	<.5	10	15.8926 #	159	16.1718 #	162	87-117		2	0-10	
cis-1,3-Dichloropropene	1	<.5	10	6.9288 #	69	7.0631 #	71	87-117		2	0-10	

J-Estimated value #-Outside limits

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories,Inc.

Quality Control Summary
Matrix Spike/Matrix Spike Duplicate
Method: 8260

Sample: M9543
Samp. Description: URS-14D
Units: ug/L
Instrument: HP5973 GCMS#3

Matrix: Water

%Solids:
Number of analytes: 39

Parameter	Dilution	Result	Spike Added	MS Value	%R	MSD Value	%R	%R Limits	RPD	RPD Limits	Note
4-Methyl-2-pentanone	1	<5	10	7.9377	79	7.9319	79	67-137	0	0-16	
trans-1,3-Dichloropropene	1	<.5	10	5.5395 #	55	5.7329 #	57	84-122	3	0-12	
1,1,2-Trichloroethane	1	<.5	10	9.032	90	9.1432	91	84-123	1	0-12	
Toluene	1	<.5	10	8.8171	88	8.7975	88	88-120	0	0-10	
Dibromochloromethane	1	<.5	10	16.8175 #	168	17.1549 #	172	84-119	2	0-11	
2-Hexanone	1	<5	10	7.2532	73	7.0504	71	63-143	3	0-16	
Tetrachloroethene	1	<.5	10	8.6797 #	87	8.9085	89	88-119	3	0-11	
Chlorobenzene	1	<.5	10	8.8984	89	9.0284	90	85-116	1	0-10	
Ethylbenzene	1	<.5	10	8.7177 #	87	8.9419	89	89-119	3	0-10	
Bromoform	1	<.5	10	18.9682 #	190	17.9004 #	179	72-126	6	0-13	
Xylene (total)	1	<.5	30	25.8256 #	86	25.9009 #	86	88-118	0	0-10	
Styrene	1	<.5	10	1.6691 #	17	1.6851 #	17	86-116	1	0-10	
1,1,2,2-Tetrachloroethane	1	<.5	10	9.0042	90	9.0598	91	76-132	1	0-13	
Dibromofluoromethane (surrogate)	1	100.2188%			106		111	61-136			
1,2-Dichloroethane-d4 (surrogate)	1	96.068%			103		105	80-135			
Toluene-d8 (surrogate)	1	94.9957%			104		103	84-114			
Bromofluorobenzene (surrogate)	1	94.7331%			104		102	77-117			

Notes:

J-Estimated value #-Outside limits

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories,Inc.

Quality Control Summary
Matrix Spike/Matrix Spike Duplicate
Trace Metals

Sample: M9552
Samp. Description: URS-14D (Field Filtered)

Matrix: Water Units: mg/L
% Solids: Number of analytes: 23

Parameter	MS Result	Sample Result	Spike Added	MSD Result		MS %R		MSD %R	MS/MSD Limits	RPD	RPD Limits	Method	Note
Aluminum, filtered	1.0210	<.1	1.000	1.0250		102		103	68-136	0	0-17	6010	
Antimony, filtered	.2067	<.005	.200	.2097		103	#	105	90-103	1	0-10	6010	1
Arsenic, filtered	.2051	<.005	.200	.2077		103		104	85-108	1	0-10	6010	
Barium, filtered	.2268	.0276	.200	.2276		100		100	87-107	0	0-10	6010	
Beryllium, filtered	.1971	<.003	.200	.1988		99		99	91-111	1	0-20	6010	
Cadmium, filtered	.1922	<.001	.200	.1939		96		97	78-103	1	0-10	6010	
Calcium, filtered	359.4000	365	10.000	371.2000	#	0	#	62	89-108	3	0-10	6010	35
Chromium, filtered	.1968	<.01	.200	.1993		98		100	81-111	1	0-10	6010	
Cobalt, filtered	.1928	<.025	.200	.1953		96		98	86-108	1	0-20	6010	
Copper, filtered	.2110	<.01	.200	.2112		106		106	88-110	0	0-10	6010	
Iron, filtered	.9914	<.05	1.000	.9972		99		100	69-125	1	0-23	6010	
Lead, filtered	.1911	<.005	.200	.1934		96		97	84-108	1	0-10	6010	
Magnesium, filtered	97.4200	91.05	10.000	100.5000	#	64		95	81-123	3	0-10	6010	35
Manganese, filtered	.2104	.0132	.200	.2120		99		99	80-114	1	0-10	6010	
Mercury, filtered	.0008	<.0002	.001			83			80-116		0-17	7470	
Nickel, filtered	.1913	<.05	.200	.1932		96		97	76-113	1	0-10	6010	
Potassium, filtered	14.2720	J3.4806	10.000	14.4300		108		109	88-116	1	0-10	6010	
Selenium, filtered	.1300	<.005	.200	.1299	#	65	#	65	87-106	0	0-11	6010	2
Silver, filtered	.0520	<.01	.050	.0523		104	#	105	85-104	0	0-10	6010	1
Sodium, filtered	66.2300	57.9	10.000	68.3100	#	83		104	97-120	3	0-10	6010	20
Thallium, filtered	.0211	<.001	.020	.0215		106		108	75-125	2	0-20	7841	
Vanadium, filtered	.1981	<.05	.200	.1991		99		100	89-108	0	0-20	6010	
Zinc, filtered	.2119	J.0073	.200	.2126		102		103	85-104	0	0-10	6010	

Notes:
1: High recovery due to matrix interference.
2: Low recovery due to matrix interference.
20: Sample concentration was greater than the concentration of the analyte in the spike.
J-Estimated value #-Outside limits

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories,Inc.

Quality Control Summary
Matrix Spike/Matrix Spike Duplicate
Trace Metals

Sample: M9552
Samp. Description: URS-14D (Field Filtered)

Matrix: Water Units: mg/L
% Solids: Number of analytes: 23

35: Sample concentration was much greater than the concentration of the analyte in the spike.

I-Estimated value #-Outside limits

'lBrien & Gere aboratories,Inc.

Quality Control Summary Post Digestion Spike Trace Metals

Sample: M9552
Samp. Description: URS-14D (Field Filtered)

Matrix: Water Units: mg/L
% Solids: Number of analytes: 21

Parameter	MS Result	Sample Result	Spike Added		MS %R	%R Limits	Method
Aluminum, filtered	1.0640	<.1	1.000		106	75-125	6010
Antimony, filtered	.2107	<.005	.200		105	75-125	6010
Arsenic, filtered	.2110	<.005	.200		106	75-125	6010
Barium, filtered	.2300	.0276	.200		101	75-125	6010
Beryllium, filtered	.2026	<.003	.200		101	75-125	6010
Cadmium, filtered	.1982	<.001	.200		99	75-125	6010
Calcium, filtered	349.8000	365	10.000	#	0	75-125	6010
Chromium, filtered	.2033	<.01	.200		102	75-125	6010
Cobalt, filtered	.1992	<.025	.200		100	75-125	6010
Copper, filtered	.2148	<.01	.200		107	75-125	6010
Iron, filtered	1.0244	<.05	1.000		102	75-125	6010
Lead, filtered	.1974	<.005	.200		99	75-125	6010
Magnesium, filtered	95.4900	91.05	10.000	#	44	75-125	6010
Manganese, filtered	.2156	.0132	.200		101	75-125	6010
Nickel, filtered	.1986	<.05	.200		99	75-125	6010
Potassium, filtered	13.9580	J3.4806	10.000		105	75-125	6010
Selenium, filtered	.2064	<.005	.200		103	75-125	6010
Silver, filtered	.0530	<.01	.050		106	75-125	6010
Sodium, filtered	65.6600	57.9	10.000		78	75-125	6010
Vanadium, filtered	.2028	<.05	.200		101	75-125	6010
Zinc, filtered	.2199	J.0073	.200		106	75-125	6010

J-Estimated value #-Outside limits

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O'Brien & Gere Laboratories, Inc.

Quality Control Summary
Duplicates
Trace Metals

Sample: M9552
Samp. Description: URS-14D (Field Filtered)

Matrix: Water
%Solids:

Units: mg/L
Number of analytes: 23

Parameter	Sample Result	Duplicate Result	RPD	RPD Limits	Method	Note
Aluminum, filtered	<.1	<.1			6010	
Antimony, filtered	<.005	<.005			6010	
Arsenic, filtered	<.005	<.005			6010	
Barium, filtered	.0276	.0261	6	0-10	6010	
Beryllium, filtered	<.003	<.003			6010	
Cadmium, filtered	<.001	<.001			6010	
Calcium, filtered	365	341.2	7	0-10	6010	
Chromium, filtered	<.01	<.01			6010	
Cobalt, filtered	<.025	<.025			6010	
Copper, filtered	<.01	<.01			6010	
Iron, filtered	<.05	<.05			6010	
Lead, filtered	<.005	<.005			6010	
Magnesium, filtered	91.05	85.26	7	0-10	6010	
Manganese, filtered	.0132	.0126	5	0-10	6010	
Mercury, filtered	<.0002	<.0002			7470	
Nickel, filtered	<.05	<.05			6010	
Potassium, filtered	J3.4806	<5			6010	
Selenium, filtered	<.005	<.005			6010	
Silver, filtered	<.01	<.01			6010	
Sodium, filtered	57.9	54	7	0-10	6010	
Thallium, filtered	<.001	<.001			7841	
Vanadium, filtered	<.05	<.05			6010	
Zinc, filtered	J.0073	.0224	102		6010	

Notes:

J-Estimated value #-Outside limits

O'Brien & Gere Laboratories,Inc.

Quality Control Summary
Matrix Spike/Matrix Spike Duplicate
Wet Chemistry

Sample: M9543
Samp. Description: URS-14D

Matrix: Water
Number of analytes: 1

Parameter	MS Result	Sample Result	Spike Added	MSD Result	%R	MS/MSD Limits	MSD %R	RPD	RPD Limits	Units	Method	Note
Total cyanide	.0500	<.01	.050		100	70-131				mg/L	9010B/9014	

Notes:

J-Estimated value #-Outside limits

O'Brien & Gere Laboratories,Inc.

Quality Control Summary
Duplicates
Wet Chemistry

Sample: M9543
Samp. Description: URS-14D

Number of analytes: 1

Parameter	Sample Result	Duplicate Result	RPD	RPD Limits	Units	Note
Total cyanide	<.01	<.01			mg/L	

Notes:

J-Estimated value #-Outside limits

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

'Brien & Gere aboratories,Inc.

Quality Control Summary Laboratory Control Sample GC/MS Semivolatile Organics

Sample: L082099W1
Analyzed: 08/20/99

QC Batch: 082099W1
Instrument: HP5973 GCMS#3
Number of analytes: 39

Parameter	LCS Result	Spike Added	Units	%R	QC Limits	Note
Chloromethane	6.2109	10	ug/L	62	#63-122	
Vinyl chloride	9.9768	10	ug/L	100	62-134	
Bromomethane	7.5799	10	ug/L	76	52-141	
Chloroethane	8.4356	10	ug/L	84	74-128	
Acetone	10.8317	10	ug/L	108	42-155	
1,1-Dichloroethene	10.7082	10	ug/L	107	89-135	
Methylene chloride	9.5590	10	ug/L	96	82-125	
Carbon disulfide	9.5648	10	ug/L	96	74-133	
trans-1,2-Dichloroethene	10.1579	10	ug/L	102	84-147	
1,1-Dichloroethane	10.2691	10	ug/L	103	84-129	
2-Butanone	9.6521	10	ug/L	97	62-135	
cis-1,2-Dichloroethene	10.1787	10	ug/L	102	70-131	
Bromochloromethane	10.8674	10	ug/L	109	81-129	
Chloroform	10.1626	10	ug/L	102	84-123	
1,2-Dichloroethane	9.6760	10	ug/L	97	80-124	
1,1,1-Trichloroethane	10.5519	10	ug/L	106	85-137	
Carbon tetrachloride	9.9421	10	ug/L	99	88-134	
Benzene	10.9457	10	ug/L	109	84-126	
1,2-Dichloropropane	10.8097	10	ug/L	108	86-122	
Trichloroethene	10.8727	10	ug/L	109	87-131	
Bromodichloromethane	10.8699	10	ug/L	109	86-123	
cis-1,3-Dichloropropene	9.8208	10	ug/L	98	76-139	
4-Methyl-2-pentanone	10.3861	10	ug/L	104	62-131	
trans-1,3-Dichloropropene	10.4006	10	ug/L	104	73-146	
1,1,2-Trichloroethane	11.0916	10	ug/L	111	80-126	
Toluene	10.6048	10	ug/L	106	87-126	
Dibromochloromethane	11.2893	10	ug/L	113	79-122	
2-Hexanone	10.2877	10	ug/L	103	58-127	
Tetrachloroethene	11.5014	10	ug/L	115	82-132	
Chlorobenzene	10.6559	10	ug/L	107	86-122	
Ethylbenzene	10.7490	10	ug/L	107	80-127	
Bromoform	10.6645	10	ug/L	107	75-128	
Xylene (total)	30.8563	30	ug/L	103	78-128	
Styrene	9.4254	10	ug/L	94	79-124	
1,1,2,2-Tetrachloroethane	11.9517	10	ug/L	120	71-128	
Dibromofluoromethane (surrogate)			%	96	61-136	
1,2-Dichloroethane-d4 (surrogate)			%	90	80-135	
Toluene-d8 (surrogate)			%	101	84-114	
Bromofluorobenzene (surrogate)			%	93	77-117	

- Outside control limits

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

'Brien & Gere
ıboratories,Inc.

Quality Control Summary
Laboratory Control Sample
GC/MS Volatile Organics

ɜample: L082499W1
Analyzed: 08/24/99

QC Batch: 082499W1
Instrument: HP5973 GCMS#3
Number of analytes: 39

Parameter	LCS Result	Spike Added	Units	%R	QC Limits	Note
Chloromethane	10.0954	10	ug/L	101	63-122	
Vinyl chloride	10.6614	10	ug/L	107	62-134	
Bromomethane	8.3569	10	ug/L	84	52-141	
Chloroethane	10.8538	10	ug/L	109	74-128	
Acetone	6.3109	10	ug/L	63	42-155	
1,1-Dichloroethene	7.2166	10	ug/L	72	#89-135	
Methylene chloride	7.0748	10	ug/L	71	#82-125	
Carbon disulfide	10.0043	10	ug/L	100	74-133	
trans-1,2-Dichloroethene	7.0332	10	ug/L	70	#84-147	
1,1-Dichloroethane	6.9848	10	ug/L	70	#84-129	
2-Butanone	5.4524	10	ug/L	55	#62-135	
cis-1,2-Dichloroethene	6.8769	10	ug/L	69	#70-131	
Bromochloromethane	7.2575	10	ug/L	73	#81-129	
Chloroform	7.0855	10	ug/L	71	#84-123	
1,2-Dichloroethane	6.9973	10	ug/L	70	#80-124	
1,1,1-Trichloroethane	7.0878	10	ug/L	71	#85-137	
Carbon tetrachloride	6.4791	10	ug/L	65	#88-134	
Benzene	7.0573	10	ug/L	71	#84-126	
1,2-Dichloropropane	6.9684	10	ug/L	70	#86-122	
Trichloroethene	6.9243	10	ug/L	69	#87-131	
Bromodichloromethane	6.3175	10	ug/L	63	#86-123	
cis-1,3-Dichloropropene	5.4215	10	ug/L	54	#76-139	
4-Methyl-2-pentanone	5.7330	10	ug/L	57	#62-131	
trans-1,3-Dichloropropene	5.3685	10	ug/L	54	#73-146	
1,1,2-Trichloroethane	6.8709	10	ug/L	69	#80-126	
Toluene	6.7321	10	ug/L	67	#87-126	
Dibromochloromethane	5.4599	10	ug/L	55	#79-122	
2-Hexanone	5.4047	10	ug/L	54	#58-127	
Tetrachloroethene	7.0806	10	ug/L	71	#82-132	
Chlorobenzene	6.9060	10	ug/L	69	#86-122	
Ethylbenzene	6.8135	10	ug/L	68	#80-127	
Bromoform	5.3281	10	ug/L	53	#75-128	
Xylene (total)	19.7673	30	ug/L	66	#78-128	
Styrene	5.8890	10	ug/L	59	#79-124	
1,1,2,2-Tetrachloroethane	6.9538	10	ug/L	70	#71-128	
Dibromofluoromethane (surrogate)			%	99	61-136	
1,2-Dichloroethane-d4 (surrogate)			%	99	80-135	
Toluene-d8 (surrogate)			%	104	84-114	
Bromofluorobenzene (surrogate)			%	102	77-117	

- Outside control limits

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'Brien & Gere
ıboratories, Inc.

Quality Control Summary
Laboratory Control Sample
GC/MS Volatile Organics

ɔample: D082499W1
Analyzed: 08/24/99

QC Batch: 082499W1
Instrument: HP5973 GCMS#3
Number of analytes: 39

Parameter	LCS Result	Spike Added	Units	%R	QC Limits	Note
Chloromethane	8.4838	10	ug/L	85	63-122	
Vinyl chloride	8.8499	10	ug/L	88	62-134	
Bromomethane	7.6159	10	ug/L	76	52-141	
Chloroethane	9.1167	10	ug/L	91	74-128	
Acetone	5.0244	10	ug/L	50	42-155	
1,1-Dichloroethene	5.9665	10	ug/L	60	#89-135	
Methylene chloride	6.2024	10	ug/L	62	#82-125	
Carbon disulfide	8.4795	10	ug/L	85	74-133	
trans-1,2-Dichloroethene	5.8229	10	ug/L	58	#84-147	
1,1-Dichloroethane	5.8275	10	ug/L	58	#84-129	
2-Butanone	4.4218	10	ug/L	44	#62-135	
cis-1,2-Dichloroethene	5.7949	10	ug/L	58	#70-131	
Bromochloromethane	6.1728	10	ug/L	62	#81-129	
Chloroform	5.8915	10	ug/L	59	#84-123	
1,2-Dichloroethane	5.7946	10	ug/L	58	#80-124	
1,1,1-Trichloroethane	5.8013	10	ug/L	58	#85-137	
Carbon tetrachloride	5.2024	10	ug/L	52	#88-134	
Benzene	5.8633	10	ug/L	59	#84-126	
1,2-Dichloropropane	5.8409	10	ug/L	58	#86-122	
Trichloroethene	5.7787	10	ug/L	58	#87-131	
Bromodichloromethane	5.4004	10	ug/L	54	#86-123	
cis-1,3-Dichloropropene	4.5422	10	ug/L	45	#76-139	
4-Methyl-2-pentanone	4.8150	10	ug/L	48	#62-131	
trans-1,3-Dichloropropene	4.4661	10	ug/L	45	#73-146	
1,1,2-Trichloroethane	5.8226	10	ug/L	58	#80-126	
Toluene	5.4951	10	ug/L	55	#87-126	
Dibromochloromethane	4.6809	10	ug/L	47	#79-122	
2-Hexanone	4.5419	10	ug/L	45	#58-127	
Tetrachloroethene	5.7981	10	ug/L	58	#82-132	
Chlorobenzene	5.7071	10	ug/L	57	#86-122	
Ethylbenzene	5.5647	10	ug/L	56	#80-127	
Bromoform	4.6803	10	ug/L	47	#75-128	
Xylene (total)	15.8944	30	ug/L	53	#78-128	
Styrene	4.7995	10	ug/L	48	#79-124	
1,1,2,2-Tetrachloroethane	5.8020	10	ug/L	58	#71-128	
Dibromofluoromethane (surrogate)			%	101	61-136	
1,2-Dichloroethane-d4 (surrogate)			%	98	80-135	
Toluene-d8 (surrogate)			%	104	84-114	
Bromofluorobenzene (surrogate)			%	101	77-117	

- Outside control limits

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories,Inc.

Quality Control Summary Laboratory Control Sample Trace Metals

Sample: L081999W1
Analyzed: 08/25/99
Units: mg/L

QC Batch: 081999W1
Number of analytes: 26

Parameter	LCS Result	Spike Added	%R	QC Limits	Instrument Note
Aluminum	.9729	1	97	86-117	ICAP-61
Antimony	.2004	.2	100	85-108	ICAP-61
Arsenic	.1978	.2	99	89-105	ICAP-61
Barium	.2024	.2	101	90-104	ICAP-61
Beryllium	.2014	.2	101	90-111	ICAP-61
Boron	.9815	1	98	88-108	ICAP-61
Cadmium	.1989	.2	99	89-104	ICAP-61
Calcium	10.1800	10	102	88-106	ICAP-61
Chromium	.2000	.2	100	91-104	ICAP-61
Cobalt	.1995	.2	100	91-107	ICAP-61
Copper	.2081	.2	104	92-108	ICAP-61
Iron	1.0001	1	100	89-108	ICAP-61
Lead	.1968	.2	98	91-107	ICAP-61
Magnesium	9.9850	10	100	89-103	ICAP-61
Manganese	.2027	.2	101	91-104	ICAP-61
Molybdenum	.2019	.2	101	91-107	ICAP-61
Nickel	.1967	.2	98	91-107	ICAP-61
Selenium	.1889	.2	94	88-108	ICAP-61
Silver	.0505	.05	101	84-106	ICAP-61
Sodium	9.9960	10	100	92-106	ICAP-61
Strontium	.2036	.2	102	90-105	ICAP-61
Thallium	.1986	.2	99	91-107	ICAP-61
Tin	.2010	.2	100	81-117	ICAP-61
Titanium	.2031	.2	102	92-107	ICAP-61
Vanadium	.2012	.2	101	93-106	ICAP-61
Zinc	.2054	.2	103	90-105	ICAP-61

Notes:

- Outside control limits

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O'Brien & Gere Laboratories,Inc.

Quality Control Summary Laboratory Control Sample Trace Metals

Sample: L081699W1
Analyzed: 08/20/99
Units: mg/L

QC Batch: 081699W1
Number of analytes: 1

Parameter	LCS Result	Spike Added	%R	QC Limits	Instrument	Note
Thallium	.0211	.02	106	82-108	PE5100	

Notes:

- Outside control limits

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O'Brien & Gere Laboratories,Inc.

Quality Control Summary Laboratory Control Sample Trace Metals

Sample: L081999W2
Analyzed: 08/20/99
Units: mg/L

QC Batch: 081999W2
Number of analytes: 1

Parameter	LCS Result	Spike Added	%R	QC Limits	Instrument Note
Thallium	.0191	.02	95	82-108	PE5100

Notes:

- Outside control limits

O'Brien & Gere Laboratories,Inc.

Quality Control Summary Laboratory Control Sample Trace Metals

Sample: L082099W1
Analyzed: 08/20/99
Units: mg/L

QC Batch: 082099W1
Number of analytes: 1

Parameter	LCS Result	Spike Added	%R	QC Limits	Instrument	Note
Mercury	.0044	.005	88	81-114	PE3100	

Notes:

- Outside control limits

O'Brien & Gere Laboratories,Inc.

Quality Control Summary Laboratory Control Sample Wet Chemistry

Sample: L082499W21
Analyzed: 08/24/99

QC Batch: 082499W21
Number of parameters: 1

Parameter	LCS Result	Spike Added	Units	%R	QC Limits	Instrument Note
Total cyanide	.3940	.4	mg/L	99	80-120	SPEC 21

Notes:

- Outside control limits

O'Brien & Gere Laboratories,Inc.

Quality Control Summary Laboratory Control Sample Wet Chemistry

Sample: L082699W21
Analyzed: 08/26/99

QC Batch: 082699W21
Number of parameters: 1

Parameter	LCS Result	Spike Added	Units	%R	QC Limits	Instrument Note
Total cyanide	.4380	.4	mg/L	110	80-120	SPEC 21

Notes:

- Outside control limits

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories,Inc.

Quality Control Summary
Preparation Blank
GC/MS Semivolatile Organics

Sample: PB082099W1
Analyzed: 08/20/99

Instrument: HP5973 GCMS#3
Number of analytes: 39

Parameter	Sample Result	Surrog Limits	Det. Limit	Units	QC Batch
Chloromethane	<1.		1	ug/L	082099W1
Vinyl chloride	<1.		1	ug/L	082099W1
Bromomethane	<1.		1	ug/L	082099W1
Chloroethane	<1.		1	ug/L	082099W1
Acetone	<10.		10	ug/L	082099W1
1,1-Dichloroethene	<.50		.5	ug/L	082099W1
Methylene chloride	<.50		.5	ug/L	082099W1
Carbon disulfide	J .12		.5	ug/L	082099W1
trans-1,2-Dichloroethene	<.50		.5	ug/L	082099W1
1,1-Dichloroethane	<.50		.5	ug/L	082099W1
2-Butanone	<10.		10	ug/L	082099W1
cis-1,2-Dichloroethene	<.50		.5	ug/L	082099W1
Bromochloromethane	<.50		.5	ug/L	082099W1
Chloroform	<.50		.5	ug/L	082099W1
1,2-Dichloroethane	<.50		.5	ug/L	082099W1
1,1,1-Trichloroethane	<.50		.5	ug/L	082099W1
Carbon tetrachloride	<.50		.5	ug/L	082099W1
Benzene	<.50		.5	ug/L	082099W1
1,2-Dichloropropane	<.50		.5	ug/L	082099W1
Trichloroethene	<.50		.5	ug/L	082099W1
Bromodichloromethane	<.50		.5	ug/L	082099W1
cis-1,3-Dichloropropene	<.50		.5	ug/L	082099W1
4-Methyl-2-pentanone	<5.0		5	ug/L	082099W1
trans-1,3-Dichloropropene	<.50		.5	ug/L	082099W1
1,1,2-Trichloroethane	<.50		.5	ug/L	082099W1
Toluene	<.50		.5	ug/L	082099W1
Dibromochloromethane	<.50		.5	ug/L	082099W1
2-Hexanone	<5.0		5	ug/L	082099W1
Tetrachloroethene	<.50		.5	ug/L	082099W1
Chlorobenzene	<.50		.5	ug/L	082099W1
Ethylbenzene	<.50		.5	ug/L	082099W1
Bromoform	<.50		.5	ug/L	082099W1
Xylene (total)	<.50		.5	ug/L	082099W1
Styrene	<.50		.5	ug/L	082099W1
1,1,2,2-Tetrachloroethane	<.50		.5	ug/L	082099W1
Dibromofluoromethane (surrogate)	92.	61-136	.1	%	082099W1
1,2-Dichloroethane-d4 (surrogate)	90.	80-135	.1	%	082099W1
Toluene-d8 (surrogate)	97.	84-114	.1	%	082099W1
Bromofluorobenzene (surrogate)	90.	77-117	.1	%	082099W1

Notes:

- Outside control limits J - Estimated value

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Tentatively Identified Compound (LSC) summary

Operator ID: MSV Date Acquired: 20 Aug 1999 8:30
Data File: C:\HPCHEM\1\DATA\J5382.D
Name: PB082099W1
Misc: V4587
Method: C:\HPCHEM\1\METHODS\J817TCLW.M (RTE Integrator)
Title: VOC's w/J & W DB-VRX: 0.25 mm x 60 m
Library Searched: C:\DATABASE\NBS75K.L

TIC Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc

J5382.D J817TCLW.M Mon Aug 30 08:51:24 1999

None detected

O'Brien & Gere Laboratories,Inc.

Quality Control Summary
Preparation Blank
GC/MS Volatile Organics

Sample: PB082499W1
Analyzed: 08/24/99

Instrument: HP5973 GCMS#3
Number of analytes: 39

Parameter	Sample Result	Surrog Limits	Det. Limit	Units	QC Batch
Chloromethane	<1.		1	ug/L	082499W1
Vinyl chloride	<1.		1	ug/L	082499W1
Bromomethane	<1.		1	ug/L	082499W1
Chloroethane	<1.		1	ug/L	082499W1
Acetone	<10.		10	ug/L	082499W1
1,1-Dichloroethene	<.50		.5	ug/L	082499W1
Methylene chloride	J .13		.5	ug/L	082499W1
Carbon disulfide	.65		.5	ug/L	082499W1
trans-1,2-Dichloroethene	<.50		.5	ug/L	082499W1
1,1-Dichloroethane	<.50		.5	ug/L	082499W1
2-Butanone	<10.		10	ug/L	082499W1
cis-1,2-Dichloroethene	<.50		.5	ug/L	082499W1
Bromochloromethane	<.50		.5	ug/L	082499W1
Chloroform	<.50		.5	ug/L	082499W1
1,2-Dichloroethane	<.50		.5	ug/L	082499W1
1,1,1-Trichloroethane	<.50		.5	ug/L	082499W1
Carbon tetrachloride	<.50		.5	ug/L	082499W1
Benzene	<.50		.5	ug/L	082499W1
1,2-Dichloropropane	<.50		.5	ug/L	082499W1
Trichloroethene	<.50		.5	ug/L	082499W1
Bromodichloromethane	<.50		.5	ug/L	082499W1
cis-1,3-Dichloropropene	<.50		.5	ug/L	082499W1
4-Methyl-2-pentanone	<5.0		5	ug/L	082499W1
trans-1,3-Dichloropropene	<.50		.5	ug/L	082499W1
1,1,2-Trichloroethane	<.50		.5	ug/L	082499W1
Toluene	<.50		.5	ug/L	082499W1
Dibromochloromethane	<.50		.5	ug/L	082499W1
2-Hexanone	<5.0		5	ug/L	082499W1
Tetrachloroethene	<.50		.5	ug/L	082499W1
Chlorobenzene	<.50		.5	ug/L	082499W1
Ethylbenzene	<.50		.5	ug/L	082499W1
Bromoform	<.50		.5	ug/L	082499W1
Xylene (total)	<.50		.5	ug/L	082499W1
Styrene	<.50		.5	ug/L	082499W1
1,1,2,2-Tetrachloroethane	<.50		.5	ug/L	082499W1
Dibromofluoromethane (surrogate)	100.	61-136	.1	%	082499W1
1,2-Dichloroethane-d4 (surrogate)	98.	80-135	.1	%	082499W1
Toluene-d8 (surrogate)	104.	84-114	.1	%	082499W1
Bromofluorobenzene (surrogate)	95.	77-117	.1	%	082499W1

Notes:

- Outside control limits J - Estimated value

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

Tentatively Identified Compound (LSC) summary

Operator ID: MSV Date Acquired: 24 Aug 1999 19:35
Data File: C:\HPCHEM\1\DATA\J5427.D
Name: PB082499W1
Misc: V4587
Method: C:\HPCHEM\1\METHODS\J824TCLW.M (RTE Integrator)
Title: VOC's w/J & W DB-VRX: 0.25 mm x 60 m
Library Searched: C:\DATABASE\NBS75K.L

TIC Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc
Sulfur dioxide	5.49	2.7	ug/L	1195530	ISTD01	14.37	4508640	10.0

J5427.D J824TCLW.M Mon Aug 30 09:14:55 1999

O'Brien & Gere Laboratories, Inc.

Quality Control Summary
Preparation Blank
Trace Metals

Sample: PB081999W1
Units: mg/L
Date analyzed: 08/25/99

QC Batch: 081999W1
Number of analytes: 26

Parameter	Sample Result	Det. Limit	Instrument	Note
Aluminum	<.1	.1000	ICAP-61	
Antimony	<.005	.0050	ICAP-61	
Arsenic	<.005	.0050	ICAP-61	
Barium	<.02	.0200	ICAP-61	
Beryllium	<.003	.0030	ICAP-61	
Boron	<.05	.0500	ICAP-61	
Cadmium	<.001	.0010	ICAP-61	
Calcium	<.1	.1000	ICAP-61	
Chromium	<.01	.0100	ICAP-61	
Cobalt	<.025	.0250	ICAP-61	
Copper	<.01	.0100	ICAP-61	
Iron	<.05	.0500	ICAP-61	
Lead	<.005	.0050	ICAP-61	
Magnesium	<.3	.3000	ICAP-61	
Manganese	<.01	.0100	ICAP-61	
Molybdenum	<.05	.0500	ICAP-61	
Nickel	<.05	.0500	ICAP-61	
Selenium	<.005	.0050	ICAP-61	
Silver	<.01	.0100	ICAP-61	
Sodium	<.3	.3000	ICAP-61	
Strontium	<.05	.0500	ICAP-61	
Thallium	<.005	.0050	ICAP-61	
Tin	<.05	.0500	ICAP-61	
Titanium	<.05	.0500	ICAP-61	
Vanadium	<.05	.0500	ICAP-61	
Zinc	<.01	.0100	ICAP-61	

Notes:

J - Estimated value

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories,Inc.

Quality Control Summary Preparation Blank Trace Metals

Sample: PB081699W1
Units: mg/L
Date analyzed: 08/20/99

QC Batch: 081699W1
Number of analytes: 1

Parameter	Sample Result	Det. Limit	Instrument	Note
Thallium	<.001	.0010	PE5100	

Notes:

J - Estimated value

O'Brien & Gere Laboratories,Inc.

Quality Control Summary Preparation Blank Trace Metals

Sample: PB081999W2
Units: mg/L
Date analyzed: 08/27/99

QC Batch: 081999W2
Number of analytes: 1

Parameter	Sample Result	Det. Limit	Instrument	Note
Thallium	<.001	.0010	PE5100	

Notes:

J - Estimated value

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

O'Brien & Gere Laboratories,Inc.

Quality Control Summary Preparation Blank Trace Metals

Sample: PB082099W1
Units: mg/L

QC Batch: 082099W1
Number of analytes: 1

Parameter	Sample Result	Det. Limit	Analyzed	Instrument	Note
Mercury	<.0002	.0002	08/20/99	PE3100	

Notes:

J - Estimated value

O'Brien & Gere Laboratories, Inc.

Quality Control Summary
Preparation Blank
Wet Chemistry

Sample: PB082699W21
Analyzed: 08/26/99
Number of analytes: 1

Parameter	Sample Result	Det. Limit	Units	QC Batch	Instrument Note
Total cyanide	<.01	.0100	mg/L	082699W21	SPEC 21

Notes:

J - Estimated value

O'Brien & Gere Laboratories,Inc.

Quality Control Summary
Preparation Blank
Wet Chemistry

Sample: PB082499W21
Analyzed: 08/24/99
Number of analytes: 1

Parameter	Sample Result	Det. Limit	Units	QC Batch	Instrument Note
Total cyanide	<.01	.0100	mg/L	082499W21	SPEC 21

Notes:

J - Estimated value

O'BRIEN & GERE Laboratories, Inc.

Volatile Organics Method 8260

Internal Standard Summary

Client:	Frontier	**CCC Data File:**	J5380.D	**Inst. I.D.:**	MS#3
Job No.:	5829.001.517	**Date Analyzed:**	8/20/99	**Matrix:**	Water
Site:	Niagara Co.				

		ISTD 1			ISTD 2			ISTD 3		
		Area	Q	R.T.	Area	Q	R.T.	Area	Q	R.T.
J5380.D	CCC	999682		14.37	422098		19.80	147867		25.01
Upper Limit		1999364		14.87	844196		20.30	295734		25.51
Lower Limit		99968.2		13.87	42209.8		19.30	14786.7		24.51
Data File	Sample No.									
J5381.D	L082099W1	975904		14.37	417364		19.79	149429		25.01
J5382.D	PB082099W1	902348		14.37	336698		19.80	134314		25.01
J5383.D	M9541	993628		14.36	347099		19.79	144038		25.00
J5384.D	M9542	476622		14.37	183481		19.80	81034		25.01
J5385.D	M9543	511854		14.37	191543		19.80	83362		25.01
J5386.D	M9544	800488		14.37	316074		19.80	125184		25.01
J5387.D	M9545	311944		14.37	123087		19.80	53552		25.01
J5388.D	M9546	360463		14.37	146616		19.80	59177		25.01
J5389.D	M9547	555938		14.38	234500		19.80	87396		25.01
J5390.D	M9548	525257		14.37	216159		19.80	78237		25.01
J5391.D	M9700	613224		14.37	258441		19.80	94834		25.01
J5392.D	M9701	560719		14.39	237724		19.80	88011		25.01
J5393.D	M9702	637313		14.38	280330		19.80	92395		25.01

ISTD 1 Fluorobenzene
ISTD 2 Chlorobenzene-d5
ISTD 3 1,4-Dichlorobenzene-d4

Q Column to be used to flag values outside QC limit with an asterisk.
* Value outside of required QC limits.

O'BRIEN & GERE Laboratories, Inc.

Volatile Organics Method 8260

Internal Standard Summary

Client:	Frontier	**CCC Data File:**	J5423.D	**Inst. I.D.:**	MS#3
Job No.:	5829.001.517	**Date Analyzed:**	8/24/99	**Matrix:**	Water
Site:	Niagara Co.				

		ISTD 1			ISTD 2			ISTD 3		
		Area	Q	R.T.	Area	Q	R.T.	Area	Q	R.T.
J5423.D	CCC	2241667		14.37	1066364		19.80	374203		25.01
Upper Limit		4483334		14.87	2132728		20.30	748406		25.51
Lower Limit		224166.7		13.87	106636.4		19.30	37420.3		24.51
Data File	Sample No.									
J5427.D	PB082499W1	2135568		14.37	880121		19.80	262692		25.01
J5428.D	L082499W1	1268852		14.37	558869		19.79	177383		25.01
J5429.D	D082499W1	1326983		14.37	589252		19.80	187632		25.01
J5430.D	M9549	2247982		14.37	935265		19.80	281662		25.01
J5431.D	M9703	2312249		14.36	968984		19.78	280473		25.00
J5432.D	M9541RE	2189836		14.36	898031		19.79	250039		25.00
J5433.D	M9543MS	1535430		14.36	705035		19.77	223786		25.00
J5434.D	M9543MSD	1156696		14.36	522587		19.79	167478		25.01
J5412.D	M9704	1879092		14.37	749185		19.80	256596		25.01

ISTD 1 Fluorobenzene
ISTD 2 Chlorobenzene-d5
ISTD 3 1,4-Dichlorobenzene-d4

Q Column to be used to flag values outside QC limit with an asterisk.
* Value outside of required QC limits.

Chain of Custody

External Chain of Custody

O'Brien & Gere Laboratories, Inc.

5000 Brittonfield Parkway
East Syracuse, New York 13057
(315) 437-0200

Chain of Custody

Client: Frontier Chemical

Project: Pendleton N.Y. # 24532

Sampled by: T. Prawel

Client Contact: J. Burns Phone #

Sample Description

Sample Location	Date Collected	Time Collected	Sample Matrix	Comp. or Grab	No. of Containers	Analysis/Method: VOC's EPA 8260	TAL Metals EPA 6010/7470	CN EPA 9010					Comments
88-12C	8/11/99	1515	Water	Grab	5	3	1	1					
88-12D	8/11/99	1635	Water	Grab	5	3	1	1					
URS-14D	8/12/99	900	Water	Grab	5	3	1	1					
URS-14D MS/MSD	8/12/99	900	Water	Grab	10	6	2	2					
URS-9D	8/12/99	1110	Water	Grab	5	3	1	1					
URS-9I	8/12/99	1200	Water	Grab	5	3	1	1					
85-7R	8/12/99	1445	Water	Grab	5	3	1	1					
URS-7D	8/12/99	1505	Water	Grab	5	3	1	1					
X-1	—	—	Water	Grab	5	3	1	1					
Trip Blanks	8/11/99	—	Wat	←	2	2							

Relinquished by:	Date: 8/12/99	Time: 1635	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by Lab: Mark F. Jackson	Date: 8/13/99	Time: 09:20

Shipment Method: FED-EX

Airbill Number: 808963124642
808963124653

Turnaround Time Required:

Routine_____

Rush (Specify)_____

Comments: *Metals - Field Filtered

Cooler Temperature: 4°C

Original-Laboratory Copy-Client

97

O'Brien & Gere Laboratories, Inc.

5000 Brittonfield Parkway
East Syracuse, New York 13057
(315) 437-0200

Chain of Custody

2911

Client: Frontier Chemical
Project: Pendleton, New York
Sampled by: T. Prawel, D. Canestrari
Client Contact: John Buens Phone #

Sample Description

Sample Location	Date Collected	Time Collected	Sample Matrix	Comp. or Grab	No. of Containers	VOC's EPA 8260	TAL Metals 6010/7470	CN 9010					Comments
85-5R	8/13/99	950	Water	Grab	5	3	1*	1					
URS-5D	8/13/99	1000	Water	Grab	5	3	1	1					
URS-14I	8/13/99	1035	Water	Grab	5	3	1	1					
Equipment Blank	8/13/99	1100	Wat	Grab	5	3	1	1					
Trip Blank	8/13/99	—	Wat	Grab	2	2							

Relinquished by: [signature]	Date: 8/13/99	Time: 1250	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by Lab: Mark F. Jackson	Date: 8/16/99	Time: 07 00
Shipment Method: FED - Ex.			Airbill Number: 808963124631		

Turnaround Time Required:
Routine__________
Rush (Specify)__________

Cooler Temperature: 3°C

Comments: * Metals Field Filtered
* Equip Blank CN, used Organic Free H_2O

Original-Laboratory Copy-Client

SAMPLE CONTROL RECORD

CLIENT: Frontier Chemical JOB #: 5829.001.517 DATE RECEIVED: 08/13/99

package #: 2892 PROJECT MANAGER: TAA SAMPLE NUMBER(S): M9541 → 9557

Laboratory Sample Number	Removed By	Date and Time Removed	Reason	Date and Time Returned
M9541-57 43MS, MSD	[signature]	8-20-99	8260	Consumed in full
m9550-57	D. ROBERTS	8-19-99 10:00	ICP DIG	8-19-99 12:30
M9541, 43MS, MSD	[signature]	8-23-99 1400	8260	Consumed in full
M9543	D. Saint Amour	8-26-99 0800	CN	
M9541-42, 44-48	[signature]	8/24/99 8:00	Cyanide	8/24/99 13:00
M9550-57	L. Bonner	8-20-99 8:00	Hg Dig	8-20-99 9:00
M9550-57	L. Bonner	8-16-99 8:00	GFAA Dig	8-16-99 9:00

O'BRIEN & GERE LABORATORIES, INC.

SUBJECT	SHEET	BY	DATE	JOB NO
Frontier Chemical		MBJ	8/13/99	5829-001 517

FedEx USA Airbill

FedEx Tracking Number 808953124642

Form ID No. 0210 **Recipient's Copy**

1 From
Date 8/12/99 [redacted]
Sender's Name T. Canestrari Phone (7 ...
Company O'BRIEN & GERE ENGR INC
Address 5500 MAIN ST STE 301 Dept./Floor/Suite/Room
City WILLIAMSVILLE State NY ZIP ...

2 Your Internal Billing Reference Information 24532

3 To
Recipient's Name Clem Alexander Phone (315) 431-6100
Company O'Brien & Gere Operations
☐ Check here if residence (Extra charge applies for FedEx Express Saver)
Address 5000 Brittonfield Pkwy. Dept./Floor/Suite/Room
(To HOLD at FedEx location, print FedEx address here)
City E. Syracuse State NY ZIP 13057

For HOLD at FedEx Location check here
☐ Hold Weekday (Not available with FedEx First Overnight)
☐ Hold Saturday (Not available at all locations) (Available for FedEx Priority Overnight and FedEx 2Day only)

For WEEKEND Delivery check here (Extra Charge. Not available at all locations)
☐ Saturday Delivery (Available for FedEx Priority Overnight and FedEx 2Day only)
☐ NEW Sunday Delivery (Available for FedEx Priority Overnight only)

8 0 8 9 5 3 1 2 4 6 4 2

4a Express Package Service *Packages under 150 lbs.* Delivery commitment may be later in some areas.
☒ FedEx Priority Overnight (Next business morning)
☐ FedEx Standard Overnight (Next business afternoon)
☐ FedEx First Overnight (Earliest next business morning delivery to select locations) (Higher rates apply)
☐ FedEx 2Day (Second business day)
☐ FedEx Express Saver (Third business day)
FedEx Letter Rate not available. Minimum charge: One pound rate

4b Express Freight Service *Packages over 150 lbs.* Delivery commitment may be later in some areas.
☐ FedEx Overnight Freight (Next business day)
☐ FedEx 2Day Freight (Second business day)
☐ FedEx Express Saver Freight (Up to 3 business days)
(Call for delivery schedule. See back for detailed descriptions of freight services.)

5 Packaging
☐ FedEx Letter ☐ FedEx Pak (Declared value limit $500) ☐ FedEx Box ☐ FedEx Tube ☒ Other Pkg

6 Special Handling
(One box must be checked)
Does this shipment contain dangerous goods? ☒ No ☐ Yes (As per attached Shipper's Declaration) ☐ Yes (Shipper's Declaration not required)
☐ Dry Ice Dry Ice, 9, UN 1845 ____ x ____ kg
☐ Cargo Aircraft Only
*Dangerous Goods cannot be shipped in FedEx packaging

7 Payment
Bill to: ☒ Sender (Account No. in Section 1 will be billed) ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check
☐ Obtain Recipient FedEx Account No.
(Enter FedEx Account No. or Credit Card No. below)
[redacted]

Total Packages	Total Weight	Total Declared Value*	Total Charges
1	49	$ .00	$

*When declaring a value higher than $100 per shipment, you pay an additional charge. See SERVICE CONDITIONS, DECLARED VALUE, AND LIMIT OF LIABILITY section for further information.

Credit Card Auth.

8 Release Signature

Your signature authorizes Federal Express to deliver this shipment without obtaining a signature and agrees to indemnify and hold harmless Federal Express from any resulting claims.

Questions?
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100

O'BRIEN & GERE LABORATORIES, INC.
CASE FILE FORM

O'BRIEN & GERE LABORATORIES, INC.

PROGRAM INFORMATION

Client : Frontier Div. ____ Job No. 5829.001.517

Program : ____

Custody Seal : X Intact ____ Not Intact ____ NA

AFTER HOURS CUSTODY

RELINQUISHED BY:	DATE	TIME	RECEIVED BY SECURITY GUARD:	DATE:	TME:
[signature]	8-14-99	9:41	[signature]	8/14	9:45
RELINQUISHED BY SECURITY GUARD TO COOLER:	DATE	TIME	RECEIVED BY SAMPLE CUSTODIAN:	DATE:	TME:
[signature]	8/14	952	Marlo F. Jackson	8/16/99	07:00

COMMENTS/DISCREPANCY:

Cooler found intact in a secured walkin cooler

Cooler temp 3°C

RESOLUTION/CLIENT COMMENT:

Signed: Marlo F. Jackson QA/QC Approval: [signature]

Date: 8/16/99 Signed: [signature]

Date: 9.14.99

O'BRIEN & GERE LABORATORIES, INC. an O'Brien & Gere Company
5000 Brittonfield Parkway / P.O. Box 4942 / Syracuse, NY 13221 / (315) 437-0200 FAX (315) 463-7554

SAMPLE CONTROL RECORD

CLIENT: Frontier Chemical JOB #: 5829 001 517 DATE RECEIVED: 8/14/99

package #: 2911 PROJECT MANAGER: TAA SAMPLE NUMBER(S): M 9700 → 9708

Laboratory Sample Number	Removed By	Date and Time Removed	Reason	Date and Time Returned
M9700-04	[signature]	8-20-99	8260	Consumed in full
19705-08	D. ROBERTS	8·19·99 10:00	GFAA DIG, ICP DIG	~~NO~~ 8·19·99 12:30
M9703,04	[signature]	8-23-99	8260	Consumed in full
M9700-03	[signature]	8/24/99 8:00	Cyanides	8/24/99 13:00
19705-08	L. Bonner	8-20-99 8:00	Hg Dig	8-20-99 9:00

FedEx *USA Airbill* FedEx Tracking Number 808963124631

Form ID No. 0210 **Recipient's Copy**

1 From

Date 8/13/99

Sender's Name D. Constantino Phone (716) [illegible]

Company O'BRIEN & GERE ENGR INC

Address 5500 MAIN ST STE 201 Dept./Floor/Suite/Room

City WILLIAMSVILLE State NY ZIP [illegible]

2 Your Internal Billing Reference Information 21220

3 To

Recipient's Name Tim Alexander Phone (2[illegible]) 437-6100

Company O'Brien + Gere Technologies

Address 5000 Brittonfield Pkwy. Dept/Floor/Suite/Room

(To "HOLD" at FedEx location, print FedEx address here)

☐ Check here if residence (Extra charge applies for FedEx Express Saver)

City East Syracuse State NY ZIP 13057

For HOLD at FedEx Location check here

☐ **Hold Weekday** (Not available with FedEx First Overnight)

☐ **Hold Saturday** (Not available at all locations) (Available for FedEx Priority Overnight and FedEx 2Day only)

For WEEKEND Delivery check here (Extra Charge. Not available at all locations)

☒ **Saturday Delivery** (Available for FedEx Priority Overnight and FedEx 2Day only)

☐ **NEW Sunday Delivery** (Available for FedEx Priority Overnight only)

808963124631

4a Express Package Service *Packages under 150 lbs.* Delivery commitment may be later in some areas

☒ FedEx Priority Overnight (Next business morning)

☐ FedEx Standard Overnight (Next business afternoon)

☐ FedEx First Overnight (Earliest next business morning delivery to select locations) (Higher rates apply)

☐ FedEx 2Day (Second business day)

☐ FedEx Express Saver (Third business day)

FedEx Letter Rate not available. Minimum charge: One pound rate.

4b Express Freight Service *Packages over 150 lbs.* Delivery commitment may be later in some areas

☐ FedEx Overnight Freight (Next business day)

☐ FedEx 2Day Freight (Second business day)

☐ FedEx Express Saver Freight (Up to 3 business days)

(Call for delivery schedule. See back for detailed descriptions of freight services.)

5 Packaging

☐ FedEx Letter ☐ FedEx Pak (Declared value limit $500) ☐ FedEx Box ☐ FedEx Tube ☒ Other Pkg.

6 Special Handling (One box must be checked)

Does this shipment contain dangerous goods?*

☒ No ☐ Yes (As per attached Shipper's Declaration) ☐ Yes (Shipper's Declaration not required)

☐ Dry Ice Dry Ice, 9, UN 1845 _____ x _____ kg

☐ Cargo Aircraft Only

*Dangerous Goods cannot be shipped in FedEx packaging

7 Payment ☐ Obtain Recipient FedEx Account No

Bill to: ☒ Sender (Account No. in Section 1 will be billed) ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check

(Enter FedEx Account No. or Credit Card No. below)

Total Packages	Total Weight	Total Declared Value*	Total Charges
1		$ .00	$

* When declaring a value higher than $100 per shipment, you pay an additional charge. See SERVICE CONDITIONS, DECLARED VALUE, AND LIMIT OF LIABILITY section for further information.

Credit Card Auth. _____

8 Release Signature

Your signature authorizes Federal Express to deliver this shipment without obtaining a signature and agrees to indemnify and hold harmless Federal Express from any resulting claims

Questions?
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O'BRIEN & GERE LABORATORIES, INC.

SUBJECT: Frontier Chemical

SHEET

BY: DWS

DATE: 8/16/99

JOB NO.: 5829.001.517

Internal Chain of Custody

ICP METALS SAMPLE CONTROL LOG

QC Batch #: 081999 W1 Date Digested: 8/19/99

Client/Job Number	Laboratory Sample Number Range	Laboratory Sample Numbers Removed	Removed by	Date Removed	Time Removed	Time Returned
FRONTIER CHEMICAL 5829-001-517	M9550 - 57 M9705 - 08	M9550-57, M9705-08	C. Tran	8/25/99	9:30 AM	13:00 PM
		M9550-57, M9705-08	C. Tran	8/30/99	9:00 AM	11:30 AM

FURNACE METALS SAMPLE CONTROL LOG

QC Batch #: 081699C01 **Date Digested:** 8/16/99

Client/Job Number	Laboratory Sample Number Range	Laboratory Sample Numbers Removed	Removed by	Date Removed	Time Removed	Time Returned
FRONTIER CHEMICAL J829-001-517	M9550 – 57	M9550 – 57	C. Trau	8/20/99	10:00 AM	14:00 PM

FURNACE METALS SAMPLE CONTROL LOG

QC Batch #: 081999c02 **Date Digested:** 8/19/99

Client/Job Number	Laboratory Sample Number Range	Laboratory Sample Numbers Removed	Removed by	Date Removed	Time Removed	Time Returned
FRONTIER CHEMICAL 5829-001-517	M9705-08	M9705-08	C. Tran	8/20/99	10:00 AM	14:00 PM

ATTACHMENT D

Attachment D – Site Maintenance Work Items and Field Observation Reports

D-1 Field Observation Reports

Field Observation Reports

- August 4, 1999, Field Observation Report

GLYNN GEOTECHNICAL ENGINEERING
GEOTECHNICAL AND CIVIL ENGINEERING SERVICES

LETTER OF TRANSMITTAL

TO:

Pendleton PRP Group
P. O. Box 248
1186 Lower River Road
Charleston, Tennessee 37310

DATE:	August 5, 1999
ATTENTION:	Mr. John Burns
SUBJECT:	Pendleton (Frontier Chemical) Site Remediation
GGE PROJECT NO:	94-1014-0

WE ARE SENDING ATTACHED:

- [ ] LABORATORY TEST DATA
- [ ] FIELD TEST DATA
- [X] REPORT
- [ ] ENGINEERING DRAWINGS
- [ ] _____

COPIES	DATE	REPORT NO.	DESCRIPTION
1	8.4.99	99-02	Field Observation Report

THESE ARE BEING SENT:

- [X] FOR YOUR USE
- [ ] PER YOUR REQUEST
- [ ] _____

SINCERELY,
GLYNN GEOTECHNICAL ENGINEERING

Jesse E. Grossman, P.E.
Project Manager

DISTRIBUTION

Jen Smith - O'Brien & Gere

DOCFILE:ggeltr.xls RL
6503 Campbell Blvd., Lockport, New York 14094 (716) 625-6933 / fax (716) 625-6983

GLYNN GEOTECHNICAL ENGINEERING
GEOTECHNICAL AND CIVIL ENGINEERING SERVICES

FIELD OBSERVATION REPORT

PROJECT NO.: 94-1014-O REPORT NO.: 99-02 DATE: 4-Aug-99 PAGE: 1 OF 1

PROJECT: Pendleton (Frontier Chemical) Site Remediation DAY: Wednesday

SUBJECT: Semi-Annual Site Inspection PROJECT TIME: 9:15 am - 11:15 pm

CLIENT: Pendleton Site PRP Group SITE TIME: 9:30 am - 11:00 am

WEATHER: Warm, Overcast, Int. Rain (70° F) PHOTOS: YES NO X

- Meet Olin and NYSDEC representatives on site for Semi-Annual site inspection. Site inspection limited due to rain.
- Record Quarry Lake water surface elevation via level survey. The water surface elevation is 577.60'.
- With Olin reps. Open wet well and operate collection drain pinch valve, fully closing valve and noting flow stoppage then returning valve to fully opened. Note the presence of active wasp nests beneath well cover.
- With Olin and NYSDEC reps. inspect pre-treatment vault. Olin discusses ongoing system operations with NYSDEC reps. Olin notes that the typical daily discharge rate is approx. 100 gpd, however discharge spikes in the range of 400 gpd are noted immediately coincidental with precipitation / snow melt events. Olin suspects that runoff is entering the collection system via standpipe risers and/or manholes. Olin reports that a response is being prepared relative to Y2K compliance through O'B&G.
- Olin reps. discuss ongoing sampling routine with NYSDEC reps. as well as filter change out frequencies, GAC bed lifespan, etc.
- Note that vault roof is leaking from the mid-vault joint on the lakeside of the vault when it rains. From the top of the vault note that joint is slightly misaligned and mastic sealant is disturbed.
- Briefly observe capped area. Cap vegetation is in good condition. A small rodent hole is noted near the east end of the cap.
- Olin reports that wetland plantings on the north side of the lake were damaged by geese and didn't take well. However, wetland plant species are naturally well established along other lake shore areas. Olin will coordinate a wetlands inspection with the NYSDEC.
- Olin notes that the semi-annual sample collection event by O'B&G is scheduled for next week.

PERSONNEL ON SITE / CONTACTED:
John Burns, Ben Brailey - Olin
Abul Barkat, Brian Sedowski - NYSDEC

DISTRIBUTION:
John Burns - PPRP
Jen Smith - O'B&G

Man-hours: 2.0

REPORTED BY: Jesse E. Grossman, P.E., Project Manager

REVIEWED BY: Mark W. Glynn, P.E.

DOCFILE:99FOR.xls9902

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ATTACHMENT E

Attachment E – Year 2000 Reports

- E-1 Year 2000 Reports, Manufacturer Correspondence

Year 2000 Reports

- Year 2000 Manufacturer Correspondence

To: Steve Anagnost (71)
From: Phil DuChene (58)
Re: Pendleton Y2K Issues
File: 5829/24532 #3
Date: August 16, 1999

cc: Jennifer Smith (71)

As you are aware, there are three instruments at the Pendleton Site that may potentially be affected by Y2K issues. We have contacted each of the manufacturers and have received the following responses:

1. ISCO 3700FR/3720 Sampler: This unit has a 2 digit date readout, no control, and assumes century (i.e., 99 = 1999, 00 = 2000, etc.). Refer to attached information from manufacturer. *(Also – we understand this sampler is no longer in service)*

2. Honeywell DR4500 Recorder: This unit has a 2 digit date readout with no control features. It will rollover from 99 to 00 automatically. See attached information from manufacturer.

3. RACO Verbatim Autodialer – No response yet. We again contacted the manufacturer on 8/11/99.

FAX MESSAGE

Isco, Inc., P.O. Box 82531, Lincoln, NE 68501
F.ax: (402) 464-0318
Phone: (402) 464-0231
(800) 288-4250

Fax to:	Phil DuChene, O'Brien & Gere Engineers Inc.
Fax:	315 463 7554
From:	A.G. Craske
Date:	August 5, 1999
Subject:	Year 2000

Thank you for your interest in Isco's preparedness for the computer issues that revolve around the year 2000.

The attached document covers the broad range of Isco products and contains answers for almost all questions that have been raised by our customers about "Y2K".

If additional information is required, please contact us directly:

USA call: (800) 228-4250 or (402) 464-0231
International: call (402) 464-0231

You can also find additional specific product information on the Isco web pages at: www.isco.com.

Sincerely,

A.G. "Skip" Craske
Vice President, Sales & Marketing

Appendix B

PRODUCT LINE YEAR 2000 COMMENTS

Samplers

• Model 6700	Compliant with Isco standards through Year 2045.
• Models 3700, 3710, 6000, 6100 VOC, GLS	Compliant with Isco standards. Two-digit assumes century in reports.
• Models 2100, 2700, 2710, 2900, 2910, 1580, 1680, 701, 710, 720,730, 750	Does not apply, no real time clock.
• PAL	Compliant with Isco standards. Two-digit year assumes century in reports.
• Samplink	Does not comply with Isco standards. Operational range years 1997-2017. Fails for dates after February, 2018.

Flow Meters

• Models 4210, 4220, 4230, 4250	Complies to Isco standards with exception. some reports fail if the time interval spans the century mark. Reports ending before or after the century mark are acceptable for dates prior to Year 2045.
• Models 4110, 4120, 4150, 4402 4501	Compliant with Isco standards. Operational range years 1997-2045.
• Models 2870, 3010, 3020 201, 4401, 4404, 674 Rain Gauge	Not applicable. No real time clock.
• Models 3210, 3220, 3230	Discontinued products, not compliant with Isco standards. Work to Dec. 31, 1999.
• 675 Rain Gauge	Compliant with Isco standards.

Honeywell

Industrial Automation and Control
Honeywell Inc.
16404 North Black Canyon Highway
Phoenix, Arizona 85023

602 313-5000

08/05/99

Phil DuChene
O'Brien & Gere Engineers, Inc
5000 Brittonfield Pathoway
Syracuse NY 1321

Dear Phil:

First of all let us thank you and your organization for choosing Honeywell and our products. In reference to your questions concerning Year 2000 readiness of Honeywell products, please find enclosed the most up-to-date information. Included is a copy of the Honeywell matrix listing numerous products and their Year 2000 ready status, as well as phone numbers for contacts, updates and other concerns.

Honeywell updates the Product Readiness Matrix periodically, therefore we encourage you to access our internet site http://www.honeywell.com/year2000/iac/readiness.stm, for the latest up-to-date information.

Per our Honeywell matrix, the DR4500 Recorders (Truline) lists a Readiness Status of Y; processes dates and is Year 2000 ready. This applies to all member of the DR 4500 Truline family. This product only supports the date function with the last two digits of the year (i.e. 1999=99). This product does rollover properly to 00.

We will be updating our Customer Contact Database with your information. If you need to contact us again, please state that you are a repeat caller, so we may address your current issues and update your company file.

If you need further assistance please contact us at 1-800-972-6954.

Regards,

Year 2000 Program Office

sscy2k@iac.honeywell.com

"YEAR 2000 READINESS DISCLOSURE"

From: Jennifer L Smith
To: gwia: "jmburns@corp.olin.com"
Date: 8/24/99 11:43AM
Subject: Pendleton - Y2K Compliance

Hi John,

We received information back from RACO, the manufacturer of the autodialer at the Pendleton Site. RACO stated that the RACO Verbatim Autodialer in use at the Pendleton Site is Y2K compliant and that there should be no problems with the autodialer. Please feel free to call me if you have any questions or comments.

Thank you,
Jen

CC: Anagnost, Steve