Olin

P. O. BOX 248, 1186 LOWER RIVER ROAD, NW, CHARLESTON, TN 37310-0248

(423) 336-4000 FAX: (423) 336-4183

October 27, 2000

VIA AIRBORNE EXPRESS

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

Subject: Frontier Chemical - Pendleton Site, Pendleton, New York
Order on Consent (#B9-0270-89-05)
September 2000, Semi-Annual Report #7
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.

↳ or at home if really important jmburns64@aol.com

Sincerely,

Pendleton PRP Group

John Burns
MAB

John M. Burns
Chairman, Technical Committee

Distribution

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2030 Dow Center
Midland, MI 48674

Table of Contents
Semi-Annual Report #5
September 2000

==========

Attachments

Introduction

This seventh 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 2000 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 and initial wetland inspections were performed on August 9, 2000. The inspection reports are included in this report as Attachment D and E, respectively.

   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, O'Brien & Gere, 1997.

   Included in Attachment B are the operation and maintenance activities performed during this reporting period. The activities include monthly submittals to the Niagara Country Sewer District #1 detailing analytical and discharge flow data. Six months (April 2000 September 2000) of submittals are located in Table 2-1.

Table 2-1 Niagara County Sewer District #1 Submittals

Submittal Date	Sampling Date
September 10,2000	August 10, 2000
August 10, 2000	July 6, 2000
July 11, 2000	June 2, 2000
June 10, 2000	May 5, 2000
May 10, 2000	April 7, 2000
April 10. 2000	March 2, 2000

   Operation, Maintenance, and Monitoring Activities for the site during this reporting period are summarized in Table 2-2.

3. Regarding performance of a ground water monitoring program, the report "Frontier Chemical - Pendleton Site, Semi-Annual Ground Water Monitoring Report" dated September 2000 is included as Attachment C-2.

   The main purpose of the groundwater monitoring program is to monitor on-site and off-site groundwater condition and to verify that an inward hydraulic gradient is occurring within the capped area and to evaluate the operation, maintenance, and monitoring activities and identify proposed

changes to the O&M Manual or site procedures and policies which would provide a safer and/or more cost-effective operation.

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.

Conclusions

The work performed during this reporting period, April 2000 to September 2000 were reviewed and found to be in accordance with the approved O&M Manual for the Site.

Attachment A

Attachment A – Quarry Lake Level Plot versus Time
Quarry Lake Level – August 9, 2000

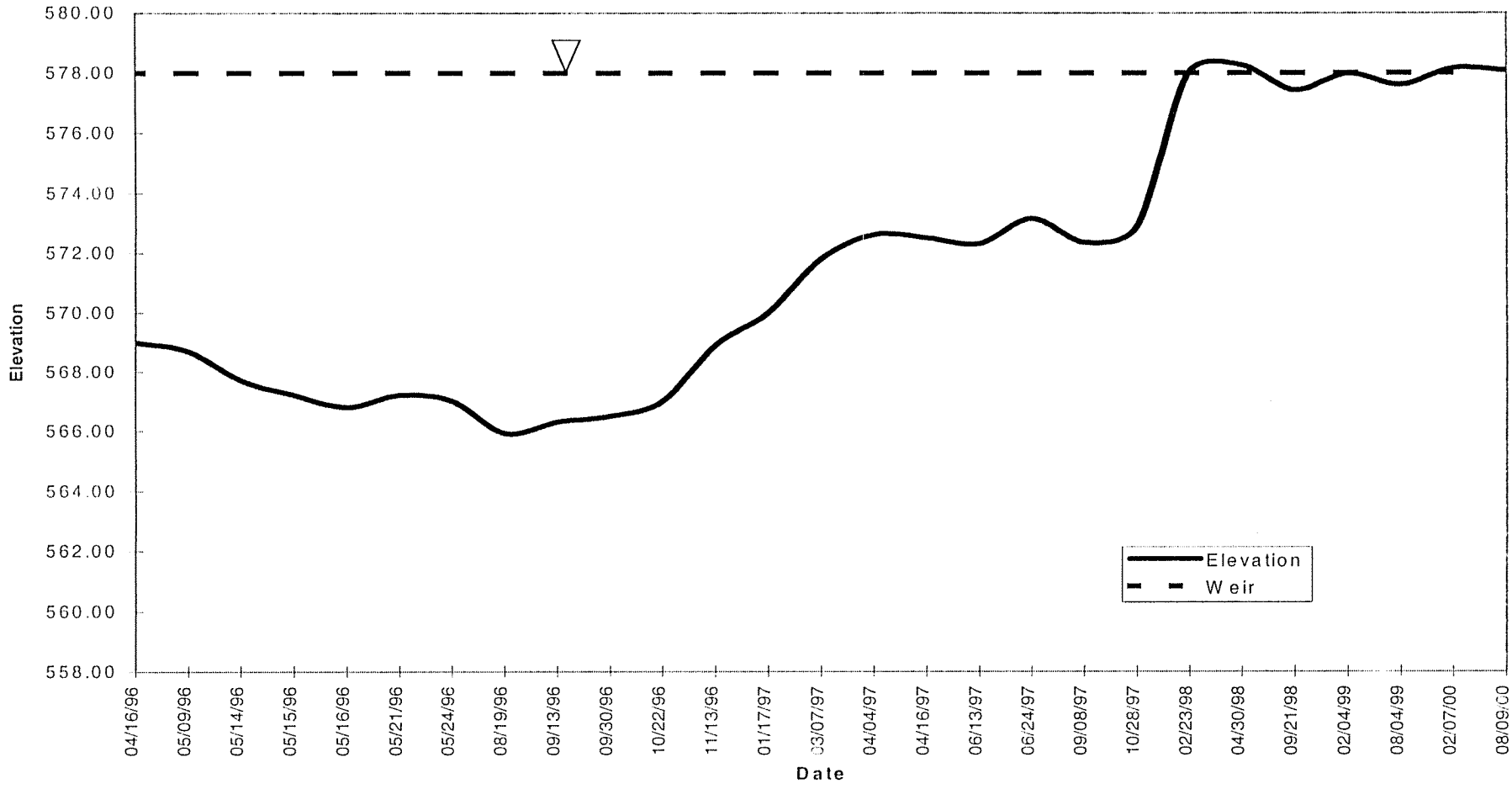
Quarry Lake Level – August 9, 2000

- 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
2/7/00	578.16
8/9/00	578.07

CHART A-1
QUARRY LAKE WATER LEVELS



Attachment B

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

B-1 Niagara County Sewer District #1 Submittals

B-2 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
September 10,2000	August 10, 2000
August 10, 2000	July 6, 2000
July 11, 2000	June 2, 2000
June 10, 2000	May 5, 2000
May 10, 2000	April 7, 2000
April 10. 2000	March 2, 2000

FILE COPY

April 10, 2000 **VIA AIRBORNE EXPRESS**

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

Subject: Analytical Sampling Results (3/2/2000 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 March 2, 2000, 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
For the Frontier Chemical - Pendleton Site PRP Group

Enclosures: as stated

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Pittsburgh, CA 94565

March 2000 Analytical Summary for WS 001
Permit # 98-11
Groundwater Discharge Point: D 002

375,622 Gallons Discharged Prior To 3/2/00
4,506 Gallons Since Last Report
161 Average Daily Flow Based on 28 days Between Samples

Parameters Treatment System Discharge	Permit Limit GPD	Detection Limits	3/2/00 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		
beta BHC	20.0		
delta BHC	10.0		
gamme BHC	10.0		
Heptachlor	8.0		
Aldrin	8.0		
Heptachlor Epoxide	9.0		
4,4-DDE	20.0		
Methoxychlor	18.0		
Metals	mg/L	mg/L	mg/L
Antimony	0.1	0.009	< 0.009
Boron	4.00	0.012	0.295
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	0.012
TSS	300	4.000	< 4.000

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

DAILY FLOW DATA - PENDLETON SITE
MARCH 2000

DATE	TOTALIZER READING	DAILY FLOW	COMMENTS
3/1/00	372429	102.0	
3/2/00	372575	146.0	Average Flow & Sampling
3/3/00		16.3	Average Flow
3/4/00		16.3	Average Flow
3/5/00	372624	16.3	Average Flow
3/6/00	372726	102.0	
3/7/00	372776	50.0	
3/8/00	372825	49.0	
3/9/00	372875	50.0	
3/10/00		51.3	Average Flow
3/11/00		51.3	Average Flow
3/12/00		51.3	Average Flow
3/13/00	373080	51.3	
3/14/00	373283	203.0	
3/15/00	373389	106.0	
3/16/00	373813	424.0	
3/17/00		140.7	Average Flow
3/18/00		140.7	Average Flow
3/19/00	374235	140.7	Average Flow
3/20/00	374284	49.0	
3/21/00	374385	101.0	
3/22/00	374485	100.0	
3/23/00	376197	1712.0	Surface water leaking into vault
3/24/00		67.7	Surface water leaking into vault & Avg. Flow
3/25/00		67.7	Average Flow
3/26/00	376400	67.7	Average Flow
3/27/00		67.7	Average Flow
3/28/00	376501	67.7	Average Flow
3/29/00	376552	51.0	
3/30/00	376654	102.0	
3/31/00	376833	179.0	

AVERAGE DAILY FLOW IN GALLONS 146.5

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

avg =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 : 03/17/00
Group Number : 2001-391

Prepared For :
Mr. Ben Brayley
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
00C02690	WS62220	Aqueous	03/02/00	03/03/00	14:00
00C02691	WS62221	Aqueous	03/02/00	03/03/00	14:00
00C02692	WS62222	Aqueous	03/02/00	03/03/00	14:00
00C02693	WS62223	Aqueous	03/02/00	03/03/00	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 : B Schepart
Dr. Brian Schepart, Laboratory Director

ENVIRONMENTAL LABORATORY ACCREDITATION CERTIFICATION NUMBERS
NYSDOH ELAP #11179 NJDEPE #73977 FDOH #E87581

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.

Total Recoverable Phenol

EPA 420.1

Site: Frontier Pendleton
Date Sampled: 03/02/00
Date Received: 03/03/00

Group Number: 2001-390
Matrix: Aqueous
Units: mg/L

WST ID	Client ID	Detection Limit	Result	Date Analyzed
WS62221	00C02691	0.005	0.012	03/13/00

Waste Stream Technology, Inc.

Cyanide in Water

EPA 335.2

Site: Frontier Pendleton
Date Sampled: 03/02/00
Date Received: 03/03/00

Group Number: 2001-390
Matrix: Aqueous
Units: mg/L

WST ID	Client ID	Detection Limit	Result	Date Analyzed
WS62222	00C02692	0.005	Not detected	03/07/00

Waste Stream Technology, Inc.

Total Suspended Solids

EPA 160.2

Site: Frontier Pendleton
Date Sampled: 03/02/00
Date Received: 03/03/00

Group Number: 2001-390
Matrix: Aqueous
Units: mg/L

WST ID	Client ID	Detection Limit	Result	Date Analyzed
WS62223	00C02693	4.0	Not detected	03/08/00

Waste Stream Technology, Inc.
Metals Analysis Result Report

Site: Frontier Pendleton
Date Sampled: 03/02/00
Date Received: 03/03/00

Group Number: 2001-390
Units: mg/L
Matrix: Aqueous

WST ID: WS62220
Client ID: 00C02690
Digestion Date: 03/13/00

Analyte	Detection Limit	Result	Date Analyzed	Analysis Method
Antimony by GFAA	0.009	Not detected	03/15/00	EPA 200.9
Boron by ICP	0.012	0.295	03/16/00	EPA 200.7
Chromium by ICP	0.005	Not detected	03/16/00	EPA 200.7

CHAIN OF CUSTODY

WASTE STREAM TECHNOLOGY

Waste Stream Technology Inc.
302 Grote Street, Buffalo, NY 14207
(716) 876-5290 • FAX (716) 876-2412

OFFICE USE ONLY
GROUP # 2001-390
DUE DATE

PAGE ____ OF ____

ARE SPECIAL DETECTION LIMITS REQUIRED:
YES NO
If yes please attach requirements.

TURN AROUND TIME: 10 BD
QUOTATION NUMBER:

Is a QC Package required:
YES NO
If yes please attach requirements

REPORT TO: Olin

CONTACT: Ben Brayley
PH. # ( ) 716-278-6422
FAX # ( )
BILL TO:
PO#
PROJECT DESCRIPTION: Frontier Bradleton
SAMPLER SIGNATURE: B Brayley

DW DRINKING WATER
GW GROUND WATER
SW SURFACE WATER
WW WASTE WATER
O OIL
SL SLUDGE
SO SOIL
S SOLID
W WIPE
OTHER

ANALYSES TO BE PERFORMED

	SAMPLE I.D.	DATE SAMPLED	TIME OF SAMPLING	SAMPLE TYPE	TOTAL NO. OF CONTAINERS	Br, Cr, Sb	Phenols	Cyanide	TSS							TYPE OF CONTAINER/ COMMENTS:	OFFICE USE ONLY WST. I.D.
1	00C02690 1L	3/02/00	330 P	Comp	1	1										1L (HNO3)	WS62220
2	00C02691 1L	3/02/00	330 P	Comp	1		1									1L (H2SO4)	21
3	00C02692 1L	3/02/00	330 P	Comp	1			1								1L (NaOH)	22
4	00C02693 500 mL	3/02/00	330 P	Comp	1				1							500 mL (Ø3)	23
5																	
6																	
7																	
8																	
9																	
10																	

REMARKS:

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:
W. R. Moore	3/3/00	11:30 am	[illegible]	3/3/00	11:30
[illegible]	3/3/00	1400	[illegible]	3/3/00	1400

FILE COPY

May 10, 2000

VIA AIRBORNE EXPRESS

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

Subject: Analytical Sampling Results (4/7/2000 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 April 7, 2000, 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

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Fleet Bank Building
Twelve Fountain Plaza
Buffalo, NY 14202-2292

Tracy Goad Walter. Esq.
Legal Department
The Dow Chemical Company
2030 Dow Center
Midland, MI 48674

April 2000 Analytical Summary for WS 001
Permit # 98-11
Groundwater Discharge Point: D 002

381,341 Gallons Discharged Prior To 4/7/00
5,719 Gallons Since Last Report
161 Average Daily Flow Based on 36 days Between Samples

Parameters Treatment System Discharge	Permit Limit GPD	Detection Limits	4/7/00 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		
beta BHC	20.0		
delta BHC	10.0		
gamme BHC	10.0		
Heptachlor	8.0		
Aldrin	8.0		
Heptachlor Epoxide	9.0		
4,4-DDE	20.0		
Methoxychlor	18.0		
Metals	mg/L	mg/L	mg/L
Antimony	0.1	0.009	< 0.009
Boron	4.00	0.012	0.448
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	< 0.012
TSS	300	4.000	5.200

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

DAILY FLOW DATA - PENDLETON SITE
APRIL 2000

DATE	TOTALIZER READING	DAILY FLOW	COMMENTS
4/1/00		23.7	Average Flow
4/2/00		23.7	Average Flow
4/3/00	366904	23.7	
4/4/00	377162	285.0	
4/5/00	377265	103.0	
4/6/00	377541	276.0	
4/7/00		504.8	Average Flow & Sampling
4/8/00		504.8	Average Flow
4/9/00		504.8	Average Flow
4/10/00	379560	504.8	Average Flow
4/11/00	379663	103.0	
4/12/00	379826	163.0	
4/13/00	380038	212.0	
4/14/00	380195	157.0	
4/15/00		87.3	Average Flow
4/16/00		87.3	Average Flow
4/17/00	380457	87.3	Average Flow
4/18/00	380559	102.0	
4/19/00	380660	101.0	
4/20/00	380759	99.0	
4/21/00		500.0	Surface water leaking into vault & Avg. Flow
4/22/00		500.0	Surface water leaking into vault & Avg. Flow
4/23/00	382259	500.0	Surface water leaking into vault & Avg. Flow
4/24/00	382360	101.0	
4/25/00	382461	101.0	
4/26/00	382566	105.0	
4/27/00	382666	100.0	
4/28/00		100.3	Average Flow
4/29/00		100.3	Average Flow
4/30/00	382967	100.3	Average Flow

AVERAGE DAILY FLOW IN GALLONS 205.4

= DRY VAULT GROUNDWATER RELIEF

		gallons
		gallons
		gallons
		gallons
TOTAL GALLONS	0	

avg =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 : 04/24/00
Group Number : 2001-657

Prepared For :
Mr. James Young
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
00D07694	WS63423	Aqueous	04/07/00	04/07/00	13:00
00D07695	WS63424	Aqueous	04/07/00	04/07/00	13:00
00D07696	WS63425	Aqueous	04/07/00	04/07/00	13:00
00D07697	WS63426	Aqueous	04/07/00	04/07/00	13:00
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. Voll

Daniel Vollmer, Laboratory QA QC Officer

ENVIRONMENTAL LABORATORY ACCREDITATION CERTIFICATION NUMBERS
NYSDOH ELAP #11179 NJDEPE #73977 FDOH #E87581

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: 04/07/00
Date Received: 04/07/00

Group Number: 2001-657
Units: mg/L
Matrix: Aqueous

WST ID: WS63423
Client ID: 00D07694
Digestion Date: 04/17/00

Analyte	Detection Limit	Result	Date Analyzed	Analysis Method
Antimony by GFAA	0.009	Not detected	04/18/00	EPA 200.9
Boron by ICP	0.012	0.448	04/24/00	EPA 200.7
Chromium by ICP	0.005	Not detected	04/24/00	EPA 200.7

WASTE STREAM TECHNOLOGY

Waste Stream Technology, Inc.

Total Recoverable Phenol

EPA 420.1

Site: Frontier Pendleton
Date Sampled: 04/07/00
Date Received: 04/07/00

Group Number: 2001-657
Matrix: Aqueous
Units: mg/L

WST ID	Client ID	Detection Limit	Result	Date Analyzed
WS63424	00D07695	0.005	Not detected	04/17/00

Waste Stream Technology, Inc.

Cyanide in Water

EPA 335.2

Site: Frontier Pendleton
Date Sampled: 04/07/00
Date Received: 04/07/00

Group Number: 2001-657
Matrix: Aqueous
Units: mg/L

WST ID	Client ID	Detection Limit	Result	Date Analyzed
WS63425	00D07696	0.005	Not detected	04/14/00

Waste Stream Technology, Inc.

Total Suspended Solids

EPA 160.2

Site: Frontier Pendleton
Date Sampled: 04/07/00
Date Received: 04/07/00

Group Number: 2001-657
Matrix: Aqueous
Units: mg/L

WST ID	Client ID	Detection Limit	Result	Date Analyzed
WS63426	00D07697	4.0	5.2	04/11/00

Metals/CN Analyses

Accuracy and precision evaluations for URS-14D were acceptable, with the exception of the recovery of selenium, which was 70%. Therefore the sample selenium results should be considered estimated ("J") in all project samples. This element also produced a low recovery in the low concentration standard (CRI) (57%). No corrective action was required of the laboratory.

Due to elevated recovery of the mercury CRI (130%), the detected value reported in sample 88-12D, which was at a concentration equal to that of the CRDL, should be regarded as estimated, possibly biased high.

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

Data Validation Services

120 Cobble Creek Road P. O. Box 208
North Creek, NY 12853
Phone (518) 251-4429
Facsimile (518) 251-4428

Facsimile Transmission

TO: Jen Smith

COMPANY: OBG Engineers

FAX NUMBER: 315 463 7554

FROM: Judy Harry

DATE: 03-20-00

No. of pages (including cover): 1

COMMENTS: RE: Frontier Chemical data packages

The spectrum that I would like to review is that pertaining to the broad peak present around retention time 3.5-4.0' in sample N9181-DL (file G7775 on 2/17). They may need to do a manual subtract of background from about 3', or after 4.5'. The early part of the response is likely due to moisture, but the latter may be the sulfur dioxide.

Hope this helps. Thanks.

___ Hardcopy to follow _X__ Hardcopy not to follow

TELEFAX

O'BRIEN & GERE ENGINEERS, INC. *Direct Line Fax No. (315) 463-7554*

CONFIDENTIALITY NOTICE

Job Number: 5829/24532

Number of Pages: 3 (including cover sheet) Date: March 21, 2000

If pages are missing or illegible, please contact telefax operator at (315) 437-1990, ext. 2593, as soon as possible. Thank you.

TO: **Judy Harry**

COMPANY: **Data Validation Services**

FAX NO: **518-251-4428**

FROM: **Jennifer Smith**

ORIGINAL —

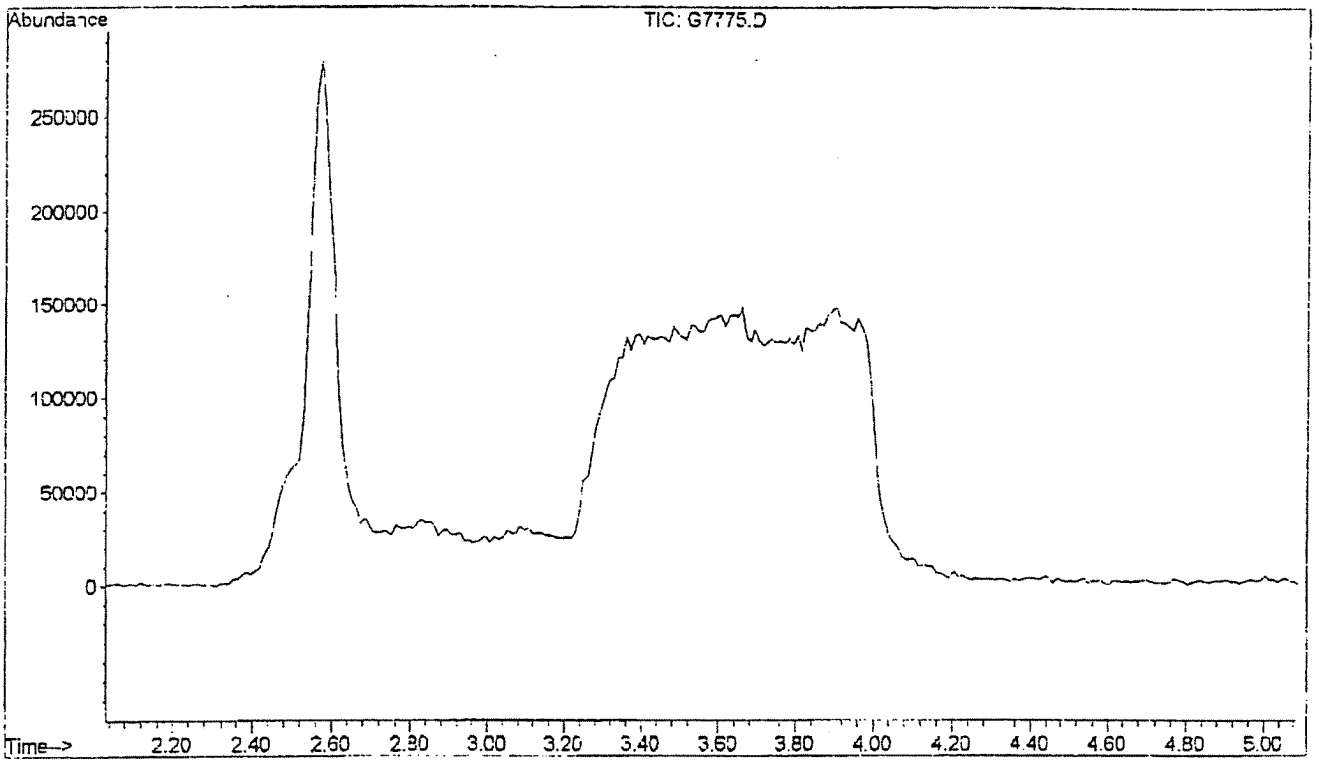
____ will follow via regular mail ____ will follow via overnight delivery x will not follow

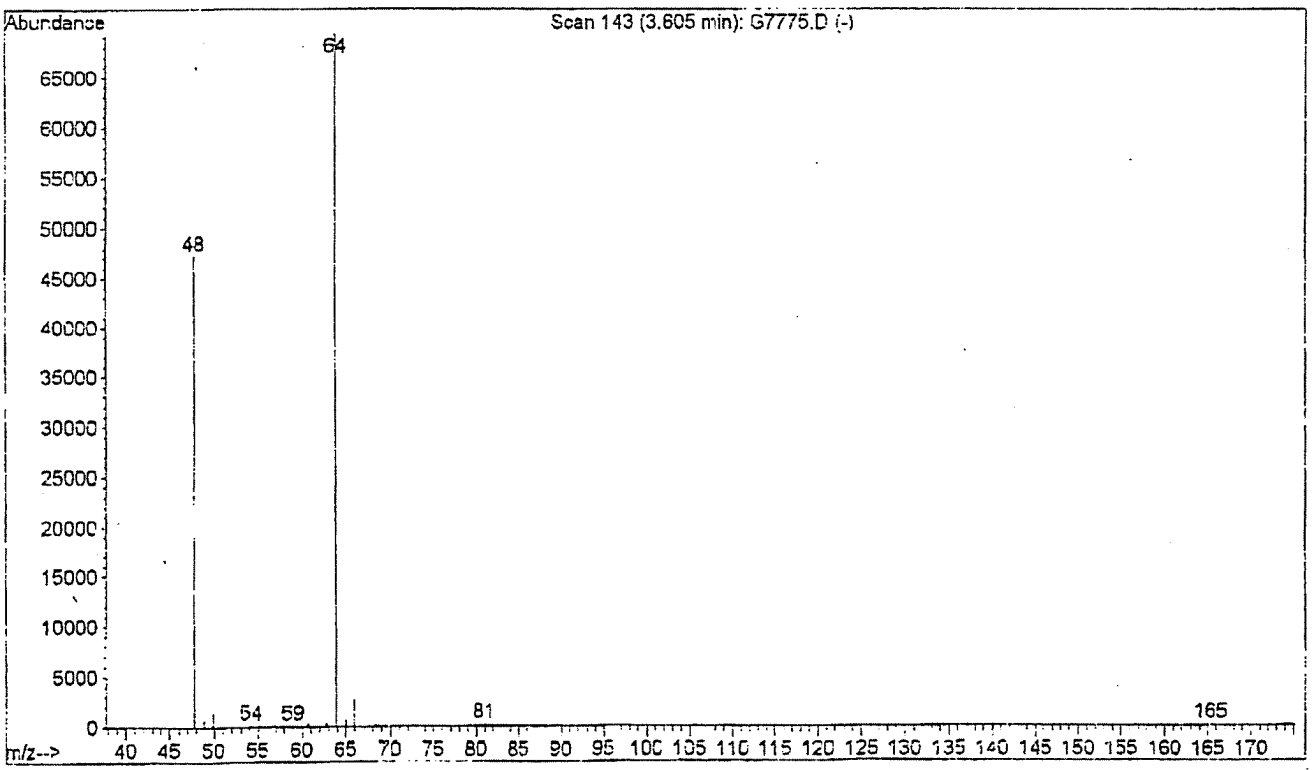
MESSAGE:

Hi Judy,
As discussed, attached is the spectrum for the N9181-DL sample. Please feel free to call me if you have any questions or need additional information.

Thank you,
Jen

File : J:\MS2\G7775.D
Operator : MSV
Acquired : 17 Feb 00 11:37 am using AcqMethod G216VOCW
Instrument : #2MS12
Sample Name: N9181DL 5x
Misc Info :
Vial Number: 6





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.

RAW DATA

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

GC/MS Volatile Organics Case Narrative

Client: Frontier Chemical
Job Number: 5829.001.517
Package #: 4663, 4671
Methodology: 8260B

Analyzed/Reviewed by (Date/Initials): 2-23-00 SG

Supervisor/Reviewed by (Date/Initials): 7-24-00

QA/QC Review (Date/Initials): 3/7/00

File Name in G/ Drive: C:\WPWIN60\WPDOCS\V4663.NAR

GC/MS Volatile Organics

The GC/MS Volatile instruments used a J&W DB-VRX, 75 m x 0.45 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

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

MS/MSD

The following compound(s) did not meet matrix spike/matrix spike duplicate percent recovery and/or RPD criteria:

Sample Description	Sample #	Compound	% REC	RPD	Corrective Action
URS-14D	N9182	Chloroethane	X	X	1

1. Due to high level sulfur dioxide in the sample N9182MSD. Ion 64 of chloroethane was co-eluted with sulfur dioxide. LCS passed for this compound. No corrective action was taken.

Surrogate

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

Internal Standards

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

Calibrations

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.

Client: Frontier Chemical
Job Number: 5829.001.517
Package #: 4663, 4671
Methodology: 8260B

The following continuing calibration compound(s) exceeded method percent drift and/or RRF criteria:

Calibration Date	Instrument	Compound	%D	RRF	Corrective Action
2/17/00	MS2	1,1-Dichloroethene	-20.5		1

1. The compound failed high. There were no positive hits for the compound in associated samples. The associated LCS met criteria. No corrective action was taken.

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

Trace Metals Case Narrative

Client: Frontier Chemical
Job Number: 5829.001.517
Package #: 4663,4671
Methodology: ICP metals - 6010B

Analyzed/Reviewed by (Date/Initials): 3-2-00 MT

Supervisor/Reviewed by (Date/Initials): 3-2-00 MT

QA/QC Review (Date/Initials): 3-7-00

File Name in G/ Drive: G:\NARRATIV\4663FRON.ICP

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.

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

Sample Description	Sample #	Analyte	% REC	RPD	Corrective Action
UPS-14D (Field Filtered)	N9189	Calcium	X		2
		Magnesium	X		2
		Selenium	X		1
		Potassium		X	3

1. A post-digestion spike was performed as required. 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 as required. No further corrective action was taken.

3. The RPD for the sample and duplicate was within control limits. No further corrective action was taken.

Sample Duplicate
All sample duplicate RPD data met method and/or project specific QC criteria.

Client: Frontier Chemical
Job Number: 5829.001.517
Package #: 4663,4671
Methodology: ICP metals - 6010B

ICP Serial Dilution
All percent differences met method and/or project specific QC criteria.

.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.

Trace Metals Case Narrative

Client:	Frontier Chemical
Job Number:	5829.001.517
Package #:	4663,4671
Methodology:	Mercury - 7470A
Analyzed/Reviewed by (Date/Initials):	3-2-00 mt
Supervisor/Reviewed by (Date/Initials):	3-2-00 mt
QA/QC Review (Date/Initials):	3/7/00
File Name in G/ Drive:	G:\NARRATIV\4663FRON.HG

Trace Metals

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

Trace Metals Case Narrative

Client:	Frontier Chemical
Job Number:	5829.001.517
Package #:	4663,4671
Methodology:	Thallium - 7841
Analyzed/Reviewed by (Date/Initials):	3-2-00 [illegible]
Supervisor/Reviewed by (Date/Initials):	3-2-00 [illegible]
QA/QC Review (Date/Initials):	[illegible] 3/7/00
File Name in G/ Drive:	G:\NARRATIV\4663FRON.TL

Trace Metals

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

Wet Chemistry Case Narrative

Client:	Frontier Chemical
Job Number:	5829.001.517
Package #:	4663,4671
Methodology:	Total cyanide - 9010B/9014
Analyzed/Reviewed by (Date/Initials):	3-2-00 mt
Supervisor/Reviewed by (Date/Initials):	3-2-00 mt
QA/QC Review (Date/Initials):	3/4/00
File Name in G/ Drive:	G:\NARRATIV\4663FRON.WC

Wet Chemistry

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

CROSS REFERENCE TABLE

Site	Sample Number	Date Collected	Date Received	Pkg
88-12C	N9180	02/07/00	02/09/00	4663
88-12D	N9181	02/07/00	02/09/00	4663
URS-14D	N9182	02/08/00	02/09/00	4663
URS-14D	N9182MS	02/08/00	02/09/00	4663
URS-14D	N9182MSD	02/08/00	02/09/00	4663
URS-14D	N9182D	02/08/00	02/09/00	4663
URS-9I	N9183	02/08/00	02/09/00	4663
URS-9D	N9184	02/08/00	02/09/00	4663
Blind Dup	N9185	02/08/00	02/09/00	4663
QC Trip Blank	N9186	02/07/00	02/09/00	4663
88-12C (Field Filtered)	N9187	02/07/00	02/09/00	4663
88-12D (Field Filtered)	N9188	02/07/00	02/09/00	4663
URS-14D (Field Filtered)	N9189	02/08/00	02/09/00	4663
URS-14D (Field Filtered)	N9189MS	02/08/00	02/09/00	4663
URS-14D (Field Filtered)	N9189MSD	02/08/00	02/09/00	4663
URS-14D (Field Filtered)	N9189D	02/08/00	02/09/00	4663
URS-9I (Field Filtered)	N9190	02/08/00	02/09/00	4663
URS-9D (Field Filtered)	N9191	02/08/00	02/09/00	4663
Blind Dup (Field Filtered)	N9192	02/08/00	02/09/00	4663
85-5R	N9219	02/08/00	02/10/00	4671
URS-5D	N9220	02/08/00	02/10/00	4671
Equip. Blank	N9221	02/09/00	02/10/00	4671
URS-14I	N9222	02/09/00	02/10/00	4671
85-7R	N9223	02/09/00	02/10/00	4671
URS-7D	N9224	02/09/00	02/10/00	4671
QC Trip Blank	N9225	02/08/00	02/10/00	4671
85-5R (Field Filtered)	N9226	02/08/00	02/10/00	4671
URS-5D (Field Filtered)	N9227	02/08/00	02/10/00	4671
Equip. Blank (Field Filtered)	N9228	02/09/00	02/10/00	4671

URS-14I (Field Filtered)	N9229	02/09/00	02/10/00	4671
85-7R (Field Filtered)	N9230	02/09/00	02/10/00	4671
URS-7D (Field Filtered)	N9231	02/09/00	02/10/00	4671

Volume 1 of 3 of the validated analytical data is separately bound.

Attachment D

GGE GLYNN GEOTECHNICAL ENGINEERING

LETTER OF TRANSMITTAL

APRIL 6, 2000

TO:

Pendleton PRP Group
P. O. Box 248
1186 Lower River Road
Charleston, Tennessee 37310

DATE: February 8, 2000
ATTENTION: ~~Mr. John Burns~~ JAMES YOUNG
SUBJECT: Pendleton (Frontier Chemical) Site Remediation
GGE PROJECT NO: 94-1014-0

WE ARE SENDING ATTACHED:

☐ LABORATORY TEST DATA ☐ FIELD TEST DATA ☒ REPORT
☐ ENGINEERING DRAWINGS ☐ _____

COPIES	DATE	REPORT NO.	DESCRIPTION
1	2.8.00	00-01	Field Observation Report

THESE ARE BEING SENT:

☒ FOR YOUR USE ☐ PER YOUR REQUEST ☐ _____

SINCERELY,
GLYNN GEOTECHNICAL ENGINEERING

Jesse E. Grossman, P.E.
Project Manager

DISTRIBUTION

~~Jen Smith - O'Brien & Gere~~

415 South Transit Street, Lockport, New York 14094
voice: 716.625.6933 / fax: 716.625.6983

DOCFILE:ggelot\XL

• VISIT OUR WEB SITE AT www.glynngroup.com / E-MAIL: gge@glynngroup.com •

GLYNN GEOTECHNICAL ENGINEERING

FIELD OBSERVATION REPORT

PROJECT NO.: 94-1014-O REPORT NO.: 00-01 DATE: 07-Feb-00 PAGE: 1 OF 1

PROJECT: Pendleton (Frontier Chemical) Site Remediation DAY: Monday

SUBJECT: Semi-Annual Sampling, Lake Level Survey PROJECT TIME: 10:00 am - 12:00 pm

CLIENT: Pendleton Site PRP Group SITE TIME: 10:45 am - 11:30 am

WEATHER: Cold, Partly Cloudy (25° F) PHOTOS: YES X NO

- On site per O'Brien & Gere notification to record lake water elevation coincidental with semi-annual groundwater sampling event.
- Record Quarry Lake water surface elevation via level survey. Lake is ice covered. The ice surface elevation is 578.16'. Attempt to break through the ice to record free water elevation. The ice cannot be penetrated and the free water surface is not measured.
- The O'Brien & Gere sampling team is also on site for sample collection. O'B&G team is clearing the interior sample locations of snow and recording water elevations.
- Site accessibility is limited due to drifted snow on the perimeter access road.
- Observe general site conditions and no major problems are noted. The pump vault is not accessed.

PERSONNEL ON SITE / CONTACTED:

Tim Prawel, Don Canastrari - O'B&G

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:00fr0001

415 South Transit Street, Lockport, New York 14094
voice: 716.625.6933 / fax: 716.625.6983

• VISIT OUR WEB SITE AT www.glynngroup.com / E-MAIL: gge@glynngroup.com •

CHAIN OF CUSTODY

TECHNOLOGY

Waste Stream Technology Inc.
302 Grote Street, Buffalo, NY 14207
(716) 876-5290 • FAX (716) 876-2412

GROUP # 01-657

DUE DATE

PAGE _____ OF _____

REPORT TO: Jimmy Young
John Burns

CONTACT

PH. # ( )

FAX # ( )

BILL TO: OLIN Corp (FRG)
Charleston, TN

PO# Frontier Pendleton

PROJECT DESCRIPTION
Liff Rangley

SAMPLER SIGNATURE

DW DRINKING WATER
GW GROUND WATER
SW SURFACE WATER
WW WASTE WATER
O OIL
SL SLUDGE
SO SOIL
S SOLID
W WIPE
OTHER

TURN AROUND TIME: 10 B.D.

QUOTATION NUMBER:

ARE SPECIAL DETECTION LIMITS REQUIRED:
YES NO
If yes please attach requirements.

Is a QC Package required:
YES NO
If yes please attach requirements

ANALYSES TO BE PERFORMED

	SAMPLE I.D.	DATE SAMPLED	TIME OF SAMPLING	SAMPLE TYPE	TOTAL NO. OF CONTAINERS	Ba, Cr, Sb	Phenols	Cyanide	TSS							TYPE OF CONTAINER/ COMMENTS:	OFFICE USE ONLY WST. I.D.
1	00D07694	4/7/00	715A	GW	1	1										HNO3	WS63423
2	00D07695	4/7/00	715A	GW	1		1									H2SO4	24
3	00D07696	4/7/00	715A	GW	1			1								NaOH	25
4	00D07697	4/7/00	715A	GW	1				1							Ø3	26
5																	
6																	
7																	
8																	
9																	
10																	

REMARKS:

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:
[illegible]	4/7/00	1125 AM	[illegible]	1/1	
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:
[illegible]	4/7/00	[illegible]	[illegible]	4/7/00	1300

FILE COPY

June 10, 2000

VIA AIRBORNE EXPRESS

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

Subject: Analytical Sampling Results (5/5/2000 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 May 5, 2000, 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

David Cook, Esq.
Nixon, Hargrave, Devans & Doyle
900 Clinton Square
P.O. Box 1051
Rochester, NY 14604

Dave Moreira
Waste Management – Closed Sites
Department
4 Liberty Lane West
Hampton, New Jersey 03842

Bill Witt
Radian
304 West Wackerly St.
Midland, MI 48640

David Paley
Allied Signal, Inc.
101 Columbia Road
P.O. Box 1139
Morristown, NJ 07962

Mark Piazza
Elf AtoChem
2000 Market Street
Philadelphia, PA 19103

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April 2000 Analytical Summary for WS 001
Permit # 98-11
Groundwater Discharge Point: D 002

387,879 Gallons Discharged Prior 5/5/00
6,538 Gallons Since Last Report
112.9 Average Daily Flow Based on 28 days Between Samples

Parameters / Treatment System Discharge	Permit Limit GPD	Detection Limits	5/5/00 Sample Results GPD
Discharge Rate (1)	662		
624 Analytes	ug/L	ug/L	ug/L
Toluene	10.0	1.0	< 1.0
1,2-Dichloroethane	10.0	1.0	< 1.0
4-Methyl-2-Pentanone	10.0	5.0	< 5.0
Vinyl Chloride	10.0	2.0	< 2.0
Methylene Chloride	10.0	2.8	< 2.8
trans-1,2-Dichloroethene	10.0	1.0	< 1.0
1,1,1-Trichloroethane	10.0	1.0	< 1.0
Trichloroethene	10.0	1.0	< 1.0
Benzene	10.0	1.0	< 1.0
Chloromethane		2.0	< 2.0
Bromomethane		2.0	< 2.0
Chloroethane		2.0	< 2.0
Chloroform		1.0	< 1.0
Carbon Tetrachloride		1.0	< 1.0
1,1-Dichloroethene		1.0	< 1.0
Trichlorofluoromethane		2.0	< 2.0
1,1-Dichloroethane		1.0	< 1.0
1,2-Dichloropropane		1.0	< 1.0
Bromodichloromethane		1.0	< 1.0
2-Chloroethylvinyl ether		2.0	< 2.0
cis-1,3-Dichloropropene		1.0	< 1.0
trans-1,3-Dichloropropene		1.0	< 1.0
1,1,2-Trichloroethane		1.0	< 1.0
Tetrachloroethene		1.2	< 1.2
Dibromochloromethane		1.0	< 1.0
Chlorobenzene		1.0	< 1.0
Ethylbenezene		1.0	< 1.0
Bromoform		1.0	< 1.0
1,1,2,2-Tetrachloroethane		1.0	< 1.0
1,3-Dichlorobenzene		1.0	< 1.0
1,4-Dichlorobezene		1.0	< 1.0
1,2-Dichlorobenzene		1.0	< 1.0
Sum of 624 Analytes		100.0	< 44.0
608 Pesticides (2)	ug/L	ug/L	ug/L
alpha BHC	10.0		
beta BHC	20.0		
delta BHC	10.0		
gamme BHC	10.0		
Heptachlor	8.0		
Aldrin	8.0		
Heptachlor Epoxide	9.0		
4,4-DDE	20.0		
Methoxychlor	18.0		
Metals	mg/L		mg/L
Antimony	0.1	0.009	< 0.009
Boron	4.00	0.012	0.912
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	0.008
TSS	300	4.000	5.200

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

DAILY FLOW DATA - PENDLETON SITE
MAY 2000

DATE	TOTALIZER READING	DAILY FLOW	COMMENTS
5/1/00	383067	100.0	
5/2/00	383117	50.0	
5/3/00	383243	126.0	
5/4/00	383592	349.0	
5/5/00		25.0	Avg. Flow, Sampling & Site Inspection
5/6/00		25.0	Average Flow
5/7/00		25.0	Average Flow
5/8/00	383692	25.0	Average Flow
5/9/00	383792	100.0	
5/10/00	383892	100.0	
5/11/00	384103	211.0	
5/12/00	384321	218.0	Average Flow
5/13/00		410.9	Average Flow
5/14/00		410.9	Average Flow
5/15/00		410.9	Average Flow
5/16/00		410.9	Average Flow
5/17/00		410.9	Average Flow
5/18/00		410.9	Average Flow
5/19/00		410.9	Average Flow
5/20/00		410.9	Average Flow
5/21/00	388019	410.9	Average Flow
5/22/00	388171	152.0	
5/23/00	388486	315.0	
5/24/00		127.0	Average Flow
5/25/00	388740	127.0	Average Flow
5/26/00	388847	107.0	
5/27/00		153.3	Average Flow
5/28/00		153.3	Average Flow
5/29/00	389307	153.3	Average Flow
5/30/00	389406	99.0	
5/31/00	389505	99.0	

AVERAGE DAILY FLOW IN GALLONS 207.7

= DRY VAULT GROUNDWATER RELIEF

		gallons
		gallons
		gallons
		gallons
TOTAL GALLONS	0	

avg =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 : 05/23/00
Group Number : 2001-871

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
00E05698-703 Comp Sample	WS64541	Aqueous	05/05/00	05/05/00	14:45
Trip Blank	WS64625	Aqueous	05/05/00	05/05/00	14:45
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
TCL 8260B	2	Standard

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

ENVIRONMENTAL LABORATORY ACCREDITATION CERTIFICATION NUMBERS
NYSDOH ELAP #11179 NJDEPE #73977 FDOH #E87581

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.

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.

Waste Stream Technology, Inc.
Metals Analysis Result Report

Site: Frontier Pendleton
Date Sampled: 05/05/00
Date Received: 05/05/00

Group Number: 2001-871
Units: mg/L
Matrix: Aqueous

WST ID: WS64541
Client ID: 00E05698-703 COMP SAMPLE
Digestion Date: 05/19/00

Analyte	Detection Limit	Result	Date Analyzed	Analysis Method
Antimony by GFAA	0.009	Not detected	05/22/00	EPA 200.9
Boron by ICP	0.012	0.925	05/22/00	EPA 200.7
Chromium by ICP	0.005	Not detected	05/22/00	EPA 200.7

Waste Stream Technology, Inc.

40 CFR Part 136 Method 624

EPA 624

Site: Frontier Pendleton
Date Sampled: 05/05/00
Date Received: 05/05/00

Group Number: 2001-871
Units: µg/L
Matrix: Aqueous

WST ID: WS64541
Client ID: 00E05698-703 COMP SAMPLE
Extraction Date: NA
Date Analyzed: 05/08/00

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
omodichloromethane	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 (%)		99	76-114	
Toluene-d8 (%)		100	88-110	
Bromofluorobenzene (%)		94	86-115	

Dilution Factor 1

Waste Stream Technology, Inc.

40 CFR Part 136 Method 624

EPA 624

Site: Frontier Pendleton
Date Sampled: 05/05/00
Date Received: 05/05/00

WST ID: WS64625
Client ID: TRIP BLANK
Extraction Date: NA
Date Analyzed: 05/08/00

Group Number: 2001-871
Units: µg/L
Matrix: Aqueous

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
omodichloromethane	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 (%)		100	76-114	
Toluene-d8 (%)		98	88-110	
Bromofluorobenzene (%)		91	86-115	

Dilution Factor 1

Waste Stream Technology, Inc.

Method 624 Method Blank Results

EPA 624

Site: Frontier Pendleton
Date Sampled: NA
Date Received: NA

Group Number: 2001-871
Units: µg/L

WST ID: IB050800
Client ID: NA
Extraction Date: NA
Date Analyzed: 05/08/00

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
-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 (%)		96	76-114	
Toluene-d8 (%)		91	88-110	
Bromofluorobenzene (%)		94	86-115	
		Dilution Factor	**1**	

IB denotes Instrument Blank
NA denotes Not Applicable

Waste Stream Technology, Inc.
Wet Chemistry Analyses

Site: Frontier Pendleton
Date Sampled: 05/05/00
Date Received: 05/05/00

Group Number: 2001-871
Matrix: Aqueous

WST ID: WS64541
Client ID: 00E05698-703 COMP SAMPLE

Analysis	Method Reference	Detection Limit	Result	Units	Date Analyzed
Cyanide in Water	EPA 335.2	0.005	Not detected	mg/L	05/10/00
Total Recoverable Phenol	EPA 420.1	0.005	0.008	mg/L	05/10/00
Total Suspended Solids	EPA 160.2	4.0	5.2	mg/L	05/10/00

CHAIN OF CUSTODY

WASTE STREAM TECHNOLOGY

Waste Stream Technology Inc.
302 Grote Street, Buffalo, NY 14207
(716) 876-5290 • FAX (716) 876-2412

OFFICE USE ONLY
GROUP # 200-871
DUE DATE

PAGE ____ OF ____

REPORT TO: Jimmy Jones
John Burns

CONTACT
PH. # ( )
FAX # ( )

BILL TO: Olin Corp (ERG)
Charleston, TN
PO#

PROJECT DESCRIPTION: Fendleton

SAMPLER SIGNATURE: Bill Bradley

DW DRINKING WATER
GW GROUND WATER
SW SURFACE WATER
WW WASTE WATER
O OIL
SL SLUDGE
SO SOIL
S SOLID
W WIPE
OTHER

TURN AROUND TIME: 10 BUS

QUOTATION NUMBER:

ARE SPECIAL DETECTION LIMITS REQUIRED:
YES NO
If yes please attach requirements.

Is a QC Package required:
YES NO
If yes please attach requirements

ANALYSES TO BE PERFORMED

	SAMPLE I.D.	DATE SAMPLED	TIME OF SAMPLING	SAMPLE TYPE	TOTAL NO. OF CONTAINERS	Ba, Cr, Sb	Phenols	Cyanide	TSS	VOC	VOC	Trip Blank				TYPE OF CONTAINER/ COMMENTS:	OFFICE USE ONLY WST. I.D.
1	00E05698	5/5/00	800 AM	Comp	1	1										1L	WS64154
2	00E05699	5/5/00	800 AM	Comp	1		1									1L	
3	00E05700	5/5/00	800 AM	Comp	1			1								1L	
4	00E05701	5/5/00	800 AM	Comp	1				1							500 ML	
5	00E05702	5/5/00	800 AM	Comp	1					1						40 ML HCL	
6	00E05703	5/5/00	800 AM	Comp	1						1					40 ML HCL	
7	00E05704	5/5/00	800 AM	Comp	1							1				40 ML HCL	WS64102
8																	
9																	
10																	

REMARKS:

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:
	5/5/00			5/5/00	1
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:
	5/5/00	2:45		5/5/00	1445

FRONTIER CHEMICAL PENDLETON PRP GROUP
C/O OLIN CORPORATION
1186 LOWER RIVER ROAD
CHARLESTON, TN 37310

FILE COPY

July 11, 2000

VIA AIRBORNE EXPRESS

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

Subject: Analytical Sampling Results (6/2/2000 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 June 2, 2000, 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.

Note that due to significant rainfall events the volume of water (surface water and treated water) discharged through the treatment system exceeds the permit limits. The PRP Group has implemented steps to address this phenomenon. A status update of the steps taken will be provided in the next report submittal.

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

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Tracy Goad Walter. Esq.
Legal Department
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2030 Dow Center
Midland, MI 48674

DAILY FLOW DATA - PENDLETON SITE
JUNE 2000

DATE	TOTALIZER READING	DAILY FLOW	COMMENTS
6/1/00	389605	100.0	
6/2/00		315.8	Avg. Flow, Sampling & Site Inspection
6/3/00		315.8	Average Flow
6/4/00		315.8	Average Flow
6/5/00	390868	315.8	Average Flow
6/6/00		355.0	Average Flow
6/7/00		355.0	Average Flow
6/8/00		355.0	Average Flow
6/9/00		355.0	Average Flow
6/10/00		355.0	Average Flow
6/11/00		355.0	Average Flow
6/12/00	393353	355.0	Average Flow
6/13/00	393567	214.0	
6/14/00	394494	927.0	
6/15/00	394704	210.0	
6/16/00		320.0	Average Flow
6/17/00		320.0	Average Flow
6/18/00		320.0	Average Flow
6/19/00	395984	320.0	Average Flow
6/20/00	396402	418.0	
6/21/00	396725	323.0	
6/22/00	396927	368.3	Average Flow
6/23/00		368.3	Average Flow
6/24/00		368.3	Average Flow
6/25/00	398400	368.3	Average Flow
6/26/00	398710	310.0	
6/27/00		206.3	Average Flow
6/28/00		206.3	Average Flow
6/29/00	399329	206.3	Average Flow
6/30/00	399539	210.0	

AVERAGE DAILY FLOW IN GALLONS 327.7

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

avg =flow between data points divided by days of missing data

June 2000 Analytical Summary for WS 001
Permit # 98-11
Groundwater Discharge Point: D 002

397,661 Gallons Discharged Prior To 6/2/00
9,832 Gallons Since Last Report
351.1 Average Daily Flow Based on 28 days Between Samples

Parameters Treatment System Discharge	Permit Limit GPD	Detection Limits	6/2/00 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		
beta BHC	20.0		
delta BHC	10.0		
gamme BHC	10.0		
Heptachlor	8.0		
Aldrin	8.0		
Heptachlor Epoxide	9.0		
4,4-DDE	20.0		
Methoxychlor	18.0		
Metals	mg/L		mg/L
Antimony	0.1	0.009	< 0.009
Boron	4.00	0.012	0.377
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	5.600

Legend:
(1) Permit limit @ 662 GPD with maximum daily discharged @ 2500 GPD
(2) Discontinued 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

FILE COPY

Analytical Data Report

Report Date : 06/19/00
Group Number : 2001-1073

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
00F06705	WS65609	Aqueous	06/02/00	06/02/00	15:00
00F06706	WS65610	Aqueous	06/02/00	06/02/00	15:00
00F06707	WS65611	Aqueous	06/02/00	06/02/00	15:00
00F06708	WS65612	Aqueous	06/02/00	06/02/00	15:00
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

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: 06/02/00
Date Received: 06/02/00

Group Number: 2001-1073
Units: mg/L
Matrix: Aqueous

WST ID: WS65609
Client ID: 00F06705
Digestion Date: 06/05/00

Analyte	Detection Limit	Result	Date Analyzed	Analysis Method
Antimony by GFAA	0.009	Not detected	06/16/00	EPA 200.9
Boron by ICP	0.012	0.377	06/07/00	EPA 200.7
Chromium by ICP	0.005	Not detected	06/07/00	EPA 200.7

Waste Stream Technology, Inc.

Cyanide in Water

EPA 335.2

Site: Frontier - Pendleton
Date Sampled: 06/02/00
Date Received: 06/02/00

Group Number: 2001-1073
Matrix: Aqueous
Units: mg/L

WST ID	Client ID	Detection Limit	Result	Date Analyzed
WS65610	00F06706	0.005	0.005	06/08/00

Waste Stream Technology, Inc.

Total Recoverable Phenol

EPA 420.1

Site: Frontier - Pendleton
Date Sampled: 06/02/00
Date Received: 06/02/00

Group Number: 2001-1073
Matrix: Aqueous
Units: mg/L

WST ID	Client ID	Detection Limit	Result	Date Analyzed
WS65611	00F06707	0.005	Not detected	06/15/00

Waste Stream Technology, Inc.

Total Suspended Solids

EPA 160.2

Site: Frontier - Pendleton
Date Sampled: 06/02/00
Date Received: 06/02/00

Group Number: 2001-1073
Matrix: Aqueous
Units: mg/L

WST ID	Client ID	Detection Limit	Result	Date Analyzed
WS65612	00F06708	4.0	5.6	06/06/00

CHAIN OF CUSTODY

WASTE STREAM TECHNOLOGY

Waste Stream Technology Inc.
302 Grote Street, Buffalo, NY 14207
(716) 876-5290 • FAX (716) 876-2412

OFFICE USE ONLY
GROUP # 2001-1073
DUE DATE

PAGE ____ OF ____

REPORT TO: Jimmy Young
John Burns
CONTACT
PH. # ( )
FAX # ( )
BILL TO: Olin Corp - ERG
Charleston, TN
PO#
PROJECT DESCRIPTION: Pendleton
SAMPLER SIGNATURE: Bill Brady

DW DRINKING WATER
GW GROUND WATER
SW SURFACE WATER
WW WASTE WATER
O OIL
SL SLUDGE
SO SOIL
S SOLID
W WIPE
OTHER

TURN AROUND TIME: 6/12 10 BD
QUOTATION NUMBER:

ARE SPECIAL DETECTION LIMITS REQUIRED: YES NO
If yes please attach requirements.

Is a QC Package required: YES NO
If yes please attach requirements

ANALYSES TO BE PERFORMED

	SAMPLE I.D.	DATE SAMPLED	TIME OF SAMPLING	SAMPLE TYPE	TOTAL NO. OF CONTAINERS	B, Cr, Sb	Cyanide	Phenols	TSS	TYPE OF CONTAINER/ COMMENTS:	OFFICE USE ONLY WST. I.D.
1	00+06 705	6/2/00	1230p	Comp	1	1				1L HNO3	WS65609
2	00+06 706	6/2/00	1230p	Comp	1		1			1L NaOH	10
3	00+06 707	6/2/00	1230p	Comp	1			1		1L H2SO4	11
4	00+06 708	6/2/00	1230p	Comp	1				1	500mL 3°C	12
5											
6											
7											
8											
9											
10											

REMARKS:

RELINQUISHED BY: Bill Brady	DATE: 6/02/00	TIME: 142 PM	RECEIVED BY:	DATE: 6/2/00	TIME: 1:40
RELINQUISHED BY:	DATE: 6/2/00	TIME: 15:00	RECEIVED BY:	DATE: 6/2/00	TIME: 15:00

FRONTIER CHEMICAL PENDLETON PRP GROUP
C/O OLIN CORPORATION
1186 LOWER RIVER ROAD
CHARLESTON, TN 37310

FILE COPY

August 22, 2000

VIA AIRBORNE EXPRESS

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

Subject: Analytical Sampling Results (7/6/2000 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 July 6, 2000, 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

David Cook, Esq.
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900 Clinton Square
P.O. Box 1051
Rochester, NY 14604

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Waste Management – Closed Sites
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Hampton, New Jersey 03842

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Midland, MI 48640

David Paley
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P.O. Box 1139
Morristown, NJ 07962

Mark Piazza
Elf AtoChem
2000 Market Street
Philadelphia, PA 19103

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Buffalo, NY 14202-2212

Dennis P. Harkowitz. Esq.
Jaecekle, Fleishman & Mugel
Fleet Bank Building
Twelve Fountain Plaza
Buffalo, NY 14202-2292

Tracy Goad Walter. Esq.
Legal Department
The Dow Chemical Company
2030 Dow Center
Midland, MI 48674

July 2000 Analytical Summary for WS 001
Permit # 98-11
Groundwater Discharge Point: D 002

408,324 Gallons Discharged Prior To 7/6/00
5,893 Gallons Since Last Report
173.3 Average Daily Flow Based on 34 days Between Samples

Parameters Treatment System Discharge	Permit Limit GPD	Detection Limits	7/6/00 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		
beta BHC	20.0		
delta BHC	10.0		
gamme BHC	10.0		
Heptachlor	8.0		
Aldrin	8.0		
Heptachlor Epoxide	9.0		
4,4-DDE	20.0		
Methoxychlor	18.0		
Metals	mg/L		mg/L
Antimony	0.1	0.009	< 0.009
Boron	4.00	0.012	0.355
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) Discontinued per April 14, 1997 Letter from F. Narrone to PRP Group.
(B) Detected in blank
NA Not applicable

DAILY FLOW DATA - PENDLETON SITE
JULY 2000

DATE	TOTALIZER READING	DAILY FLOW	COMMENTS
7/1/00	399992	226.5	Average Flow
7/2/00		226.5	Average Flow
7/3/00		178.5	Average Flow
7/4/00	400349	178.5	Average Flow
7/5/00	400553	204.0	
7/6/00	400756	203.0	Sampling & Site Inspection
7/7/00		207.8	Average Flow
7/8/00		207.8	Average Flow
7/9/00		207.8	Average Flow
7/10/00	401587	207.8	Average Flow
7/11/00	401689	102.0	
7/12/00	401888	199.0	
7/13/00	402094	206.0	
7/14/00		242.3	Average Flow
7/15/00		242.3	Average Flow
7/16/00	402615	242.3	Average Flow
7/17/00	402825	210.0	
7/18/00	402983	158.0	
7/19/00	403197	214.0	
7/20/00	403353	156.0	
7/21/00		195.5	Average Flow
7/22/00	403744	195.5	Average Flow
7/23/00	403844	100.0	
7/24/00	404053	209.0	
7/25/00	404207	154.0	Site Inspection
7/26/00		154.5	Average Flow
7/27/00	404516	154.5	Average Flow
7/28/00		157.0	Average Flow
7/29/00		157.0	Average Flow
7/30/00	404987	157.0	Average Flow
7/31/00	405226	239.0	

AVERAGE DAILY FLOW IN GALLONS 190.1

[redacted] = DRY VAULT GROUNDWATER RELIEF

		gallons
		gallons
		gallons
		gallons

TOTAL GALLONS 0

avg =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 : 07/21/00
Group Number : 2001-1360

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

Site : Pendleton

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

WASTE STREAM TECHNOLOGY

Waste Stream Technology, Inc.
302 Grote Street
Buffalo, NY 14207
(716) 876-5290

Analytical Data Report

Group Number: 2001-1360

Site: Pendleton

Field and Laboratory Information

WST ID	Client ID	Matrix	Date Sampled	Date Received	Time
WS67369	00G07709	Aqueous	07/06/00	07/07/00	13:15
WS67370	00G07710	Aqueous	07/06/00	07/07/00	13:15
WS67371	00G07711	Aqueous	07/06/00	07/07/00	13:15
WS67372	00G07712	Aqueous	07/06/00	07/07/00	13:15

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: Pendleton
Date Sampled: 07/06/00
Date Received: 07/07/00

Group Number: 2001-1360
Units: mg/L
Matrix: Aqueous

WST ID: WS67369
Client ID: 00G07709
Digestion Date: 07/11/00

Analyte	Detection Limit	Result	Date Analyzed	Analysis Method
Antimony by GFAA	0.009	Not detected	07/21/00	EPA 200.9
Boron by ICP	0.012	0.355	07/11/00	EPA 200.7
Chromium by ICP	0.005	Not detected	07/11/00	EPA 200.7

Waste Stream Technology, Inc.
Wet Chemistry Analyses

Site: Pendleton
Date Sampled: 07/06/00
Date Received: 07/07/00

Group Number: 2001-1360
Matrix: Aqueous

WST ID: WS67370
Client ID 00G07710

Analysis	Method Reference	Detection Limit	Result	Units	Date Analyzed
Cyanide in Water	EPA 335.2	0.005	Not detected	mg/L	07/20/00

Waste Stream Technology, Inc.
Wet Chemistry Analyses

Site: Pendleton
Date Sampled: 07/06/00
Date Received: 07/07/00

Group Number: 2001-1360
Matrix: Aqueous

WST ID: WS67371
Client ID 00G07711

Analysis	Method Reference	Detection Limit	Result	Units	Date Analyzed
Total Recoverable Phenol	EPA 420.1	0.005	Not detected	mg/L	07/19/00

Waste Stream Technology, Inc.
Wet Chemistry Analyses

Site: Pendleton
Date Sampled: 07/06/00
Date Received: 07/07/00

Group Number: 2001-1360
Matrix: Aqueous

WST ID: WS67372
Client ID 00G07712

Analysis	Method Reference	Detection Limit	Result	Units	Date Analyzed
Total Suspended Solids	EPA 160.2	4.0	Not detected	mg/L	07/12/00

CHAIN OF CUSTODY

WASTE STREAM TECHNOLOGY

Waste Stream Technology Inc.
302 Grote Street, Buffalo, NY 14207
(716) 876-5290 • FAX (716) 876-2412

OFFICE USE ONLY
GROUP # 2001-1340
DUE DATE

REPORT TO: John Burns
CONTACT
PH. # ( )
FAX # ( )
BILL TO: Olin Corp
PO# Pendleton
PROJECT DESCRIPTION
SAMPLER SIGNATURE

DW DRINKING WATER
GW GROUND WATER
SW SURFACE WATER
WW WASTE WATER
O OIL
SL SLUDGE
SO SOIL
S SOLID
W WIPE
OTHER

TURN AROUND TIME: 10 DAY
QUOTATION NUMBER:

ARE SPECIAL DETECTION LIMITS REQUIRED: YES NO
If yes please attach requirements.

Is a QC Package required: YES NO
If yes please attach requirements

ANALYSES TO BE PERFORMED

	SAMPLE I.D.	DATE SAMPLED	TIME OF SAMPLING	SAMPLE TYPE	TOTAL NO. OF CONTAINERS	B, Cr, Sb	Cyanide	Phenols	TSS							TYPE OF CONTAINER/ COMMENTS:	OFFICE USE ONLY WST. I.D.
1	ØØGØ7709	7/6/00	330p	Comp	1	1										1L (HNO3)	WSL73690
2	ØØGØ7710	7/6/00	330p	Comp	1		1									1L (NAOH)	70
3	ØØGØ7711	7/6/00	330p	Comp	1			1								1L (H2SO4)	71
4	ØØGØ7712	7/6/00	330p	Comp	1				1							500ML (3°C)	72
5																	
6																	
7																	
8																	
9																	
10																	

REMARKS:

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:
W. Moore	7/7/00	11:30 am		7/7/00	11:30
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:
	7/7/00	1:15		7/7/00	1315

FRONTIER CHEMICAL PENDLETON PRP GROUP
C/O OLIN CORPORATION
1186 LOWER RIVER ROAD
CHARLESTON, TN 37310

FILE COPY

September 10, 2000

VIA AIRBORNE EXPRESS

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

Subject: Analytical Sampling Results (8/10/2000 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 10, 2000, 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

David Cook, Esq.
Nixon, Hargrave, Devans & Doyle
900 Clinton Square
P.O. Box 1051
Rochester, NY 14604

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Waste Management – Closed Sites
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Hampton, New Jersey 03842

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Buffalo, NY 14202-2292

Tracy Goad Walter. Esq.
Legal Department
The Dow Chemical Company
2030 Dow Center
Midland, MI 48674

August 2000 Analytical Summary for WS 001
Permit # 98-11
Groundwater Discharge Point: D 002

412,126 Gallons Discharged Prior To 8/10/00
3,802 Gallons Since Last Report
180.2 Average Daily Flow Based on 35 days Between Samples

Parameters Treatment System Discharge	Permit Limit GPD	Detection Limits	8/10/00 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		
beta BHC	20.0		
delta BHC	10.0		
gamme BHC	10.0		
Heptachlor	8.0		
Aldrin	8.0		
Heptachlor Epoxide	9.0		
4,4-DDE	20.0		
Methoxychlor	18.0		
Metals	mg/L		mg/L
Antimony	0.1	0.009	< 0.009
Boron	4.00	0.012	0.433
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) Discontinued per April 14, 1997 Letter from F. Narrone to PRP Group.
(B) Detected in blank
NA Not applicable

DAILY FLOW DATA - PENDLETON SITE
AUGUST 2000

DATE	TOTALIZER READING	DAILY FLOW	COMMENTS
8/1/00	405375	149.0	
8/2/00	405478	103.0	
8/3/00	405686	208.0	
8/4/00		154.7	Average Flow
8/5/00		154.7	Average Flow
8/6/00	406150	154.7	Sampling & Site Inspection
8/7/00	406359	209.0	Average Flow
8/8/00	406615	256.0	Average Flow
8/9/00	406964	349.0	Sampling & Average Flow
8/10/00		100.8	Average Flow
8/11/00		100.8	Average Flow
8/12/00		100.8	Average Flow
8/13/00	407367	100.8	Average Flow
8/14/00	407466	99.0	
8/15/00		105.5	Average Flow
8/16/00	407677	105.5	Average Flow
8/17/00	407776	99.0	
8/18/00	407876	100.0	
8/19/00		85.0	Average Flow
8/20/00		85.0	Average Flow
8/21/00		85.0	Average Flow
8/22/00	408226	85.0	Average Flow
8/23/00	408301	85.0	Filter Bag Change
8/24/00		99.8	Average Flow
8/25/00		99.8	Average Flow
8/26/00		99.8	Average Flow
8/27/00	408700	99.8	Average Flow
8/28/00	408750	50.0	Average Flow
8/29/00		92.7	Inspection & Average Flow
8/30/00		92.7	Average Flow
8/31/00	409028	92.7	Average Flow

AVERAGE DAILY FLOW IN GALLONS 122.7

= DRY VAULT GROUNDWATER RELIEF

		gallons
		gallons
		gallons
		gallons
TOTAL GALLONS	0	

avg =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 : 08/28/00
Group Number : 2001-1647

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

Site : Frontier Pendleton

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

WASTE STREAM TECHNOLOGY

Waste Stream Technology, Inc.
302 Grote Street
Buffalo, NY 14207
(716) 876-5290

Analytical Data Report

Group Number: 2001-1647

Site: Frontier Pendleton

Field and Laboratory Information

WST ID	Client ID	Matrix	Date Sampled	Date Received	Time
WS69381	00H08713	Aqueous	08/10/00	08/11/00	10:30
WS69382	00H08714	Aqueous	08/10/00	08/11/00	10:30
WS69383	00H08715	Aqueous	08/10/00	08/11/00	10:30
WS69384	00H08716	Aqueous	08/10/00	08/11/00	10:30

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: 08/10/00
Date Received: 08/11/00

Group Number: 2001-1647
Units: mg/L
Matrix: Aqueous

WST ID: WS69381
Client ID: 00H08713
Digestion Date: 08/18/00

Analyte	Detection Limit	Result	Date Analyzed	Analysis Method
Antimony by GFAA	0.009	Not detected	08/23/00	EPA 200.9
Boron by ICP	0.012	0.433	08/21/00	EPA 200.7
Chromium by ICP	0.005	Not detected	08/21/00	EPA 200.7

Waste Stream Technology, Inc.
Wet Chemistry Analyses

Site: Frontier Pendleton
Date Sampled: 08/10/00
Date Received: 08/11/00

Group Number: 2001-1647
Matrix: Aqueous

WST ID: WS69382
Client ID 00H08714

Analysis	Method Reference	Detection Limit	Result	Units	Date Analyzed
Cyanide in Water	EPA 335.2	0.005	Not detected	mg/L	08/22/00

Waste Stream Technology, Inc.
Wet Chemistry Analyses

Site: Frontier Pendleton
Date Sampled: 08/10/00
Date Received: 08/11/00

Group Number: 2001-1647
Matrix: Aqueous

WST ID: WS69383
Client ID 00H08715

Analysis	Method Reference	Detection Limit	Result	Units	Date Analyzed
Total Recoverable Phenol	EPA 420.1	0.005	Not detected	mg/L	08/17/00

Waste Stream Technology, Inc.
Wet Chemistry Analyses

Site: Frontier Pendleton
Date Sampled: 08/10/00
Date Received: 08/11/00

Group Number: 2001-1647
Matrix: Aqueous

WST ID: WS69384
Client ID 00H08716

Analysis	Method Reference	Detection Limit	Result	Units	Date Analyzed
Total Suspended Solids	EPA 160.2	4.0	Not detected	mg/L	08/15/00

CHAIN OF CUSTODY

WASTE STREAM TECHNOLOGY

Waste Stream Technology Inc.
302 Grote Street, Buffalo, NY 14207
(716) 876-5290 • FAX (716) 876-2412

OFFICE USE ONLY
GROUP # 2021-1647
DUE DATE

PAGE ____ OF ____

REPORT TO:
Olin Corp
Charleston, TN

CONTACT: John Burns
PH. # ( )
FAX # ( )

BILL TO:

PO#: Frontier Pendleton
PROJECT DESCRIPTION:
SAMPLER SIGNATURE:

DW DRINKING WATER
GW GROUND WATER
SW SURFACE WATER
WW WASTE WATER
O OIL
SL SLUDGE
SO SOIL
S SOLID
W WIPE
OTHER

TURN AROUND TIME: 10 BD @ 8/11

QUOTATION NUMBER:

ARE SPECIAL DETECTION LIMITS REQUIRED: YES NO
If yes please attach requirements.

Is a QC Package required: YES NO
If yes please attach requirements

ANALYSES TO BE PERFORMED

	SAMPLE I.D.	DATE SAMPLED	TIME OF SAMPLING	SAMPLE TYPE	TOTAL NO. OF CONTAINERS	B, Cr, Sb	Cyanide	Phenols	TSS	TYPE OF CONTAINER/ COMMENTS:	OFFICE USE ONLY WST. I.D.
1	00H08713	8/10/00	730A	Comp	1	1				1L HNO3	WS69381
2	00H08714	8/10/00	730A	Comp	1		1			1L NAOH	82
3	00H08715	8/10/00	730A	Comp	1			1		1L H2SO4	83
4	00H08716	8/10/00	730A	Comp	1				1	500ML 3°C	84
5											
6											
7											
8											
9											
10											

REMARKS:

	DATE:	TIME:		DATE:	TIME:
RELINQUISHED BY:	8/11/00	10 12 AM	RECEIVED BY:	8/11/00	10 30
RELINQUISHED BY:	8/11/00	1 45	RECEIVED BY:	/ /	

B-2 Operation, Maintenance and Monitoring Activities

Operation, Maintenance, and Monitoring Activities

Table B-3

Date	Event	Action Taken
May 8, 2000	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 2000

C-2 Frontier Chemical – Pendleton Site
Town of Pendleton, Niagara County, NY Water Samples
Volume 1 of 3
O'Brien & Gere
August 10 and 11, 2000

C-1 Frontier Chemical – Pendleton Site
Semi-Annual Ground Water Monitoring Report
O'Brien & Gere
September 2000

C-2 Frontier Chemical – Pendleton Site
Town of Pendleton, Niagara County, NY Water Samples
Volume 1 of 2
O'Brien & Gere
August 10 and 11, 2000

Attachment D

Attachment D – Site Maintenance Work Items and Field Observation Reports

D-1 Field Observation Reports

Field Observation Reports

- February 7, 2000, Field Observation Report

GGE
a member of the GLYNN GROUP

FIELD OBSERVATION REPORT
(With attachments)

Civil • Structural • Geotechnical • Materials Testing • Consulting

PROJECT NO.: 94-1014-O REPORT NO.: 00-02 DATE: 08/10/00 PAGE: 1 OF 3

PROJECT: Pendleton – Frontier Chemical Site

DAY: Thursday

SUBJECT: Semi-Annual Inspection

PROJECT TIME: 7:30 am – 2:30 pm

CLIENT: Pendleton PRP Group

SITE TIME: 8:00 am – 2:00 pm

WEATHER: Hazy, Warm (75°F)

PHOTOS: YES X NO

- Arrive at site for Semi-Annual site inspection. Meet Ben Brayley (Olin) and review ongoing operation of the pre-treatment system.

- In discussions with Ben B., note following items relative to pre-teatment system operation:
  - Earlier this morning, Ben B. operated the system manually and collected routine monthly discharge sample.
  - Filter bags are changed out at approx. 3 mo. Intervals.
  - The waste container barrel in the vault is nearly full and Ben B. notes that waste sampling and disposal should be arranged.
  - The hydrostatic relief inlet piping in the vault sump has been replaced and the valve on the inlet piping is currently closed (just closed this am).
  - Ben B. reports that the battery operated flow meter on the hydrostatic relief inlet does not provide reliable totalized flow data and the PPRP is considering an alternate flow meter for measuring groundwater returned to MH #3.
  - Groundwater typically leaks into the pre-treatment vault from the horizontal joint between the upper and lower vault sections if hydrostatic pressure is allowed to build up on the vault exterior.
  - The pre-treatment system discharge rate is approx. 200 gpd.
  - Ben B. reports that system discharge rates and pressure differentials across the BF's and GAC's have remained consistent. There is no indication of scale build up or loss of flow area in the pre-treatment system piping based on the observed system discharge.

PERSONNEL ON SITE / CONTACTED:
Jim Young – PPRP
Ben Brayley – Olin
Abul Barkat – NYSDEC
Jennifer Smith, Ron Chiarello – O'B&G
Tim Prawel, Don Canastrari – O'B&G

DISTRIBUTION:
Jim Young, John Burns – PPRP
Ben Brayley – Olin
Jennifer Smith, P.E. – O'Brien & Gere

DAILY MANHOURS: 7.0

Jesse E. Grossman, P.E., Project Manager

Mark W. Glynn, P.E.

GLYNN GEOTECHNICAL ENGINEERING

415 South Transit Street, Lockport, New York 14094
voice 716.625.6933 / fax 716.625.6983 DOCFILE:D:\C19BACKUP\C-19\Word Data\wordshare\Pendleton\FOR\8.10.00FOR02.doc
www.glynngroup.com

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FIELD OBSERVATION REPORT
(With attachments)

Civil • Structural • Geotechnical • Materials Testing • Consulting

PROJECT NO.: 94-1014-O REPORT NO.: 00-02 DATE: 08/10/00 PAGE: 2 OF 3

PROJECT:	Pendleton – Frontier Chemical Site	DAY:	Thursday
SUBJECT:	Semi-Annual Inspection	PROJECT TIME:	7:30 am – 2:30 pm
CLIENT:	Pendleton PRP Group	SITE TIME:	8:00 am – 2:00 pm

- Ben B. reports that the air relief valve on the top of GAC #2 passes water when discharge stops and as the pressure drops. Ben suggests that the ARV's may need to be replaced.
- No leaks are noted in any of the pre-treatment system piping or vessel elements

- M.H. #3 (wet well) is essentially empty from earlier manual operation of the pre-treatment discharge system. With Ben B., use the "T" handle to fully close and reopen the pinch valve on the end of the leachate collection pipe at the inlet into M.H. #3. Note that inflow stops completely with the valve closed. The valve is returned to the full open position. The observed inflow into M.H.#3 from the collection pipe is at a "trickle" (est. @ say, 0.1 gpm). There is no visible build up of sediments in the M.H. #3 invert.

- With Jennifer Smith and Ron Chiarello (O'B&G) and later Jim Young (PPRP) perform semi-annual site inspection as outlined in Table 2-1 of the O&M Manual. The completed Inspection Checklist is attached. Some specific site inspection item notes follow:
  - The Quarry Lake water elevation is 578.07'.
  - The M.H. #1 inv. Is clean and dry.
  - There is some sediment M.H. #2 inv. (est. less than 2" in the pipe flow trough).
  - Areas of the low-permeability cover system that were repaired in April, 1998 are fully vegetated. There are no eroded or thinly vegetated areas on the cap.

- Ron Chiarello and Jennifer Smith (O'B&G) complete an inspection of the engineered wetlands including the wetlands on the north side of Quarry Lake, areas northeast and southeast of the pre-treatment vault, and south of the capped area. O'B&G will prepare a separate wetlands inspection and recommendations report.

- O'B&G sampling team on site for semi-annual groundwater sampling event. O'B&G will complete sampling tomorrow.

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FIELD OBSERVATION REPORT
(With attachments)

Civil • Structural • Geotechnical • Materials Testing • Consulting

PROJECT NO.: 94-1014-O REPORT NO.: 00-02 DATE: 08/10/00 PAGE: 3 OF 3

PROJECT:	Pendleton – Frontier Chemical Site	DAY:	Thursday
SUBJECT:	Semi-Annual Inspection	PROJECT TIME:	7:30 am – 2:30 pm
CLIENT:	Pendleton PRP Group	SITE TIME:	8:00 am – 2:00 pm

- Abul Barkat (NYSDEC) on site in the am. Abul B. discusses wetlands inspection with O'B&G and observes areas of the perimeter berm, the overflow weir, the capped area, and the containment berm along the east side of Quarry Lake. Abul notes that a NYSDEC wetlands specialist may also perform a wetlands inspection. Abul notes that the site is in good condition and notes no deficiencies.

- With Jim Young, note that a pipeline Contractor is working in the Oxy brine line R.O.W. along the east side of the site. In discussions with an operator working in the R.O.W. determine that a new gas pipeline has been installed along the R.O.W. Operator notes that the 3" force main containment pipe from the pre-treatment system to the POTW MH-16 was located and was not damaged during pipeline installation. The new pipe crosses above the discharge piping to the POTW MH-16.

- The manhole covers are replaced and the pre-treatment system is locked upon leaving the site. O'B&G sampling team remains on site to continue sample collection.

- Attachments to this report include:
  - Site Inspection Checklist (3 pages).
  - Copy of the Pre-treatment System Operator's Log (2 pages) completed by B. Brayley.

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Table 2-1. Frontier Chemical - Pendleton Site - inspection checklist.

Date Performed: AUGUST 10, 2000 Weather: HAZY & WARM (75-80° F)

Site Name: PENDLETON - FRONTIER CHEMICAL Inspector Name: JESSE GROSSMAN (W/BB, JS, RC, JY)

Site Location: TOWNLINE RD., PENDLETON NY Inspector Signature: JGy

Item	Task	Response		Comments
		Yes	No	
Low-Permeability Cover	**Visually inspect surface conditions.**			
	1. Erosion problem?		X	COVER IN EXCELLENT CONDITION,
	2. Lack or thinning of vegetation?		X	THICK VEG. GROWTH 10" DEEP ±
	3. Mowing required?		X	
	4. Drainage problems?		X	
	5. Areas of settlement?		X	
	6. Areas of slope instability?		X	
	7. Areas of damage?		X	
Ground Water Collection and Conveyance System	**Visually inspect manholes and cleanouts.**			
	1. Buildup of solids/precipitates to the extent that the flow of ground water is affected?		X	
	2. Measure water levels in manholes and Quarry Lake. a. MH-1? DRY b. MH-2? < 2" c. MH-3? 6" ± d. Quarry Lake? 578.07'			MH-1 : CLEAN MH-2 : SOME SEDIMENT IN PIPE FLOW TROUGH
	3. Closed and opened pinch valve?	X		FULLY CLOSED & RETURNED TO OPEN
	4. Leakage, degradation or corrosion of valves, pipes, or appurtenances?		X	
	5. Areas of damage?		X	

Table 2-1. rontier Chemical - Pendleton Site - inspection checklist.

Date Performed: AUGUST 10, 2000

Weather: HAZY & WARM (75-80°F)

Site Name: PENDLETON - FRONTIER CHEMICAL

Inspector Name: JESSE GRUSSMAN (IW/BB, JS, RG, JY)

Site Location: TOWNLINE RD, PENDLETON, NY

Inspector Signature: JGJ

Item	Task	Response		Comments
		Yes	No	
Ground Water Pre-Treatment System (including Dry Vault and Wet Well)	**Perform inspection in accordance with Pre-Treatment System Operations Plan.**	X		ALL SYSTEM WORKING PROPERLY • POSSIBLE FAULTY ARV @ GAC #2 • MID HT. CRACK IN VAULT WALL
Surface Water Runoff Facilities	**Visually inspect ditches and culverts.**			
	1. Accumulation of debris?		X	DITCHES CLEAR
	2. Excessive scouring?		X	WELL VEGETATED
	3. Areas of damage?		X	
Perimeter Berm, Containment Berm, and Outlet Weir	**Visually inspect condition.**			
	1. Erosion problems?		X	NO DEFICIENCIES NOTED
	2. Areas of settlement?		X	
	3. Areas of slope instability?		X	
	4. Areas of damage?		X	
Ground Water Monitoring Wells and Piezometers	**Visually inspect condition.**			
	1. Casings secured and locked?		X	WELLS/PIEZOMETERS ACCESS FOR SAMPLING
	2. Areas of damage?		X	

Table 2-1. ..ontier Chemical - Pendleton Site - inspection checklist.

Date Performed: AUGUST 10, 2000

Weather: HAZY & WARM (75° - 85° F)

Site Name: PENDLETON - FRONTIER CHEMICAL

Inspector Name: JESSE GROSSMAN (W/BB, JC, RC, NY)

Site Location: TOWNLINE RD., PENDLETON, NY

Inspector Signature: JGG.

Item	Task	Response		Comments
		Yes	No	
Access Road	**Visually inspect surface conditions of access roads.**			
	1. Rutting?		X	NO DEFICIENCIES NOTED
	2. Potholes?		X	
	3. Settlement?		X	
	4. Areas of damage?		X	
Physical Site Security	**Visually inspect fences and gates.**			
	1. Signs intact?	X		
	2. Fence breached?		X	
	3. Access gates locked?	X		GATES LOCKED BY SAMPLING TEAM.
	4. Areas of damage?		X	
Notes:	**Note any additional comments.**			

- COINCIDENTAL SEMI-ANNUAL SAMPLING (O'B&G)
- COINCIDENTAL PRE-TREATMENT SYSTEM DISCHARGE SAMPLING (OLIN)
- COINCIDENTAL ENGINEERED WETLANDS INSPECTION (OB&G)

FRONTIER CHEMICAL - PENDLETON SITE
Pretreatment System Operator's Log

Date: 8/10/00

Time In: 710 AM
Time Out: 940 AM

Weather: Clear, cool

Precipitation: Ø

Temp: 62° f

Reason for Visit: Sampling + Inspection
Assist Jesse Grossman w/ Semi-Annual Inspection

		Reading		Time
Flowmeter Totalization Reading (upon arrival)		406354	gal	
Flowmeter Totalization Reading (upon departure)		406502	gal	
Flow Rate		8.12	gpm	
Pump Hour Meter Readings:	Pump #1	441.2	hrs	
	Pump #2	346.0	hrs	
Wet Well Water Level		1.8	ft	
Pressure Sensor Reading (Bar Graph)		31.20	psi	

	Influent Gauge	Effluent Gauge	Differential
BF1	32	28	4
BF2	28	20	8
GAC1	14	4	10
GAC2	14	4	10

Change Filter Bags (Circle One) YES (NO) TIME

Details:

Actions taken to correct problems NONE

Recommended actions to prevent future problems _____

Other relevant information Scheduling of filter bag replacement.

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	✓	✓
#2 Panel Door	✓	✓
#3 Vault Sump High	✓	✓
#4 Containment Pipe Leak	✓	✓
#5 High Wet Well Alarm	✓	✓
#6 Pump #1 Fail	✓	✓
#7 Pump #2 Fail	✓	✓
#8 Bag Filter Diff. Pressure High	✓	✓
#9 Wet Well Level (Actual Measure Spoken)	1.7	0.5
#10 Flow Rate	0	0
#11 - #16: Reserved for future use		
FOR CURRENT STATUS CALL: 716-743-1335		

Operator Name: B.H. Brayley

Signature: B.H. Brayley

M:\CASTIGLI\FRONTIER\PTSOL.WPD

Attachment E – Wetland Inspections Report

E-1 Wetland Inspections Report

Field Observation Reports

- February 7, 2000, Field Observation Report