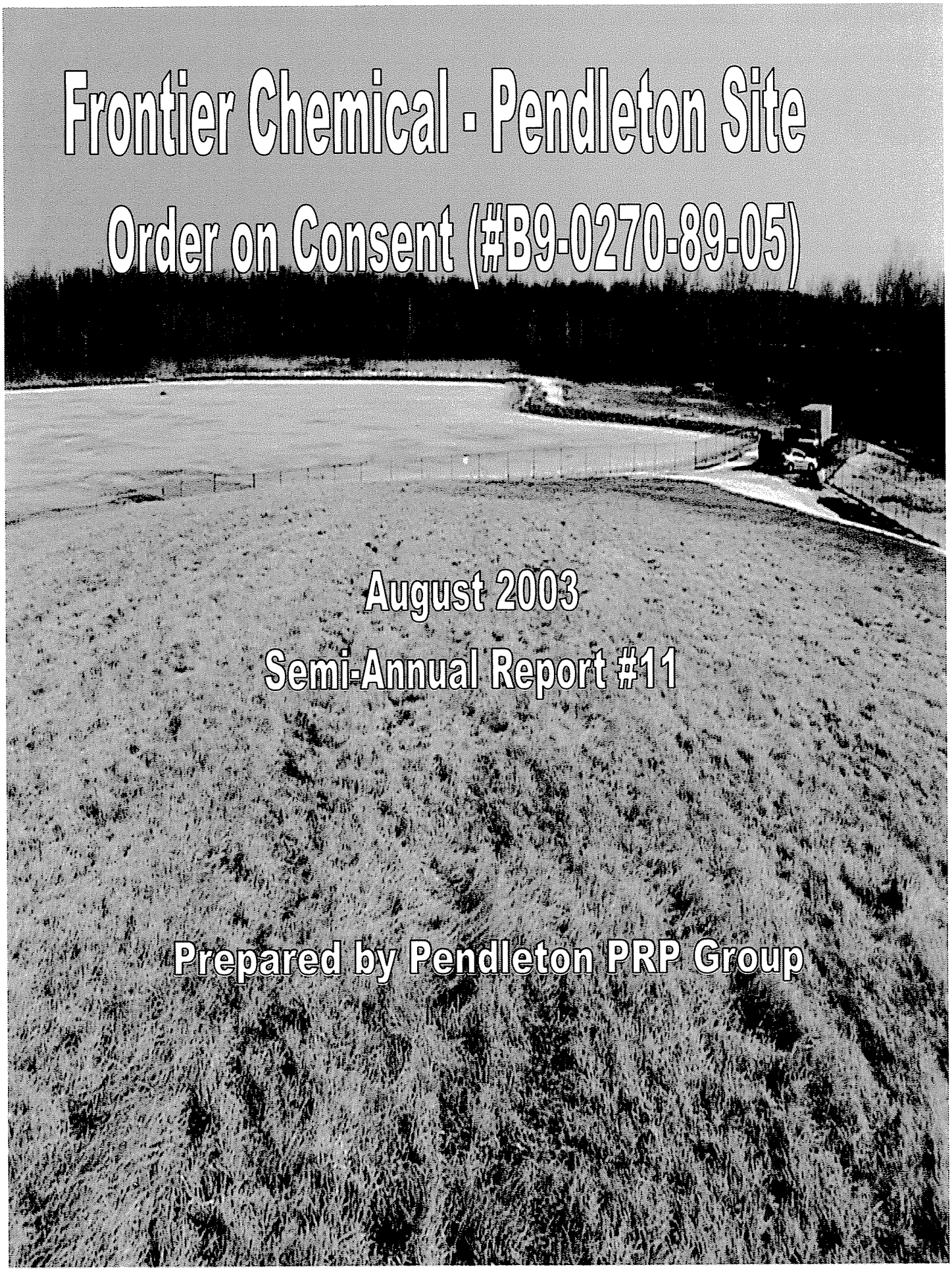

Frontier Chemical - Pendleton Site

Order on Consent (#B9-0270-89-05)

August 2003

Semi-Annual Report #11

Prepared by Pendleton PRP Group

August 14, 2003

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)
April 2003, Annual Report #11
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@olin.com.

Sincerely,

Pendleton PRP Group

John M. Burns
Chairman, Technical Committee

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Semi-Annual Report #11
April 2003

Attachments

1.0 INTRODUCTION

This report is the eleventh submittal for the operation, maintenance and monitoring at the Frontier Chemical – Pendleton Site located on Town Line Road in the Town of Pendleton, Niagara County, New York. This report is prepared based upon the New York State Department of Environmental Conservation-approved Operation and Maintenance Manual for this Site prepared by O'Brien & Gere Engineers on behalf of the Frontier Chemical – Pendleton Site PRP Group in 1996.

The Frontier Chemical – Pendleton Site PRP Group is responsible for the operation, maintenance and monitoring of the closure components of the Site. The approved O&M Plan identifies certain tasks that the Frontier Chemical – Pendleton PRP Group will perform related to the Site. The tasks that the Frontier Chemical – Pendleton PRP Group are required to perform are associated with the closure components of the Frontier Chemical – Pendleton Site.

2.0 CONSTRUCTED FEATURES

Constructed features for the Site include the capped area, ground water collection and conveyance system, surface water runoff facilities, constructed wetlands, perimeter and containment berms, and outlet weir, ground water monitoring system, access road, and site security. Each of the construction features is described briefly in the following paragraphs.

- The low-permeability capped system at the Site is a multi-component system designed to isolate the contaminants in the landfill. The 60-mil thick textured high-density polyethylene (HDPE) geomembrane is the component that covers and isolates the contaminants in the landfill. A 2-foot thick soil barrier layer was installed to protect the HPDE geomembrane cover. An 18-inch thick layer of soil barrier protection layer was placed over the HDPE geomembrane to protect the HDPE geomembrane from external forces. A 6-inch thick layer of topsoil was added to bring the soil barrier protection layer to a thickness of 2-feet. The soil barrier protection layer supports the vegetative cover c that minimizes erosion.

- The ground water collection system installed along the southern perimeter of the capped area and eastern edge of Quarry Lake is approximately 1,594 feet in length. The southern perimeter collection system is a perforated 6-inch diameter HDPE pipe approximately 420 feet in length sloped to discharge to manhole MH-1 of the eastern edge of Quarry Lake collection system. The collection system along the eastern edge of Quarry Lake is a perforated 6-inch pipe approximately 1,174 feet in length. The perforated pipe transitions to 6-inch diameter solid HDPE pipe prior to the manhole MH-3 pumping station wet well. A pinch valve is located at the entrance to the wet well. When the pinch valve is in the closed position, ground water will build up in the ground water collection trench. When the pinch valve is in the normal open position, ground water will flow into the wet well.

- The surface water runoff control facilities at the Site are designed to protect the toe of the capped area from run on and to convey runoff away from the capped area during a 25-year, 24-hour storm or a seasonal thaw event. Runoff from the northern portion of the cap drains directly to the existing wetland areas as sheet flow runoff. Sheet flow runoff from the western half of the cap drains across the western access roads discharging directly into the lake. Sheet flow runoff from the eastern portion of the cap drains across the eastern access road into a storm water ditch.

- Wetlands are constructed in Quarry Lake between the lake and the reconstructed perimeter berm, north of the capped area, and south of the capped area. In addition to direct precipitation, the constructed and existing wetlands receive surface water runoff from the capped area, Quarry Lake, and other areas of the Site.

- The perimeter berm constructed at a top elevation of approximately 580.5 feet and with a slope of 1V:3H provides containment for 25-year, 24-hour event while maintaining two feet of freeboard. The containment berm is constructed along the lakeside of the ground water collection trench at a 1V:3H and supports for the ground water collection system. The outlet weir with a crest elevation ranging from 577.2 feet to 577.5 feet is designed to discharge water from Quarry Lake into the surrounding wetlands when the water surface elevation rises above a crest elevation of 577.2 feet.

- The ground water monitoring system includes ten ground water monitoring wells (URS-14I, URS-14D, URS-9I, URS-9D, 85-5R, URS-5D, 85-7R, URS-7D, 88-12C, and 88-12D), eight piezometers (P-1 through P-8), and one standpipe (SP-1). The ground water monitoring wells are located outside the limits of the capped area and serve to monitor the elevation of the ground water table as well as to collect samples of ground water to be analyzed. Five piezometers are located within the capped area, and three piezometers are located outside the capped area. The standpipe is located within the ground water collection trench. The surface water elevation in Quarry Lake is measured along with water elevations from the eight piezometers, and the standpipe in the collection trench to monitor the establishment of an inward hydraulic gradient at the perimeter of the capped area.

- The access road from Townline Road allows access to the perimeter of the capped area and ground water collection, conveyance and pre-treatment system for inspection and maintenance purposes.

- Site access is controlled by a vehicle access gate at Town Line Road, a vehicle access gate located adjacent to the dry vault, and a perimeter fence around the capped area and pump station. The gates and fence are six-foot high chain link type with warning signs to discourage trespassers. To maintain the security of the capped area and pump station, the access gates are locked while the Site is unattended.

Operation, maintenance, and monitoring activities to be performed by the Group include:

- 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.

- Operation and maintenance of the ground water pre-treatment system.

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

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

- Recordkeeping.

3.0 INSPECTION AND MAINTAINENCE OF CAPPED AREA

Routine inspection of the capped area and immediately adjacent areas is performed semi-annually. NYSDEC is informed of the inspections at least one week in advance of the inspections to enable their participation in the inspections. The inspector for the Pendleton PRP Group, Sevenson Environmental Services, Inc. observes the condition of the vegetative cover for areas of settlement, erosion, slope instability, or any other damage to the capped area. If such features are noted, appropriate engineered solutions are implemented. Mowing is performed semi-annually and as required to prevent the establishment of woody plants (trees) that may penetrate the flexible membrane cover. Routine cover inspection will also note any problems with thinning of vegetation. Areas that appear to be thinning out over time will require overseeding to keep the vegetative cover uniform.

Inspections of the capped area and other constructed features using the Semi-Annual Inspection Checklist were conducted three times, 07/26/2002, 09/17/2002, and 04/08/2003 during this reporting period. Problem areas noted during these inspections are listed in the following table. Copies of the inspection forms from the three inspections are included in Attachment A – Exhibit 1.

CAPPED AREA AND IMMEDIATELY ADJACENT AREA INSPECTION SUMMARY		
DATE	**PROBLEM**	**STATUS/CORRECTIVE ACTION**
06-28-02	Burrowing Animals	Inspected & Filled Hole
07-26-02	Burrowing Animals	Monitoring Activity
04-08-03	Burrowing Animals	Inspected, Filled & Seeded Holes
04-08-03	Ground Shifting @ SP-1	Monitoring Activity
04-08-03	Well Protective Pipe Tilted @ P-6	Monitoring Activity

4.0 GROUND WATER COLLECTION, CONVEYANCE AND PRE-TREATMENT SYSTEM

Ground water within the capped area flows toward the ground water collection trench. The collected ground water flows by gravity through the collection trench piping to Manhole #3. The level of the collected ground water in Manhole #3 and in the collection trench piping is monitored by instrumentation that activates one of the pre-treatment pumps and initiates the pre-treatment process. The pre-treatment system is installed in the dry vault adjacent to Manhole #3. All ground water from the collection trench piping is filtered and carbon treated prior to discharge to the NCSD #1's interceptor system at Manhole #16.

The ground water collection system is inspected semi-annually for the buildup of hard or soft scale-like deposits. The inspection is performed concurrently with inspection of the capped area. The inspection measures the water levels in the manholes (MH-1, MH-2, and MH-3) and monitoring the flow rate of water being pumped to the pre-treatment system from the wet well (MH-3) to observe if there is any buildup in the ground water collection trench piping. The pinch valve in the wet well is closed and opened during the inspection. The dry vault and wet well components are visually inspected monthly for leakage or corrosion of valves, pipes and appurtenances, and for proper operation. A leak is repaired when found. If a component of the ground water collection, conveyance, or pre-treatment system is found to be damaged or malfunctioning, it is repaired or replaced.

The operation of the pre-treatment system is a process controlled by the quantity of ground water flowing from the landfill into the collection system piping. The ground water collected from inside the capped area is stored in the wet well and collection system piping when the system is not pumping. Two alternating progressive cavity pumps, each with a pumping capacity of 10 gallons per minute, are operated singularly by the ground water level in the wet well, Manhole #3. Water from the pre-treatment system is discharge from the dry vault via a dual contained force main to the Niagara County Sewer District #1 interceptor system at manhole MH-16. The flow rate and volume of ground water pumped from the wet well is measured using a magnetic-type flowmeter. The flowmeter is located downstream of the progressive cavity pumps but prior to the filter and carbon treatment units. The flowmeter is the measurement device used in reporting discharge flow from the Site to MH-16. A sump is installed within the dry vault to recycle spills and leaks inside the dry vault back into the wet well. A sump pump with a float switch pumps spills and leaks from the floor of the dry vault back into the wet well for treatment.

The pre-treatment system was designed for continuous operation capable of treating approximately 15,000 gallons per day at a rate of 10 gallons per minute. The water level sensor in the wet well can be set at various levels but is currently set to activate the pumping system when the wet well sump begins to back up water in the ground water collection piping.

PRE-TREATMENT PROCESSING, AVERAGE FLOW RATE		
PROCESS FLOW RATES	**DESIGN**	**ACTUAL**
Gallons Per Day	15,000	227
Gallons Per Minute	10	10

Under current conditions, the pumping system is always on-line but under normal ground water flow rates to the collection trench piping, operates six to eight times per 24-hour period. Each time a pump is activated by the level sensor, approximately 60 gallons of water is pumped into the pre-treatment system. Based upon the volume of the pre-treatment system, it takes at least a day for the ground water to pass through the pre-treatment system and be discharged to Manhole #16. A summary of the pre-treatment flow volume by year is shown in the table below.

PRE-TREATMENT FLOW SUMMARY BY OPERATING YEAR		
DATE	**GALLONS PER YEAR**	**GALLONS PER DAY**
1997	68,557	187
1998	64,935	178
1999	61,187	168
2000	69,998	191
2001	105,524	289
2002	107,268	294
2003*	40,978	418
NOTE:* implies year-to-date total and average		

Calendar-year flows by day for 1997 through 2002 as well as 2003 Y-T-D are presented in Attachment B – Figures 1 through 7.

The permit to discharge from the pre-treatment system to Manhole #16 of the Niagara County Sewer District #1 is currently granted by District Permit # 02-11. The permit effective date was August 28, 2002 and expires on August 28, 2004. A copy of Industrial Waste Permit #2-11 is included as Attachment B – Exhibit 1. Semi-annual reporting to Niagara County Sewer District #1 includes the volume and chemical characteristics of the water being discharge from the Site. Copies of the semi-annual reports to the Niagara County Sewer District #1 for this reporting period, Reports dated 09/19/2002 and 04/28/2003, are included in Attachment B – Exhibit 2.

The performance of the pre-treatment system has met the discharge criteria of the permit since startup in 1997.

Maintenance for the pre-treatment system is recorded in the Pre-Treatment System Operator Log. Information on the Pre-treatment System Operator Log include the purpose of the visit, local time and conditions, status of the process, details of the visit, planned action, and recommendations to prevent future problems. A log sheet is filled out during each visit to record site conditions and actions taken by the technician. Site visits are normally monthly unless alarm conditions, call by neighbors, data request, etc., require additional visits. The maintenance records for May 2002 through April 2003 are summarized in the table below.

Because of the leaking that continued to appear in the equipment, the filters, carbon beds and piping were replaced during this reporting period. Report #10 referenced the problem of corrosion and the changing out of the equipment was to occur if the leaking could not be stopped. Copies of the correspondence, waste profiles, TCLP and other analytical criteria developed for the spent carbon and filter bags, and the certificate of disposal for the materials, equipment, and piping from dry vault are included in Attachment B – Exhibit 3. Regular inspections are currently conducted monthly. These inspections are a part of the pre-treatment systems operating log. The Pre-Treatment Operator's Logs for this reporting period are summarized in the table below and the log sheets are included as Attachment B-Exhibit 4.

MAINTANANCE SUMMARY		
DATE	**PROBLEM**	**STATUS**
05-17-02	Power Failure	Restarted
05-29-03	Leak On GAC Unit #1	Flow Reduced But Not Stopped
06-28-03	Leak On GAC Unit #1	Flow Increasing For Bottom Of Unit
07-01-02	Autodialer Out	Fuse Replaced
07-03-02	Leak On GAC Unit #1	Offline For Repairs
08-02-02	Exhaust Fan Stopped	Replaced
10-02-02	Power Failure – Flow Meter	Repaired
01-13-03	Autodialer – Locked	Reprogrammed And Reset Alarms
03-21-03	Differential Pressure High	Replaced Pressure Gage
03-24-03	System Down	Replaced Equipment
03-25-03	Backpressure On GAC Unit #1	Bulging Slightly
03-27-03	Power Failure	No Problems Found; Restart
03-28-03	Flowmeter-Autodialer Agreement	Installed Electronic Filter
04-08-03	GAC Unit#1 Differential Pressure	Investigating
04-11-03	Differential Pressure	Pressure Drop In Discharge Line
04-14-03	Flow Meter	LCD Replaced

Solids resulting from ground water collection system cleaning and equipment decontamination activities are stored, handled, and disposed of in accordance with the New York State Hazardous Waste Manifest System Regulations 6NYCRR Part 372 and any other applicable local, state, and federal regulations.

5.0 GROUND WATER MONITORING PROGRAM

This Ground Water Monitoring program includes piezometer and monitoring well inspections; hydraulic data for Quarry Lake, the capped area and collection trench, and the ground water wells; and ground water chemistry of the ground water zones. Piezometers

(P-1 through P-8), standpipe (SP-1), and ground water monitoring wells (85-5R, URS-5D, 85-7R, URS-7D, URS-9I, URS-9D, 88-12C, 88-12D, URS-14I, and URS-14D) were identified as the monitoring network in the O&M Manual for the Site. The Ground Water Monitoring program's site activity scheduled is included as Attachment C – Table 1. This is the eleventh round of ground water and piezometer data collected since remedial action construction was completed. The first data collection for O&M was performed in July 24, 1997. The information from each round of data collection is used to evaluate whether or not the landfill cap and ground water collection trench are effectively controlling ground water migration.

The piezometer and monitoring well inspections were conducted on April 9 and April 10, 2003. The piezometer integrity checklists are included in Attachment C – Exhibit 1. The monitoring well integrity checklists are included in Attachment C – Exhibit 2. During each monitoring event, ground water monitoring wells and piezometers are inspected for signs of damage. If damage is detected, or if routine sampling indicates a problem with one or more of the ground water monitoring wells or piezometers, it is noted in the well integrity checklist. Before any action is taken with the wells, the action will be discussed with the NYSDEC.

Problems noted with the well inspection are listed in the table below. It should be noted that at this time these issues are not affecting the integrity of the piezometers or monitoring wells.

GROUND WATER MONITORING SUMMARY	
WELL TYPE	**PROBLEM**
SP-1	Ground Around Well Box Shifting Toward Lake
P-6	Well Pipe Tilted @ 15 To 20 Degrees
85-5R	Casing Shifted; Bailer Will Not Go Down To Well Bottom
URS-5D	Protective Casing Cover Hinge Broken
URS-7D	Broken and Shifted Concrete Base
URS-9I	Shifted Casing and A Broken Outer Cap

A complete round of static ground water elevations was collected on April 8, April 9, and April 10, 2003. The static ground water elevations measured in the piezometers and standpipe, and in the monitoring wells, are summarized in Attachment C – Table 2 and Table 3 respectively.

The surface water elevation of Quarry Lake was measured on April 9, 2003, by Glynn Geotechnical Engineering, Inc. Field notes containing the water level measurement are included in Attachment C – Exhibit 3. Quarry Lake surface water elevations are summarized in Attachment C - Table 4.

Between April 9 and 10, 2003, ground water samples were obtained from the ten ground water monitoring wells (85-5R, URS-5D, 85-7R, URS-7D, URS-9I, URS-9D, 88-12C, 88-12D, URS-14I, and URS-14D). Purge water generated during this sampling event was contained, passed through a 25-micron bag filter, and discharged into Manhole –3.

Following sample collection, the ground water samples were submitted to O'Brien & Gere Laboratories, Inc., for analysis of the parameters shown in Attachment C - Table 7. Ground water sampling logs and chain of custody forms are included in Attachment C- Exhibit 3 and 4.

The ground water samples collected Sevenson Environmental Services were analyzed by O'Brien & Gere Laboratories, Inc. for VOCs using USEPA Method 8260B, inorganics using USEPA Methods 6010B/7470A/7841, and cyanide using EPA Method 9010B/9014.

A request to change sampling frequency and other sampling parameters was submitted to NYSDEC with Report #10. A copy of this request is included as Attachment C- Exhibit 4. NYSDEC approved only the sampling frequency change from semi-annual to annual. A copy of the correspondence dated September 16, 2002 from NYSDEC regarding the sampling frequency is included in Attachment C – Exhibit 5.

6.0 EVALUATION OF OPERATION, MAINTENANCE, AND MONITORING ACTIVITIES

The capped area was mowed on a regular basis to prevent establishment of woody vegetation during this reporting period. The only problem associated with the capped area is burrowing animals. This problem is being addressed during regular monthly inspections and by attempting to discourage burrowing animals from remaining in the holes once the hole is established. The capped area functions as designed and complies with the O&M Plan.

The ground water collection piping and the wet well continued to function as designed. Minor leaks with various pieces of the pre-treatment system continued to worsen and repairs to the equipment became more frequent. The increased daily flows from the pre-treatment system in 2001, 2002, and the first quarter of 2003 were assumed to be mainly due to leaks occurring downstream of the flowmeter and the leaked ground water being recycled back to the wet well. The leak problems with both the filter and carbon units were eliminated by installing new equipment in April 2003. The data collection and flow meter problems were eliminated by installing a new autodialer and two additional flow meters. The three flow meters that are now installed on the flow to the filter, the discharge to NCSD #1, and the recycle back to the wet well will allow for a water balance of flow in the pre-treatment system. Both the ground water collection and pre-treatment systems function as designed and comply with the O&M Plan.

The water level in the wetlands to the north of Quarry Lake is currently higher than the Quarry Lake outlet weir. The water level at the outlet weir for Quarry Lake is approximately 578 feet. The weir was constructed at an elevation of 577.2-577.5 feet to maintain a design water level in Quarry Lake and to provide a discharge point for rainfall runoff from the capped area. The perimeter berm for Quarry Lake is approximately 580.5. Currently, this elevated water level has not adversely impacted any components of the site. The surface control features function as designed and comply with the O&M Plan.

The relocated wetlands inside the Quarry Lake levee have design elevations for aquatic bed species, for non-persistent emergent species, and for persistent emergence species. With Quarry Lake's water elevation approximately one foot above the weir elevation; the design concept of various wetlands zones within Quarry Lake may no longer be applicable. Currently, the wetland areas inside the berm area of Quarry Lake functions as designed and comply with the O&M Plan.

The perimeter berm, constructed along the perimeter of Quarry Lake, provides a stable embankment to contain runoff associated with a 25-year, 24-hour storm event. The containment berm, constructed along the lakeside of the capped area, provides support for the ground water collection system. The outlet weir is designed to discharge water from the lake into the surrounding wetlands when the water surface elevation rises above a crest elevation of 577.2 feet. Water in Quarry Lake consistently above the design weir elevation will reduce holding capacity during the design storm event. The containment berm functions as designed and complies with the O&M Plan.

The water elevation data collected from the piezometers and ground water wells was used to determine whether an inward hydraulic gradient exists was made by comparing water level measurements within the capped area to those measured outside the capped area. This information was also used to determine the ground water flow potential inside the capped area, and to determine whether the ground water collection trench is effectively controlling ground water migration away from the capped area.

An inward hydraulic gradient will be established when water levels in piezometers outside of the capped area (P-1, P-5, P-8) and Quarry Lake are higher than water levels in piezometers within the capped area (P-2, P-3, P-4, P-6, P-7). There are four pairs of piezometer placed around the perimeter of the capped landfill to determine attainment of an inward gradient. The progress made by each of the four pairs of piezometers is discussed in the following paragraphs.

The ground water levels for piezometer pair, P-1 and P-2, located in the eastern portion of the capped area that borders the abandoned ROW, were presented previously in Attachment C – Table 2. These measurements along with measurements from the earlier ten reports are plotted in Attachment D - Figure 1. Figure 1 implies that except for 02/23/98 and 02/2101 measurements, little to no progress has been made toward establishing an inward gradient for this pair of piezometers.

The ground water levels for the piezometer pair, P-5 and P-6, located in the southern portion of the capped area were presented previously in Attachment C – Table 2.These measurements along with measurements from the earlier reports are shown in Attachment D - Figure 2. Figure 2 implies that an inward gradient was obtained for this pair of piezometers in September 1998 and that an inward gradient has been maintained since that reporting period.

The ground water levels for the piezometer pair, P-7 and P-8, located in the northern portion of the capped area were presented previously in Attachment C – Table 2. These measurements along with measurements from the earlier reports are shown in Attachment D - Figure 3. Figure 3 implies that an inward gradient was obtained for this pair of piezometers in February 1999 and that an inward gradient has been maintained since that reporting period.

The ground water levels for piezometer P-4 and Quarry Lake located in the western portion of the capped area were presented previously in Attachment C – Table 2 and Attachment C – Table 4. These measurements along with measurements from the earlier reports are shown in Attachment D - Figure 4. Figure 4 implies that an inward gradient was obtained in February 1998 and that an inward gradient has been maintained through this reporting period. Figure 4 implies that the ground water level in both P-4 that is located directly across from SP-1 and P-3 located in the middle of the capped area are continuing to dewater the materials under the capped area.

Two additional comparisons were made using the piezometer data. In the first comparison all of the inside the capped area piezometers were plotted using data from June 1997 forward and is included as Attachment D – Figure 5. The same type of plot was made for the piezometers outside the capped area and is included as Attachment D – Figure 6. The contrasting fluctuations of ground water levels inside and outside the capped area demonstrate that ground water within the capped area has been isolated from the ground water outside the capped area.

In addition, the ground water elevation in the standpipe (SP-1) in the ground water collection trench is less than the surface water elevation of Quarry Lake, indicating that Quarry Lake is isolated from the capped area.

In summary, although the static ground water level data indicates a slight outward hydraulic gradient within the eastern portion of the capped area, the ground water elevations collected in the piezometers installed within the capped area (P-2, P-3, P-4, P-6, and P-7 as shown in Attachment D- Figure 5) are lower than originally water levels measured in June 1997. Also shown in Figure 5 is steady decrease or downward trend in the water level under the cap. In addition, the water levels in the piezometers located outside the capped area (P-1, P-5, and P-8) are lower than have been previously measured, due to seasonal variations. Finally, the amount of ground water present within the capped area and the time to dewater beneath the capped area has minimal impact on the effectiveness of the containment, since hydraulic isolation within the capped area has been established and ground water beneath the capped area is migrating towards the ground water collection trench.

Results of the ground water analyses (TCL VOCs and TAL Metals and cyanide) from the monitoring wells, along with a comparison of the results with New York State Class GA standards, are summarized on Table 4 in Attachment D. In general, the April 2003 ground water chemistry is similar to previous sampling events.

Detected inorganic constituents exceeding New York State Class GA standards from this sampling event are chromium at one location (88-12d), iron at eight locations (85-5R, URS-5D, 85-7R, URS-7D, URS-9I, 88-12C, 88-12D, and URS-14I) and sodium at ten locations (85-5R, URS-5D, 85-7R, URS-7D, URS-9I, URS-9D, 88-12C, 88-12D, URS-14I, and URS-14D). The level of chromium is the first exceedance of New York State Class GA standards since a similar value was reported in URS-14I in February 1998. Concentrations of iron and sodium are similar concentrations as detected in the monitoring wells during previous sampling. It is likely that the elevated concentrations of sodium and iron are naturally occurring and are not related to previous site activities.

VOCs were not detected in the Site monitoring wells above the New York State Class GA standards.

The access road was inspected at the same frequency as inspection of the final cover for rutting, potholes or settlement. No repairs were needed. The access road functions as designed and complies with the O&M Plan.

The integrity of the six-foot high chain link fence immediately surrounding the capped area and pump station was inspected at the same time as the capped area. The structural integrity of the fencing system was verified. Site security functions as designed and complies with the O&M Plan.

Recordkeeping requirements for the site including copies of records, reports, or other information relative to maintenance and monitoring activities at the Frontier Chemical-Pendleton Site were provided to the NYSDEC by the Pendleton PRP Group. The recordkeeping requirements comply with the O&M Plan.

7.0 Conclusions

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

- The isolation of ground water within the capped area has been established and is being maintained by current operation and maintenance activities.

- The ground water elevation data indicates that ground water within the capped area is migrating to the west toward the ground water collection trench.

- The ground water elevation data indicates that the ground water collection trench is effectively removing shallow ground water from within the capped area.

- The April 2003 ground water chemistry collected from the monitoring wells is similar to previous sampling events.

- VOCs were not detected in the monitoring wells above the New York State Class GA standards.

- Review of the ground water elevations data indicate that inward hydraulic gradients were observed between piezometers within the capped area and piezometers outside of the capped area, with the exception of the vicinity of P-1 and P-2. Not withstanding the absence of inward hydraulic gradients, potential contaminant migration in the P-1/P-2 area is still not of concern given the analytical data for P-1 and P-2 collected during October 2001.

- Since VOCs are more readily transported in ground water compared with SVOCs, PCBs, and inorganics, the absence of VOCs detected at concentrations above the New York State Class GA standards in the monitoring wells and piezometers surrounding the capped area provide further evidence that contaminants are not migrating from beneath the cap.

Attachment A

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FRONTIER CHEMICAL - PENDLETON SITE
MAY 2002 TO APRIL 2003
REPORT #11

ATTACHMENT A – EXHIBIT 1
FRONTIER CHEMICAL - PENDLETON SITE
SEMI-ANNUAL INSPECTION CHECKLIST
~~MAY 2002 TO APRIL 2003~~
REPORT #11

CONTENTS BY REPORT DATE

JULY 26, 2002
SEPTEMBER 17, 2002
APRIL 8, 2003

Table 2-1 Frontier Chemical – Pendleton Site Inspection Checklist

Date Performed: 7-26-02	Weather: Cloudy
Site Name: Town line Landfill	Inspector Name: M. Walker
Site Location: Pendleton, NY	Inspector Signature:

Item	Task	Response		Comments
		Yes	No	
Low-Permeability Cover	**Visually inspect surface conditions.**			
	1. Erosion problem?		X	
	2. Lack or thinning of vegetation?		X	
	3. Mowing required?		X	
	4. Drainage problems?		X	
	5. Areas of settlement?		X	
	6. Areas of slope instability?		X	
	7. Areas of damage?	X		One gopher came back, to the side of landfill
Ground Water Collection and Conveyance System	**Visually inspect manholes and cleanouts.**			
	1. Buildup of solids/precipitates to the extent that the flow of groundwater is affected?		X	
	2. Measure water levels in manholes and Quarry Lake. a. MH-1 b. MH-2 c. MH-3 d. Quarry Lake			a. Clean and dry b. Dry with ~ ½" of moist silt c. ~1.71" of water with 0.1" of silt d.
	3. Closed and opened pinch valve?	X		
	4. Leakage, degradation or corrosion of valves, pipes or appurtenances?		X	
	5. Areas of damage?		X	

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		
Surface Water Runoff Facilities	**Visually inspect ditches and culverts.**			
	1. Accumulation of debris?		X	
	2. Excessive scouring?		X	
	3. Areas of damage?		X	
Perimeter Berm, Containment Berm, and Outlet Weir	**Visually inspect condition.**			
	1. Erosion problems?		X	
	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		Some casings have rusted away at the hinges
	2. Areas of damage?	X		Some have settled to deep to lock
Access Road	**Visually inspect surface conditions of access roads.**			
	1. Rutting?		X	
	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		

Item	Task	Response		Comments
		Yes	No	
	4. Areas of damage?		X	
Notes	**Note any additional comments.**			
Some casings have rusted away at the hinges				
Some have settled to deep to lock				
Bull Creek Status				
Wetlands Status				
Firing range				

Table 2-1 Frontier Chemical – Pendleton Site Inspection Checklist

Date Performed: 7-26-02	Weather: Cloudy
Site Name: Town line Landfill	Inspector Name: M. Walker
Site Location: Pendleton, NY	Inspector Signature:

Item	Task	Response		Comments
		Yes	No	
Low-Permeability Cover	**Visually inspect surface conditions.**			
	1. Erosion problem?		X	
	2. Lack or thinning of vegetation?		X	
	3. Mowing required?		X	
	4. Drainage problems?		X	
	5. Areas of settlement?		X	
	6. Areas of slope instability?		X	
	7. Areas of damage?	X		One gopher came back, to the side of landfill
Ground Water Collection and Conveyance System	**Visually inspect manholes and cleanouts.**			
	1. Buildup of solids/precipitates to the extent that the flow of groundwater is affected?		X	
	2. Measure water levels in manholes and Quarry Lake. a. MH-1 b. MH-2 c. MH-3 d. Quarry Lake			a. Clean and dry b. Dry with ~ ½" of moist silt c. ~1.71" of water with 0.1" of silt d.
	3. Closed and opened pinch valve?	X		
	4. Leakage, degradation or corrosion of valves, pipes or appurtenances?		X	
	5. Areas of damage?		X	

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		
Surface Water Runoff Facilities	**Visually inspect ditches and culverts.**			
	1. Accumulation of debris?		X	
	2. Excessive scouring?		X	
	3. Areas of damage?		X	
Perimeter Berm, Containment Berm, and Outlet Weir	**Visually inspect condition.**			
	1. Erosion problems?		X	
	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		Some casings have rusted away at the hinges
	2. Areas of damage?	X		Some have settled to deep to lock
Access Road	**Visually inspect surface conditions of access roads.**			
	1. Rutting?		X	
	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		

Item	Task	Response		Comments
		Yes	No	
	4. Areas of damage?		X	
Note:	Need additional comments			
Some casings have rusted away at the hinges				
Some have settled to deep to lock				
Bull Creek Status				
Wetlands Status				
Firing range				

4-1 Frontier Chemical – Pendleton Site – Inspection Checklist

Date Performed: 9-17-02	Weather: Sunny 80F
Site Name: TOWNLINE LANDFILL	Inspector Name: Michael E. Walker
Site Location: PENDLETON, NY	Inspector Signature:

Item	Task	Response		Comments
		Yes	No	
Low-Permeability Cover	**Visually inspect surface conditions.**			
	1. Erosion problem?		X	
	2. Lack or thinning of vegetation?		X	
	3. Mowing required?		X	
	4. Drainage problems?		X	
	5. Areas of settlement?		X	
	6. Areas of slope instability?	X		Near clean out & SP-1 on N. side of cap
	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 groundwater is affected?		X	
	2. Measure water levels in manholes and Quarry Lake. a. MH-1? b. MH-2 c. MH-3? d. Quarry Lake?		X	MH-1, MH-2,MH-3, were dry, the lake level was at 577.34'.(about 1' lower than "normal".)
	3. Closed and opened pinch valve?	X		
	4. Leakage, degradation or corrosion of valves, pipes or appurtenances?	X		Bag Filter unit #1 and GAC unit #1 offline due to corrosion breakthrough.
	5. Areas of damage?		X	
Ground Water Pre-Treatment System (including Dry Vault and Wet Well)	**Perform inspection in accordance with Pre-Treatment System Operations Plan**	X		
Surface Water Runoff Facilities	**Visually inspect ditches and culverts.**			

Item	Task	Response		Comments
		Yes	No	
	1. Accumulation of debris?		X	
	2. Excessive scouring?		X	
	3. Areas of damage?		X	
Perimeter Berm, Containment Berm, and Outlet Weir	**Visually inspect condition.**			
	1. Erosion problems?		X	
	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		
	2. Areas of damage?		X	
Access Road	**Visually inspect surface conditions of access roads.**			
	1. Rutting?		X	
	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		
	4. Areas of damage?		X	
Notes	Note any additional comments.			
There is only 1 active Gopher hole remaining on the hill. Lake level is 1' below what is considered normal, probably due to the hot, dry summer season.				

Table 2-1 Frontier Chemical – Pendleton Site – Inspection Checklist

Date Performed:4/08/03	Weather: 35 F
Site Name: Frontier Chemical Site (Townline Landfill)	Inspector Name: Michael Walker
Site Location: Townline Road, Pendleton, NY	Inspector Signature:

Item	Task	Response		Comments
		Yes	No	
Low-Permeability Cover	**Visually inspect surface conditions.**			
	1. Erosion problem?		X	
	2. Lack or thinning of vegetation?		X	
	3. Mowing required?		X	
	4. Drainage problems?		X	
	5. Areas of settlement?		X	
	6. Areas of slope instability?	X		The well box around SP-1 has shifted 6" toward the lake.
	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 groundwater is affected?		X	Wet well has 4"-6" of silt, MH-2 has 1"
	2. Measure water levels in manholes and Quarry Lake.			
	a. MH-1?		Dry	Clean and Dry
	b. MH-2		Dry	No water, but 1" of silt on bottom
	c. MH-3?		2.8'	Wet Well, 4"-6" of silt on bottom
	d. Quarry Lake?		578.63	About 1' higher than Sept.'02
	3. Closed and opened pinch valve?	X		Works fine
	4. Leakage, degradation or corrosion of valves, pipes or appurtenances?		X	All is fine
	5. Areas of damage?		X	

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		
Surface Water Runoff Facilities	**Visually inspect ditches and culverts.**			
	1. Accumulation of debris?		X	
	2. Excessive scouring?		X	
	3. Areas of damage?		X	
Perimeter Berm, Containment Berm, and Outlet Weir	**Visually inspect condition.**			
	1. Erosion problems?		X	
	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		
	2. Areas of damage?		X	
Access Road	**Visually inspect surface conditions of access roads.**			
	1. Rutting?		X	
	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	

Item	Task	Response		Comments
		Yes	No	
	3. Access gates locked?	X		
	4. Areas of damage?		X	

Notes/Additional Comments

I re-seeded areas where gophers had dug up the lawn on the cap. The effluent pipe that runs from the pretreatment vault to the POTW is showing signs of blockage or restriction. It now generates 17 psi. of back pressure, and should probably be cleaned out. Brian Sydowski of the NYSDEC also came out for a site inspection, he suggested that the wet well and MH-2 be vacuumed out as preventative maintenance, due to build up of silt on the bottom.

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FRONTIER CHEMICAL - PENDLETON SITE
MAY 2002 TO APRIL 2003
REPORT #11

ATTACHMENT B – EXHIBIT 1
FRONTIER CHEMICAL - PENDLETON SITE
INDUSTRIAL WASTE PERMIT
MAY 2002 TO APRIL 2003
REPORT #11

PERMIT

#2-11

Niagara County Sewer District #1

Industrial Waste Permit

FILE COPY

Industrial User: Pendleton Site PRP Group
(Permitee)

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

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

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

Site Address: Pendleton Site Townline Road
Street Address

Pendleton, New York
City, State

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

Effective Date: August 28, 2002

Expiration Date: August 28, 2004

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

District Permit No. 02-11

Date: 10/4/02 Signed:

Schedule A – Listing of Discharged Wastestreams

Industry Name: Pendleton (Frontier Chemical) Site
Groundwater Remediation

The following wastestreams are discharged to sanitary sewer system tributary of Niagara County Sewer District #1.

Waste-Streams	Nature of Waste	Volume gallons per day	Discharge Point
WS 001	Groundwater Remediation	250	D 002

PART I – WASTEWATER DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

Industry Name: Pendleton (Frontier Chemical) Site
Sample Point: Sample Point A: Groundwater Pump Station Discharge
Description: Contaminated Groundwater

Parameter	Discharge Limitations[1]	Monitoring Requirements: Sampling Frequency	Monitoring Requirements: Sample Type
Flow		Continuous	
a.) Groundwater Remediation	2500 GPD, Daily Maximum		
Pollutants	**Discharge Limit**		
624	0.100 mg/L (Sum of all EPA 624 cmpds.)	Semi-Annual	24C[2]
Antimony	0.1 mg/L	Semi-Annual	24C
Boron	4.0 mg/L	Semi-Annual	24C
Chromium	5.33 mg/L	Semi-Annual	24C
Cyanide (T)	2.0 mg/L	Semi-Annual	4 Grabs[4]
Total Phenolics (4AAP)	Surveillance Only	Semi-Annual	
Total Suspended Solids	300 mg/L	Semi-Annual	24C

These Limitations shall be effective immediately.

Notes:

(1) All other limitations as set forth in the District's Sewer Use Law shall also apply.

(2) 24-hour composite samples for volatile (624) organics to consist of a minimum of four (4) grabs within a 24-hour period. (See Sampling Measurement & Analytical Guidelines, Section 9, Paragraph 2.)

(3) Cyanide will be analyzed from 4 grabs collected over the 24 hour period using the appropriate containers/preservatives and lab composited.

PART II – SPECIAL CONDITIONS/COMPLIANCE SCHEDULE

1. Compliance Schedules: If additional pretreatment and/or operation and maintenance are required to meet discharge limitation and/or Pretreatment Regulations, the User will immediately advise District of the shortest schedule by which the User provide such additional pretreatment or reduction in flow discharged. The completion date in this schedule shall not be later than the compliance date established for any applicable Pretreatment Regulations.

PART III – REPORTING REQUIREMENTS

1. The Industrial User shall notify the District immediately upon any accidental or slug discharge to the sanitary sewer system. Formal written notification discussing circumstances of the event and remedies to prevent recurrence shall be submitted to the District within 3 days of occurrence.

2. The Industrial User shall notify the District and apply for a revised permit 30 days prior to the introduction of new wastewater or pollutants or any substantial change in the volume or characteristics of the wastewater being introduced into the POTW from the User's industrial processes.

3. Any upset experienced by the Industrial User of its treatment that places it in a temporary state of non-compliance with wastewater discharge limitations contained in this permit or other limitations specified in the District's Sewer Use Law shall be reported to the District within 24 hours of first awareness of the commencement of the upset. A detailed report shall be filed within 5 days.

4. Self-monitoring reports are due at the NCSD #1 office within 30 days of sampling. When reporting results, the following information shall be provided:

   a.)
   1. The date, exact place, and time of sampling or measurements;
   2. The individual(s) who performed the sampling or measurements;
   3. The date(s) analyses were performed;
   4. The individual(s) who performed the analyses;
   5. The analytical techniques or methods used;
   6. The results of such analyses

   b.) A copy of the original lab report(s) as provided by the certified testing lab(s), including properly completed chain(s) of custody.

   c.) The original data from the lab report shall be transcribed into a table comparing the permit requirements to the obtained results. In cases where the permit contains requirements for daily maximum and maximum monthly average, columns for both of these shall be included in the table. When a single value applies to both daily max. and max. mo. avg. (because monitoring was only performed once during a month), separate columns shall still be included in the table, clearly indicating that the value is both the daily maximum and the monthly average.

   d.) All daily flows obtained since the previous reporting period, as well as the maximum and average daily flow for each month.

   e.) A certification statement as to whether the Industrial User is in compliance with the permit limitations. If the permit contains limitations for both daily max. and max. mo. avg., the statement must specify whether the User is in compliance with both limitations.

   f.) A certification statement that all normally operated (applicable) processes were operating (and discharging) during the monitoring period. Any processes not in operation shall be cited together with a listing of pollutants which might normally be present in said process discharge.

5. Additional Monitoring by Permittee - If the permittee monitors any pollutants at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified herein, the results of such monitoring shall be included in the calculation and reporting of values required under Part I. Such increased frequency shall also be indicated.

PART III – REPORTING REQUIREMENTS (cont'd)

6. All self-monitoring reports prepared shall be submitted to:

Frank A. Nerone, Chief Operator
Niagara County Sewer District #1 Water Pollution Control Center
7346 Liberty Drive
Niagara Falls, New York 14304

7. Signatory Requirements - All reports required by this permit shall be signed by an authorized representative of the Industrial User.

8. If sampling performed by the Industrial User indicates a violation, the Industrial User is required to repeat the sampling and analysis and submit the results to the District within thirty (30) days after becoming aware of the violation.

Additionally, applicable quality control is mandatory in cases where the Industrial User is conducting additional self-monitoring as a result of non-compliance. (See Sampling Measurement and Analytical Guidelines, Item #19 "Quality Control.")

9. Toxic Organic Management Plan - For Industrial Users who are required to monitor for Total Toxic Organics (TTO), and who are implementing a District-Approved, Toxic Organic Management Plan in lieu of this monitoring, the following certification shall be included with each self-monitoring report:

> "Based on my inquiry of the person or persons directly responsible for managing compliance with the permit limitation for total toxic organics, I certify that, to the best of my knowledge and belief, no dumping of concentrated toxic organics into the wastewaters has occurred since filing of the last discharge monitoring report. I further certify that this facility is implementing the toxic organic management plan submitted to the control authority."

PART IV - STANDARD CONDITIONS

1. PROHIBITED DISCHARGES

The Industrial User shall comply with all the general prohibitive discharge standards.

2. INSPECTION/RIGHT-OF-ENTRY

The administrator and/or other duly authorized employees of the District, NYSDEC and/or USEPA, bearing proper credentials and identification, shall be permitted to enter all industrial properties without advance notice for the purpose of inspection, observation, measurement, sampling, monitoring, and testing in accordance with the provisions of its Sewer Use Law. The District shall also have the right to inspect and copy records pertaining to the Industry's self-monitoring procedures.

3. RECORDS RETENTION

The Industrial User shall retain and preserve for no less than (3) years any records, books, documents, memoranda, reports, correspondence, records of calibration and maintenance of instrumentation, recordings from continuous monitoring instrumentation, and any summaries thereof, relating to monitoring, sampling and chemical analysis made by or in behalf of the user in connection with its discharge. All records that pertain to matters that are the subject of special orders, or any other enforcement or litigation activities brought by the District, shall be retained and observed by the Industrial User until all enforcement activities have concluded and all periods of limitation with respect to any and all appeals have expired.

4. CONFIDENTIAL INFORMATION

Except for data determined to be confidential under Section 5.15 of the District's Sewer Use Law, all reports required by this permit shall be available for public inspection at the office of the Pretreatment Administrator, 7346 Liberty Drive, Niagara Falls, New York 14304.

PART IV – STANDARD CONDITIONS (cont'd.)

5. **DILUTION**

No Industrial User shall increase the use of potable or process water or, in any way, attempt to dilute a discharge as a partial or complete substitute for adequate treatment to achieve compliance with the limitations contained in this permit.

6. **PROPER DISPOSAL OF PRETREATMENT SLUDGES AND SPENT CHEMICALS**

The disposal of sludges and spent chemicals generated shall be done in a manner such as to prevent the pollutants from such material from entering the NCSD #1 sewer system. Said disposal shall also conform to all applicable State/Federal regulations.

7. **REVOCATION OF PERMIT**

The permit issued to the Industrial User by the District may be revoked when after inspection, monitoring or analysis, it is determined that the discharge of wastewater to the sanitary sewer is in violation of Federal, State, or local laws, ordinances, or regulations. Additionally, falsification or intentional misrepresentation of data or statements pertaining to the permit application or any other required reporting form, shall be cause for permit revocation, revocation of sewer discharges privileges, and/or imposition of criminal penalties.

8. **LIMITATION ON PERMIT TRANSFER**

Wastewater discharge permits are issued to a specific user for a specific operation and are not assignable to another user or transferrable to any other location without the prior written approval of the District. Sale of a facility by a User shall obligate the purchaser to seek prior written approval of the District for continued discharge to the sewerage system.

9. **PERMIT AVAILABILITY**

The original signed permit must be available upon request at all times for review at the Industrial User's address stated on the first page of this permit.

10. **MODIFICATION OR REVISION OF THE PERMIT**

a. The terms and conditions of this permit may be subject to modification by the District at any time as limitations or requirements, as identified in the District Sewer Use Law, are modified or other just cause exists.

b. This permit may also be modified to incorporate special conditions resulting from the issuance of a special order by NYSDEC or EPA.

c. The terms and conditions may be modified as a result of EPA promulgating a new federal pretreatment standard. If a pretreatment standard or prohibition (including Schedule of Compliance specified in such pretreatment standard or prohibition) is established under Section 807 (b) of the Act for a pollutant which is present, the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in permit, this permit shall be revised or modified in accordance with such pretreatment standard or prohibition.

d. The terms and conditions of this permit shall remain in effect until the permit is terminated or replaced by a subsequent permit.

11. **DUTY TO REAPPLY**

Within ninety (90) days of the expiration, the User shall reapply for reissuance of the permit. Application forms are available from the District upon request.

12. **SEVERABILITY**

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

PART IV – STANDARD CONDITIONS (cont'd).

13. ENFORCEMENT AND PENALTIES

Any violation of Section 2 or 3 of the Niagara County Sewer Use Law (adopted January 18, 1994) is declared a violation except as otherwise provided by law. Any violation of Section 4, 5 or 6 of the Niagara County Sewer Use Law is thereby a misdemeanor except as otherwise provided by law. A User who is found to have violated any provision of the Niagara County Sewer Use Law (or permits and orders issued thereunder) and/or applicable pretreatment standards and requirements, shall be subject to applicable civil and criminal penalties including but not limited to fines not to exceed five thousand dollars ($5,000) per violation per day for each day on which non-compliance shall occur or continue.

PART V - SPECIFIC CONDITIONS

NONE

NIAGARA COUNTY SEWER DISTRICT #1

SAMPLING MEASUREMENT AND ANALYTICAL GUIDELINES

1. Prior to implementing the self-monitoring sampling and analyses, the Industrial User must submit the following information to the District.

   a. The name(s) and address(es) of the laboratory or laboratories proposed to perform each of the chemical analyses.
   b. A description of the equipment and test methods proposed for the chemical analyses for each parameter.
   c. A list of the lower level of detectability expected for each parameter.
   d. A description of the overall recovery efficiency of the prepared sample, where applicable.
   e. A description of the quality control procedures used by the laboratory or laboratories to ensure reliable test results.
   f. A description of the sample collection point and sample collection procedures.
   g. A description of the compositing technique and equipment.
   h. A description of the sample preservation methods used for each parameter.

2. Before commencement of any sampling or flow monitoring, Niagara County Sewer District #1 Water Pollution Control Center shall be notified in writing at least seventy-two (72) hours in advance by the firm or designee. The District will give a twenty-four (24) hour verbal notification to the firm or District designee of whether split sampling will be initiated.

3. Before sampling is done, the sample points must be approved by the District.

4. All discharge lines from one (1) building, or all discharge lines from only one (1) single process must be sampled at the same time.

5. Sampling record must be used and submitted with monitoring reports. The sampling report shall contain the following minimum information:

   a. Date of each sample day.
   b. Exact location of sampling points – attach drawing for reference.
   c. If done manually, time of each grab sample with sampler's initials each time.
   d. Type of auto-sampler used. Size and type of tubing and sampling interval.
   e. Record all physical observation (sight, smell etc.) of the discharge at start-up, during inspections and changing samples.
   f. Note weather conditions.
   g. Signature of immediate sampling supervisor at the bottom of page.

6. If an auto-sampler is used, new tubing must be at least ¼ I.D. If visibly contaminated after sampling, it must be cleaned with detergent or methanol and deionized water each day. Proper refrigeration of the sample must be maintained during entire sampling period, when necessary. The intake hose velocity must be at least 2.0 f.p.s. with a maximum lift of twenty (20) feet.

7. All sampling shall be taken at the highest velocity, greatest turbulence and center of flow.

8. All sampling must be done on normal work days. If there is a process discharge after normal working hours, sampling must continue until no further discharge.

9. "COMPOSITE SAMPLE" "Composite" shall mean a combination of individual (or continuously taken) samples obtained at regular intervals over the entire discharge day. The volume of each sample shall be proportional to the discharge flow rate, when possible. For a continuous discharge, a minimum of forty-eight (48) individual grab samples (at half hour intervals shall be collected and combined to constitute a twenty-four (24) hour composite sample. For intermittent discharges of less than four hours duration, grab samples shall be taken at a minimum of fifteen (15) minute intervals.

SAMPLING MEASUREMENT AND ANALYTICAL GUIDELINES (cont'd.)

Composite samples for purgeable halocarbons (Method 601/8010), purgeable aromatics (Method 602/8020), acrolein/acrylonitrile (Method 603), volatile organics (Method 624/8240), or cyanide shall be lab composited from grab samples taken at regular intervals over the entire discharge day utilizing the appropriate special sample containers, preservatives and collection techniques. The number of grabs collected is dependent on the length of the sampling period, and shall be determined the following:

For a discharge period of one hour or less, a single grab sample may be collected for analysis of the above parameters.

For a discharge period between one and 24 hours, a minimum of four (4) grabs will be taken at regular intervals and lab composited for analysis of the above parameters.

Proper sample collection containers and techniques must be used.

"SPLIT SAMPLE" - must be done on site with both parties present before preservatives are added.

"DAILY" - each operating day

"DAILY MAXIMUM" - shall mean the highest allowable discharge of a pollutant and/or flow measured during any twenty-four (24) hour sampling period. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the daily discharge is calculated as the average measurement of the pollutant over the day.

"GRAB" - shall mean an individual sample which is taken from a wastestream on a one (1) time basis with no regard to the flow in the wastestream and without consideration of time.

"MONTHLY" on day each month (the same day each month) and a normal operating day (i.e. the 2nd Tuesday of each month).

"MONTHLY AVERAGE" - discharge limitation means the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month, divided by the number of daily discharges measured during that month.

"WEEKLY" - every seventh day (the same day each week) and a normal operating day.

10. Total water consumption shall be recorded for each day's composite using the water meters. Water consumption method must be explained in report.

11. All discharges shall be flow-monitored whenever possible. If flow monitoring cannot be done, flow determination should be a best practical engineering estimate without being economically burdensome to the firm involved. Results and procedure used to determine flow must be included with the analysis report.

12. **Sample Collection Techniques for Single Discharge Lines**

On single discharge lines (all regulated wastes discharge through one outlet), sample collection for the required parameters will be collected according to the following:

a. The following parameters should only be analyzed on manually taken grab samples:

pH
Temperature
Chlorine Residual
Dissolved Oxygen
Fecal Coliforms

SAMPLING MEASUREMENT AND ANALYTICAL GUIDELINES (cont'd.)

Sample Collection Techniques for Single Discharge Lines (cont'd.)

b. The following parameters should only be analyzed on composite samples made from manually collected grab samples:

Oil and Grease
Purgeable Halocarbons (EPA 601)
Purgeable Aromatics (EPA 602)
Acrolein/Acrylonitrile (EPA 603)
Purgeables (EPA 624)
Cyanide

For a discharge period of one hour or less, a single grab sample may be collected for analysis of the above parameters.

For a discharge period between one and 24 hours, a minimum of four (4) grabs will be taken at regular intervals and lab composited for analysis of the above parameters.

Proper sample collection containers and techniques must be used

c. The following parameters should be analyzed on an automatically collected composite sample or, if an auto sampler is unavailable, a manually collected composite sample:

Metals
Phenol-4AAP
BOD
Total Suspended Solids
Total Phosphorus
TKN/Ammonia
Base/Neutral Acids (EPA 625)
EPA Methods 604-614

(For a continuous discharge, a minimum of forty-eight (48) individual grab samples (at half-hour intervals) shall be collected and combined to constitute a twenty-four (24) hour composite sample. For intermittent discharges of less than four (4) hours duration, grab samples shall be taken at a minimum of fifteen (15) minute intervals.)

13. **Sample Collection Techniques for Multiple Discharge Lines**

For multiple discharge lines (all regulated wastes discharge through more than one outlet), sample collection for the required parameters will be collected according to the following:

a. The following parameters must be analyzed separately from each discharge line's individual grab samples:

pH
Temperature
Chlorine Residual
Dissolved Oxygen
Fecal Coliforms

b. For the following parameters, a composite made from manually collected grab samples must be used. A separate composite must be made from each discharge line. The composites from the different discharge lines cannot be combined for analysis.

Oil and Grease
Purgeable Halocarbons (EPA 601)
Purgeable Aromatics (EPA 602)
Acrolein/Acrylonitrile (EPA 603)
Purgeables (EPA 624)
Cyanide

For a discharge period of one hour or less, a single grab sample may be collected for analysis of the above parameters.

SAMPLING MEASUREMENT AND ANALYTICAL GUIDELINES (cont'd.)

Sample Collection Techniques for Multiple Discharge Lines (cont'd.)

For a discharge period between one hour and 24 hours, a minimum of four (4) grabs will be taken at regular intervals and lab composted for analysis of the above parameters.

Proper sample collection containers and techniques must be used.

c. For the following parameters, composites from each discharge line may be combined proportional to their flow only if physical flow measurement can be done.

Metals
Phenol-4AAP
BOD
Total Suspended Solids
Total Phosphorus
TKN/Ammonia
Base/Neutral Acids (EPA 625)
EPA Methods 604-613

(For a continuous discharge, a minimum of forty-eight (48) individual grab samples (at half-hour intervals) shall be collected from each discharge line and combined to constitute a twenty-four (24) hour composite sample. For intermittent discharges of less than four (4) hours duration, grab samples shall be taken at a minimum of fifteen (15) minute intervals.)

14. A chain of custody log sheet is required to be used for all sampling and analysis of each sample and attached to the report.

15. The handling, storage preservation and analytical procedures for each parameter shall follow Environmental Protection Agency Guidelines published in the Federal Register, pursuant to 40 CFR 136, dated October 26, 1984, or as subsequently revised.

16. The monitoring results report, sampling record(s), and chain of custody log sheet must be sent by the industry to the District and not by the consulting firm.

17. If any exemptions or changes have to be made due to unique situations, the District must be notified immediately for approval. When approved, a written explanation of the change must accompany the analysis sheet.

18. Any split samples that indicate a discrepancy of greater than 20% may be grounds for requiring resampling and analyses.

19. "QUALITY CONTROL" - All additional analyses which were run along with self-monitoring samples as a quality control measure, such as field blanks, duplicates or matrix spikes, etc., must be included in the self-monitoring report submitted to the District. Applicable quality control is mandatory in cases where the industrial user is conducting additional self-monitoring as a result of non-compliance.

20. All analyses conducted pursuant to this permit shall be performed by a laboratory certified for said analyses by the New York State Department of Health.

Niagara County Sewer District #1

Industrial Waste Permit

FILE COPY

Industrial User: Pendleton Site PRP Group
(Permitee)

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

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

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

Site Address: Pendleton Site Townline Road
Street Address

Pendleton, New York
City, State

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

Effective Date: August 28, 2002

Expiration Date: August 28, 2004

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

District Permit No. 02-11

Date: 10/4/02 Signed: [signature]

Schedule A – Listing of Discharged Wastestreams

Industry Name: Pendleton (Frontier Chemical) Site
Groundwater Remediation

The following wastestreams are discharged to sanitary sewer system tributary of Niagara County Sewer District #1.

Waste-Streams	Nature of Waste	Volume gallons per day	Discharge Point
WS 001	Groundwater Remediation	250	D 002

PART I – WASTEWATER DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

Industry Name: Pendleton (Frontier Chemical) Site
Sample Point: Sample Point A: Groundwater Pump Station Discharge
Description: Contaminated Groundwater

Parameter	Discharge Limitations[1]	Monitoring Requirements: Sampling Frequency	Monitoring Requirements: Sample Type
Flow		Continuous	
a.) Groundwater Remediation	2500 GPD, Daily Maximum		
Pollutants	**Discharge Limit**		
624	0.100 mg/L (Sum of all EPA 624 cmpds.)	Semi-Annual	24C[2]
Antimony	0.1 mg/L	Semi-Annual	24C
Boron	4.0 mg/L	Semi-Annual	24C
Chromium	5.33 mg/L	Semi-Annual	24C
Cyanide (T)	2.0 mg/L	Semi-Annual	4 Grabs[4]
Total Phenolics (4AAP)	Surveillance Only	Semi-Annual	
Total Suspended Solids	300 mg/L	Semi-Annual	24C

These Limitations shall be effective immediately.

Notes:

(1) All other limitations as set forth in the District's Sewer Use Law shall also apply.

(2) 24-hour composite samples for volatile (624) organics to consist of a minimum of four (4) grabs within a 24-hour period. (See Sampling Measurement & Analytical Guidelines, Section 9, Paragraph 2.)

(3) Cyanide will be analyzed from 4 grabs collected over the 24 hour period using the appropriate containers/preservatives and lab composited.

PART II – SPECIAL CONDITIONS/COMPLIANCE SCHEDULE

1. Compliance Schedules: If additional pretreatment and/or operation and maintenance are required to meet discharge limitation and/or Pretreatment Regulations, the User will immediately advise District of the shortest schedule by which the User provide such additional pretreatment or reduction in flow discharged. The completion date in this schedule shall not be later than the compliance date established for any applicable Pretreatment Regulations.

PART III – REPORTING REQUIREMENTS

1. The Industrial User shall notify the District immediately upon any accidental or slug discharge to the sanitary sewer system. Formal written notification discussing circumstances of the event and remedies to prevent recurrence shall be submitted to the District within 3 days of occurrence.

2. The Industrial User shall notify the District and apply for a revised permit 30 days prior to the introduction of new wastewater or pollutants or any substantial change in the volume or characteristics of the wastewater being introduced into the POTW from the User's industrial processes.

3. Any upset experienced by the Industrial User of its treatment that places it in a temporary state of non-compliance with wastewater discharge limitations contained in this permit or other limitations specified in the District's Sewer Use Law shall be reported to the District within 24 hours of first awareness of the commencement of the upset. A detailed report shall be filed within 5 days.

4. Self-monitoring reports are due at the NCSD #1 office within 30 days of sampling. When reporting results, the following information shall be provided:

   a.) 1. The date, exact place, and time of sampling or measurements;
   2. The individual(s) who performed the sampling or measurements;
   3. The date(s) analyses were performed;
   4. The individual(s) who performed the analyses;
   5. The analytical techniques or methods used;
   6. The results of such analyses

   b.) A copy of the original lab report(s) as provided by the certified testing lab(s), including properly completed chain(s) of custody.

   c.) The original data from the lab report shall be transcribed into a table comparing the permit requirements to the obtained results. In cases where the permit contains requirements for daily maximum and maximum monthly average, columns for both of these shall be included in the table. When a single value applies to both daily max. and max. mo. avg. (because monitoring was only performed once during a month), separate columns shall still be included in the table, clearly indicating that the value is both the daily maximum and the monthly average.

   d.) All daily flows obtained since the previous reporting period, as well as the maximum and average daily flow for each month.

   e.) A certification statement as to whether the Industrial User is in compliance with the permit limitations. If the permit contains limitations for both daily max. and max. mo. avg., the statement must specify whether the User is in compliance with both limitations.

   f.) A certification statement that all normally operated (applicable) processes were operating (and discharging) during the monitoring period. Any processes not in operation shall be cited together with a listing of pollutants which might normally be present in said process discharge.

5. Additional Monitoring by Permittee - If the permittee monitors any pollutants at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified herein, the results of such monitoring shall be included in the calculation and reporting of values required under Part I. Such increased frequency shall also be indicated.

PART III – REPORTING REQUIREMENTS (cont'd)

6. All self-monitoring reports prepared shall be submitted to:

Frank A. Nerone, Chief Operator
Niagara County Sewer District #1 Water Pollution Control Center
7346 Liberty Drive
Niagara Falls, New York 14304

7. Signatory Requirements - All reports required by this permit shall be signed by an authorized representative of the Industrial User.

8. If sampling performed by the Industrial User indicates a violation, the Industrial User is required to repeat the sampling and analysis and submit the results to the District within thirty (30) days after becoming aware of the violation.

Additionally, applicable quality control is mandatory in cases where the Industrial User is conducting additional self-monitoring as a result of non-compliance. (See Sampling Measurement and Analytical Guidelines, Item #19 "Quality Control.")

9. Toxic Organic Management Plan - For Industrial Users who are required to monitor for Total Toxic Organics (TTO), and who are implementing a District-Approved, Toxic Organic Management Plan in lieu of this monitoring, the following certification shall be included with each self-monitoring report:

> "Based on my inquiry of the person or persons directly responsible for managing compliance with the permit limitation for total toxic organics, I certify that, to the best of my knowledge and belief, no dumping of concentrated toxic organics into the wastewaters has occurred since filing of the last discharge monitoring report. I further certify that this facility is implementing the toxic organic management plan submitted to the control authority."

PART IV - STANDARD CONDITIONS

1. PROHIBITED DISCHARGES

The Industrial User shall comply with all the general prohibitive discharge standards.

2. INSPECTION/RIGHT-OF-ENTRY

The administrator and/or other duly authorized employees of the District, NYSDEC and/or USEPA, bearing proper credentials and identification, shall be permitted to enter all industrial properties without advance notice for the purpose of inspection, observation, measurement, sampling, monitoring, and testing in accordance with the provisions of its Sewer Use Law. The District shall also have the right to inspect and copy records pertaining to the Industry's self-monitoring procedures.

3. RECORDS RETENTION

The Industrial User shall retain and preserve for no less than (3) years any records, books, documents, memoranda, reports, correspondence, records of calibration and maintenance of instrumentation, recordings from continuous monitoring instrumentation, and any summaries thereof, relating to monitoring, sampling and chemical analysis made by or in behalf of the user in connection with its discharge. All records that pertain to matters that are the subject of special orders, or any other enforcement or litigation activities brought by the District, shall be retained and observed by the Industrial User until all enforcement activities have concluded and all periods of limitation with respect to any and all appeals have expired.

4. CONFIDENTIAL INFORMATION

Except for data determined to be confidential under Section 5.15 of the District's Sewer Use Law, all reports required by this permit shall be available for public inspection at the office of the Pretreatment Administrator, 7346 Liberty Drive, Niagara Falls, New York 14304.

PART IV – STANDARD CONDITIONS (cont'd.)

5. **DILUTION**

No Industrial User shall increase the use of potable or process water or, in any way, attempt to dilute a discharge as a partial or complete substitute for adequate treatment to achieve compliance with the limitations contained in this permit.

6. **PROPER DISPOSAL OF PRETREATMENT SLUDGES AND SPENT CHEMICALS**

The disposal of sludges and spent chemicals generated shall be done in a manner such as to prevent the pollutants from such material from entering the NCSD #1 sewer system. Said disposal shall also conform to all applicable State/Federal regulations.

7. **REVOCATION OF PERMIT**

The permit issued to the Industrial User by the District may be revoked when after inspection, monitoring or analysis, it is determined that the discharge of wastewater to the sanitary sewer is in violation of Federal, State, or local laws, ordinances, or regulations. Additionally, falsification or intentional misrepresentation of data or statements pertaining to the permit application or any other required reporting form, shall be cause for permit revocation, revocation of sewer discharges privileges, and/or imposition of criminal penalties.

8. **LIMITATION ON PERMIT TRANSFER**

Wastewater discharge permits are issued to a specific user for a specific operation and are not assignable to another user or transferrable to any other location without the prior written approval of the District. Sale of a facility by a User shall obligate the purchaser to seek prior written approval of the District for continued discharge to the sewerage system.

9. **PERMIT AVAILABILITY**

The original signed permit must be available upon request at all times for review at the Industrial User's address stated on the first page of this permit.

10. **MODIFICATION OR REVISION OF THE PERMIT**

a. The terms and conditions of this permit may be subject to modification by the District at any time as limitations or requirements, as identified in the District Sewer Use Law, are modified or other just cause exists.

b. This permit may also be modified to incorporate special conditions resulting from the issuance of a special order by NYSDEC or EPA.

c. The terms and conditions may be modified as a result of EPA promulgating a new federal pretreatment standard. If a pretreatment standard or prohibition (including Schedule of Compliance specified in such pretreatment standard or prohibition) is established under Section 807 (b) of the Act for a pollutant which is present, the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in permit, this permit shall be revised or modified in accordance with such pretreatment standard or prohibition.

d. The terms and conditions of this permit shall remain in effect until the permit is terminated or replaced by a subsequent permit.

11. **DUTY TO REAPPLY**

Within ninety (90) days of the expiration, the User shall reapply for reissuance of the permit. Application forms are available from the District upon request.

12. **SEVERABILITY**

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

PART IV – STANDARD CONDITIONS (cont'd).

13. ENFORCEMENT AND PENALTIES

Any violation of Section 2 or 3 of the Niagara County Sewer Use Law (adopted January 18, 1994) is declared a violation except as otherwise provided by law. Any violation of Section 4, 5 or 6 of the Niagara County Sewer Use Law is thereby a misdemeanor except as otherwise provided by law. A User who is found to have violated any provision of the Niagara County Sewer Use Law (or permits and orders issued thereunder) and/or applicable pretreatment standards and requirements, shall be subject to applicable civil and criminal penalties including but not limited to fines not to exceed five thousand dollars ($5,000) per violation per day for each day on which non-compliance shall occur or continue.

PART V - SPECIFIC CONDITIONS

NONE

NIAGARA COUNTY SEWER DISTRICT #1

SAMPLING MEASUREMENT AND ANALYTICAL GUIDELINES

1. Prior to implementing the self-monitoring sampling and analyses, the Industrial User must submit the following information to the District.

   a. The name(s) and address(es) of the laboratory or laboratories proposed to perform each of the chemical analyses.
   b. A description of the equipment and test methods proposed for the chemical analyses for each parameter.
   c. A list of the lower level of detectability expected for each parameter.
   d. A description of the overall recovery efficiency of the prepared sample, where applicable.
   e. A description of the quality control procedures used by the laboratory or laboratories to ensure reliable test results.
   f. A description of the sample collection point and sample collection procedures.
   g. A description of the compositing technique and equipment.
   h. A description of the sample preservation methods used for each parameter.

2. Before commencement of any sampling or flow monitoring, Niagara County Sewer District #1 Water Pollution Control Center shall be notified in writing at least seventy-two (72) hours in advance by the firm or designee. The District will give a twenty-four (24) hour verbal notification to the firm or District designee of whether split sampling will be initiated.

3. Before sampling is done, the sample points must be approved by the District.

4. All discharge lines from one (1) building, or all discharge lines from only one (1) single process must be sampled at the same time.

5. Sampling record must be used and submitted with monitoring reports. The sampling report shall contain the following minimum information:

   a. Date of each sample day.
   b. Exact location of sampling points – attach drawing for reference.
   c. If done manually, time of each grab sample with sampler's initials each time.
   d. Type of auto-sampler used. Size and type of tubing and sampling interval.
   e. Record all physical observation (sight, smell etc.) of the discharge at start-up, during inspections and changing samples.
   f. Note weather conditions.
   g. Signature of immediate sampling supervisor at the bottom of page.

6. If an auto-sampler is used, new tubing must be at least ¼ I.D. If visibly contaminated after sampling, it must be cleaned with detergent or methanol and deionized water each day. Proper refrigeration of the sample must be maintained during entire sampling period, when necessary. The intake hose velocity must be at least 2.0 f.p.s. with a maximum lift of twenty (20) feet.

7. All sampling shall be taken at the highest velocity, greatest turbulence and center of flow.

8. All sampling must be done on normal work days. If there is a process discharge after normal working hours, sampling must continue until no further discharge.

9. "COMPOSITE SAMPLE" "Composite" shall mean a combination of individual (or continuously taken) samples obtained at regular intervals over the entire discharge day. The volume of each sample shall be proportional to the discharge flow rate, when possible. For a continuous discharge, a minimum of forty-eight (48) individual grab samples (at half hour intervals shall be collected and combined to constitute a twenty-four (24) hour composite sample. For intermittent discharges of less than four hours duration, grab samples shall be taken at a minimum of fifteen (15) minute intervals.

SAMPLING MEASUREMENT AND ANALYTICAL GUIDELINES (cont'd.)

Composite samples for purgeable halocarbons (Method 601/8010), purgeable aromatics (Method 602/8020), acrolein/acrylonitrile (Method 603), volatile organics (Method 624/8240), or cyanide shall be lab composited from grab samples taken at regular intervals over the entire discharge day utilizing the appropriate special sample containers, preservatives and collection techniques. The number of grabs collected is dependent on the length of the sampling period, and shall be determined the following:

For a discharge period of one hour or less, a single grab sample may be collected for analysis of the above parameters.

For a discharge period between one and 24 hours, a minimum of four (4) grabs will be taken at regular intervals and lab composited for analysis of the above parameters.

Proper sample collection containers and techniques must be used.

"SPLIT SAMPLE" - must be done on site with both parties present before preservatives are added.

"DAILY" - each operating day

"DAILY MAXIMUM" - shall mean the highest allowable discharge of a pollutant and/or flow measured during any twenty-four (24) hour sampling period. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the daily discharge is calculated as the average measurement of the pollutant over the day.

"GRAB" - shall mean an individual sample which is taken from a wastestream on a one (1) time basis with no regard to the flow in the wastestream and without consideration of time.

"MONTHLY" on day each month (the same day each month) and a normal operating day (i.e. the 2nd Tuesday of each month).

"MONTHLY AVERAGE" - discharge limitation means the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month, divided by the number of daily discharges measured during that month.

"WEEKLY" - every seventh day (the same day each week) and a normal operating day.

10. Total water consumption shall be recorded for each day's composite using the water meters. Water consumption method must be explained in report.

11. All discharges shall be flow-monitored whenever possible. If flow monitoring cannot be done, flow determination should be a best practical engineering estimate without being economically burdensome to the firm involved. Results and procedure used to determine flow must be included with the analysis report.

12. **Sample Collection Techniques for Single Discharge Lines**

On single discharge lines (all regulated wastes discharge through one outlet), sample collection for the required parameters will be collected according to the following:

a. The following parameters should only be analyzed on manually taken grab samples:

pH
Temperature
Chlorine Residual
Dissolved Oxygen
Fecal Coliforms

SAMPLING MEASUREMENT AND ANALYTICAL GUIDELINES (cont'd.)

Sample Collection Techniques for Single Discharge Lines (cont'd.)

b. The following parameters should only be analyzed on composite samples made from manually collected grab samples:

Oil and Grease
Purgeable Halocarbons (EPA 601)
Purgeable Aromatics (EPA 602)
Acrolein/Acrylonitrile (EPA 603)
Purgeables (EPA 624)
Cyanide

For a discharge period of one hour or less, a single grab sample may be collected for analysis of the above parameters.

For a discharge period between one and 24 hours, a minimum of four (4) grabs will be taken at regular intervals and lab composited for analysis of the above parameters.

Proper sample collection containers and techniques must be used

c. The following parameters should be analyzed on an automatically collected composite sample or, if an auto sampler is unavailable, a manually collected composite sample:

Metals
Phenol-4AAP
BOD
Total Suspended Solids
Total Phosphorus
TKN/Ammonia
Base/Neutral Acids (EPA 625)
EPA Methods 604-614

(For a continuous discharge, a minimum of forty-eight (48) individual grab samples (at half-hour intervals) shall be collected and combined to constitute a twenty-four (24) hour composite sample. For intermittent discharges of less than four (4) hours duration, grab samples shall be taken at a minimum of fifteen (15) minute intervals.)

13. **Sample Collection Techniques for Multiple Discharge Lines**

For multiple discharge lines (all regulated wastes discharge through more than one outlet), sample collection for the required parameters will be collected according to the following:

a. The following parameters must be analyzed separately from each discharge line's individual grab samples:

pH
Temperature
Chlorine Residual
Dissolved Oxygen
Fecal Coliforms

b. For the following parameters, a composite made from manually collected grab samples must be used. A separate composite must be made from each discharge line. The composites from the different discharge lines cannot be combined for analysis.

Oil and Grease
Purgeable Halocarbons (EPA 601)
Purgeable Aromatics (EPA 602)
Acrolein/Acrylonitrile (EPA 603)
Purgeables (EPA 624)
Cyanide

For a discharge period of one hour or less, a single grab sample may be collected for analysis of the above parameters.

SAMPLING MEASUREMENT AND ANALYTICAL GUIDELINES (cont'd.)

Sample Collection Techniques for Multiple Discharge Lines (cont'd.)

For a discharge period between one hour and 24 hours, a minimum of four (4) grabs will be taken at regular intervals and lab composted for analysis of the above parameters.

Proper sample collection containers and techniques must be used.

c. For the following parameters, composites from each discharge line may be combined proportional to their flow only if physical flow measurement can be done.

Metals
Phenol-4AAP
BOD
Total Suspended Solids
Total Phosphorus
TKN/Ammonia
Base/Neutral Acids (EPA 625)
EPA Methods 604-613

(For a continuous discharge, a minimum of forty-eight (48) individual grab samples (at half-hour intervals) shall be collected from each discharge line and combined to constitute a twenty-four (24) hour composite sample. For intermittent discharges of less than four (4) hours duration, grab samples shall be taken at a minimum of fifteen (15) minute intervals.)

14. A chain of custody log sheet is required to be used for all sampling and analysis of each sample and attached to the report.

15. The handling, storage preservation and analytical procedures for each parameter shall follow Environmental Protection Agency Guidelines published in the Federal Register, pursuant to 40 CFR 136, dated October 26, 1984, or as subsequently revised.

16. The monitoring results report, sampling record(s), and chain of custody log sheet must be sent by the industry to the District and not by the consulting firm.

17. If any exemptions or changes have to be made due to unique situations, the District must be notified immediately for approval. When approved, a written explanation of the change must accompany the analysis sheet.

18. Any split samples that indicate a discrepancy of greater than 20% may be grounds for requiring resampling and analyses.

19. "QUALITY CONTROL" - All additional analyses which were run along with self-monitoring samples as a quality control measure, such as field blanks, duplicates or matrix spikes, etc., must be included in the self-monitoring report submitted to the District. Applicable quality control is mandatory in cases where the industrial user is conducting additional self-monitoring as a result of non-compliance.

20. All analyses conducted pursuant to this permit shall be performed by a laboratory certified for said analyses by the New York State Department of Health.

ATTACHMENT B – EXHIBIT 2
FRONTIER CHEMICAL - PENDLETON SITE
NCSD #1 SEMI-ANNUAL REPORTS
MAY 2002 TO APRIL 2003
REPORT #11

REPORT DATE

NOVEMBER 19, 2002
JUNE 26, 2003

November 19, 2002

VIA AIRBORNE EXPRESS

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

FILE COPY

Subject: Analytical Sampling Results (09/19/2002 Semi-Annual Sample)
Groundwater Discharge Through Pre-Treatment System
Pendleton (Frontier Chemical) Site

Dear Mr. Nerone:

Enclosed for your review are the analytical results from the September 19, 2002, 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 (#00-11) requirements on the attached Analytical Summary and Monthly Reports for daily flow.

A review of the analytical data report shows that all permit parameters are significantly below the permit discharge requirements. A review of the daily flows from April 2002 to September 2002 show no change during normal operating conditions. However the flow volume recorded by the flowmeter, which is inside the pumping facility and prior to the filters and carbon beds, is high due to a series of leaks in the lead carbon bed. The PRP Group had planned to overhaul the system during the summer but the work was delayed until later this year. We also had a lighting strike that caused the flow meter to malfunction. Repairs are in progress.

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

Sincerely,

John M. Burns

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

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

WASTE STREAM TECHNOLOGY, INC.

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

Analytical Data Report
Report Date : 10/03/02
Group Number : 2021-2251

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

Site : Leachate Treated Effluent

Analytical Parameters	Analytical Services Number of Samples	Turnaround Time
EPA 624	2	Standard
Metals (3)	1	Standard
Cyanide	1	Standard
Total Recoverable Phenol	1	Standard
Total Suspended Solids	1	Standard

Report Released By : _____
Brian S. Schepart, Ph.D., Laboratory Director

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

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

Analytical Data Report

Group Number: 2021-2251
Site: Leachate Treated Effluent

Field and Laboratory Information

WST ID	Client ID	Matrix	Date Sampled	Date Received	Time
WT10498	TW-091902	Aqueous	09/19/02	09/20/02	09:00
WT10499	Trip Blank	Aqueous	09/19/02	09/20/02	09:00

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.

DETECTION LIMIT DEFINITIONS

MDL = Method Detection Limit. When reported, the MDL is the minimum concentration that can be measured and reported with 99 percent confidence that the concentration is greater than zero.

MQL = Method Quantitation Limit. The MQL is the minimum concentration that can be reliably reported. The MQL is equal to the concentration of the lowest standard used for the initial calibration of the instrument.

Reporting Limit = A reporting limit is the minimum concentration that can be measured and reported for analyses where initial calibration is not applicable. The reporting limit is based on the specifics of the anlysis procedure.

ORGANIC DATA QUALIFIERS

U - Indicates compound was analyzed for but not detected at the stated MQL or Reporting Limit. If the MDL has been reported, U indicates that the compound was not detected at the MDL.

J - Indicates an estimated value. This flag is used to qualify the following: when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed; a compound is detected in the sample but the result is less than the method quantitation limit but greater than the statistically calculated laboratory method detection limit; the result for a compound is estimated due to the analysis of a sample beyond the USEPA defined holding time; the result for a compound is estimated due to a quality control sample result that is outside the laboratory quality control recovery limits.

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.

Volatile Organics in Water

EPA 624

Site: Leachate Treated Effluent
Date Sampled: 09/19/02
Date Received: 09/20/02

Group Number: 2021-2251
Units: µg/L
Matrix: Aqueous

WST ID: WT10498
Client ID: TW-091902
Extraction Date: NA
Date Analyzed: 09/26/02

Compound	MQL	Result	QC Limits (%)	Qualifier
chloromethane	2.0	Not detected		U
vinyl chloride	1.0	Not detected		U
bromomethane	2.0	Not detected		U
chloroethane	2.0	Not detected		U
trichlorofluoromethane	1.0	Not detected		U
1,1-dichloroethene	1.0	Not detected		U
methylene chloride	2.0	Not detected		U
trans-1,2-dichloroethene	1.0	Not detected		U
1,1-dichloroethane	1.0	2.7		
chloroform	1.0	Not detected		U
1,1,1-trichloroethane	1.0	Not detected		U
carbon tetrachloride	1.0	Not detected		U
benzene	1.0	Not detected		U
1,2-dichloroethane	1.0	Not detected		U
trichloroethene	1.0	Not detected		U
1,2-dichloropropane	1.0	Not detected		U
bromodichloromethane	1.0	Not detected		U
2-chloroethylvinyl ether	10.0	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	1.0	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	10.0	Not detected		U
1,2-Dichloroethane-d4 (%)		105	76-114	
Toluene-d8 (%)		107	84-118	
Bromofluorobenzene (%)		105	82-117	
Dilution Factor	1			

Waste Stream Technology, Inc.

Volatile Organics in Water

EPA 624

Site: Leachate Treated Effluent
Date Sampled: 09/19/02
Date Received: 09/20/02

Group Number: 2021-2251
Units: µg/L
Matrix: Aqueous

WST ID: WT10499
Client ID: Trip Blank
Extraction Date: NA
Date Analyzed: 09/26/02

Compound	MQL	Result	QC Limits (%)	Qualifier
chloromethane	2.0	Not detected		U
vinyl chloride	1.0	Not detected		U
bromomethane	2.0	Not detected		U
chloroethane	2.0	Not detected		U
trichlorofluoromethane	1.0	Not detected		U
1,1-dichloroethene	1.0	Not detected		U
methylene chloride	2.0	Not detected		U
trans-1,2-dichloroethene	1.0	Not detected		U
1,1-dichloroethane	1.0	Not detected		U
chloroform	1.0	Not detected		U
1,1,1-trichloroethane	1.0	Not detected		U
carbon tetrachloride	1.0	Not detected		U
benzene	1.0	Not detected		U
1,2-dichloroethane	1.0	Not detected		U
trichloroethene	1.0	Not detected		U
1,2-dichloropropane	1.0	Not detected		U
bromodichloromethane	1.0	Not detected		U
2-chloroethylvinyl ether	10.0	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	1.0	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	10.0	Not detected		U
1,2-Dichloroethane-d4 (%)		107	76-114	
Toluene-d8 (%)		107	84-118	
Bromofluorobenzene (%)		103	82-117	
Dilution Factor	1			

Waste Stream Technology, Inc.

Method 624 Method Blank Results

EPA 624

Site: Leachate Treated Effluent
Date Sampled: NA
Date Received: NA

Group Number: 2021-2251
Units: µg/L

WST ID: MB092602
Client ID: NA
Extraction Date: NA
Date Analyzed: 09/26/02

Compound	MQL	Result	QC Limits (%)	Qualifier
chloromethane	2.0	Not detected		U
vinyl chloride	1.0	Not detected		U
bromomethane	2.0	Not detected		U
chloroethane	2.0	Not detected		U
trichlorofluoromethane	1.0	Not detected		U
1,1-dichloroethene	1.0	Not detected		U
methylene chloride	2.0	Not detected		U
trans-1,2-dichloroethene	1.0	Not detected		U
1,1-dichloroethane	1.0	Not detected		U
chloroform	1.0	Not detected		U
1,1,1-trichloroethane	1.0	Not detected		U
carbon tetrachloride	1.0	Not detected		U
benzene	1.0	Not detected		U
1,2-dichloroethane	1.0	Not detected		U
trichloroethene	1.0	Not detected		U
1,2-dichloropropane	1.0	Not detected		U
bromodichloromethane	1.0	Not detected		U
2-chloroethylvinyl ether	10.0	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	1.0	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	10.0	Not detected		U
1,2-Dichloroethane-d4 (%)		104	76-114	
Toluene-d8 (%)		106	84-118	
Bromofluorobenzene (%)		104	82-117	

Dilution Factor 1

MB denotes Method Blank
NA denotes Not Applicable

Waste Stream Technology, Inc.
Metals Analysis Result Report

Site: Leachate Treated Effluent
Date Sampled: 09/19/02
Date Received: 09/20/02

Group Number: 2021-2251
Units: mg/L
Matrix: Aqueous

WST ID: WT10498
Client ID: TW-091902
Digestion Date: 09/24/02

Analyte	Reporting Limit	Result	Date Analyzed	Analysis Method
Antimony by ICP	0.011	Not detected	09/24/02	EPA 200.7
Boron by ICP	0.012	0.554	09/25/02	EPA 200.7
Chromium by ICP	0.005	Not detected	09/24/02	EPA 200.7

Waste Stream Technology, Inc.
Wet Chemistry Analyses

Site: Leachate Treated Effluent
Date Sampled: 09/19/02
Date Received: 09/20/02

Group Number: 2021-2251
Matrix: Aqueous

WST ID: WT10498
Client ID TW-091902

Analysis	Method Reference	Reporting Limit	Result	Units	Date Analyzed
Cyanide in Water	EPA 335.2	0.005	Not detected	mg/L	10/01/02
Total Recoverable Phenol	EPA 420.1	0.005	Not detected	mg/L	09/25/02
Total Suspended Solids	EPA 160.2	4.0	Not detected	mg/L	09/24/02

CHAIN OF CUSTODY

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

REPORT TO: Olin Corp, Lower River Rd, Charleston, TN
CONTACT: John Burns
PH. #: (423) 336-
FAX #: ( )
BILL TO: Same
PO#:
PROJECT DESCRIPTION: Leachate Treated Effluent
SAMPLER SIGNATURE: [signature]

OFFICE USE ONLY
GROUP #: 2021-2251
DUE DATE:
TURN AROUND TIME:
QUOTATION NUMBER:

PAGE 1 OF 1

ARE SPECIAL DETECTION LIMITS REQUIRED: YES / NO (circled: NO)
If yes please attach requirements.

Is a QC Package required: YES (circled) / NO
If yes please attach requirements

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	T. Metals	TSS	Phenol	T. CN	VOC						TYPE OF CONTAINER/ COMMENTS: (Plastic)	OFFICE USE ONLY WST. ID:
1	TW-091902	9/19/02	1310	Comp	1	X										(HNO3) 500mL Pl	[illegible]
2	TW-091902				1		X									(Ø) 500mL Pl	
3	TW-091902				1			X								1 Lt. Gl (H_2SO_4)	
4	TW-091902				1				X							1L Pl (NaOH)	
5	TW-091902		1200	Grab	3					X						40mL (HCl)	
6	Trip Blank				1												[illegible]
7																	
8																	
9																	
10																	

REMARKS:

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:
[signature]	9/20/02	0810	[signature]	9/20/02	5:15
[signature]	9/20/02	09:00	[illegible]	[illegible]	[illegible]

April 2002 Analytical Summary for WS 001
Permit # 00-11
Groundwater Discharge Point: D 002

616,392 Gallons Discharged Prior To 04/04/02
46,550 Gallons Since Last Report(1)
278.7 Average Gallons per Day Flow Between Reporting Events

Parameters Treatment System Discharge	Permit Limit	Detection Limits, MQL	09/19/02 Sample Results
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	10.0	< 10.0
Vinyl Chloride	10.0	1.0	< 1.0
Methylene Chloride	10.0	2.0	< 2.0
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		1.0	< 1.0
1,1-Dichloroethane		1.0	2.7
1,2-Dichloropropane		1.0	< 1.0
Bromodichloromethane		1.0	< 1.0
2-Chloroethylvinyl ether		10.0	< 10.0
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		1.0	< 1.0
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	55.7
608 Pesticides	ug/L	ug/L	ug/L
alpha BHC	10.0		NA
beta BHC	20.0		NA
delta BHC	10.0		NA
gamme BHC	10.0		NA
Heptachlor	8.0		NA
Aldrin	8.0		NA
Heptachlor Epoxide	9.0		NA
4,4-DDE	20.0		NA
Methoxychlor	18.0		NA
Metals	mg/L		mg/L
Antimony	0.1	0.011	< 0.011
Boron	4.00	0.012	0.554
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:
(B) Detected in blank
NA Not applicable
(1) Volume includes recirculating water from hole in GAC unit and bag filter back to sump.

FILE COPY

June 26, 2003

VIA AIRBORNE EXPRESS

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

Subject: Analytical Sampling Results (04/28/2003 Semi-Annual 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 28, 2003, 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 (#02-11) requirements on the attached Analytical Summary and Monthly Reports for daily flow.

A review of the analytical data report shows that all permit parameters are significantly below the permit discharge requirements. A review of the daily flows from September 2002 to April 2003 shows no change during normal operating conditions. However, the leakage problem was resolved and additional flow meters install during April 2003 to provide accurate accounting of discharge as well as circulating flows.

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

Sincerely,

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

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

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Rochester, NY 14604

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Sandra VanWormer Esq.
Legal Department
The Dow Chemical Company
2030 Dow Center
Midland, MI 48642

April 2002 Analytical Summary for WS 001
Permit # 02-11
Groundwater Discharge Point: D 002

662,943 Gallons Discharged Prior To 09/19/02
96,383 Gallons Since Last Report(1)
264.0 Average Gallons per Day Flow Between Reporting Events

Parameters Treatment System Discharge	Permit Limit	Detection Limits, MQL	04/28/03 Sample Results
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	10.0	< 10.0
Vinyl Chloride	10.0	1.0	< 1.0
Methylene Chloride	10.0	2.0	< 2.0
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		1.0	< 1.0
1,1-Dichloroethane		1.0	< 1.0
1,2-Dichloropropane		1.0	< 1.0
Bromodichloromethane		1.0	< 1.0
2-Chloroethylvinyl ether		10.0	< 10.0
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		1.0	< 1.0
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	54.0
608 Pesticides	ug/L	ug/L	ug/L
alpha BHC	10.0		NA
beta BHC	20.0		NA
delta BHC	10.0		NA
gamme BHC	10.0		NA
Heptachlor	8.0		NA
Aldrin	8.0		NA
Heptachlor Epoxide	9.0		NA
4,4-DDE	20.0		NA
Methoxychlor	18.0		NA
Metals	mg/L		mg/L
Antimony	0.1	0.011	< 0.011
Boron	4.00	0.012	0.076
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:
(B) Detected in blank
NA Not applicable
(1) Volume includes recirculating water from hole in GAC unit and bag filter back to sump.

WASTE STREAM TECHNOLOGY, INC.

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

Analytical Data Report
Report Date : 05/12/03
Group Number : 2031-977

Prepared For :
Mr. John Burns
Olin Corporation
11185 Lower River Road
Charleston, TN 37310
Fax: 423-336-4166

Site : Frontier Chemical

Analytical Parameters	Analytical Services Number of Samples	Turnaround Time
EPA 624	1	Standard
Metals (3)	1	Standard
Cyanide	1	Standard
Total Recoverable Phenol	1	Standard
Total Suspended Solids	1	Standard

Report Released By : _____
Brian S. Schepart, Ph.D., Laboratory Director

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

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

Analytical Data Report

Group Number: 2031-977
Site: Frontier Chemical

Field and Laboratory Information

WST ID	Client ID	Matrix	Date Sampled	Date Received	Time
WT17888	TW-042803	Aqueous	04/28/03	04/29/03	09:05

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.

DETECTION LIMIT DEFINITIONS

MDL = Method Detection Limit. When reported, the MDL is the minimum concentration that can be measured and reported with 99 percent confidence that the concentration is greater than zero.

MQL = Method Quantitation Limit. The MQL is the minimum concentration that can be reliably reported. The MQL is equal to the concentration of the lowest standard used for the initial calibration of the instrument.

Reporting Limit = A reporting limit is the minimum concentration that can be measured and reported for analyses where initial calibration is not applicable. The reporting limit is based on the specifics of the analysis procedure.

ORGANIC DATA QUALIFIERS

U - Indicates compound was analyzed for but not detected at the stated MQL or Reporting Limit. If the MDL has been reported, U indicates that the compound was not detected at the MDL.

J - Indicates an estimated value. This flag is used to qualify the following: when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed; a compound is detected in the sample but the result is less than the method quantitation limit but greater than the statistically calculated laboratory method detection limit; the result for a compound is estimated due to the analysis of a sample beyond the USEPA defined holding time; the result for a compound is estimated due to a quality control sample result that is outside the laboratory quality control recovery limits.

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.

Volatile Organics in Water

EPA 624

Site: Frontier Chemical
Date Sampled: 04/28/03
Date Received: 04/29/03

Group Number: 2031-977
Units: µg/L
Matrix: Aqueous

WST ID: WT17888
Client ID: TW-042803
Extraction Date: NA
Date Analyzed: 05/06/03

Compound	MQL	Result	QC Limits (%)	Qualifier
chloromethane	2.0	Not detected		U
vinyl chloride	1.0	Not detected		U
bromomethane	2.0	Not detected		U
chloroethane	2.0	Not detected		U
trichlorofluoromethane	1.0	Not detected		U
1,1-dichloroethene	1.0	Not detected		U
methylene chloride	2.0	Not detected		U
trans-1,2-dichloroethene	1.0	Not detected		U
1,1-dichloroethane	1.0	Not detected		U
chloroform	1.0	Not detected		U
1,1,1-trichloroethane	1.0	Not detected		U
carbon tetrachloride	1.0	Not detected		U
benzene	1.0	Not detected		U
1,2-dichloroethane	1.0	Not detected		U
trichloroethene	1.0	Not detected		U
1,2-dichloropropane	1.0	Not detected		U
bromodichloromethane	1.0	Not detected		U
2-chloroethylvinyl ether	10.0	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	1.0	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	10.0	Not detected		U
1,2-Dichloroethane-d4 (%)		103	76-114	
Toluene-d8 (%)		104	84-118	
Bromofluorobenzene (%)		107	82-117	
Dilution Factor	1			

Waste Stream Technology, Inc.

Method 624 Method Blank Results

EPA 624

Site: Frontier Chemical
Date Sampled: NA
Date Received: NA

Group Number: 2031-977
Units: µg/L

WST ID: MB050603
Client ID: NA
Extraction Date: NA
Date Analyzed: 05/06/03

Compound	MQL	Result	QC Limits (%)	Qualifier
chloromethane	2.0	Not detected		U
vinyl chloride	1.0	Not detected		U
bromomethane	2.0	Not detected		U
chloroethane	2.0	Not detected		U
trichlorofluoromethane	1.0	Not detected		U
1,1-dichloroethene	1.0	Not detected		U
methylene chloride	2.0	Not detected		U
trans-1,2-dichloroethene	1.0	Not detected		U
1,1-dichloroethane	1.0	Not detected		U
chloroform	1.0	Not detected		U
1,1,1-trichloroethane	1.0	Not detected		U
carbon tetrachloride	1.0	Not detected		U
benzene	1.0	Not detected		U
1,2-dichloroethane	1.0	Not detected		U
trichloroethene	1.0	Not detected		U
1,2-dichloropropane	1.0	Not detected		U
bromodichloromethane	1.0	Not detected		U
2-chloroethylvinyl ether	10.0	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	1.0	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	10.0	Not detected		U
1,2-Dichloroethane-d4 (%)		106	76-114	
Toluene-d8 (%)		106	84-118	
Bromofluorobenzene (%)		106	82-117	

Dilution Factor 1

MB denotes Method Blank
NA denotes Not Applicable

Waste Stream Technology, Inc.
Metals Analysis Result Report

Site: Frontier Chemical
Date Sampled: 04/28/03
Date Received: 04/29/03

Group Number: 2031-977
Units: mg/L
Matrix: Aqueous

WST ID: WT17888
Client ID: TW-042803
Digestion Date: 05/05/03

Analyte	Reporting Limit	Result	Date Analyzed	Analysis Method
Antimony by ICP	0.011	Not detected	05/06/03	EPA 200.7
Boron by ICP	0.012	0.076	05/07/03	EPA 200.7
Chromium by ICP	0.005	Not detected	05/06/03	EPA 200.7

Waste Stream Technology, Inc.
Wet Chemistry Analyses

Site: Frontier Chemical
Date Sampled: 04/28/03
Date Received: 04/29/03

Group Number: 2031-977
Matrix: Aqueous

WST ID: WT17888
Client ID TW-042803

Analysis	Method Reference	Reporting Limit	Result	Units	Date Analyzed
Cyanide in Water	EPA 335.2	0.005	Not detected	mg/L	05/05/03
Total Recoverable Phenol	EPA 420.1	0.005	Not detected	mg/L	05/07/03
Total Suspended Solids	EPA 160.2	4.0	Not detected	mg/L	05/01/03

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 # 2031-977
DUE DATE

PAGE 1 OF 1

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

TURN AROUND TIME: Standard
QUOTATION NUMBER:

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

REPORT TO: Olin Corp
1155 Lower River Rd
Charleston TN

CONTACT: Julius Burns
PH. #( ) 423 336 4057
FAX #( ) 423 336 4166
BILL TO: Severson
Call Walker @
PO# Severson for PO#
PROJECT DESCRIPTION: Fountain Channel
SAMPLER SIGNATURE: [signature]

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	6 ey	T-CN	T-Metals	TSS	Total Recov. Phenols						TYPE OF CONTAINER/ COMMENTS:	OFFICE USE ONLY WST. I.D.
1	Th10423803	4/28/03	1200	GW	2	X										HCl	
2	"				1		X									NaOH	WT17858
3	"				1			X								HNO_3	
4	"				1				X							∅	
5	"				1					X						H_2SO_4	
6																	
7																	
8																	
9																	
10																	

REMARKS: Copy Results to Mike Walker @ Severson. Fax 285 4201
Any Questions, Call " " " ph 284 0431

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:
[signature]	4/29/03	0845		/ /	
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:
	/ /			/ /	

ATTACHMENT B – EXHIBIT 4
FRONTIER CHEMICAL - PENDLETON SITE
PRE-TREATMENT SYSTEM OPERATOR LOG
MAY 2002 TO APRIL 2003
REPORT #11

OPERATOR LOG DATE

05/17/02
05/29/02
06/28/02
07/03/03
07/02/02
08/30/02
09/17/02
09/24/02
10/02/02
10/03/02
10/25/02
11/20/02
12/17/02
01/13/03
01/20/03
02/25/03
03/24/03
03/25/03
03/26/03
03/28/03
04/08/03
04/09/03
04/11/03
04/14/03

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Date:	5-17-02

Time In:	15:00
Time Out:	17:00

Weather:	Stormy, Thunder & Lightning
Precipitation:	2.5"
Temperature:	50 °F
Reason for Visit:	Alarm call, Power Outage

Process Information	**Reading**	**Units**	**Time**
Flowmeter Totalization Reading (upon arrival)		**Gal**	
Flowmeter Totalization Reading (upon departure)		**Gal**	
Flow rate	0	**GPM**	
Pump Hour Meter Readings: Pump #1		**Hours**	
Pump Hour Meter Readings: Pump #2		**Hours**	
Wet Well Level		**Ft**	
Pressure Sensor Reading (Bar Graph)	0.0	**Psi**	

	Influent Gauge, Psi	**Effluent Gauge, Psi**	**Differential**
BF1			
BF2			
GAC1			
GAC2			

Changed Filter Bags (Check One)	**YES**		**TIME**	
	NO			

Item	**Details**
0517-1	I received an alarm call from the auto dialer indicating the power was out at the site. Responded immediately because I was in the area. By the time I had arrived onsite, the power had been re-established. I ran the system on manual to check everything out. All systems responded OK.

Item	**Planned Actions**

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Item	Recommended actions to prevent future problems

Other relevant information:
1. During the visit (and before) there was a very bad storm going on, which was the probable cause of the power outage. I also took a drive around the site to see if anything looked threatening to the power lines (branches, etc.).

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	NO	NO
#7 Pump # 2 Fail (Yes / No)	NO	NO
#8 Bag Filter Differential Pressure High	OK	OK
#9 Wet Well Level (Actual Measure Spoken)	1.7	1.7
#10 Flow Rate	0	0
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Michael Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Date:	5-29-02

Time In:	15:00
Time Out:	17:00

Weather:	Sunny
Precipitation:	0
Temperature:	80 °F
Reason for Visit:	Monthly inspection

Process Information	Reading	Units	Time
Flowmeter Totalization Reading (upon arrival)	610414	**Gal**	15:00
Flowmeter Totalization Reading (upon departure)	610546	**Gal**	17:00
Flow rate, (during test #1=8.6gpm, #2=8.83gpm)	0	**GPM**	15:00
Pump Hour Meter Readings: Pump #1	657.2	**Hours**	15:00
Pump Hour Meter Readings: Pump #2	515.9	**Hours**	15:00
Wet Well Level	1.9835	**Ft**	15:00
Pressure Sensor Reading (Bar Graph)	0	**Psi**	15:00

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1	20	20	0
BF2	Off line	Off line	Off line
GAC1	19	3	16
GAC2	19	3	16

Changed Filter Bags (Check One)	**YES**	X	**TIME**	13:30
	NO			

Item	Details
0529-1	Bag filter unit #2 is still offline due to leak caused by corrosion.
0529-2	GAC unit # 1 still leaks into the sump, but not as much since the last attempted epoxy repair.

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Item	Planned Actions

Item	Recommended actions to prevent future problems
0529-3	Replace leaking and offline units

~~Other relevant information:~~

1. Vegetative cover has come in nicely this spring

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	NO	OK
#7 Pump # 2 Fail (Yes / No)	NO	OK
#8 Bag Filter Differential Pressure High	NO	OK
#9 Wet Well Level (Actual Measure Spoken)	1.9	
#10 Flow Rate	OK	OK
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Date:	6-28-02

Time In:	13:00
Time Out:	15:00

Weather:	Sunny, Hot
Precipitation:	0
Temperature:	84 °F
Purpose for Visit:	Monthly Inspection

Process Information	Reading	Units	Time
Flowmeter Totalization Reading (upon arrival)	622078	**Gal**	13:00
Flowmeter Totalization Reading (upon departure)		**Gal**	
Flow rate, (during testing, P-1=8.89, P-2=8.60)	Note	**GPM**	13:10
Pump Hour Meter Readings: Pump #1	668.2	**Hours**	13:10
Pump Hour Meter Readings: Pump #2	527.0	**Hours**	13:10
Wet Well Level	1.54	**Ft**	
Pressure Sensor Reading (Bar Graph)	0	**Psi**	13:10

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1	24	24	0
BF2	Off line	Off line	Off line
GAC1	22	4	18
GAC2	22	4	18

Changed Filter Bags (Check One)	**YES**	X	**TIME**	01:30
	NO			

Item	Details
0602-1	System tested OK
0602-2	The leak in GAC #1 has increased and seems to be coming from the lower flange on the bottom of the vessel now.
0602-3	There are now 2 "gopher" holes on the north slope of the cap, I filled them in and inspected the spoils for fragments of liner, there were none, I will exterminate them this week.

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Item	Planned Actions
0602-2	Replace filter vessels

Item	Recommended actions to prevent future problems
0602-3	Kill gophers

~~Other relevant information:~~

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	NO	OK
#7 Pump # 2 Fail (Yes / No)	NO	OK
#8 Bag Filter Differential Pressure High	NO	OK
#9 Wet Well Level (Actual Measure Spoken)		
#10 Flow Rate	OK	OK
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Date:	7-2-02

Time In:	09:30
Time Out:	11:30

Weather:	Sunny
Precipitation:	0
Temperature:	80 °F
Purpose for Visit:	Repairing autodialer

Process Information	Reading	Units	Time
Flowmeter Totalization Reading (upon arrival)	622777	**Gal**	9:30
Flowmeter Totalization Reading (upon departure)	622777	**Gal**	11:30
Flow rate, (No test today)		**GPM**	
Pump Hour Meter Readings: Pump #1	668.9	**Hours**	
Pump Hour Meter Readings: Pump #2	527.7	**Hours**	
Wet Well Level	--	**Ft**	
Pressure Sensor Reading (Bar Graph)	--	**Psi**	

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1			
BF2	Off line	Off line	Off line
GAC1			
GAC2			

Changed Filter Bags (Check One)	**YES**		**TIME**	
	NO			

Item	Details
0702-1	Opened up the control panel and performed some basic diagnostic checks as described by the RACO customer service technician on the phone. Everything checked out OK but the unit still will not operate.

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Item	Planned Actions
0702-1	Having a meeting onsite tomorrow (service call with Carrier Controls) to have a manufacturers representative troubleshoot the unit.

Item	Recommended actions to prevent future problems

Other relevant information:

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	NO	NO
#7 Pump # 2 Fail (Yes / No)	NO	NO
#8 Bag Filter Differential Pressure High	NO	NO
#9 Wet Well Level (Actual Measure Spoken)	OK	OK
#10 Flow Rate	OK	OK
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Date:	7-3-02

Time In:	11:00
Time Out:	13:00

Weather:	Sunny, Hot
Precipitation:	0
Temperature:	92 °F
Purpose for Visit:	Site meeting with Carrier Controls technician.

Process Information	Reading	Units	Time
Flowmeter Totalization Reading (upon arrival)		**Gal**	
Flowmeter Totalization Reading (upon departure)	623582	**Gal**	13:00
Flow rate, (No test today)		**GPM**	
Pump Hour Meter Readings: Pump #1		**Hours**	
Pump Hour Meter Readings: Pump #2		**Hours**	
Wet Well Level		**Ft**	
Pressure Sensor Reading (Bar Graph)		**Psi**	

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1	24	24	0
BF2	Off line	Off line	Off line
GAC1	Off line	------	-------
GAC2			

Changed Filter Bags (Check One)	**YES**		**TIME**	
	NO	X		

Item	Details
0702-1	Technician fixed autodialer by testing and replacing an internal fuse.
0702-2	Due to extensive leaking, one GAC unit was taken off line for repair.

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Item	Planned Actions

Item	Recommended actions to prevent future problems

Other relevant information:

1. The system now is operating on 1 bag filter unit and 1 GAC unit. This has raised the working pressure up to about 30 psi from the usual 25 psi. However, the system is still operating normally, and the autodialer is back on line

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	NO	NO
#7 Pump # 2 Fail (Yes / No)	NO	NO
#8 Bag Filter Differential Pressure High	NO	NO
#9 Wet Well Level (Actual Measure Spoken)	OK	OK
#10 Flow Rate	OK	OK
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Date:	8-30-02

Time In:	13:00
Time Out:	16:00

Weather:	Sunny
Precipitation:	0
Temperature:	80 °F
Purpose for Visit:	Monthly Inspection

Process Information	Reading	Units	Time
Flowmeter Totalization Reading (upon arrival)	634322	**Gal**	13:00
Flowmeter Totalization Reading (upon departure)		**Gal**	
Flow rate, (during testing, P-1=8.7, P-2=8.6)		**GPM**	
Pump Hour Meter Readings: Pump #1	679	**Hours**	13:00
Pump Hour Meter Readings: Pump #2	538	**Hours**	13:00
Wet Well Level	1.7	**Ft**	13:00
Pressure Sensor Reading (Bar Graph)	.42	**Psi**	13:00

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1	29	29	0 after C/O
BF2	Off line	Off line	Off line
GAC1	Off line	Off line	Off line
GAC2	26	4	22

Changed Filter Bags (Check One)	**YES**	X	**TIME**	13:30
	NO			

Item	Details
0802-1	Exhaust fan in vault does not work.

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Item	Planned Actions
0802-1	I will investigate this more during the week of sampling. (9-16-02)

Item	Recommended actions to prevent future problems
0602-3	

Other relevant information:

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	NO	NO
#7 Pump # 2 Fail (Yes / No)	NO	NO
#8 Bag Filter Differential Pressure High	OK	OK
#9 Wet Well Level (Actual Measure Spoken)	OK	OK
#10 Flow Rate	OK	OK
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Date:	9-17-02

Time In:	11:00
Time Out:	15:00

Weather:	Sunny, Hot
Precipitation:	0
Temperature:	82 °F
Purpose for Visit:	Semi-Annual Inspection

Process Information	Reading	Units	Time
Flowmeter Totalizer Reading (upon arrival)	635766	**Gal**	14:40
Flowmeter Totalizer Reading (upon departure)		**Gal**	
Flow rate, (during testing, P-1=8.58, P-2=8.76)		**GPM**	14:40
Pump Hour Meter Readings: Pump #1	681	**Hours**	14:41
Pump Hour Meter Readings: Pump #2	540	**Hours**	14:41
Wet Well Level	1.7	**Ft**	14:41
Pressure Sensor Reading (Bar Graph) During test	29.5	**Psi**	

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1	27	27	0
BF2	Off line	Off line	Off line
GAC1	Off line	Off line	Off line
GAC2	25	5	20

Changed Filter Bags (Check One)	**YES**		**TIME**	
	NO	X		

Item	Details
0802-1	Exhaust fan in vault still no operational

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Item	Planned Actions
0802-2	I will investigate fan problem after sampling is over.

Item	Recommended actions to prevent future problems

Other relevant information:

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	NO	NO
#7 Pump # 2 Fail (Yes / No)	NO	NO
#8 Bag Filter Differential Pressure High	NO	NO
#9 Wet Well Level (Actual Measure Spoken)	1.7	.8
#10 Flow Rate	0	0
#11 - #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Date:	9-24-02

Time In:	08:00
Time Out:	12:00

Weather:	Clear
Precipitation:	0
Temperature:	67 °F
Purpose for Visit:	Monthly Inspection.

Process Information	Reading	Units	Time
Flowmeter Totalization Reading (upon arrival)	636014	Gal	08:15
Flowmeter Totalization Reading (upon departure)	636278	Gal	09:30
Flow rate, (during testing, P-1=8.68, P-2=8.70)		GPM	08:45
Pump Hour Meter Readings: Pump #1	681	Hours	08:15
Pump Hour Meter Readings: Pump #2	540	Hours	08:15
Wet Well Level	2.63	Ft	08:13
Pressure Sensor Reading (Bar Graph) During test	32	Psi	08:45

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1	30	30	0
BF2	Off line	Off line	Off line
GAC1	Off line	Off line	Off line
GAC2	26	20	0

Changed Filter Bags (Check One)	YES	X	TIME	08:40
	NO			

Item	Details
0802-1	Exhaust fan in vault still not working.

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Item	Planned Actions
0802-1	

Item	Recommended actions to prevent future problems
0802-1	Determine failure time and replace fan unit prior to historical failure.

Other relevant information:

1. Checked out the electrical circuitry for the fan, it was OK. Removed the fan from the fan mount, and found the fan motor looks burnt on the outside housing, and the bearing for the main shaft was shot. I will take the fan out with me and find a replacement for it.

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	NO	NO
#7 Pump # 2 Fail (Yes / No)	NO	NO
#8 Bag Filter Differential Pressure High	NO	NO
#9 Wet Well Level (Actual Measure Spoken)	OK	OK
#10 Flow Rate	OK	OK
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Date:	10-2-02

Time In:	07:00
Time Out:	09:00

Weather:	P/Cloudy
Precipitation:	0
Temperature:	55 °F
Purpose for Visit:	Alarm call at 06:00 regarding pump failure

Process Information	Reading	Units	Time
~~Flowmeter Totalizer Reading (upon arrival)~~	~~0~~	~~Gal~~	~~07:00~~
Flowmeter Totalizer Reading (upon departure)	0	**Gal**	09:00
Flow rate, (during testing, P-1=0, P-2=0)		**GPM**	
Pump Hour Meter Readings: Pump #1	683	**Hours**	07:00
Pump Hour Meter Readings: Pump #2	541	**Hours**	07:00
Wet Well Level	2.10	**Ft**	07:00
Pressure Sensor Reading (Bar Graph)	0	**Psi**	07:00

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1			
BF2	Off line	Off line	Off line
GAC1			
GAC2			

Changed Filter Bags (Check One)	**YES**		**TIME**	
	NO	X		

Item	Details
1002-1	Received alarm call at 06:00, onsite @ 07:00 to check out Pump #1 failure. Noticed that the flow meter was not showing any display, or even any signs of power. Checked all circuitry from the pole at the street to the meter, all OK. Determined that the problem was internal to the meter, and decided to call in Carrier Controls to correct it. The rest of the system seemed to test out OK, so I reset the pump and left the site. Flowmeter not working

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Item	Details
1002-1	Later that evening @ 7:15 PM, I received another alarm call indicating that pump # 2 had failed this time. Arrived onsite at 8:00 PM to check it out. Determined that the reason that the pumps were going into failure was that the malfunctioning flowmeter was not sending the proper signal through the system and the low flow shut down relay was dropping the power to the pumps to try to protect them.
0802-1	Have received new exhaust fan, have not installed new exhaust fan.

Item	Planned Actions
1002-1	Determined that the problem was internal to the flowmeter, and decided to call in Carrier Controls to correct it.

Item	Recommended actions to prevent future problems

Other relevant information:
1. I then shut down the system for the evening knowing that I would be back in the morning to meet with Steve Frank, Carrier Controls, to sort this out.

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	YES @ 6:00AM	OK
#7 Pump # 2 Fail (Yes / No)	YES @ 7:15PM	OK
#8 Bag Filter Differential Pressure High	OK	OK
#9 Wet Well Level (Actual Measure Spoken)	OK	OK
#10 Flow Rate		
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Date:	10-03-02

Time In:	08:30
Time Out:	10:30

Weather:	Rainy
Precipitation:	0.5"
Temperature:	55 °F
Purpose for Visit:	Flowmeter Problems - Meet with Carrier Controls

Process Information	Reading	Units	Time
Flowmeter Totalizer Reading (upon arrival)	0	Gal	
Flowmeter Totalizer Reading (upon departure)	0	Gal	
Flow rate,	0	GPM	
Pump Hour Meter Readings: Pump #1		Hours	
Pump Hour Meter Readings: Pump #2		Hours	
Wet Well Level		Ft	
Pressure Sensor Reading (Bar Graph)		Psi	

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1			
BF2	Off line	Off line	Off line
GAC1			
GAC2			

Changed Filter Bags (Check One)	**YES**		**TIME**	
	NO	X		

Item	Details
1002-1	Met onsite with Steve Frank (Carrier Controls). I explained the situation of 10-02-02, and he opened up the flow meter.

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Item	Planned Actions
1002-1	Send the unit out to be repaired or replaced, I asked him if we could bypass the low flow relay in the meantime, so we could still run the system, and he showed me how. He will send the unit back to the manufacturer and get it repaired and sent back ASAP.
1002-1	Bypass the low flow relay, so we could still run the system. Although the flowmeter does not transmit any readings via the phone line, the other parameters do continue to work and alarm capabilities are still online and functional.

Item	Recommended actions to prevent future problems

Other relevant information:
1. The first thing that we noticed was the smell of burnt electrical equipment.

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	OK	OK
#7 Pump # 2 Fail (Yes / No)	OK	OK
#8 Bag Filter Differential Pressure High	OK	OK
#9 Wet Well Level (Actual Measure Spoken)	1.7	1.2
#10 Flow Rate	---	---
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Date:	10-25-02

Time In:	08:00
Time Out:	12:00

Weather:	Partly sunny
Precipitation:	0
Temperature:	35 °F
Purpose for Visit:	Monthly Inspection & Re-install exhaust fan

Process Information	Reading	Units	Time
~~Flowmeter Totalizer Reading (upon arrival)~~	~~Off line~~	~~Gal~~	
Flowmeter Totalizer Reading (upon departure)	Off line	**Gal**	
Flow rate, (during testing, P-1=8.89, P-2=8.60)	Off line	**GPM**	
Pump Hour Meter Readings: Pump #1	686	**Hours**	08:36
Pump Hour Meter Readings: Pump #2	545	**Hours**	08:36
Wet Well Level	1.97	**Ft**	08:40
Pressure Sensor Reading (Bar Graph)	0	**Psi**	08:40

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1	30	30	0
BF2	Off line	Off line	Off line
GAC1	Off line	Off line	Off line
GAC2	25	5	20

Changed Filter Bags (Check One)	**YES**	X	**TIME**	11:00
	NO			

Item	Details
802-1	Installed new exhaust fan in vault, works fine now.
1002-1	Still waiting for word from the flowmeter manufacturer on repair/replacement time.

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Item	Planned Actions

Item	Recommended actions to prevent future problems

Other relevant information:

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	NO	NO
#7 Pump # 2 Fail (Yes / No)	NO	NO
#8 Bag Filter Differential Pressure High	NO	OK
#9 Wet Well Level (Actual Measure Spoken)	1.9	1.5
#10 Flow Rate	---	---
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Date:	11-20-02

Time In:	11:00
Time Out:	13:00

Weather:	Sunny
Precipitation:	0
Temperature:	40 °F
Purpose for Visit:	Re-install flow meter & Monthly inspection

Process Information	Reading	Units	Time
~~Flowmeter Totalization Reading (upon arrival)~~	---	~~Gal~~	---
Flowmeter Totalization Reading (upon departure)	77	**Gal**	13:00
Flow rate, (during testing, P-1=8.74, P-2=8.60)		**GPM**	12:30
Pump Hour Meter Readings: Pump #1	694	**Hours**	11:20
Pump Hour Meter Readings: Pump #2	552	**Hours**	11:20
Wet Well Level	1.86	**Ft**	11:20
Pressure Sensor Reading (Bar Graph)	35	**Psi**	11:40

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1	29	29	0
BF2	Off line	Off line	Off line
GAC1	Off line	Off line	Off line
GAC2	26	3	23

Changed Filter Bags (Check One)	**YES**	X	**TIME**	12:10
	NO			

Item	Details
1002-1	Installed new flow meter parts and put the system back on line.
1002-2	The hour meters for the pumps were at 683 and 541 when the flow meter went down. This means that the total operating time of the pumps during the down time was 11 hours each (perfect alternation), or 22 hours total. The average GPM of the pumps is 8.65, therefore, we can assume that the total discharge for the period of time that the flow meter was down, would be approximately 11,418 gallons, over a period of 49 days, with the daily average being around 233 GPD. Probably a little less because the pumps don't start immediately at 8.65 GPM, but work their way up to that point after a minute or two, and then there are backpressure issues as the filter bags start to get loaded up over time.

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Item	Planned Actions

Item	Recommended actions to prevent future problems

Other relevant information:
1. Performed monthly inspection and changed filter bag.

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	OK	OK
#7 Pump # 2 Fail (Yes / No)	OK	OK
#8 Bag Filter Differential Pressure High	OK	OK
#9 Wet Well Level (Actual Measure Spoken)	OK	OK
#10 Flow Rate	OK	OK
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Date:	12-17-02

Time In:	08:00
Time Out:	11:00

Weather:	Sunny, cold
Precipitation:	0
Temperature:	17 °F
Purpose for Visit:	Monthly Inspection

Process Information	Reading	Units	Time
Flowmeter Totalization Reading (upon arrival)	494786	**Gal**	08:10
Flowmeter Totalization Reading (upon departure)	494812	**Gal**	10:50
Flow rate, (during testing, P-1=8.87, P-2=8.61)		**GPM**	08:30
Pump Hour Meter Readings: Pump #1	705.9	**Hours**	08:10
Pump Hour Meter Readings: Pump #2	563.2	**Hours**	08:10
Wet Well Level	1.91	**Ft**	08:10
Pressure Sensor Reading (Bar Graph)	33.5	**Psi**	08:30

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1	33	26	7
BF2	Off line	Off line	Off line
GAC1	Off line	Off line	Off line
GAC2	26	4	22

Changed Filter Bags (Check One)	**YES**		**TIME**	
	NO	X		

Item	Details
1202-1	Noticed that the system was pumping high daily volumes lately, so I thought that I would do the inspection a little early this month. Every thing seems normal inside the vault. The wetland area adjacent to the vault is now full of water, due to the high lake level.

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System Operator's Log

Item	Planned Actions

Item	Recommended actions to prevent future problems

Other relevant information:
1. I would assume that ground water saturation around the vault, NOT from within the landfill is causing the higher volumes of water.

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	NO	NO
#7 Pump # 2 Fail (Yes / No)	NO	NO
#8 Bag Filter Differential Pressure High	OK	OK
#9 Wet Well Level (Actual Measure Spoken)	1.91	
#10 Flow Rate	OK	OK
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Date:	1-13-03

Time In:	09:00
Time Out:	12:00

Weather:	Cold and windy
Precipitation:	Flurries
Temperature:	14 °F
Purpose for Visit:	Autodialer Malfunction

Process Information	Reading	Units	Time
Flow meter Totalization Reading (upon arrival)		**Gal**	
Flow meter Totalization Reading (upon departure)		**Gal**	
Flow rate, (during testing, P-1=8.89, P-2=8.60)		**GPM**	
Pump Hour Meter Readings: Pump #1		**Hours**	
Pump Hour Meter Readings: Pump #2		**Hours**	
Wet Well Level		**Ft**	
Pressure Sensor Reading (Bar Graph)		**Psi**	

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1			
BF2	Offline	Offline	Offline
GAC1			
GAC2			

Changed Filter Bags (Check One)	**YES**		**TIME**	
	NO	X		

Item	Details
0103-1	Called the auto dialer to get the daily flow numbers, the machine would not respond. Went out to the site to check it out, found that the system was intact and operating normally with the exception of the auto dialer, which seemed to be "locked up", that is, it was not responding to any input from an operator. It would not even shut down when I turned off the power switch. I called Carrier Controls to get some ideas from them on what the problem could be, we ran through some checks over the phone, but nothing worked. He said that he would make arrangements for a site visit to troubleshoot the unit personally.

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Item	Planned Actions

Item	Recommended actions to prevent future problems

Other relevant information:

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door		
#2 Panel Door		
#3 Vault Sump High		
#4 Containment Pipe Alarm		
#5 High Wet Well Alarm		
#6 Pump #1 Fail (Yes / No)		
#7 Pump # 2 Fail (Yes / No)		
#8 Bag Filter Differential Pressure High		
#9 Wet Well Level (Actual Measure Spoken)		
#10 Flow Rate		
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Date:	1-20-03

Time In:	13:00
Time Out:	18:00

Weather:	Cold and windy
Precipitation:	Flurries - 2"
Temperature:	12 °F
Purpose for Visit:	Work on Autodialer/Monthly inspection

Process Information	Reading	Units	Time
Flow meter Totalization Reading (upon arrival)	24954	**Gal**	13:00
Flow meter Totalization Reading (upon departure)	25004	**Gal**	17:00
Flow rate, (during testing, P-1=8.78, P-2=8.60)		**GPM**	16:45
Pump Hour Meter Readings: Pump #1	718.1	**Hours**	13:00
Pump Hour Meter Readings: Pump #2	576.4	**Hours**	13:00
Wet Well Level	---	**Ft**	
Pressure Sensor Reading (Bar Graph)	35.5	**Psi**	16:45

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1	30	30	0
BF2	Offline	Offline	Offline
GAC1	Offline	Offline	Offline
GAC2	26	4	22

Changed Filter Bags (Check One)	**YES**	X	**TIME**	1645
	NO			

Item	Details
0103-1	After talking with the RACO rep and with Carrier Controls over the telephone, I visited the site for a monthly inspection and tried some of their suggestions before having them out here for a service call. I have managed to reprogram the dialer and reset all of the alarm inputs with the exception of the wet well level indicator.

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Item	Planned Actions

Item	Recommended actions to prevent future problems

Other relevant information:	During the auto dialer downtime, the pre-treatment system ran fine and the flow meter retained its memory in recording the discharge gallonage. No data was lost.

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	OK	OK
#7 Pump # 2 Fail (Yes / No)	OK	OK
#8 Bag Filter Differential Pressure High	OK	OK
#9 Wet Well Level (Actual Measure Spoken)		
#10 Flow Rate		
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Date:	2-25-03

Time In:	11:00
Time Out:	13:00

Weather:	Cold
Precipitation:	0"
Temperature:	22 °F
Purpose for Visit:	Monthly inspection

Process Information	Reading	Units	Time
Flowmeter Totalization Reading (upon arrival)	36935	**Gal**	11:30
Flowmeter Totalization Reading (upon departure)	36972	**Gal**	14:00
Flow rate, (during testing, P-1=8.84, P-2=8.40)		**GPM**	13:30
Pump Hour Meter Readings: Pump #1	729	**Hours**	11:30
Pump Hour Meter Readings: Pump #2	587	**Hours**	11:30
Wet Well Level		**Ft**	
Pressure Sensor Reading (Bar Graph)	35	**Psi**	13:30

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1	28	28	0
BF2	OFFLINE	OFFLINE	OFFLINE
GAC1	Off Line	"	"
GAC2	25	4	21

Changed Filter Bags (Check One)	**YES**	X	**TIME**	1:30
	NO			

Item	Details

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Item	Planned Actions

Item	Recommended actions to prevent future problems

Other relevant information:

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	NO	NO
#7 Pump # 2 Fail (Yes / No)	NO	NO
#8 Bag Filter Differential Pressure High	NO	NO
#9 Wet Well Level (Actual Measure Spoken)	OK	OK
#10 Flow Rate	OK	OK
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Date:	3-24-03

Time In:	08:00
Time Out:	17:00

Weather:	Drizzle
Precipitation:	Trace
Temperature:	36 °F
Purpose for Visit:	Work on WWT System

Process Information	Reading	Units	Time
½" Process Flowmeter Totalization Reading (orig.)	52042	Gal	09:00
1" Final Discharge Flowmeter Totalization Reading	--	Gal	
½" Sump Flowmeter Totalization Reading	--	Gal	
Flow rate, (during testing, P-1=, P-2=)		GPM	
Pump Hour Meter Readings: Pump #1	748.6	Hours	09:00
Pump Hour Meter Readings: Pump #2	598	Hours	09:00
Wet Well Level		Ft	
Pressure Sensor Reading (Bar Graph) during test		Psi	

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1			
BF2			
GAC1			
GAC2			

Changed Filter Bags (Check One)	**YES**		**TIME**	
	NO			

Item	Details
	Today, Craig and I concentrated on running the electrical conduit and pulling the wires for the new flow meters, so Carrier controls can do their thing. We also built the foot guard in front of the bag filter units.
	We also started cutting the old steel into smaller pieces so they would fit into the disposal bins.

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Item	Planned Actions

Item	Recommended actions to prevent future problems

Other relevant information:

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	NO	NO
#7 Pump # 2 Fail (Yes / No)	NO	NO
#8 Bag Filter Differential Pressure High	OK	OK
#9 Wet Well Level (Actual Measure Spoken)	OK	OK
#10 Flow Rate	OK	OK
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Date:	3-25-03

Time In:	08:00
Time Out:	16:00

Weather:	Cloudy, rain
Precipitation:	0.3"
Temperature:	44 °F
Purpose for Visit:	Work on WWT System

Process Information	Reading	Units	Time
½" Process Flowmeter Totalization Reading (orig.)	52570	Gal	08:30
1" Final Discharge Flowmeter Totalization Reading	--	Gal	
½" Sump Flowmeter Totalization Reading	--	Gal	
Flow rate, (during testing, P-1=, P-2=)		GPM	
Pump Hour Meter Readings: Pump #1		Hours	
Pump Hour Meter Readings: Pump #2		Hours	
Wet Well Level		Ft	
Pressure Sensor Reading (Bar Graph) during test		Psi	

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1			
BF2			
GAC1			
GAC2			

Changed Filter Bags (Check One)	YES		TIME	
	NO			

Item	Details
	Continued with cutting steel, while Carrier Controls installed the new meter readouts in the main cabinet and checked our wiring of the previous day.
	GAC unit #1 is bulging a little, even though the operating pressure never rises above 18 psi. I will call the manufacturer to check this out.

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Item	Planned Actions

Item	Recommended actions to prevent future problems

Other relevant information:

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	NO	NO
#7 Pump # 2 Fail (Yes / No)	NO	NO
#8 Bag Filter Differential Pressure High	OK	OK
#9 Wet Well Level (Actual Measure Spoken)	OK	OK
#10 Flow Rate	OK	OK
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Date:	3-26-03

Time In:	08:00
Time Out:	17:00

Weather:	Cloudy, Windy
Precipitation:	0
Temperature:	40 °F
Purpose for Visit:	Work on WWT System

Process Information	Reading	Units	Time
½" Process Flowmeter Totalization Reading (orig.)	53061	Gal	08:30
1" Final Discharge Flowmeter Totalization Reading	407	Gal	08:30
½" Sump Flowmeter Totalization Reading	308	Gal	08:30
Flow rate, (during testing, P-1=, P-2=)	8.5	GPM	08:30
Pump Hour Meter Readings: Pump #1	749.5	Hours	08:30
Pump Hour Meter Readings: Pump #2	599.1	Hours	08:30
Wet Well Level		Ft	
Pressure Sensor Reading (Bar Graph) during test	25	Psi	

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1			
BF2			
GAC1			
GAC2			

Changed Filter Bags (Check One)	**YES**		**TIME**	
	NO			

Item	Details
	Continued working on the "loose ends" of the system, and running tests on the automatic alarms and set points.

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Item	Planned Actions

Item	Recommended actions to prevent future problems

Other relevant information:

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	OK	OK
#7 Pump # 2 Fail (Yes / No)	OK	OK
#8 Bag Filter Differential Pressure High	OK	OK
#9 Wet Well Level (Actual Measure Spoken)	OK	OK
#10 Flow Rate	OK	OK
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Date:	3-28-03

Time In:	14:30
Time Out:	15:30

Weather:	Windy
Precipitation:	0
Temperature:	70 °F
Purpose for Visit:	De-Bug System

Process Information	Reading	Units	Time
½" Process Flowmeter Totalization Reading (orig.)	54157	Gal	14:30
1" Final Discharge Flowmeter Totalization Reading	1454	Gal	14:30
½" Sump Flowmeter Totalization Reading	1206	Gal	14:30
Flow rate, (during testing, P-1=, P-2=)	8.6	GPM	14:30
Pump Hour Meter Readings: Pump #1	750.5	Hours	14:30
Pump Hour Meter Readings: Pump #2	600	Hours	14:30
Wet Well Level		Ft	
Pressure Sensor Reading (Bar Graph) during test	22	Psi	14:30

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1	22	24	2
BF2	24	22	-2
GAC1	19	19	0
GAC2	19	17	-2

Changed Filter Bags (Check One)	YES		TIME	
	NO	X		

Item	Details
	Came out with Steve from Carrier Controls to investigate why the new meters are not communicating properly with the autodialer system. The local readouts, however, are working OK. We are just not getting the proper #'s at the remote (online) station.

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Item	Planned Actions
	Steve will install a small relay and a resistor between the autodialer and the new flow meters, as per the manufacturers troubleshooting suggestion.

Item	Recommended actions to prevent future problems

Other relevant information:

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	NO	NO
#7 Pump # 2 Fail (Yes / No)	NO	NO
#8 Bag Filter Differential Pressure High	OK	OK
#9 Wet Well Level (Actual Measure Spoken)	OK	OK
#10 Flow Rate	OK	OK
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Date:	04-08-03

Time In:	10:30
Time Out:	17:00

Weather:	Cold windy
Precipitation:	0
Temperature:	33 °F
Purpose for Visit:	Semi-Annual Inspection

Process Information	Reading	Units	Time
½" Process Flowmeter Totalization Reading (orig.)	58440	Gal	10:40
1" Final Discharge Flowmeter Totalization Reading	5502	Gal	10:40
½" Sump Flowmeter Totalization Reading	3696	Gal	10:40
Flow rate, (during testing, P-1=, P-2=)	8.6	GPM	10:40
Pump Hour Meter Readings: Pump #1	754.6	Hours	10:40
Pump Hour Meter Readings: Pump #2	604.2	Hours	10:40
Wet Well Level		Ft	
Pressure Sensor Reading (Bar Graph) during test	25	Psi	10:40

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1	22	22	0
BF2	22	20	2
GAC1	18	18	0
GAC2	18	10	-8

Changed Filter Bags (Check One)	**YES**		**TIME**	
	NO			

Item	Details
	GAC unit #1 shows signs of pressure buildup even though psi gauges show an operating pressure of only 18 psi. Maximum psi on the GAC units is listed as 25 psi.

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Item	Planned Actions

Item	Recommended actions to prevent future problems

Other relevant information:

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	NO	NO
#7 Pump # 2 Fail (Yes / No)	NO	NO
#8 Bag Filter Differential Pressure High	OK	OK
#9 Wet Well Level (Actual Measure Spoken)	OK	OK
#10 Flow Rate	OK	OK
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Date:	04-09-03

Time In:	08:00
Time Out:	17:00

Weather:	Cloudy
Precipitation:	0
Temperature:	30 °F
Purpose for Visit:	Semi-Annual Sampling

Process Information	Reading	Units	Time
½" Process Flowmeter Totalization Reading (orig.)	58878	Gal	12:00
1" Final Discharge Flowmeter Totalization Reading	5914	Gal	12:00
½" Sump Flowmeter Totalization Reading	4035	Gal	12:00
Flow rate, (during testing, P-1=, P-2=)		GPM	
Pump Hour Meter Readings: Pump #1	754.9	Hours	12:00
Pump Hour Meter Readings: Pump #2	604.7	Hours	12:00
Wet Well Level		Ft	
Pressure Sensor Reading (Bar Graph) during test		Psi	

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1			
BF2			
GAC1			
GAC2			

Changed Filter Bags (Check One)	YES		TIME	
	NO			

Item	Details
	Came out to the site to sample the Ground water wells as per the O&M.

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Item	Planned Actions

Item	Recommended actions to prevent future problems

Other relevant information:

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door		
#2 Panel Door		
#3 Vault Sump High		
#4 Containment Pipe Alarm		
#5 High Wet Well Alarm		
#6 Pump #1 Fail (Yes / No)		
#7 Pump # 2 Fail (Yes / No)		
#8 Bag Filter Differential Pressure High		
#9 Wet Well Level (Actual Measure Spoken)		
#10 Flow Rate		
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Date:	4-11-03

Time In:	08:00
Time Out:	14:00

Weather:	Partly Cloudy
Precipitation:	0
Temperature:	33 °F
Purpose for Visit:	Monthly Insp.

Process Information	Reading	Units	Time
½" Process Flowmeter Totalization Reading (orig.)	58931	Gal	08:30
1" Final Discharge Flowmeter Totalization Reading	5964	Gal	08:30
½" Sump Flowmeter Totalization Reading	4664	Gal	08:30
Flow rate, (during testing, P-1=, P-2=)	8.4	GPM	08:30
Pump Hour Meter Readings: Pump #1	755.0	Hours	08:30
Pump Hour Meter Readings: Pump #2	604.7	Hours	08:30
Wet Well Level		Ft	
Pressure Sensor Reading (Bar Graph) during test	24.33	Psi	08:30

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1	22	22	0
BF2	22	22	0
GAC1	18	18	0
GAC2	18	17	1

Changed Filter Bags (Check One)	**YES**	X	**TIME**	08:40
	NO			

Item	Details
	Checked pressure drops across each individual GAC units and found them to be less than 1 psi. Then checked the effluent pipe and discovered that it generates 17 pounds of back pressure. This seems very high.
	I would suggest that this effluent pipe be cleaned out to check for any obstructions. I backwashed each GAC units while the system was apart and down.
	Brian Sydowski from the NYSDEC showed up for a site inspection. We did a site walk. He suggested that we also vacuum out the silt buildup that has accumulated in the manholes that the leachate runs through

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Item	Planned Actions

Item	Recommended actions to prevent future problems

Other relevant information:

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	NO	NO
#7 Pump # 2 Fail (Yes / No)	NO	NO
#8 Bag Filter Differential Pressure High	OK	OK
#9 Wet Well Level (Actual Measure Spoken)	OK	OK
#10 Flow Rate	OK	OK
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

Operator Name: Mike Walker

Operator Signature:

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Date:	4-14-03

Time In:	09:00
Time Out:	11:00

Weather:	Sunny
Precipitation:	0
Temperature:	55 °F
Purpose for Visit:	Repair Flowmeter

Process Information	Reading	Units	Time
½" Process Flowmeter Totalization Reading (orig.)	60964	Gal	09:10
1" Final Discharge Flowmeter Totalization Reading	7683	Gal	09:10
½" Sump Flowmeter Totalization Reading	4878	Gal	09:10
Flow rate, (during testing, P-1=, P-2=)		GPM	
Pump Hour Meter Readings: Pump #1	756.1	Hours	09:10
Pump Hour Meter Readings: Pump #2	607.5	Hours	09:10
Wet Well Level		Ft	
Pressure Sensor Reading (Bar Graph) during test		Psi	

	Influent Gauge, Psi	Effluent Gauge, Psi	Differential
BF1			
BF2			
GAC1			
GAC2			

Changed Filter Bags (Check One)	YES		TIME	
	NO			

Item	Details
	Replaced LCD display in the 1" final flow meter. It was delivered with a factory defect. Also installed the resistor and electrical relay that was supposed to correct the communications problem between the new flow meters and the auto dialer.

FRONTIER CHEMICAL – PENDLETON SITE
Pretreatment System' Operator's Log

Item	Planned Actions

Item	Recommended actions to prevent future problems

Other relevant information:

SYSTEM CHECK LIST	Arrival	Departure
#1 Vault Door	OK	OK
#2 Panel Door	OK	OK
#3 Vault Sump High	OK	OK
#4 Containment Pipe Alarm	OK	OK
#5 High Wet Well Alarm	OK	OK
#6 Pump #1 Fail (Yes / No)	OK	OK
#7 Pump # 2 Fail (Yes / No)	OK	OK
#8 Bag Filter Differential Pressure High	OK	OK
#9 Wet Well Level (Actual Measure Spoken)	OK	OK
#10 Flow Rate	OK	OK
#11 #16; Reserved for future use		
FOR CURRENT STATUS CALL: (716) 743-1335		

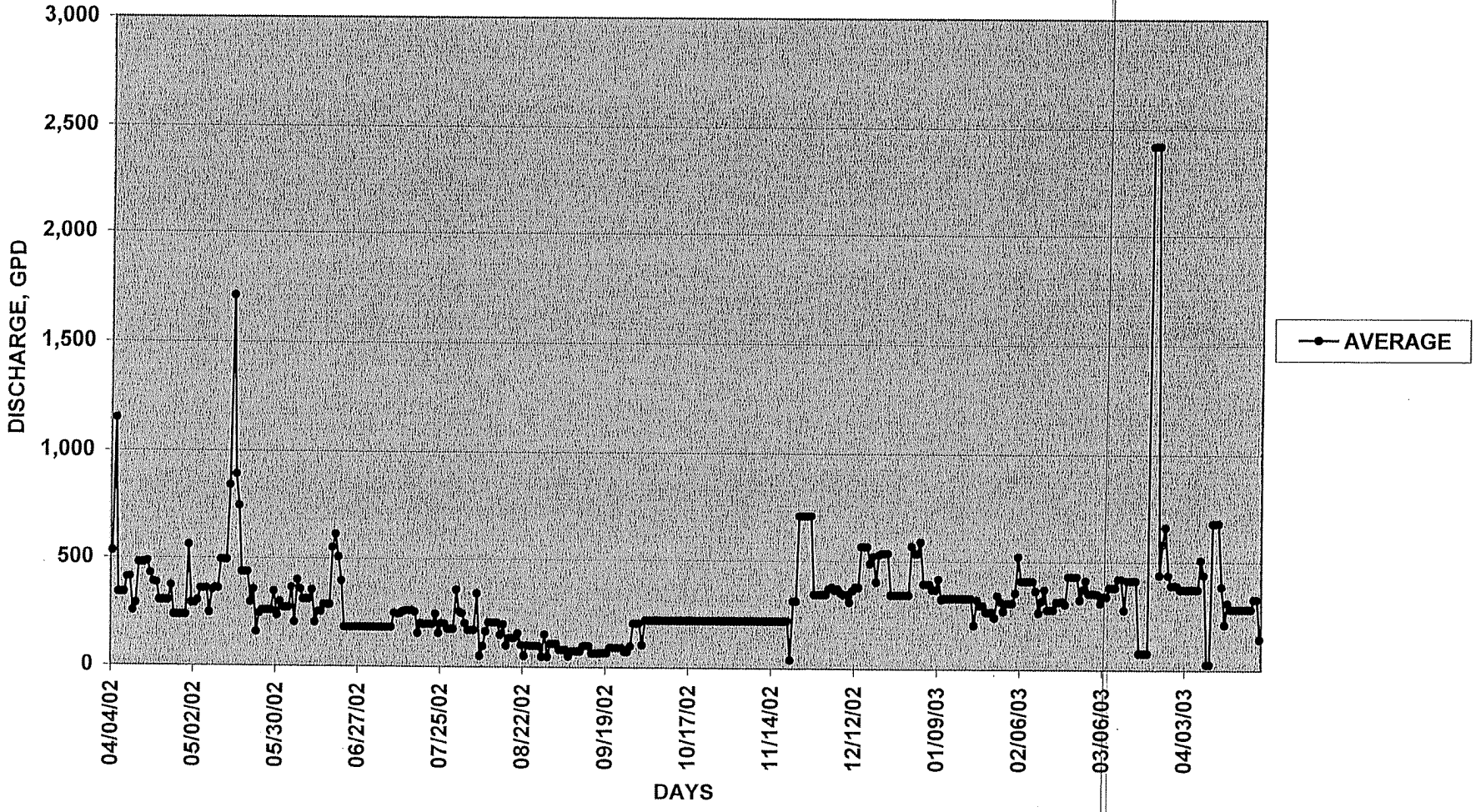
Operator Name: Mike Walker

Operator Signature:

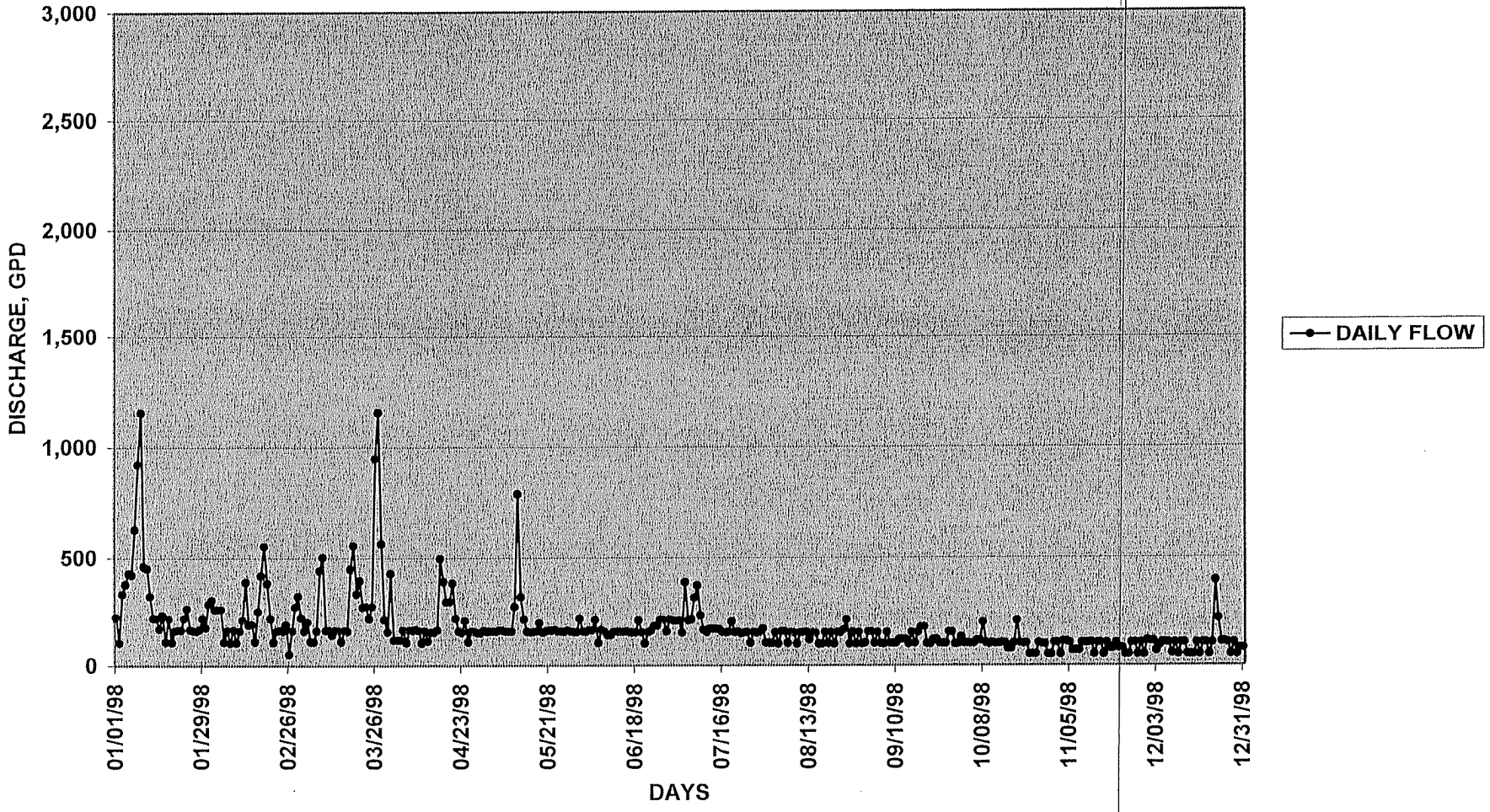
ATTACHMENT B – FIGURES
FRONTIER CHEMICAL - PENDLETON SITE
DISCHARGE BY YEAR
1997 THROUGH 2002
REPORT #11

FIGURE

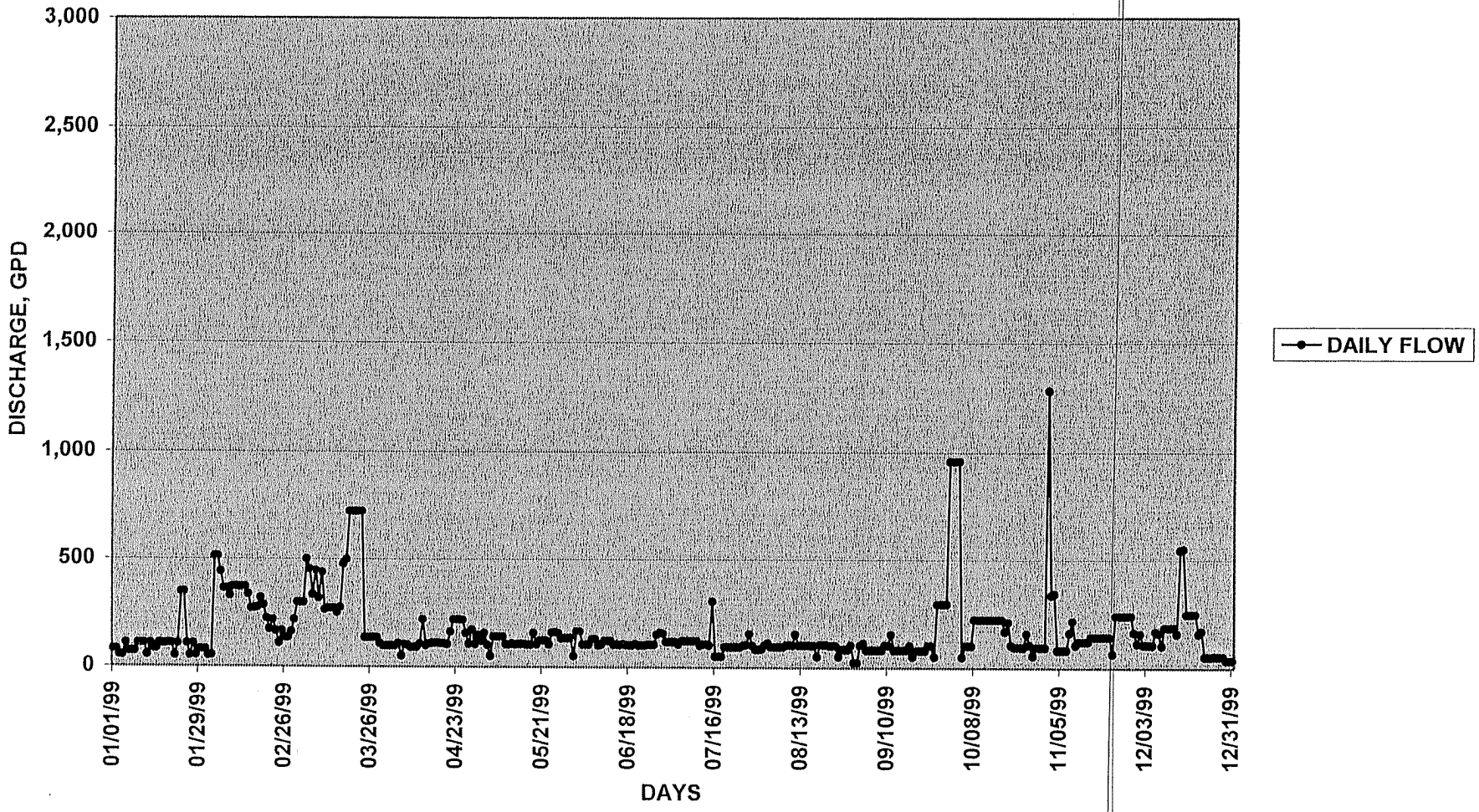
ATTACHMENT B - FIGURE 1
FRONTIER CHEMICAL - PENDLETION SITE
NCSD #1 DISCHARGE - 04/04/02 TO 04/28/03
REPORT #11



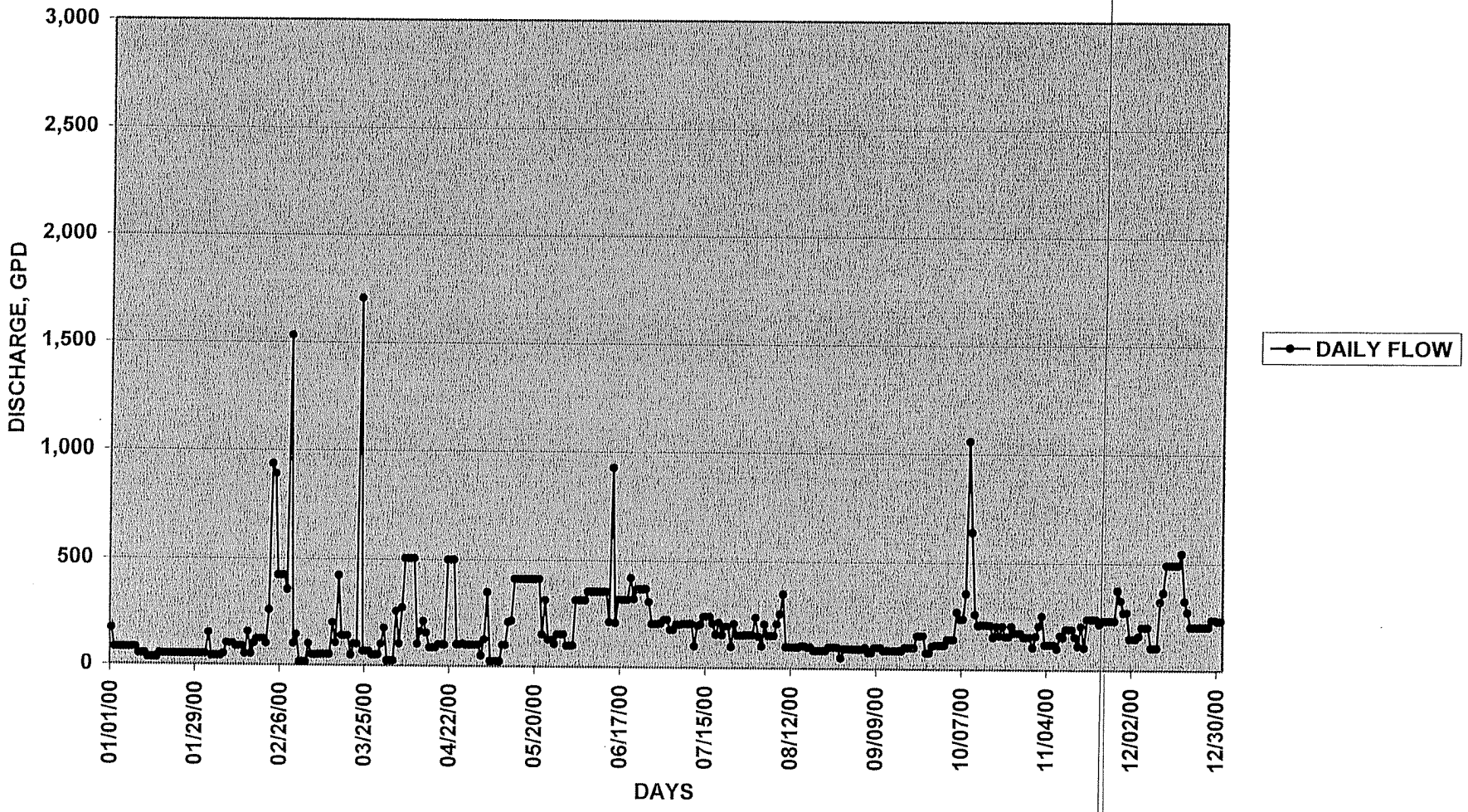
ATTACHMENT B - FIGURE 2
FRONTIER CHEMICAL - PENDLETION SITE
SITE DISCHARGE -1998
REPORT #11



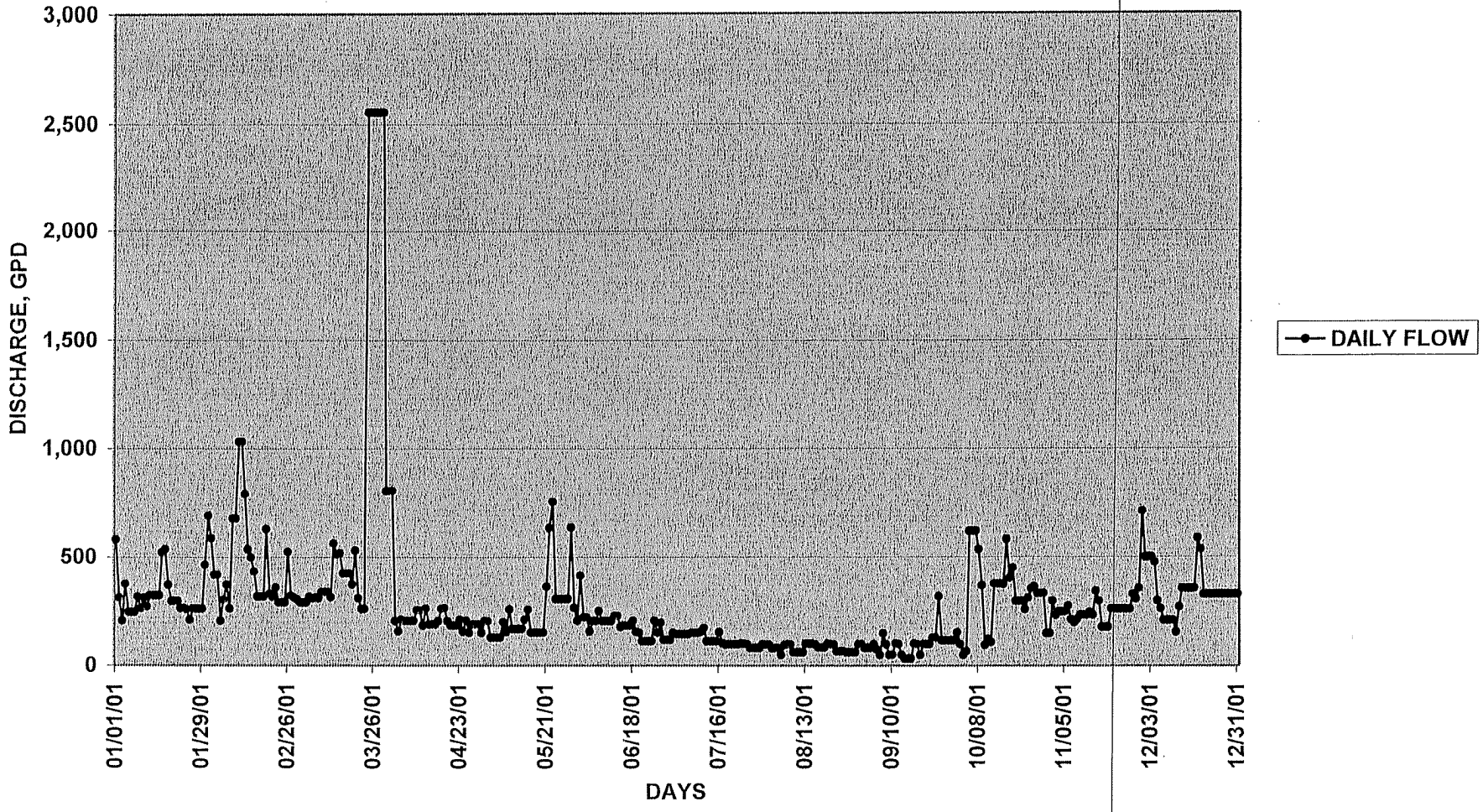
ATTACHMENT B - FIGURE 3
FRONTIER CHEMICAL - PENDLETION SITE
SITE DISCHARGE -1999
REPORT #11



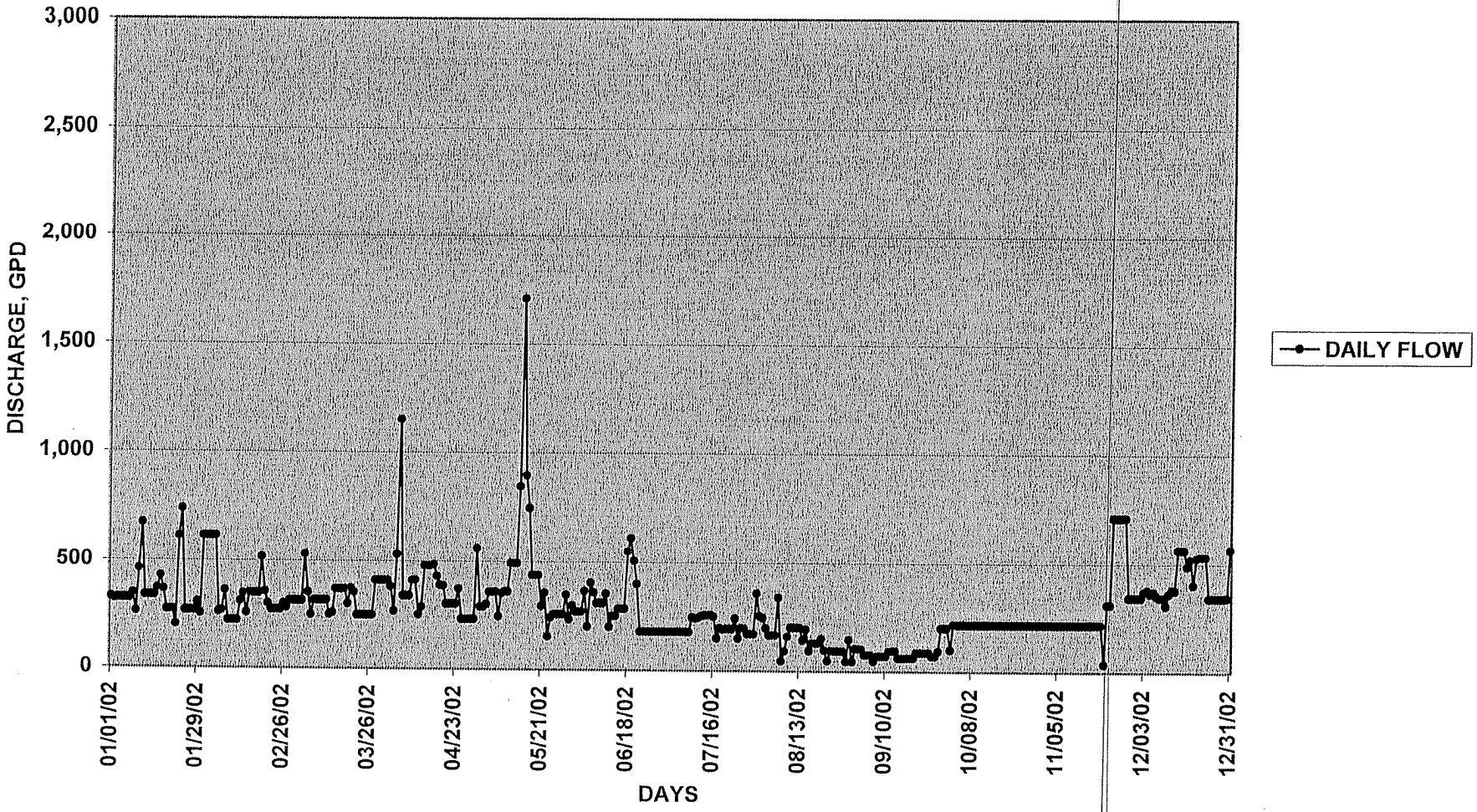
ATTACHMENT B - FIGURE 4
FRONTIER CHEMICAL - PENDLETION SITE
SITE DISCHARGE -2000
REPORT #11



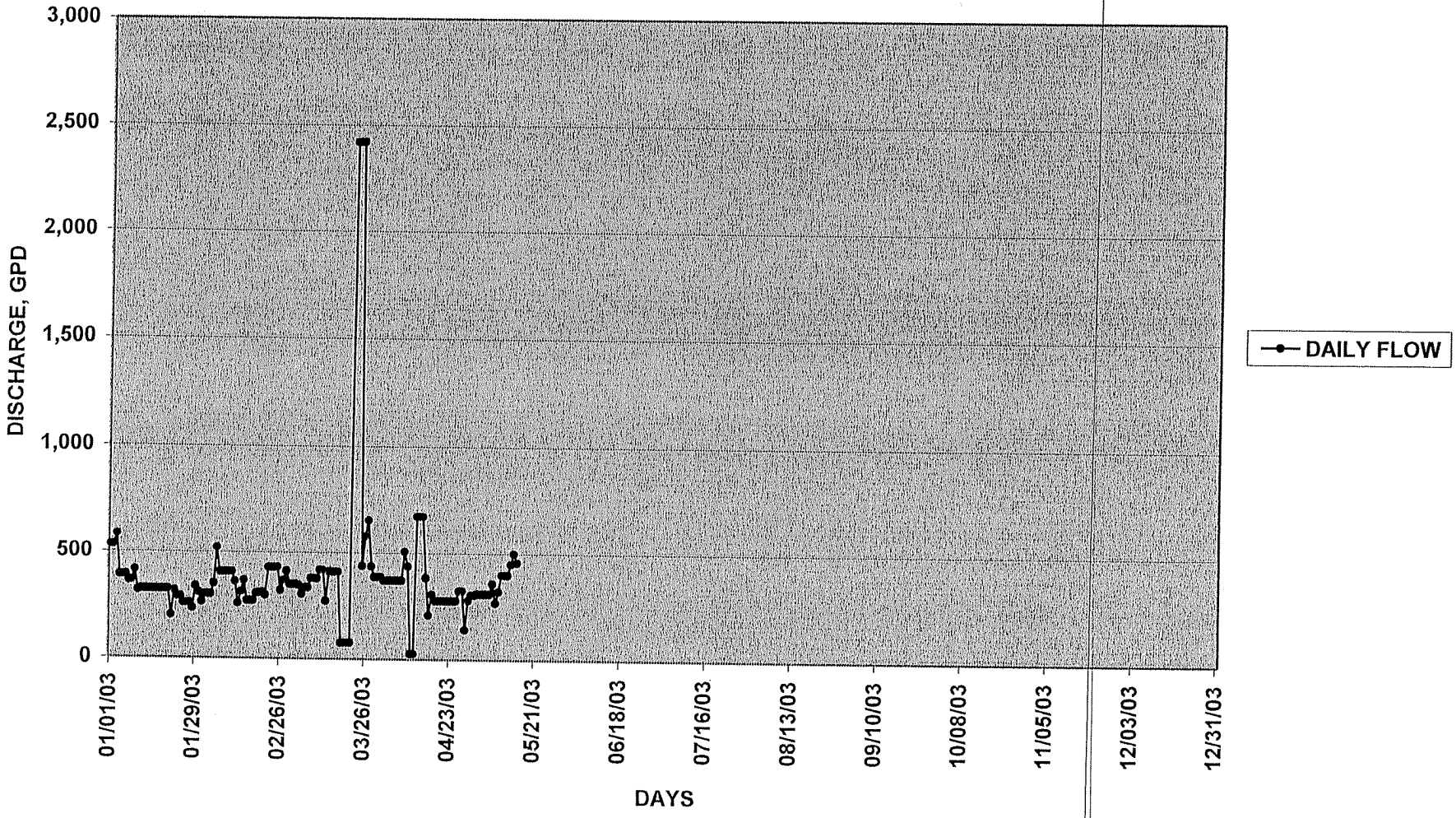
ATTACHMENT B - FIGURE 5
FRONTIER CHEMICAL - PENDLETION SITE
SITE DISCHARGE -2001
REPORT #11



ATTACHMENT B - FIGURE 6
FRONTIER CHEMICAL - PENDLETION SITE
SITE DISCHARGE - 2002
REPORT #11



ATTACHMENT B - FIGURE 7
FRONTIER CHEMICAL - PENDLETION SITE
SITE DISCHARGE - 2002
REPORT #11



ATTACHMENT C
FRONTIER CHEMICAL - PENDLETON SITE
TABLE OF CONTENTS
MAY 2002 TO APRIL 2003
REPORT #11

EXHIBITS

TABLES

ATTACHMENT C- EXHIBIT 1
FRONTIER CHEMICAL – PENDLETON SITE
PIEZOMETER CHECKLIST
REPORT #11

PIEZOMETERS

SP-1
P-1
P-2
P-3
P-4
P-5
P-6
P-7
P-8

PIEZOMETER INTRIGITY CHECKLIST

SITE NAME: FRONTIER CHEMICAL – PENDLETON SITE	IDENTIFICATION: SP-1
PERSONNEL: WALKER, BOVE	DATE: 4/08/03

PIEZOMETER SPECIFICATIONS				
PROTECTIVE CASING		ABOVE GROUND	X	FLUSH MOUNTED
PIEZOMETER CONSTRUCTION	X	PVC		STAINLESS STEEL
PIEZOMETER DIAMETER		2-INCH	X	6-INCH
DEPTH TO GROUND WATER	DRY			
PIEZOMETER DEPTH				

PIEZOMETER INTEGRITY		
PIEZOMETER IDENTIFICATION CLEARLY MARKED?	YES	
PIEZOMETER COVERS AND LOCKS IN GOOD CONDITION AND SECURE?	YES	
IS THE PIEZOMETER STANDPIPE VERTICALLY ALIGNED AND SECURE?		NO
IS THE CONCRETE PAD AND SURFACE SEAL IN GOOD CONDITION?	YES	
ARE SOILS SURROUNDING THE PIEZOMETER PAD ERODED?	YES	
IS THE PIEZOMETER CASING IN GOOD CONDITION?		NO
IS THE MEASURING POINT ON CASING WELL MARKED?		
IS THERE STANDING WATER IN THE ANNULAR SPACE?		NO
IS THE STANDPIPE VENTED AT THE BASE TO ALLOW DRAINAGE?	YES	
DOES THE TOTAL SOUNDED DEPTH CORRESPOND TO THE ORIGINAL PIEZOMETER COMPLETION DEPTH?		
IS THE ACCESS DOWN THE PIEZOMETER IMPEDED OR BLOCKED? EXPLAIN.		NO

COMMENTS AND RECOMMENDATIONS

IT LOOKS LIKE THE GROUND SURROUNDING THE WELL BOX THAT ENCASES THE STANDPIPE HAS SHIFTED ABOUT 6" TOWARD THE LAKE. THIS WOULD INDICATE A SUBTLE SLIDING OF THE LANDFILL COVER, ALSO TOWARD THE LAKE.

PIEZOMETER INTRIGITY CHECKLIST

SITE NAME: FRONTIER CHEMICAL – PENDLETON SITE IDENTIFICATION: P-1

PERSONNEL: WALKER, BOVE DATE: 4/08/03

PIEZOMETER SPECIFICATIONS				
PROTECTIVE CASING	X	ABOVE GROUND		FLUSH MOUNTED
PIEZOMETER CONSTRUCTION	X	PVC		STAINLESS STEEL
PIEZOMETER DIAMETER	X	2-INCH		6-INCH
DEPTH TO GROUND WATER	10.65′			
PIEZOMETER DEPTH	16.45			

PIEZOMETER INTEGRITY		
PIEZOMETER IDENTIFICATION CLEARLY MARKED?	YES	
PIEZOMETER COVERS AND LOCKS IN GOOD CONDITION AND SECURE?	YES	
IS THE PIEZOMETER STANDPIPE VERTICALLY ALIGNED AND SECURE?	YES	
IS THE CONCRETE PAD AND SURFACE SEAL IN GOOD CONDITION?	YES	
ARE SOILS SURROUNDING THE PIEZOMETER PAD ERODED?		NO
IS THE PIEZOMETER CASING IN GOOD CONDITION?	YES	
IS THE MEASURING POINT ON CASING WELL MARKED?	YES	
IS THERE STANDING WATER IN THE ANNULAR SPACE?		NO
IS THE STANDPIPE VENTED AT THE BASE TO ALLOW DRAINAGE?	YES	
DOES THE TOTAL SOUNDED DEPTH CORRESPOND TO THE ORIGINAL PIEZOMETER COMPLETION DEPTH?	YES	
IS THE ACCESS DOWN THE PIEZOMETER IMPEDED OR BLOCKED? EXPLAIN.		NO

COMMENTS AND RECOMMENDATIONS

PIEZOMETER INTRIGITY CHECKLIST

SITE NAME: FRONTIER CHEMICAL – PENDLETON SITE IDENTIFICATION: P-2

PERSONNEL: WALKER, BOVE DATE: 4/08/03

PIEZOMETER SPECIFICATIONS				
PROTECTIVE CASING		ABOVE GROUND	X	FLUSH MOUNTED
PIEZOMETER CONSTRUCTION	X	PVC		STAINLESS STEEL
PIEZOMETER DIAMETER	X	2-INCH		6-INCH
DEPTH TO GROUND WATER	8.20′			
PIEZOMETER DEPTH	15.70′			

PIEZOMETER INTEGRITY		
PIEZOMETER IDENTIFICATION CLEARLY MARKED?	YES	
PIEZOMETER COVERS AND LOCKS IN GOOD CONDITION AND SECURE?	YES	
IS THE PIEZOMETER STANDPIPE VERTICALLY ALIGNED AND SECURE?	YES	
IS THE CONCRETE PAD AND SURFACE SEAL IN GOOD CONDITION?	YES	
ARE SOILS SURROUNDING THE PIEZOMETER PAD ERODED?		NO
IS THE PIEZOMETER CASING IN GOOD CONDITION?	YES	
IS THE MEASURING POINT ON CASING WELL MARKED?	YES	
IS THERE STANDING WATER IN THE ANNULAR SPACE?	YES	
IS THE STANDPIPE VENTED AT THE BASE TO ALLOW DRAINAGE?		NO
DOES THE TOTAL SOUNDED DEPTH CORRESPOND TO THE ORIGINAL PIEZOMETER COMPLETION DEPTH?	YES	
IS THE ACCESS DOWN THE PIEZOMETER IMPEDED OR BLOCKED? EXPLAIN.		NO

COMMENTS AND RECOMMENDATIONS

PIEZOMETER INTRIGITY CHECKLIST

SITE NAME: FRONTIER CHEMICAL – PENDLETON SITE IDENTIFICATION: P-3

PERSONNEL: WALKER, BOVE DATE: 4/08/03

PIEZOMETER SPECIFICATIONS				
PROTECTIVE CASING		ABOVE GROUND	X	FLUSH MOUNTED
PIEZOMETER CONSTRUCTION	X	PVC		STAINLESS STEEL
PIEZOMETER DIAMETER	X	2-INCH		6-INCH
DEPTH TO GROUND WATER	29.22′			
PIEZOMETER DEPTH	40.15			

PIEZOMETER INTEGRITY		
PIEZOMETER IDENTIFICATION CLEARLY MARKED?	YES	
PIEZOMETER COVERS AND LOCKS IN GOOD CONDITION AND SECURE?	YES	
IS THE PIEZOMETER STANDPIPE VERTICALLY ALIGNED AND SECURE?	YES	
IS THE CONCRETE PAD AND SURFACE SEAL IN GOOD CONDITION?	YES	
ARE SOILS SURROUNDING THE PIEZOMETER PAD ERODED?		NO
IS THE PIEZOMETER CASING IN GOOD CONDITION?	YES	
IS THE MEASURING POINT ON CASING WELL MARKED?	YES	
IS THERE STANDING WATER IN THE ANNULAR SPACE?		NO
IS THE STANDPIPE VENTED AT THE BASE TO ALLOW DRAINAGE?		NO
DOES THE TOTAL SOUNDED DEPTH CORRESPOND TO THE ORIGINAL PIEZOMETER COMPLETION DEPTH?	YES	
IS THE ACCESS DOWN THE PIEZOMETER IMPEDED OR BLOCKED? EXPLAIN.		NO

COMMENTS AND RECOMMENDATIONS

PIEZOMETER INTRIGITY CHECKLIST

SITE NAME: FRONTIER CHEMICAL – PENDLETON SITE IDENTIFICATION: P-4

PERSONNEL: WALKER, BOVE DATE: 4/08/03

PIEZOMETER SPECIFICATIONS				
PROTECTIVE CASING	X	ABOVE GROUND		FLUSH MOUNTED
PIEZOMETER CONSTRUCTION	X	PVC		STAINLESS STEEL
PIEZOMETER DIAMETER	X	2-INCH		6-INCH
DEPTH TO GROUND WATER	9.42′			
PIEZOMETER DEPTH	17.00′			

PIEZOMETER INTEGRITY		
PIEZOMETER IDENTIFICATION CLEARLY MARKED?	YES	
PIEZOMETER COVERS AND LOCKS IN GOOD CONDITION AND SECURE?	YES	
IS THE PIEZOMETER STANDPIPE VERTICALLY ALIGNED AND SECURE?	YES	
IS THE CONCRETE PAD AND SURFACE SEAL IN GOOD CONDITION?	YES	
ARE SOILS SURROUNDING THE PIEZOMETER PAD ERODED?		NO
IS THE PIEZOMETER CASING IN GOOD CONDITION?	YES	
IS THE MEASURING POINT ON CASING WELL MARKED?	YES	
IS THERE STANDING WATER IN THE ANNULAR SPACE?	YES	
IS THE STANDPIPE VENTED AT THE BASE TO ALLOW DRAINAGE?		NO
DOES THE TOTAL SOUNDED DEPTH CORRESPOND TO THE ORIGINAL PIEZOMETER COMPLETION DEPTH?	YES	
IS THE ACCESS DOWN THE PIEZOMETER IMPEDED OR BLOCKED? EXPLAIN.		NO

COMMENTS AND RECOMMENDATIONS

PIEZOMETER INTRIGITY CHECKLIST

SITE NAME: FRONTIER CHEMICAL – PENDLETON SITE IDENTIFICATION: P-5

PERSONNEL: WALKER, BOVE DATE: 4/08/03

PIEZOMETER SPECIFICATIONS				
PROTECTIVE CASING	X	ABOVE GROUND		FLUSH MOUNTED
PIEZOMETER CONSTRUCTION	X	PVC		STAINLESS STEEL
PIEZOMETER DIAMETER	X	2-INCH		6-INCH
DEPTH TO GROUND WATER	3.2′			
PIEZOMETER DEPTH	15.55′			

PIEZOMETER INTEGRITY		
PIEZOMETER IDENTIFICATION CLEARLY MARKED?	YES	
PIEZOMETER COVERS AND LOCKS IN GOOD CONDITION AND SECURE?	YES	
IS THE PIEZOMETER STANDPIPE VERTICALLY ALIGNED AND SECURE?	YES	
IS THE CONCRETE PAD AND SURFACE SEAL IN GOOD CONDITION?	YES	
ARE SOILS SURROUNDING THE PIEZOMETER PAD ERODED?		NO
IS THE PIEZOMETER CASING IN GOOD CONDITION?	YES	
IS THE MEASURING POINT ON CASING WELL MARKED?	YES	
IS THERE STANDING WATER IN THE ANNULAR SPACE?		NO
IS THE STANDPIPE VENTED AT THE BASE TO ALLOW DRAINAGE?	YES	
DOES THE TOTAL SOUNDED DEPTH CORRESPOND TO THE ORIGINAL PIEZOMETER COMPLETION DEPTH?	YES	
IS THE ACCESS DOWN THE PIEZOMETER IMPEDED OR BLOCKED? EXPLAIN.		NO

COMMENTS AND RECOMMENDATIONS

ATTACHMENT C – EXHIBIT 2
ERONTIER CHEMICAL – PENDLETON SITE
MONITORING WELL INTEGRITY CHECKLIST
REPORT #11

GROUND WATER WELL

85-5R
URS-5D
85-7R
URS-7D
URS-9I
URS-9D
88-12C
88-12D
URS-14I
URS-14D

MONITORING WELL INTEGRITY CHECKLIST

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

Personnel: Walker, Bove Date: 4/10/03

WELL SPECIFICATIONS				
Protective Casing	X	Above Ground		Flush Mounted
Well Construction		PVC	X	Stainless Steel
Well Diameter	X	2-inch		6-inch
Depth to Ground Water	7.60′			
Well Depth	39.50′			

WELL INTEGRITY		
Well identification clearly marked?	Yes	
Well covers and locks in good condition and secure?	Yes	
Is the well standpipe vertically aligned and secure?	Yes	
Is the concrete pad and surface seal in good condition?	Yes	
Are soils surrounding the well pad eroded?		No
Is the well casing in good condition?	Yes	
Is the measuring point on casing well marked?	Yes	
Is there standing water in the annular space?	Yes	
Is the standpipe vented at the base to allow drainage?	Yes	
Does the total sounded depth correspond to the original well completion depth?	Yes	
Is the access down the well impeded or blocked? Explain.		No

COMMENTS AND RECOMMENDATIONS
The well is in some standing water. Not able to drain out the drain hole in the well casing

MONITORING WELL INTEGRITY CHECKLIST

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

Personnel: Walker, Bove Date: 4/10/03

WELL SPECIFICATIONS				
Protective Casing	X	Above Ground		Flush Mounted
Well Construction		PVC	X	Stainless Steel
Well Diameter	X	2-inch		6-inch
Depth to Ground Water	6.30′			
Well Depth	28.70′			

WELL INTEGRITY		
Well identification clearly marked?	Yes	
Well covers and locks in good condition and secure?	Yes	
Is the well standpipe vertically aligned and secure?	Yes	
Is the concrete pad and surface seal in good condition?	Yes	
Are soils surrounding the well pad eroded?		No
Is the well casing in good condition?	Yes	
Is the measuring point on casing well marked?	Yes	
Is there standing water in the annular space?	Yes	
Is the standpipe vented at the base to allow drainage?	Yes	
Does the total sounded depth correspond to the original well completion depth?	Yes	
Is the access down the well impeded or blocked? Explain.		No

COMMENTS AND RECOMMENDATIONS

MONITORING WELL INTEGRITY CHECKLIST

Site Name: **Frontier Chemical – Pendleton site** Well Identification: **URS-5D**

Personnel: Walker, Bove Date: 4/10/03

WELL SPECIFICATIONS				
Protective Casing	X	Above Ground		Flush Mounted
Well Construction		PVC	X	Stainless Steel
Well Diameter	X	2-inch		6-inch
Depth to Ground Water	4.8′			
Well Depth	49.8			

WELL INTEGRITY		
Well identification clearly marked?	Yes	
Well covers and locks in good condition and secure?		No
Is the well standpipe vertically aligned and secure?	Yes	
Is the concrete pad and surface seal in good condition?	Yes	
Are soils surrounding the well pad eroded?	Yes	
Is the well casing in good condition?	Yes	
Is the measuring point on casing well marked?	Yes	
Is there standing water in the annular space?		No
Is the standpipe vented at the base to allow drainage?	Yes	
Does the total sounded depth correspond to the original well completion depth?	Yes	
Is the access down the well impeded or blocked? Explain.		No

Comments and Recommendations
Protective casing cover hinge broken.

MONITORING WELL INTEGRITY CHECKLIST

Site Name: **Frontier Chemical – Pendleton site**

Well Identification: **85-5R**

Personnel: Walker, Bove

Date: 4/10/03

WELL SPECIFICATIONS				
Protective Casing	X	Above Ground		Flush Mounted
Well Construction		PVC	X	Stainless Steel
Well Diameter	X	2-inch		6-inch
Depth to Ground Water	7.0′			
Well Depth	50.3′			

WELL INTEGRITY		
Well identification clearly marked?	Yes	
Well covers and locks in good condition and secure?	Yes	
Is the well standpipe vertically aligned and secure?		No
Is the concrete pad and surface seal in good condition?	Yes	
Are soils surrounding the well pad eroded?	Yes	
Is the well casing in good condition?		No
Is the measuring point on casing well marked?	Yes	
Is there standing water in the annular space?		No
Is the standpipe vented at the base to allow drainage?	Yes	
Does the total sounded depth correspond to the original well completion depth?	Yes	
Is the access down the well impeded or blocked? Explain.	Yes	

COMMENTS AND RECOMMENDATIONS
The well casing has shifted and the bailer will not go down to the bottom of the well. We used the pump to draw the water out for sampling.

MONITORING WELL INTEGRITY CHECKLIST

Site Name: **Frontier Chemical – Pendleton site**

Well Identification: **URS-9D**

Personnel: Walker, Bove

Date: 4/09/03

WELL SPECIFICATIONS				
Protective Casing	X	Above Ground		Flush Mounted
Well Construction	X	PVC		Stainless Steel
Well Diameter	X	2-inch		6-inch
Depth to Ground Water	8.35'			
Well Depth	51.0"			

WELL INTEGRITY		
Well identification clearly marked?	Yes	
Well covers and locks in good condition and secure?	Yes	
Is the well standpipe vertically aligned and secure?	Yes	
Is the concrete pad and surface seal in good condition?	Yes	
Are soils surrounding the well pad eroded?		No
Is the well casing in good condition?	Yes	
Is the measuring point on casing well marked?	Yes	
Is there standing water in the annular space?	Yes	
Is the standpipe vented at the base to allow drainage?		No
Does the total sounded depth correspond to the original well completion depth?	Yes	
Is the access down the well impeded or blocked? Explain.		No

COMMENTS AND RECOMMENDATIONS

MONITORING WELL INTEGRITY CHECKLIST

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

Personnel: Walker, Bove Date: 4/09/03

WELL SPECIFICATIONS				
Protective Casing	X	Above Ground		Flush Mounted
Well Construction	X	PVC		Stainless Steel
Well Diameter	X	2-inch		6-inch
Depth to Ground Water	9.3'			
Well Depth	46.0			

WELL INTEGRITY		
Well identification clearly marked?	Yes	
Well covers and locks in good condition and secure?		No
Is the well standpipe vertically aligned and secure?	Yes	
Is the concrete pad and surface seal in good condition?	Yes	
Are soils surrounding the well pad eroded?		No
Is the well casing in good condition?		No
Is the measuring point on casing well marked?	Yes	
Is there standing water in the annular space?	Yes	
Is the standpipe vented at the base to allow drainage?		No
Does the total sounded depth correspond to the original well completion depth?	Yes	
Is the access down the well impeded or blocked? Explain.		No

COMMENTS AND RECOMMENDATIONS
Lid of the outside casing is broken

MONITORING WELL INTEGRITY CHECKLIST

Site Name: **Frontier Chemical – Pendleton site** Well Identification: **URS-14I**

Personnel: Walker, Bove Date: 4/10/03

WELL SPECIFICATIONS			
Protective Casing	X	Above Ground	Flush Mounted
Well Construction		PVC	X Stainless Steel
Well Diameter	X	2-inch	6-inch
Depth to Ground Water	7.5′		
Well Depth	31.0′		

WELL INTEGRITY		
Well identification clearly marked?	Yes	
Well covers and locks in good condition and secure?	Yes	
Is the well standpipe vertically aligned and secure?	Yes	
Is the concrete pad and surface seal in good condition?	Yes	
Are soils surrounding the well pad eroded?		No
Is the well casing in good condition?	Yes	
Is the measuring point on casing well marked?	Yes	
Is there standing water in the annular space?	Yes	
Is the standpipe vented at the base to allow drainage?		No
Does the total sounded depth correspond to the original well completion depth?	Yes	
Is the access down the well impeded or blocked? Explain.		No

COMMENTS AND RECOMMENDATIONS

MONITORING WELL INTEGRITY CHECKLIST

Site Name: **Frontier Chemical – Pendleton site**

Well Identification: **URS-14D**

Personnel: Walker, Bove

Date: 4/10/03

WELL SPECIFICATIONS				
Protective Casing	X	Above Ground		Flush Mounted
Well Construction		PVC	X	Stainless Steel
Well Diameter	X	2-inch		6-inch
Depth to Ground Water	6.15′			
Well Depth	41.95′			

WELL INTEGRITY		
Well identification clearly marked?	Yes	
Well covers and locks in good condition and secure?	Yes	
Is the well standpipe vertically aligned and secure?	Yes	
Is the concrete pad and surface seal in good condition?	Yes	
Are soils surrounding the well pad eroded?		No
Is the well casing in good condition?	Yes	
Is the measuring point on casing well marked?	Yes	
Is there standing water in the annular space?	Yes	
Is the standpipe vented at the base to allow drainage?		No
Does the total sounded depth correspond to the original well completion depth?	Yes	
Is the access down the well impeded or blocked? Explain.		No

COMMENTS AND RECOMMENDATIONS

MONITORING WELL INTEGRITY CHECKLIST

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

Personnel: Walker, Bove Date: 4/10/03

WELL SPECIFICATIONS				
Protective Casing	X	Above Ground		Flush Mounted
Well Construction		PVC	X	Stainless Steel
Well Diameter	X	2-inch		6-inch
Depth to Ground Water	10.4′			
Well Depth	51.2′			

WELL INTEGRITY		
Well identification clearly marked?	Yes	
Well covers and locks in good condition and secure?	Yes	
Is the well standpipe vertically aligned and secure?	Yes	
Is the concrete pad and surface seal in good condition?	Yes	
Are soils surrounding the well pad eroded?		No
Is the well casing in good condition?	Yes	
Is the measuring point on casing well marked?	Yes	
Is there standing water in the annular space?		No
Is the standpipe vented at the base to allow drainage?	Yes	
Does the total sounded depth correspond to the original well completion depth?	Yes	
Is the access down the well impeded or blocked? Explain.		No

COMMENTS AND RECOMMENDATIONS

MONITORING WELL INTEGRITY CHECKLIST

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

Personnel: Walker, Bove Date: 4/10/03

WELL SPECIFICATIONS				
Protective Casing	X	Above Ground		Flush Mounted
Well Construction		PVC	X	Stainless Steel
Well Diameter	X	2-inch		6-inch
Depth to Ground Water	10.5"			
Well Depth	31.25			

WELL INTEGRITY		
Well identification clearly marked?	Yes	
Well covers and locks in good condition and secure?	Yes	
Is the well standpipe vertically aligned and secure?	Yes	
Is the concrete pad and surface seal in good condition?	Yes	
Are soils surrounding the well pad eroded?		No
Is the well casing in good condition?	Yes	
Is the measuring point on casing well marked?	Yes	
Is there standing water in the annular space?		No
Is the standpipe vented at the base to allow drainage?	Yes	
Does the total sounded depth correspond to the original well completion depth?	Yes	
Is the access down the well impeded or blocked? Explain.		No

COMMENTS AND RECOMMENDATIONS

ATTACHMENT C – EXHIBIT 3
FRONTIER CHEMICAL – PENDLETON SITE
GGE FIELD REPORT
REPORT #11

DATED APRIL 11, 2003

GGE
a member of the GLYNN GROUP

LETTER OF TRANSMITTAL

FILE COPY

TO:

Sevenson Environmental Services, Inc.
2749 Lockport Road
Niagara Falls, New York 14305

DATE: April 11, 2003
ATTENTION: Mr. Mike Walker
SUBJECT: Frontier Chemical - Pendleton site
GGE PROJECT NO: 94-1014-O

WE ARE SENDING ATTACHED:

- [ ] LABORATORY TEST DATA
- [X] FIELD REPORTS
- [ ] REPORT
- [ ] ENGINEERING DRAWINGS
- [ ] _____

COPIES	DATE	Rpt. No.	DESCRIPTION
1	04/09/03	03-01	Field Observation Report

THESE ARE BEING SENT:

- [X] FOR YOUR USE
- [ ] PER YOUR REQUEST
- [ ] _____

SINCERELY,

Jesse E. Grossman, P.E.
Engineering Manager

DISTRIBUTION

John Burns - PPRP Group

USPS/4.11.03

Civil • Structural • Geotechnical • Materials Testing • Consulting

GLYNN GEOTECHNICAL ENGINEERING

415 South Transit Street, Lockport, New York 14094
voice 716.625.6933 / fax 716.625.6983
www.glynngroup.com

GGE
a member of the GLYNN GROUP

FIELD OBSERVATION REPORT

PROJECT NO.: 94-1014-O REPORT NO.: 03-01 DATE: 4/9/03 PAGE: 1 OF 1

PROJECT: Pendleton – Frontier Chemical Site

SUBJECT: Semi-Annual Sampling

CLIENT: Sevenson Environmental Services, Inc.

WEATHER: Overcast, Cool (45°F)

DAY: Wednesday

PROJECT TIME: 3:00 pm – 4:30 pm

SITE TIME: 3:15 pm – 4:15 pm

PHOTOS: Yes No X

- As notified by Mike Walker (Sevenson Environmental), regarding the scheduled annual sampling event, GGE visits the site to record the Quarry Lake water elevation coincidental with groundwater sampling.
- The Quarry Lake water level is recorded at El. 578.36 by level survey based on the 580.50 benchmark elevation at the top of the pre-treatment vault.
- SES sampling team is on site collecting groundwater samples and provides access through rear site gate.
- The site is wet and snow-covered, however the lake is free of ice. Note that the overflow weir is inundated and is approx. 1' below the lake water level. There is approx. 8" of standing water in wetland area at the northeast corner of the site
- Mike Walker notes that the carbon vessels in the pre-treatment vault have been replaced with more compact filter units. SES is preparing schematic drawings for the modified treatment system and will provide drawings for GGE review.
- GGE leaves site at approx. 4:30 pm.

PERSONNEL ON SITE / CONTACTED:
Mike Walker – Sevenson

DISTRIBUTION:
Mike Walker – Sevenson Environmental
John Burns – Pendleton PRP Group

DAILY MANHOURS: 1.5

Jesse E. Grossman, P.E.: Engineering Manager

Mark W. Glynn, P.E.

Civil • Structural • Geotechnical • Materials Testing • Consulting

GLYNN GEOTECHNICAL ENGINEERING

415 South Transit Street, Lockport, New York 14094
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ATTACHMENT C – EXHIBIT 4
FRONTIER CHEMICAL – PENDLETON SITE
GROUND WATER SAMPLING LOG
REPORT #11

WELLS

85-5R
URS-5D
85-7R
URS-7D
URS-9I
URS-9D
88-12C
88-12D
URS-14I
URS-14D

SES, Inc.

Standard Ground Water Sampling Log
Pendleton Site

Date	4/10/03	Weather	55°F & Partly Cloudy
Site Name	Frontier Chemical	Well #	85-5R
Location	Pendleton, New York	Evacuation Method	Parastaltic pump with dedicated hose
Project No.	E-780	Sampling Method	Low flow
Personnel	Walker, Bove		

Well Information

Depth of Well*	50.3 Feet	Water Volume/Foot of Casing for:
Depth to Water*	7.0 Feet	☒2" Diameter Well = 0.163 X LWC
Length of Water Column (LWC)	43.3 Feet	☐4" Diameter Well = 0.653 x LWC
Volume of Water in Well	7.1 Gallons	☐6" Diameter Well = 1.469 X LWC
3X Volume of Water in Well	21.3 Gallons	Volume removed before sampling = 21.3 Gallons.
		Did well go dry? ☐YES ☒NO

* Measurements taken from: ☒Well Casing ☐Protective Casing ☐Other (specify)

Instrument Calibration

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard	4.00	447 Standard	454
7.0 Standard	7.01	1413 Standard	
10.0 Standard			

Water Parameters

Interval	Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings µS/cm	Turbidity Readings Ntu
Initial	-	11.5	7.46	1043	4.6
1st	7.1	7.8	7.63	1005	45.4
2nd	14.2	8.4	7.57	1008	22
3rd	21.3	7.4	7.51	1005	22.2

Water Sample

Time Collected: 1245

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Cloudy	Color	Cloudy
Odor	No	Odor	No
Turbidity (>100 Ntu)	No	Turbidity (>100 Ntu)	No
Sheen/Free Product	No	Sheen/Free Product	No

Samples Collected

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40 ml	Glass	3	No	1:1 HCL	
Liter	Plastic	1	Not if < 50 Ntu	HNO3	2.63
Pint	Plastic	1	No	NaOH	11.94

NOTES:

SES, Inc.

Standard Ground Water Sampling Log
Pendleton Site

Date	4/9/03	Weather	Partly Cloudy & 55 F
Site Name	Frontier Chemical	Well #	URS-5D
Location	Pendleton, New York	Evacuation Method	Bailer
Project No.	E-780	Sampling Method	Bailer
Personnel	Walker, Bove		

Well Information

Depth of Well*	38.2 Feet
Depth to Water*	4.8 Feet
Length of Water Column (LWC)	33.4 Feet
Volume of Water in Well	5.4 Gallons
3X Volume of Water in Well	16.2 Gallons

Water Volume/Foot of Casing for:
☒ 2" Diameter Well = 0.163 X LWC
☐ 4" Diameter Well = 0.653 x LWC
☐ 6" Diameter Well = 1.469 X LWC
Volume removed before sampling = 16.2 Gallons.
Did well go dry? ☐ YES ☒ NO

* Measurements taken from: ☒ Well Casing ☐ Protective Casing ☐ Other (specify)

Instrument Calibration

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard	4.00	447 Standard	454
7.0 Standard	7.01	1413 Standard	
10.0 Standard			

Water Parameters

Interval	Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings µS/cm	Turbidity Readings Ntu
Initial	-	9.8	7.5	3.08	4.6
1st	5.4	10.2	8.88	1.95	4.3
2nd	10.8	10.3	8.85	2.15	18.0
3rd	16.2	10.6	7.95	2.84	22.0

Water Sample

Time Collected: 1225

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Clear	Color	Clear
Odor	0	Odor	0
Turbidity (>100 Ntu)	0	Turbidity (>100 Ntu)	0
Sheen/Free Product	0	Sheen/Free Product	0

Samples Collected

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40 ml	Glass	3	No	1:1 HCL	
Liter	Plastic	1	Not if < 50 Ntu	HNO3	1.71
Pint	Plastic	1	No	NaOH	11.73

NOTES:

SES, Inc.

Standard Ground Water Sampling Log
Pendleton Site

Date	4/10/03	Weather	45°F & Sunny
Site Name	Frontier Chemical	Well #	85-7R
Location	Pendleton, New York	Evacuation Method	Parastaltic pump with dedicated hose
Project No.	E-780	Sampling Method	Low flow
Personnel	Walker, Bove		

Well Information

Depth of Well*	28.7 Feet	Water Volume/Foot of Casing for:
Depth to Water*	6.3 Feet	☒ 2" Diameter Well = 0.163 X LWC
Length of Water Column (LWC)	22.4 Feet	☐ 4" Diameter Well = 0.653 x LWC
Volume of Water in Well	3.7 Gallons	☐ 6" Diameter Well = 1.469 X LWC
3X Volume of Water in Well	11.1 Gallons	Volume removed before sampling = 11.1 Gallons
		Did well go dry? ☐ YES ☒ NO

* Measurements taken from: ☒ Well Casing ☐ Protective Casing ☐ Other (specify)

Instrument Calibration

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard	4.00	447 Standard	454
7.0 Standard	7.01	1413 Standard	
10.0 Standard			

Water Parameters

Interval	Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings µS/cm	Turbidity Readings Ntu
Initial	-	10.3	8.3	415	20
1st	3.7	9.9	8.17	1257	20
2nd	7.4	10.1	8.00	1382	17
3rd	11.1	11.5	7.9	1529	20

Water Sample

Time Collected: 1400

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Clear	Color	Clear
Odor	No	Odor	No
Turbidity (>100 Ntu)	No	Turbidity (>100 Ntu)	No
Sheen/Free Product	No	Sheen/Free Product	No

Samples Collected

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40 ml	Glass	3	No	1:1 HCL	
Liter	Plastic	1	Not if < 50 Ntu	HNO3	1.83
Pint	Plastic	1	No	NaOH	11.85

NOTES:

SES, Inc.

Standard Ground Water Sampling Log
Pendleton Site

Date	4/10/03	Weather	45ºF & Sunny
Site Name	Frontier Chemical	Well #	URS-7D
Location	Pendleton, New York	Evacuation Method	Bailer
Project No.	E-780	Sampling Method	Bailer
Personnel	Walker, Bove		

Well Information

Depth of Well*	39.5 Feet	Water Volume/Foot of Casing for:
Depth to Water*	7.6 Feet	☒2" Diameter Well = 0.163 X LWC
Length of Water Column (LWC)	31.9 Feet	☐4" Diameter Well = 0.653 x LWC
Volume of Water in Well	5.2 Gallons	☐6" Diameter Well = 1.469 X LWC
3X Volume of Water in Well	15.6 Gals	Volume removed before sampling = 16.0 gals
		Did well go dry? ☐YES ☒NO

* Measurements taken from: ☒Well Casing ☐Protective Casing ☐Other (specify)

Instrument Calibration

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard	4.00	447 Standard	454
7.0 Standard	7.01	1413 Standard	
10.0 Standard			

Water Parameters

Interval	Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings µS/cm	Turbidity Readings Ntu
Initial	-	8.8	8.35	1193	24
1st	5.2	10.3	7.43	2.56	21
2nd	10.4	10.1	7.35	2.40	20
3rd	15.6	10.1	7.24	2.23	13

Water Sample

Time Collected: 1410

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Clear w/tan cloudiness	Color	Clear
Odor	Sulfur	Odor	Sulfur
Turbidity (>100 Ntu)	No	Turbidity (>100 Ntu)	No
Sheen/Free Product	No	Sheen/Free Product	No

Samples Collected

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40 ml	Glass	3	No	1:1 HCL	
Liter	Plastic	1	Not if < 50 Ntu	HNO3	2.05
Pint	Plastic	1	No	NaOH	11.36

NOTES:

SES, Inc.

Standard Ground Water Sampling Log
Pendleton Site

Date	4/9/03	Weather	34°F & Cloudy
Site Name	Frontier Chemical	Well #	URS-9I
Location	Pendleton, New York	Evacuation Method	Parastaltic pump with dedicated hose
Project No.	E-780	Sampling Method	Low flow
Personnel	Walker, Bove		

Well Information

Depth of Well*	46.0 Feet	Water Volume/Foot of Casing for:
Depth to Water*	9.3 Feet	☒2" Diameter Well = 0.163 X LWC
Length of Water Column (LWC)	36.7 Feet	☐4" Diameter Well = 0.653 x LWC
Volume of Water in Well	6 Gallons	☐6" Diameter Well = 1.469 X LWC
3X Volume of Water in Well	18 Gallons	Volume removed before sampling = 18 gals.
		Did well go dry? ☐YES ☒NO

* Measurements taken from: ☒Well Casing ☐Protective Casing ☐Other (specify)

Instrument Calibration

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard	4.00	447 Standard	454
7.0 Standard	7.01	1413 Standard	
10.0 Standard			

Water Parameters

Interval	Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings µS/cm	Turbidity Readings Ntu
Initial	-	8.7	8.02	1545	90.1
1st	6	9.1	7.64	1461	5.1
2nd	6	8.9	7.66	1520	5.1
3rd	6	8.9	7.68	1528	5.1

Water Sample

Time Collected:

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Cloudy	Color	Clear
Odor	0	Odor	Slight Sulfur
Turbidity (>100 Ntu)	90.1	Turbidity (>100 Ntu)	5.1
Sheen/Free Product	0	Sheen/Free Product	0

Samples Collected

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40 ml	Glass	3	No	1:1 HCL	
Liter	Plastic	1	Not if < 50 Ntu	HNO3	2.06
Pint	Plastic	1	No	NaOH	11.66

NOTES: Initially purged grey silty colored water, no sheen, then cleared up almost immediately. Another set of samples was taken for QC purposes, and labeled "Blind Dup. X-1".

SES, Inc.

Standard Ground Water Sampling Log
Pendleton Site

Date	4/9/03	Weather	34°F & Cloudy
Site Name	Frontier Chemical	Well #	URS-9D
Location	Pendleton, New York	Evacuation Method	Parastaltic pump with dedicated hose
Project No.	E-780	Sampling Method	Low flow
Personnel	Walker, Bove		

Well Information

Depth of Well*	51.0 Feet
Depth to Water*	8.35 Feet
Length of Water Column (LWC)	42.65 Feet
Volume of Water in Well	7 Gallons
3X Volume of Water in Well	21 Gallons

Water Volume/Foot of Casing for:
- ☒ 2" Diameter Well = 0.163 X LWC
- ☐ 4" Diameter Well = 0.653 x LWC
- ☐ 6" Diameter Well = 1.469 X LWC

Volume removed before sampling = 21 Gallons
Did well go dry? ☐ YES ☒ NO

* Measurements taken from: ☒ Well Casing ☐ Protective Casing ☐ Other (specify)

Instrument Calibration

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard	4.00	447 Standard	454
7.0 Standard	7.01	1413 Standard	
10.0 Standard			

Water Parameters

Interval	Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings µS/cm	Turbidity Readings Ntu
Initial	-	8.7	8.1	1801	6.4
1st	7	8.7	8.1	1800	6.4
2nd	14	8.7	8.0	1880	6.1
3rd	21	8.7	7.9	1706	5.9

Water Sample

Time Collected: 1504

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Clear	Color	Clear
Odor	Sight Sulfur	Odor	Slight Sulfur
Turbidity (>100 Ntu)	No	Turbidity (>100 Ntu)	No
Sheen/Free Product	No	Sheen/Free Product	0

Samples Collected

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40 ml	Glass	3	No	1:1 HCL	
Liter	Plastic	1	Not if < 50 Ntu	HNO3	3.3
Pint	Plastic	1	No	NaOH	12.7

NOTES:

SES, Inc.

Standard Ground Water Sampling Log
Pendleton Site

Date	4/10/03	Weather	Partly Cloudy & 55 F
Site Name	Frontier Chemical	Well #	88-12C
Location	Pendleton, New York	Evacuation Method	Parastaltic pump with dedicated hose
Project No.	E-780	Sampling Method	Low flow
Personnel	Walker, Bove		

Well Information

Depth of Well*	31.25 Feet
Depth to Water*	10.5 Feet
Length of Water Column (LWC)	20.75 Feet
Volume of Water in Well	3.38Gallons
3X Volume of Water in Well	10.2 Gallons

Water Volume/Foot of Casing for:
- ☒ 2" Diameter Well = 0.163 X LWC
- ☐ 4" Diameter Well = 0.653 x LWC
- ☐ 6" Diameter Well = 1.469 X LWC

Volume removed before sampling = 10.2 Gallons.
Did well go dry? ☐ YES ☒ NO

* Measurements taken from: ☒ Well Casing ☐ Protective Casing ☐ Other (specify)

Instrument Calibration

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard	4.00	447 Standard	454
7.0 Standard	7.01	1413 Standard	
10.0 Standard			

Water Parameters

Interval	Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings µS/cm	Turbidity Readings Ntu
Initial	-	10.3	7.96	1198	467
1st	3.4	9.8	7.95	1320	31
2nd	6.8	10.4	7.89	1308	22
3rd	10.2	10.3	7.8	1277	17

Water Sample

Time Collected: 1520

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Very Cloudy	Color	Clear
Odor	No	Odor	No
Turbidity (>100 Ntu)	Yes	Turbidity (>100 Ntu)	No
Sheen/Free Product	No	Sheen/Free Product	No

Samples Collected

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40 ml	Glass	3	No	1:1 HCL	
Liter	Plastic	1	Not if < 50 Ntu	HNO3	2.08
Pint	Plastic	1	No	NaOH	11.11

NOTES:

SES, Inc.

Standard Ground Water Sampling Log
Pendleton Site

Date	4/10/03	Weather	55°F & Partly Cloudy
Site Name	Frontier Chemical	Well #	88-12D
Location	Pendleton, New York	Evacuation Method	Bailer
Project No.	E-780	Sampling Method	Bailer
Personnel	Walker, Bove		

Well Information

Depth of Well*	51.2 Feet
Depth to Water*	10.4 Feet
Length of Water Column (LWC)	40.8 Feet
Volume of Water in Well	6.7 Gallons
3X Volume of Water in Well	20.1 Gallons

Water Volume/Foot of Casing for:
☒ 2" Diameter Well = 0.163 X LWC
☐ 4" Diameter Well = 0.653 x LWC
☐ 6" Diameter Well = 1.469 X LWC
Volume removed before sampling = 20.1 Gallons
Did well go dry? ☐ YES ☒ NO

* Measurements taken from: ☒ Well Casing ☐ Protective Casing ☐ Other (specify)

Instrument Calibration

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard	4.00	447 Standard	454
7.0 Standard	7.01	1413 Standard	
10.0 Standard			

Water Parameters

Interval	Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings µS/cm	Turbidity Readings Ntu
Initial	-	8.7	7.65	4.31	31
1st	6.7	10.4	7.97	5.76	35
2nd	13.4	10.2	7.87	13.4	30
3rd	20.1	10.0	7.70	11.5	20

Water Sample

Time Collected: 1540

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Cloudy>Clear	Color	Clear
Odor	Slight Sulfur	Odor	No
Turbidity (>100 Ntu)	No	Turbidity (>100 Ntu)	No
Sheen/Free Product	No	Sheen/Free Product	No

Samples Collected

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40 ml	Glass	3	No	1:1 HCL	
Liter	Plastic	1	Not if < 50 Ntu	HNO3	
Pint	Plastic	1	No	NaOH	11.16

NOTES:

SES, Inc.

Standard Ground Water Sampling Log
Pendleton Site

Date	4/10/03	Weather	33°F & Foggy
Site Name	Frontier Chemical	Well #	URS-14I
Location	Pendleton, New York	Evacuation Method	Bailer
Project No.	E-780	Sampling Method	Bailer
Personnel	Walker, Bove		

Well Information

Depth of Well*	31.0 Feet
Depth to Water*	7.50 Feet
Length of Water Column (LWC)	23.5 Feet
Volume of Water in Well	3.8 Gallons
3X Volume of Water in Well	11.4 Gallons

Water Volume/Foot of Casing for:
☒ 2" Diameter Well = 0.163 X LWC
☐ 4" Diameter Well = 0.653 x LWC
☐ 6" Diameter Well = 1.469 X LWC
Volume removed before sampling = 11.4 Gallons
Did well go dry? ☐ YES ☒ NO

* Measurements taken from: ☒ Well Casing ☐ Protective Casing ☐ Other (specify)

Instrument Calibration

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard	4.00	447 Standard	454
7.0 Standard	7.01	1413 Standard	
10.0 Standard			

Water Parameters

Interval	Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings µS/cm	Turbidity Readings Ntu
Initial	-	5.3	7.72	256	2.6
1st	3.8	7.9	7.94	312	2.6
2nd	7.6	8.4	8.07	604	2.6
3rd	11.4	7.5	8.3	610	5.8

Water Sample

Time Collected: 0925

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Clear	Color	Slighty Cloudy
Odor	Slight Sulfur	Odor	Sulfur
Turbidity (>100 Ntu)	No	Turbidity (>100 Ntu)	No
Sheen/Free Product	No	Sheen/Free Product	No

Samples Collected

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40 ml	Glass	3	No	1:1 HCL	
Liter	Plastic	1	Not if < 50 Ntu	HNO3	1.88
Pint	Plastic	1	No	NaOH	12.01

NOTES:

SES, Inc.

Standard Ground Water Sampling Log
Pendleton Site

Date	4/10/03	Weather	33ºF & Foggy
Site Name	Frontier Chemical	Well #	URS-14D
Location	Pendleton, New York	Evacuation Method	Parastaltic pump with dedicated hose
Project No.	E-780	Sampling Method	Low flow
Personnel	Walker, Bove		

Well Information

Depth of Well*	41.95 Feet	Water Volume/Foot of Casing for:
Depth to Water*	6.15 Feet	☒2" Diameter Well = 0.163 X LWC
Length of Water Column (LWC)	35.80 Feet	☐4" Diameter Well = 0.653 x LWC
Volume of Water in Well	5.8 Gallons	☐6" Diameter Well = 1.469 X LWC
3X Volume of Water in Well	17.5 Gallons	Volume removed before sampling = 17.5 Gallons
		Did well go dry? ☐YES ☒NO

* Measurements taken from: ☒Well Casing ☐Protective Casing ☐Other (specify)

Instrument Calibration

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard	4.00	447 Standard	454
7.0 Standard	7.01	1413 Standard	
10.0 Standard			

Water Parameters

Interval	Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings µS/cm	Turbidity Readings Ntu
Initial	-	6.9	7.13	510	5.1
1st	5.8	8.7	7.49	658	5.7
2nd	11.6	8.7	7.51	640	5.7
3rd	17.6	8.8	7.53	645	5.7

Water Sample

Time Collected: 0955

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Clear w/Stringy particulate	Color	Clear
Odor	Slight Sulfur	Odor	Sulfur
Turbidity (>100 Ntu)	No	Turbidity (>100 Ntu)	No
Sheen/Free Product	No	Sheen/Free Product	No

Samples Collected

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40 ml	Glass	3	No	1:1 HCL	
Liter	Plastic	1	Not if < 50 Ntu	HNO3	1.93
Pint	Plastic	1	No	NaOH	11.07

NOTES: MS/MSD Samples taken at this location for QC purposes.

ATTACHMENT C – EXHIBIT 5

FRONTIER CHEMICAL – PENDLETON SITE

CHAIN OF CUSTODY FORM

REPORT #11

DATE
04/10/03

O'Brien & Gere Laboratories, Inc.

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

Chain of Custody

Client: Frontier Chemical
Project: Pendelton, NY
Sampled by: Michael WALKER, CRAIG BOVE
Client Contact: Michael WALKER **Phone #** (716) 284-0431

Sample Description

Sample Location	Date Collected	Time Collected	Sample Matrix	Comp. or Grab	No. of Containers	Analysis/Method: VOC's 8260	SVOC's 8270 TAL METALS	Cyanide					Comments
PSGW-URS-9D	4.9.03	1504	Aq	Grab	5	3	1	1					5046
PSGW-URS-9I	4.9.03	1645	Aq	Grab	5	3	1	1					
PSGW-URS-14D, MS/MSD	4.10.03	0955	Aq	Grab	15	9	3	3					
PSGW-URS-14I	4.10.03	0925	Aq	Grab	5	3	1	1					
PSGW-URS-5D	4.10.03	1225	Aq	Grab	5	3	1	1					
PSGW-85-5R	4.10.03	1245	Aq	Grab	5	3	1	1					
PSGW-85-7R	4.10.03	1400	Aq	Grab	5	3	1	1					
PSGW-URS-7D	4.10.03	1410	Aq	Grab	5	3	1	1					
Field Blank	4.10.03	1500	Aq	Grab	5	3	1	1					
PSGW-88-12C	4.10.03	1520	Aq	Grab	5	3	1	1					
Blind Dup X-1 PSGW-88-12D	4.10.03	1540	Aq	Grab	5	3	1	1					

Relinquished by: Craig Bove **Date:** 4.10.03 **Time:** 1750
Relinquished by: **Date:** **Time:**
Relinquished by: **Date:** **Time:**

Received by: **Date:** 4/11/03 **Time:**
Received by: **Date:** 4/11/03 **Time:**
Received by Lab: Barbara Wheeler **Date:** 4/11/03 **Time:** 10:35

Shipment Method: UPS RED
Airbill Number: 1ZF094470141450364

Turnaround Time Required:
Routine X
Rush (Specify)

Comments:

Cooler Temperature: 2.8° C

Original Laboratory Copy-Client

O'Brien & Gere Laboratories, Inc.

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

Chain of Custody

Client: Frontier Chemical
Project: Pendelton, NY
Sampled by: CB, M. WALKER
Client Contact: Michael Walker Phone # 716.284-043

Sample Description

Sample Location	Date Collected	Time Collected	Sample Matrix	Comp. or Grab	No. of Containers	Analysis/Method: VOC	Comments
~~HRS-14D~~ CKB							
~~HRS-14I~~ CKB							
TRIP BLANK	—	—	AQ	G	1	X	

Relinquished by: Craig K. Bove Date: 4.10.03 Time: 1750
Relinquished by: Date: Time:
Relinquished by: Date: Time:

Received by: Date: BPW 4/11/03 Time:
Received by: Date: 4/11/03 Time:
Received by Lab: Barbara A Sheeler Date: 4/10/03 Time: 10:35

Shipment Method: UPS Red
Airbill Number: 1Z F09447014157 0378

Turnaround Time Required:
Routine X
Rush (Specify)

Comments:

Cooler Temperature:

Original Laboratory Copy Client

ATTACHMENT C – EXHIBIT 6

FRONTIER CHEMICAL – PENDLETON SITE

DISPOSAL OF MATERIALS, EQUIPMENT AND PIPING

REPORT #11

ENCLOSURES

Correspondence with NYSDEC Dated 3/11/2003
Waste Profile for Drums of Carbon
Analytical Report for Carbon
Analytical Report for Bag Filter
Waste Manifest
Certificate of Disposal

ATTACHMENT C – EXHIBIT 7

FRONTIER CHEMICAL – PENDLETON SITE

REQUEST FOR CHANGE IN MONITORING

REPORT #11

DATE

09/16/02

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
270 Michigan Avenue, Buffalo, New York, 14203-2999
Phone: (716) 851-7220 • **FAX:** (716) 851-7226
Website: www.dec.state.ny.us

Erin M. Crotty
Commissioner

September 16, 2002

Mr. John M. Burns
Chairman, Technical Committee
Pendleton PRP Group
Olin Corporation
P.O. Box 248
1186 Lower River Road, NW
Charleston, TN 37310-0248

FILE COPY

Dear Mr. Burns:

Frontier Pendleton Site # 932043
Long-Term Operation & Maintenance

The Department has reviewed your recommendations outlined in your letter dated June 27, 2002 regarding ground water monitoring at the site.

Based on review and assessment of the past five years of groundwater analytical monitoring results provided in the Semi-Annual Report # 10 of April 2002, the Department concurs with the recommendation to reduce the current semi-annual monitoring frequency to an annual frequency. This is consistent with the monitoring schedule followed on other hazardous waste sites in the region.

The recommendations for deletion of cyanide from chemical analysis and bi-annual VOCs analysis are not acceptable as these contaminants have been detected at the site at elevated levels and are contained in the landfill. They should be monitored with the same frequency as the other chemical parameters of the site.

All other requirements of the approved O&M Plan remain unchanged. Should you have any questions, please contact me on 716/851-7220.

Sincerely,

Abul Barkat, P.E.
Environmental Engineer II

cc: Mr. Daniel King, NYSDEC
Mr. Brian Sadowski, NYSDEC

ATTACHMENT C – EXHIBIT 5 4 8
FRONTIER CHEMICAL – PENDLETON SITE
REQUEST FOR CHANGE IN MONITORING
REPORT #11

DATE
09/16/02

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
270 Michigan Avenue, Buffalo, New York, 14203-2999
Phone: (716) 851-7220 • **FAX:** (716) 851-7226
Website: www.dec.state.ny.us

Erin M. Crotty
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September 16, 2002

Mr. John M. Burns
Chairman, Technical Committee
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P.O. Box 248
1186 Lower River Road, NW
Charleston, TN 37310-0248

FILE COPY

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Frontier Pendleton Site # 932043
Long-Term Operation & Maintenance

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The recommendations for deletion of cyanide from chemical analysis and bi-annual VOCs analysis are not acceptable as these contaminants have been detected at the site at elevated levels and are contained in the landfill. They should be monitored with the same frequency as the other chemical parameters of the site.

All other requirements of the approved O&M Plan remain unchanged. Should you have any questions, please contact me on 716/851-7220.

Sincerely,

Abul Barkat, P.E.
Environmental Engineer II

cc: Mr. Daniel King, NYSDEC
Mr. Brian Sadowski, NYSDEC

ATTACHMENT C - TABLE 1
FRONTIER CHEMICAL - PENDLETON SITE
ACTIVITY SCHEDULE
REPORT #11

DATA ITEM	PIEZOMETER AND GROUND WATER WELL INSPECTIONS	STATIC GROUND WATER ELEVATIONS	GROUND WATER SAMPLINGS
SP-1	04/08/03	04/08/03	
P-1	04/08/03	04/08/03	
P-2	04/08/03	04/08/03	
P-3	04/08/03	04/08/03	
P-4	04/08/03	04/08/03	
P-5	04/08/03	04/08/03	
P-6	04/08/03	04/08/03	
P-7	04/08/03	04/08/03	
P-8	04/08/03	04/08/03	
85-5R	04/10/03	04/10/03	04/10/03
URS-5D	04/10/03	04/10/03	04/10/03
85-7R	04/10/03	04/10/03	04/10/03
URS-7D	04/10/03	04/10/03	04/10/03
URS-9I	04/09/03	04/09/03	04/09/03
URS-9D	04/09/03	04/09/03	04/09/03
88-12C	04/10/03	04/10/03	04/10/03
88-12D	04/10/03	04/10/03	04/10/03
URS-14I	04/10/03	04/10/03	04/10/03
URS-14D	04/10/03	04/10/03	04/10/03

ATTACHMENT C - TABLE 2
FRONTIER CHEMICAL - PENDLETON SITE
MAY 2002 THROUGH APRIL 2003
PIEZOMETER GROUND WATER ELEVATION SUMMARY

PIEZOMETER	POSITION	LOCATION	TOP OF RISER ELEVATION,	TOP OF COVER ELEVATION,	DEPTH IN FEET BELOW	SCREENED ELEVATION, FEET	GROUND WATER ELEVATION, FEET												
							0	157	303	367	511	648	837	1017	1201	1388	1626	1802	2174
							6/24/97	9/30/97	2/23/98	4/28/98	9/17/98	2/3/99	8/11/99	2/7/00	8/9/00	02/12/01	10/08/01	04/02/02	04/09/03
P-1	(O)	EASTERN PORTION OF CAPPED AREA	583.21	583.30	16.4	576.8 - 566.8	579.54	577.09	579.25	579.60	575.62	572.97	575.83	573.76	576.66	577.24	574.27	575.11	572.56
P-2	(I)		582.90	583.20	15.7	577.2 - 567.2	579.60	579.24	578.20	578.37	578.76	576.96	578.27	575.59	577.60	577.24	577.36	576.30	574.70
P-3	(I)	CENTER OF CAPPED AREA	606.33	606.64	39.7	586.6 - 566.6	580.36	580.38	580.06	579.94	579.80	579.96	579.38	579.29	578.95	577.24	578.64	578.79	577.11
P-4	(I)	ADJACENT TO QUARRY LAKE	582.31	583.85	15.6	576.7 - 566.7	577.15	577.43	576.70	575.11	575.96	574.58	575.56	573.96	575.11	573.90	576.51	573.30	572.89
SP-1	(T)		579.86	580.07	15.0	BOP = 564.9	564.90	564.90	564.90	564.90	564.90	564.90	564.90	564.90	564.90	564.90	564.90	564.90	564.90
P-5	(O)	SOUTHERN PORTION OF CAPPED AREA	583.05	583.55	15.5	577.6 - 567.6	576.87	577.25	578.57	579.31	576.13	574.70	576.48	578.16	579.02	578.70	577.88	578.50	579.85
P-6	(I)		584.45	584.60	16.2	578.3 - 568.3	578.77	579.17	578.14	578.20	578.63	577.94	578.28	577.74	577.78	577.12	577.49	578.00	575.85
P-7	(I)	NORTHERN PORTION OF CAPPED AREA	580.97	582.00	15.9	575.0 - 565.0	578.33	578.62	576.45	576.17	577.15	574.43	575.55	573.02	574.97	573.21	576.04	572.86	572.17
P-8	(O)		582.83	583.00	17.3	575.5 - 565.5	577.76	578.87	578.75	579.61	576.90	574.72	576.15	576.12	578.26	577.43	576.15	578.35	578.23

Notes:

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

ATTACHMENT C - TABLE 3
FRONTIER CHEMICAL - PENDLETON SITE
MAY 2002 THROUGH APRIL 2003
PIEZOMETER GROUND WATER ELEVATION SUMMARY

PIEZOMETER	POSITION	LOCATION	TOP OF RISER ELEVATION,	TOP OF COVER ELEVATION,	DEPTH IN FEET BELOW	SCREENED ELEVATION, FEET	GROUND WATER ELEVATION, FEET												
							0	157	303	367	511	648	837	1017	1201	1388	1626	1802	2174
							6/24/97	9/30/97	2/23/98	4/28/98	9/17/98	2/3/99	8/11/99	2/7/00	8/9/00	02/12/01	10/08/01	04/02/02	04/09/03
P-1	(O)	EASTERN PORTION OF CAPPED AREA	583.21	583.30	16.4	576.8 - 566.8	579.54	577.09	579.25	579.60	575.62	572.97	575.83	573.76	576.66	577.24	574.27	575.11	572.56
P-2	(I)		582.90	583.20	15.7	577.2 - 567.2	579.60	579.24	578.20	578.37	578.76	576.96	578.27	575.59	577.60	577.24	577.36	576.30	574.70
P-3	(I)	CENTER OF CAPPED AREA	606.33	606.64	39.7	586.6 - 566.6	580.36	580.38	580.06	579.94	579.80	579.96	579.38	579.29	578.95	577.24	578.64	578.79	577.11
P-4	(I)	ADJACENT TO QUARRY LAKE	582.31	583.85	15.6	576.7 - 566.7	577.15	577.43	576.70	575.11	575.96	574.58	575.56	573.96	575.11	573.90	576.51	573.30	572.89
SP-1	(T)		579.86	580.07	15.0	BOP = 564.9	564.90	564.90	564.90	564.90	564.90	564.90	564.90	564.90	564.90	564.90	564.90	564.90	564.90
P-5	(O)	SOUTHERN PORTION OF CAPPED AREA	583.05	583.55	15.5	577.6 - 567.6	576.87	577.25	578.57	579.31	576.13	574.70	576.48	578.16	579.02	578.70	577.88	578.50	579.85
P-6	(I)		584.45	584.60	16.2	578.3 - 568.3	578.77	579.17	578.14	578.20	578.63	577.94	578.28	577.74	577.78	577.12	577.49	578.00	575.85
P-7	(I)	NORTHERN PORTION OF CAPPED AREA	580.97	582.00	15.9	575.0 - 565.0	578.33	578.62	576.45	576.17	577.15	574.43	575.55	573.02	574.97	573.21	576.04	572.86	572.17
P-8	(O)		582.83	583.00	17.3	575.5 - 565.5	577.76	578.87	578.75	579.61	576.90	574.72	576.15	576.12	578.26	577.43	576.15	578.35	578.23

Notes:

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

ATTACHMENT C - TABLE 4
FRONTIER CHEMICAL - PENDLETON SITE
QUARRY LAKE WATER LEVEL SUMMARY
REPORT #11

DATE	QUARRY LAKE SURFACE WATER ELEVATION, FEET	
09/08/97	572.30	1
02/23/98	578.00	
04/30/98	578.26	
09/21/98	577.42	
02/04/99	577.97	
08/04/99	577.60	
02/07/00	578.16	2
08/10/00	578.07	
02/14/01	578.47	
10/08/01	577.39	
04/02/02	578.46	
04/09/03	578.36	

NOTES:

1. ELEVATION BASED ON USGS DATUM.
2. ICE SURFACE ELEVATION.

ATTACHMENT C - TABLE 5
FRONTIER CHEMICAL - PENDLETON SITE
ANALYTICAL DATA FOR GROUNDWATER SAMPLING - APRIL 2003
REPORT #11

PARAMETER	UNITS	85-5R SAMPLE RESULT *	85-7R SAMPLE RESULT *	88-12C SAMPLE RESULT *	88-12D SAMPLE RESULT *	URS-14D SAMPLE RESULT *	URS-14I SAMPLE RESULT *	URS-5D SAMPLE RESULT *	URS-7D SAMPLE RESULT *	URS-9D SAMPLE RESULT *	URS-9I SAMPLE RESULT *
METALS											
ALUMINUM	mg/L	2.4	0.046 J	0.062 J	0.24	0.044 J	5.6	0.3	0.18	0.1 U	0.058 J
ANTIMONY	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
ARSENIC	mg/L	0.0017 J	0.0041 J	0.017	0.0084	0.0029 J	0.0075	0.0046 J	0.0038 J	0.0019 J	0.0029 J
BARIUM	mg/L	0.049	0.094	0.014 J	0.0055 J	0.11	0.092	0.028	0.019 J	0.011 J	0.015 J
BERYLLIUM	mg/L	0.003 U	0.003 U	0.003 U	0.00009 J	0.00008 J	0.0003 J	0.00019 J	0.00011 J	0.003 U	0.003 U
CADMIUM	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0019	0.00028 J	0.001 U	0.001 U	0.001 U
CALCIUM	mg/L	110	210	77	730	230	57	530	400	240	170
CHROMIUM	mg/L	0.0034 J	0.0052 J	0.0082 J	0.11	0.0072 J	0.026	0.021	0.014	0.0063 J	0.0069 J
COBALT	mg/L	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.0046 J	0.25	0.025 U	0.025 U	0.025 U
COPPER	mg/L	0.0065 J	0.0013 J	0.00093 J	0.0056 J	0.0015 J	0.013	0.014	0.0021 J	0.0014 J	0.00096 J
IRON	mg/L	2.2	0.85	0.82	1.4	0.14	7.7	1.8	0.41	0.051	0.45
LEAD	mg/L	0.0021 J	0.005 U	0.005 U	0.0042 J	0.005 U	0.0083	0.0053	0.005 U	0.005 U	0.005 U
MAGNESIUM	mg/L	39	68	120	200	67	33	97	110	75	76
MANGANESE	mg/L	0.097	0.21	0.018	0.084	0.092	0.29	0.12	0.085	0.011	0.036
NICKEL	mg/L	0.05 U	0.05 U	0.0015 J	0.054	0.05 U	0.017 J	0.097	0.0028 J	0.05 U	0.05 U
POTASSIUM	mg/L	1.1 J	5.8	2.9 J	17	4.6 J	5.1	6.9	6.2	3.8 J	3.1 J
SELENIUM	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SILVER	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
SODIUM	mg/L	51	39	47	440	40	58	110	61	41	41
VANADIUM	mg/L	0.0042 J	0.05 U	0.05 U	0.05 U	0.05 U	0.01 J	0.002 J	0.0016 J	0.05 U	0.05 U
ZINC	mg/L	0.01	0.023	0.01 U	0.014	0.01 U	0.054	0.65	0.01 U	0.01 U	0.01 U
MERCURY	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
THALLIUM	mg/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
TOTAL CYANIDE	mg/L	0.0029 J	0.01 U	0.01 U	0.023	0.0086 J	0.0029 J	0.0052 J	0.004 J	0.01 U	0.01 U

ATTACHMENT C - TABLE 5
FRONTIER CHEMICAL - PENDLETON SITE
ANALYTICAL DATA FOR GROUNDWATER SAMPLING - APRIL 2003
REPORT #11

PARAMETER	UNITS	85-5R SAMPLE RESULT *	85-7R SAMPLE RESULT *	88-12C SAMPLE RESULT *	88-12D SAMPLE RESULT *	URS-14D SAMPLE RESULT *	URS-14I SAMPLE RESULT *	URS-5D SAMPLE RESULT *	URS-7D SAMPLE RESULT *	URS-9D SAMPLE RESULT *	URS-9I SAMPLE RESULT *
VOCs											
1,1,1-TRICHLOROETHANE	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2,2-TETRACHLOROETHANE	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-TRICHLOROETHANE	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-DICHLOROETHANE	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.18 J	0.5 U
1,1-DICHLOROETHENE	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROETHANE	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROPROPANE	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-BUTANONE	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-HEXANONE	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-METHYL-2-PENTANONE	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ACETONE	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BENZENE	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMODICHLOROMETHANE	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMOFORM	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMOMETHANE	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CARBON DISULFIDE	ug/L	0.5 U	0.22 J	0.13 J	0.47 J	0.28 J	0.11 J	0.15 J	0.15 J	0.19 J	0.13 J
CARBON TETRACHLORIDE	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROBENZENE	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROETHANE	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROFORM	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROMETHANE	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CIS-1,2-DICHLOROETHENE	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.21 J	0.5 U
CIS-1,3-DICHLOROPROPENE	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
DIBROMOCHLOROMETHANE	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ETHYLBENZENE	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
METHYLENE CHLORIDE	ug/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
STYRENE	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TETRACHLOROETHENE	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TOLUENE	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRANS-1,2-DICHLOROETHENE	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRANS-1,3-DICHLOROPROPENE	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRICHLOROETHENE	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VINYL CHLORIDE	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.11 J	0.5 U
XYLENE (TOTAL)	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

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FRONTIER CHEMICAL - PENDLETON SITE
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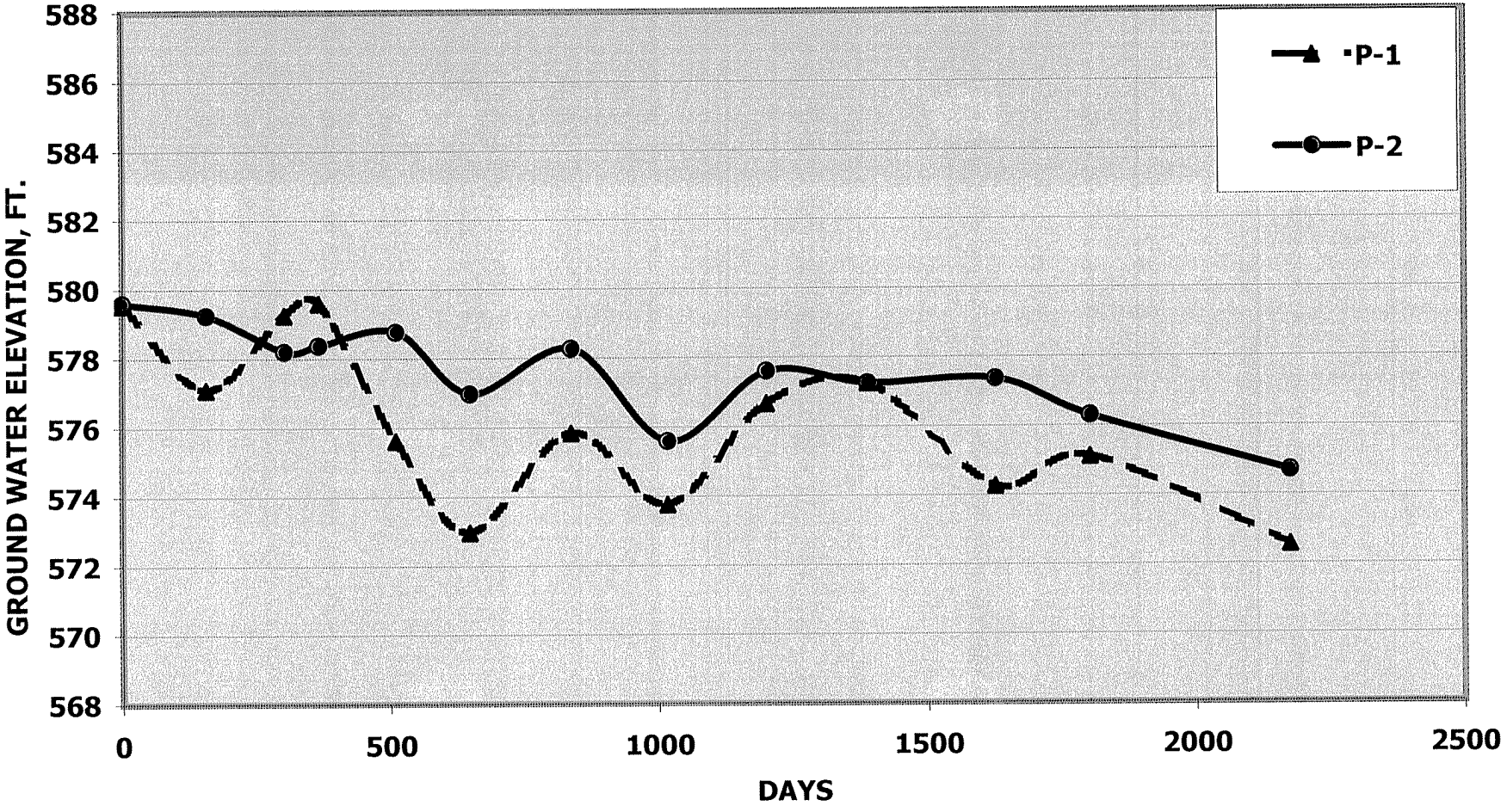
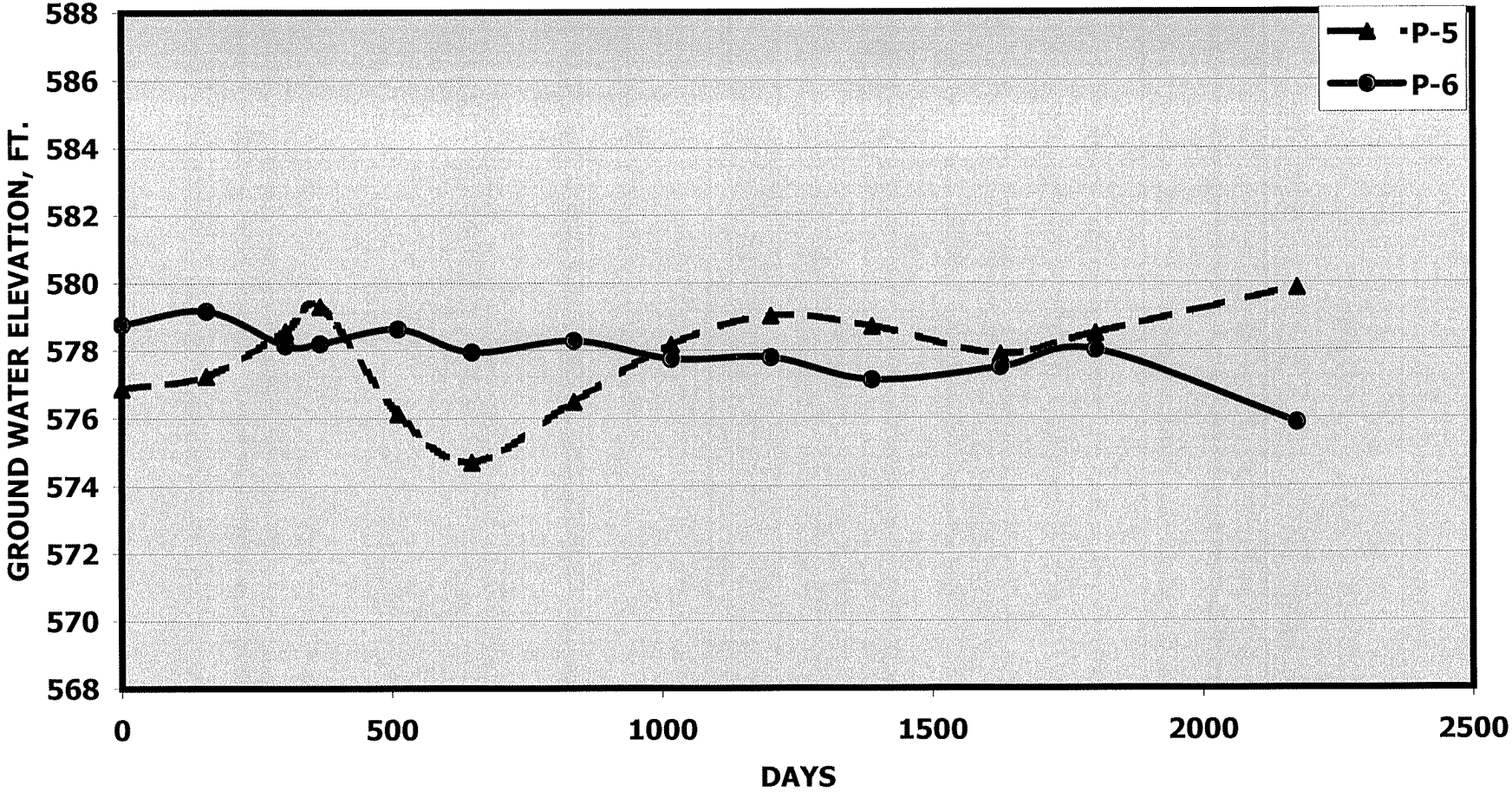
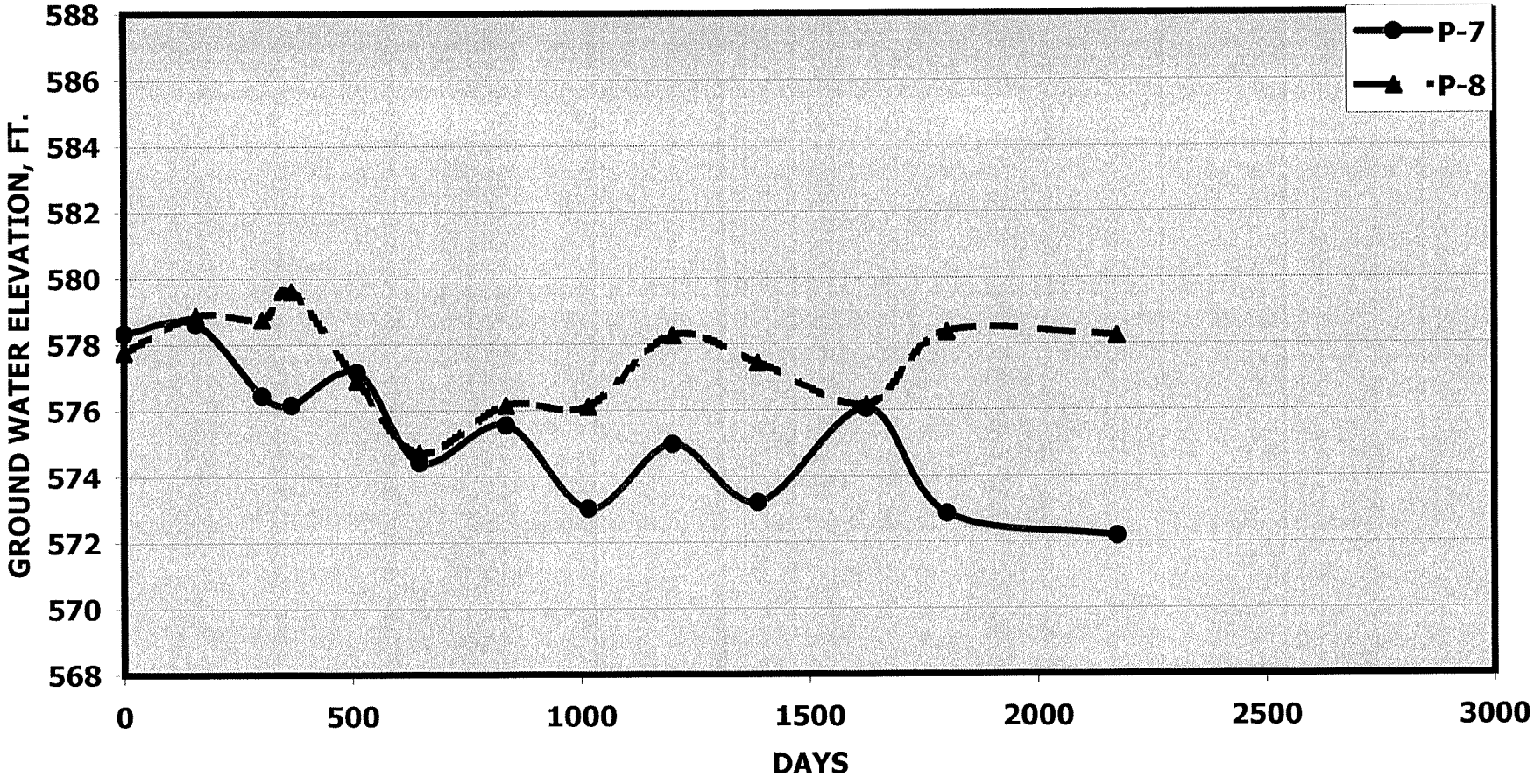
ATTACHMENT D- FIGURE 1
FRONTIER CHEMICAL - PENDLETON SITE
EASTERN PORTION OF CAPPED AREA
REPORT #11



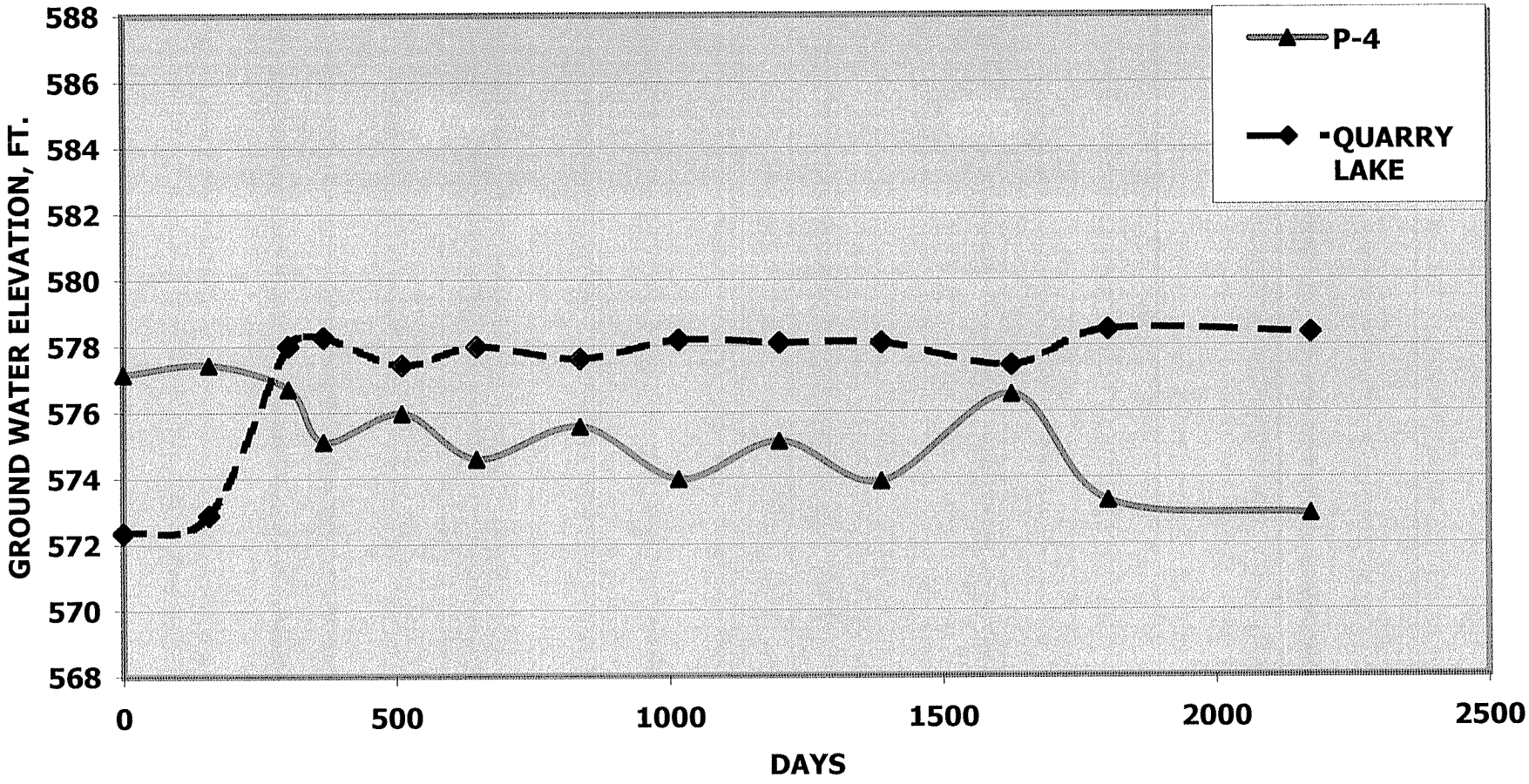
ATTACHMENT D - FIGURE 2
FRONTIER CHEMICAL - PENDLETON SITE
SOUTHERN PORTION OF CAPPED AREA
REPORT #11



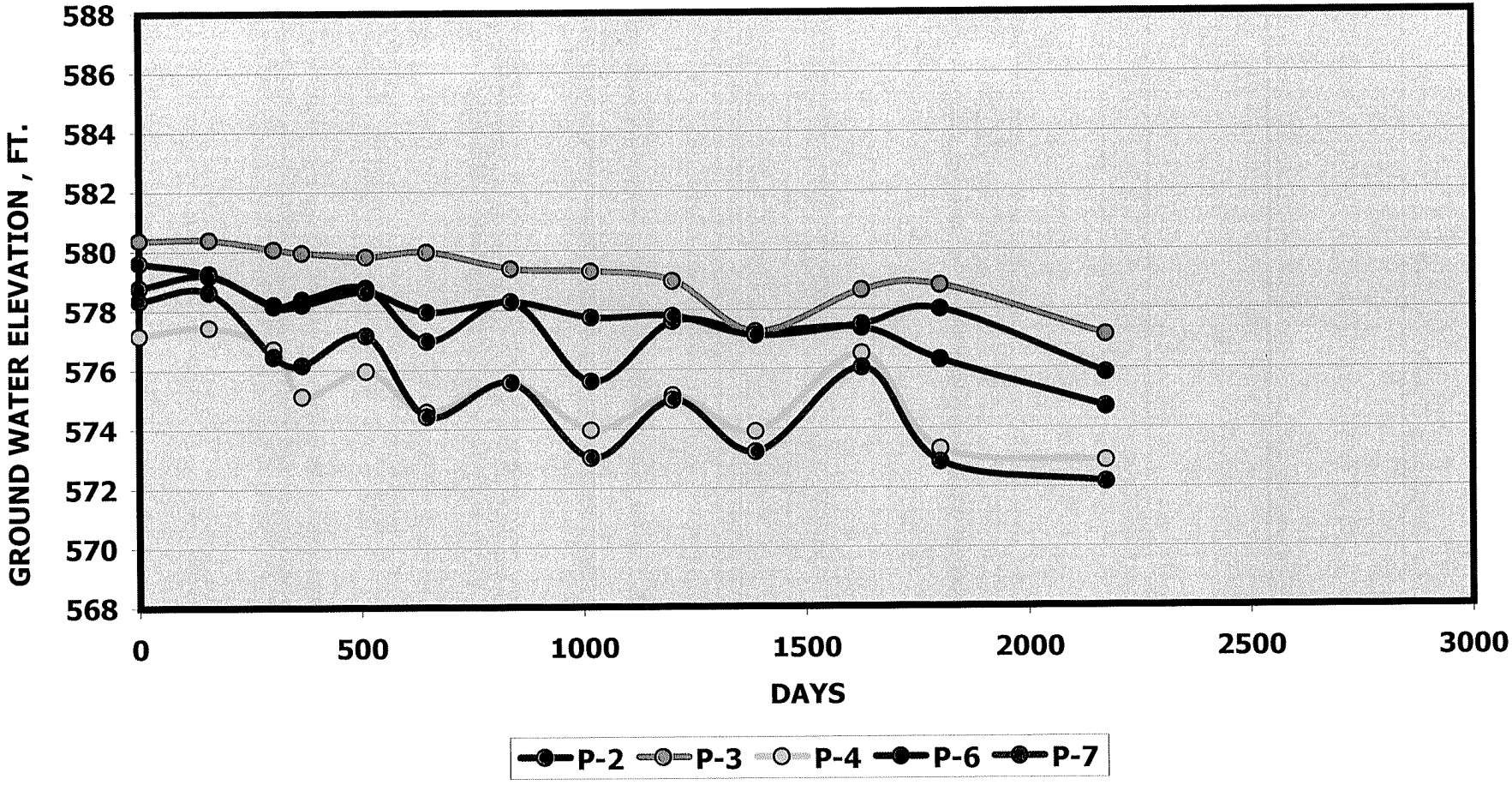
ATTACHMENT D - FIGURE 3
FRONTIER CHEMICAL - PENDLETON SITE
NORTHERN PORTION OF CAPPED AREA
REPORT #11



ATTACHMENT D - FIGURE 4
FRONTIER CHEMICAL - PENDLETON SITE
QUARRY LAKE AND ADJACENT TO QUARRY LAKE
REPORT #11



ATTACHMENT D - FIGURE 5
FRONTIER CHEMICAL - PENDLETON SITE
PIEZOMETERS - INSIDE CAPPED AREA
REPORT #11



ATTACHMENT D - FIGURE 6
FRONTIER CHEMICAL - PENDLETON SITE
PIEZOMETERS - OUTSIDE CAPPED AREA
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