REPORT

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

Pendleton Site PRP Group

March 2001

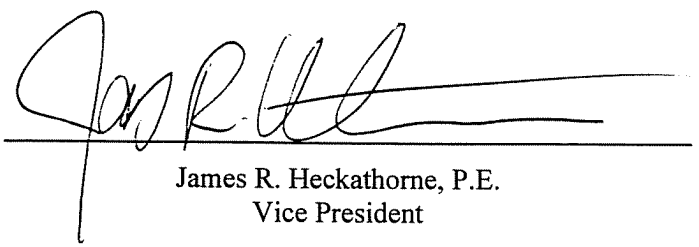
O'BRIEN & GERE
ENGINEERS, INC.

5829/27084

REPORT

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

Pendleton Site PRP Group



James R. Heckathorne, P.E.
Vice President

March 2001

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1. Introduction

This document is the second 2000/2001 Semi-Annual Ground Water Monitoring Report for the Frontier Chemical - Pendleton Site (Site), located on Town Line Road in the Town of Pendleton, Niagara County, New York. This report is prepared based on the New York State Department of Environmental Conservation (NYSDEC)-approved Operation & Maintenance (O&M) Manual (O'Brien & Gere Engineers, 1997) for the Site, which addresses, among other items, long-term ground water monitoring at the Site. This Semi-Annual Ground Water Monitoring Report presents a discussion of the following:

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

These items are described in the following sections.

1.1. Piezometer/monitoring well inspection

The piezometer/monitoring well inspection was conducted on February 12, 2001, and included the piezometers (P-1 through P-8), standpipe (SP-1), and ground water monitoring wells (85-5R, URS-5D, 85-7R, URS-7D, URS-9I, URS-9D, 88-12C, 88-12D, URS-14I, and URS-14D) identified as the Site monitoring network in the O&M Manual for the Site.

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

- Piezometer P-6 is currently angled +/-15 degrees from vertical.

February 2001 inspection forms are included in Appendix A.

1.2. Hydraulic evaluation of capped area and collection trench

In accordance with the O&M Manual, a complete round of static ground water elevations was collected from the piezometers (P-1 through P-8), standpipe (SP-1), and ground water monitoring wells (85-5R, URS-5D, 85-7R, URS-7D, URS-9I, URS-9D, 88-12C, 88-12D, URS-14I, and URS-14D). The ground water elevation measurements were collected on February 12, 2001. Glynn Geotechnical Engineering, Inc. measured the surface water elevation of Quarry Lake on February 14, 2001. The lake was ice covered, therefore a hole was punched through the ice to measure the "free" water level of the lake. The "free" and ice surface levels were essentially equal. The ground water elevations measured in the piezometers and standpipe, and in the monitoring wells, are summarized on Tables 1 and 2, respectively. Quarry Lake elevations are summarized on Table 3. As shown on Table 3, the February 14, 2001 "free" surface water elevation of Quarry Lake was recorded at 578.47 ft, which is above the outlet weir elevation of 577.2 ft.

The water level measurements collected on February 12, 2001 are illustrated on Figure 1. These measurements are the tenth round collected since remedial construction was substantially completed in August 1996. The water elevation data was used to evaluate the following:

- Whether an inward hydraulic gradient exists at the site by comparing water level measurements within the capped area (P-2, P-3, P-4, P-6, and P-7) to those measured outside the capped area (P-1, P-5, P-8, SP-1, and Quarry Lake)
- The ground water flow potential inside the capped area
- Whether the ground water collection trench is effectively controlling ground water migration away from the capped area.

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

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

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

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

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

1.3. Ground water sampling and chemistry

Between February 12 and 14, 2001, the eighth round of post-closure ground water samples was collected in accordance with the protocols presented in the O&M Manual. Ground water samples were obtained from the ten ground water monitoring wells identified for sampling in the O&M Manual (85-5R, URS-5D, 85-7R, URS-7D, URS-9I, URS-9D, 88-12C, 88-12D, URS-14I, and URS-14D).

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

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

Parameter	Method
VOCs	USEPA Method 8260B
Inorganics	USEPA Methods 6010B/7470A/7841
Cyanide	USEPA Method 9010B/9014

Source: O'Brien & Gere Engineers, Inc.

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

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

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

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

Results of the ground water analyses, along with a comparison of the results with New York State Class GA Standards, are summarized on Table 4. The New York State Class GA Standards presented on Table 4 have been revised to reflect revisions to the New York State water quality standards (NYSDEC, 1999). In general, the February 2001 ground water chemistry is similar to previous sampling events.

Detected constituents exceeding New York State Class GA Standards included iron at three locations (88-12D, URS-5D, and URS-9I), nickel at URS-5D, and chromium at 88-12D. Concentrations of these constituents are similar to historical data, except for the iron concentration in well URS-5D. Concentrations of iron have previously been detected in background well URS-14I at similar concentrations. Sodium exceeded New York State Class GA Standards at the ten locations (85-5R, URS-5D, 85-7R, URS-7D, URS-9I, URS-9D, 88-12C, 88-12D, URS-14I, and URS-14D). Concentrations of sodium have also been detected above the New York State Class GA Standards in background wells URS-14I and URS-14D at similar concentrations. 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 above the New York State Class GA Standards. The database will be updated with data from future sampling events, and ground water standards will be reviewed annually to evaluate whether standards have been revised.

As specified in the O&M Manual, statistical analyses of the ground water chemistry data have been completed. A preliminary exploratory data analysis, using univariate statistics in SAS®, was performed for fifteen analytes that have been detected a total of nine or more times in various monitoring wells since the initial post-construction sampling event in June 1997. Based on the results of the preliminary exploratory data analysis, concentrations for thirteen analytes (at $\alpha = 0.10$) do not appear to be normally distributed. Magnesium and 1,2-dichloroethene appear to be normally distributed.

The February 2001 data represents the results of the eighth baseline data collection effort. A t-test analysis was conducted based on the data collected from the post-construction sampling events, between June 1997 and February 2001, to evaluate whether downgradient concentrations exceed upgradient concentrations, based on a comparison of downgradient wells with the appropriate upgradient wells, URS-14I or URS-14D. Based on the results of the t-test, Table 1-2 presents a summary of locations where constituent concentrations in downgradient wells exceeded concentrations at the appropriate upgradient comparison well, at a confidence level (α) equal to 0.05.

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

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

Source: O'Brien & Gere Engineers, Inc.

It should be noted that there are currently no New York State Class GA Standards for calcium, magnesium, or potassium. Concentrations of arsenic and manganese have not been detected above the New York State Class GA Standards during the post-construction sampling. In addition, it is likely that elevated concentrations of calcium, magnesium, manganese, potassium, and sodium are naturally occurring and are not related to previous site activities.

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

T-test analysis results indicate that calcium concentrations are greater in upgradient well URS-14D than in corresponding downgradient well URS-9D, at a confidence level of α=0.05. In addition, t-test analysis results indicate that zinc concentrations are greater in upgradient well URS-14I than in corresponding downgradient well 85-7R, at a confidence level of α=0.05.

Chromium was detected above the New York State Class GA Standards at monitoring well 88-12D. Chromium has been previously detected in similar concentrations at this monitoring well. Even though this concentration exceeds New York State Class GA Standards, it was not significantly different (α=0.05) from the corresponding upgradient well.

Nickel was detected above the New York State Class GA Standards at monitoring well URS-5D. Nickel has been previously detected in similar concentrations at this monitoring well. Even though this concentration exceeds New York State Class GA Standards, it was not significantly different (α=0.05) from the corresponding upgradient well.

Although carbon disulfide was detected in some of the samples and was detected in the trip blanks at levels above typical laboratory contamination, and is not considered valid data. Many samples show evidence of sulfur dioxide, based on a review of the analytical spectrum by the data validator, which may be related to the detection of carbon disulfide. There are currently no New York State Standards for carbon disulfide. In addition, carbon disulfide has been detected in the background wells.

2. Conclusions

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

- The isolation of ground water within the capped area has been established.

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

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

- The February 2001 ground water chemistry is similar to previous sampling events.

- Results of the t-test analysis indicate that concentrations of arsenic (88-12C), calcium (85-5R, URS-5D, 85-7R, URS-7D, URS-9I, 88-12C, and 88-12D), magnesium (85-5R, 85-7R, URS-7D, URS-9I, 88-12C, and 88-12D), manganese (URS-5D, URS-7D, and 88-12D), potassium (88-12D), and sodium (URS-5D, 85-7R, URS-7D, and 88-12D) exceed upgradient concentrations, based on a comparison of downgradient wells with the appropriate upgradient wells, URS-14I or URS-14D. There are currently no New York State Class GA Standards for calcium, magnesium, or potassium. Concentrations of arsenic and manganese have not been detected above the New York State Class GA Standards during the post-construction sampling. It is likely that elevated concentrations of calcium, magnesium, manganese, potassium, and sodium are naturally occurring and are not related to previous site activities.

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

- T-test analysis results indicate that zinc concentrations are greater in upgradient well URS-14I than in corresponding downgradient well 85-7R, at a confidence level of α=0.05.

- T-test analysis results indicate that sodium concentrations are greater in upgradient well URS-14I than in corresponding downgradient wells URS-9I and 88-12C, at a confidence level of α=0.05.

- Iron was detected in three monitoring wells at concentrations above New York State Class GA Standards. Concentrations of iron have previously been detected in the background wells at similar concentrations. In addition, results of the t-test analysis indicate that concentrations of iron are not statistically higher downgradient than upgradient at the Site, indicating that the capped area is not impacting ground water.

- Chromium was detected in one monitoring well at a concentration above New York State Class GA Standards. The concentration was within the range of historical detections and was not significantly different from the corresponding upgradient well.

- Nickel was detected in one monitoring well at a concentration above New York State Class GA Standards. The concentration was within the range of historical detections and was not significantly different from the corresponding upgradient well.

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

- Although carbon disulfide was detected in some of the samples at levels above typical laboratory contamination, many samples show evidence of sulfur dioxide, based on a review of the analytical spectrum by the data validator, which may be related to the detection of carbon disulfide. There are currently no New York State Standards for carbon disulfide. In addition, carbon disulfide was detected in the background wells.

References

New York State Department of Environmental Conservation, 1999. Title 6, Chapter X, Subchapter A, Article 2, Part 703.5, Table 1, Water Quality Standards Surface Waters and Groundwater, Effective August 4, 1999.

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

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

TABLES

Table 1

Frontier Chemical - Pendleton Site

Piezometer Ground Water Elevation Summary Table

Piezometer		Location	Top of Riser Elev. (ft)	Top of Cover Elev. (ft)	Depth (ft below riser)	Screened Elev. (ft)	Ground water elevation (ft)									
							6/24/97	9/30/97	2/23/98	4/28/98	9/17/98	2/3/99	8/11/99	2/7/00	8/9/00	2/12/01
P-1	(O)	Eastern portion	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
P-2	(I)	of capped area	582 90	583 20	15 7	577 2 - 567 2	579 60	579 24	578 20	578 37	578 76	576 96	578 27	575 59	577 60	577 40
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	578 91
P-4	(I)	Adjacent to	582 31	583 85	15 6	576 7 - 566 7	577 15	577 43	576 70	575 11	575 96	574 58	575 56	573 96	575 11	573 90
SP-1	(T)	Quarry Lake	579 86	580 07	15 0	bop = 564 9	<564 9	<564 9	<564 9	<564 9	<564 9	<564 9	<564 9	<564 9	<564 9	<564 9
P-5	(O)	Southern portion	583 05	583 55	15 5	577 6 - 567 6	576 87	577 25	578 57	579 31	576 13	574 70	576 48	578 16	579 02	578 70
P-6	(I)	of capped area	584 45	584 60	16 2	578 3 - 568 3	578 77	579 17	578 14	578 20	578 63	577 94	578 28	577 74	577 78	577 12
P-7	(I)	Northern portion	580 97	582 00	15 9	575 0 - 565 0	578 33	578 62	576 45	576 17	577 15	574 43	575 55	573 02	574 97	573 21
P-8	(O)	of capped area	582 83	583 00	17 3	575 5 - 565 5	577 76	578 87	578 75	579 61	576 90	574 72	576 15	576 12	578 26	577 43

Notes

1 Elevation based on USGS Datum

2 bop = bottom of pipe

3 O = piezometer located outside of capped area

4 I = piezometer located inside capped area

5 T = standpipe located within the ground water collection trench

6 The top of riser of piezometer P-4 was modified on 4/28/98 from 583 68 ft to 582 31 ft to allow clearance for the installation of a locking expansion plug beneath the flush-mounted cover

7 The top of riser of piezometer P-7 was modified on 4/28/98 from 581 84 ft to 580 97 ft to allow clearance for the installation of a locking expansion plug beneath the flush-mounted cover

Table 2

Frontier Chemical - Pendleton Site

Monitoring Well Ground Water Elevation Summary Table

Monitoring Well	Location	Top of Riser Elev. (ft)	Ground Elev. (ft)	Depth (ft below riser)	Screened Elev. (ft)	Ground water elevation (ft)									
						6/24/97	9/30/97	2/23/98	4/28/98	9/17/98	2/3/99	8/11/99	2/7/00	8/9/00	2/12/01
URS-14I	Upgradient well nest	581 14	580 84	31 0	550 1 - 555 1	577 15	578 77	580 24	580 14	574 76	577 35	575 42	577 68	577 74	579 58
URS-14D	in church parking lot	580 71	580 85	41 5	539 2 - 544 2	575 50	574 28	575 87	576 05	573 94	572 89	571 92	571 87	573 05	574 41
URS-9I	Southern well nest	581 68	579 90	46 0	535 6 540 6	575 38	574 22	575 69	575 91	573 76	572 67	571 82	571 78	572 98	574 17
URS-9D	along Town Line Road	580 80	579 00	46 5	534 3 - 539 3	575 36	574 21	575 68	575 89	573 64	572 66	571 24	571 66	572 94	574 15
85-5R	Middle well nest	580 84	578 70	40 0	540 9 - 542 9	574 70	573 97	575 39	575 70	574 98	572 78	571 92	571 10	572 95	573 76
URS-5D	along Town Line Road	580 60	578 00	49 9	530 8 - 535 8	574 73	574 02	575 42	575 74	573 80	572 12	571 97	571 39	572 89	573 80
85-7R	North well nest	577 90	576 60	27 8	550 2 - 552 2	575 09	574 21	575 53	575 87	573 74	572 30	572 04	571 52	573 10	573 95
URS-7D	along Town Line Road	579 35	576 50	39 9	539 5 - 544 5	575 15	574 35	575 60	575 99	573 75	572 40	571 99	571 57	573 13	574 14
88-12C	Well nest outside northeast	583 12	583 70	31 3	551 8 - 553 8	576 60	574 03	576 53	577 06	572 79	571 72	571 26	571 12	573 01	574 34
88-12D	portion of capped area	582 87	583 28	54 5	528 4 - 533 4	575 72	574 54	576 17	576 33	574 00	572 97	572 36	572 33	573 53	574 74

Notes

1 Elevation based on USGS Datum

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Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Sample ID	NYS Class GA Water Quality	85-5R	85-5R	85-5R	85-5R	85-5R	85-5R
Sample Date	Standards	08/01/90	02/01/91	10/01/92	06/25/97	02/24/98	09/18/98
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/l
Compound							
VOCs							
1,1,1-Trichloroethane	5	5 U	5 U	0.5 U	0.5 U	0 5 U	0 5 U
1,1,2,2-Tetrachloroethane	5	2 J	5 U	0 5 U	0 5 U	0 5 U	0 5 U
1,1-Dichloroethane	5	5 U	5 U	0 5 U	0 5 U	0.5 U	0.5 U
1,2-Dichloroethene	5	5 U	5 U	0 5 U	NA	NA	NA
2-Butanone (MEK)	NC	10 U	10 U	0 5 U	10 U	10 U	10 U
4-Methyl-2-pentanone (MIBK)	NC	2 J	10 U	0 5 U	5 U	5 U	5 U
Acetone	NC	0 R	10 U	0 5 U	10 U	10 UJ	10 UJ
Benzene	1	[15]	5 U	0 5 U	0 5 U	0 34 J	0 5 U
Bromodichloromethane	NC	5 U	5 U	0.5 U	0 5 U	0 5 U	0.5 U
Carbon disulfide	NC	5 U	5 U	0 5 U	0 74 U	0 11 U	0 5 U
Chlorobenzene	5	NA	NA	NA	0.5 U	0 28 J	0 5 U
Chloroform	7	5 U	5 U	0 5 U	0 5 U	0 5 U	0 5 U
Dibromochloromethane	5	5 U	5 U	0.5 U	0 5 U	0 5 U	0.5 U
Ethylbenzene	5	5 U	5 U	0 5 U	0 5 U	0 24 J	0 5 U
Methylene chloride	5	5 U	5 U	0 5 U	0.5 U	0 5 U	0.5 U
Toluene	5	5 U	5 U	0 5 U	0 5 U	0 14 J	0 5 U
Trichloroethene	5	5 U	5 U	0.5 U	0.5 U	0 5 U	0.5 U
Vinyl chloride	2	10 U	10 U	0 5 U	1 U	1 U	1 U
Xylene (total)	5	5 U	5 U	0 5 U	0 5 U	0.96	0 5 U
cis-1,2-Dichloroethene	5	NA	NA	NA	0 5 U	0 5 U	0 5 U
Metals							
Aluminum	NC	214	37 8 B	153	100 U	300	100 U
Antimony	3	18 U	[42.4 B]	80 U	10 U	10 U	5 U
Arsenic	25	1 B	1 U	10 U	10 U	10 U	5 U
Barium	1000	73.5 B	23.4 B	15	40	80	50 J
Beryllium	NC	1 U	1 U	1 U	ND	ND	3 U
Cadmium	5	1 U	2 U	5 U	ND	ND	1 U
Calcium	NC	355000	378000	321000	270000	220000	220000
Chromium	50	7 5 B	4 U	5 U	10 U	30	10
Cobalt	NC	2 U	3 U	5 U	30 U	30 U	25 U
Copper	200	4 U	12 U	11	10 U	10 U	10 U
Cyanide	200	10 U	10 U	2 U	10 UJ	10 U	10 U
Iron	300	[669]	[915]	[419]	140	[2300]	190
Lead	25	1 U	1 2 B	10 U	10 U	10 U	5 U
Magnesium	NC	106000	170000	139000	130000	85000	110000

NOTES. U - not detected, J,B - estimated value, R - unusable, NA - not analyzed, ND - not detected
E - estimated, N - tentatively identified, NC - no criteria
[ ] - exceeds standard

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FXP File N \5829\22038\TABLEPR FXP

File Number 5829 22038

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

Date	Quarry Lake Surface Water Elevation (ft) (1)
9/8/97	572.3
2/23/98	578 0
4/30/98	578.26
9/21/98	577.42
2/4/99	577.97
8/4/99	577 60
2/7/00	578.16 (2)
8/10/00	578.07
2/14/01	578.47

Notes:
1. Elevation based on USGS Datum
2. Ice surface elevation.

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Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	85-5R	85-5R	85-5R	85-5R	85-5R	85-5R
	Sample Date		08/01/90	02/01/91	10/01/92	06/25/97	02/24/98	09/18/98
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Manganese		300	40	57 5	42	50	260	40
Mercury		0.7	0.2 U	0 2 U	0 2 U	ND	ND	0.2 U
Nickel		100	48 1	13 U	5 U	50 U	50 U	50 U
Potassium		NC	60700	6280	6400	5000 U	5000 U	5000 U
Selenium		10	2 U	1 U	5 U	10 U	10 U	5 U
Sodium		20000	[132000]	[120000]	[100000]	[93000 J]	[58000]	[87000]
Thallium		NC	1 U	2 U	80 U	10 U	8	1 UJ
Vanadium		NC	4 B	2 U	5 U	50 U	50 U	50 U
Zinc		NC	12 9 B	17 6 B	10 U	10 U	10 U	10 U

NOTES U - not detected, J,B - estimated value, R - unusable, NA - not analyzed, ND - not detected
E - estimated, N - tentatively identified, NC - no criteria
[ ] - exceeds standard

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O'BRIEN & GERE ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	85-5R	85-5R	85-5R	85-5R	85-5R	85-7R
	Sample Date		02/04/99	08/13/99	02/08/00	08/11/00	02/13/01	08/01/90
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
VOCs								
1,1,1-Trichloroethane		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
1,1,2,2-Tetrachloroethane		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
1,1-Dichloroethane		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
1,2-Dichloroethene		5	NA	NA	NA	NA	NA	5 U
2-Butanone (MEK)		NC	10 U	10 UJ	10 UJ	10 U	10 UJ	10 U
4-Methyl-2-pentanone (MIBK)		NC	5 U	5 U	5 UJ	5 U	5 U	10 U
Acetone		NC	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 U
Benzene		1	0.5 U	0.1 J	0.5 U	0.5 U	0.5 U	[6]
Bromodichloromethane		NC	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Carbon disulfide		NC	0.5 U	0.83 U	18	0.5 UJ	0.59 U	5 U
Chlorobenzene		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA
Chloroform		7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Dibromochloromethane		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Ethylbenzene		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Methylene chloride		5	0.5 U	0.5 U	2 U	5 U	2 U	5 U
Toluene		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Trichloroethene		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Vinyl chloride		2	1 U	1 U	1 U	1 U	1 U	10 U
Xylene (total)		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
cis-1,2-Dichloroethene		5	0.5 U	0.17 J	0.1 J	0.11 J	0.5 U	NA
Metals								
Aluminum		NC	100 U	100 U	100 U	100 U	100 U	277
Antimony		3	5 U	5 U	5 U	5 U	5 U	[28.3 B]
Arsenic		25	5 U	5 UJ	5 U	5 U	5 U	1.4 B
Barium		1000	100 U	60	60	60	40	91 B
Beryllium		NC	10 U	3 U	3 U	3 U	3 U	1 U
Cadmium		5	10 U	1 U	1 U	1 U	1 U	1 U
Calcium		NC	130000	220000	200000	190000	140000	354000
Chromium		50	10 U	10 U	10 U	10 U	10 U	3 U
Cobalt		NC	50 U	25 U	25 U	20 U	25 U	2 U
Copper		200	10 U	10 U	10 U	10 U	10 U	4 U
Cyanide		200	10 U	10 U	10 U	10 U	10 U	10 U
Iron		300	50 U	100	50 U	[420]	50 U	[586]
Lead		25	5 U	5 U	5 U	5 U	5 U	1 U
Magnesium		NC	59000	99000	90000	85000	62000	119000

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O'BRIEN & GERE
ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

	Sample ID	NYS Class GA Water Quality	85-5R	85-5R	85-5R	85-5R	85 5R	85 7R
	Sample Date	Standards	02/04/99	08/13/99	02/08/00	08/11/00	02/13/01	08/01/90
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/l
Compound								
Manganese		300	50 U	80	110	130 J	50	40 5
Mercury		0.7	0 2 U	0 2 U	0.2 U	0.2 U	0.2 U	0 2 U
Nickel		100	50 U	50 U	50 U	50 U	50 U	7 4 B
Potassium		NC	5000 U	5000	5000 U	5000 U	5000 U	5540
Selenium		10	5 UJ	5 UJ	5 UJ	5 U	5 UJ	2 U
Sodium		20000	[52000]	[96000]	[67000]	[69000]	[62000]	[67900]
Thallium		NC	1 U	5 U	2 U	2 U	2 U	1 U
Vanadium		NC	50 U	50 U	50 U	50 U	50 U	2 U
Zinc		NC	10 U	10 J	10	10 U	20	3 U

NOTES: U - not detected, J,B - estimated value, R - unusable, NA - not analyzed, ND - not detected
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O'BRIEN & GERE
ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

	Sample ID	NYS Class GA Water Quality	85-7R	85-7R	85-7R	85-7R	85-7R	85-7R
	Sample Date	Standards	02/01/91	10/01/92	06/24/97	02/24/98	09/18/98	02/04/99
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Compound								
VOCs								
1,1,1-Trichloroethane		5	5 U	0 5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane		5	5 U	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U
1,1-Dichloroethane		5	5 U	0 5 U	0.5 U	0.5 U	0.5 U	0 5 U
1,2-Dichloroethene		5	5 U	0 5 U	NA	NA	NA	NA
2-Butanone (MEK)		NC	10 U	0.5 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (MIBK)		NC	10 U	0 5 U	5 U	5 U	5 U	5 U
Acetone		NC	0 R	0.5 U	10 U	10 UJ	10 UJ	10 U
Benzene		1	5 U	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U
Bromodichloromethane		NC	5 U	0 5 U	0.5 U	0 5 U	0 5 U	0 5 U
Carbon disulfide		NC	5 U	0 5 U	1 9 U	0 13 J	0 5 U	0 93 J
Chlorobenzene		5	NA	NA	0.5 U	0 5 U	0.5 U	0.5 U
Chloroform		7	5 U	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U
Dibromochloromethane		5	5 U	0 5 U	0.5 U	0 5 U	0 5 U	0.5 U
Ethylbenzene		5	5 U	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U
Methylene chloride		5	5 U	0 5 U	0 5 U	0 5 U	0 5 U	0.5 U
Toluene		5	1 J	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U
Trichloroethene		5	5 U	0 5 U	0 5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride		2	10 U	0 5 U	1 U	1 U	1 U	1 U
Xylene (total)		5	5 U	0 5 U	0 5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene		5	NA	NA	0 14 J	0 19 U	0 14 J	0 21 J
Metals								
Aluminum		NC	265	249	100 U	100 U	100 U	100 U
Antimony		3	26 U	80 U	10 U	10 U	5 U	5 U
Arsenic		25	1 7 B	10 U	10 U	10 U	5 U	5 U
Barium		1000	143 B	106	100	80	50 J	100 U
Beryllium		NC	1 U	1 U	ND	ND	3 U	10 U
Cadmium		5	2 U	5 U	ND	ND	1 U	10 U
Calcium		NC	298000	389000	350000	350000	420000	400000
Chromium		50	4 U	5 U	10 U	10 U	10 U	10
Cobalt		NC	3 U	5 U	30 U	30 U	25 U	50 U
Copper		200	12 U	8	10 U	10 U	10 U	10 U
Cyanide		200	10 U	2 U	10 UJ	10 U	10 U	10 U
Iron		300	[820]	[435]	190	[310]	270	170
Lead		25	2 6 B	10 U	10 U	10 U	5 U	5 U
Magnesium		NC	42600	124000	120000	120000	140000	140000

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O'BRIEN & GERE
ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	85-7R	85-7R	85-7R	85-7R	85-7R	85-7R
	Sample Date		02/01/91	10/01/92	06/24/97	02/24/98	09/18/98	02/04/99
	Units	ug/L	ug/L	ug/l	ug/l	ug/L	ug/L	ug/L
Manganese		300	31 5	30	70	80	90	80
Mercury		0 7	0 2 U	0 2 U	ND	ND	0.2 U	0 2 U
Nickel		100	13 U	5 U	50 U	50 U	50 U	50 U
Potassium		NC	5770	6700	5000	5000	6000	6000
Selenium		10	1 U	5 U	10 U	10 U	5 U	5 UJ
Sodium		20000	[38900]	[73100]	[66000 J]	[67000]	[75000]	[74000]
Thallium		NC	2 U	80 U	10 U	10	1 UJ	1 U
Vanadium		NC	2 U	5 U	50 U	50 U	50 U	50 U
Zinc		NC	21 5	10 U	10 U	10 U	10 U	10 U

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O'BRIEN & GERE ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	85-7R	85-7R	85-7R	85-7R	88-12C	88-12C
	Sample Date		08/12/99	02/09/00	08/10/00	02/14/01	08/01/90	02/01/91
	Units	ug/L	ug/l	ug/l	ug/l	ug/L	ug/L	ug/L
VOCs								
1,1,1-Trichloroethane		5	0.5 UJ	0.5 U	0.5 U	0.5 U	5 U	5 U
1,1,2,2-Tetrachloroethane		5	0.5 UJ	0.5 U	0.5 U	0.5 U	5 U	5 U
1,1-Dichloroethane		5	0.5 UJ	0.5 U	0.5 U	0.5 U	5 U	5 U
1,2-Dichloroethene		5	NA	NA	NA	NA	5 U	5 U
2-Butanone (MEK)		NC	10 UJ	10 UJ	10 U	10 UJ	10 U	10 U
4-Methyl-2-pentanone (MIBK)		NC	5 UJ	5 UJ	5 U	5 U	10 U	10 U
Acetone		NC	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 U
Benzene		1	0.5 UJ	0.5 U	0.5 U	0.5 U	5 U	5 U
Bromodichloromethane		NC	0.5 UJ	0.5 U	0.5 U	0.5 U	5 U	5 U
Carbon disulfide		NC	0.64 UJ	32	0.5 UJ	1.4 U	5 U	5 U
Chlorobenzene		5	0.5 UJ	0.5 U	0.5 U	0.5 U	NA	NA
Chloroform		7	0.5 UJ	0.5 U	0.5 U	0.5 U	5 U	5 U
Dibromochloromethane		5	0.5 UJ	0.5 U	0.5 U	0.5 U	5 U	5 U
Ethylbenzene		5	0.5 UJ	0.5 U	0.5 U	0.5 U	5 U	5 U
Methylene chloride		5	0.5 UJ	2 U	5 U	2 U	5 U	5 U
Toluene		5	0.5 UJ	0.5 U	0.5 U	0.5 U	5 U	5 U
Trichloroethene		5	0.5 UJ	0.5 U	0.5 U	0.5 U	5 U	5 U
Vinyl chloride		2	1 UJ	1 U	1 U	1 U	10 U	10 U
Xylene (total)		5	0.5 UJ	0.5 U	0.5 U	0.5 U	5 U	5 U
cis-1,2-Dichloroethene		5	0.4 J	0.11 J	0.14 J	0.5 U	NA	NA
Metals								
Aluminum		NC	100 U	100 U	100 U	100 U	481	187 B
Antimony		3	5 U	5 U	5 U	5 U	[19.2 B]	[28 B]
Arsenic		25	5 UJ	5 U	5 U	5 U	10	12.3 B
Barium		1000	40	40	80	50	11.4 B	17.3
Beryllium		NC	3 U	3 U	3 U	3 U	1 U	1 U
Cadmium		5	1 U	1 U	1 U	1 U	1 U	2 U
Calcium		NC	440000	410000	390000	430000	62600	68500
Chromium		50	10 U	10 U	10 U	10 U	21	4.6 B
Cobalt		NC	25 U	25 U	20 U	25 U	2 U	3 U
Copper		200	10 U	10 U	10 U	10 U	4.2 B	12 U
Cyanide		200	10 U	10 U	10 U	10 U	10 U	10 U
Iron		300	90	70	210	150	[1530]	[1040]
Lead		25	5 U	5 U	5 U	5 U	1.5 B	1.2 B
Magnesium		NC	130000	130000	130000	140000	88500	103000

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O'BRIEN & GERE
ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	85-7R	85-7R	85-7R	85-7R	88-12C	88-12C
	Sample Date		08/12/99	02/09/00	08/10/00	02/14/01	08/01/90	02/01/91
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Manganese		300	40	40	50 J	50	45 4	37 8
Mercury		0.7	0.2 U	0 2 U	0.2 U	0 2 U	0 2 U	0.2 U
Nickel		100	50 U	50 U	50 U	50 U	14 6 B	13 U
Potassium		NC	7000	6000	6000	6000	2520 B	3200 B
Selenium		10	5 UJ	5 UJ	5 U	5 UJ	2 U	1 U
Sodium		20000	[85000]	[72000]	[71000]	[69000]	[34600]	[41100]
Thallium		NC	5 U	2 U	2 U	2 U	1 U	2 U
Vanadium		NC	50 U	50 U	50 U	50 U	22 1 B	10 B
Zinc		NC	10 U	10 U	10 U	10 U	10 1 B	15 7 B

NOTES: U - not detected, J,B - estimated value, R - unusable, NA - not analyzed, ND - not detected
F - estimated N - tentatively identified, NC - no criteria
[ ] - exceeds standard

O'BRIEN & GERE ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	88-12C	88-12C	88-12C	88-12C	88-12C	88-12C
	Sample Date		10/01/92	06/24/97	02/25/98	09/17/98	02/04/99	08/11/99
	Units	ug/L	ug/L	ug/L	ug/l	ug/L	ug/L	ug/L
VOCs								
1,1,1-Trichloroethane		5	0 5 U	0.5 U	0.5 U	0 5 U	0.5 U	0.5 UJ
1,1,2,2-Tetrachloroethane		5	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U	0 5 UJ
1,1-Dichloroethane		5	0.5 U	0 5 U	0.5 U	0 5 U	0 5 U	0.5 UJ
1,2-Dichloroethene		5	0 5 U	NA	NA	NA	NA	NA
2-Butanone (MEK)		NC	0 5 U	10 U	10 U	10 U	10 U	10 UJ
4-Methyl-2-pentanone (MIBK)		NC	0 5 U	5 U	5 U	5 U	5 U	5 UJ
Acetone		NC	0 5 U	10 U	10 UJ	10 UJ	10 U	10 UJ
Benzene		1	0 5 U	0 5 U	0 5 U	0.5 U	0 5 U	0 5 UJ
Bromodichloromethane		NC	0.5 U	0 5 U	0 5 U	0.5 U	0 5 U	0.5 UJ
Carbon disulfide		NC	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U	0 5 UJ
Chlorobenzene		5	NA	0 5 U	0 5 U	0 5 U	0.5 U	0 5 UJ
Chloroform		7	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U	0 5 UJ
Dibromochloromethane		5	0 5 U	0 5 U	0 5 U	0.5 U	0 5 U	0 5 UJ
Ethylbenzene		5	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U	0 5 UJ
Methylene chloride		5	0 5 U	0.5 U	0 5 U	0.5 U	0 5 U	0.5 UJ
Toluene		5	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U	0 5 UJ
Trichloroethene		5	0.5 U	0 5 U	0.5 U	0 5 U	0.5 U	0.5 UJ
Vinyl chloride		2	0 5 U	1 U	1 U	1 U	1 U	1 UJ
Xylene (total)		5	0.5 U	0 5 U	0.5 U	0 5 U	0.5 U	0.5 UJ
cis-1,2-Dichloroethene		5	NA	0 5 U	0 5 U	0 5 U	0 5 U	0 5 UJ
Metals								
Aluminum		NC	453	100 U	900	100 U	600	100 U
Antimony		3	80 U	10 U	10 U	5 U	5 U	5 U
Arsenic		25	14	9	7	10	12	11 J
Barium		1000	14	20 U	20 U	20 U	20 U	20 U
Beryllium		NC	1 U	ND	ND	3 U	3 U	3 U
Cadmium		5	5 U	ND	ND	1 U	1 U	1 U
Calcium		NC	68900	73000	70000	71000	76000	80000
Chromium		50	5 U	10 U	10	10	20	10 U
Cobalt		NC	5 U	30 U	30 U	25 U	25 U	25 U
Copper		200	5	10 U	10 U	10 U	10 U	10 U
Cyanide		200	2 U	10 UJ	10 U	10 U	10 U	10 U
Iron		300	[1560]	50 U	[2200]	[330]	[1600]	100
Lead		25	10 U	10 U	10 U	5 U	5 U	5 U
Magnesium		NC	92500	110000	98000	110000	100000	110000

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O'BRIEN & GERE
ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	88-12C	88-12C	88-12C	88-12C	88-12C	88-12C
	Sample Date		10/01/92	06/24/97	02/25/98	09/17/98	02/04/99	08/11/99
	Units	ug/l	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Manganese		300	54	10	70	10	40	20
Mercury		0.7	0 2 U	ND	ND	0.2 U	0.2 U	0.2 U
Nickel		100	5 U	50 U	50 U	50 U	50 U	50 U
Potassium		NC	3000	5000 U	5000 U	5000 U	5000 U	5000 U
Selenium		10	5 U	10 U	10 U	5 U	5 UJ	5 UJ
Sodium		20000	[41300]	[47000 J]	[43000]	[40000]	[42000]	[50000]
Thallium		NC	80 U	10 U	13	1 UJ	1 U	5 U
Vanadium		NC	5 U	50 U	50 U	50 U	50 U	50 U
Zinc		NC	10 U	20	20	10 U	10 U	20 J

NOTES: U - not detected, J,B - estimated value, R - unusable, NA - not analyzed, ND - not detected
E - estimated N - tentatively identified, NC - no criteria
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O'BRIEN & GERE
ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	88-12C	88-12C	88-12C	88-12D	88-12D	88-12D
	Sample Date		02/07/00	08/10/00	02/12/01	06/24/97	02/25/98	09/17/98
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/l
VOCs								
1,1,1-Trichloroethane		5	0.5 U	0 5 U	0 5 U	0 5 U	0.5 U	0 5 U
1,1,2,2-Tetrachloroethane		5	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U
1,1-Dichloroethane		5	0.5 U	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U
1 2-Dichloroethene		5	NA	NA	NA	NA	NA	NA
2-Butanone (MEK)		NC	10 UJ	10 U	10 UJ	10 U	10 U	10 U
4-Methyl-2-pentanone (MIBK)		NC	5 UJ	5 U	5 U	5 U	5 U	5 U
Acetone		NC	10 UJ	10 UJ	10 UJ	10 U	10 UJ	10 UJ
Benzene		1	0 5 U	0 5 U	0 5 U	0 5 U	0 13 J	0 13 J
Bromodichloromethane		NC	0.5 U	0 5 U	0.5 U	0 5 U	0.5 U	0.5 U
Carbon disulfide		NC	0 84	0 5 UJ	0 72 U	0 63 U	0 13 U	0 56
Chlorobenzene		5	0.5 U	0 5 U	0 5 U	0.5 U	0.5 U	0 5 U
Chloroform		7	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U
Dibromochloromethane		5	0 5 U	0 5 U	0.5 U	0 5 U	0 5 U	0.5 U
Ethylbenzene		5	0 5 U	0 5 U	0 5 U	0 5 U	0 11 J	0 5 U
Methylene chloride		5	2 U	5 U	2 U	0 5 U	0 5 U	0 5 U
Toluene		5	0 19 J	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U
Trichloroethene		5	0.5 U	0 5 U	0.5 U	0 5 U	0.5 U	0 5 U
Vinyl chloride		2	1 U	1 U	1 U	1 U	1 U	1 U
Xylene (total)		5	0 15 J	0 5 U	0 5 U	0 5 U	0.48 J	0 5 U
cis-1,2-Dichloroethene		5	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U
Metals								
Aluminum		NC	100 U	100 U	100 U	100 U	100 U	100 U
Antimony		3	5 U	5 U	5 U	10 U	10 U	5 U
Arsenic		25	12	12 J	11	10 U	10 U	5 U
Barium		1000	20 U	20 U	20 U	20 U	20 U	20 U
Beryllium		NC	3 U	3 U	3 U	ND	ND	3 U
Cadmium		5	1 U	1 U	1 U	ND	ND	1 U
Calcium		NC	78000	78000	76000	490000	480000	630000
Chromium		50	10 U	10 U	10 U	10	30	30
Cobalt		NC	25 U	20 U	25 U	30 U	30 U	25 U
Copper		200	10 U	10 U	10 U	10 U	10 U	10 U
Cyanide		200	10 U	10 U	10 U	10 UJ	10 U	10 U
Iron		300	200	[590]	80	180	[480]	110
Lead		25	5 U	5 U	5 U	10 U	10 U	5 U
Magnesium		NC	110000	110000	100000	130000	110000	180000

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O'BRIEN & GERE ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	88-12C	88-12C	88-12C	88-12D	88-12D	88-12D
	Sample Date		02/07/00	08/10/00	02/12/01	06/24/97	02/25/98	09/17/98
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Manganese		300	20	10 J	20	90	60	40
Mercury		0.7	0.2 U	0.2 U	0.2 U	ND	ND	0.2 U
Nickel		100	50 U	50 U	50 U	50 U	50 U	50 U
Potassium		NC	5000 U	5000 U	5000 U	6000	6000	10000
Selenium		10	5 UJ	5 U	5 UJ	10 U	10 U	6
Sodium		20000	[47000]	[48000]	[43000]	[140000 J]	[100000]	[330000]
Thallium		NC	2 U	2 U	2 U	10 U	10 U	1 UJ
Vanadium		NC	50 U	50 U	50 U	50 U	50 U	50 U
Zinc		NC	20	10 U	10 U	10 U	10	10 U

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O'BRIEN & GERE
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Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	88-12D	88-12D	88-12D	88-12D	88-12D	URS-14D
	Sample Date		02/04/99	08/11/99	02/07/00	08/10/00	02/12/01	02/01/91
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
VOCs								
1,1,1-Trichloroethane		5	0.5 U	0 5 UJ	0 5 U	0 5 U	0.5 U	5 U
1,1,2,2-Tetrachloroethane		5	0 5 U	0 5 UJ	0 5 U	0 5 U	0 5 U	5 U
1,1-Dichloroethane		5	0 5 U	0 5 UJ	0 5 U	0 5 U	0 5 U	5 U
1,2-Dichloroethene		5	NA	NA	NA	NA	NA	5 U
2-Butanone (MEK)		NC	10 U	10 UJ	10 UJ	10 U	10 UJ	10 U
4-Methyl-2-pentanone (MIBK)		NC	5 U	5 UJ	5 UJ	5 U	5 U	10 U
Acetone		NC	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 U
Benzene		1	0 5 U	0 16 J	0 5 U	0 5 U	0 5 U	5 U
Bromodichloromethane		NC	0.5 U	0 5 UJ	0.5 U	0.5 U	0.5 U	5 U
Carbon disulfide		NC	0 7 J	0 68 UJ	77	0 5 UJ	2 7 U	5 U
Chlorobenzene		5	0.5 U	0 5 UJ	0 5 U	0 5 U	0 5 U	NA
Chloroform		7	0 5 U	0 5 UJ	0 5 U	0 5 U	0 5 U	5 U
Dibromochloromethane		5	0 5 U	0.5 UJ	0 5 U	0.5 U	0 5 U	5 U
Ethylbenzene		5	0 5 U	0 5 UJ	0 5 U	0 5 U	0 5 U	5 U
Methylene chloride		5	0 5 U	0 5 UJ	2 U	5 U	2 U	0 R
Toluene		5	0 5 U	0 5 UJ	0 5 U	0 5 U	0 5 U	5 U
Trichloroethene		5	0 5 U	0 5 UJ	0.5 U	0.5 U	0.5 U	5 U
Vinyl chloride		2	1 U	1 UJ	1 U	1 U	1 U	10 U
Xylene (total)		5	0 5 U	0 5 UJ	0.5 U	0.5 U	0.5 U	5 U
cis-1,2-Dichloroethene		5	0 5 U	0 5 UJ	0 5 U	0 5 U	0 5 U	NA
Metals								
Aluminum		NC	100 U	100 U	100 U	100 U	100 U	99 8
Antimony		3	5 U	5 U	5 U	5 U	5 U	[32.1 B]
Arsenic		25	5 U	5 UJ	6	5 U	5 U	2 B
Barium		1000	20 U	20 U	20 U	20 U	20 U	25.5 B
Beryllium		NC	3 U	3 U	3 U	3 U	3 U	1 U
Cadmium		5	1 U	1 U	1 U	1 U	1 U	2 U
Calcium		NC	630000	670000	720000	630000	620000	255000
Chromium		50	[90]	10 U	20	10 U	[60]	10 3
Cobalt		NC	25 U	25 U	25 U	20 U	25 U	3 U
Copper		200	10 U	10 U	10 U	10 U	10 U	12 U
Cyanide		200	10 U	12	10 U	10 U	10 U	12 2 U
Iron		300	[650]	90	70	50 U	[330]	[357]
Lead		25	5 U	5 U	5 U	5 U	5 U	1 1 B
Magnesium		NC	160000	180000	210000	160000	150000	75200

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O'BRIEN & GERE ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	88-12D	88-12D	88-12D	88-12D	88-12D	URS-14D
	Sample Date		02/04/99	08/11/99	02/07/00	08/10/00	02/12/01	02/01/01
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Manganese		300	50	30	30	20 J	20	30 8
Mercury		0.7	0 2 U	0 2 U	0 2 J	0 2	0.2 U	0.2 U
Nickel		100	70	50 U	50 U	50 U	50 U	13 U
Potassium		NC	9000	9000	11000	9000	9000	4250 B
Selenium		10	5 UJ	5 UJ	5 UJ	5 U	5 UJ	1 U
Sodium		20000	[250000]	[330000]	[450000]	[240000]	[180000]	[40700]
Thallium		NC	1 U	5 U	2 U	2 U	2 U	2 U
Vanadium		NC	50 U	50 U	50 U	50 U	50 U	2 U
Zinc		NC	10 U	10 J	10	10 U	20	26 8

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O'BRIEN & GERE ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	URS-14D	URS-14D	URS-14D	URS-14D	URS-14D	URS-14D
	Sample Date		10/01/92	06/24/97	02/25/98	09/17/98	02/05/99	08/12/99
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
VOCs								
1,1,1-Trichloroethane		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
1,1,2,2-Tetrachloroethane		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
1,1-Dichloroethane		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
1,2-Dichloroethene		5	0.5 U	NA	NA	NA	NA	NA
2-Butanone (MEK)		NC	0.5 U	10 U	10 U	10 U	10 UJ	10 UJ
4-Methyl-2-pentanone (MIBK)		NC	0.5 U	5 U	5 U	5 U	5 UJ	5 U
Acetone		NC	0.5 U	10 U	10 UJ	10 UJ	10 UJ	10 UJ
Benzene		1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
Bromodichloromethane		NC	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
Carbon disulfide		NC	0.5 U	1.6 U	0.27 U	0.47 J	1.1 J	0.5 U
Chlorobenzene		5	NA	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
Chloroform		7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
Dibromochloromethane		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
Ethylbenzene		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
Methylene chloride		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
Toluene		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
Trichloroethene		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
Vinyl chloride		2	0.5 U	1 U	1 U	1 U	1 UJ	1 U
Xylene (total)		5	0.5 U	0.11 J	0.21 J	0.5 U	0.5 UJ	0.5 U
cis-1,2-Dichloroethene		5	NA	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
Metals								
Aluminum		NC	100 U	100 U	100 U	100 U	100 U	100 U
Antimony		3	80 U	10 U	10 U	5 U	5 U	5 U
Arsenic		25	10 U	10 U	10 U	5 U	5 U	5 UJ
Barium		1000	23	20	20 U	20 U	40	30
Beryllium		NC	1 U	ND	ND	3 U	3 U	3 U
Cadmium		5	5 U	ND	ND	1 U	1 U	1 U
Calcium		NC	292000	210000	250000	310000	280000	360000
Chromium		50	7	10 U	10 U	10	10 U	10 U
Cobalt		NC	5 U	30 U	30 U	25 U	25 U	25 U
Copper		200	8	10 U	10 U	10 U	10 U	10 U
Cyanide		200	8 U	10 UJ	10	10	10 U	10 U
Iron		300	193	50 U	50 U	50 U	80	50 U
Lead		25	10 U	10 U	10 U	5 U	5 U	5 U
Magnesium		NC	78000	61000	66000	81000	71000	91000

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O'BRIEN & GERE
ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	URS-14D	URS-14D	URS-14D	URS-14D	URS-14D	URS-14D
	Sample Date		10/01/92	06/24/97	02/25/98	09/17/98	02/05/99	08/12/99
	Units	ug/l	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Manganese		300	27	10 U	10 U	10 U	10 U	10
Mercury		0 7	0.2 U	ND	ND	0.2 U	0.2 U	0 2 U
Nickel		100	5 U	50 U	50 U	50 U	50 U	50 U
Potassium		NC	3700	5000 U	5000 U	5000 U	5000 U	5000 U
Selenium		10	5 U	10 U	10 U	5 U	5 UJ	5 UJ
Sodium		20000	[38700]	[52000 J]	[49000]	[50000]	[48000]	[58000]
Thallium		NC	80 U	10 U	10 U	1 UJ	1 U	5 U
Vanadium		NC	5 U	50 U	50 U	50 U	50 U	50 U
Zinc		NC	10 U	10 U	10	10	10 U	10 U

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O'BRIEN & GERE ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

	Sample ID	NYS Class GA Water Quality	URS-14D	URS 14D	URS 14D	URS-14I	URS-14I	URS-14I
	Sample Date	Standards	02/08/00	08/10/00	02/13/01	02/01/91	10/01/92	06/26/97
	Units	ug/L	ug/L	ug/l	ug/l	ug/l	ug/L	ug/L
Compound								
VOCs								
1,1,1-Trichloroethane		5	0.5 U	0.5 U	0.29 J	5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane		5	0 5 U	0 5 U	0 5 U	5 U	0 5 U	0 5 U
1,1-Dichloroethane		5	0 5 U	0 5 U	0.5 U	5 U	0.5 U	0 5 U
1,2-Dichloroethene		5	NA	NA	NA	5 U	0 5 U	NA
2-Butanone (MEK)		NC	10 UJ	10 U	10 UJ	10 U	0.5 U	10 U
4-Methyl-2-pentanone (MIBK)		NC	5 UJ	5 U	5 U	10 U	0 5 U	5 U
Acetone		NC	10 UJ	10 UJ	10 UJ	10 U	0 5 U	10 U
Benzene		1	0 5 U	0 5 U	0 5 U	5 U	0 5 U	0 5 U
Bromodichloromethane		NC	0 5 U	0 5 U	0.5 U	5 U	0 5 U	0 5 U
Carbon disulfide		NC	6 7	0 5 UJ	1 8 U	5 U	0 5 U	0 5 U
Chlorobenzene		5	0.5 U	0 5 U	0 5 U	NA	NA	0 5 U
Chloroform		7	0 5 U	0 5 U	0 5 U	5 U	0 5 U	0 5 U
Dibromochloromethane		5	0 5 U	0 5 U	0 5 U	5 U	0 5 U	0 5 U
Ethylbenzene		5	0 5 U	0 5 U	0 5 U	5 U	0 5 U	0 5 U
Methylene chloride		5	2 U	5 U	2 U	5 U	0 5 U	0.5 U
Toluene		5	0 5 U	0 5 U	0 5 U	5 U	0 5 U	0 5 U
Trichloroethene		5	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0 5 U
Vinyl chloride		2	1 U	1 U	1 U	10 U	0 5 U	1 U
Xylene (total)		5	0 5 U	0 5 U	0 5 U	5 U	0 5 U	0 5 U
cis-1,2-Dichloroethene		5	0 5 U	0 5 U	0.5 U	NA	NA	0 5 U
Metals								
Aluminum		NC	100 U	100	100 U	7140	1170	1300
Antimony		3	5 U	5 U	5 U	26 U	80 U	10 U
Arsenic		25	5 U	5 U	5 U	7 2 B	10 U	10 U
Barium		1000	30	30	20 U	115 B	47	50
Beryllium		NC	3 U	3 U	3 U	1 2 B	1 U	ND
Cadmium		5	1 U	1 U	1 U	2 U	5 U	ND
Calcium		NC	310000	320000	260000	73900	35200	28000
Chromium		50	10 U	20	10	30 9	5 U	10 UJ
Cobalt		NC	25 U	20 U	25 U	5 8 B	5 U	30 U
Copper		200	10 U	10 U	10 U	18 5 B	8	10 U
Cyanide		200	10 U	10 U	10 U	10 U	2 U	10 UJ
Iron		300	50 U	[340]	110	[10400]	[2060]	[1800]
Lead		25	5 U	5 U	5 U	7 5	10 U	10 U
Magnesium		NC	83000	84000	74000	32800	22300	21000

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Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	URS-14D	URS 14D	URS-14D	URS-14I	URS 14I	URS 14I
	Sample Date		02/08/00	08/10/00	02/13/01	02/01/91	10/01/92	06/26/97
	Units	ug/L	ug/L	ug/l	ug/l	ug/L	ug/l	ug/L
Manganese		300	10 U	20 J	10	[484]	145	70
Mercury		0.7	0 2 U	0 2 U	0.2 U	0.2 U	0.2 U	ND
Nickel		100	50 U	50 U	50 U	30 4 B	5 U	50 U
Potassium		NC	5000 U	5000 U	5000 U	17100	5500	5000 UJ
Selenium		10	5 UJ	5 U	5 UJ	1 U	5 U	10 U
Sodium		20000	[47000]	[45000]	[35000]	[44700]	[42500]	[58000 J]
Thallium		NC	2 U	2 U	2 U	2 U	80 U	10 U
Vanadium		NC	50 U	50 U	50 U	16 1 B	5 U	50 U
Zinc		NC	10 U	10 U	10	52 3	10 U	10

NOTES: U - not detected, J,B - estimated value, R - unusable, NA - not analyzed, ND - not detected
E - estimated, N - tentatively identified, NC - no criteria
[ ] - exceeds standard

O'BRIEN & GERE ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	URS-14I	URS-14I	URS-14I	URS-14I	URS-14I	URS 14I
	Sample Date		02/25/98	09/17/98	02/05/99	08/13/99	02/09/00	08/11/00
	Units	ug/L	ug/l	ug/L	ug/L	ug/L	ug/L	ug/l
VOCs								
1,1,1-Trichloroethane		5	0.5 U	0 5 U	0 5 U	0 5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane		5	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U
1,1-Dichloroethane		5	0.5 U	0 5 U	0.5 U	0 5 U	0 5 U	0 5 U
1,2-Dichloroethene		5	NA	NA	NA	NA	NA	NA
2-Butanone (MEK)		NC	10 U	10 U	10 U	10 UJ	10 UJ	10 U
4-Methyl-2-pentanone (MIBK)		NC	5 U	5 U	5 U	5 U	5 UJ	5 U
Acetone		NC	10 UJ	10 UJ	10 U	10 UJ	10 UJ	10 UJ
Benzene		1	1	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U
Bromodichloromethane		NC	0.5 U	0 5 U	0.5 U	0 5 U	0.5 U	0.5 U
Carbon disulfide		NC	1 8 U	0 5 U	0 5 U	0 5 UJ	1 2	0 5 UJ
Chlorobenzene		5	0 81	0 5 U	0.5 U	0.5 U	0 5 U	0.5 U
Chloroform		7	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U
Dibromochloromethane		5	0 5 U	0.5 U	0.5 U	0.5 U	0 5 U	0.5 U
Ethylbenzene		5	0 13 J	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U
Methylene chloride		5	0 5 U	0.5 U	0 5 U	0 5 UJ	0 17 J	5 U
Toluene		5	0 15 J	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U
Trichloroethene		5	0.5 U	0.5 U	0 5 U	0.5 U	0.5 U	0 5 U
Vinyl chloride		2	1 U	1 U	1 U	1 U	1 U	1 U
Xylene (total)		5	0 5 U	0 5 U	0.5 U	0 5 U	0 5 U	0 5 U
cis-1,2-Dichloroethene		5	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U	0.5 U
Metals								
Aluminum		NC	400	100 U	300	100 U	100 U	100 U
Antimony		3	10 U	5 U	5 U	5 U	5 U	5 U
Arsenic		25	10 U	5 U	5	5 UJ	6	5 U
Barium		1000	40	40 J	40	50	50	60
Beryllium		NC	ND	3 U	3 U	3 U	3 U	3 U
Cadmium		5	ND	1 U	1 U	1 U	2	1 U
Calcium		NC	21000	23000	26000	30000	34000	32000
Chromium		50	[160]	10 U	10 U	10 U	10	10 U
Cobalt		NC	30 U	25 U	25 U	25 U	25 U	20 U
Copper		200	10	10 U	10 U	10 U	10 U	10 U
Cyanide		200	10 U	10 U	10 U	10 U	10 U	10 U
Iron		300	[2300]	50 U	[320]	50 U	50 U	50 U
Lead		25	10 U	5 U	5 U	5 U	5 U	5 U
Magnesium		NC	17000	21000	23000	25000	29000	26000

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O'BRIEN & GERE ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	URS-14I	URS-14I	URS-14I	URS-14I	URS-14I	URS-14I
	Sample Date		02/25/98	09/17/98	02/05/99	08/13/99	02/09/00	08/11/00
	Units	ug/L	ug/L	ug/L	ug/L	ug/l	ug/L	ug/L
Manganese		300	60	10 U	10 U	10 U	10 U	250 J
Mercury		0 7	ND	0 2 U	0 2 U	0 2 U	0.2 U	0.2 U
Nickel		100	[170]	50 U	50 U	50 U	50 U	50 U
Potassium		NC	25000	8000	6000	6000	5000 U	5000 U
Selenium		10	10 U	5 U	5 UJ	5 UJ	5 UJ	5 U
Sodium		20000	[48000]	[48000]	[54000]	[62000]	[67000]	[59000]
Thallium		NC	6	1 UJ	1 U	5 U	2 U	2 U
Vanadium		NC	50 U	50 U	50 U	50 U	50 U	50 U
Zinc		NC	30	10 U	10 U	30 J	20	10 U

NOTES: U - not detected, J,B - estimated value, R - unusable, NA - not analyzed, ND - not detected
E - estimated, N - tentatively identified, NC - no criteria
[ ] - exceeds standard

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File Number 5829 22038

O'BRIEN & GERE
ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Sample ID	NYS Class GA Water Quality	URS 14I	URS 5D	URS 5D	URS-5D	URS-5D	URS-5D
Sample Date	Standards	02/14/01	08/01/90	02/01/91	10/01/92	06/25/97	02/24/98
Units	ug/L	ug/L	ug/L	ug/l	ug/l	ug/l	ug/l
Compound							
VOCs							
1,1,1-Trichloroethane	5	0 5 U	10 U	5 U	0 5 U	0 5 U	0 5 U
1,1,2,2-Tetrachloroethane	5	0 5 U	10 U	5 U	0 5 U	0 5 U	0 5 U
1,1-Dichloroethane	5	0.5 U	10 U	5 U	0 5 U	0.5 U	0 5 U
1,2-Dichloroethene	5	NA	10 U	5 U	0 5 U	NA	NA
2-Butanone (MEK)	NC	10 UJ	20 U	0 R	0 5 U	10 U	10 U
4-Methyl-2-pentanone (MIBK)	NC	5 U	20 U	10 U	0 5 U	5 U	5 U
Acetone	NC	10 UJ	250	0 R	0 5 U	10 U	10 UJ
Benzene	1	0 5 U	10 U	5 U	1	0 5 U	0 25 J
Bromodichloromethane	NC	0 5 U	10 U	5 U	0.5 U	0.5 U	0.5 U
Carbon disulfide	NC	0 58 U	10 U	5 U	0 5 U	0 5 U	0 5 U
Chlorobenzene	5	0 5 U	NA	NA	NA	0.5 U	0 31 J
Chloroform	7	0 5 U	10 U	5 U	0 5 U	0 5 U	0 5 U
Dibromochloromethane	5	0 5 U	10 U	5 U	0.5 U	0 5 U	0 5 U
Ethylbenzene	5	0 5 U	10 U	5 U	0 5 U	0 5 U	0 32 J
Methylene chloride	5	2 U	10 U	0 R	0 5 U	0 5 U	0 5 U
Toluene	5	0 5 U	10 U	1 J	0 5 U	0 5 U	0 19 J
Trichloroethene	5	0.5 U	10 U	5 U	0 5 U	0 5 U	0.5 U
Vinyl chloride	2	1 U	20 U	10 U	0 5 U	1 U	1 U
Xylene (total)	5	0.5 U	10 U	0 5 J	0 5 U	0 5 U	1 5
cis-1,2-Dichloroethene	5	0 5 U	NA	NA	NA	0 5 U	0 5 U
Metals							
Aluminum	NC	200	104 U	35 U	100 U	100 U	100 U
Antimony	3	5 U	18 U	[31.5 B]	80 U	10 U	10 U
Arsenic	25	5 U	1 3 B	1 B	10 U	10 U	10 U
Barium	1000	50	224	71.7 B	32	20	20 U
Beryllium	NC	3 U	1 U	1 U	1 U	ND	ND
Cadmium	5	1 U	1 U	2 U	5 U	ND	ND
Calcium	NC	32000	378000	407000	387000	440000	300000
Chromium	50	10 U	3 B	4 U	5 U	10 U	10 U
Cobalt	NC	25 U	2 U	3 U	5 U	30 U	60
Copper	200	10 U	4 U	12 U	8	10 U	10 U
Cyanide	200	10 U	10 U	10 U	2 U	10 UJ	10 U
Iron	300	220	188	143	25	50 U	120
Lead	25	5 U	1 U	1 3 B	12	10 U	10 U
Magnesium	NC	25000	33300	2450 B	570000	100000	24000

NOTES: U - not detected, J,B - estimated value, R - unusable, NA - not analyzed, ND - not detected
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[ ] - exceeds standard

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O'BRIEN & GERE
ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

	Sample ID	NYS Class GA Water Quality	URS-14I	URS-5D	URS-5D	URS-5D	URS-5D	URS-5D
	Sample Date	Standards	02/14/01	08/01/90	02/01/91	10/01/92	06/25/97	02/24/98
	Units	ug/L	ug/l	ug/L	ug/L	ug/L	ug/L	ug/L
Compound								
Manganese		300	20	8 8 B	3 5 B	5 U	50	10
Mercury		0 7	0 2 U	0 2 U	0.2 U	0 2 U	ND	ND
Nickel		100	50 U	11 4 B	13 U	5 U	90	50 U
Potassium		NC	5000 U	22700	16900	8500	5000 U	5000 U
Selenium		10	5 UJ	2 U	1 U	5 U	10 U	10 U
Sodium		20000	[56000]	[192000]	[194000]	[114000]	[88000 J]	[93000]
Thallium		NC	2 U	1 U	2 U	80 U	10 U	10 U
Vanadium		NC	50 U	3 8 B	2 U	5 U	50 U	50 U
Zinc		NC	10	19 9 B	14 7 B	10 U	10 U	10

NOTES U - not detected, J,B - estimated value, R - unusable, NA - not analyzed, ND - not detected
E - estimated, N - tentatively identified, NC - no criteria
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O'BRIEN & GERE ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	URS-5D	URS-5D	URS-5D	URS-5D	URS-5D	URS-5D
	Sample Date		09/18/98	02/04/99	08/13/99	02/08/00	08/11/00	02/13/01
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/l
VOCs								
1,1,1-Trichloroethane		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethene		5	NA	NA	NA	NA	NA	NA
2-Butanone (MEK)		NC	10 U	10 U	10 UJ	10 UJ	10 U	10 UJ
4-Methyl-2-pentanone (MIBK)		NC	5 U	5 U	5 U	5 UJ	5 U	5 U
Acetone		NC	10 UJ	10 U	10 UJ	10 UJ	10 UJ	10 UJ
Benzene		1	0.11 J	0.5 U	0.16 J	0.5 U	0.5 U	0.5 U
Bromodichloromethane		NC	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon disulfide		NC	0.5 U	0.5 U	2.1 U	4.2	0.5 UJ	0.73 U
Chlorobenzene		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform		7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dibromochloromethane		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene chloride		5	0.5 U	0.5 U	0.5 U	2 U	5 U	2 U
Toluene		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride		2	1 U	1 U	1 U	1 U	1 U	1 U
Xylene (total)		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene		5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Metals								
Aluminum		NC	100 U	100 U	100 U	100 U	300	200
Antimony		3	5 U	5 U	5 U	5 U	5 U	5 U
Arsenic		25	5 U	5 U	5 UJ	5 U	5 U	5 U
Barium		1000	20 U	100 U	20	20 U	20	20
Beryllium		NC	3 U	10 U	3 U	3 U	3 U	3 U
Cadmium		5	1 U	10 U	1 U	1 U	1 U	1 U
Calcium		NC	490000	510000	490000	500000	430000	490000
Chromium		50	10 U	10 U	10 U	10 U	20	30
Cobalt		NC	210	850	350	59	50	130
Copper		200	10 U	10 U	10 U	10 U	10 U	10 U
Cyanide		200	10 U	10 U	10 U	10 U	10 U	10 U
Iron		300	50 U	50 U	50 U	50 U	[410]	[1000]
Lead		25	5 U	5 U	5 U	5 U	5 U	5 U
Magnesium		NC	87000	76000	93000	97000	52000	88000

NOTES U - not detected, J,B - estimated value, R - unusable, NA - not analyzed, ND - not detected
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O'BRIEN & GERE ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	URS-5D	URS-5D	URS-5D	URS-5D	URS-5D	URS-5D
	Sample Date		09/18/98	02/04/99	08/13/99	02/08/00	08/11/00	02/13/01
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Manganese		300	70	70	50	60	20 J	60
Mercury		0.7	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel		100	[180]	90	80	50	50 U	[170]
Potassium		NC	5000 U	5000	5000 U	5000 U	5000 U	5000 U
Selenium		10	5 U	5 UJ	5 UJ	5 UJ	5 U	5 UJ
Sodium		20000	[94000]	[120000]	[110000]	[120000]	[110000]	[97000]
Thallium		NC	1 UJ	1 U	5 U	2 U	2 U	2 U
Vanadium		NC	50 U	50 U	50 U	50 U	50 U	50 U
Zinc		NC	10 U	10 U	10 J	10	90	180

NOTES U - not detected, J,B - estimated value, R - unusable, NA - not analyzed, ND - not detected
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O'BRIEN & GERE
ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	URS-7D	URS-7D	URS-7D	URS-7D	URS-7D	URS-7D
	Sample Date		08/01/90	02/01/91	10/01/92	06/24/97	02/24/98	09/18/98
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/l
VOCs								
1,1,1-Trichloroethane		5	5 U	5 U	0.5 U	0.5 U	0.5 U	0 5 U
1,1,2,2-Tetrachloroethane		5	5 U	5 U	0 5 U	0 5 U	0 5 U	0 5 U
1,1-Dichloroethane		5	5 U	5 U	0.5 U	0.5 U	0.5 U	0 5 U
1,2-Dichloroethene		5	5 U	5 U	0 5 U	NA	NA	NA
2-Butanone (MEK)		NC	10 U	10 U	0.5 U	10 U	10 U	10 U
4-Methyl-2-pentanone (MIBK)		NC	10 U	10 U	0 5 U	5 U	5 U	5 U
Acetone		NC	120	0 R	0.5 U	10 U	10 UJ	61
Benzene		1	5 U	5 U	0 5 U	0 5 U	0 11 J	0 5 U
Bromodichloromethane		NC	5 U	5 U	0.5 U	0 5 U	0 5 U	0.5 U
Carbon disulfide		NC	0 5 J	5 U	0 5 U	0 5 U	0 24 U	0 5 U
Chlorobenzene		5	NA	NA	NA	0 5 U	0.5 U	0 5 U
Chloroform		7	5 U	5 U	0 5 U	0 5 U	0 5 U	0 5 U
Dibromochloromethane		5	5 U	5 U	0 5 U	0 5 U	0 5 U	0 5 U
Ethylbenzene		5	5 U	5 U	0 5 U	0 5 U	0 5 U	0 5 U
Methylene chloride		5	5 U	5 U	0.5 U	0.5 U	0 5 U	0 5 U
Toluene		5	5 U	5 U	0 5 U	0 5 U	0 5 U	0 5 U
Trichloroethene		5	5 U	5 U	0.5 U	0.5 U	0 5 U	0.5 U
Vinyl chloride		2	10 U	10 U	0 5 U	1 U	1 U	1 U
Xylene (total)		5	5 U	5 U	0 5 U	0.5 U	0 37 J	0 5 U
cis-1,2-Dichloroethene		5	NA	NA	NA	0 5 U	0 5 U	0 5 U
Metals								
Aluminum		NC	167 B	52 5 B	100 U	100 U	100 U	100 U
Antimony		3	[20 5 B]	[36.3 B]	80 U	10 U	10 U	5 U
Arsenic		25	1 U	1 U	10 U	10 U	10 U	5 U
Barium		1000	20.3 B	47.2 B	29	30	40	20 U
Beryllium		NC	1 U	1 U	1 U	ND	ND	3 U
Cadmium		5	1 U	2 U	5 U	ND	ND	1 U
Calcium		NC	277000	333000	403000	360000	300000	480000
Chromium		50	3 U	4 U	5 U	10 U	10 U	10
Cobalt		NC	2 U	3 U	5 U	30 U	30 U	25 U
Copper		200	4 U	12 U	8	10 U	10 U	10 U
Cyanide		200	10 U	10 U	2 U	10 UJ	10 U	10 U
Iron		300	[387]	283	63	50 U	70	50 U
Lead		25	1 U	1 U	10 U	10 U	10 U	5 U
Magnesium		NC	96200	115000	140000	120000	89000	140000

NOTES: U - not detected, J,B - estimated value, R - unusable, NA - not analyzed, ND - not detected
E - estimated N - tentatively identified NC - no criteria
[ ] - exceeds standard

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O'BRIEN & GERE
ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	URS 7D	URS-7D	URS-7D	URS-7D	URS-7D	URS-7D
	Sample Date		08/01/90	02/01/91	10/01/92	06/24/97	02/24/98	09/18/98
	Units	ug/L	ug/l	ug/L	ug/l	ug/L	ug/L	ug/L
Manganese		300	71 2	140	86	40	30	40
Mercury		0.7	0 2 U	0 2 U	0 2 U	ND	ND	0.2 U
Nickel		100	23 5 B	13 U	5 U	50 U	50 U	50 U
Potassium		NC	5990	8550	8300	5000	5000 U	6000
Selenium		10	2 U	1 U	5 U	10 U	10 U	5 U
Sodium		20000	[82700]	[68900]	[78900]	[66000 J]	[54000]	[79000]
Thallium		NC	1 U	2 U	80 U	10 U	10 U	1 UJ
Vanadium		NC	4 2 B	6 7 B	5 U	50 U	50 U	50 U
Zinc		NC	5 3 B	12 2 B	10 U	10 U	10 U	10 U

NOTES: U - not detected, J,B - estimated value, R - unusable, NA - not analyzed, ND - not detected
E - estimated, N - tentatively identified, NC - no criteria
[ ] - exceeds standard

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O'BRIEN & GERE
ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	URS-7D	URS-7D	URS-7D	URS-7D	URS-7D	URS-9D
	Sample Date		02/04/99	08/12/99	02/09/00	08/10/00	02/14/01	08/01/90
	Units	ug/L	ug/l	ug/l	ug/L	ug/L	ug/L	ug/L
VOCs								
1,1,1-Trichloroethane		5	0.5 U	0.5 U	0 5 U	0.5 U	0 5 U	5 U
1,1,2,2-Tetrachloroethane		5	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U	5 U
1,1-Dichloroethane		5	0.5 U	0 5 U	0.5 U	0.5 U	0.5 U	5 U
1,2-Dichloroethene		5	NA	NA	NA	NA	NA	5 U
2-Butanone (MEK)		NC	10 U	10 UJ	10 UJ	10 U	10 UJ	10 U
4-Methyl-2-pentanone (MIBK)		NC	5 U	5 U	5 UJ	5 U	5 U	10 U
Acetone		NC	6 J	10 UJ	10 UJ	10 UJ	10 UJ	9 R
Benzene		1	0.5 U	0 5 U	0 5 U	0 5 U	0 5 U	5 U
Bromodichloromethane		NC	0 5 U	0 5 U	0.5 U	0 5 U	0.5 U	4 J
Carbon disulfide		NC	1 3 J	3 U	5 2	0 5 UJ	0 86 U	5 U
Chlorobenzene		5	0 5 U	0 5 U	0 5 U	0 5 U	0.5 U	NA
Chloroform		7	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U	[8]
Dibromochloromethane		5	0 5 U	0 5 U	0.5 U	0 5 U	0 5 U	1 J
Ethylbenzene		5	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U	5 U
Methylene chloride		5	0 5 U	0 5 U	2 U	5 U	2 U	5 U
Toluene		5	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U	0 6 J
Trichloroethene		5	0 5 U	0 5 U	0.5 U	0.5 U	0 5 U	5 U
Vinyl chloride		2	1 U	1 U	1 U	1 U	1 U	10 U
Xylene (total)		5	0.5 U	0 5 U	0 5 U	0.5 U	0.5 U	5 U
cis-1,2-Dichloroethene		5	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U	NA
Metals								
Aluminum		NC	100 U	100 U	100	100 U	100	128
Antimony		3	5 U	5 U	5 U	5 U	5 U	18 U
Arsenic		25	5 U	5 UJ	5 U	5 U	5 U	1 6 B
Barium		1000	100 U	30	30	30	20	110 B
Beryllium		NC	10 U	3 U	3 U	3 U	3 U	1 U
Cadmium		5	10 U	1 U	1 U	1 U	1 U	1 U
Calcium		NC	400000	470000	420000	480000	450000	56500
Chromium		50	10	10 U	10	20	20	3 U
Cobalt		NC	50 U	25 U	25 U	20 U	25 U	2 U
Copper		200	10 U	10 U	10 U	10 U	10 U	5 2 B
Cyanide		200	10 U	10 U	10 U	10 U	10 U	10 U
Iron		300	100	50 U	180	170 J	240	127
Lead		25	5 U	5 U	5 U	5 U	5 U	1 U
Magnesium		NC	130000	140000	140000	150000	140000	29900

NOTES: U - not detected, J,B - estimated value, R - unusable, NA - not analyzed, ND - not detected
E - estimated, N - tentatively identified, NC - no criteria
[ ] - exceeds standard

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O'BRIEN & GERE ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	URS 7D	URS 7D	URS 7D	URS-7D	URS-7D	URS-9D
	Sample Date		02/04/99	08/12/99	02/09/00	08/10/00	02/14/01	08/01/90
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Manganese		300	50	50	70	50 J	140	20 1
Mercury		0.7	0 2 U	0 2 U	0.2 U	0.3 J	0 2 U	0 2 U
Nickel		100	50 U	50 U	50 U	50 U	50 U	15 3 B
Potassium		NC	5000 U	6000	5000 U	5000	5000	9880
Selenium		10	5 UJ	5 UJ	5 UJ	5 U	5 UJ	2 U
Sodium		20000	[74000]	[81000]	[68000]	[78000]	[69000]	[27400]
Thallium		NC	1 U	5 U	2 U	2 U	2 U	1 U
Vanadium		NC	50 U	50 U	50 U	50 U	50 U	10 7 B
Zinc		NC	10 U	10 U	10 U	10 U	10 U	50 5

NOTES: U - not detected, J,B - estimated value, R - unusable, NA - not analyzed, ND - not detected
E - estimated N - tentatively identified NC - no criteria
[ ] - exceeds standard

O'BRIEN & GERE ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	URS-9D	URS 9D	URS-9D	URS-9D	URS-9D	URS-9D
	Sample Date		02/01/91	10/01/92	06/24/97	02/23/98	09/18/98	02/03/99
	Units	ug/L	ug/L	ug/l	ug/L	ug/L	ug/L	ug/L
VOCs								
1,1,1-Trichloroethane		5	5 U	0 5 U	0 5 U	0 5 U	0 5 U	0.5 U
1,1,2,2-Tetrachloroethane		5	5 U	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U
1,1-Dichloroethane		5	5 U	0 7	0 37 J	0 34 J	0 17 J	0 16 JN
1,2-Dichloroethene		5	5 U	1	NA	NA	NA	NA
2-Butanone (MEK)		NC	6 J	0.5 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (MIBK)		NC	10 U	0 5 U	5 U	5 U	5 U	5 U
Acetone		NC	0 R	0.5 U	10 U	10 UJ	10 U	10 U
Benzene		1	5 U	0 5 U	0 5 U	[1 9]	0 5 U	0 5 U
Bromodichloromethane		NC	5 U	0 5 U	0 5 U	0.5 U	0.5 U	0 5 U
Carbon disulfide		NC	5 U	0 5 U	0 5 U	0 35 U	0 5 U	0 5 U
Chlorobenzene		5	NA	NA	0.5 U	0.79	0 5 U	0 5 U
Chloroform		7	5 U	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U
Dibromochloromethane		5	5 U	0 5 U	0 5 U	0.5 U	0 5 U	0 5 U
Ethylbenzene		5	5 U	0 5 U	0 5 U	0 44 J	0 5 U	0 5 U
Methylene chloride		5	5 U	2	0.5 U	0 5 U	0 5 U	0 5 U
Toluene		5	5 U	0 5 U	0 5 U	0 51	0 5 U	0 5 U
Trichloroethene		5	5 U	0 6	0.36 J	0 24 J	0.2 J	0 21 J
Vinyl chloride		2	10 U	0 5 U	0 26 J	0 44 J	0 11 NJ	1 U
Xylene (total)		5	5 U	0 5 U	0.5 U	1 8	0.5 U	0 5 U
cis-1,2-Dichloroethene		5	NA	NA	0 66	0 59	0 33 J	0 35 J
Metals								
Aluminum		NC	64 2 B	100 U	100 U	100 U	100 U	100 U
Antimony		3	[28 B]	80 U	10 U	10 U	5 U	5 U
Arsenic		25	1 U	10 U	10 U	10 U	5 U	5 U
Barium		1000	38.2 B	23	20 U	20 U	20 U	20 U
Beryllium		NC	1 U	1 U	ND	ND	3 U	3 U
Cadmium		5	2 U	5 U	ND	ND	1 U	1 U
Calcium		NC	146000	120000	200000	190000	190000	200000
Chromium		50	4 U	5 U	10 U	10 U	10	10 U
Cobalt		NC	3 U	5 U	30 U	30 U	25 U	25 U
Copper		200	12 U	5 U	10 U	10 U	10 U	10 U
Cyanide		200	11 1 B	2 U	10 UJ	10 U	10 U	10 U
Iron		300	[506]	252	50 U	70	80	70
Lead		25	1 U	10 U	10 U	10 U	5 U	5 U
Magnesium		NC	70200	60000	58000	73000	71000	72000

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File Number 5829 22038

O'BRIEN & GERE
ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	URS-9D	URS 9D	URS-9D	URS-9D	URS-9D	URS-9D
	Sample Date		02/01/91	10/01/92	06/24/97	02/23/98	09/18/98	02/03/99
	Units	ug/L	ug/L	ug/L	ug/L	ug/l	ug/L	ug/L
Manganese		300	25 5	9	10 U	10 U	10	10
Mercury		0 7	0 2 U	0 2 U	ND	ND	0.2 U	0.2 U
Nickel		100	13 U	5 U	50 U	50 U	50 U	50 U
Potassium		NC	4170 B	3600	5000 U	5000 U	5000 U	5000 U
Selenium		10	1 U	5 U	10 U	10 U	5 U	5 UJ
Sodium		20000	[37000]	[42800]	[48000 J]	[52000]	[41000]	[38000]
Thallium		NC	2 U	80 U	10 U	14	1 UJ	1 U
Vanadium		NC	2 U	5 U	50 U	50 U	50 U	50 U
Zinc		NC	16 7 B	10 U	10 U	10 U	10 U	10 U

NOTES U - not detected, J,B - estimated value, R - unusable, NA - not analyzed, ND - not detected
E - estimated, N - tentatively identified, NC - no criteria
[ ] - exceeds standard

O'BRIEN & GERE ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	URS-9D	URS-9D	URS-9D	URS-9D	URS-9I	URS-9I
	Sample Date		08/12/99	02/08/00	08/11/00	02/13/01	08/01/90	02/01/91
	Units	ug/l	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
VOCs								
1,1,1-Trichloroethane		5	0.5 U	0 5 U	0 5 U	0.28 J	5 U	5 U
1,1,2,2-Tetrachloroethane		5	0 5 U	0 5 U	0 5 U	0 5 U	5 U	5 U
1,1-Dichloroethane		5	0.15 J	0 14 J	0 14 J	0 12 J	5 U	5 U
1,2-Dichloroethene		5	NA	NA	NA	NA	5 U	5 U
2-Butanone (MEK)		NC	10 UJ	10 UJ	10 U	10 UJ	10 U	2 J
4-Methyl-2-pentanone (MIBK)		NC	5 U	5 UJ	5 U	5 U	10 U	10 U
Acetone		NC	10 UJ	10 UJ	10 UJ	10 UJ	0 R	0 R
Benzene		1	0 5 U	0 5 U	0 5 U	0 5 U	5 U	5 U
Bromodichloromethane		NC	0 5 U	0 5 U	0.5 U	0.5 U	5 U	5 U
Carbon disulfide		NC	0 5 U	16	0 5 UJ	1 2 U	5 U	5 U
Chlorobenzene		5	0.5 U	0 5 U	0 5 U	0.5 U	NA	NA
Chloroform		7	0 5 U	0 5 U	0 5 U	0 5 U	5 U	5 U
Dibromochloromethane		5	0 5 U	0 5 U	0 5 U	0 5 U	5 U	5 U
Ethylbenzene		5	0 5 U	0 5 U	0 5 U	0 5 U	5 U	5 U
Methylene chloride		5	0 5 U	2 U	5 U	2 U	5 U	5 U
Toluene		5	0 5 U	0 5 U	0 5 U	0 5 U	0 7 J	5 U
Trichloroethene		5	0.14 J	0 5 U	0.5 U	0 13 J	5 U	5 U
Vinyl chloride		2	1 U	1 U	1 U	1 U	10 U	10 U
Xylene (total)		5	0 5 U	0 5 U	0.5 U	0 5 U	5 U	5 U
cis-1,2-Dichloroethene		5	0 29 J	0 25 J	0 23 J	0 2 J	NA	NA
Metals								
Aluminum		NC	100 U	100 U	100 U	100 U	221	197
Antimony		3	5 U	5 U	5 U	5 U	18 U	26 U
Arsenic		25	5 UJ	5 U	5 U	5 U	1 7 B	1 U
Barium		1000	20 U	20 U	20 U	20 U	30.1 B	22.8 B
Beryllium		NC	3 U	3 U	3 U	3 U	1 U	1 U
Cadmium		5	1 U	1 U	1 U	1 U	1 U	2 U
Calcium		NC	210000	220000	210000	200000	106000	143000
Chromium		50	10 U	10 U	20	30	8 6 B	10.1
Cobalt		NC	25 U	25 U	20 U	25 U	2 U	3 U
Copper		200	10 U	10 U	10 U	10 U	12 7 B	12 U
Cyanide		200	10 U	10 U	10 U	10 U	10 U	10 5 U
Iron		300	60	50	220	200	[1020]	[1170]
Lead		25	5 U	5 U	5 U	5 U	1 U	1 B
Magnesium		NC	77000	78000	75000	70000	54500	71300

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O'BRIEN & GERE
ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	URS 9D	URS-9D	URS-9D	URS-9D	URS 9I	URS 9I
	Sample Date		08/12/99	02/08/00	08/11/00	02/13/01	08/01/90	02/01/91
	Units	ug/L	ug/l	ug/L	ug/l	ug/l	ug/L	ug/L
Manganese		300	10	10	10 J	10	67 5	80
Mercury		0.7	0 2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel		100	50 U	50 U	50 U	50 U	7 6 B	13 U
Potassium		NC	5000 U	5000 U	5000 U	5000 U	3910 B	4250 B
Selenium		10	5 UJ	5 UJ	5 U	5 UJ	2 U	1 U
Sodium		20000	[52000]	[48000]	[45000]	[38000]	[34500]	[54000]
Thallium		NC	5 U	2 U	2 U	2 U	1 U	2 U
Vanadium		NC	50 U	50 U	50 U	50 U	2 U	9.6 B
Zinc		NC	10 U	10 U	10 U	10 U	19 3 B	34 6

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O'BRIEN & GERE ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	URS-91	URS-91	URS-91	URS-91	URS-91	URS-91
	Sample Date		10/01/92	06/24/97	02/23/98	09/18/98	02/03/99	08/12/99
	Units	ug/l	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
VOCs								
1,1,1-Trichloroethane		5	0.5 U	0 5 U	0 5 U	0 5 U	0.5 U	0.5 UJ
1,1,2,2-Tetrachloroethane		5	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U	0 5 UJ
1,1-Dichloroethane		5	0.5 U	0 5 U	0 5 U	0 5 U	0 5 U	0 5 UJ
1,2-Dichloroethene		5	0 5 U	NA	NA	NA	NA	NA
2-Butanone (MEK)		NC	0 5 U	10 U	10 U	10 U	10 U	10 UJ
4-Methyl-2-pentanone (MIBK)		NC	0 5 U	5 U	5 U	5 U	5 U	5 UJ
Acetone		NC	0 5 U	10 U	10 UJ	10 UJ	10 U	10 UJ
Benzene		1	0 5 U	0 12 J	0 29 J	0 5 U	0 5 U	0 5 UJ
Bromodichloromethane		NC	0.5 U	0 5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
Carbon disulfide		NC	0 5 U	0 5 U	0 16 U	0 13 J	0 5 U	6 3 UJ
Chlorobenzene		5	NA	0 5 U	0.2 J	0.5 U	0.5 U	0 5 UJ
Chloroform		7	0 5 U	0 5 U	0 5 U	0 5 U	0 5 U	0 5 UJ
Dibromochloromethane		5	0 5 U	0.5 U	0 5 U	0.5 U	0 5 U	0.5 UJ
Ethylbenzene		5	0 5 U	0 5 U	0 14 J	0 5 U	0 5 U	0 5 UJ
Methylene chloride		5	0 5 U	0.5 U	0 5 U	0 5 U	0 5 U	0 55 UJ
Toluene		5	0 5 U	0 5 U	0 11 J	0 5 U	0 5 U	0 16 J
Trichloroethene		5	0.5 U	0 5 U	0.5 U	0 5 U	0.5 U	0 5 UJ
Vinyl chloride		2	0 5 U	1 U	1 U	1 U	1 U	1 UJ
Xylene (total)		5	0.5 U	0 29 J	0.54	0.5 U	0.5 U	0 5 UJ
cis-1,2-Dichloroethene		5	NA	0 5 U	0 5 U	0 5 U	0 5 U	0 5 UJ
Metals								
Aluminum		NC	110	100 U	100 U	100 U	200	100 U
Antimony		3	80 U	10 U	10 U	5 U	5 U	5 U
Arsenic		25	10 U	10 U	10 U	5 U	5 U	5 UJ
Barium		1000	14	30	20 U	20 U	20 U	20 U
Beryllium		NC	1 U	ND	ND	3 U	3 U	3 U
Cadmium		5	5 U	ND	ND	1 U	1 U	1 U
Calcium		NC	123	170000	150000	160000	160000	160000
Chromium		50	5 U	10 U	10 U	10	10	10 U
Cobalt		NC	5 U	30 U	30 U	25 U	25 U	25 U
Copper		200	5 U	10 U	10 U	10 U	10 U	10 U
Cyanide		200	2 U	10 UJ	10 U	10 U	10 U	10 U
Iron		300	[808]	[460]	[440]	290	[590]	240
Lead		25	10 U	10 U	10 U	5 U	5 U	5 U
Magnesium		NC	63500	70000	69000	77000	70000	75000

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O'BRIEN & GERE
ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	URS-91	URS-91	URS-91	URS-91	URS-91	URS-91
	Sample Date		10/01/92	06/24/97	02/23/98	09/18/98	02/03/99	08/12/99
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Manganese		300	75	50	30	40	50	40
Mercury		0.7	0.2 U	ND	ND	0.2 U	0.2 U	0.2 U
Nickel		100	5 U	50 U	50 U	50 U	50 U	50 U
Potassium		NC	2900	5000 U	5000 U	5000 U	5000 U	5000 U
Selenium		10	5 U	10 U	10 U	5 U	5 UJ	5 UJ
Sodium		20000	[52400]	[43000 J]	[45000]	[49000]	[39000]	[54000]
Thallium		NC	80 U	10 U	10	1 UJ	1 U	5 U
Vanadium		NC	5 U	50 U	50 U	50 U	50 U	50 U
Zinc		NC	10 U	10 U	10 U	20	10 U	10 J

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O'BRIEN & GERE
ENGINEERS, INC.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	URS-91	URS-91	URS-91
	Sample Date		02/08/00	08/11/00	02/13/01
	Units	ug/L	ug/L	ug/l	ug/L
VOCs					
1,1,1-Trichloroethane		5	0 5 U	0 5 U	0.5 U
1,1,2,2-Tetrachloroethane		5	0 5 U	0 5 U	0 5 U
1,1-Dichloroethane		5	0 5 U	0 5 U	0.5 U
1,2-Dichloroethene		5	NA	NA	NA
2-Butanone (MEK)		NC	10 UJ	10 U	10 UJ
4-Methyl-2-pentanone (MIBK)		NC	5 UJ	5 U	5 U
Acetone		NC	10 UJ	10 UJ	10 UJ
Benzene		1	0 5 U	0 5 U	0 5 U
Bromodichloromethane		NC	0.5 U	0.5 U	0.5 U
Carbon disulfide		NC	8 5	0 5 UJ	0 68 U
Chlorobenzene		5	0 5 U	0 5 U	0.5 U
Chloroform		7	0 5 U	0 5 U	0 5 U
Dibromochloromethane		5	0 5 U	0 5 U	0 5 U
Ethylbenzene		5	0 5 U	0 5 U	0 5 U
Methylene chloride		5	2 U	5 U	2 U
Toluene		5	0 5 U	0 5 U	0 5 U
Trichloroethene		5	0.5 U	0 5 U	0.5 U
Vinyl chloride		2	1 U	1 U	1 U
Xylene (total)		5	0.5 U	0 5 U	0.5 U
cis-1,2-Dichloroethene		5	0 5 U	0 5 U	0 5 U
Metals					
Aluminum		NC	200	100 U	100 U
Antimony		3	5 U	5 U	5 U
Arsenic		25	5 U	5 U	5 U
Barium		1000	20 U	20 U	20 U
Beryllium		NC	3 U	3 U	3 U
Cadmium		5	1 U	1 U	1 U
Calcium		NC	170000	160000	150000
Chromium		50	10 U	10 U	10 U
Cobalt		NC	25 U	20 U	25 U
Copper		200	10 U	10 U	10 U
Cyanide		200	10 U	10 U	10 U
Iron		300	[520]	210	[390]
Lead		25	5 U	5 U	5 U
Magnesium		NC	76000	75000	69000

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O'BRIEN & GERE
ENGINEERS, INC

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
March 2001

Compound	Sample ID	NYS Class GA Water Quality Standards	URS-9I	URS-9I	URS 9I
	Sample Date		02/08/00	08/11/00	02/13/01
	Units	ug/L	ug/L	ug/L	ug/L
Manganese		300	50	40 J	40
Mercury		0.7	0.2 U	0.2 U	0.2 U
Nickel		100	50 U	50 U	50 U
Potassium		NC	5000 U	5000 U	5000 U
Selenium		10	5 UJ	5 U	5 UJ
Sodium		20000	[48000]	[48000]	[41000]
Thallium		NC	2 U	2 U	2 U
Vanadium		NC	50 U	50 U	50 U
Zinc		NC	10 U	10 U	10 U

NOTES: U - not detected, J,B - estimated value R - unusable, NA - not analyzed, ND - not detected
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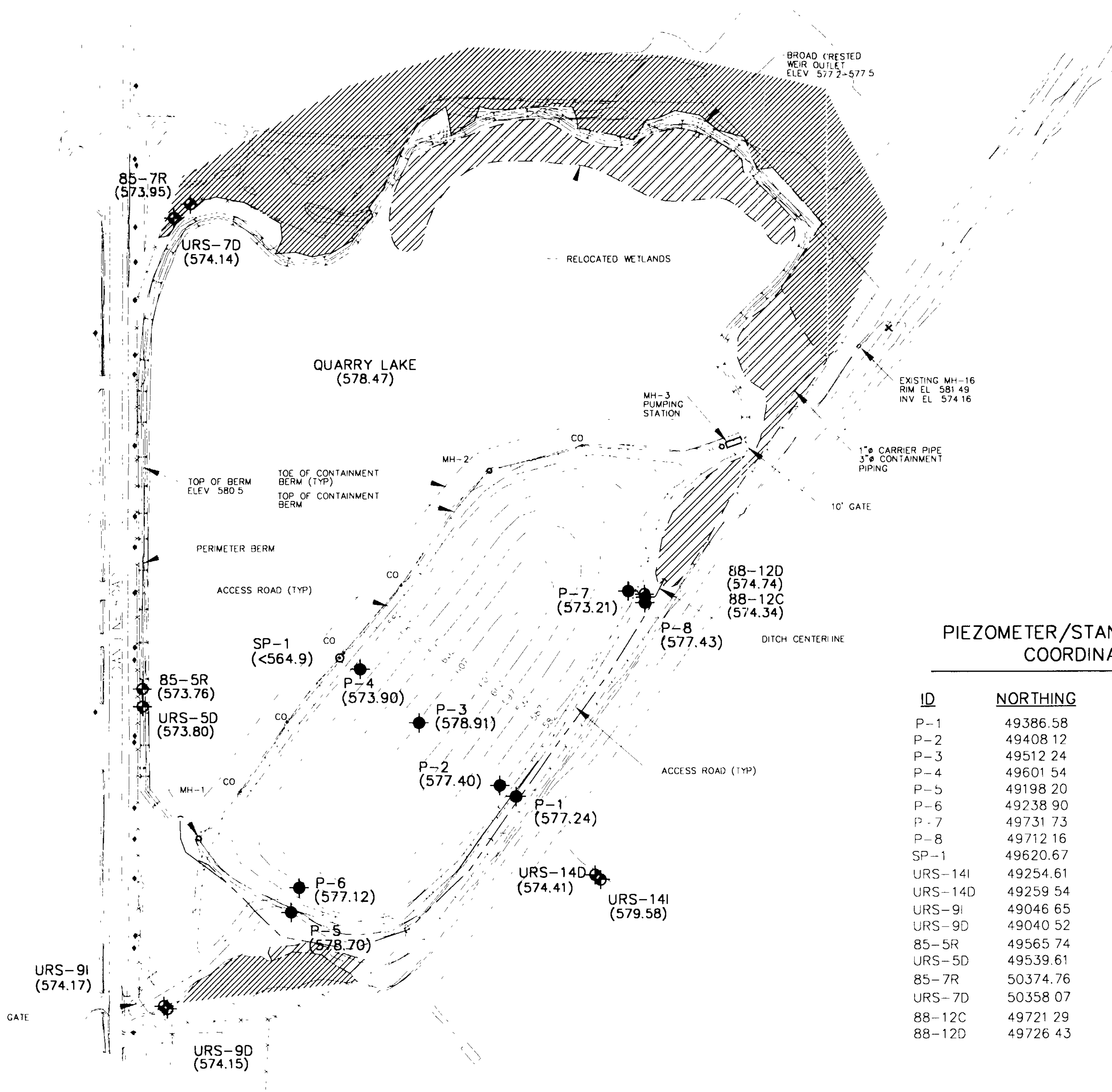
File Number 5829 22038

FIGURES

FIGURE 1



PIEZOMETER/STANDPIPE AND MONITORING WELL COORDINATES AND ELEVATIONS

ID	NORTHING	EASTING	RISER	COVER
P–1	49386.58	100656 87	583 21	583 30
P–2	49408 12	100630 30	582 90	583 20
P–3	49512 24	100496 39	606 33	606 64
P–4	49601 54	100399 33	583.68	583 85
P–5	49198 20	100282 65	583 05	583 55
P–6	49238 90	100296 52	584 45	584 60
P–7	49731 73	100842 30	581 84	582 00
P–8	49712 16	100869 82	582 83	583 00
SP–1	49620.67	100365 59	579 86	580 07
URS–14I	49254.61	100794 43	581 14	580 84
URS–14D	49259 54	100789 09	580 71	580 85
URS–9I	49046 65	100075 10	581 68	579 90
URS–9D	49040 52	100076.81	580 80	579 00
85–5R	49565 74	100036.14	580 84	578 70
URS–5D	49539.61	100035.69	580 60	578 00
85–7R	50374.76	100115 55	577 90	576 60
URS–7D	50358 07	100095 40	579 35	576 50
88–12C	49721 29	100870.45	583 12	583 70
88–12D	49726 43	100869 13	582 87	583 28

LEGEND

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

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

HYDRAULIC POTENTIAL MAP (FEBRUARY 12, 2001)

200 0 200
SCALE IN FEET

FILE NO 5829 27084 001
DATE· MARCH 2001

O'BRIEN & GERE ENGINEERS INC

MWH I\DIV71\PROJECTS\5829\27084\DWG\7\GC' DWG SF ' (7 DC)

PLOT DATE 03/09/01 MTW

APPENDICES

Appendix A

Piezometer/monitoring well inspection forms

MONITORING WELL INTEGRITY CHECKLIST

Site Name: Frontier Chemical, Pendelton NY Well Identification : P-1

Personnel : TPP/DEC Date : 2/12/01

WELL SPECIFICATIONS

Protective Casing	Above Ground	Flush Mounted
Well Construction	PVC	Stainless Steel
Well Diameter	2-inch	4-inch
Depth to Ground Water :	597	
Well Depth:	1642	

WELL INTEGRITY

1. Well identification clearly marked ?	yes	no
2. Well covers and locks in good condition and secure ?	yes	no
3. Is the well stand pipe vertically aligned and secure ?	yes	no
4. Is the concrete pad and surface seal in good condition ?	yes	no
5. Are soils surrounding the well pad eroded ?	yes	no
6. Is the well casing in good condition ?	yes	no
7. Is the measuring point on casing well marked ?	yes	no
8. Is there standing water in the annular space ?	yes	no
9. Is the stand pipe vented at the base to allow drainage ?	yes	no
10. Does the total sounded depth correspond to the original well completion depth?	yes	no
11. Is the access down the well impeded or blocked? Explain.	yes	no

COMMENTS/RECOMMENDATIONS:

MONITORING WELL INTEGRITY CHECKLIST

Site Name: Frontier Chemical, Pendelton NY Well Identification : P-2

Personnel : TPP/DEC Date : 2/12/01

WELL SPECIFICATIONS

Protective Casing	Above Ground	Flush Mounted
Well Construction	PVC	Stainless Steel
Well Diameter	2-inch	4-inch
Depth to Ground Water :	550	
Well Depth:	1572	

WELL INTEGRITY

1. Well identification clearly marked ?	(yes)	no	
2. Well covers and locks in good condition and secure ?	(yes)	no	
3. Is the well stand pipe vertically aligned and secure ?	(yes)	no	N/A
4. Is the concrete pad and surface seal in good condition ?	(yes)	no	
5. Are soils surrounding the well pad eroded ?	yes	(no)	
6. Is the well casing in good condition ?	(yes)	no	
7. Is the measuring point on casing well marked ?	(yes)	no	
8. Is there standing water in the annular space ?	yes	(no)	
9. Is the stand pipe vented at the base to allow drainage ?	yes	no	N/A
10. Does the total sounded depth correspond to the original well completion depth?	(yes)	no	
11. Is the access down the well impeded or blocked? Explain.	yes	(no)	

COMMENTS/RECOMMENDATIONS:

MONITORING WELL INTEGRITY CHECKLIST

Site Name: Frontier Chemical, Pendelton NY Well Identification : P-3

Personnel : TPP/DEC Date : 2/12/01

WELL SPECIFICATIONS

Protective Casing	Above Ground	Flush Mounted
Well Construction	PVC	Stainless Steel
Well Diameter	2-inch	4-inch
Depth to Ground Water :	27.42	
Well Depth:	39.77	

WELL INTEGRITY

1. Well identification clearly marked ?	yes	no	
2. Well covers and locks in good condition and secure ?	yes	no	
3. Is the well stand pipe vertically aligned and secure ?	yes	no	
4. Is the concrete pad and surface seal in good condition ?	yes	no	
5. Are soils surrounding the well pad eroded ?	yes	no	
6. Is the well casing in good condition ?	yes	no	
7. Is the measuring point on casing well marked ?	yes	no	
8. Is there standing water in the annular space ?	yes	no	
9. Is the stand pipe vented at the base to allow drainage ?	yes	no	N/A
10. Does the total sounded depth correspond to the original well completion depth?	yes	no	
11. Is the access down the well impeded or blocked? Explain.	yes	no	

COMMENTS/RECOMMENDATIONS:

MONITORING WELL INTEGRITY CHECKLIST

Site Name: Frontier Chemical, Pendelton NY Well Identification : P-4

Personnel : TPP/DEC Date : 2/12/01

WELL SPECIFICATIONS

Protective Casing	Above Ground	(Flush Mounted)
Well Construction	(PVC)	Stainless Steel
Well Diameter	(2-inch)	4-inch
Depth to Ground Water :	34'	
Well Depth:	116.92'	

WELL INTEGRITY

1. Well identification clearly marked ?	(yes)	no	
2. Well covers and locks in good condition and secure ?	(yes)	no	
3. Is the well stand pipe vertically aligned and secure ?	(yes)	no	N/A
4. Is the concrete pad and surface seal in good condition ?	(yes)	no	
5. Are soils surrounding the well pad eroded ?	yes	(no)	
6. Is the well casing in good condition ?	(yes)	no	
7. Is the measuring point on casing well marked ?	(yes)	no	
8. Is there standing water in the annular space ?	yes	(no)	
9. Is the stand pipe vented at the base to allow drainage ?	yes	no	N/A
10. Does the total sounded depth correspond to the original well completion depth?	(yes)	no	
11. Is the access down the well impeded or blocked? Explain.	yes	(no)	

COMMENTS/RECOMMENDATIONS:

MONITORING WELL INTEGRITY CHECKLIST

Site Name: Frontier Chemical, Pendelton NY Well Identification : SP-1

Personnel : TPP/DEC Date : 2/12/01

WELL SPECIFICATIONS

Protective Casing	Above Ground	(Flush Mounted)	
Well Construction	PVC	Stainless Steel	HDPE
Well Diameter	2-inch	4-inch	6" ϕ
Depth to Ground Water :	DRY		
Well Depth:	12.20		

WELL INTEGRITY

1. Well identification clearly marked ?	(yes)	no
2. Well covers and locks in good condition and secure ?	(yes)	no
3. Is the well stand pipe vertically aligned and secure ?	(yes)	no
4. Is the concrete pad and surface seal in good condition ?	(yes)	no
5. Are soils surrounding the well pad eroded ?	yes	(no)
6. Is the well casing in good condition ?	(yes)	no
7. Is the measuring point on casing well marked ?	(yes)	no
8. Is there standing water in the annular space ?	yes	(no)
9. Is the stand pipe vented at the base to allow drainage ?	(yes)	no
10. Does the total sounded depth correspond to the original well completion depth?	yes	(no)
11. Is the access down the well impeded or blocked? Explain.	yes	(no)

COMMENTS/RECOMMENDATIONS:

The well depth was noted to be 2.7 ft less than previously measured. On March 28, 2001 the depth was remeasured and found to be 14.9 ft consistent with previous monitoring. The remeasurement indicated a lip near bottom of SP-1 at depth of 12.2 ft accounting for errant initial measurement.

MONITORING WELL INTEGRITY CHECKLIST

Site Name: Frontier Chemical, Pendelton NY Well Identification : P-5

Personnel : TPP/DEC Date : 2/12/01

WELL SPECIFICATIONS

Protective Casing	(Above Ground)	Flush Mounted
Well Construction	(PVC)	Stainless Steel
Well Diameter	(2-inch)	4-inch
Depth to Ground Water :	4.35	
Well Depth:	15.56	

WELL INTEGRITY

1. Well identification clearly marked ?	(yes)	no
2. Well covers and locks in good condition and secure ?	(yes)	no
3. Is the well stand pipe vertically aligned and secure ?	(yes)	no
4. Is the concrete pad and surface seal in good condition ?	(yes)	no
5. Are soils surrounding the well pad eroded ?	yes	(no)
6. Is the well casing in good condition ?	(yes)	no
7. Is the measuring point on casing well marked ?	(yes)	no
8. Is there standing water in the annular space ?	yes	(no)
9. Is the stand pipe vented at the base to allow drainage ?	(yes)	no
10. Does the total sounded depth correspond to the original well completion depth?	(yes)	no
11. Is the access down the well impeded or blocked? Explain.	yes	(no)

COMMENTS/RECOMMENDATIONS:

MONITORING WELL INTEGRITY CHECKLIST

Site Name: Frontier Chemical, Pendelton NY Well Identification : P-6

Personnel : TPP/DEC Date : 2/12/01

WELL SPECIFICATIONS

Protective Casing	Above Ground	(Flush Mounted)
Well Construction	(PVC)	Stainless Steel
Well Diameter	(2-inch)	4-inch
Depth to Ground Water :	7.33	
Well Depth:	16.16	

WELL INTEGRITY

1. Well identification clearly marked ?	(yes)	no
2. Well covers and locks in good condition and secure ?	(yes)	no
3. Is the well stand pipe vertically aligned and secure ?	yes	(no)
4. Is the concrete pad and surface seal in good condition ?	(yes)	no
5. Are soils surrounding the well pad eroded ?	yes	(no)
6. Is the well casing in good condition ?	(yes)	no
7. Is the measuring point on casing well marked ?	(yes)	no
8. Is there standing water in the annular space ?	yes	(no)
9. Is the stand pipe vented at the base to allow drainage ?	yes	no N/A
10. Does the total sounded depth correspond to the original well completion depth?	(yes)	no
11. Is the access down the well impeded or blocked? Explain.	yes	(no)

COMMENTS/RECOMMENDATIONS:

PVC well casing has 15°+/- angle from installation

MONITORING WELL INTEGRITY CHECKLIST

Site Name: Frontier Chemical, Pendelton NY Well Identification : P-7

Personnel : TPP/DEC Date : 2/12/01

WELL SPECIFICATIONS

Protective Casing	Above Ground	Flush Mounted
Well Construction	PVC	Stainless Steel
Well Diameter	2-inch	4-inch
Depth to Ground Water :	7.76	
Well Depth:	10.05	

WELL INTEGRITY

1. Well identification clearly marked ?	yes	no	
2. Well covers and locks in good condition and secure ?	yes	no	
3. Is the well stand pipe vertically aligned and secure ?	yes	no	N/A
4. Is the concrete pad and surface seal in good condition ?	yes	no	
5. Are soils surrounding the well pad eroded ?	yes	no	
6. Is the well casing in good condition ?	yes	no	
7. Is the measuring point on casing well marked ?	yes	no	
8. Is there standing water in the annular space ?	yes	no	
9. Is the stand pipe vented at the base to allow drainage ?	yes	no	N/A
10. Does the total sounded depth correspond to the original well completion depth?	yes	no	
11. Is the access down the well impeded or blocked? Explain.	yes	no	

COMMENTS/RECOMMENDATIONS:

MONITORING WELL INTEGRITY CHECKLIST

Site Name: Frontier Chemical, Pendelton NY Well Identification : P-8

Personnel : TPP/DEC Date : 2/12/01

WELL SPECIFICATIONS

Protective Casing	Above Ground	Flush Mounted
Well Construction	PVC	Stainless Steel
Well Diameter	2-inch	4-inch
Depth to Ground Water :	5.40	
Well Depth:	17.22	

WELL INTEGRITY

1. Well identification clearly marked ?	yes	no
2. Well covers and locks in good condition and secure ?	yes	no
3. Is the well stand pipe vertically aligned and secure ?	yes	no
4. Is the concrete pad and surface seal in good condition ?	yes	no
5. Are soils surrounding the well pad eroded ?	yes	no
6. Is the well casing in good condition ?	yes	no
7. Is the measuring point on casing well marked ?	yes	no
8. Is there standing water in the annular space ?	yes	no
9. Is the stand pipe vented at the base to allow drainage ?	yes	no
10. Does the total sounded depth correspond to the original well completion depth?	yes	no
11. Is the access down the well impeded or blocked? Explain.	yes	no

COMMENTS/RECOMMENDATIONS:

MONITORING WELL INTEGRITY CHECKLIST

Site Name: Frontier Chemical, Pendelton NY Well Identification : URS-14I

Personnel : TPP/DEC Date : 2/12/01

WELL SPECIFICATIONS

Protective Casing	Above Ground	(Flush Mounted)
Well Construction	PVC	(Stainless Steel)
Well Diameter	(2-inch)	4-inch
Depth to Ground Water :	156	
Well Depth:	3108	

WELL INTEGRITY

1. Well identification clearly marked ?	(yes)	no	
2. Well covers and locks in good condition and secure ?	(yes)	no	
3. Is the well stand pipe vertically aligned and secure ?	(yes)	no	N/A
4. Is the concrete pad and surface seal in good condition ?	(yes)	no	
5. Are soils surrounding the well pad eroded ?	yes	(no)	
6. Is the well casing in good condition ?	(yes)	no	
7. Is the measuring point on casing well marked ?	(yes)	no	
8. Is there standing water in the annular space ?	yes	(no)	
9. Is the stand pipe vented at the base to allow drainage ?	yes	no	N/A
10. Does the total sounded depth correspond to the original well completion depth?	yes	no	
11. Is the access down the well impeded or blocked? Explain.	yes	(no)	

COMMENTS/RECOMMENDATIONS:

MONITORING WELL INTEGRITY CHECKLIST

Site Name: Frontier Chemical, Pendelton NY Well Identification : URS-14D

Personnel : TPP/DEC Date : 2/12/01

WELL SPECIFICATIONS

Protective Casing	Above Ground	(Flush Mounted)
Well Construction	PVC	(Stainless Steel)
Well Diameter	(2-inch)	4-inch
Depth to Ground Water :	6.30	
Well Depth:	41.58	

WELL INTEGRITY

1. Well identification clearly marked ?	(yes)	no	
2. Well covers and locks in good condition and secure ?	(yes)	no	
3. Is the well stand pipe vertically aligned and secure ?	(yes)	no	N/A
4. Is the concrete pad and surface seal in good condition ?	(yes)	no	
5. Are soils surrounding the well pad eroded ?	yes	(no)	
6. Is the well casing in good condition ?	(yes)	no	
7. Is the measuring point on casing well marked ?	(yes)	no	
8. Is there standing water in the annular space ?	yes	(no)	
9. Is the stand pipe vented at the base to allow drainage ?	yes	no	N/A
10. Does the total sounded depth correspond to the original well completion depth?	yes	no	
11. Is the access down the well impeded or blocked? Explain.	yes	(no)	

COMMENTS/RECOMMENDATIONS:

MONITORING WELL INTEGRITY CHECKLIST

Site Name: Frontier Chemical, Pendelton NY Well Identification : URS-9I

Personnel : TPP/DEC Date : 2/12/01

WELL SPECIFICATIONS

Protective Casing	(Above Ground)	Flush Mounted
Well Construction	PVC	(Stainless Steel)
Well Diameter	(2-inch)	4-inch
Depth to Ground Water :	7.51	
Well Depth:	4592 ~ 46.18	8/9/00

WELL INTEGRITY

1. Well identification clearly marked ?	(yes)	no	
2. Well covers and locks in good condition and secure ?	(yes)	no	
3. Is the well stand pipe vertically aligned and secure ?	(yes)	no	
4. Is the concrete pad and surface seal in good condition ?	(yes)	no	snow Covered
5. Are soils surrounding the well pad eroded ?	yes	(no)	
6. Is the well casing in good condition ?	(yes)	no	
7. Is the measuring point on casing well marked ?	(yes)	no	
8. Is there standing water in the annular space ?	yes	(no)	
9. Is the stand pipe vented at the base to allow drainage ?	(yes)	no	
10. Does the total sounded depth correspond to the original well completion depth?	(yes)	no	
11. Is the access down the well impeded or blocked? Explain.	yes	(no)	

COMMENTS/RECOMMENDATIONS:

MONITORING WELL INTEGRITY CHECKLIST

Site Name: Frontier Chemical, Pendelton NY Well Identification : URS-9D

Personnel : TPP/DEC Date : 2/12/01

WELL SPECIFICATIONS

Protective Casing	(Above Ground)	Flush Mounted
Well Construction	PVC	(Stainless Steel)
Well Diameter	(2-inch)	4-inch
Depth to Ground Water :	6.65	
Well Depth:	50.88	

WELL INTEGRITY

1. Well identification clearly marked ?	(yes)	no	
2. Well covers and locks in good condition and secure ?	(yes)	no	
3. Is the well stand pipe vertically aligned and secure ?	(yes)	no	
4. Is the concrete pad and surface seal in good condition ?	(yes)	no	snow covered
5. Are soils surrounding the well pad eroded ?	(yes)	(no)	
6. Is the well casing in good condition ?	(yes)	no	
7. Is the measuring point on casing well marked ?	(yes)	no	
8. Is there standing water in the annular space ?	yes	(no)	
9. Is the stand pipe vented at the base to allow drainage ?	(yes)	no	
10. Does the total sounded depth correspond to the original well completion depth?	(yes)	no	
11. Is the access down the well impeded or blocked? Explain.	yes	(no)	

COMMENTS/RECOMMENDATIONS:

MONITORING WELL INTEGRITY CHECKLIST

Site Name: Frontier Chemical, Pendelton NY Well Identification : 85-5R

Personnel : TPP/DEC Date : 2/12/01

WELL SPECIFICATIONS

Protective Casing	Above Ground	Flush Mounted
Well Construction	PVC	Stainless Steel
Well Diameter	2-inch	4-inch
Depth to Ground Water :	7.08	
Well Depth:	38.02	

WELL INTEGRITY

1. Well identification clearly marked ?	yes	no
2. Well covers and locks in good condition and secure ?	yes	no
3. Is the well stand pipe vertically aligned and secure ?	yes	no
4. Is the concrete pad and surface seal in good condition ?	yes	no
5. Are soils surrounding the well pad eroded ?	yes	no
6. Is the well casing in good condition ?	yes	no
7. Is the measuring point on casing well marked ?	yes	no
8. Is there standing water in the annular space ?	yes	no
9. Is the stand pipe vented at the base to allow drainage ?	yes	no
10. Does the total sounded depth correspond to the original well completion depth?	yes	no
11. Is the access down the well impeded or blocked? Explain.	yes	no

COMMENTS/RECOMMENDATIONS:

MONITORING WELL INTEGRITY CHECKLIST

Site Name: Frontier Chemical, Pendelton NY Well Identification : URS-5D

Personnel : TPP/DEC Date : 2/12/01

WELL SPECIFICATIONS

Protective Casing	(Above Ground)	Flush Mounted
Well Construction	PVC	(Stainless Steel)
Well Diameter	(2-inch)	4-inch
Depth to Ground Water :	6.80	
Well Depth:	49.83	

WELL INTEGRITY

1. Well identification clearly marked ?	(yes)	no
2. Well covers and locks in good condition and secure ?	(yes)	no
3. Is the well stand pipe vertically aligned and secure ?	(yes)	no
4. Is the concrete pad and surface seal in good condition ?	(yes)	no
5. Are soils surrounding the well pad eroded ?	yes	(no)
6. Is the well casing in good condition ?	(yes)	no
7. Is the measuring point on casing well marked ?	(yes)	no
8. Is there standing water in the annular space ?	yes	(no)
9. Is the stand pipe vented at the base to allow drainage ?	(yes)	no
10. Does the total sounded depth correspond to the original well completion depth?	(yes)	no
11. Is the access down the well impeded or blocked? Explain.	yes	(no)

COMMENTS/RECOMMENDATIONS:

MONITORING WELL INTEGRITY CHECKLIST

Site Name: Frontier Chemical, Pendelton NY Well Identification : 85-7R

Personnel : TPP/DEC Date : 2/12/01

WELL SPECIFICATIONS

Protective Casing	Above Ground	Flush Mounted
Well Construction	PVC	Stainless Steel
Well Diameter	2-inch	4-inch
Depth to Ground Water :	3.95	
Well Depth:	27.71	

WELL INTEGRITY

1. Well identification clearly marked ?	yes	no
2. Well covers and locks in good condition and secure ?	yes	no
3. Is the well stand pipe vertically aligned and secure ?	yes	no
4. Is the concrete pad and surface seal in good condition ?	yes	no
5. Are soils surrounding the well pad eroded ?	yes	no
6. Is the well casing in good condition ?	yes	no
7. Is the measuring point on casing well marked ?	yes	no
8. Is there standing water in the annular space ?	yes	no
9. Is the stand pipe vented at the base to allow drainage ?	yes	no
10. Does the total sounded depth correspond to the original well completion depth?	yes	no
11. Is the access down the well impeded or blocked? Explain.	yes	no

COMMENTS/RECOMMENDATIONS:

MONITORING WELL INTEGRITY CHECKLIST

Site Name: Frontier Chemical, Pendelton NY Well Identification : URS-7D

Personnel : TPP/DEC Date : 2/12/01

WELL SPECIFICATIONS

Protective Casing	Above Ground	Flush Mounted
Well Construction	PVC	Stainless Steel
Well Diameter	2-inch	4-inch
Depth to Ground Water :	5.21	
Well Depth:	39.82	

WELL INTEGRITY

1. Well identification clearly marked ?	yes	no
2. Well covers and locks in good condition and secure ?	yes	no
3. Is the well stand pipe vertically aligned and secure ?	yes	no
4. Is the concrete pad and surface seal in good condition ?	yes	no
5. Are soils surrounding the well pad eroded ?	yes	no
6. Is the well casing in good condition ?	yes	no
7. Is the measuring point on casing well marked ?	yes	no
8. Is there standing water in the annular space ?	yes	no
9. Is the stand pipe vented at the base to allow drainage ?	yes	no
10. Does the total sounded depth correspond to the original well completion depth?	yes	no
11. Is the access down the well impeded or blocked? Explain.	yes	no

COMMENTS/RECOMMENDATIONS:

MONITORING WELL INTEGRITY CHECKLIST

Site Name: Frontier Chemical, Pendelton NY Well Identification : 88-12C

Personnel : TPP/DEC Date : 2/12/01

WELL SPECIFICATIONS

Protective Casing	(Above Ground)	Flush Mounted
Well Construction	PVC	(Stainless Steel)
Well Diameter	(2-inch)	4-inch
Depth to Ground Water :	8.78	
Well Depth:	~~30.97~~ 31.27 Remeasured	

WELL INTEGRITY

1. Well identification clearly marked ?	(yes)	no
2. Well covers and locks in good condition and secure ?	(yes)	no
3. Is the well stand pipe vertically aligned and secure ?	(yes)	no
4. Is the concrete pad and surface seal in good condition ?	(yes)	no
5. Are soils surrounding the well pad eroded ?	yes	(no)
6. Is the well casing in good condition ?	(yes)	no
7. Is the measuring point on casing well marked ?	(yes)	no
8. Is there standing water in the annular space ?	yes	(no)
9. Is the stand pipe vented at the base to allow drainage ?	(yes)	no
10. Does the total sounded depth correspond to the original well completion depth?	(yes)	no
11. Is the access down the well impeded or blocked? Explain.	yes	(no)

COMMENTS/RECOMMENDATIONS:

MONITORING WELL INTEGRITY CHECKLIST

Site Name: Frontier Chemical, Pendelton NY Well Identification : 88-12D

Personnel : TPP/DEC Date : 2/12/01

WELL SPECIFICATIONS

Protective Casing	(Above Ground)	Flush Mounted
Well Construction	PVC	(Stainless Steel)
Well Diameter	(2-inch)	4-inch
Depth to Ground Water :	8.13	
Well Depth:	51.85 ~ 52.38	8/9/00

WELL INTEGRITY

1. Well identification clearly marked ?	(yes)	no
2. Well covers and locks in good condition and secure ?	(yes)	no
3. Is the well stand pipe vertically aligned and secure ?	(yes)	no
4. Is the concrete pad and surface seal in good condition ?	(yes)	no
5. Are soils surrounding the well pad eroded ?	yes	(no)
6. Is the well casing in good condition ?	(yes)	no
7. Is the measuring point on casing well marked ?	(yes)	no
8. Is there standing water in the annular space ?	yes	(no)
9. Is the stand pipe vented at the base to allow drainage ?	(yes)	no
10. Does the total sounded depth correspond to the original well completion depth?	yes	(no)
11. Is the access down the well impeded or blocked? Explain.	yes	(no)

COMMENTS/RECOMMENDATIONS:

Appendix B

Ground water sampling logs

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

Date: 2/13/01
Site Name: Frontier Chemical
Location: Pendelton, New York
Project No.: 27084
Personnel: TPP/DEC

Weather: Sunny 40° +/-
Well #: 85-5R
Evacuation Method: Stainless Steel Bailer
Sampling Method: Stainless Steel Bailer

Well Information:

Depth of Well *	38.02	ft.
Depth to Water *	7.08	ft.
Length of Water Column	30.94	ft.
Volume of Water in Well	5.04	gal.(s)
3X Volume of Water in Well	15.1	gal.(s)

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

Volume removed before sampling: 13 gal.(s)
Did well go dry? yes

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

Instrument Calibration:

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

Water parameters:

	Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings uS/cm	Turbidity Readings Ntu
			3 strips		
initial	0	initial 53.7	initial 7.0	initial >1000	initial 95.2
	5	56.5	7.0		188
	10	54.9	6.5 - 7.0		144

Water Sample:
Time Collected: 1545

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Clear	Color	Tan/Sandy
Odor	None	Odor	None
Turbidity (> 100 NTU)	100 +/-	Turbidity (> 100 NTU)	97.4
Sheen/Free Product	None	Sheen/Free Product	None

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	

Notes:
Dry @ 8 Recharge, Bail Dry - Recharge Sample

meter not working properly * Filtered Metals
pH used strips
Conductivity not working

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

Date: 2/13/01
Site Name: Frontier Chemical
Location: Pendelton, New York
Project No.: 27084
Personnel: TPP/DEC

Weather: Sunny 40° +/-
Well #: URS-5D
Evacuation Method: Stainless Steel Bailer
Sampling Method: Stainless Steel Bailer

Well Information:

Depth of Well *	49.83	ft.
Depth to Water *	6.80	ft.
Length of Water Column	43.03	ft.
Volume of Water in Well	7.01	gal.(s)
3X Volume of Water in Well	21.0	gal.(s)

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

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

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

Instrument Calibration:

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

Water parameters:

	Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings uS/cm	Turbidity Readings Ntu
initial	0	52.3	6.5 pH strip	>2,000	6.46
	7	55.9	6-7 "	"	25.00
	14	54.2	6-7	710,000	15.8
	21				

Water Sample:
Time Collected: 1525

Physical Appearance at Start		Physical Appearance at Sampling	
Color	clear	Color	Clear
Odor	None	Odor	Sulfur
Turbidity (> 100 NTU)	6.46	Turbidity (> 100 NTU)	15.8
Sheen/Free Product	None	Sheen/Free Product	None

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	

Notes:
Dry 7gal. Recharge Bail Dry @ 14, Recharge Sample

Meter not working Properly
pH - off used strips
Conductivity not working

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

Date: 2/14/01
Site Name: Frontier Chemical
Location: Pendelton, New York
Project No.: 27084
Personnel: TPP/DEC

Weather: ~~2/14/01~~ Rain 35°F+/-
Well #: 85-7R
Evacuation Method: Stainless Steel Bailer
Sampling Method: Stainless Steel Bailer

Well Information:

Depth of Well *	27.71	ft.
Depth to Water *	3.95	ft.
Length of Water Column	23.76	ft.
Volume of Water in Well	3.87	gal.(s)
3X Volume of Water in Well	11.6	gal.(s)

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

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

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

Instrument Calibration:

pH Buffer Readings		Conductivity Standard Readings	
	strips		
4.0 Standard		84 S Standard	
7.0 Standard	7	1413 S Standard	
10.0 Standard			

Water parameters:

Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings uS/cm	Turbidity Readings Ntu
initial ϕ	initial 50.2	initial 12	initial 1551	initial 75
4	53.8	10	1242	250
8	54.2	7	1510	110
15	54.2	7	1517	200

Water Sample:
Time Collected: 1100

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Lt TAN	Color	Lt Tan
Odor	None	Odor	None
Turbidity (> 100 NTU)	75	Turbidity (> 100 NTU)	200
Sheen/Free Product	None	Sheen/Free Product	None

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	

Notes:
* Conductivity may not be accurate - Meter Problems

* Filtered Metals

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

Date: 2/14/01
Site Name: Frontier Chemical
Location: Pendelton, New York
Project No.: 27084
Personnel: TPP/DEC

Weather: Rain 35° +/-
Well #: URS-7D
Evacuation Method: Stainless Steel Bailer
Sampling Method: Stainless Steel Bailer

Well Information:

Depth of Well *	39.82	ft.
Depth to Water *	5.21	ft.
Length of Water Column	34.61	ft.
Volume of Water in Well	5.64	gal.(s)
3X Volume of Water in Well	16.9	gal.(s)

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

Volume removed before sampling: 17 gal.(s)
Did well go dry? No

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

Instrument Calibration:

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

Water parameters:

	Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings uS/cm	Turbidity Readings Ntu
initial	0	49.5	7.0	1109	7.2
	5	53.7	8.0	540	16
	11	53.4	8.0	1270	21
	17	53.1	8.0	250	39

Water Sample:
Time Collected: 11 15

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Clear	Color	Clear
Odor	Sulfur	Odor	Sulfur
Turbidity (> 100 NTU)	7.2	Turbidity (> 100 NTU)	39
Sheen/Free Product	None	Sheen/Free Product	None

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	

Notes:
* Conductivity may not be accurate - meter Problems

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

Date: 2/13/01
Site Name: Frontier Chemical
Location: Pendelton, New York
Project No.: 27084
Personnel: TPP/DEC

Weather: Sunny 35°+/-
Well #: URS-9I
Evacuation Method: Stainless Steel Bailer
Sampling Method: Stainless Steel Bailer

Well Information:

Depth of Well *	45 92	ft.
Depth to Water *	7.51	ft.
Length of Water Column	38 41	ft.
Volume of Water in Well	6.26	gal.(s)
3X Volume of Water in Well	18.8	gal.(s)

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

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

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

Instrument Calibration:

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

Water parameters:

	Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings uS/cm	Turbidity Readings Ntu
initial	0	53.1	16 09	753	34.2
	6	54.6	16.4 (7.0 strip)	> 10000	38.9
	12	55.1	14.76 (7.0 strip)	> 10000	315.0
	18	55.0	7.0 (strip)	> 1000	1004.0

Water Sample:
Time Collected: 1130

Physical Appearance at Start		Physical Appearance at Sampling	
Color	clear	Color	Gray
Odor	None	Odor	None
Turbidity (> 100 NTU)	34.2	Turbidity (> 100 NTU)	1004
Sheen/Free Product	None	Sheen/Free Product	None

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	

Notes:
* Filtered Metals

Multi function meter not working Properly
Used pH strips for pH Readings
Conductivity not working

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

Date: 2/13/01
Site Name: Frontier Chemical
Location: Pendelton, New York
Project No.: 27084
Personnel: TPP/DEC

Weather: Sunny 35°+/-
Well #: URS-9D
Evacuation Method: Stainless Steel Bailer
Sampling Method: Stainless Steel Bailer

Well Information:

Depth of Well *	50.88	ft.
Depth to Water *	6.65	ft.
Length of Water Column	44.23	ft.
Volume of Water in Well	7.21	gal.(s)
3X Volume of Water in Well	21.6	gal.(s)

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

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

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

Instrument Calibration:

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

Water parameters:

	Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings uS/cm	Turbidity Readings Ntu
initial	0	51.7	14.17	1040	7.72
	7	55	7.5 * pH STRIP	710000	11.0
	14	55.8	6.5-7.0 strip	710000	8.62
	21	55.5	7.0 strip	710000	10.64

Water Sample:
Time Collected: 1120

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Clear	Color	Clear
Odor	None	Odor	slight sulfur
Turbidity (> 100 NTU)	7.72	Turbidity (> 100 NTU)	10.64
Sheen/Free Product	None	Sheen/Free Product	None

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	

Notes: Collect X-1

Blind Dup

multi function meter not working Properly
Used pH strips for Readings:
Conductivity not working

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

Date: 2/12/01
Site Name: Frontier Chemical
Location: Pendelton, New York
Project No.: 27084
Personnel: TPP/DEC

Weather: overcast 33°+/-
Well #: ~~88-12B~~ 12C
Evacuation Method: Stainless Steel Bailer
Sampling Method: Stainless Steel Bailer

Well Information:

Depth of Well *	31.27	ft.
Depth to Water *	8.78	ft.
Length of Water Column	22.49	ft.
Volume of Water in Well	3.67	gal.(s)
3X Volume of Water in Well	11.0 gal	gal.(s)

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

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

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

Instrument Calibration:

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard		84 S Standard	
7.0 Standard	7.0	1413 S Standard	
10.0 Standard	10.01		

Water parameters:

	Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings uS/cm	Turbidity Readings Ntu
initial	~~0~~ 3	52.8	8.21	1159	>100
	~~7~~ 7	54.9	8.06	1267	7100
	11	55.5	7.80	13.20	7100
		54.9	7.83	1318	7100

Water Sample:
Time Collected: 1430

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Lt Tan	Color	Lt CREAM
Odor	Slight	Odor	Slight
Turbidity (> 100 NTU)	>100	Turbidity (> 100 NTU)	>100
Sheen/Free Product	None	Sheen/Free Product	None

Samples collected:

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40 ml	Glass	3	No	1:1 HCL	
Liter	Plastic	1	Not if < 50 ntu	HNO3	>1
Pint	Plastic	1	No	NaOH	11

Notes:
* Filtered Metals

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

Date: 2/12/01
Site Name: Frontier Chemical
Location: Pendelton, New York
Project No.: 27084
Personnel: TPP/DEC

Weather: Sunny 29°F
Well #: ~~88-12C~~ 12D
Evacuation Method: Stainless Steel Bailer
Sampling Method: Stainless Steel Bailer

Well Information:

Depth of Well *	51.85	ft.
Depth to Water *	8.13	ft.
Length of Water Column	43.72	ft.
Volume of Water in Well	7.13	gal.(s)
3X Volume of Water in Well	21.4	gal.(s)

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

Volume removed before sampling: 21 gal.(s)
Did well go dry? yes

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

Instrument Calibration:

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard		84 S Standard	
7.0 Standard	7.00	1413 S Standard	
10.0 Standard	10.01		

Water parameters:

	Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings uS/cm	Turbidity Readings Ntu
initial	0	51.6	7.23	8240	13
	7	53.7	7.01	9700	5.1
	14	55.5	6.72	3970	2.7
	21	54.5	6.85	4180	26.2

Water Sample:
Time Collected: 1530

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Clear	Color	Clear
Odor	Sulfur Odor	Odor	Heavy Sulfur
Turbidity (> 100 NTU)	13	Turbidity (> 100 NTU)	26.2
Sheen/Free Product	None	Sheen/Free Product	None

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	

Notes:

Dry @ 10 gal, Let Recharge

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

Date: 2/13/01
Site Name: Frontier Chemical
Location: Pendelton, New York
Project No.: 27084
Personnel: TPP/DEC

Weather: Pt Sunny 30° +/-
Well #: URS-14I
Evacuation Method: Stainless Steel Bailer
Sampling Method: Stainless Steel Bailer

Well Information:

Depth of Well *	31.08	ft.
Depth to Water *	1.56	ft.
Length of Water Column	29.52	ft.
Volume of Water in Well	4.81	gal.(s)
3X Volume of Water in Well	14.4	gal.(s)

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

Volume removed before sampling: 12 gal.(s)
Did well go dry? Yes

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

Instrument Calibration:

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard		84 S Standard	
7.0 Standard	7.00	1413 S Standard	
10.0 Standard	10.00		

Water parameters:

	Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings uS/cm	Turbidity Readings Ntu
initial	0	46.8	7.96	1 765	7,20
	5	55.4	6.80	720	7100
	10	55.4	10.80	752	7100
	15				

Water Sample:
Time Collected: 0900 2/14/01

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Clear to Cream	Color	Clear
Odor	None	Odor	None
Turbidity (> 100 NTU)	7.20 ntu	Turbidity (> 100 NTU)	7100
Sheen/Free Product	None	Sheen/Free Product	None

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	

Notes:
Dry @ 12 gal. Sampled 2/14/01

* Filtered Metals

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

Date: 2/13/01
Site Name: Frontier Chemical
Location: Pendelton, New York
Project No.: 27084
Personnel: TPP/DEC

Weather: Pt. Sunny 30°+/-
Well #: URS-14D
Evacuation Method: Stainless Steel Bailer
Sampling Method: Stainless Steel Bailer

Well Information:

Depth of Well *	41.58	ft.
Depth to Water *	6.30	ft.
Length of Water Column	35.28	ft.
Volume of Water in Well	5.75	gal.(s)
3X Volume of Water in Well	17.3	gal.(s)

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

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

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

Instrument Calibration:

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard		84 S Standard	
7.0 Standard	7.00	1413 S Standard	
10.0 Standard	10.00		

Water parameters:

Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings uS/cm	Turbidity Readings Ntu
initial ∅	initial 51.1	initial 7.99	initial 1948	initial 6.68
6	54.3	5.11	1950	3.49
12	54.5	5.07	1950	3.17
18	54.4	4.91	2030	5.43

Water Sample:
Time Collected: 930

Physical Appearance at Start		Physical Appearance at Sampling	
Color	Clear	Color	Clear
Odor	Slight Sulfur	Odor	~~Slight~~ Sulfur
Turbidity (> 100 NTU)	6.68	Turbidity (> 100 NTU)	5.43
Sheen/Free Product	None	Sheen/Free Product	None

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	

Notes: Collected MS/MSD

CALIBRATION DATA SHEET **O'BRIEN & GERE ENGINEERS, INC.**

Equipment Name	Hydac Multifunction meter		
Model Number			
Serial Number	3502360		
☐ New	Serviced	☐ As Found ☐ As Left	☐ In Tolerance ☐ Out of Tolerance

Routine Calibration Due Date: when used

Standards Used: pH - 7.0 exist · 6.85 Reset - 7.00

pH 10.0 Exist 10.30 Reset 10.01

post check — 7.04

— 10.10

☒ **Environmental Conditions are Suitable for Calibration**

TEMPERATURE = 35°+/-

ATMOSHPHERIC PRESSURE = ?

Comments:

Turbidity meter Hatch.

10ntu Standard Reading 10.50

Reset to 10.00

post 10.12

This equipment has been calibrated using standards whose accuracies are traceable to the National Institute of Standards & Technology (NIST) within the limits of the Institutes's calibration service.

Calibration Performed By: T. Prawel

Date: 2/12/01

CALIBRATION DATA SHEET **O'BRIEN & GERE ENGINEERS, INC.**

Equipment Name	Hydac Multifunction meter		
Model Number			
Serial Number	350236		
☐ New	Serviced	☐ As Found ☐ As Left	☐ In Tolerance ☐ Out of Tolerance

Routine Calibration Due Date: when used

Standards Used: pH 7.0 initial 7.12 Reset 7.00

10.0 10.14 10.00

10:00 instrument stopped Reading pH & Conductivity - Temp OK

post calib. check 17.07 instrument broken

~~[illegible]~~ not Reading

☐ **Environmental Conditions are Suitable for Calibration**

TEMPERATURE =
ATMOSHPHERIC PRESSURE =

Comments:

Turbidity meter Hatch.

10 ntu Standard Reading 10.21

Reset 10.00

post 10.07

This equipment has been calibrated using standards whose accuracies are traceable to the National Institute of Standards & Technology (NIST) within the limits of the Institutes's calibration service.

Calibration Performed By: T. Prawel

Date: 2/13/01

O'Brien & Gere Laboratories, Inc.

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

Chain of Custody

Client: FRONTIER CHEMICAL
Project: PENDERTON NY
Sampled by: T. Prawel, D. Canestrari
Client Contact: **Phone #**

Sample Description / Analysis/Method

Sample Location	Date Collected	Time Collected	Sample Matrix	Comp. or Grab	No. of Containers	VOC's 8260	Metals	CN					Comments
BB-12C	2/12/01	1430	Water	Grab	5	3	1	1					Field Filtered
BB-12D	2/12/01	1530	Water	Grab	5	3	1	1					
URS-14D MS/MSD	2/13/01	930	Water	Grab	15	9	3	3					
URS 9D	2/13/01	1120	Water	Grab	5	3	1	1					
URS 9I	2/13/01	1130	Water	Grab	5	3	1	1					FIELD FILTERED
URS-5D	2/13/01	1525	Water	Grab	5	3	1	1					
BS-5R	2/13/01	1545	Water	Grab	5	3	1	1					
Blind Dup X-1	2/ /01	—	Water	Grab	5	3	1	1					
TRIP Blank			Water		1	1							

Relinquished by: David E Canestrari **Date:** 2/13/01 **Time:** 1645
Relinquished by: **Date:** **Time:**
Relinquished by: **Date:** **Time:**

Received by: **Date:** **Time:**
Received by: **Date:** **Time:**
Received by Lab: **Date:** **Time:**

Shipment Method: FED EX
Airbill Number: FED EX 8236 0948 1582
8236 0948 1571

Turnaround Time Required:
Routine_____
Rush (Specify)_____

Comments:

Cooler Temperature:_____

Original-Laboratory Copy-Client

O'Brien & Gere Laboratories, Inc.

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

Chain of Custody

Client: FRONTIER CHEMICAL
Project: PENDLETON, NY
Sampled by: T. Prawel, D. Canestrari
Client Contact: Phone #

Sample Description

Sample Location	Date Collected	Time Collected	Sample Matrix	Comp. or Grab	No. of Containers	Analysis/Method: VOCs 8260	METALS	CN					Comments
URS-14I	2/14/01	0900	WATER	GRAB	5	3	1	1					Field Filtered
EQUIP. BLANK	2/14/01	0920	WATER	GRAB	5	3	1	1					
~~85-7R~~	2/14/01	1100	WATER	GRAB	5	3	1	1					Field Filtered
URS-7D	2/14/01	1115	WATER	GRAB	5	3	1	1					
TRIP BLANK			WATER		1	1							

Relinquished by: Donald E. Canestrari Date: 2/14/01 Time: 1315
Relinquished by: Date: Time:
Relinquished by: Date: Time:

Received by: Date: Time:
Received by: Date: Time:
Received by Lab: Date: Time:

Shipment Method: FED EX
Airbill Number: 8264 519 59099

Turnaround Time Required:
Routine_____
Rush (Specify)_____

Comments:

Cooler Temperature:_____

Original-Laboratory Copy-Client

Appendix C

Data validation report

Data Validation Services

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

March 20, 2001

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

RE: Validation of Frontier Chemical Site Data Packages
OBG Labs Report for Samples Collected 2/12/01 through 2/14/01

Dear Mr. Carnevale:

Review has been completed for the data packages generated by OBG Laboratories, pertaining to samples collected at the Frontier Chemical Site on February 12, 2001 through February 14,2001. Eleven aqueous samples were analyzed for TCL volatiles and TAL metals/cyanide parameters (four of these were for filtered metals). Matrix spikes/duplicates, and equipment and trip blanks were also processed. Methodologies utilized are those of the USEPA SW846.

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

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

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

In summary, sample processing was primarily conducted with compliance to protocol requirements and with adherence to quality criteria, and most reported results are usable as reported, or with minor qualification as estimated. Carbon disufide detections are considered contamination. These issues are discussed in the following analytical sections.

The summary data package, with recommended qualifiers applied in red ink, are attached to this narrative, and should be reviewed in conjunction with this text.

Data Completeness

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

Volatile Analyses

Due to copresence in the associated trip blanks, the detections of carbon disulfide in the project samples are considered external contamination, and edited to nondetection ("<") at either the reported concentration, or the CRDL of 0.5 ug/L, whichever is greater.

Due to low response factors in the calibration standards, results for acetone, 2-butanone, and 2-hexanone should be considered estimated ("J") in the project samples.

Matrix spikes of URS-14D involved evaluation of recoveries of all target analytes. All accuracy and precision values were acceptable except for two analytes which were not detected in the samples showing high recovery. Sample results are unaffected.

The continuing calibration standards low responses for bromomethane (30%D to 59%D). Results for that analyte in all project samples are considered estimated ("J" and "UJ"), biased low:

The Tentatively Identified Compounds should be qualified as estimated in value, and should be reported to one significant figure. Those identified as "solvent" or "column bleed" are analysis artifacts and should be disregarded as sample components.

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

Metals/CN Analyses

Accuracy and precision evaluations for URS-14D were acceptable with the exception of selenium recoveries. However, the duplicate correlations for the elements were performed on matrix spikes rather than the sample itself. Selenium recovered at only 68% and 71%, and therefore sample reported results are qualified as estimated ("J"), possibly biased low.

CRI standard recoveries were acceptable, although only one CRI standard was run for each analytical sequence. Low level detection of cadmium in a calibration blank does not affect sample reported results because they showed no detection of that element.

The serial dilution determinations for URS-14D produced acceptable correlations for all elements, and the field duplicate correlation between URS-9D and Blind Dup X-1 was acceptable.

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

Very truly yours,

Judy Harry

CROSS REFERENCE TABLE

Site	Sample Number	Date Collected	Time	Received	Package
2C	S 531	02/12/2001		02/14/2001	8084
2D	S 532	02/12/2001		02/14/2001	8084
JRS-14D	S 533D	02/13/2001		02/14/2001	8084
14D	S 533MS	02/13/2001		02/14/2001	8084
14D	S 533MSD	02/13/2001		02/14/2001	8084
JRS-14D	S 533	02/13/2001		02/14/2001	8084
JRS-9D	S 534	02/13/2001		02/14/2001	8084
9I	S 535	02/13/2001		02/14/2001	8084
5D	S 536	02/13/2001		02/14/2001	8084
85-5R	S 537	02/13/2001		02/14/2001	8084
d Dup X-1	S 538	02/13/2001		02/14/2001	8084
rip Blank	S 539	02/12/2001		02/14/2001	8084
88-12C (Field Filtered	S 540	02/12/2001		02/14/2001	8084
9I (Field Filtered	S 541	02/13/2001		02/14/2001	8084
14I	S 617	02/14/2001		02/15/2001	8096
Equipment Blank(Equipment Blank)	S 618	02/14/2001		02/15/2001	8096
85-7R	S 619	02/14/2001		02/15/2001	8096
7D	S 620	02/14/2001		02/15/2001	8096
rip Blank	S 621	02/14/2001		02/15/2001	8096
URS-14I (Field Filtered)	S 622	02/14/2001		02/15/2001	8096
7R (Field Filtered)	S 623	02/14/2001		02/15/2001	8096

NARRATIVE

INTRODUCTION/ANALYTICAL RESULTS

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

CONDITION UPON RECEIPT/CHAIN OF CUSTODY

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

No discrepancies were noted upon receipt. The cooler temperatures upon receipt were 2°C and 3°C.

METHODOLOGY

The following methods were used to perform the analyses:

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

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

QUALITY CONTROL

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

RAW DATA

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

GC/MS Volatile Organics Case Narrative

Client: Frontier Chemical
Job Number: 5829.001.517
Package: 8084,8096
Methodology: 8260B

Analyzed/Reviewed by (Date/Initials): (AW) 3-1-01

Supervisor/Reviewed by (Date/Initials): (AW) 3-1-01

QA/QC Review (Date/Initials): 3/5/01

File Name in G/ Drive: 8084v.nar.doc

GC/MS Volatile Organics

The GC/MS Volatile instruments used a J&W DB-VRX, 75 m x 0.45 mm ID capillary column and a Vocarb 3000 trap.

Holding Times and Sample Preservation

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

Laboratory Control Sample

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

MS/MSD

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

Sample Description	Sample #	Compound	% REC	RPD	Corrective Action
URS-14D	S0533	Chloromethane	X		1
		Bromomethane	X		1
		Chloroethane	X		1

1. The recovery exceeded the upper control limit and was not detected in associated samples. The RPD and LCS recovery met acceptance criteria. No corrective action was taken.

Surrogate

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

Internal Standards

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

Calibrations

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

GC/MS Volatile Organics Case Narrative

Client: Frontier Chemical
Job Number: 5829.001.517
Package: 8084,8096
Methodology: 8260B

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

Miscellaneous
The following compound(s) were detected in the following equipment/trip blank(s):

Sample Description	Sample #	Compound	Conc. (ug/L)	Corrective Action
QC Trip Blank	S0539	Carbon disulfide	0.67	1

1. This compound was not detected in the associated Prep Blank and was detected in associated samples. It is suspected that it is an artifact from high sulfur content of the associated samples. Due to limited sample volume the sample was not reanalyzed for confirmation.

Trace Metals Case Narrative

Client:	Frontier Chemical
Job Number:	5829.001.517
Package #:	8084,8096
Methodology:	ICP metals - 6010B
Analyzed/Reviewed by (Date/Initials):	MT 3-5-01
Supervisor/Reviewed by (Date/Initials):	MT 3-5-01
QA/QC Review (Date/Initials):	3/5/01
File Name in G/ Drive:	G:\NARRATIV\8084fron.icp.wpd

Trace Metals

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

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

Matrix Spike
The following analyte did not meet matrix spike/matrix spike duplicate percent recovery criteria:

Sample Description	Sample #	Analyte	% REC	RPD	Corrective Action
URS-14D	S0533	Selenium	X		1

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

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

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

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

Trace Metals Case Narrative

Client:	Frontier Chemical
Job Number:	5829.001.517
Package #:	8084,8096
Methodology:	Mercury - 7470A
Analyzed/Reviewed by (Date/Initials):	MT 3-2-01
Supervisor/Reviewed by (Date/Initials):	MT 3-2-01
QA/QC Review (Date/Initials):	3/5/01
File Name in G/ Drive:	G:\NARRATIV\8084fron.hg.wpd

Trace Metals

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

Trace Metals Case Narrative

Client:	Frontier Chemical
Job Number:	5829.001.517
Package #:	8084,8096
Methodology:	Thallium - 7841
Analyzed/Reviewed by (Date/Initials):	MT 3-3-01
Supervisor/Reviewed by (Date/Initials):	MT 3-3-01
QA/QC Review (Date/Initials):	3/5/01
File Name in G/ Drive:	G:\NARRATIV\8084fron.tl.wpd

Trace Metals

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

Wet Chemistry Case Narrative

Client:	Frontier Chemical
Job Number:	5829.001.517
Package #:	8084, 8096
Methodology:	Total cyanide - 9010B/9014
Analyzed/Reviewed by (Date/Initials):	KB 3/7/01
Supervisor/Reviewed by (Date/Initials):	MT 3-7-01
QA/QC Review (Date/Initials):	3/8/01
File Name in G/ Drive:	G:\NARRATIV\8084FRON.WC

Wet Chemistry

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

Volumes 1 of 1 of the metals and wet chemistry and volatile organics validated analytical data packages are separately bound.