

**RealCo Inc.**

P.O. Box 1932, Windermere, FL 34786-1932

(407) 230-7737 FAX: (214) 889-9333

August 13, 2004

Ms. Alicia Barraza, Environmental Engineer  
Division of Solid & Hazardous Materials  
NYS Dept. of Environmental Conservation  
625 Broadway, 8<sup>th</sup> Floor  
Albany, New York 12233-7252

Re: Watervliet Main Plant Area Year 5 Semi-Annual Monitoring Report  
EPA I.D. No. NYD060545209

Dear Ms. Barraza:

Enclosed please find the Year 5 Semi-Annual Monitoring Report for the Main Plant Area at the Watervliet site. This report presents the results for groundwater samples collected for Year 5, Round 1 (June 2004) of the monitoring program.

If you have any questions or require additional information, please do not hesitate to contact the undersigned at 407-230-7737.

Sincerely,  
RealCo Inc.



Jin Park  
President

Enclosure

cc: James Reidy (USEPA)

**RealCo Inc.**  
P.O. Box 1932, Windermere, FL 34786-1932  
(407) 226-7737 FAX: (314) 889-1333

**MAIN PLANT AREA  
YEAR 5 SEMI-ANNUAL MONITORING REPORT  
FORMER AL TECH SPECIALTY STEEL CORPORATION  
WATERVLIET, NEW YORK**

**PREPARED BY  
REALCO INC.  
AUGUST 13, 2004**

## Table of Contents

	Page
<b>1.0 Introduction</b> .....	<b>1</b>
<b>2.0 Scope of Work</b> .....	<b>2</b>
2.1 Groundwater Sampling and Analytical Plans .....	2
2.1.1 Site-Wide Plan .....	2
2.1.2 Fuel Oil ICM Plan .....	2
2.1.3 Groundwater ICM Plan.....	2
2.2 Field Activities .....	3
2.2.1 Well Inspection, Maintenance and Water Level Measurements.....	3
2.2.2 Well Purging.....	3
2.3 Groundwater Sampling Procedures .....	3
<b>3.0 Groundwater and LNAPL Characteristics</b> .....	<b>5</b>
3.1 Groundwater.....	5
3.2 LNAPL.....	5
3.2.1 Site Monitoring Program.....	5
3.2.2 In-House LNAPL Monitoring Program.....	5
<b>4.0 Groundwater Quality Data</b> .....	<b>7</b>
4.1 Metals.....	7
4.1.1 Antimony .....	7
4.1.2 Arsenic .....	8
4.1.3 Barium.....	8
4.1.4 Beryllium .....	8
4.1.5 Chromium.....	8
4.1.6 Molybdenum.....	8
4.1.7 Nickel .....	8
4.2 Miscellaneous Parameters .....	9
4.2.1 Ammonia .....	9
4.2.2 Fluoride .....	9
4.2.3 Nitrate .....	9
4.2.4 Sulfate .....	9
4.2.5 pH .....	10
4.3 Total Petroleum Hydrocarbon (TPH).....	10
4.4 Polychlorinated Biphenyls (PCBs).....	10

**Table of Contents**  
(continued)

<b>5.0</b>	<b>Data Analysis and Discussion</b> .....	<b>11</b>
5.1	Metals .....	11
5.1.1	Antimony (3 µg/l) .....	11
5.1.2	Arsenic (25 µg/l) .....	11
5.1.3	Barium (1,000 µg/l) .....	11
5.1.4	Chromium (50 µg/l) .....	11
5.1.5	Molybdenum (180 µg/l) .....	12
5.1.6	Nickel (100 µg/l) .....	12
5.2	Miscellaneous Parameters .....	13
5.2.1	Ammonia (2 mg/l) .....	13
5.2.2	Fluoride (1.5 mg/l) .....	13
5.2.3	Nitrate (10 mg/l) .....	13
5.2.4	Sulfate (250 mg/l) .....	13
5.2.5	pH (6.5 s.u. to 8.5 s.u.) .....	14
5.2.6	TPHs (no standard) .....	14
5.2.7	PCBs (0.09 µg/l) .....	14
5.3	Migration of Contaminants .....	14
5.4	Isopleth Maps for Significant Contaminants .....	15
<b>6.0</b>	<b>Effectiveness of ICMs</b> .....	<b>16</b>
6.1	Groundwater ICM .....	16
6.1.1	Analytical Data and Graphical Presentations .....	16
6.1.2	Effectiveness of Groundwater ICM .....	17
6.2	Fuel Oil ICM .....	18
6.2.1	Oil Recovery Well RW-3 .....	18
6.2.2	Fuel Oil Interceptor Trench .....	18
6.2.3	Effectiveness of Fuel Oil ICM .....	19
<b>7.0</b>	<b>Summary</b> .....	<b>20</b>
<b>8.0</b>	<b>References</b> .....	<b>22</b>

## **Table of Contents** (continued)

### **List of Figures**

Figure 2-1	Site Map and Monitoring Network
Figure 3-1	Potentiometric Surface Map, Overburden (June 2004)
Figure 3-2	Potentiometric Surface Map, Bedrock (June 2004)
Figure 3-3	OW-2 LNAPL and Groundwater Elevations (January 1999 - June 2004)
Figure 3-4	OW-4 LNAPL and Groundwater Elevations (January 1999 - June 2004)
Figure 3-5	OW-13 LNAPL and Groundwater Elevations (January 1999-June 2004)
Figure 3-6	PZ-8 LNAPL and Groundwater Elevations (January 1999 - June 2004)
Figure 3-7	RW-3 LNAPL and Groundwater Elevations (August 2000 - June 2004)
Figure 3-8	RW-4 LNAPL and Groundwater Elevations (August 2000 - June 2004)
Figure 4-1	Exceedance of Standards in Groundwater (Site-Wide)
Figure 4-2	Exceedance of Standards in Groundwater (Groundwater ICM)
Figure 5-1	Barium Concentrations
Figure 5-2	Fluoride Isopleth Map
Figure 5-3	Nitrate Isopleth Map
Figure 5-4	LNAPL Thickness Isopleth Map
Figure 6-1	Nickel in Groundwater (MW-4/MW-4B, MW-19/MW-19B and RW-5)
Figure 6-2	Fluoride in Groundwater (MW-4/MW-4B, MW-19/MW-19B and RW-5)
Figure 6-3	Nitrate in Groundwater (MW-4/MW-4B, MW-19/MW-19B and RW-5)
Figure 6-4	Sulfate in Groundwater (MW-4/MW-4B, MW-19/MW-19B and RW-5)
Figure 6-5	pH in Groundwater (MW-4/MW-4B, MW-19/MW-19B and RW-5)

### **List of Tables**

Table 2-1	Main Plant Area Groundwater Monitoring Program
Table 3-1	Groundwater Elevations and Well Depths
Table 3-2	LNAPL Measurements
Table 4-1	Groundwater Results for Metals and Miscellaneous Parameters
Table 4-2	Groundwater Results for TPHs
Table 4-3	Groundwater Results for PCBs

### **List of Appendices**

Appendix A	Field Data Summary, Year 5, Round 1
Appendix B	Quality Assurance Certifications (Case Narratives)

## 1.0 Introduction

This Semi-Annual Monitoring Report summarizes the data and information generated during implementation of Year 5, Round 1 of the groundwater monitoring program for the Main Plant Area at the former AL Tech Specialty Steel Corporation steel manufacturing facility in Watervliet, New York.

The program was implemented pursuant to the Resource Conservation and Recovery Act (RCRA) Corrective Action Program. Phase I (*ESC 1995a*) and Phase II (*ESC 1998*) RCRA Facility Investigations (RFIs) were previously implemented at the site. Based on the results of these investigations, the Main Plant Area Groundwater Monitoring Work Plan (*ESC 1999*) was developed, which was approved by the New York State Department of Environmental Conservation (*NYSDEC 2000a*). The implementation of this monitoring program has been performed in accordance with the approved work plan and modifications to the scopes of work (*RealCo 2001a*) as approved by the NYSDEC (*NYSDEC 2001a and 2002a*).

This monitoring program consists of three separate, but overlapping monitoring plans. These plans include provisions for:

- Monitoring general groundwater quality at the site. – “Site-Wide Plan”
- Monitoring and evaluating the effectiveness of the Groundwater Interim Corrective Measure (ICM) installed in November and December 1994 (*ESC 1995b*). – “Groundwater ICM Plan”
- Monitoring and evaluating the effectiveness of the Fuel Oil ICM installed in September 2000 (*Malcolm Pirnie 2001*). – “Fuel Oil ICM Plan”

The approved work plan requires that the data generated during the first six months of each year be compiled and presented in a semi-annual report that includes the following information:

- A summary of analytical data collected during the first six months of each year.
- Groundwater elevation data in tabulated form. Potentiometric contour maps. If applicable, product thickness measurements and an associated figure.
- An evaluation of contaminant migration. Maps, which illustrate the concentration of contaminants at the various monitoring wells. Groundwater isopleth maps for all significant contaminants as applicable.
- Well maintenance activities performed or planned.
- Pumping/extraction well rates and volumes and description of time in operation, if applicable.
- Contaminant recovery levels and/or product recovery volumes, if applicable.
- Any other problems, activities planned.

## **2.0 Scope of Work**

Groundwater samples are currently being collected on a semi-annual basis. Year 5, Round 1 sampling of the program was implemented on June 1, 2, 3, 4, 7, 8 and 9, 2004. On behalf of RealCo, Adirondack Environmental Services, Inc. ("Adirondack") conducted the sample collections.

The site map and locations of the monitoring wells are presented in Figure 2-1. The scopes of work implemented during Year 5, Round 1 are summarized in Section 2.1. Miscellaneous field-related activities associated with implementation of the monitoring plans are summarized in Section 2.2. Except as otherwise noted, all work was performed in accordance with the approved work plan and the approved modifications to the work plan.

### **2.1 Groundwater Sampling and Analytical Plans**

Individual sampling and analytical plans were developed for each of the three monitoring plans (Table 2-1), which are presented below. Field analyses of the groundwater samples include temperature, pH, turbidity, specific conductance and dissolved oxygen.

#### **2.1.1 Site-Wide Plan**

The site-wide monitoring plan includes analyses of thirty (30) groundwater samples for one or more of the following:

- metals, including
  - antimony, barium, chromium, molybdenum and nickel
  - arsenic at MW-D2
- polychlorinated biphenyls (PCBs) at MW-14, H-4S and H-4D
- ammonia at MW-4B, MW-19B and MW-D2

#### **2.1.2 Fuel Oil ICM Plan**

The Fuel Oil ICM Plan includes analyses of seven groundwater samples (MW-6, MW-15, MW-16, MW-17, MW-19, MW-20 and MW-B) for total petroleum hydrocarbons (TPHs) as required by the NYSDEC (*NYSDEC 2002b*).

#### **2.1.3 Groundwater ICM Plan**

The Groundwater ICM Plan includes analyses of fifteen (15) groundwater samples for the following parameters:

- Metals, including
  - chromium and nickel
  - beryllium at MW-4, MW-4B, MW-8B, MW-19 and MW-19B
- pH
- fluoride, nitrate and sulfate

## **2.2 Field Activities**

Field activities associated with the sampling rounds included well inspection and maintenance, water level measurements, well purging and subsequent handling of the purged water.

### **2.2.1 Well Inspection, Maintenance and Water Level Measurements**

Each well was inspected for corrosion, damage to the lock, positive drainage and general integrity. The well integrity at each location was generally acceptable.

Static depth-to-water measurements were made from the top of well casing at each monitoring well. Total well depths were also measured to determine the need for well redevelopment due to a build-up of silt. No wells were identified as containing silt in excess of ten percent of the screened interval and therefore redevelopment is not currently required.

### **2.2.2 Well Purging**

All of the wells were purged before sample collection. Static water levels and total well depth measurements were used to calculate the water column in each well and determine the volume of water to be purged. Purging was accomplished using a peristaltic pump for shallow wells and wells requiring smaller purge volumes and using a submersible pump at all other locations. A weighted polyethylene bailer was used for the background well, MW-8B, where it was difficult for field personnel to access with a pump and a generator.

In situ water quality parameters (pH, specific conductance, temperature, turbidity and dissolved oxygen) were measured before and after purging. Purging was considered complete when three volumes or more have been removed. Wells evacuated to dryness before the removal of three well volumes were also considered purged. Wells MW-2B, MW-3B, MW-5B, MW-6B and MW-19B were purged dry before three volumes of groundwater could be removed during this sampling round.

A dedicated length of polyvinyl tubing was used for each well. Where possible, the tubing was suspended in the well for use during subsequent monitoring events. The submersible pumps were decontaminated between sampling locations using the procedures documented in the work plan.

Purge and decontamination water from MW-1, MW-2, MW-4, MW-4B, MW-11, MW-14, MW-19, MW-19B, MW-B, MW-D2, RW-5, OW-12 and OW-13 were conveyed into 55-gallon drums staged throughout the main plant. The wastewater in these drums will be collected, transported to and treated at a commercial wastewater treatment plant with the landfill leachate at a later date. Purge and decontamination water from the other monitoring wells were discharged directly to the ground surface.

## **2.3 Groundwater Sampling Procedures**

Groundwater samples were collected immediately after purging using the submersible pump or the peristaltic pump or the bailer. Wells that were purged to dryness were sampled after sufficient recovery had occurred. Sample aliquots were

discharged directly from the tubing into the appropriate, uniquely labeled sample bottles.

The filled sample bottles were placed into coolers chilled to approximately 4°C and transported to the analytical laboratory with a chain-of-custody record in accordance with the work plan.

According to cost-saving measures recommended by the NYSDEC (*NYSDEC 2000b*), filtered (dissolved) metal samples were not collected for this sampling round even when the turbidity were greater than 50 NTUs.

### **3.0 Groundwater and LNAPL Characteristics**

Groundwater elevation data and potentiometric contour maps are presented in Section 3.1. LNAPL measurement data are presented in Section 3.2.

#### **3.1 Groundwater**

The depth-to-water measurement results, the groundwater elevation data and the well depth measurement results are presented in Table 3-1.

The groundwater elevation data were used to develop the potentiometric contour maps for the overburden (Figure 3-1) and bedrock (Figure 3-2). In these figures, groundwater elevation data are presented next to each monitoring well. In Figure 3-2, groundwater elevation data for the bedrock wells were limited and only meaningful isopleth line for the groundwater elevation was plotted for the 40 feet above mean sea level (ft-msl).

Inferred directions of groundwater flows are also plotted in these figures. The groundwater flow directions in both zones were to the east, consistent with the historical results.

#### **3.2 LNAPL**

##### **3.2.1 Site Monitoring Program**

Adirondack noticed petroleum odor during this sampling round at MW-11, MW-16, MW-B, MW-D2, RW-4, OW-13 and OW-14. Oily sheen was visible at MW-21, MW-22, MW-B, MW-D2, RW-4, OW-13 and OW-14.

##### **3.2.2 In-House LNAPL Monitoring Program**

AL Tech/RealCo has been monitoring the presence of LNAPL at various wells as part of an in-house program since July 1989. The in-house monitoring program was conducted on a monthly basis until the end of 2000. It is currently being conducted on a quarterly basis since 2001. The in-house monitoring program has been modified several times based on a review of the information generated from this in-house monitoring program and the groundwater monitoring program. For example, five wells (MW-20, MW-22, PZ-11, RW-3 and RW-4) were added to the monitoring program in August 2000.

The in-house program measures the elevations of the groundwater and LNAPL and detects the presence of LNAPL when the LNAPL thickness is at least 0.1 inch. The historical LNAPL thickness data were presented in two earlier reports (*RealCo 2001b and 2002*). In this semi-annual monitoring report, only the LNAPL thickness data since April 2001 are presented in Table 3-2 for the monitoring wells that are currently measured for the LNAPL thickness.

According to the historical data, LNAPL was observed at each well on the following dates:

- OW-1 – 7/10/89, 8/4/89, 3/22/90, none since 3/22/90
- OW-2 – almost always
- OW-3 – 8/9/94, 12/20/94, 1/16/95, 4/26/95, none since 4/26/95
- OW-4 – almost always
- OW-7 – 12/12/89 to 7/16/92, 6/10/93, 5/9/94 to 4/26/95, 8/14/97, 9/16/97, none since 9/16/97
- OW-9 – 1/16/95 only
- OW-10 – none
- OW-11 – 9/6/97 to 12/24/97, 2/18/99 to 8/19/99, 11/6/00, none since 12/5/00
- OW-12 – none
- OW-13 – almost always since 5/8/97 but none since 7/11/01
- OW-14 – 12/4/95 to 10/31/96, 7/22/97, 8/19/99, none since 8/19/99
- OW-15 – none
- OW-16 – none
- OW-17 – none
- OW-18 – 5/21/96, 9/10/96, none since 9/10/96
- OW-19 – none
- MW-A1 – none
- MW-B – frequently during 11/17/89 to 12/9/96, none since 12/9/96
- MW-C – frequently during 11/17/89 to 10/31/96, none since 10/31/96
- MW-D1 – 12/12/89 to 5/15/95, 9/16/97 to 12/1/97, 4/10/03
- MW-5 – none
- MW-6 – frequently during 8/25/95 to 6/10/97, none since 6/10/97
- PZ-8 – 12/4/95, 10/29/97 to 12/20/00, none since 4/3/01
- PZ-9 – none
- PZ-11 – none
- PZ-12 – none
- RW-3 – always
- RW-4 – almost always but not since 10/9/03

As usual, LNAPL was observed at OW-2, OW-4 and RW-3 during two most recent in-house monitoring events (March and June 2004). LNAPL used to be observed almost always at OW-13, PZ-8 and RW-4 but no LNAPL has been observed at OW-13 and PZ-8 since mid-2001 and at RW-4 since October 2003.

LNAPL and groundwater elevations during the period of January 1999 (August 2000 for RW-3 and RW-4) through June 2004 are presented in Figures 3-3 through 3-8 for the above six wells. In these graphs, the difference between LNAPL and groundwater elevations represents the LNAPL thickness (the LNAPL thickness measurements in these figures are presented in feet, while those in Table 3-2 are presented in inches).

## **4.0 Groundwater Quality Data**

Adirondack analyzed the groundwater samples. Field data summary (well records) for Year 5, Round 1 is presented in Appendix A. Quality assurance certifications (Case Narratives) by Adirondack for this sampling round are included in this report as Appendix B.

Summary discussions of the data are presented in Sections 4.1 through 4.4 for the following:

- Metals
- Miscellaneous parameters
- TPHs
- PCBs

The groundwater data were compared to the NYSDEC Water Quality Regulations, Surface Water and Groundwater Classifications and Standards, New York State Codes, Rules and Regulations, Title 6, Chapter X, Parts 700-706, Through March 1998, Amended April 1999.

### **4.1 Metals**

Table 4-1 presents the groundwater analytical data for metals and miscellaneous parameters for Year 5, Round 1 as well as historical data for corresponding monitoring wells. Historical data for metals include the results for total (not dissolved) metals only.

The following sections briefly summarize the groundwater data and identify exceedances of the potentially applicable criteria based on the above NYSDEC Water Quality Regulations (NYSWQR). In Table 4-1, all exceedances are underlined and presented in red. The groundwater discussion is typically limited to the total (unfiltered) sample results. Duplicate sample results are not discussed either unless mentioned otherwise.

Exceedances of the standards for groundwater samples included in the Site-Wide Plan are presented in Figure 4-1; exceedances of the standards for samples included in the Groundwater ICM Plan are presented in Figure 4-2. In these figures, corresponding data at each location for the Year 4, Round 2 sampling event are also presented for comparison purpose.

#### **4.1.1 Antimony**

The groundwater standard for antimony is 3  $\mu\text{g/l}$ . Antimony was detected above the standard at MW-5 (20.0  $\mu\text{g/l}$ ) but not detected in the groundwater samples collected from MW-3, MW-3B, MW-4, MW-4B, MW-5B and OW-12 at the detection limit of 5.7  $\mu\text{g/l}$ .

#### 4.1.2 Arsenic

The groundwater standard for arsenic is 25 µg/l. Arsenic was analyzed for MW-D2 only according to the approved monitoring plan. Arsenic was not detected at MW-D2 at the detection limit of 3.7 µg/l.

#### 4.1.3 Barium

The groundwater standard for barium is 1,000 µg/l. Barium was detected in twenty-five samples at concentrations less than 1,000 µg/l. Barium was detected above the standard in samples collected from MW-1B (1,140 µg/l), MW-2B (1,390 µg/l), MW-3B (1,350 µg/l), MW-6B (1,390 µg/l) and MW-14 (1,130 µg/l).

#### 4.1.4 Beryllium

The groundwater standard for beryllium is 3 µg/l. Analysis of beryllium was performed for samples collected from MW-4, MW-4B, MW-19, MW-19B and MW-8B (the background well). Beryllium was not detected at its detection limit of 0.2 µg/l in MW-4 and MW-8B. Beryllium was detected at MW-4B (1.3 µg/l) and MW-19 (1.2 µg/l) at a concentration less than the standard but was detected above the standard at MW-19B (3.1 µg/l).

#### 4.1.5 Chromium

The groundwater standard for chromium is 50 µg/l. The chromium results for groundwater during Year 5, Round 1 are as follows:

- not detected at its detection limit of 2.3 µg/l in eighteen of the thirty-six samples collected
- detected at concentrations less than the standard in fourteen of the thirty-six samples collected
- detected at concentrations above the standard in MW-1 (207 µg/l), MW-2 (144 µg/l), MW-4B (88.6 µg/l) and OW-12 (110 µg/l).

#### 4.1.6 Molybdenum

The groundwater standard for molybdenum is 180 µg/l. The molybdenum results for groundwater during Year 5, Round 1 are as follows:

- not detected at its detection limit of 2.5 µg/l in ten of the thirty samples collected
- detected at concentrations less than the standard in sixteen of the thirty samples collected
- detected at concentrations above the standard in MW-1 (1,290 µg/l), MW-4 (284 µg/l), MW-11 (1,450 µg/l) and MW-14 (253 µg/l).

#### 4.1.7 Nickel

The groundwater standard for nickel is 100 µg/l. The nickel results for groundwater during Year 5, Round 1 are as follows:

- not detected at its detection limit of 2.7 µg/l in twenty-four of the thirty-six samples collected
- detected at concentrations less than the standard in nine of the thirty-six samples collected
- detected at concentrations above the standard in MW-4B (2,710 µg/l), MW-19 (275 µg/l) and MW-19B (6,880 µg/l).

## 4.2 Miscellaneous Parameters

Several miscellaneous parameters were analyzed for selected groundwater samples. These parameters included: ammonia, fluoride, nitrate, sulfate and pH. The results of analyses for the miscellaneous parameters are also presented in Table 4-1.

### 4.2.1 Ammonia

The groundwater standard for ammonia is 2 milligrams per liter (mg/l). Analysis for ammonia was performed for groundwater samples collected from MW-4B, MW-19B and MW-D2 where ammonia has been historically detected above the standard.

Ammonia was detected below the standard at MW-4B (0.76 mg/l) and MW-D2 (1.79 mg/l). Ammonia was not detected at its detection limit of 0.1 mg/l in MW-19B.

### 4.2.2 Fluoride

The groundwater standard for fluoride is 1.5 mg/l. The fluoride results for groundwater during Year 5, Round 1 are as follows:

- detected at concentrations less than the standard in seven of the fifteen samples analyzed
- detected at concentrations greater than the standard in MW-4 (2.13 mg/l), MW-4B (17.6 mg/l), MW-19 (21.4 mg/l), MW-19B (22.2 mg/l), MW-B (1.55 mg/l), MW-D2 (1.51 mg/l), RW-5 (7.11 mg/l) and OW-13 (3.41 mg/l).

### 4.2.3 Nitrate

The groundwater standard for nitrate is 10 mg/l. The nitrate results for groundwater during Year 5, Round 1 are as follows:

- not detected at its detection limit of 0.02 mg/l in eight of the fifteen samples analyzed for nitrate
- detected at concentrations less than the standard in five of the fifteen samples
- detected at concentrations greater than the standard in MW-4B (12.3 mg/l) and MW-19B (38 mg/l).

### 4.2.4 Sulfate

The groundwater standard for sulfate is 250 mg/l. The sulfate results for groundwater during Year 5, Round 1 are as follows:

- not detected at its detection limit of 1 mg/l at MW-D2
- detected at concentrations less than the standard in eleven of the fifteen samples analyzed for sulfate
- detected at concentrations greater than the standard in MW-4B (707 mg/l), MW-8B (361 mg/l) and MW-19B (1,009 mg/l).

#### 4.2.5 pH

The acceptable range of pH in groundwater is 6.5 to 8.5 standard units (s.u.). During Year 5, Round 1, thirty of the thirty-six samples showed acceptable pH values. High pH values were observed at MW-1 (12.1 s.u.), MW-2B (9.6 s.u.), MW-3B (8.7 s.u.) and MW-5B (9.1 s.u.). Low pH values were observed at MW-15 (5.8 s.u.) and MW-20 (6.1 s.u.).

### 4.3 Total Petroleum Hydrocarbon (TPH)

The TPH results are presented in Table 4-2 along with historical TPH data for these seven wells. There is no groundwater standard for TPH. TPH was not detected at the detection limit of 100  $\mu\text{g/l}$  in five of the seven samples. TPH was detected in MW-6 (510  $\mu\text{g/l}$ ) and in MW-B (5,100  $\mu\text{g/l}$ ).

### 4.4 Polychlorinated Biphenyls (PCBs)

The groundwater standard for PCBs is 0.09  $\mu\text{g/l}$ . Analyses of PCBs were performed for groundwater samples collected from MW-14, H-4S and H-4D. The PCB results are presented in Table 4-3 along with historical PCB data from previous investigations. Since Arochlor 1016, Arochlor 1221, Arochlor 1232, Arochlor 1242 and Arochlor 1248 have never been detected in any of the groundwater samples collected from the monitoring wells at the Main Plant Area, Table 4-3 lists the data for Arochlor 1254 and Arochlor 1260 only. In Table 4-3, all exceedances are underlined and presented in red.

During Year 5, Round 1, Arochlor 1254 was detected in MW-14 at 0.43  $\mu\text{g/l}$  and Arochlor 1260 was detected in H-4S at 0.37  $\mu\text{g/l}$ . Other PCBs were not detected at detection limits of 0.065  $\mu\text{g/l}$ . PCBs were not detected in H-4D.

## **5.0 Data Analysis and Discussion**

The purpose of this monitoring program is to evaluate general site conditions at the Main Plant Area in order to understand potential impact from historical site operations and to investigate any changes in the groundwater quality over time at the Main Plant Area.

Summary of discussions of the conditions identified through implementation of the groundwater monitoring program are presented in the following sections. The data for each parameter will be discussed individually. The groundwater standards have been restated and are provided in parentheses, where available.

### **5.1 Metals**

#### **5.1.1 Antimony (3 µg/l)**

Antimony was detected above the standard at MW-5 (20.0 µg/l) but not detected in the groundwater samples collected from MW-3, MW-3B, MW-4, MW-4B, MW-5B and OW-12 at the detection limit of 5.7 µg/l, which was above the standard.

The low to not detected concentrations during Year 5 and the general absence in the past suggest that antimony should not be considered a constituent of interest at the site.

#### **5.1.2 Arsenic (25 µg/l)**

Arsenic was not detected at MW-D2 at the detection limit of 3.7 µg/l during Year 5, Round 1. Although the historical arsenic concentrations at MW-D2 (Table 4-1, page 26) have been high, arsenic was not detected at MW-D2 during the last four sampling rounds. RealCo recommends not monitoring the arsenic concentration at MW-D2 in the future.

#### **5.1.3 Barium (1,000 µg/l)**

Barium was detected in twenty-five samples at concentrations less than 1,000 µg/l. Barium was detected above the standard in samples collected from MW-1B (1,140 µg/l), MW-2B (1,390 µg/l), MW-3B (1,350 µg/l), MW-6B (1,390 µg/l) and MW-14 (1,130 µg/l).

Barium concentrations greater than the standard were consistently reported for samples collected from the above five wells (Table 4-1). The first four wells are screened in bedrock but the last well is screened in overburden. These five wells are randomly located throughout the Main Plant Area and it is not clear why these particular wells show high concentrations of barium.

#### **5.1.4 Chromium (50 µg/l)**

Chromium was not detected in 50 percent of the samples collected during Year 5, Round 1 and was detected at concentrations less than the standard in 39

percent of the samples. Concentrations above the standard were reported for MW-1 (207 µg/l), MW-2 (144 µg/l), MW-4B (88.6 µg/l) and OW-12 (110 µg/l).

Chromium concentrations greater than the standard have been consistently reported for samples collected from MW-1, MW-4B and OW-12. Chromium concentrations above the standard were observed at MW-2 during the last five sampling events.

MW-1 and MW-2 are located in the former scrap metal storage and handling area. The high chromium concentrations reported in these wells are likely the result of impact from historical scrap storage and handling in this area.

MW-4B and OW-12 are located in the Groundwater ICM area. The high chromium concentrations reported in these wells are likely the result of impact from historical pickle house releases.

#### 5.1.5 Molybdenum (180 µg/l)

Molybdenum was not detected in 33 percent of the samples collected during Year 5, Round 1 and was detected at concentrations less than the standard in 53 percent of the samples. Concentrations above the standard were reported for MW-1 (1,290 µg/l), MW-4 (284 µg/l), MW-11 (1,450 µg/l) and MW-14 (253 µg/l).

Molybdenum concentrations greater than the standard have been consistently reported for samples collected from MW-1, MW-11 and MW-14.

MW-1 and MW-14 are located in the former scrap metal storage and handling area. The high molybdenum concentrations reported in these wells are likely the result of impact from historical scrap metal storage in this area.

MW-11 is located directly down gradient of the former continuous caster cooling water pit. Oily scales generated from the continuous casting process had been deposited at the bottom of the cooling water pit and may be the source of molybdenum in MW-11.

Molybdenum concentrations greater than the standard were detected at MW-4 during the last four sampling rounds. Molybdenum concentrations at this well will be closely monitored in the future.

#### 5.1.6 Nickel (100 µg/l)

Nickel was not detected in 67 percent of the samples collected during Year 5, Round 1 and was detected at concentrations less than the standard in 25 percent of the samples. Concentrations above the standard were reported for MW-4B (2,710 µg/l), MW-19 (275 µg/l) and MW-19B (6,880 µg/l).

Nickel concentrations greater than the standard have been consistently reported for samples collected from MW-4B, MW-19 and MW-19B. These wells are all located in the Groundwater ICM area. The high nickel concentrations reported in these wells strongly suggest that nickel is a key indicator of impact from historical pickle house releases.

## 5.2 Miscellaneous Parameters

### 5.2.1 Ammonia (2 mg/l)

During Year 5, Round 1, ammonia was detected in MW-4B (0.76 mg/l) and in MW-D2 (1.79 mg/l). Ammonia was not detected at its detection limit of 0.1 mg/l in MW-19B.

The historical data in Table 4-1 indicate that the ammonia concentrations have decreased over time at MW-4B and MW-19B.

### 5.2.2 Fluoride (1.5 mg/l)

During Year 5, Round 1, fluoride was detected at concentrations less than the standard in 47 percent of the samples. Fluoride was detected at concentrations greater than the standard in MW-4 (2.13 mg/l), MW-4B (17.6 mg/l), MW-19 (21.4 mg/l), MW-19B (22.2 mg/l), MW-B (1.55 mg/l), MW-D2 (1.51 mg/l), RW-5 (7.11 mg/l) and OW-13 (3.41 mg/l).

Fluoride has been consistently detected at concentrations above the standard in samples collected from the above listed wells. Fluoride concentrations have been very high at MW-4, MW-4B, MW-19, MW-19B and RW-5. Fluoride concentrations have also been high historically at RW-1B, OW-13 and OW-14. These wells are all located within the area known to be impacted by historical pickle house releases and the presence of fluoride is believed to be directly related to the materials released from the pickle house.

### 5.2.3 Nitrate (10 mg/l)

During Year 5, Round 1, nitrate was not detected in 53 percent of the samples. Nitrate was detected at concentrations less than the standard in 33 percent of the samples. Nitrate was detected at concentrations greater than the standard in MW-4B (12.3 mg/l) and MW-19B (38 mg/l).

Nitrate has been consistently detected at concentrations above the standard in samples collected from the above two wells. Between 1994 and 1997, high concentrations of nitrate were also reported in MW-4, MW-19 and RW-5. Since then, the nitrate concentrations in these three wells have been significantly reduced. As discussed earlier, these wells are all located within the area known to be impacted by historical pickle house releases and the presence of nitrate is believed to be directly related to the materials released from the pickle house.

### 5.2.4 Sulfate (250 mg/l)

During Year 5, Round 1, sulfate was detected at concentrations less than the standard in 80 percent of the samples. Sulfate was detected at concentrations greater than the standard in MW-4B (707 mg/l), MW-8B (361 mg/l) and MW-19B (1,009 mg/l).

Sulfate has been consistently detected at concentrations above the standard in samples collected from these three wells. Again, MW-4B and MW-19B are located within the area that are known to be impacted by historical pickle house

releases and the presence of sulfate in these wells is believed to be directly related to the materials released from the pickle house. MW-8B is a background well, indicating that regional groundwater contains elevated concentrations of sulfate.

#### 5.2.5 pH (6.5 s.u. to 8.5 s.u.)

During Year 5, Round 1, 83 percent of the samples showed acceptable pH values. High pH values were observed at MW-1 (12.1 s.u.), MW-2B (9.6 s.u.), MW-3B (8.7 s.u.) and MW-5B (9.1 s.u.). Low pH values were observed at MW-15 (5.8 s.u.) and MW-20 (6.1 s.u.).

pH values of equal to or greater than 8.5 s.u. have been consistently reported for groundwater samples collected from MW-1, MW-2B, and MW-5B as well as occasionally at MW-3B. These wells are not located within the same area of any significant impact from site operations. Therefore, the elevated pH is believed to be indicative of impact from well construction (cement) and/or the nature of the bedrock shale (except for MW-1) (ESC 2001).

It is not clear why MW-15 and MW-20 exhibit low pH values.

#### 5.2.6 TPHs (no standard)

During Year 5, Round 1, somewhat elevated TPH concentrations were reported in MW-B and MW-6. MW-B and MW-6 are located down gradient of the oil feed lines and the presence of high TPH in these wells is believed to be directly related to the fuel oil released from the feed lines.

#### 5.2.7 PCBs (0.09 µg/l)

During Year 5, Round 1, Arochlor 1254 was detected in MW-14 at 0.43 µg/l and Arochlor 1260 was detected in H-4S at 0.37 µg/l. Other PCBs were not detected at detection limits of 0.065 µg/l. PCBs were not detected in H-4D.

The source of PCBs at MW-14 is not known but could be related to historical scrap handling in the area. The source of PCBs at MW-14 is clearly not similar to that observed at H-4S based on the Arochlors present.

The source of PCBs at H-4S is speculated to be related to historical waste oil handling practices in the adjacent South Lagoon. The PCB data continue to suggest the potential presence of Arochlor 1260 in the South Lagoon area.

RealCo will continue to analyze samples from the required locations (MW-14, H-4S and H-4D) for PCBs to monitor the presence of PCBs in the groundwater in these areas.

### 5.3 **Migration of Contaminants**

As discussed in Section 3.1, the groundwater flow directions at the Main Plant Area are to the east. A groundwater flow velocity of 136 to 693 feet/year was calculated in a previous investigation (RealCo 2002). If contaminants migrate with

the flow of groundwater, the contaminants should migrate easterly 136 to 693 feet per year.

MW-19/MW-19B are located approximately 80 feet down gradient of MW-4/MW-4B. They show similar concentrations in many contaminants and it is very likely that the contaminated groundwater migrated from the pickle house to MW-4/MW-4B and then to MW-19/MW-19B.

However, it does not appear the contaminants are migrating at other locations. For example, MW-11 showed very high molybdenum concentrations (1,330 to 3,580  $\mu\text{g/l}$ ) over the years but none of the down gradient wells such as MW-22, MW-21, MW-D2, MW-B and OW-13 showed elevated molybdenum concentrations.

During in-house LNAPL monitoring program, LNAPL has been almost always observed at OW-2 and OW-4 since November 1989 but was rarely observed (especially since 1997) at their down gradient wells such as OW-19, OW-3, MW-5, MW-6, MW-B, MW-C, MW-D1, OW-16 and OW-14. The fact that LNAPL was frequently observed at RW-4, OW-13 and PZ-8 in the past but not observed at nearby wells such as OW-14, MW-D1, PZ-9, PZ-11 and PZ-12 which are located amongst RW-4, OW-13 and PZ-8 suggests that LNAPL in this area was not migrating either.

#### **5.4 Isopleth Maps for Significant Contaminants**

The approved work plan requires a semi-annual report to include groundwater isopleth maps for all significant contaminants. According to the recent modifications recommended by the NYSDEC (*NYSDEC 2002a*), RealCo does not need to prepare isopleth maps for aluminum, antimony, arsenic, chromium, molybdenum, nickel and ammonia but is recommended to prepare isopleth maps for barium, fluoride, nitrate and LNAPL thickness. Isopleth maps for these four parameters have been prepared for the Year 5, Round 1 monitoring program in Figure 5-1 through 5-4.

The barium concentrations are presented in Figure 5-1. However, no meaningful isoconcentration lines could be drawn from these results.

The fluoride concentrations near the pickle house area are presented in Figure 5-2. Isoconcentration lines for 1.5 mg/l and 10 mg/l of fluoride are plotted in Figure 5-2, which delineate the extent of fluoride contamination near the pickle house.

The nitrate concentrations near the pickle house area are presented in Figure 5-3. Isoconcentration lines for 1 mg/l and 10 mg/l of nitrate are plotted in Figure 5-3, which delineate the extent of nitrate contamination near the pickle house.

The LNAPL thickness measurement results for June 2004 are presented in Figure 5-4. The LNAPL map also includes TPH concentrations measured during Year 5, Round 1, where available, so that the entire area impacted by the fuel oil can be depicted. Inferred iso-thickness lines for 1-inch and 10-inch thick LNAPL layers are plotted in Figure 5-4, which delineate the extent of fuel oil contamination in the Main Plant Area.

## **6.0 Effectiveness of ICMs**

Impacts of two ICMs on groundwater quality at the Main Plant Area are discussed in the following sections. The ICMs included:

- Groundwater ICM – A groundwater recovery system was installed proximate to the pickle house in November 1994 and operated until November 4, 2003.
- Fuel Oil ICM – A fuel oil recovery well (RW-3) had been operating from 1989 to November 2001. A fuel oil interceptor trench was constructed along the eastern boundary of the Main Plant Area in September 2000.

### **6.1 Groundwater ICM**

The groundwater recovery system has been in place, with some modifications, since November 1994. Approximately 37,512,000 gallons of groundwater have been recovered through the groundwater recovery system until its permanent shutdown on November 4, 2003. The annual recovery quantity has been as follows:

- 1994 – 532,800 gallons
- 1995 – 7,430,400 gallons
- 1996 – 7,279,200 gallons
- 1997 – 6,551,280 gallons
- 1998 – 4,953,600 gallons
- 1999 – 3,875,760 gallons
- 2000 – 2,799,360 gallons
- 2001 – 2,397,600 gallons
- 2002 – 1,303,200 gallons
- 2003 – 388,650 gallons

The annual recovery has decreased from a high of 7,430,400 gallons in 1995 to a low of 388,650 gallons in 2003.

The groundwater recovery system has been permanently shut down on November 4, 2003 when RealCo's wastewater treatment plant (WWTP) was permanently shut down. Prior to its shutdown, groundwater had been recovered from the bedrock recovery well, RW-2B, at a recovery rate of approximately 5 gallons per minute. The recovered water had been conveyed to a temporary holding tank and subsequently to the WWTP for treatment and proper disposal.

#### **6.1.1 Analytical Data and Graphical Presentations**

The existing database suggests that those wells most useful in the evaluation of the Groundwater ICM effectiveness are MW-4, MW-4B, MW-19, MW-19B and RW-5 (so-called "indicator wells").

In order to evaluate the effectiveness of the groundwater ICM, aluminum, beryllium, chromium, magnesium, molybdenum, nickel, chloride, fluoride, nitrate, sulfate concentrations and pH levels in the groundwater from the above indicator

wells have been analyzed in the past. The historical data (*ESC 2001*) suggest that the concentrations of most parameters have improved significantly during the first several years (between 1994 and 1997) of the groundwater recovery but the improvement rates have slowed down recently.

The data obtained during this and previous groundwater monitoring programs indicate that the parameters that are still reported significantly above the standards in most of these indicator wells are nickel and fluoride. Nitrate and sulfate concentrations are consistently above the standards only in MW-4B and MW-19B.

Graphical presentations of the data for nickel, fluoride, nitrate, sulfate and pH for these five indicator wells are presented in Figures 6-1 through 6-5. In these graphs (except for pH values), concentrations (Y-axis) are expressed in logarithmic scale to account for significant differences in concentrations reported over time and for different wells.

Nickel results are presented in Figure 6-1. June 2000 nickel value at MW-19B has been rejected and is not included in this graph. The graph suggests that nickel concentrations significantly decreased at all locations since the RFIs and little overall change between 2000 and 2001. Nickel concentrations appear to be decreasing again at these wells during the last two years.

Fluoride results are presented in Figure 6-2. The graph suggests that fluoride concentrations have:

- steadily decreased at MW-4 and RW-5
- decreased at MW-4B since the RFIs and remained stable between 2000 and June 2004
- remained stable at MW-19 and MW-19B

Nitrate results are presented in Figure 6-3. The graph suggests that nitrate concentrations decreased at all locations since the RFIs and changed little between June 2000 and June 2001. Nitrate concentrations appear to be decreasing at MW-4B, MW-19 and MW-19B during the last two years. Nitrate concentrations have been well below the standard (10 mg/l) at MW-4, MW-19 and RW-5 since June 2000.

Sulfate results are presented in Figure 6-4. The graph suggests that sulfate concentrations decreased since the RFIs and remained stable since February 2000 at MW-4, MW-4B and MW-19. Sulfate concentrations at MW-19B have increased modestly. Sulfate concentrations have also been well below the standard (250 mg/l) at MW-4 and RW-5 since June 2000.

pH values are presented in Figure 6-5. This graph suggests the following: the pH in RW-5 and MW-4B has risen (improved) significantly and pH in the remaining wells has increased somewhat. The pH values at all five locations have been within the acceptable range of 6.5 s.u. to 8.5 s.u. in a fairly consistent manner during the last twelve months.

#### 6.1.2 Effectiveness of Groundwater ICM

The current and historical data and graphs suggest that the concentrations of beryllium, chromium, molybdenum, nickel, fluoride, nitrate and sulfate have improved

(decreased) in groundwater samples collected from the majority of the indicator wells since the installation of the Groundwater ICM in 1994. The concentrations of many parameters have decreased by several orders of magnitude during the first two or three years of operation of the groundwater recovery system. The pH in RW-5 and MW-4B has also improved (increased) significantly during the first several years of operation. In summary, the Groundwater ICM has been very effective in improving the groundwater quality during the first several years of operation.

However, there appears to be only minor improvements in the groundwater quality at the indicator wells since the Main Plant Area groundwater monitoring program began in February 2000. Nickel concentrations are still very high at MW-4B and MW-19B and remain above the standard (100 µg/l) at MW-19. Fluoride concentrations are still very high at all indicator wells. Nitrate and sulfate concentrations are above the standards (10 mg/l and 250 mg/l, respectively) at MW-4B and MW-19B.

## 6.2 Fuel Oil ICM

### 6.2.1 Oil Recovery Well RW-3

RW-3 had been an active oil recovery well. Since its installation in 1989, approximately 38,000 gallons of oil have been recovered from RW-3. The annual volume of the recovered oil has been as follows:

• 1989 – 1991	20,647 gallons
• 1992	4,736 gallons
• 1993	1,961 gallons
• 1994	2,049 gallons
• 1995	1,787 gallons
• 1996	988 gallons
• 1997	2,413 gallons
• 1998	1,683 gallons
• 1999	1,554 gallons
• 2000	254 gallons
• 2001	0 gallons

The volume of recovered oil has generally declined from year to year. In 2000, approximately 254 gallons were recovered as of March 12. There has been no oil recovery since March 13, 2000. Due to the lack of oil recovery, RealCo shut down the pump at RW-3 on November 20, 2001 after receiving an approval from the NYSDEC (*NYSDEC 2001b*). The NYSDEC approval letter stipulates that if a marked increase in LNAPL thickness were observed at RW-3, groundwater pumping would have to be reactivated. The LNAPL thickness remains relatively thin at RW-3 (Table 3-2) since the pump has been shut down except for July 2003

### 6.2.2 Fuel Oil Interceptor Trench

In order to prevent further migration of leaked fuel oil beyond the eastern boundary of the Main Plant Area, a fuel oil interceptor trench (Fuel Oil ICM) was constructed along the eastern boundary (Figure 2-1) between early August and late September 2000. In essence, the interceptor trench system features a

geomembrane curtain placed vertically through and beyond the span of known elevations of the local groundwater table and extends in a north-south orientation beyond the boundaries of the fuel oil plume. Gravel drainage material is utilized as backfill around the geomembrane curtain. Three sump manholes are located in the gravel filled trench and contain oil skimmers and associated piping. Product recovery storage tanks store the skimmed oil, if there is any.

The skimmers and the oil recovery system along the interceptor trench have been in operation since October 2000. To date, however, no oil has been recovered from the interceptor trench.

### 6.2.3 Effectiveness of Fuel Oil ICM

The interceptor trench is a passive system, which promotes neither the groundwater flow nor the migration of fuel oil. Therefore, the presence or absence of LNAPL, increase or decrease of TPHs in the observed monitoring wells or the groundwater quality data for nearby wells will not provide any meaningful information with which to evaluate the effectiveness of the Fuel Oil ICM. For example, the TPH data presented in Table 4-2 cannot provide any useful information in evaluating the effectiveness of the Fuel Oil ICM.

MW-5, MW-6, MW-B, MW-C, OW-3 and PZ-11 are located downgradient of the interceptor trench. However, LNAPL was not observed in these wells prior to the construction of the interceptor trench and absence of LNAPL at these wells does not provide any meaningful information regarding the effectiveness of the Fuel Oil ICM. LNAPL was briefly observed at MW-B between May 3 and August 3, 2000 but disappeared after the construction of the interceptor trench. This may support the effectiveness of the Fuel Oil ICM but this is a weak support at best since no measurable LNAPL has been observed at MW-B for previous three years.

The effectiveness of the Fuel Oil ICM can be best evaluated by measuring the amount of recovered oil from the interceptor trench, assuming that the leaked fuel oil is still migrating through the eastern boundary of the Main Plant Area. However, no oil has been recovered from the interceptor trench after nearly four years of operation. This indicates that oil encountered within the subsurface at numerous locations in the Main Plant Area no longer exists as a separate phase in any significant amount, which can easily migrate and be recovered as free-product by pumping or skimming. RealCo understands though that there are still numerous areas of oil-contaminated soil throughout the Main Plant Area.

## 7.0 Summary

1. During Year 5, Round 1, the following exceedances of the potentially applicable NYSWQR standards were observed in the groundwater quality.
  - Antimony – MW-5 (20.0 µg/l)
  - Barium - MW-1B (1,140 µg/l), MW-2B (1,390 µg/l), MW-3B (1,350 µg/l), MW-6B (1,390 µg/l) and MW-14 (1,130 µg/l)
  - Beryllium – MW-19B (3.1 µg/l)
  - Chromium – MW-1 (207 µg/l), MW-2 (144 µg/l), MW-4B (88.6 µg/l) and OW-12 (110 µg/l)
  - Molybdenum – MW-1 (1,290 µg/l), MW-4 (284 µg/l), MW-11 (1,450 µg/l) and MW-14 (253 µg/l)
  - Nickel – MW-4B (2,710 µg/l), MW-19 (275 µg/l) and MW-19B (6,880 µg/l)
  - Fluoride - MW-4 (2.13 mg/l), MW-4B (17.6 mg/l), MW-19 (21.4 mg/l), MW-19B (22.2 mg/l), MW-B (1.55 mg/l), MW-D2 (1.51 mg/l), RW-5 (7.11 mg/l) and OW-13 (3.41 mg/l)
  - Nitrate – MW-4B (12.3 mg/l) and MW-19B (38 mg/l)
  - Sulfate – MW-4B (707 mg/l), MW-8B (361 mg/l) and MW-19B (1,009 mg/l)
  - pH – MW-1 (12.1 s.u.), MW-2B (9.6 s.u.), MW-3B (8.7 s.u.) and MW-5B (9.1 s.u.), MW-15 (5.8 s.u.) and MW-20 (6.1 s.u.)
  - PCBs – MW-14 (0.43 µg/l for Arochlor 1254), H-4S (0.37 µg/l for Arochlor 1260)
2. During Year 5, Round 1, TPH was detected at MW-6 (510 µg/l) and MW-B (5,100 µg/l).
3. LNAPL was observed at OW-2, OW-4 and RW-3.
4. The high chromium and molybdenum concentrations reported at MW-1 and MW-14 are likely the results of impact from historical scrap storage and handling in the area.
5. The high molybdenum concentrations reported at MW-11 are likely the results of impact from historical continuous casting cooling operation.
6. Ammonia concentrations have decreased over time at MW-4B and MW-19B.
7. The source of PCBs at MW-14 could be related to historical scrap storage and handling in the area. The source of PCBs at H-4S is speculated to be related to historical waste oil handling in the adjacent South Lagoon.
8. Groundwater ICM
  - Since its installation proximate to the pickle house in November 1994, the groundwater recovery system has recovered more than 37 million gallons of groundwater. The recovered groundwater was treated at RealCo's wastewater treatment plant. The groundwater recovery system was permanently shut down on November 4, 2003 when RealCo's wastewater treatment plant (WWTP) was permanently shut down.

- MW-4, MW-4B, MW-19, MW-19B and RW-5 (so-called "indicator wells") are most useful in evaluation of the Groundwater ICM effectiveness.
- The Groundwater ICM has been very effective in improving the groundwater quality near the pickle house during the first several years of operation. There appears to be only minor improvements in the groundwater quality since early 2000.
- Nickel concentrations are still very high at MW-4B and MW-19B and remain above the standard at MW-19. Fluoride concentrations remain very high at all indicator wells. Nitrate and sulfate concentrations are above the standards at MW-4B and MW-19B. Chromium concentrations are above the standard at MW-4B.

9. Fuel Oil ICM

- Since its installation in 1989, approximately 38,000 gallons of oil have been recovered from the oil recovery well, RW-3. There has been no oil recovery since March 13, 2000 and the pumping system has been shut down since November 20, 2001.
- A fuel oil interceptor trench (Fuel Oil ICM) was constructed along the eastern boundary of the Main Plant Area in late September 2000. The oil recovery system along the interceptor trench has been in operation since October 2000.
- The effectiveness of the Fuel Oil ICM can be best evaluated by measuring the amount of recovered oil from the interceptor trench. To date, however, no oil has been recovered from the fuel oil interceptor trench. It appears that little oil is migrating to the interceptor trench.

## 8.0 References

Environmental Strategies Corporation (ESC) 1995a. "Draft Phase I RCRA Facility Investigation Report, AL Tech Specialty Steel Corporation, Watervliet, New York," August 11, 1995.

Environmental Strategies Corporation (ESC) 1995b. "Groundwater ICM Technical Memorandum, AL Tech Specialty Steel Corporation, Watervliet, New York," September 11, 1995.

Environmental Strategies Corporation (ESC) 1998. "Phase II RCRA Facility Investigation Report, AL Tech Specialty Steel Corporation, Watervliet, New York," December 30, 1998.

Environmental Strategies Corporation (ESC) 1999. "Main Plant Area Groundwater Monitoring Program, AL Tech Specialty Steel Corporation Facility, Watervliet, New York," October 29, 1999.

Environmental Strategies Corporation (ESC) 2001. "Main Plant Area, Year 1 Annual Monitoring Report, Former AL Tech Specialty Steel Corporation, Watervliet, New York," March 30, 2001.

Malcolm Pirnie, Inc. 2001. "Construction Certification Report, LNAPL Cutoff/Collection Trench," April 2001.

New York State Department of Environmental Conservation (NYSDEC) 2000a. "Main Plant Area Groundwater Monitoring Program, Former AL Tech Facility, Watervliet, New York," February 7, 2000.

New York State Department of Environmental Conservation (NYSDEC) 2000b. "Groundwater Monitoring Programs at the Former AL Tech Facility in Watervliet, New York," January 26, 2000.

New York State Department of Environmental Conservation (NYSDEC) 2001a. "RealCo Inc. (formerly AL Tech Specialty Steel), Watervliet, NY; Proposal for Modification to Main Plant Area Groundwater Monitoring Program," May 18, 2001.

New York State Department of Environmental Conservation (NYSDEC) 2001b. "Spill #88-00821 - Former AL Tech Facility, Watervliet" November 14, 2001.

New York State Department of Environmental Conservation (NYSDEC) 2002a. "Year 2 Semi-Annual/Annual Monitoring Reports," May 1, 2002.

New York State Department of Environmental Conservation (NYSDEC) 2002b. "Total Petroleum Hydrocarbon Analysis," April 25, 2002.

RealCo Inc. 2001a. "Request for Modification to the Main Plant Area Monitoring Program, Former AL Tech Specialty Steel Corporation, Watervliet, New York Facility," April 11, 2001.

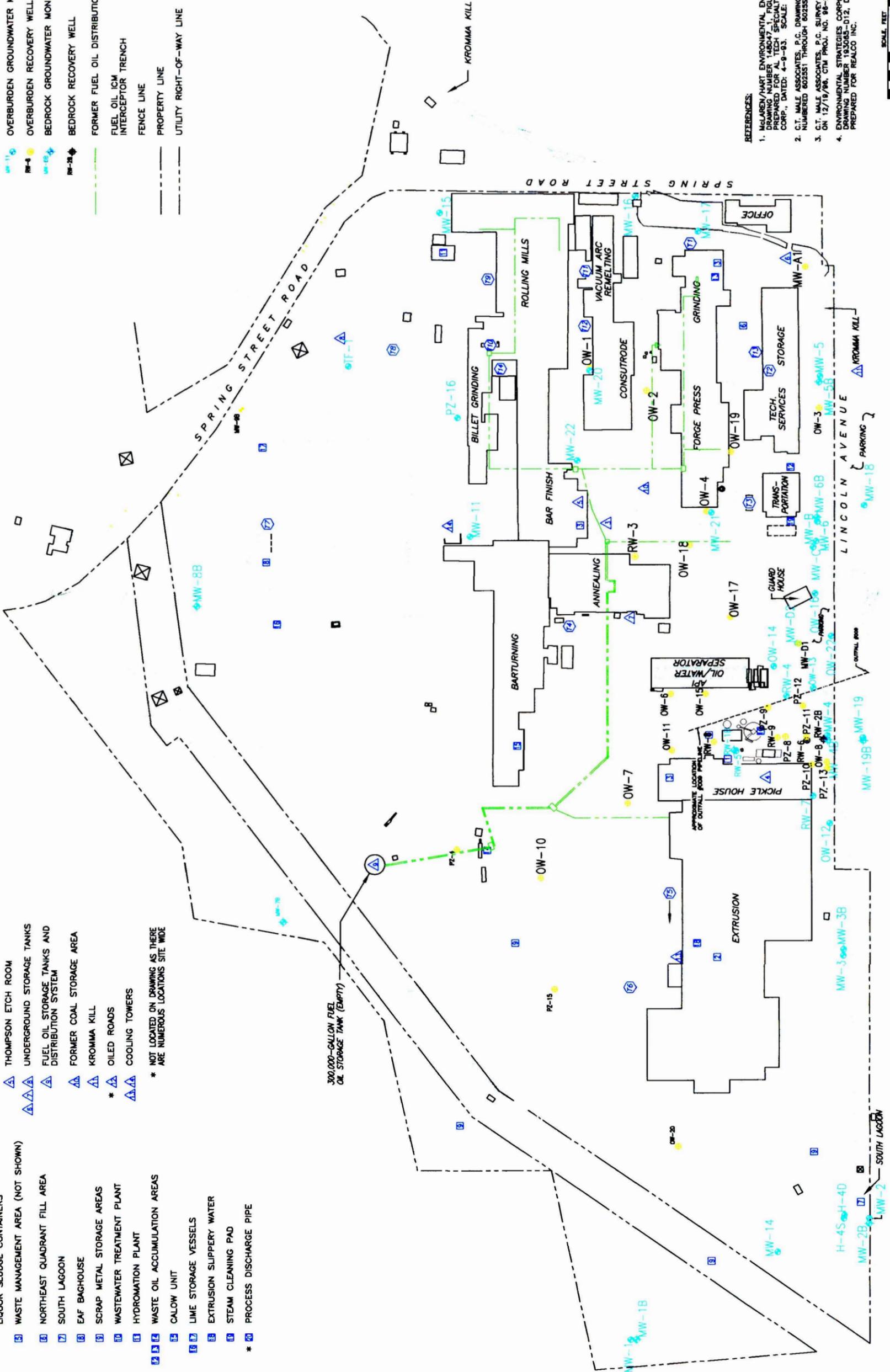
RealCo Inc. 2001b. "Main Plant Area Year 2 Semi-Annual Monitoring Report, Former AL Tech Specialty Steel Corporation, Watervliet, New York," September 14, 2001.

RealCo Inc. 2002. "Main Plant Area Year 2 Annual Monitoring Report, Former AL Tech Specialty Steel Corporation, Watervliet, New York," February 28, 2002.

- SOLID WASTE MANAGEMENT UNITS**
- 1 WASTE ACID PITS
  - 2 EXTRUSION PIT
  - 3 CONTAINER STORAGE AREAS
  - 4 LIME NEUTRALIZED WASTE PICKLE LIQUOR SLUDGE CONTAINERS
  - 5 WASTE MANAGEMENT AREA (NOT SHOWN)
  - 6 NORTHEAST QUADRANT FILL AREA
  - 7 SOUTH LAGOON
  - 8 EAF BAGHOUSE
  - 9 SCRAP METAL STORAGE AREAS
  - 10 WASTEWATER TREATMENT PLANT
  - 11 HYDROMATION PLANT
  - 12 WASTE OIL ACCUMULATION AREAS
  - 13 CALLOW UNIT
  - 14 LIME STORAGE VESSELS
  - 15 EXTRUSION SLIPPERY WATER
  - 16 STEAM CLEANING PAD
  - 17 PROCESS DISCHARGE PIPE

- AREAS OF CONCERN**
- 1 TRANSFORMERS/CAPACITORS
  - \* 2 PROCESS PITS
  - 3 SEPTIC TANK
  - 4 PICKLING ROOM
  - 5 THOMPSON ETCH ROOM
  - 6 UNDERGROUND STORAGE TANKS
  - 7 FUEL OIL STORAGE TANKS AND DISTRIBUTION SYSTEM
  - 8 FORMER COAL STORAGE AREA
  - 9 KROMMA KILL
  - 10 OILED ROADS
  - \* 11 COOLING TOWERS
- \* NOT LOCATED ON DRAWING AS THERE ARE NUMEROUS LOCATIONS SITE WIDE

- LEGEND**
- 12 TRANSFORMER/CAPACITOR AREA LOCATION
  - OW-2 OVERBURDEN OBSERVATION WELL
  - OW-11 OVERBURDEN GROUNDWATER MONITORING
  - RW-8 OVERBURDEN RECOVERY WELL
  - OW-16 BEDROCK GROUNDWATER MONITORING
  - RW-28 BEDROCK RECOVERY WELL
  - FORMER FUEL OIL DISTRIBUTION SYSTEM
  - FUEL OIL ICM INTERCEPTOR TRENCH
  - FENCE LINE
  - PROPERTY LINE
  - UTILITY RIGHT-OF-WAY LINE



**REFERENCES:**

1. MCLAREN/HART ENVIRONMENTAL ENGINEERING DRAWING NUMBER 148047-1, FIGURE 8-1, PREPARED FOR AL TECH SPECIALTY STEEL CORP., DATED: 4-9-93. SCALE: 1" = 200'
2. C.T. MALE ASSOCIATES, P.C. DRAWINGS NUMBERED 602551 THROUGH 602557.
3. C.T. MALE ASSOCIATES, P.C. SURVEY DATA DATED ON 12/19/98. CTM PROJ. NO. 98-279A.
4. ENVIRONMENTAL STRATEGIES CORPORATION DRAWING NUMBER 185083-012, DATED 8-10-00, PREPARED FOR REALCO INC.

665-2: 217  
 665-2: 5994

- LEGEND
- OVERBURDEN OBSERVATION WELL MONITORING
  - OVERBURDEN GROUNDWATER MONITORING
  - OVERBURDEN RECOVERY WELL
  - BEDROCK GROUNDWATER MONITORING
  - BEDROCK RECOVERY WELL
  - [49.22] GROUNDWATER ELEVATION
  - 55 GROUNDWATER ELEVATION CONTOUR
  - INFERRED DIRECTION OF GROUNDWATER FLOW
  - FUEL OIL ICM INTERCEPTOR TRENCH
  - FENCE LINE
  - PROPERTY LINE
  - UTILITY RIGHT-OF-WAY LINE

DESIGNED BY TYP 08-05-04  
 DRAWING NUMBER WMPA0402

FORMER AL TECH SPECIALTY  
 STEEL CORPORATION  
 WATERVLIET, NEW YORK

POTENTIOMETRIC SURFACE MAP  
 OVERBURDEN (JUNE 2004)  
 YEAR 5  
 SEMI-ANNUAL MONITORING REPORT

REALCO INC.  
 WATERVLIET, NEW YORK

- REFERENCES:
1. MCLAREN/HART ENVIRONMENTAL ENGINEERING  
 DRAWING NUMBER 148047, FIGURE 6.1,  
 PREPARED FOR AL TECH SPECIALTY STEEL  
 CORP., DATED: 4-9-93, SCALE: 1" = 200'  
 NUMBERED 602551 THROUGH 602557.
  2. C.T. MALE ASSOCIATES, P.C. DRAWINGS  
 NUMBERED 602551 THROUGH 602557.
  3. C.T. MALE ASSOCIATES, P.C. SURVEY DATA FAXED  
 ON 12/19/96, CDM PROJ. NO. 96-2794.
  4. ENVIRONMENTAL STRATEGIES CORPORATION  
 DRAWING NUMBER 193085-012, DATED 8-10-00,  
 PREPARED FOR REALCO INC.

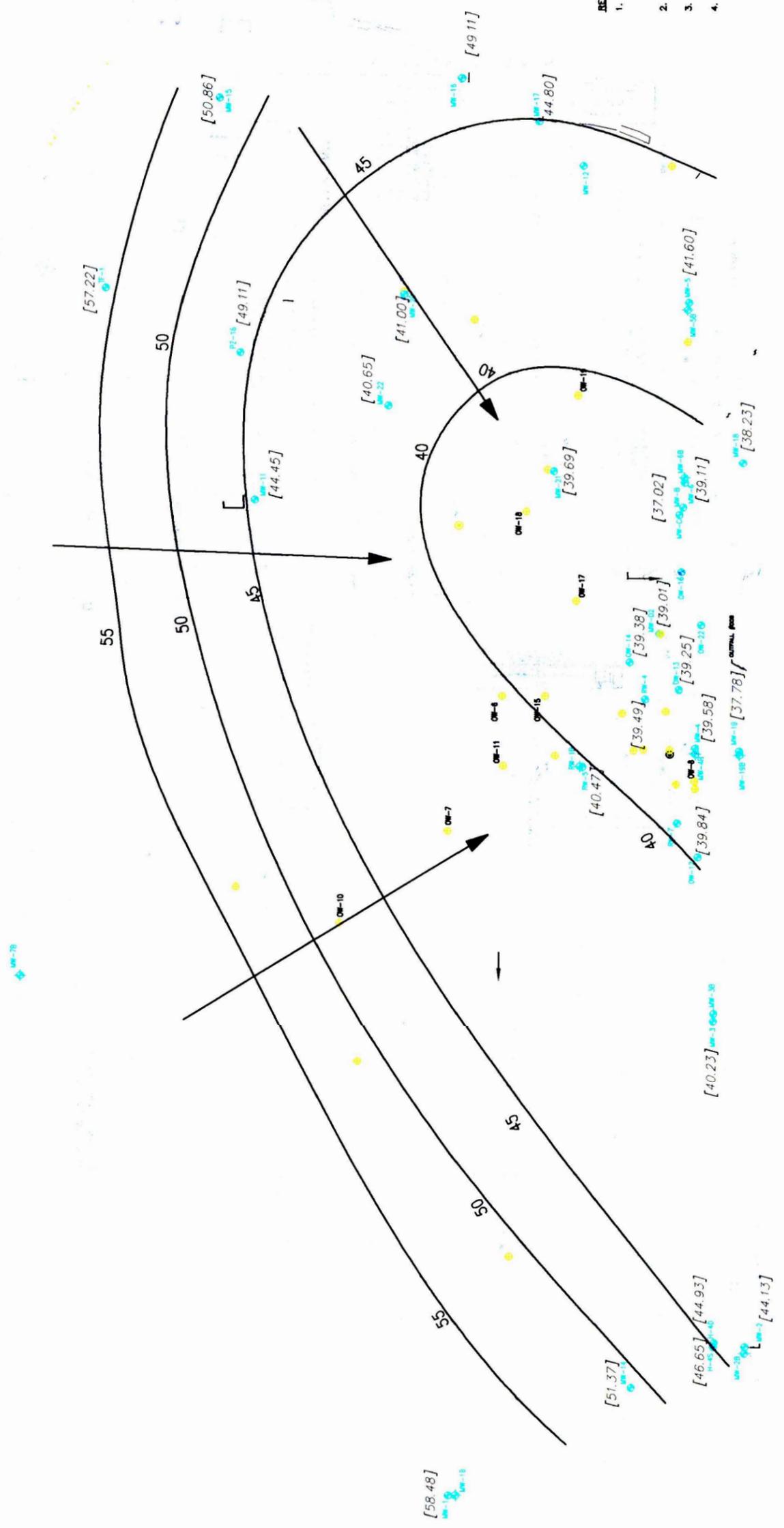


Figure 3-1

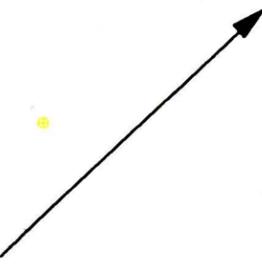
[39.  
40  
→

[101.38]



[55.52]

55



[41.82]

40

[30.00]

40

[38.88]

[39.76]

[38.96]

[38.94]

[38.33]

06-7

06-11

06-3

06-15

06-18

06-17

06-19

06-22

06-22

06-16

06-17

06-16

06-13

06-18

06-11

06-14

06-5

06-20

06-2

06-12

06-22

06-13

06-4

06-14

06-20

06-16

06-3

06-8

06-10

06-11

06-12

06-13

06-14

06-15

06-16

06-17

06-18

06-19

06-20

06-21

06-22

06-23

06-24

06-25

06-26

06-27

06-28

06-29

06-30

06-31

06-32

06-33

06-34

06-35

06-36

06-37

06-38

06-39

06-40

06-41

06-42

06-43

06-44

06-45

06-46

06-47

06-48

06-49

06-50

06-51

06-52

06-53

06-54

06-55

06-56

06-57

06-58

06-59

06-60

06-61

06-62

06-63

06-64

06-65

06-66

06-67

06-68

06-69

06-70

06-71

06-72

06-73

06-74

06-75

06-76

06-77

06-78

06-79

06-80

06-81

06-82

06-83

06-84

06-85

06-86

06-87

06-88

06-89

06-90

06-91

06-92

06-93

06-94

06-95

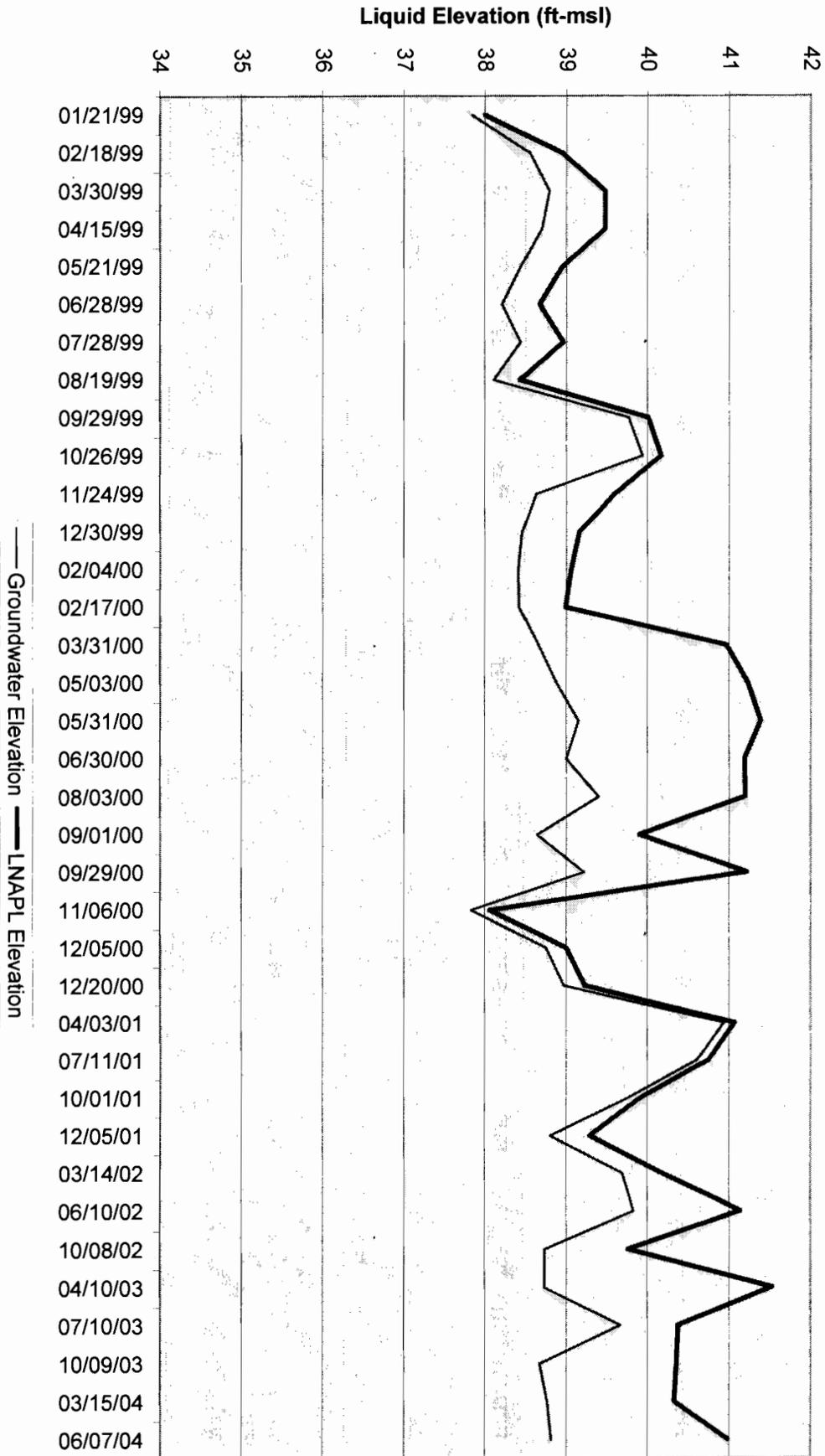
06-96

06-97

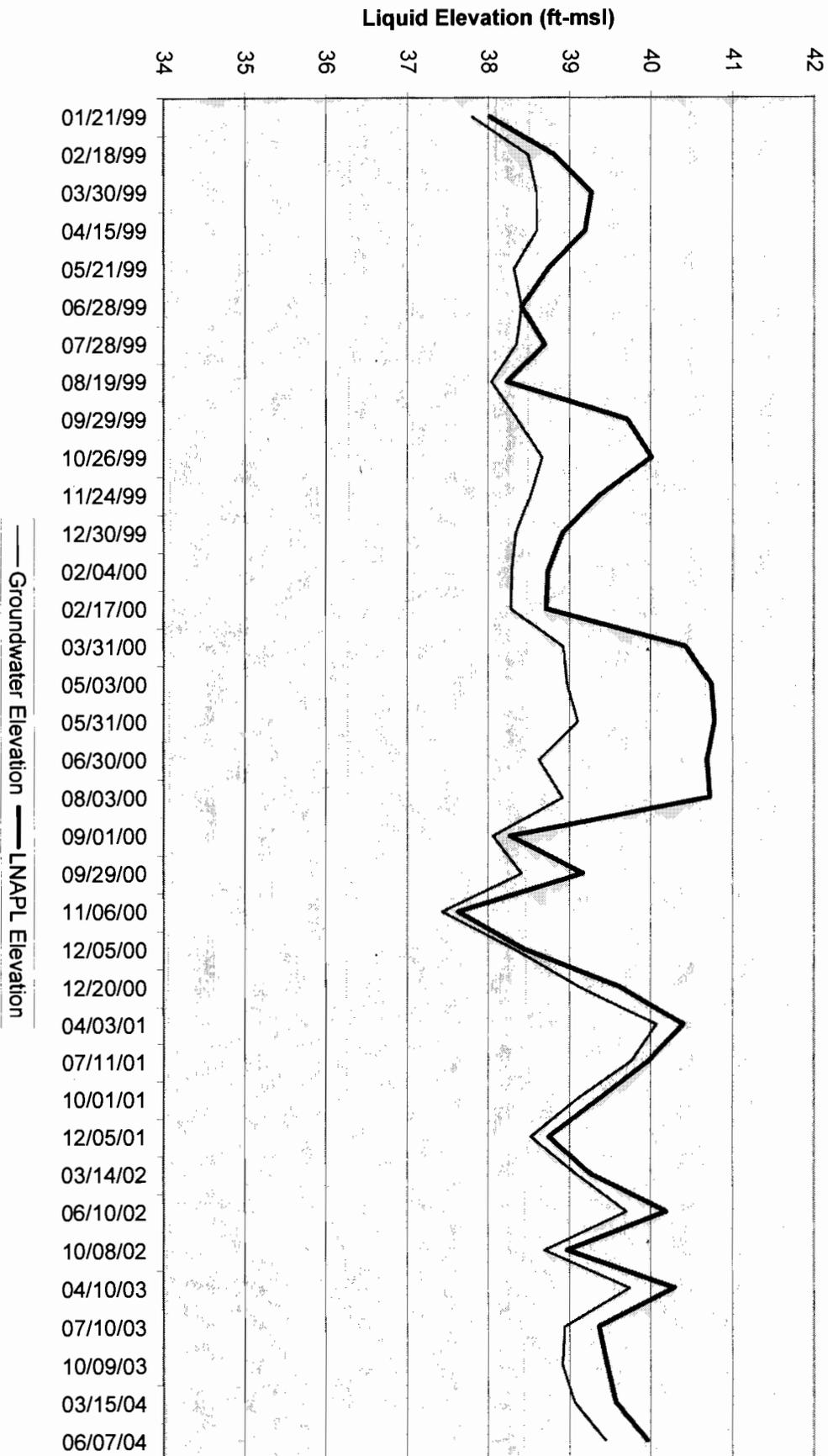
06-98

06-99

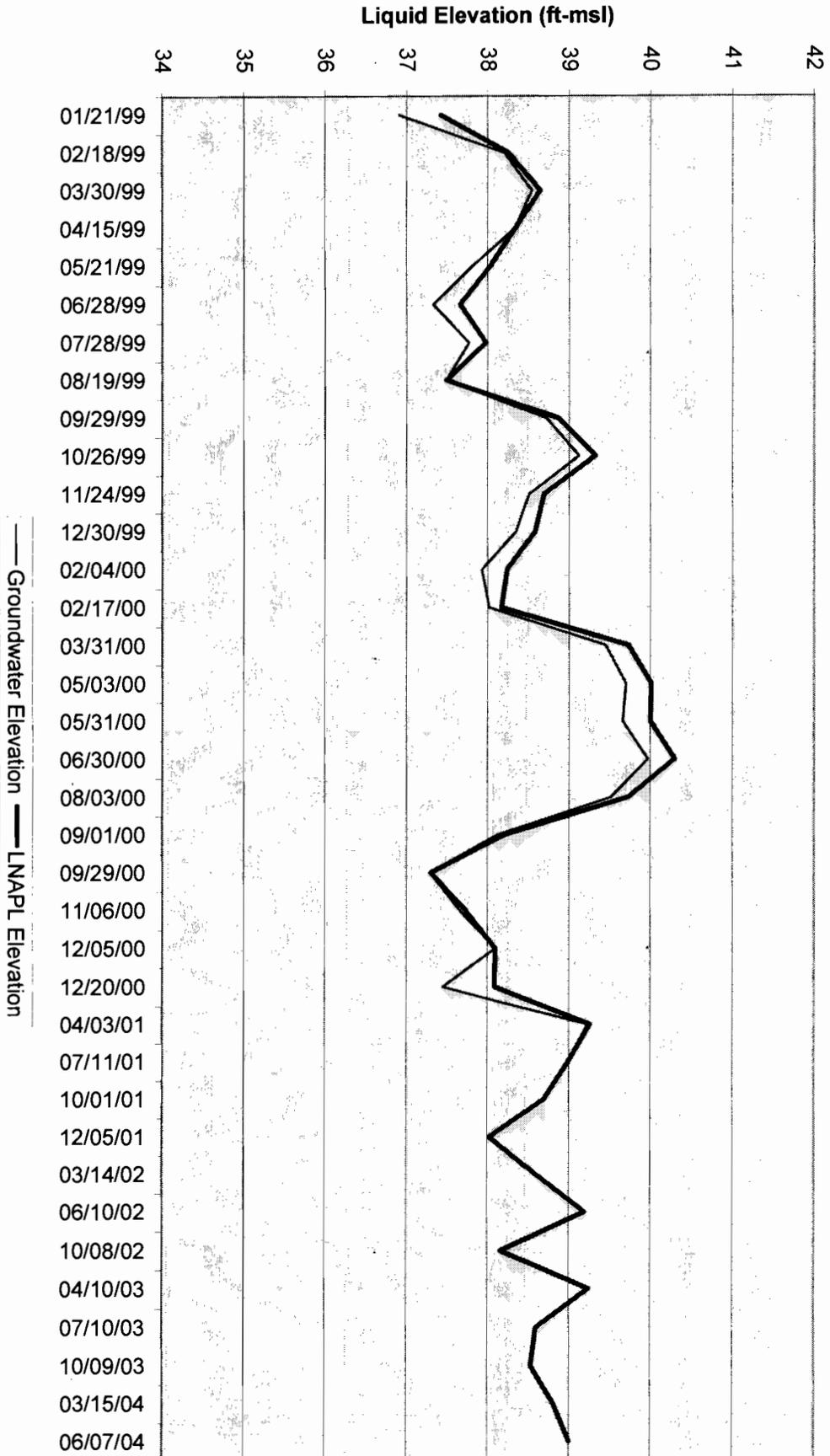
06-100



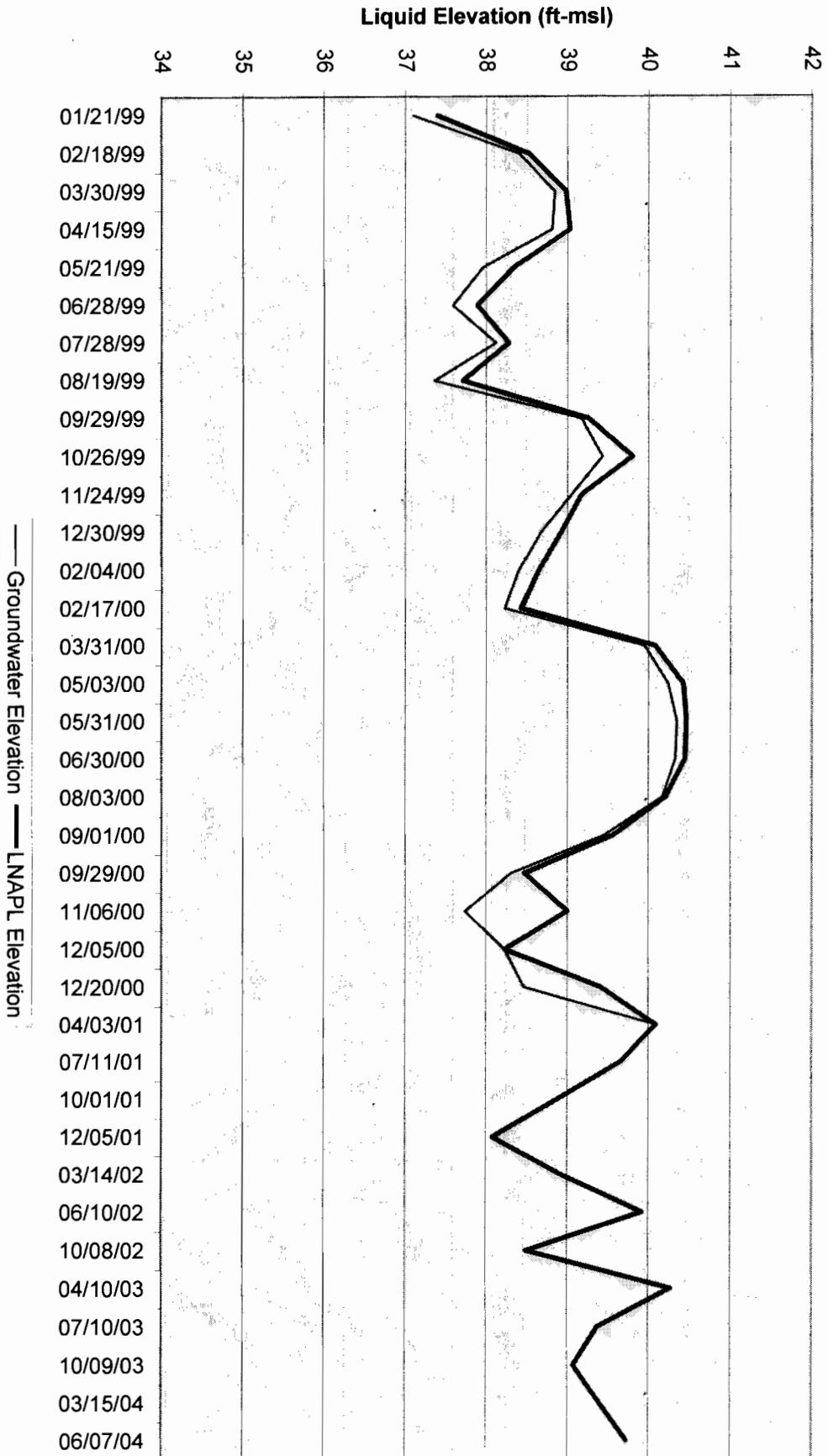
**Figure 3-3**  
**OW-2 LNAPL and Groundwater Elevations**  
 (January 1999 - June 2004)



**Figure 3-4**  
**OW-4 LNAPL and Groundwater Elevations**  
 (January 1999 - June 2004)



**Figure 3-5**  
**OW-13 LNAPL and Groundwater Elevations**  
 (January 1999 - June 2004)



**Figure 3-6**  
**PZ-8 LNAPL and Groundwater Elevations**  
 (January 1999 - June 2004)

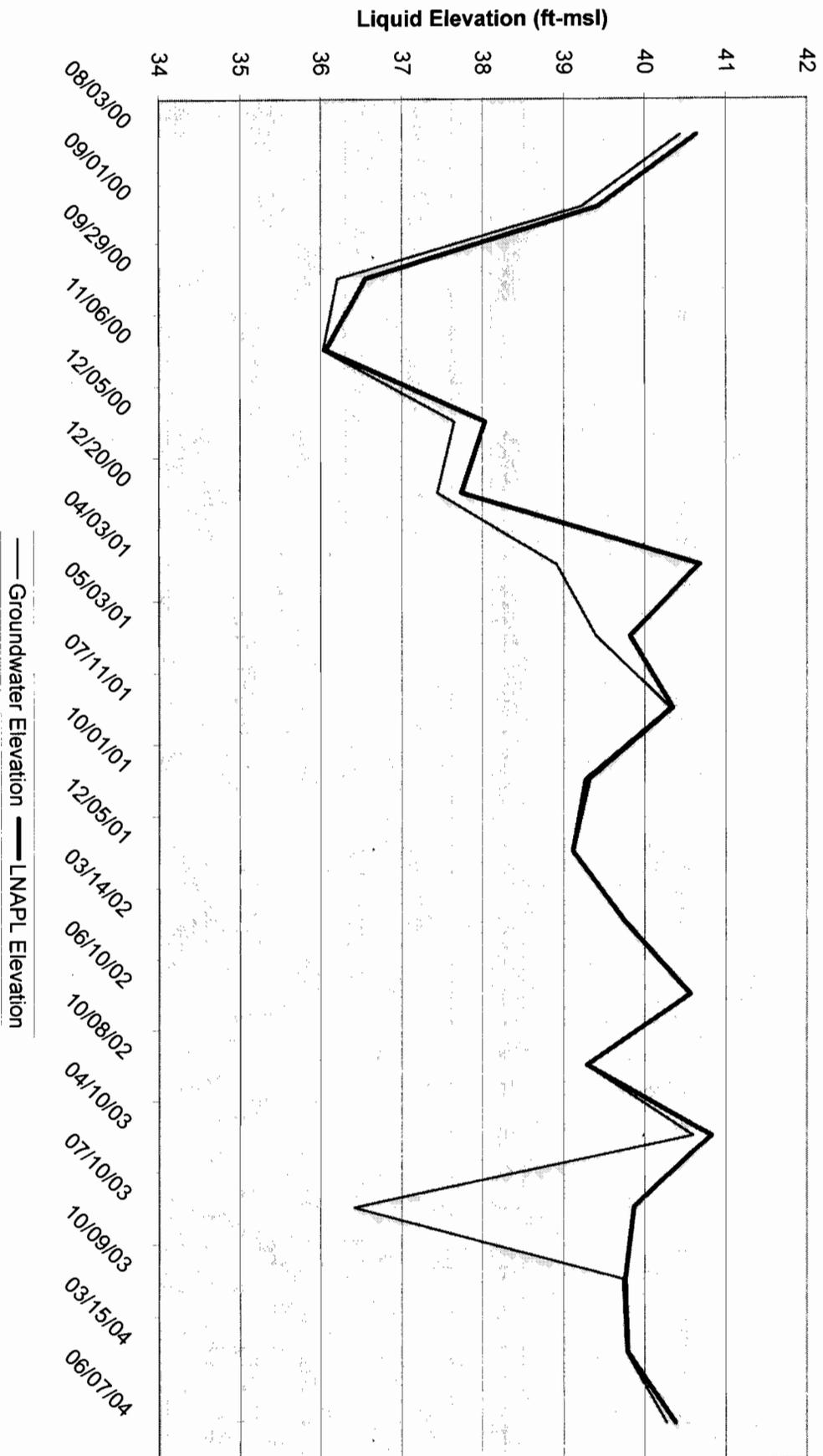
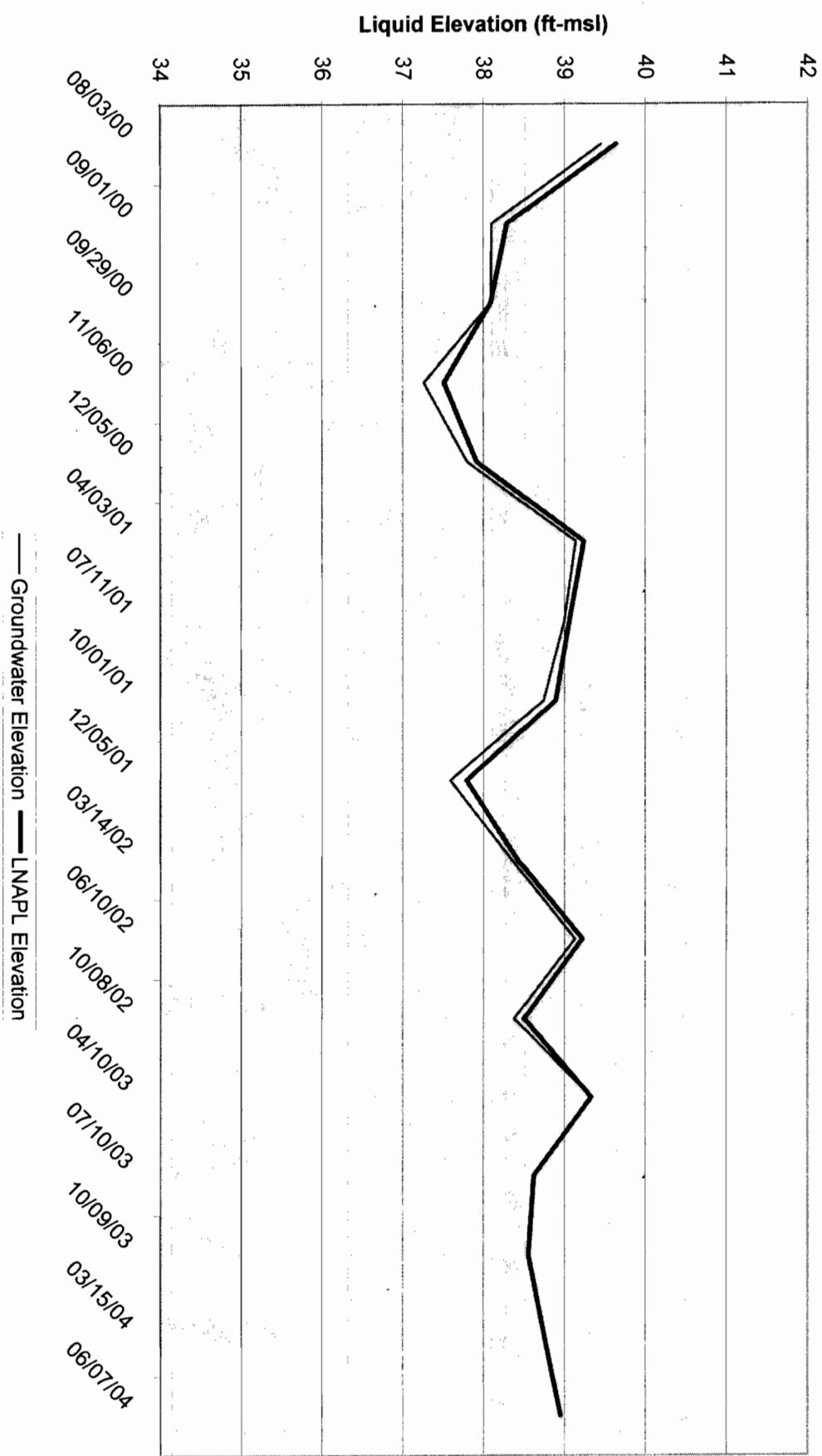


Figure 3-7  
 RW-3 LNAPL and Groundwater Elevations  
 (August 2000 - June 2004)

Figure 3-8  
RW-4 LNAPL and Groundwater Elevations  
(August 2000 - June 2004)



**REALCO INC.**  
WATERVLIET, NEW YORK

EXCEEDANCE OF STANDARDS  
IN GROUNDWATER (SITE-WIDE)  
YEAR 5  
SEMI-ANNUAL MONITORING REPORT

FORMER AL TECH SPECIALTY  
STEEL CORPORATION  
WATERVLIET, NEW YORK

REVISD BY YTP 08-05-04  
DRAWING NUMBER WMPAD408

- LEGEND**
- OW-2 OVERBURDEN OBSERVATION WELL
  - OW-11 OVERBURDEN GROUNDWATER MONITORING
  - OW-4 OVERBURDEN RECOVERY WELL
  - OW-10 BEDROCK GROUNDWATER MONITORING
  - OW-28 BEDROCK RECOVERY WELL

SAMPLE LOCATION  
SAMPLE ROUND

MW-3B	Y5	R1	Y4	R2
Bg	1.510	2.380		
pH	8.6	8.4		

REPORTED CONCENTRATION  
 - IN ug/l FOR METALS & PCBs  
 - IN mg/l FOR MISCELLANEOUS PARAMETERS  
 - IN s.u. FOR pH  
 - CONSTITUENT

EXCEEDANCES ARE SHOWN IN RED.

FUEL OIL ICM  
INTERCEPTOR TRENCH

FENCE LINE

PROPERTY LINE

UTILITY RIGHT-OF-WAY LINE

- REFERENCES:**
- McLAREN/HART ENVIRONMENTAL ENGINEERING  
DRAWING NUMBER: TECH. SPEC. 11-STEEL,  
CORP., DATED: 4-9-93. SCALE: 1" = 200'
  - C.T. MALE ASSOCIATES, P.C. DRAWINGS  
NUMBERED 8025ST THROUGH 8025T7.
  - C.T. MALE ASSOCIATES, P.C. SURVEY DATA FAXED  
ON 12/19/86, CTM PROJ. NO. 98-2794.
  - ENVIRONMENTAL STRATEGIES CORPORATION  
DRAWING NUMBER: 18308E-012, DATED 8-10-00.  
PREPARED FOR REALCO INC.



Figure 4-1



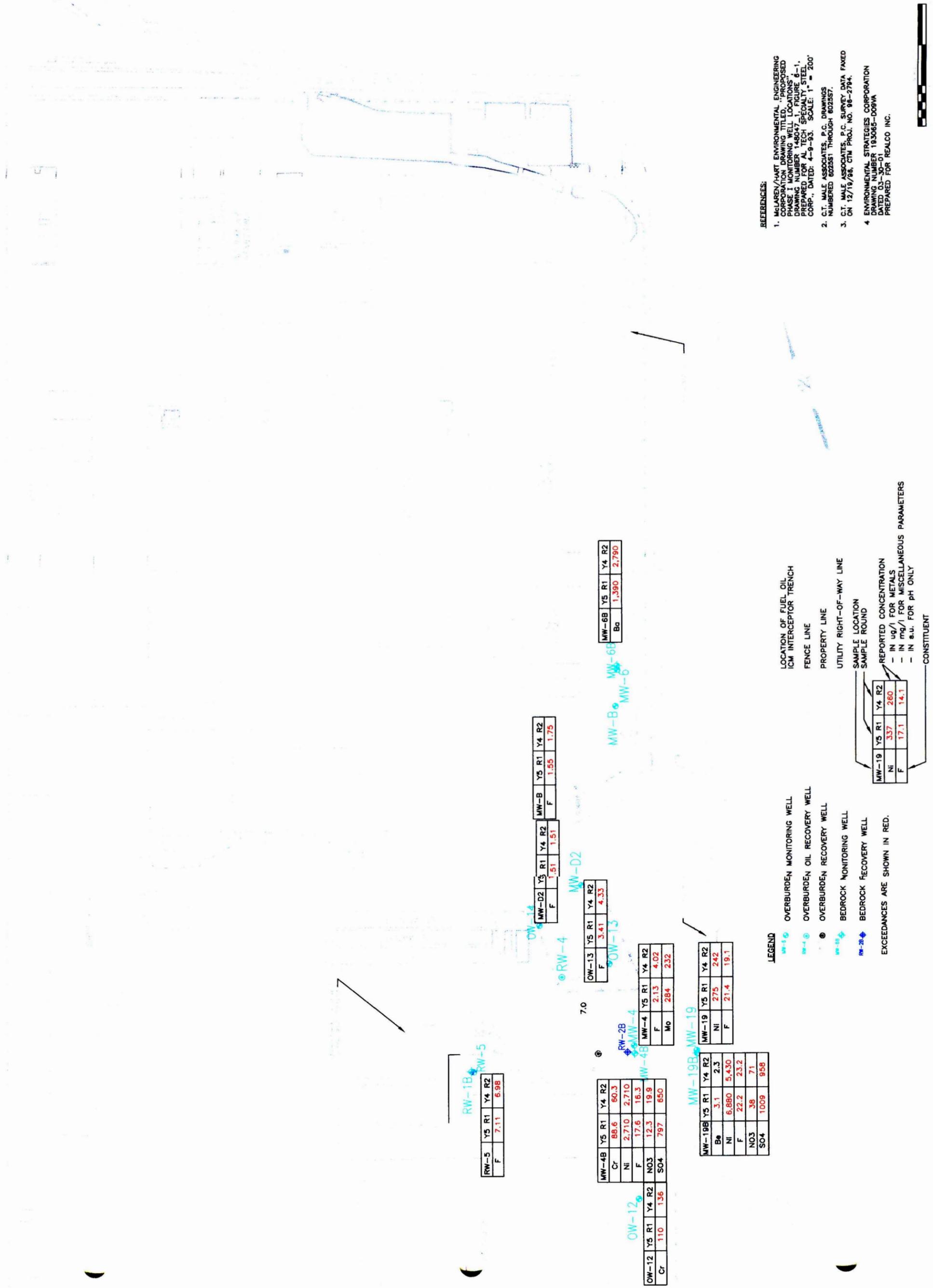
REVISD BY YJP 05-05-04  
 DRAWING NUMBER WMPA0407

EXCEEDANCE OF STANDARDS (CM)  
 IN GROUNDWATER (GROUNDWATER ICM)  
 YEAR 5  
 SEMI-ANNUAL MONITORING REPORT  
 FORMER AL TECH SPECIALTY  
 STEEL CORPORATION  
 WATERVLIET, NEW YORK

REALCO INC.  
 WATERVLIET, NEW YORK

- REFERENCES:
1. McLAREN/HART ENVIRONMENTAL ENGINEERING CORPORATION DRAWING NO. 148047, PROPOSED PHASE 1 MONITORING WELL LOCATIONS, DRAWING NUMBER 148047, FIGURE 6-1, PREPARED FOR AL TECH SPECIALTY STEEL CORP., DATED: 4-9-93. SCALE: 1" = 200'
  2. C.T. MALE ASSOCIATES, P.C. DRAWINGS NUMBERED 802551 THROUGH 802557.
  3. C.T. MALE ASSOCIATES, P.C. SURVEY DATA FAXED ON 12/19/96. CTM PROJ. NO. 96-2794.
  4. ENVIRONMENTAL STRATEGIES CORPORATION DRAWING NUMBER 183085-009WA DATED 03-30-01 PREPARED FOR REALCO INC.

Figure 4-2



RW-5

	Y5	Y4	Y1	R1	R2
F	7.11	6.98			

MW-4B

	Y5	Y4	Y1	R1	R2
Cr	88.6	60.3			
Ni	2,710	2,710			
F	17.6	16.3			
NO3	12.3	19.9			
SO4	797	650			

OW-12

	Y5	Y4	Y1	R1	R2
Cr	110	136			

OW-13

	Y5	Y4	Y1	R1	R2
F	3.41	4.33			

MW-4

	Y5	Y4	Y1	R1	R2
F	2.13	4.02			
Mo	284	232			

MW-19B

	Y5	Y4	Y1	R1	R2
B <sup>e</sup>	3.1	2.3			
Ni	6,880	5,430			
F	22.2	23.2			
NO3	38	71			
SO4	1009	958			

MW-D2

	Y5	Y4	Y1	R1	R2
F	1.51	1.51			

MW-6B

	Y5	Y4	Y1	R1	R2
B <sub>a</sub>	1,390	2,790			

- LEGEND
- MW-15: OVERBURDEN MONITORING WELL
  - MW-4: OVERBURDEN OIL RECOVERY WELL
  - MW-19: OVERBURDEN RECOVERY WELL
  - MW-19B: BEDROCK MONITORING WELL
  - MW-2B: BEDROCK RECOVERY WELL

- LOCATION OF FUEL OIL ICM INTERCEPTER TRENCH
- FENCE LINE
- PROPERTY LINE
- UTILITY RIGHT-OF-WAY LINE
- SAMPLE LOCATION
- SAMPLE ROUND
- REPORTED CONCENTRATION
  - IN ug/l FOR METALS
  - IN mg/l FOR MISCELLANEOUS PARAMETERS
  - IN s.u. FOR pH ONLY
- CONSTITUENT

MW-19

	Y5	Y4	Y1	R1	R2
Ni	337	260			
F	17.1	14.1			

EXCEEDANCES ARE SHOWN IN RED.

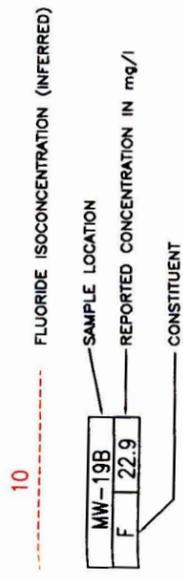


**REFERENCES:**

1. McLAREN/HART ENVIRONMENTAL ENGINEERING  
DRAWING NUMBER 148047-1, FIGURE B-1,  
DATE: 12/19/88, SCALE: 1" = 200'  
CORP., DATED: 4-9-93.
2. C.T. MALE ASSOCIATES, P.C. DRAWINGS  
NUMBERED 602651 THROUGH 602657.
3. C.T. MALE ASSOCIATES, P.C. SURVEY DATA FAXED  
ON 12/19/88, CTM PROJ. NO. 96-2794.
4. ENVIRONMENTAL STRATEGIES CORPORATION  
DRAWING NUMBER 102501012, DATED 8-10-00,  
PREPARED FOR REALCO INC.

**LEGEND:**

- MW-11 OVERBURDEN MONITORING WELL
- RW-4 OVERBURDEN RECOVERY WELL
- MW-6B BEDROCK MONITORING WELL
- RW-2B BEDROCK RECOVERY WELL
- FUEL OIL ICM INTERCEPTOR TRENCH
- FENCE LINE



REVISION BY YJP 06-06-04  
DRAWING NUMBER WMPAD410

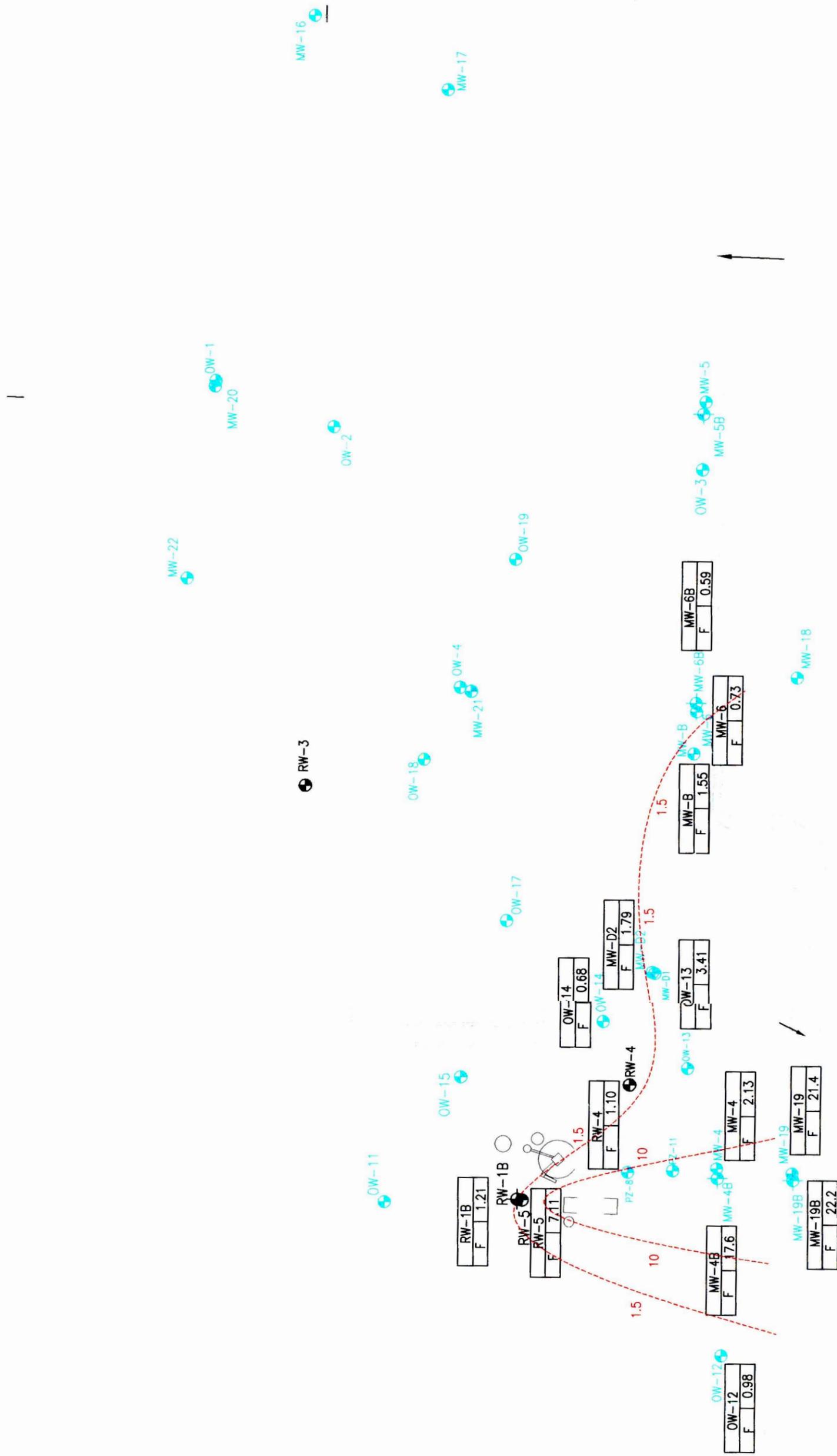
FORMER AL TECH SPECIALTY  
STEEL CORPORATION  
WATERVILLE, NEW YORK

FLUORIDE ISOPLETH MAP  
JUNE 2004  
YEAR 5  
SEMI-ANNUAL MONITORING REPORT

REALCO INC.  
WATERVILLE, NEW YORK



Figure 5-2

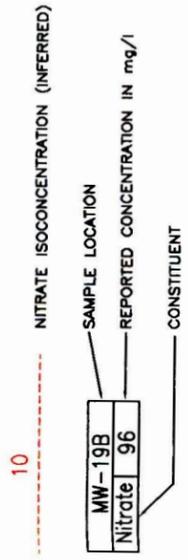


**REFERENCES**

1. McLAREN/HART ENVIRONMENTAL ENGINEERING  
DRAWING NUMBER 148047-1, FIGURE 6-11,  
PREPARED FOR AL TECH SPECIALTY STEEL  
CORP., DATED: 4-9-83. SCALE: 1" = 200'
2. C.T. MALE ASSOCIATES, P.C. DRAWINGS  
NUMBERED 602251 THROUGH 602357
3. C.T. MALE ASSOCIATES, P.C. SURVEY DATA FAXED  
ON 12/19/86, CDM PROJ. NO. 86-2784.
4. ENVIRONMENTAL STRATEGIES CORPORATION  
DRAWING NUMBER 193085-012, DATED 8-10-00,  
PREPARED FOR REALCO INC.

**LEGEND**

- OW-11 OVERBURDEN MONITORING WELL
- RW-4 OVERBURDEN RECOVERY WELL
- MW-6B BEDROCK MONITORING WELL
- RW-28 BEDROCK RECOVERY WELL
- FUEL OIL ICM INTERCEPTOR TRENCH
- FENCE LINE



REVISION BY YJP 08-06-04  
DRAWING NUMBER WRPAD0412

FORMER AL TECH SPECIALTY  
STEEL CORPORATION  
WATERLIET, NEW YORK

NITRATE ISOPLETH MAP  
JUNE 2004  
YEAR 5  
SEMI-ANNUAL MONITORING REPORT

REALCO INC.  
WATERLIET, NEW YORK



Figure 5-3

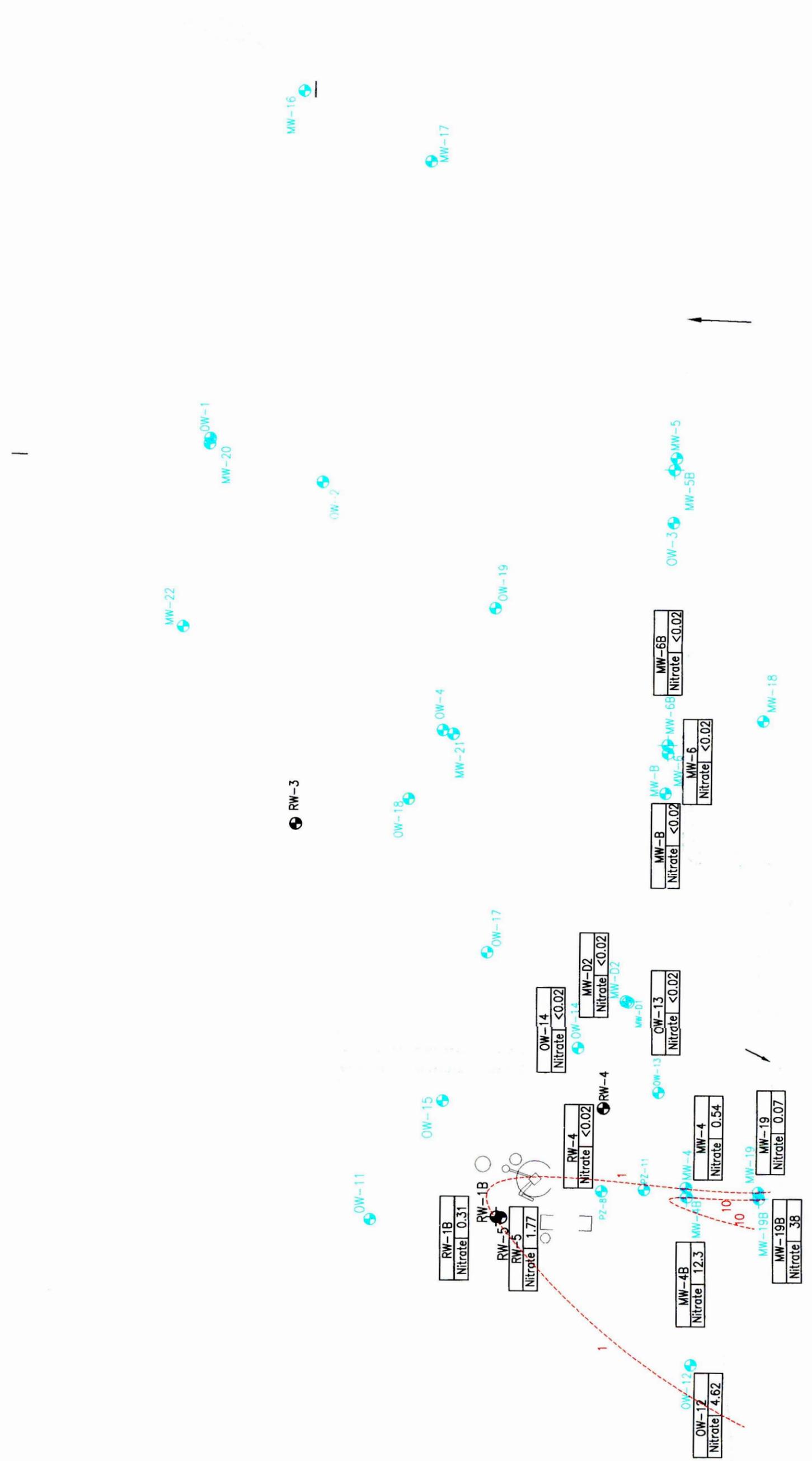




Figure 6-1  
 Nickel in Groundwater (MW-4/MW-4B, MW-19/MW-19B and RW-5)  
 Watervliet Main Plant Area Groundwater Monitoring Program

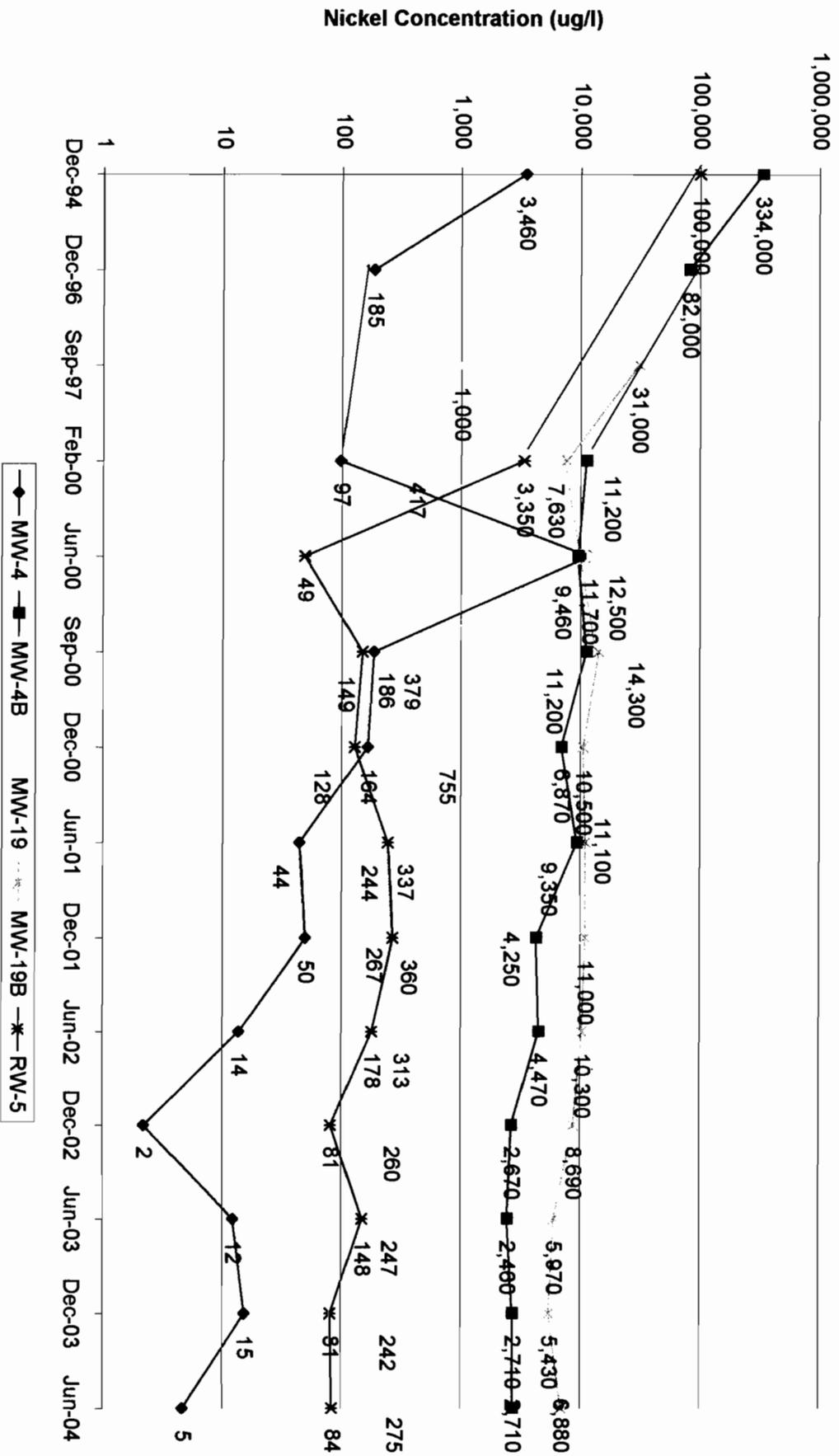


Figure 6-2  
 Fluoride in Groundwater (MW-4/MW-4B, MW-19/MW-19B and RW-5)  
 Watervliet Main Plant Area Groundwater Monitoring Program

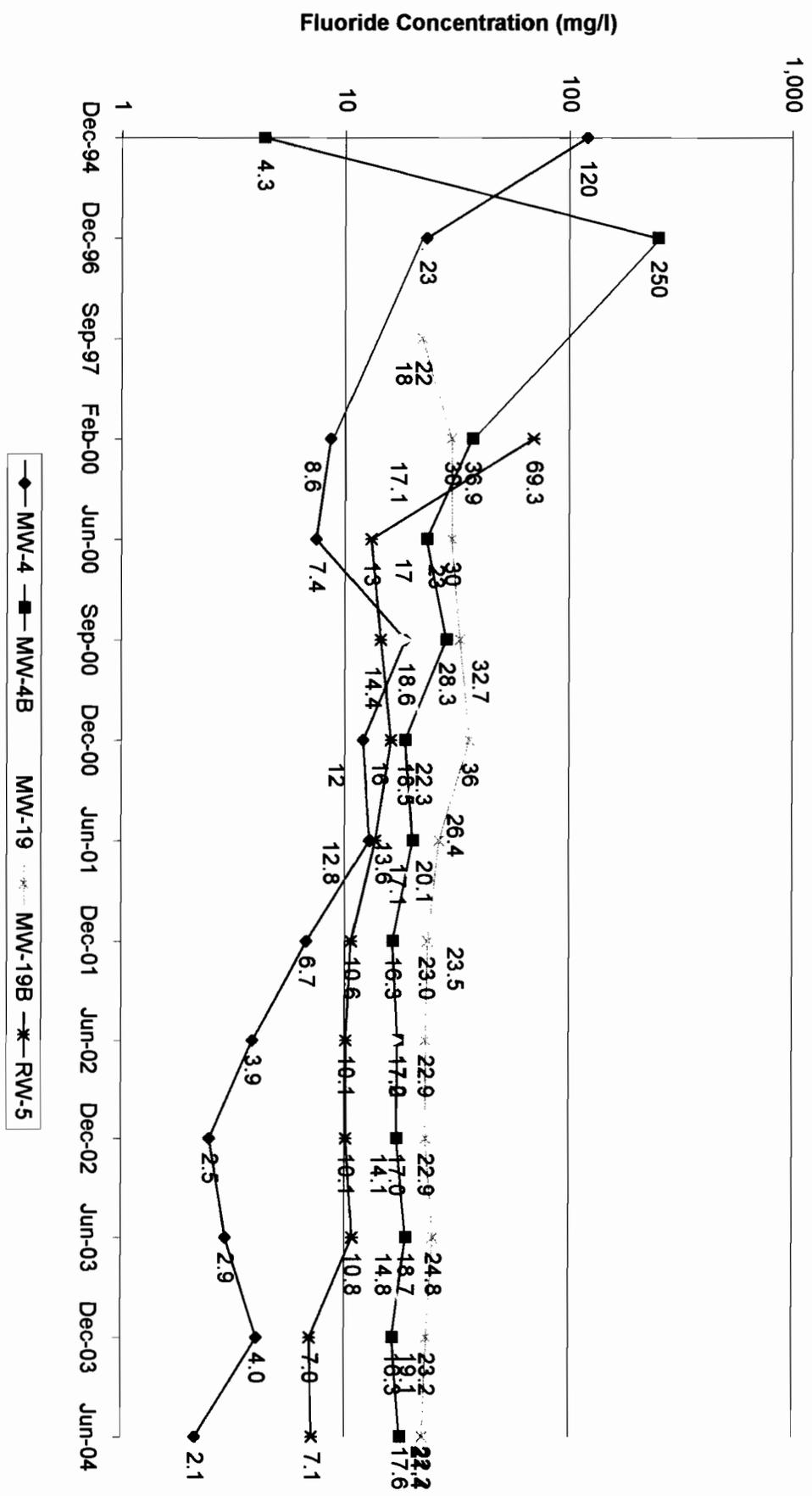


Figure 6-3  
 Nitrate in Groundwater (MW-4/MW-4B, MW-19/MW-19B and RW-5)  
 Waterliet Main Plant Area Groundwater Monitoring Program

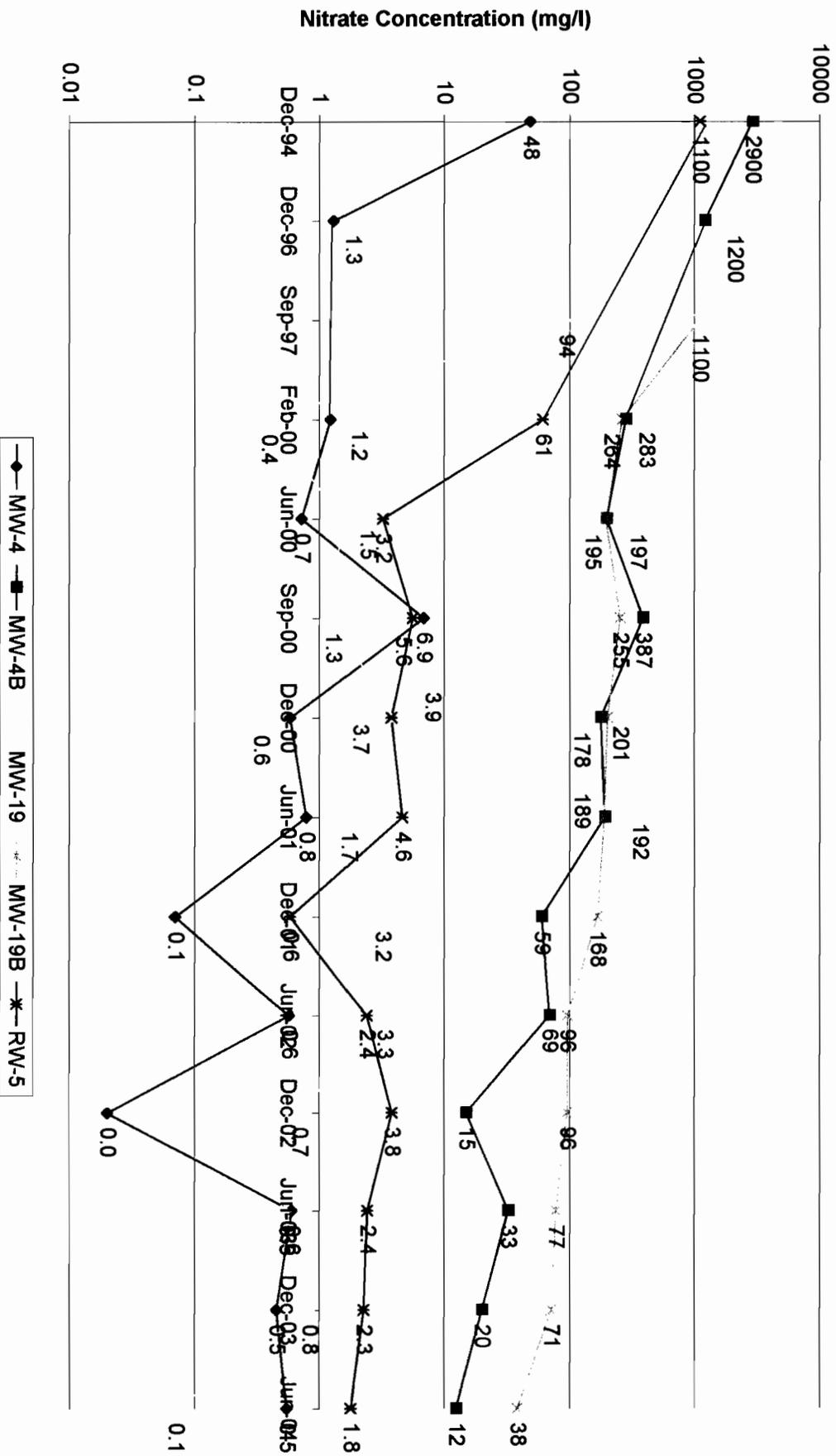


Figure 6-4  
 Sulfate in Groundwater (MW-4/MW-4B, MW-19/MW-19B and RW-5)  
 Watervliet Main Plant Area Groundwater Monitoring Program

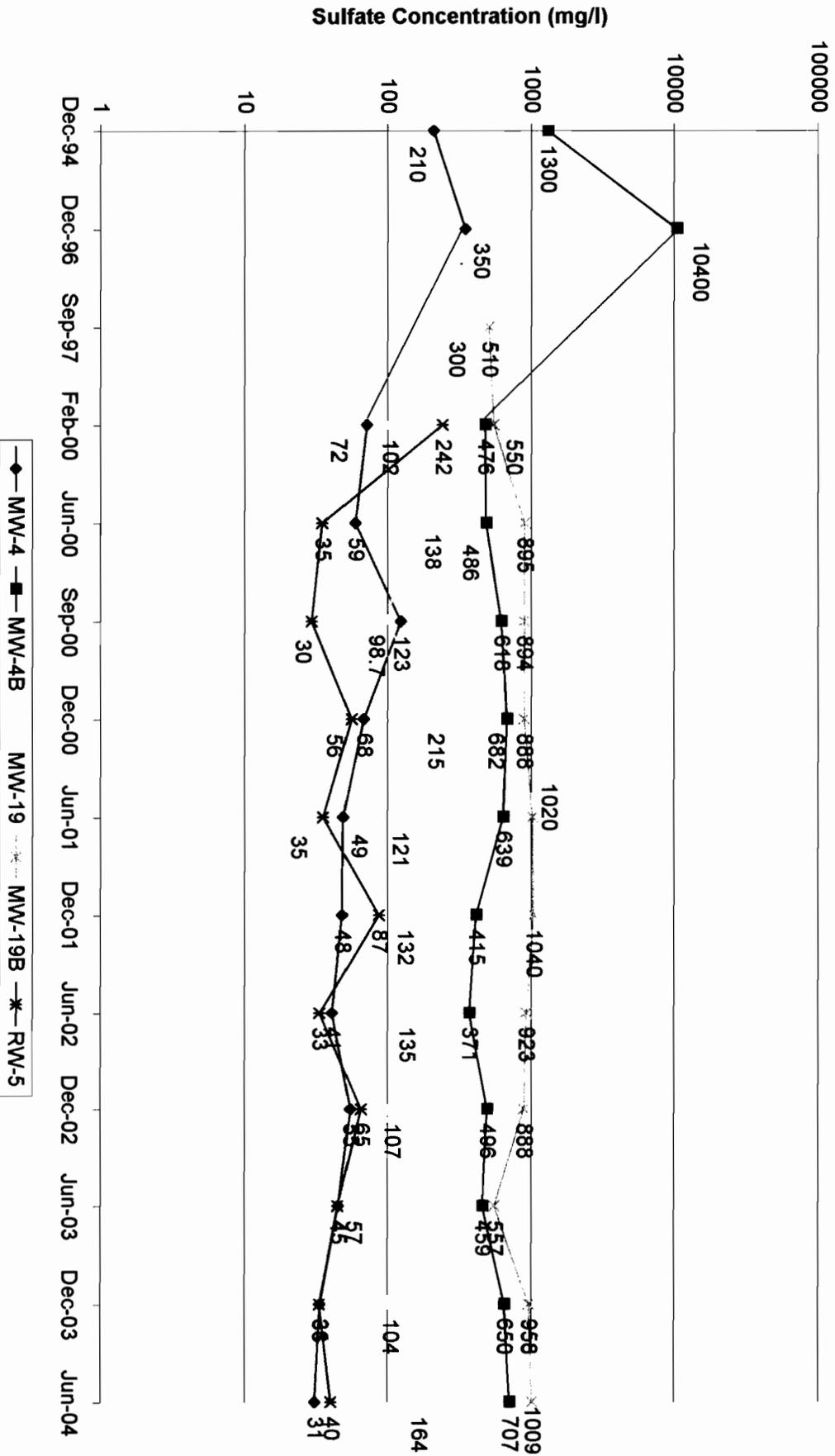
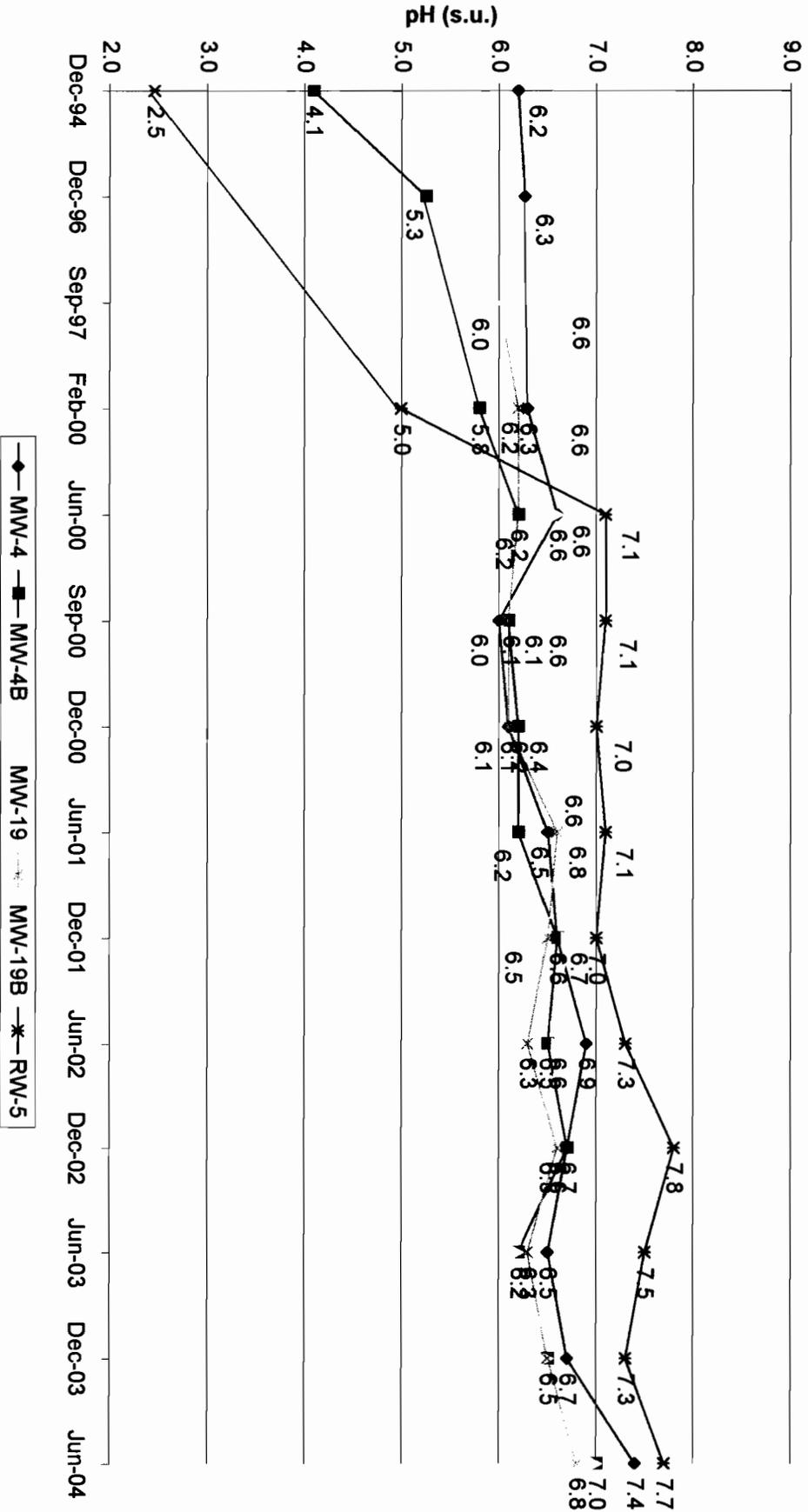


Figure 6-5  
 pH in Groundwater (MW-4/MW-4B, MW-19/MW-19B and RW-5)  
 Watervliet Main Plant Area Groundwater Monitoring Program





**Groundwater Elevations and Well Depths  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, NY**

Table 3-1

Well No.	Top-of Casing Elevation (ft-msl)	Depth to Water (feet)	June 2004		Original Well Depth (feet)
			Groundwater Elevation (ft-msl)	Well Depth (feet)	
MW-1	67.18	8.70	58.48	20.04	18
MW-1B	66.90	11.38	55.52	40.21	38
MW-2	53.69	9.56	44.13	20.09	17
MW-2B	53.72	11.90	41.82	47.98	46
MW-3	54.64	14.41	40.23	21.95	20
MW-3B	54.31	15.35	38.96	52.35	50
MW-4	53.26	13.68	39.58	19.92	18
MW-4B	53.55	14.61	38.94	51.16	49
MW-5	51.35	9.75	41.60	20.06	17.5
MW-5B	51.25	11.49	39.76	61.07	59
MW-6	51.21	12.10	39.11	18.47	16.5
MW-6B	51.80	12.92	38.88	65.41	63.5
MW-8B	120.31	18.93	101.38	45.34	42.5
MW-11	53.45	9.00	44.45	15.01	14
MW-14	56.93	5.56	51.37	16.57	16.7
MW-15	55.01	4.15	50.86	11.89	11.7
MW-16	53.21	4.10	49.11	13.99	15
MW-17	49.45	4.65	44.80	13.94	14.5
MW-18	47.17	8.94	38.23	18.08	17.8
MW-19	48.03	10.25	37.78	24.43	24.8
MW-19B	48.16	9.83	38.33	44.82	50
MW-20	50.85	9.85	41.00	22.70	23
MW-21	48.99	9.30	39.69	19.00	19.7
MW-22	51.00	10.35	40.65	18.81	20
MW-B	48.40	11.38	37.02	18.36	20
MW-D2	49.70	10.69	39.01	15.22	15
H-4S	55.27	8.62	46.65	17.05	15
H-4D	55.36	10.43	44.93	26.33	24
TF-1	62.22	5.00	57.22	14.80	15
RW-1B	54.86	14.86	40.00	71.03	68
RW-4	50.34	10.85	39.49	28.00	25
RW-5	55.15	14.68	40.47	28.18	25
OW-12	53.80	13.96	39.84	30.54	27
OW-13	52.69	13.44	39.25	27.31	28
OW-14	52.91	13.53	39.38	27.27	27
PZ-16	53.21	4.10	49.11	13.32	14

"ft-msl" = feet above mean sea level

Table 3-2

**LNAPL Measurements (April 2001 - June 2004)**  
**Year 5 Semi-Annual Report**  
**Main Plant Area Groundwater Monitoring Program - Watervliet, New York**  
**LNAPL Thickness (inches)**

Well No.	04/03/01	07/11/01	10/01/01	12/05/01	03/14/02	06/10/02	10/08/02	04/10/03	07/10/03	10/09/03	03/15/04	06/07/04
OW-1	0	0	0	0	0	0	0	0	0	0	0	0
OW-2	1.6	1.6	1.8	5.9	5.9	15.7	12.4	33.6	8.5	20.3	18.8	26.0
OW-3	0	0	0	0	0	0	0	0	0	0	0	0
OW-4	4.0	2.5	3.2	2.7	2.2	5.9	3.3	6.6	5.0	6.6	6.1	6.2
OW-9	0	0	0	0	0	0	0	0	0	0	0	0
OW-11	0	0	0	0	0	0	0	0	0	0	0	0
OW-12	0	0	0	0	0	0	0	0	0	0	0	0
OW-13	0.3	0	0	0	0	0	0	0	0	0	0	0
OW-14	0	0	0	0	0	0	0	0	0	0	0	0
OW-15	0	0	0	0	0	0	0	0	0	0	0	0
OW-17	0	0	0	0	0	0	0	0	0	0	0	0
OW-19	0	0	0	0	0	0	0	0	0	0	0	0
MW-B	0	0	0	0	0	0	0	0	0	0	0	0
MW-D1	0	0	0	0	0	0	0	2.4	0	0	0	0
MW-5	0	0	0	0	0	0	0	0	0	0	0	0
MW-6	0	0	0	0	0	0	0	0	0	0	0	0
MW-20	0	0	0	0	0	0	0	-	0	0	0	0
MW-22	0	0	0	0	0	0	0	0	0	0	0	0
PZ-8	0	0	0	0	0	0	0	0	0	0	0	0
PZ-11	0	0	0	0	0	0	0	0	0	0	0	0
RW-3	21.3	0.3	0.6	0.1	0.3	0.3	0.1	2.7	41.6	0.3	0.2	1.2
RW-4	1.2	0.7	1.8	2.4	0.9	1.1	1.4	0	0.1	0	0	0

Table 4-1

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

	Well I.D.: MW-1																												
	Investigation:		Ph. I RFI		Ph. II RFI		Y1 R1		Y1 R2		Y1 R3		Y1 R4		Y2 R2		Y2 R4		Y3 R1		Y3 R2		Y4 R1		Y4 R2		Y5 R1		
	Sample Date:		Dec-94	Total	Dec-96	Total	Feb-00	Total	Jun-00	Total	Sep-00	Total	Dec-00	Total	Jun-01	Total	Dec-01	Total	Jun-02	Total	Dec-02	Total	Jun-03	Total	Dec-03	Total	Jun-04	Total	
<b>Metals (µg/l)</b>																													
Aluminum			4790		-		2480		1950		2550		2250		2140		1240		-		-		-		-		-		-
Antimony			<28.7		-		<5.4		<1.7		<2		<2		<3.4		<10		-		-		-		-		-		-
Barium			178		517		89.3		106		138		130		131		89.2		236		36.1		248		197		139		139
Chromium			29.8		347		75.8		93.3		187		181		206		46.8		374		29.7		402		367		207		207
Molybdenum			189		1100		1740		1360		1410		1470		1270		1630		1410		328		1340		1520		1290		1290
Nickel			26.8		254		4.8		3.6		4.9		3.3		0.81		0.86		2.6		<1.0		<1.0		<2.4		<2.4		<2.7
<b>Miscellaneous</b>																													
pH (standard units)			8.42		11.57		11.4		11.2		11.5		11.3		11.6		11.4		12.0		11.5		12.3		12.0		12.1		12.1
SC (µmhos/cm)			380		781		678		676		839		909		1160		386		1258		1310		2067		1409		1430		1430
Temperature (°C)			-		8.7		9.9		13.7		13.0		9.7		14.2		11.8		11		11		10		12		10		10
Turbidity (NTU)			>200		10		<10		<10		<10		<10		10		134		20		8		6		4		4		3
Dis. Oxygen (mg/l)			-		-		11.98		14.38		10.47		8.55		14.4		10.32		4.97		2.14		0.06		0.7		2.02		2.02

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "-" indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

	MW-1B														
	Ph. I RFI		Ph. II RFI		Y1 R1	Y1 R2	Y1 R3	Y1 R4	Y2 R2	Y2 R4	Y3 R1	Y3 R2	Y4 R1	Y4 R2	Y5 R1
	Dec-94	Dec-96	Feb-00	Jun-00	Sep-00	Dec-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04	Total	
<b>Metals (µg/l)</b>	<u>Total</u>														
Aluminum	1350	-	82.9	24.9	138	381	1390	1830	-	-	-	-	-	-	-
Antimony	46.9	-	<5.4	2.7	<2	2.5	<3.4	<10	-	-	-	-	-	-	-
Barium	2710	1320	1110	1270	1220	1310	958	2380	1230	1150	1050	971	1140	1140	
Chromium	9.7	<7.8	3.3	12.9	5	<4.1	4.9	<3.5	<3.0	<3.6	<5.2	<5.5	<2.3	<2.3	
Molybdenum	<12	10.3	<2.5	<2.7	<1.6	<5	<5	5.5	<1.6	9.9	<2.5	<2.5	<2.5	<2.5	
Nickel	12.9	<10.1	<2.2	1.8	2.9	2.3	5.3	2.7	<0.7	<1.0	<1.0	<2.4	<2.4	<2.7	
<b>Miscellaneous</b>															
pH (standard units)	7.28	7.83	7.8	7.5	7.5	7.5	7.4	8.3	7.4	8.2	7.1	7.3	7.8	7.8	
SC (µmhos/cm)	660	721	697	784	765	762	873	486	620	799	922	928	1014	1014	
Temperature (°C)	-	-	10.3	12.4	11.6	10.9	14.5	11.8	13	11	12	12	13	13	
Turbidity (NTU)	138	-	<10	0	<10	357	734	258	27	38	54	11	15	15	
Dis. Oxygen (mg/l)	-	-	10.03	15.8	11.08	8.22	13.85	10.41	1.67	5.59	1.83	0.05	1.03	1.03	

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Well I.D:	MW-2																												
	Investigation:		Ph. I RFI		Ph. II RFI		Y1 R1		Y1 R2		Y1 R3		Y1 R4		Y2 R2		Y2 R4		Y3 R1		Y3 R2		Y4 R1		Y4 R2		Y5 R1		
	Sample Date:		Dec-94	Total	Dec-96	Total	Feb-00	Total	Jun-00	Total	Sep-00	Total	Dec-00	Total	Jun-01	Total	Dec-01	Total	Jun-02	Total	Dec-02	Total	Jun-03	Total	Dec-03	Total	Jun-04	Total	
Metals (µg/l)																													
Aluminum		1462	-	69	126	87.9	83.7	192	28.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony		<27	-	<5.4	<1.7	<2	<2	<3.4	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium		98	60.8	69.5	71.4	81.9	75.7	64.1	64.0	65.0	74.3	62.4	78.3	78.5															
Chromium		<6.6	-	20.9	29.3	4.4	46.7	12.9	8.8	173	313	81.4	197	144															
Molybdenum		10.6	20.8	22	27.4	20.3	16.9	15.4	12.6	53.5	66.6	61.9	103	28.3															
Nickel		24.8	-	4.6	5.6	5.6	4.1	2.4	3.6	3.4	<1.0	1.6	<2.4	<2.7															
Miscellaneous																													
TPH (mg/l)		<1	<1	<1	-	<0.1	<0.1	0.025	0.027	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (standard units)		6.58	6.68	6.6	6.6	6.4	6.4	6.5	6.6	6.5	6.3	6.1	6.3	6.7															
SC (µmhos/cm)		600	538	620	501	636	606	658	448	406	589	589	683	714															
Temperature (°C)		-	13.2	10.6	13.3	14.9	12.3	12.2	12.9	13	12	11	12	10															
Turbidity (NTU)		161	<10	<10	<8	<10	<10	42	31	23	11	6	4	32															
Dis. Oxygen (mg/l)		-	-	9.30	17.35	12.48	8.9	14.56	10.76	5.16	4.13	0.07	0.57	1.58															

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Well I.D:	MW-2B																											
	Investigation:		Ph I RFI		Ph II RFI		Y1 R1		Y1 R2		Y1 R3		Y1 R4		Y2 R2		Y2 R4		Y3 R1		Y3 R2		Y4 R1		Y4 R2		Y5 R1	
	Sample Date:	Dec-94	Dec-94	Dec-96	Feb-00	Jun-00	Sep-00	Dec-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04													
<b>Metals (µg/l)</b>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	
Aluminum	5570	-	3070	1170	2460	1070	474	7750	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	<27	-	<5.4	2.3	<2	<2	3.7	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	2390	1830	2380	1600	2120	1590	2280	2940	2550	1940	1540	1670	1390	1390	1390	1390	1390	1390	1390	1390	1390	1390	1390	1390	1390	1390	1390	1390
Chromium	<6.6	-	9.2	7.7	9.8	<4.1	<3.6	4.7	29.6	5.1	<5.2	<5.5	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
Molybdenum	14.6	10.3	3	<2.7	<1.6	<5	<5	<2.4	2.0	<1.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Nickel	36	-	8.1	3.3	18.2	6.8	3.6	24.3	32.5	<1.0	1.8	<2.4	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
<b>Miscellaneous</b>																												
pH (standard units)	8.87	9.20	9.2	9.2	9	8.8	11.8	9.3	9.9	9.6	11.1	9.0	9.6	9.6	11.1	9.0	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6
SC (µmhos/cm)	760	780	1070	691	769	837	1380	570	587	713	886	819	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926
Temperature (°C)	-	10.5	11.3	16.7	12.7	10.7	19.4	12.7	14	12	13	13	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Turbidity (NTU)	>200	>999	231	>999	>999	>999	5	>999	>999	188	>999	>999	>999	>999	>999	>999	>999	>999	>999	>999	>999	>999	>999	>999	>999	>999	>999	>999
Dis. Oxygen (mg/l)	-	-	9.5	17.49	13.03	8.37	14.3	11.17	3.09	4.19	0.07	0.19	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.97

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 " - " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Investigation: Sample Date:	Well ID:		MW-3														
	Phase I	Phase II	Y1 R1	Y1 R2	Y1 R3	Y1 R4	Y2 R2	Y2 R4	Y3 R1	Y3 R2	Y4 R1	Y4 R2	Y5 R1	Total			
	Dec-94	Dec-96	Feb-00	Jun-00	Sep-00	Dec-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04	Total	Total		
	<u>Total</u>																
<b>Metals (µg/l)</b>																	
Aluminum	1690	-	88.1	108	54.2	51.3	36.3	43.3	-	-	-	-	-	-	-		
Antimony	<27	-	<5.4	2.3	<2	14	<3.4	<10	<3.2	<2.5	4.1	<4.9	<5.7	<5.7	<5.7		
Barium	93	77.8	87.1	82.8	94.9	75.6	102	83.2	85.6	98.3	84.5	90.7	82.7	82.7	82.7		
Chromium	7.5	17.2	<1.9	<2.6	4.6	<4.1	<3.6	<3.5	<3.0	<3.6	<5.2	<5.5	<2.3	<2.3	<2.3		
Molybdenum	10.6	12.4	<2.5	<2.7	<1.6	5.4	<5	<2.4	<1.6	<1.5	<2.5	<2.5	4.3	4.3	4.3		
Nickel	<15.8	38	2.3	3.4	3.5	3	1.2	2.6	2.6	1.8	<1.0	<2.4	<2.7	<2.7	<2.7		
<b>Miscellaneous</b>																	
TPH (mg/l)	<1	<1	<1	-	<0.1	<0.1	0.024	0.023	-	-	-	-	-	-	-		
pH (standard units)	6.76	6.64	6.6	6.6	6.7	6.5	6.5	6.6	6.6	6.5	6.1	6.4	6.9	6.9	6.9		
SC (µmhos/cm)	800	685	868	665	920	799	980	644	647	923	894	831	945	945	945		
Temperature (°C)	-	15.4	12.5	13.7	16.0	14.0	14.9	16.4	14	15	12	15	11	11	11		
Turbidity (NTU)	>200	<10	<10	43	<10	<10	44	10	4	9	6	3	2	2	2		
Dis. Oxygen (mg/l)	-	-	8.50	12.17	9.78	7.31	13.1	10.96	5.11	1.15	4.40	0.85	1.65	1.65	1.65		

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 " - " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Well I.D:	MW-3B															
	Phase I Dec-94 Total	Phase II Dec-96 Total	Y1 R1 Feb-00 Total	Y1 R2 Jun-00 Total	Y1 R3 Sep-00 Total	Y1 R4 Dec-00 Total	Y2 R2 Jun-01 Total	Y2 R4 Dec-01 Total	Y3 R1 Jun-02 Total	Y3 R2 Dec-02 Total	Y4 R1 Jun-03 Total	Y4 R2 Dec-03 Total	Y5 R1 Jun-04 Total			
<b>Metals (µg/l)</b>																
Aluminum	3560	-	1100	2170	1090	1040	2060	7480	-	-	-	-	-	-	-	-
Antimony	<28.7	-	<5.4	7.5	3.1	2.7	<3.4	<10	<3.2	<2.5	3.5	<4.9	<5.7			
Barium	586	1330	1040	1250	1270	1650	1510	2380	1420	1270	1450	1940	1350			
Chromium	23.9	29.9	2	6.9	10.3	28.3	7.1	13	31.7	<3.6	<5.2	<5.5	3.7			
Molybdenum	27.6	10.8	17.8	7.8	2.7	6.6	<5	3.1	5.1	2.0	<2.5	<2.5	<2.5			
Nickel	32	70.3	6.5	17	15.8	43.6	7	45.7	37.5	<1.0	<1.0	<2.4	<2.7			
<b>Miscellaneous</b>																
pH (standard units)	8.07	<u>8.98</u>	<u>8.6</u>	<u>8.7</u>	8.4	8.5	<u>8.6</u>	8.4	8.3	8.4	7.9	8.3	<u>8.7</u>			
SC (µmhos/cm)	500	640	690	609	621	800	847	537	548	627	748	800	963			
Temperature (°C)	-	14.6	13.3	17	19.3	13.0	18.4	15.1	15	12	15	11	17			
Turbidity (NTU)	>200	230	235	>999	<10	438	>999	>999	>999	142	106	591	212			
Dis. Oxygen (mg/l)	-	-	9.68	12.53	8.35	7.69	12.15	12.18	2.95	2.18	3.57	3.21	2.80			

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 " - " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Well ID:	MW-4																												
	Phase I		Phase II		Y1 R1		Y1 R2		Y1 R3		Y1 R4		Y2 R2		Y2 R4		Y3 R1		Y3 R2		Y4 R1		Y4 R2		Y5 R1				
	Dec-94	Dec-96	Feb-00	Jun-00	Sep-00	Dec-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04	Dec-04	Jun-05	Dec-05	Jun-06	Dec-06	Jun-07	Dec-07	Jun-08	Dec-08	Jun-09	Dec-09	Jun-10	Dec-10	Jun-11		
Investigation:	Total																												
Sample Date:	Total																												
<b>Metals (µg/l)</b>																													
Aluminum	64400	-	741	13300	7520	4230	3560	674	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	<27	-	<5.4	<1.7	10.4	5.2	<3.4	<10	<3.2	<2.5	<3.1	<4.9	<5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	130	16.1	48.9	102	89.5	56.1	45.6	63.2	40	10.7	52.5	42.2	50.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium	9	<0.6	0.34	3.7	2	0.67	0.49	0.13	<0.30	<0.10	<0.20	<0.20	<0.20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	23.5	<7.8	<1.9	35.1	<4	4.3	<3.6	3.9	11.9	105	14.4	17.2	13.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	12900	-	1700	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	<0.2	<0.2	-	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	10.6	10.3	<2.5	<2.7	7.6	11.6	7	8.3	22.3	852	203	232	284	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	3460	185	97.4	11700	186	164	44.1	49.5	13.7	2.2	12.2	15.3	4.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Miscellaneous</b>																													
Fluoride (mg/l)	120	23	8.61	7.4	18.6	12	12.8	6.7	3.85	2.47	2.91	4.02	2.13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate (mg/l NO <sub>3</sub> -N)	48	1.3	1.22	0.72	6.85	0.58	0.78	0.07	0.57	0.02	0.6	0.45	0.54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfate (mg/l)	210	350	71.5	59	123	67.6	49	48.1	41	55.1	45.1	33.8	31.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (mg/l)	0.33	R	<1	-	0.086	0.084	0.034	0.096	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (standard units)	6.20	6.27	6.3	6.6	6	6.1	6.5	6.6	6.9	6.7	6.5	6.7	7.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SC (µmhos/cm)	1100	1490	373	378	772	476	500	416	313	718	520	420	612	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Temperature (°C)	-	16.3	10.7	15.9	20.1	15.8	17.4	17.0	15	14	13	14	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity (NTU)	47	<10	4	233	<1	25	40	10	4	<1	2	4	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dis. Oxygen (mg/l)	-	-	12.3	11.33	8.04	7.00	11.38	10.86	5.66	0.76	1.94	4.10	3.12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Well I.D:	MW-4B																															
	Phase I		Phase II		Y1 R1		Y1 R2		Y1 R3		Y1 R4		Y2 R2		Y2 R4		Y3 R1		Y3 R2		Y4 R1		Y4 R2		Y5 R1							
	Dec-94	Total	Dec-96	Total	Feb-00	Total	Jun-00	Total	Sep-00	Total	Dec-00	Total	Jun-01	Total	Dec-01	Total	Jun-02	Total	Dec-02	Total	Jun-03	Total	Dec-03	Total	Jun-04	Total						
Investigation:																																
Sample Date:																																
<b>Metals (µg/l)</b>																																
Aluminum	942000	<5	16300	9430	12900	5250	6690	3190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Antimony	459	-	<5.4	<1.7	<2	<2	<3.4	<10	3.2	3.5	<3.1	<4.9	<5.7																			
Barium	589	200	86.2	79.4	83.9	69.6	75.7	50.1	78.1	70.0	58.8	54.7																				
Beryllium	139	41	4.3	3	4.2	2.2	3.1	1.1	1.6	1.9	1.2	1.6	1.3																			
Chromium	86500	4600	70.4	94	23.2	28.8	103	34	131	262	9.1	60.3	88.6																			
Manganese	245000	-	14600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Mercury	<0.2	0.24	0.24	0.25	-	<5	0.25	4.1	6.1	3.6	3.7	4.4	3.8																			
Molybdenum	264	53	<2.5	<2.7	<1.6	<5	<5	4.1	6.1	3.6	3.7	4.4	3.8																			
Nickel	334000	82000	11200	9460	11200	6870	9350	4250	4470	2670	2460	2710	2710																			
<b>Miscellaneous</b>																																
Ammonia (mg/l NH <sub>3</sub> )	12	4.2	1.62	0.8	1.03	1.18	1.44	1.01	0.5	0.86	0.45	0.59	0.76																			
Fluoride (mg/l)	4.3	2.50	36.9	23	28.3	18.5	20.1	16.3	17.2	17.0	18.7	16.3	17.6																			
Nitrate (mg/l NO <sub>3</sub> -N)	2900	1200	283	197	387	178	192	59.4	69	15	32.5	19.9	12.3																			
Sulfate (mg/l)	1300	10400	476	486	618	682	639	415	371	496	459	650	707																			
TPH (mg/l)	0.5	<1	0.1	-	0.047	0.019	0.047	0.051	-	-	-	-	-																			
pH (standard units)	4.09	5.25	5.8	6.2	6.1	6.2	6.2	6.6	6.5	6.7	6.2	6.5	7.0																			
SC (µmhos/cm)	30100	10400	4000	3550	4040	3410	3380	2320	1833	1820	2319	2440	2908																			
Temperature (°C)	-	15.4	12.4	16.8	17.2	14.3	18.6	14.4	17	14	16	13	17																			
Turbidity (NTU)	31	99	13	43	3	<10	10	10	7	5	7	8	7																			
Dis. Oxygen (mg/l)	-	-	905	11.46	8.46	7.71	10.78	8.48	1.69	1.92	0.02	0.99	0.73																			

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Investigation: Sample Date:	Well I.D.: MW-5															
	Phase I	Phase II	Y1 R1	Y1 R2	Y1 R3	Y1 R4	Y2 R2	Y2 R4	Y3 R1	Y3 R2	Y4 R1	Y4 R2	Y5 R1			
	Dec-94	Dec-96	Feb-00	Jun-00	Sep-00	Dec-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04	Total	Total	
<b>Metals (µg/l)</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	
Aluminum	97.6	-	261	88.1	59.3	34.1	17.6	33	-	-	-	-	-	-	-	
Antimony	<27	-	<5.4	<1.7	<2	6.3	<3.4	<10	<3.2	<2.5	<3.1	<4.9	20.0	-	-	
Barium	90	101	208	137	159	159	149	149	142	302	139	147	141	141	141	
Chromium	11.5	<7.8	7.6	<2.6	<4	4.7	<3.6	<3.5	<3.0	<3.6	<5.2	<5.5	9.2	9.2	9.2	
Lead	6	<1.7	8	<1.3	<1.5	3.1	-	-	-	-	-	-	-	-	-	
Molybdenum	47.3	35.5	12.1	37.1	31.9	20.7	59.5	48.1	55.5	36.4	39.6	49.5	35.9	35.9	35.9	
Nickel	<15.8	<10.1	<2.2	1.7	2.1	2.2	<0.5	2.4	0.72	<1.0	<1.0	<2.4	<2.7	<2.7	<2.7	
<b>Miscellaneous</b>																
TPH (mg/l)	<1	<1	<1	-	<0.1	<0.1	0.014	0.069	-	-	-	-	-	-	-	
pH (standard units)	6.87	7.37	7.4	7.5	7.4	7.3	7.6	7.6	7.5	7.2	7.1	7.3	7.9	7.9	7.9	
SC (µmhos/cm)	500	495	734	548	767	870	935	615	579	1077	1000	876	1144	1144	1144	
Temperature (°C)	-	11.4	5.8	14.4	16.6	6	14.6	12.0	12	10	10	11	11	11	11	
Turbidity (NTU)	110	10	32	0	119	10	192	10	2	29	26	3	2	2	2	
Dis. Oxygen (mg/l)	-	-	14.84	14.8	-	11.9	15.38	13.3	2.6	2.92	1.76	0.07	0.76	0.76	0.76	

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "-" indicates analysis not performed.

Table 4-1 (continued)

**Groundwater Results for Metals and Miscellaneous Parameters**  
**Year 5 Semi-Annual Report**  
**Main Plant Area Groundwater Monitoring Program - Watervliet, New York**

Well I.D.	Investigation:		Phase I		Phase II		Y1 R1		Y1 R2		Y1 R3		Y1 R4		Y2 R2		Y2 R4		Y3 R1		Y3 R2		Y4 R1		Y4 R2		Y5 R1		
	Sample Date:		Dec-94	Total	Dec-96	Total	Feb-00	Total	Jun-00	Total	Sep-00	Total	Dec-00	Total	Jun-01	Total	Dec-01	Total	Jun-02	Total	Dec-02	Total	Jun-03	Total	Dec-03	Total	Jun-04	Total	
<b>Metals (µg/l)</b>																													
Aluminum			4510		-		10000		2390		1640		1630		4290		3160		-		-		-		-		-		-
Antimony			<28.7		-		<5.4		<1.7		<2		3.2		<3.4		<10		<3.2		<2.5		<3.1		<4.9		<5.7		<5.7
Barium			143		238		183		173		146		453		539		576		977		500		830		1630		761		761
Chromium			47.6		25		25.4		31.9		29.2		47		10.2		9.1		80.8		<3.6		<5.2		<5.5		<5.5		11.0
Lead			10.6		4.1		5.8		<1.3		<1.5		3.5		-		-		-		-		-		-		-		-
Molybdenum			<12		11		<2.5		<2.7		<1.6		<5		<5		<2.4		2.2		6.1		<2.5		<2.5		<2.5		<2.5
Nickel			82.6		41.9		36.4		33.7		22.6		57.2		17.2		17.9		71.9		<1.0		2.8		<2.4		<2.4		<2.7
<b>Miscellaneous</b>																													
TPH (mg/l)			<1		<1		0.39		-		0.019		0.021		<0.1		0.12		-		-		-		-		-		-
pH (standard units)			7.87		<u>9.14</u>		<u>9.1</u>		<u>9.1</u>		<u>8.9</u>		<u>9.0</u>		<u>9.3</u>		<u>9.0</u>		<u>9.0</u>		<u>8.9</u>		<u>8.5</u>		<u>8.8</u>		<u>9.1</u>		<u>9.1</u>
SC (µmhos/cm)			1620		1410		1290		1400		1350		1100		1160		1150		967		1010		1330		1437		1680		1680
Temperature (°C)			-		12.6		12.7		16.3		14.0		7.2		18.6		14.3		16.0		13		15		12		16		16
Turbidity (NTU)			175		>999		>1000		>999		>999		>999		>999		147		>999		>999		806		>999		>999		>999
Dis. Oxygen (mg/l)			-		-		7.99		12.25		0.21		9.59		13.19		9.98		0.35		1.88		1.47		0.55		1.20		1.20

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Well I.D:	Phase I		Phase II		Y1 R1		Y1 R2		Y1 R3		Y1 R4		MW-6 Y2 R2		Y2 R4		Y3 R1		Y3 R2		Y4 R1		Y4 R2		Y5 R1		
	Phase I Dec-94 Total	Phase I Dec-94 Total	Phase II Dec-96 Total	Phase II Dec-96 Total	Y1 R1 Feb-00 Total	Y1 R1 Feb-00 Total	Y1 R2 Jun-00 Total	Y1 R2 Jun-00 Total	Y1 R3 Sep-00 Total	Y1 R3 Sep-00 Total	Y1 R4 Dec-00 Total	Y1 R4 Dec-00 Total	Y2 R2 Jun-01 Total	Y2 R2 Jun-01 Total	Y2 R4 Dec-01 Total	Y2 R4 Dec-01 Total	Y3 R1 Jun-02 Total	Y3 R1 Jun-02 Total	Y3 R2 Dec-02 Total	Y3 R2 Dec-02 Total	Y4 R1 Jun-03 Total	Y4 R1 Jun-03 Total	Y4 R2 Dec-03 Total	Y4 R2 Dec-03 Total	Y5 R1 Jun-04 Total	Y5 R1 Jun-04 Total	
<b>Metals (µg/l)</b>																											
Aluminum	2430	770	65.7	87.3	49.2	57.9	125	36.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	<27	<5	<5.4	2.8	<2	3.6	<3.4	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	100	93	204	427	261	290	236	176	173	223	209	256	213	223	209	256	213	223	209	256	213	223	209	256	213	223	209
Chromium	25.9	3	<1.9	<2.6	<4	6.8	<3.6	<3.5	<3.0	<3.6	<5.2	<5.5	3.6	<3.5	<3.6	<5.2	<5.5	3.6	<3.6	<5.2	<5.5	3.6	<3.6	<5.2	<5.5	3.6	
Manganese	2050	1000	1550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Molybdenum	53.6	24	57.2	98.6	48.3	94.1	55.5	79.8	72.6	31.9	35	55.3	29.6	57.2	98.6	48.3	94.1	55.5	79.8	72.6	31.9	35	55.3	29.6	57.2	98.6	
Nickel	48.2	9	2.3	10.2	4.6	3.5	<0.5	1.6	2.1	<1.0	<1.0	<2.4	<2.7	2.3	10.2	4.6	3.5	<0.5	1.6	2.1	<1.0	<1.0	<2.4	<2.7	2.3	10.2	
<b>Miscellaneous</b>																											
Fluoride (mg/l)	0.72	0.68	0.42	1.2	1.01	0.93	0.71	0.62	0.58	0.60	0.59	0.67	0.73	0.42	1.01	0.93	0.71	0.62	0.58	0.60	0.59	0.67	0.73	0.42	1.01	0.93	
Nitrate (mg/l NO <sub>3</sub> -N)	0.29	<0.1	<0.02	<0.02	<0.02	0.4	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Sulfate (mg/l)	25	21	17.8	64	24.6	50	42.8	42.9	50.3	35.4	20.6	42.1	21.8	17.8	24.6	50	42.8	42.9	50.3	35.4	20.6	42.1	21.8	17.8	24.6	50	
TPH (mg/l)	<1	<1	0.89	-	0.06	0.32	0.12	0.13	0.4	2.2	0.35	0.5	0.51	0.89	0.06	0.32	0.12	0.13	0.4	2.2	0.35	0.5	0.51	0.89	0.06	0.32	
pH (standard units)	6.67	6.98	7	6.6	6.7	6.7	7.1	7.3	7.2	6.9	6.7	7.0	7.4	6.67	6.98	7	6.6	6.7	6.7	6.9	6.7	6.7	7.0	7.4	6.67	6.98	
SC (µmhos/cm)	470	698	664	1300	812	890	1040	601	670	981	997	1007	1111	470	698	664	1300	812	890	981	997	1007	1111	470	698	664	
Temperature (°C)	-	12.6	9.9	14.3	15.2	9	15.3	13.8	12	12	9	14	9	-	12.6	9.9	14.3	15.2	9	12	9	14	9	-	12.6	9.9	
Turbidity (NTU)	151	10	4	0	0	10	35	10	6	16	6	10	9	151	10	4	0	0	10	16	6	10	9	151	10	4	
Dis. Oxygen (mg/l)	-	-	13.12	14.67	-	9.7	13.49	12.01	0.82	2.12	2.41	0.14	0.43	-	-	13.12	14.67	12.01	0.82	2.12	2.41	0.14	0.43	-	-	13.12	

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "-" indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Well I.D:	Phase I		Phase II		Y1 R1		Y1 R2		Y1 R3		Y1 R4		Y2 R2		Y2 R4		Y3 R1		Y3 R2		Y4 R1		Y4 R2		Y5 R1			
	Dec-94	Total	Dec-96	Total	Feb-00	Total	Jun-00	Total	Sep-00	Total	Dec-00	Total	Jun-01	Total	Dec-01	Total	Jun-02	Total	Dec-02	Total	Jun-03	Total	Dec-03	Total	Jun-04	Total		
Investigation:	MW-6B																											
Sample Date:																												
<b>Metals (µg/l)</b>																												
Aluminum	12100	-	1180	1380	348	246	281	40.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Antimony	<27	-	<5.4	2.5	<2	3.1	<3.4	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Barium	2330	2490	1830	2940	2920	2800	3020	2800	3320	2870	2680	2790	1390															
Chromium	58.7	10	6.1	7.8	<4	6.7	3.9	3.8	24	<3.6	<5.2	<5.5	<2.3															
Manganese	625	-	-	-	620	-	-	-	-	-	-	-	-															
Molybdenum	10.8	10.3	15.1	<2.7	<1.6	<5	<5	<2.4	5.4	<1.5	<2.5	<2.5	<2.5															
Nickel	71.7	12.3	12.1	11.8	4.1	4.2	1.2	2.2	26.8	<1.0	<1.0	<2.4	6.3															
<b>Miscellaneous</b>																												
Fluoride (mg/l)	0.39	0.32	-	0.48	0.55	0.48	0.56	0.80	0.60	0.57	0.54	0.60	0.59															
Nitrate (mg/l NO <sub>3</sub> -N)	0.25	<0.1	-	<0.02	0.04	<0.02	0.03	0.03	<0.02	<0.02	<0.02	<0.02	<0.02															
Sulfate (mg/l)	9.3	5.9	-	8.6	3.9	2.7	3.7	2.3	5.3	7.0	8.9	3.5	5.9															
TPH (mg/l)	<1	<1	<1	-	<0.1	<0.1	<0.1	0.025	-	-	-	-	-															
pH (standard units)	6.05	7.34	8.5	7.6	7.4	7.3	8.1	7.7	7.3	7.9	7.1	7.2	7.8															
SC (µmhos/cm)	1280	1330	979	1190	1390	1230	1140	1160	935	1080	1362	1480	1671															
Temperature (°C)	-	13.4	12.4	15.8	13.6	9.3	19.5	13.0	14	12	14	14	15															
Turbidity (NTU)	77	245	790	915	85	434	63	>999	162	36	51	51	168															
Dis. Oxygen (mg/l)	-	-	9.26	13.26	0.22	9.44	19.5	9.44	0.38	4.00	1.97	0.35	0.83															

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "-" indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Well I.D:	Phase I		Phase II		Y1 R1		Y1 R2		Y1 R3		Y1 R4		Y2 R2		Y2 R4		Y3 R1		Y3 R2		Y4 R1		Y4 R2		Y5 R1		
	Dec-94	Dec-96	Feb-00	Jun-00	Sep-00	Dec-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04	Dec-04	Jun-05	Dec-05	Jun-06	Dec-06	Jun-07	Dec-07	Jun-08	Dec-08	Jun-09	Dec-09	Jun-10	Dec-10	
	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
<b>Metals (µg/l)</b>																											
Aluminum	1310	-	187	57.4	73	208	131	528	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	<28.7	-	<5.4	3.4	<2	3.2	<3.4	16.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	95.4	32.1	31	18.4	32	22.7	71.6	100	70.2	54.0	201	17.5	63.5	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Beryllium	2.5	2.6	0.49	<0.2	0.31	<0.19	<0.2	<0.1	<0.3	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	15.8	9.9	<1.9	4.3	<4	<4.1	<3.6	<3.5	<3.0	<3.6	<5.2	<5.5	<2.3	377	271	271	271	271	271	271	271	271	271	271	271	271	271
Manganese	<0.2	<0.2	-	0.21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	21	<10.3	<2.5	<2.7	<1.6	<5	<5	4.6	<1.6	<1.5	165	<2.5	<2.5	21	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6
Molybdenum	15.7	10.6	<2.2	5	9	5.7	2.5	0.74	<0.7	<1.0	<1.0	<2.4	<2.7	15.7	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6
Nickel																											
<b>Miscellaneous</b>																											
Fluoride (mg/l)	0.3	-	1.14	1	0.78	1.17	0.85	0.99	0.60	1.06	1.08	1.96	1.21	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Nitrate (mg/l NO <sub>3</sub> -N)	<0.1	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	0.33	<0.02	<0.02	<0.02	<0.02	280	280	280	280	280	280	280	280	280	280	280	280	280	280
Sulfate (mg/l)	280	-	350	356	419	398	386	363	409	414	328	418	361	7.30	7.18	7.18	7.18	7.18	7.18	7.18	7.18	7.18	7.18	7.18	7.18	7.18	7.18
pH (standard units)	7.30	7.18	7.2	7	7.2	7.1	7.0	7.3	7.0	7.0	7.0	7.1	7.6	1350	1420	1420	1420	1420	1420	1420	1420	1420	1420	1420	1420	1420	1420
SC (µmhos/cm)	1350	1420	1540	1470	1540	1670	1460	1580	1550	1769	1406	1679	1861	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Temperature (°C)	-	8.8	9.8	11.2	11.3	9.4	13.7	10.3	14	13	15	9	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity (NTU)	158	10	<10	<10	<10	44	10	32	22	14	6	64	124	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dis. Oxygen (mg/l)	-	-	9.88	14.89	11.49	8.93	15.17	13.83	13.6	7.01	6.56	3.32	1.62	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Well I.D:

MW-11

Investigation: Sample Date:	Phase I	Phase II	Y1 R1	Y1 R2	Y1 R3	Y1 R4	Y2 R2	Y2 R4	Y3 R1	Y3 R2	Y4 R1	Y4 R2	Y5 R1
	Dec-94 Total	Dec-96 Total	Feb-00 Total	Jun-00 Total	Sep-00 Total	Dec-00 Total	Jun-01 Total	Dec-01 Total	Jun-02 Total	Dec-02 Total	Jun-03 Total	Dec-03 Total	Jun-04 Total
<b>Metals (µg/l)</b>													
Aluminum	16400	-	141	112	205	41.7	1090	3810	-	-	-	-	-
Antimony	<27	-	<5.4	<1.7	<2	<2	<3.4	<10	-	-	-	-	-
Barium	310	117	60.1	61.1	83.8	53.4	117	214	81.4	55.3	50.1	90.9	117
Chromium	57.3	11.7	<1.9	<2.6	<4	<4.1	4.0	<3.5	<3.0	<3.6	<5.2	<5.5	<2.3
Molybdenum	3580	2760	1340	1840	2170	1370	1690	1390	1800	1440	1330	1600	1450
Nickel	124	25.9	4.7	4.8	7.3	2.8	4.7	8.7	4.6	<1.0	<1.0	<2.4	<2.7
<b>Miscellaneous</b>													
pH (standard units)	7.88	7.54	7.4	7.3	7.2	7.2	7.5	7.0	7.3	7.0	6.9	7.1	7.7
SC (µmhos/cm)	970	867	748	494	-	826	864	527	669	716	799	969	1154
Temperature (°C)	-	15.5	10.4	12.2	-	9.0	15.9	13.7	13	12	10	13	10
Turbidity (NTU)	>200	>1000	<10	391	-	294	580	>999	38	7	2	2	3
Dis. Oxygen (mg/l)	-	-	-	12.98	-	8.90	15.9	10.74	5.17	2.02	4.1	0.15	1.84

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Investigation: Sample Date:	Well I.D.: MW-14															
	Phase II	Y1 R1	Y1 R2	Y1 R3	Y1 R4	Y2 R2	Y2 R4	Y3 R1	Y3 R2	Y4 R1	Y4 R2	Y5 R1				
	Dec-96	Feb-00	Jun-00	Sep-00	Dec-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04	Total	Total	Total	Total
<b>Metals (µg/l)</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>
Aluminum	1120	48.5	59	79.4	181	2430	86.7	-	-	-	-	-	-	-	-	-
Antimony	<1.6	<5.4	<1.7	<2	<2	<3.4	<10	-	-	-	-	-	-	-	-	-
Barium	1260	1230	1250	1480	2660	2100	706	3640	1920	1650	1860	1130	1130	1130	1130	1130
Chromium	69.4	5.6	10.2	<4	31.1	69.9	3.5	<3.0	4.4	10.8	<5.5	<2.3	<2.3	<2.3	<2.3	<2.3
Molybdenum	549	261	330	310	562	453	189	491	557	288	324	253	253	253	253	253
Nickel	29.6	11	6.7	8.3	5	32.1	9.3	11.2	2.9	3.5	<2.4	<2.4	<2.4	<2.4	<2.4	<2.7
<b>Miscellaneous</b>																
pH (standard units)	7.45	6.9	6.8	6.9	7.4	7.3	6.8	6.7	7.4	7.2	7.2	7.3	7.3	7.3	7.3	7.3
SC (µmhos/cm)	299	621	474	568	339	405	506	423	424	620	527	889	889	889	889	889
Temperature (°C)	10.4	8.8	13.4	15.9	9.2	14.2	13.5	13	10	11	11	11	11	11	11	11
Turbidity (NTU)	<10	<10	<10	<2	<10	200	10	8	3	1	2	3	3	3	3	3
Dis. Oxygen (mg/l)	-	10.65	13.47	8.54	8.84	15.31	12.49	4.80	1.24	0.07	0.13	0.38	0.38	0.38	0.38	0.38

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "-" indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Well I.D:	MW-15																								
	Phase II		Y1 R1	Y1 R2	Y1 R3	Y1 R4	Y2 R2	Y3 R1	Y3 R2	Y4 R1	Y4 R2	Y5 R1	Investigation:												
	Dec-96	Feb-00	Jun-00	Sep-00	Dec-00	Jun-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04	Sample Date:	Phase II	Y1 R1	Y1 R2	Y1 R3	Y1 R4	Y2 R2	Y3 R1	Y3 R2	Y4 R1	Y4 R2	Y5 R1		
	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>													
<b>Metals (µg/l)</b>																									
Aluminum	107	303	108	89.6	96.3	52.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	<1.6	<5.4	<1.7	<2	<2	<3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	120	92.8	257	264	200	230	160	179	258	202	267	202	258	202	267	202	258	202	267	202	258	202	267	202	267
Chromium	9.8	<1.9	7.5	<4	<4.1	7.1	<3.0	<3.6	<5.2	<5.5	2.7	<5.5	<5.2	<5.5	2.7	<5.5	<5.2	<5.5	2.7	<5.5	<5.2	<5.5	2.7	<5.5	2.7
Molybdenum	86.3	<2.5	138	147	90.4	119	164	125	121	152	113	152	121	152	113	152	121	152	113	152	121	152	113	152	113
Nickel	20.8	13.4	13.4	8.4	10.4	7.1	8.1	2.6	3.2	5.9	2.9	5.9	3.2	5.9	2.9	5.9	3.2	5.9	2.9	5.9	3.2	5.9	2.9	5.9	2.9
<b>Miscellaneous</b>																									
TPH (mg/l)	-	-	-	-	-	-	0.07	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
pH (standard units)	6.78	6.7	6.8	6.6	6.6	6.5	6.8	6.6	5.7	6.6	5.8	6.6	6.6	5.7	6.6	6.6	6.6	5.7	6.6	6.6	5.8	6.6	6.6	5.8	6.6
SC (µmhos/cm)	2050	1820	3640	3970	3220	3660	2116	2662	4684	4182	5132	4182	2662	4684	4182	5132	2662	4684	4182	5132	2662	4684	4182	5132	2662
Temperature (°C)	10.6	8.2	15	14.8	7.7	13.4	14	9	11	11	12	11	9	11	11	12	9	11	11	12	11	12	11	12	11
Turbidity (NTU)	10	9	130	10	10	8	2	6	1	5	13	5	6	1	5	13	6	1	5	13	5	13	5	13	5
Dis. Oxygen (mg/l)	-	-	14.02	-	9.59	12.1	5.43	3.13	1.12	0.39	5.02	0.39	3.13	1.12	0.39	5.02	3.13	1.12	0.39	5.02	3.13	1.12	0.39	5.02	3.13

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Well I.D:	MW-16													
	Phase II		Y1 R1	Y1 R2	Y1 R3	Y1 R4	Y2 R4	Y3 R1	Y3 R2	Y4 R1	Y4 R2	Y5 R1		
	Dec-96	Feb-00	Total											
Investigation:	Metals (µg/l)													
Sample Date:	Aluminum													
	1490	500	376	838	104	2190	-	-	-	-	-	-	-	-
	<1.6	<5.4	<1.7	4.1	<2	<10	-	-	-	-	-	-	-	-
	Antimony	187	79.2	129	253	188	240	154	135	154	362	4.0	362	4.0
	Barium	8.2	3.8	2.7	<4	<3.5	<3.0	<3.6	<5.2	<5.5	4.0	4.0	<5.5	4.0
	Chromium	176	118	188	154	200	162	183	115	249	131	131	249	131
	Molybdenum	23.6	5	4.4	<10	4.8	2.6	<1.0	<1.0	<2.4	<2.7	<2.7	<2.4	<2.7
	Nickel													
	Miscellaneous													
	TPH (mg/l)	-	-	-	-	-	0.04	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	pH (standard units)	7.04	7	7	6.9	7.2	6.9	6.7	6.5	6.9	7.2	7.2	6.9	7.2
	SC (µmhos/cm)	2040	2810	3120	3530	2390	2660	1600	1996	2065	4519	4519	2065	4519
	Temperature (°C)	9.6	6.0	15.6	16.5	8.2	12.6	9	11	11	11	12	11	12
	Turbidity (NTU)	141	41	147	5	4	25	12	1	2	2	2	2	2
	Dis. Oxygen (mg/l)	-	-	14.29	-	11.03	13.59	5.89	1.79	0.04	0.16	0.21	0.16	0.21

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Well I.D:

MW-17

Investigation: Sample Date:	Phase II	Y1 R1	Y1 R2	Y1 R3	Y1 R4	Y2 R2	Y2 R4	Y3 R1	Y3 R2	Y4 R1	Y4 R2	Y5 R1
	Dec-96 Total	Feb-00 Total	Jun-00 Total	Sep-00 Total	Dec-00 Total	Jun-01 Total	Dec-01 Total	Jun-02 Total	Dec-02 Total	Jun-03 Total	Dec-03 Total	Jun-04 Total
<b>Metals (µg/l)</b>												
Aluminum	1630	59.1	148	78.8	121	220	157	-	-	-	-	-
Antimony	<1.6	<5.4	<1.7	<2	3	<3.4	<10	-	-	-	-	-
Barium	91.7	64.6	40.1	56.7	70.4	37.3	50	32.6	64.5	41.9	42.6	106
Chromium	14.6	<1.9	<2.6	<4	<4.1	4.1	<3.5	<3.0	<3.6	<5.2	<5.5	11.0
Molybdenum	48.9	22	98.6	132	77.6	104	87.4	73	49.4	31	43.4	5.7
Nickel	25.8	2.7	2.2	3.8	4.3	5.1	2.2	2.6	<1.0	1.6	<2.4	6.3
<b>Miscellaneous</b>												
TPH (mg/l)	R	<1	-	<0.1	<0.1	<0.1	0.3	0.02	<0.1	<0.1	<0.1	<0.1
pH (standard units)	7.54	7.5	7.4	7.4	7.4	7.3	7.5	7.4	7.1	6.5	7.0	7.8
SC (µmhos/cm)	664	958	636	774	793	668	446	381	779	652	758	545
Temperature (°C)	10.2	5.7	15.8	16.5	9.1	14.9	12.0	14	9	10	11	11
Turbidity (NTU)	626	<10	<10	1	10	74	10	15	17	12	7	27
Dis. Oxygen (mg/l)	-	-	13.25	-	9.98	12.1	13.02	4.9	1.23	0.11	1.12	0.49

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Well I.D.:

MW-18

Page 19 of 36

Investigation: Sample Date:	Phase II	Y1 R1	Y1 R2	Y1 R3	Y1 R4	Y2 R2	Y2 R4	Y3 R1	Y3 R2	Y4 R1	Y4 R2	Y5 R1
	Dec-96	Feb-00	Jun-00	Sep-00	Dec-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04
	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
<b>Metals (µg/l)</b>												
Aluminum	640	345	8260	218	75.4	35.4	59.4	-	-	-	-	-
Antimony	<5	<5.4	<1.7	<2	2	<3.4	<10	-	-	-	-	-
Barium	140	402	127	638	437	478	226	327	206	167	199	172
Chromium	2	2.4	<2.6	<4	<4.1	<3.6	<3.5	<3.0	<3.6	<5.2	<5.5	<2.3
Molybdenum	<10	<2.5	10.8	<1.6	<5	<5	<2.4	<1.6	<1.5	<2.5	<2.5	<2.5
Nickel	2	4.7	577	7.4	5	2.9	2.1	3.6	<1.0	<1.0	<2.4	<2.7
<b>Miscellaneous</b>												
TPH (mg/l)	<1	<1	-	-	-	<0.1	0.036	-	-	-	-	-
pH (standard units)	6.67	6.9	6.8	6.7	6.7	6.6	6.6	6.5	6.6	6.6	6.6	7.2
SC (µmhos/cm)	938	677	863	1140	1010	970	632	768	790	1041	1045	1157
Temperature (°C)	17.6	10.7	14.7	16.1	13.3	14.3	15.5	13	13	13	14	14
Turbidity (NTU)	625	285	78	71	47	10	5	5	28	40	17	9
Dis. Oxygen (mg/l)	-	10.31	12.64	-	7.45	13.62	7.87	-	0.97	0.11	0.3	0.59

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Well I.D:	MW-19																											
	Investigation:		Phase II		Y1 R1		Y1 R2		Y1 R3		Y1 R4		Y2 R2		Y2 R4		Y3 R1		Y3 R2		Y4 R1		Y4 R2		Y5 R1			
	Sample Date:	Phase II	Y1 R1	Y1 R2	Y1 R3	Y1 R4	Y2 R2	Y2 R4	Y3 R1	Y3 R2	Y4 R1	Y4 R2	Y5 R1	Sep-97	Feb-00	Jun-00	Sep-00	Dec-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04			
<b>Metals (µg/l)</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>		
Aluminum	7300	11600	13400	4500	9830	4420	5960	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Antimony	<5	<5.4	<1.7	2.1	5.6	<3.4	10.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Barium	130	167	182	135	127	97.3	55.8	106	107	90.1	<0.2	89.7	49.3															
Beryllium	<1	1	7.2	4.5	1.4	0.59	0.74	0.44	0.26	<0.2	<0.2	1.2																
Chromium	6	10.6	<2.6	4	<4.1	4.2	4.6	<3.0	<3.6	<5.2	<5.5	10.3																
Lead	18	12.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Manganese	11000	5680	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mercury	<0.2	-	0.25	-	-	-	-	-	<0.013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Molybdenum	22	11.4	<2.7	16.2	10.6	31	35.9	41.2	36	38	29.2	<2.5																
Nickel	1000	417	12500	379	755	337	360	313	260	247	242	275																
<b>Miscellaneous</b>																												
Fluoride (mg/l)	18	17.1	17	18.6	22.3	17.1	23.0	17.0	14.1	14.8	19.1	21.4																
Nitrate (mg/l NO <sub>3</sub> -N)	94	0.39	1.5	1.28	3.89	1.71	3.19	3.31	0.69	0.54	0.83	0.07																
Sulfate (mg/l)	300	102	138	98.7	215	121	132	135	107	57.2	104	164																
TPH (mg/l)	<1	0.22	-	-	-	<0.1	0.056	0.22	0.1	0.22	<0.1	<0.1																
pH (standard units)	6.62	6.6	6.6	6.6	6.4	6.8	6.7	6.6	6.5	6.2	6.5	7.0																
SC (µmhos/cm)	2380	1400	1380	1270	1570	1140	613	1042	1340	1283	1414	1549																
Temperature (°C)	14.9	14.7	14.7	16.0	13.3	16.0	18.9	14.0	16	13	18	16																
Turbidity (NTU)	>1000	564	708	417	>999	220	224	36	11	13	53	203																
Dis. Oxygen (mg/l)	-	9.14	13.84	-	7.61	13.44	8.43	0.45	0.95	2.74	0.28	1.46																

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Well I.D:	MW-19B																								
	Investigation:		Y1 R1		Y1 R2		Y1 R3		Y1 R4		Y2 R2		Y2 R4		Y3 R1		Y3 R2		Y4 R1		Y4 R2		Y5 R1		
	Phase II	Phase II	Y1 R1	Y1 R1	Y1 R2	Y1 R2	Y1 R3	Y1 R3	Y1 R4	Y1 R4	Y2 R2	Y2 R2	Y2 R4	Y2 R4	Y3 R1	Y3 R1	Y3 R2	Y3 R2	Y4 R1	Y4 R1	Y4 R2	Y4 R2	Y5 R1	Y5 R1	
Sample Date:	Sep-97	Sep-97	Feb-00	Feb-00	Jun-00	Jun-00	Sep-00	Sep-00	Dec-00	Dec-00	Jun-01	Jun-01	Dec-01	Dec-01	Jun-02	Jun-02	Dec-02	Dec-02	Jun-03	Jun-03	Dec-03	Dec-03	Jun-04	Jun-04	
	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	
<b>Metals (µg/l)</b>																									
Aluminum	30000	9590	108	11700	12600	9930	8390	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Antimony	<5	<5.4	<1.7	<2	<2	<3.4	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Barium	660	257	313	118	121	87.7	76.4	43.8	71.2	37.8	68.1	32.3	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	
Beryllium	7	6.1	0.55	10	6.5	6.2	3.7	4.5	5.2	4.8	2.3	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	
Chromium	11	4.7	<2.6	<4	<4.1	<3.6	<3.5	<3.0	<3.6	<5.2	<5.5	<2.3	<2.3	<2.3	<2.3	<2.3	<2.3	<2.3	<2.3	<2.3	<2.3	<2.3	<2.3	<2.3	
Lead	9	<1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Manganese	39000	12600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mercury	<0.2	-	0.28	-	-	-	-	-	-	-	-	-	<0.013	-	-	-	-	-	-	-	-	-	-	-	
Molybdenum	<10	4.5	11.5	<1.6	<5	<5	<2.4	3.1	2.5	<2.5	2.6	<2.5	2.6	<2.5	2.6	<2.5	2.6	<2.5	2.6	<2.5	2.6	<2.5	<2.5	<2.5	
Nickel	31000	7630	1.9*	14300	10500	11100	11000	10300	8690	5970	5430	6880	6880	6880	6880	6880	6880	6880	6880	6880	6880	6880	6880	6880	6880
<b>Miscellaneous</b>																									
Ammonia (mg/l NH <sub>3</sub> )	3.6	2.85	1	0.84	1.62	-	1.61	<0.1	0.8	<0.1	0.22	<0.1	0.22	<0.1	0.22	<0.1	0.22	<0.1	0.22	<0.1	0.22	<0.1	0.22	<0.1	
Fluoride (mg/l)	22	30	30	32.7	36	26.4	23.5	22.9	22.0	24.8	23.2	22.2	22.2	22.2	22.2	22.2	22.0	22.0	24.8	24.8	23.2	23.2	22.2	22.2	
Nitrate (mg/l NO <sub>3</sub> -N)	1100	264	195	255	201	189	168	96	96	77	71	38	38	38	38	38	96	96	77	77	71	71	38	38	
Sulfate (mg/l)	510	550	895	894	888	1020	1040	923	888	557	958	1009	1009	1009	1009	1009	888	888	557	557	958	958	1009	1009	
TPH (mg/l)	<0.1	<1	-	-	-	0.029	0.035	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
pH (standard units)	6.01	6.2	6.2	6.1	6.1	6.6	6.5	6.3	6.6	6.3	6.5	6.8	6.8	6.8	6.8	6.8	6.6	6.6	6.3	6.3	6.5	6.5	6.8	6.8	
SC (µmhos/cm)	7380	3810	3910	3880	3570	3840	3340	2439	3259	3142	3024	3584	3584	3584	3584	3584	3259	3259	3142	3142	3024	3024	3584	3584	
Temperature (°C)	14.5	14.6	16.5	15.8	13.3	17.6	15.7	15	17	15	12	16	16	16	16	16	17	17	15	15	12	12	16	16	
Turbidity (NTU)	10	2	33	5	6	6	10	2	26	8	4	8	8	8	8	8	26	26	8	8	4	4	8	8	
Dis. Oxygen (mg/l)	-	9.46	12.37	-	7.91	12.27	9.26	5.21	4.05	5.38	6.62	3.26	3.26	3.26	3.26	3.26	4.05	4.05	5.38	5.38	6.62	6.62	3.26	3.26	

\* Data rejected.

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Investigation: Sample Date:	MW-20														
	Y1 R2	Y1 R3	Y1 R4	Y2 R2	Y2 R4	Y3 R1	Y3 R2	Y4 R1	Y4 R2	Y5 R1					
	Jun-00	Sep-00	Dec-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04	Total	Total	Total	Total	Total
<b>Metals (µg/l)</b>	<b>Total</b>														
Aluminum	67.7	124	96.2	87.7	5880	-	-	-	-	-	-	-	-	-	-
Antimony	1.7	2.1	4	<3.4	<10	-	-	-	-	-	-	-	-	-	-
Barium	1520	1590	2420	2500	1570	2830	1010	835	1990	900					
Chromium	<2.6	<4	<4.1	<3.6	24.8	<3.0	<3.6	<5.2	<5.5	<2.3					
Molybdenum	2.7	<1.6	<5	<5	11.5	2.1	5.4	9.1	6.2	11.6					
Nickel	2.6	<0.6	6.1	<0.5	80.6	8.4	63.3	32.7	<2.4	26.8					
<b>Miscellaneous</b>															
TPH (mg/l)	-	-	-	<0.1	0.94	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
pH (standard units)	6.8	6.7	6.6	7.0	6.9	6.8	6.4	5.9	6.0	6.1					
SC (µmhos/cm)	1650	1980	1840	2040	1770	1678	1124	1398	2609	1271					
Temperature (°C)	13.8	13.1	12.3	13.9	13.5	13	12	12	13	11					
Turbidity (NTU)	<10	29	10	100	799	4	16	17	2	18					
Dis. Oxygen (mg/l)	13.04	-	7.45	14.12	11.59	1.80	1.84	2.73	0.13	2.40					

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Well I.D:	MW-21											
	Y1 R2	Y1 R3	Y1 R4	Y2 R2	Y2 R4	Y3 R1	Y3 R2	Y4 R1	Y4 R2	Y5 R1	Investigation:	Sample Date:
	Jun-00	Sep-00	Dec-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04		
	Total											
<b>Metals (µg/l)</b>												
Aluminum	147	116	41.9	66.3	62.0	-	-	-	-	-		
Antimony	1.8	4.6	<2	<3.4	<10	-	-	-	-	-		
Barium	413	460	409	501	537	595	551	404	448	431		
Chromium	<2.6	<4	<4.1	<3.6	<3.5	<3.0	<3.6	<5.2	<5.5	6.8		
Molybdenum	3.8	9.6	9.8	7.3	11.7	8.5	6.6	7.5	11.5	10.4		
Nickel	3.4	3.2	0.71	<0.5	<0.6	<0.7	<1.0	<1.0	<2.4	<2.7		
<b>Miscellaneous</b>												
TPH (mg/l)	-	-	-	1.8	1.1	-	-	-	-	-		
pH (standard units)	6.8	6.7	6.7	6.8	6.8	6.8	6.7	6.0	6.8	7.4		
SC (µmhos/cm)	928	1240	1120	1280	1310	1051	1341	1271	1394	1440		
Temperature (°C)	13.7	14.3	13	14.7	15.2	14	14	12	14	12		
Turbidity (NTU)	0	2	10	65	10	26	8	2	2	3		
Dis. Oxygen (mg/l)	14.7	-	-	12.35	11.16	0.83	1.34	1.11	0.74	0.35		

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Investigation: Sample Date:	Well I.D.: MW-22											
	Y1 R2	Y1 R3	Y1 R4	Y2 R2	Y2 R4	Y3 R1	Y3 R2	Y4 R1	Y4 R2	Y5 R1		
	Jun-00	Sep-00	Dec-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04	Total	Total
<b>Metals (µg/l)</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>
Aluminum	322	326	267	657	495	-	-	-	-	-	-	-
Antimony	2.2	<2	3.1	<3.4	<10	-	-	-	-	-	-	-
Barium	442	432	444	390	420	393	411	247	404	321	321	321
Chromium	<2.6	<4	<4.1	<3.6	<3.5	<3.0	<3.6	<5.2	<5.5	<2.3	<2.3	<2.3
Molybdenum	6.1	3.4	12.2	<5	7.2	4.5	2.1	<2.5	4.8	4.8	4.8	<2.5
Nickel	4.1	5	4.3	9.5	0.62	3.7	<1.0	<1.0	<2.4	<2.4	<2.4	<2.7
<b>Miscellaneous</b>												
TPH (mg/l)	-	-	-	2.4	0.69	-	-	-	-	-	-	-
pH (standard units)	6.8	6.8	6.7	7.0	7.0	6.9	6.7	5.9	6.8	6.8	6.8	6.8
SC (µmhos/cm)	1240	1310	1130	1160	1280	903	1390	1337	1566	1455	1455	1455
Temperature (°C)	13.5	12.9	11.8	12.2	13.5	11	13	9	13	10	10	10
Turbidity (NTU)	<10	54	89	285	10	28	48	12	25	64	64	64
Dis. Oxygen (mg/l)	14.1	-	7.94	14.34	11.97	0.88	1.25	1.51	0.06	0.17	0.17	0.17

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "-" indicates analysis not performed.

Table 4-1 (continued)

**Groundwater Results for Metals and Miscellaneous Parameters  
Year 5 Semi-Annual Report  
Main Plant Area Groundwater Monitoring Program - Watervliet, New York**

Investigation: Sample Date:	MW-B															
	Phase I	Phase II	Y1 R1	Y1 R3	Y1 R4	Y2 R2	Y2 R4	Y3 R1	Y3 R2	Y4 R1	Y4 R2	Y5 R1				
	Dec-94	Sep-97	Feb-00	Sep-00	Dec-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04	Total	Total	Total	Total
<b>Metals (µg/l)</b>	<b>Total</b>															
Aluminum	173000	2900	266	141	119	161	151	-	-	-	-	-	-	-	-	-
Antimony	65.5	<5	<5.4	<2	2.5	<3.4	<10	-	-	-	-	-	-	-	-	-
Barium	416	160	235	364	185	110	141	118	152	26.5	242	189				
Chromium	39700	9	2.3	<4	<4.1	<3.6	<3.5	<3.0	<3.6	<5.2	<5.5	9.5				
Manganese	10000	3900	5580	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	714	70	129	42.1	128	99.6	85.9	262	83	<2.5	96.1	165				
Nickel	31100	42	29.4	12.6	28.8	11	8.0	15.8	<1.0	<1.0	<2.4	12.2				
<b>Miscellaneous</b>																
Fluoride (mg/l)	1.2	2.3	1.72	1.18	1.13	1.39	1.19	1.9	1.7	1.5	1.75	1.55				
Nitrate (mg/l NO <sub>3</sub> -N)	<0.1	<0.1	0.12	<0.02	0.02	<0.02	<0.02	0.06	<0.02	0.04	<0.02	<0.02	<0.02			
Sulfate (mg/l)	18	27	35	16.9	39.6	36.7	30.0	54.8	37.4	28.7	6.2	30.9				
TPH (mg/l)	12	0.12	2.4	0.14	0.096	0.18	0.046	1.09	1.3	1.3	2.8	5.1				
pH (standard units)	7.19	6.66	6.7	6.7	6.6	6.6	7.0	6.8	6.7	6.3	6.6	7.1				
SC (µmhos/cm)	2000	357	-	1550	700	884	597	678	1074	1354	1207	1296				
Temperature (°C)	-	17.4	-	15.1	11.6	15.4	14.6	11	14	10	13	10				
Turbidity (NTU)	>200	257	-	10	13	30	10	15	28	7	6	29				
Dis. Oxygen (mg/l)	-	-	-	-	8.54	14.38	11.64	0.58	1.17	0.32	0.08	0.22				

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
"- " indicates analysis not performed.

Table 4-1 (continued)

**Groundwater Results for Metals and Miscellaneous Parameters**  
**Year 5 Semi-Annual Report**  
**Main Plant Area Groundwater Monitoring Program - Watervliet, New York**

Investigation: Sample Date:	Well ID: MW-D2																									
	Phase I		Phase II		Y1 R1		Y1 R2		Y1 R4		Y2 R2		Y2 R4		Y3 R1		Y3 R2		Y4 R1		Y4 R2		Y5 R1			
	Dec-94	Dec-96	Feb-00	Jun-00	Dec-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04	Dec-04	Jun-05	Dec-05	Jun-06	Dec-06	Jun-07	Dec-07	Jun-08	Dec-08	Jun-09	Dec-09	Jun-10		
<b>Metals (µg/l)</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	
Aluminum	1300	-	62.4	92.9	97.2	74.2	46.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Antimony	<27	-	<5.4	3	3.3	<3.4	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Arsenic	20.8	53.4	20.9	18.1	39.3	33.8	28.5	12.7	<2.2	<2.1	<3.7	<3.7	<3.7	<2.1	<3.7	<3.7	<3.7	<3.7	<2.1	<3.7	<3.7	<3.7	<3.7	<3.7	<3.7	
Barium	763	361	484	408	416	454	344	463	418	383	461	366	366	383	461	366	366	366	383	461	366	366	366	366	366	
Chromium	20	13.6	<1.9	<2.6	<4.1	<3.6	<3.5	<3.0	<3.6	<5.2	<5.5	<2.3	<2.3	<5.2	<5.5	<2.3	<2.3	<2.3	<5.2	<5.5	<2.3	<2.3	<2.3	<2.3	<2.3	
Manganese	2330	-	981	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mercury	<0.2	<0.2	-	0.296	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Molybdenum	10.6	15.8	6	15.8	<5	<5	3.8	3.1	<1.5	<2.5	<2.5	4.7	4.7	<2.5	<2.5	4.7	4.7	4.7	<2.5	<2.5	4.7	4.7	4.7	4.7	4.7	
Nickel	63.8	38.4	3	2.6	2.5	<0.5	<0.6	2.2	<1.0	<1.0	<2.4	<2.7	<2.7	<1.0	<2.4	<2.7	<2.7	<2.7	<1.0	<2.4	<2.7	<2.7	<2.7	<2.7	<2.7	
<b>Miscellaneous</b>																										
Ammonia (mg/l/NH <sub>3</sub> )	1.5	13	2.1	4.5	3.08	3.65	3.05	1.89	3.55	1.76	3.04	1.79	1.79	1.76	3.04	1.79	1.79	1.79	1.76	3.04	1.79	1.79	1.79	1.79	1.79	1.79
Fluoride (mg/l)	0.62	1.2	1.1	1.8	1.81	1.59	1.48	1.16	1.36	1.35	1.51	1.51	1.51	1.35	1.51	1.51	1.51	1.51	1.35	1.51	1.51	1.51	1.51	1.51	1.51	
Nitrate (mg/l NO <sub>3</sub> -N)	<0.1	<0.1	0.03	0.04	<0.02	<0.02	0.08	0.09	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Sulfate (mg/l)	5.1	<4	7.8	<1	<1	2.4	<1	1.9	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
TPH (mg/l)	1.2	<1	1.7	-	2.6	1.3	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
pH (standard units)	6.90	5.76	6.9	6.8	6.7	6.7	6.9	6.8	6.8	6.6	6.7	7.3	7.3	6.6	6.7	7.3	7.3	7.3	6.6	6.7	7.3	7.3	7.3	7.3	7.3	
SC (µmhos/cm)	850	1120	1020	2340	1130	2260	1440	1630	1391	1529	1834	1609	1609	1529	1834	1609	1609	1609	1529	1834	1609	1609	1609	1609	1609	
Temperature (°C)	-	14.7	13.1	14.6	12.9	16.4	16.0	14	15	12	15	11	11	12	15	11	11	11	12	15	11	11	11	11	11	
Turbidity (NTU)	110	<10	<10	146	26	10	10	5	59	1	5	4	4	1	5	4	4	4	1	5	4	4	4	4	4	
Dis. Oxygen (mg/l)	-	-	8.13	11.96	7.54	9.46	10.82	2.27	0.73	1.07	0.10	0.37	0.37	1.07	0.10	0.37	0.37	0.37	1.07	0.10	0.37	0.37	0.37	0.37	0.37	

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Investigation: Sample Date:	Well I.D.: H-4S											
	Phase I	Phase II	Y1 R1	Y1 R2	Y1 R3	Y1 R4	Y2 R2	Y3 R1	Y3 R2	Y4 R1	Y4 R2	Y5 R1
	Dec-94	Dec-96	Feb-00	Jun-00	Sep-00	Dec-00	Jun-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04
	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>
<b>Metals (µg/l)</b>												
Aluminum	3970	-	378	68.3	122	51	880	-	-	-	-	-
Antimony	<27	-	<5.4	<1.7	<2	<2	<3.4	-	-	-	-	-
Barium	111	53.3	42.6	59.7	51.9	54.3	77	68.9	58.1	48.6	52.4	35.7
Chromium	22.4	-	2.9	4.6	4.2	<4.1	<3.6	<3.0	<3.6	<5.2	<5.5	<2.3
Molybdenum	10.6	10.3	<2.5	<2.7	3.7	<5	<5	<1.6	<1.5	<2.5	<2.5	2.8
Nickel	81.3	19.6	45.1	15.6	23.3	11.2	18.8	11.1	14.1	9.3	8.3	<2.7
<b>Miscellaneous</b>												
TPH (mg/l)	0.11	<0.005	<1	-	<0.1	<0.1	0.037	-	-	-	-	-
pH (standard units)	6.90	6.59	6.8	6.6	6.6	6.7	6.6	6.5	<u>6.4</u>	<u>6.2</u>	<u>6.3</u>	6.8
SC (µmhos/cm)	1050	528	632	634	645	697	732	506	648	698	762	739
Temperature (°C)	-	12.4	8.3	13.2	14.8	11.2	14.7	13	12	11	13	11
Turbidity (NTU)	>200	<10	60	<10	<10	<10	132	83	9	9	5	3
Dis. Oxygen (mg/l)	-	-	10.41	14.4	9.74	8.79	14.0	5.7	2.9	1.8	1.2	1.4

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Well I.D:	Phase I		Phase II		Y1 R1		Y1 R2		Y1 R3		Y1 R4		Y2 R2		Y2 R4		Y3 R1		Y3 R2		Y4 R1		Y4 R2		Y5 R1		
	Dec-94	Total	Dec-96	Total	Feb-00	Total	Jun-00	Total	Sep-00	Total	Dec-00	Total	Jun-01	Total	Dec-01	Total	Jun-02	Total	Dec-02	Total	Jun-03	Total	Dec-03	Total	Jun-04	Total	
<b>Metals (µg/l)</b>																											
Aluminum	95.5		-		69.6		34.2		111		21		793		76.7		-		-		-		-		-		-
Antimony	29		-		<5.4		<1.7		8.8		<2		<3.4		25.1		-		-		-		-		-		-
Barium	191		160		146		150		161		170		163		170		146		132		120		115		98.7		98.7
Chromium	11.7		-		<1.9		4.7		<4		<4.1		<3.6		4.7		<3.0		<3.6		<5.2		<5.5		<2.3		<2.3
Molybdenum	10.6		10.3		1340		<2.7		2		<5		<5		11.1		2		5.2		<2.5		6.0		16.4		16.4
Nickel	15.8		11.8		5.6		4.7		8.6		4.5		3.7		5.4		4.3		2.2		<1.0		<2.4		<2.7		<2.7
<b>Miscellaneous</b>																											
TPH (mg/l)	<1		<1		<1		-		<0.1		<0.1		0.012		0.024		-		-		-		-		-		-
pH (standard units)	6.38		6.70		6.7		6.5		6.5		6.5		6.6		6.6		6.6		6.4		6.7		6.4		6.9		6.9
SC (µmhos/cm)	1380		1360		1300		1220		1310		1290		1120		1480		942		1117		1098		1148		1123		1123
Temperature (°C)	-		12.5		11.6		14.7		13.3		12.2		13.6		13.3		14		13		12		12		11		11
Turbidity (NTU)	40		<10		<10		9		<10		<10		220		10		9		3		2		3		4		4
Dis. Oxygen (mg/l)	-		-		9.2		16.82		10.18		9.65		14.15		12.25		4.63		0.85		0.05		0.16		6.09		6.09

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "-" indicates analysis not performed.

Table 4-1 (continued)

**Groundwater Results for Metals and Miscellaneous Parameters**  
**Year 5 Semi-Annual Report**  
**Main Plant Area Groundwater Monitoring Program - Watervliet, New York**

Well I.D:	Phase I		Phase II		Y1 R1		Y1 R2		Y1 R3		Y1 R4		Y2 R2		Y2 R4		Y3 R1		Y3 R2		Y4 R1		Y4 R2		Y5 R1	
	Dec-94	Total	Dec-96	Total	Feb-00	Total	Jun-00	Total	Sep-00	Total	Dec-00	Total	Jun-01	Total	Dec-01	Total	Jun-02	Total	Dec-02	Total	Jun-03	Total	Dec-03	Total	Jun-04	Total
<b>Metals (µg/l)</b>																										
Aluminum	16500	-	-	-	436	1810	161	247	513	12300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	52	-	-	-	<5.4	<1.7	<2	<2	<3.4	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	400	95.4	115	101	115	101	101	71.6	117	299	113	85.9	99.6	67.3	102	102	146	146	162	162	146	146	249	249	130	130
Chromium	81.1	-	2.7	5.9	2.7	5.9	<4	21.9	4.0	44.6	<3.0	<3.6	<5.2	<5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Molybdenum	48.7	239	95.8	151	95.8	151	307	163	127	102	166	162	162	162	162	162	166	166	162	162	146	146	249	249	130	130
Nickel	117	-	8	11	8	11	9.6	6.6	6.2	70.5	7.7	2.6	2.9	2.9	2.9	2.9	2.9	2.9	2.6	2.6	2.9	2.9	2.9	2.9	2.7	2.7
<b>Miscellaneous</b>																										
TPH (mg/l)	<1	<1	<1	<1	<1	-	<0.1	<0.1	0.021	0.045	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (standard units)	6.83	7.60	7.5	7.5	7.5	7.5	7.5	7.5	7.4	7.7	7.4	7.3	7.6	7.5	7.4	7.3	7.6	7.6	7.3	7.3	7.6	7.6	7.5	7.5	7.4	7.4
SC (µmhos/cm)	1950	1630	2020	1760	2020	1760	2240	1310	2290	798	1824	1491	2676	1785	2612	2612	2676	2676	1491	1491	2676	2676	1785	1785	2612	2612
Temperature (°C)	-	9.2	5.9	14.7	5.9	14.7	16.2	7.5	14.4	13.0	14.0	8	12	10	12	10	12	12	8	8	12	12	10	10	12	12
Turbidity (NTU)	>200	2	<10	10	<10	10	3	10	36	>999	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	1.8
Dis. Oxygen (mg/l)	-	-	11.66	14.45	11.66	14.45	-	9.94	12.76	11.96	4.58	2.06	0.09	0.23	0.31	0.31	4.58	4.58	2.06	2.06	0.09	0.09	0.23	0.23	0.31	0.31

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Well I.D:	RW-1B																											
	Investigation:		Y1 R1		Y1 R2		Y1 R3		Y1 R4		Y2 R2		Y2 R4		Y3 R1		Y3 R2		Y4 R1		Y4 R2		Y5 R1					
	Sample Date:	Phase II	Feb-00	Jun-00	Sep-00	Dec-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04	Phase II	Feb-00	Jun-00	Sep-00	Dec-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04			
<b>Metals (µg/l)</b>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>		
Aluminum	850	902	155	224	231	2570	983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Antimony	<5	<5.4	-	-	-	<3.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Barium	1300	1150	-	-	-	789	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Chromium	2	7.2	<2.6	<4	11.2	<3.8	<3.5	<3.0	3.7	<5.2	<5.5	<2.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Manganese	340	1230	-	-	-	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Molybdenum	<10	-	-	-	-	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Nickel	5	110	20.8	4.7	2.4	11.3	5.1	7.9	5.1	1.7	<2.4	<2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<b>Miscellaneous</b>																												
Fluoride (mg/l)	2.7	8.15	6.9	2.66	3.1	2.4	1.79	2.02	2.03	1.26	1.32	1.21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate (mg/l NO <sub>3</sub> -N)	0.92	0.73	0.06	<0.2	0.16	<0.02	<0.02	0.74	0.37	<0.02	<0.02	0.31	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Sulfate (mg/l)	31	44.2	51	13.6	11.1	14.1	91.5	25.4	25.9	28.4	19.2	46.1	7.7	7.1	7.6	7.3	7.8	7.8	7.3	7.3	7.4	7.4	7.7	7.7	7.7	7.7	7.7	7.7
pH (standard units)	7.56	7.1	7.4	7.6	7.6	7.6	7.3	7.5	7.8	7.3	7.8	7.7	7.7	7.1	7.6	7.3	7.8	7.8	7.3	7.3	7.4	7.4	7.7	7.7	7.7	7.7	7.7	7.7
SC (µmhos/cm)	1480	1640	1520	1310	1110	1250	1600	1251	1290	1785	1638	1989	1638	1480	1640	1520	1310	1110	1110	1250	1251	1290	1638	1989	1638	1989	1638	1989
Temperature (°C)	16.2	15.1	18.2	15.2	12.1	17.7	15.0	17	14	15	18	16	16	16.2	15.1	18.2	15.2	12.1	12.1	17.7	17	14	15	18	16	16	16	16
Turbidity (NTU)	45	66	0	7	181	>999	155	12	<1	7	1	8	8	45	66	0	7	181	181	>999	12	<1	7	1	8	8	8	8
Dis. Oxygen (mg/l)	-	7.62	12.53	0.20	6.98	10.62	9.35	3.27	2.62	0.64	0.04	0.93	0.93	-	7.62	12.53	0.20	6.98	6.98	10.62	3.27	2.62	0.64	0.04	0.93	0.93	0.93	0.93

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Page 31 of 36

Well I.D:	Investigation:		Y1 R3		Y2 R2		Y2 R4		RW-4 Y3 R1		Y3 R2		Y4 R1		Y4 R2		Y5 R1		
	GW ICM	Dec-94	Sep-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04	Dec-03	Jun-04	Dec-03	Jun-04	Dec-03	Jun-04	Dec-03	Jun-04	
Sample Date:	Dec-94	Dec-94	Sep-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04	Dec-03	Jun-04	Dec-03	Jun-04	Dec-03	Jun-04	Dec-03	Jun-04	
<b>Metals (µg/l)</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	
Aluminum	63000	178	-	-	520	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	1200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	460	<4	-	-	<3.5	<3.0	<3.6	<5.2	<5.5	<2.3	-	-	-	-	-	-	-	-	-
Manganese	46000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	1200	3.1	-	-	<0.6	6.6	<1.0	<1.0	<2.4	<2.7	-	-	-	-	-	-	-	-	-
<b>Miscellaneous</b>																			
Fluoride (mg/l)	-	1.9	-	-	2.47	2.02	1.38	1.93	1.94	1.10	-	-	-	-	-	-	-	-	-
Nitrate (mg/l NO <sub>3</sub> -N)	0.97	0.05	-	-	<0.02	<0.02	<0.02	0.18	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Sulfate (mg/l)	-	<1	-	-	26.6	16.9	10.6	56.2	27.0	18.6	-	-	-	-	-	-	-	-	-
pH (standard units)	4.38	6.6	-	-	6.7	6.9	7.4	6.2	7.0	7.6	-	-	-	-	-	-	-	-	-
SC (µmhos/cm)	-	855	-	-	1250	916	1150	1347	1393	1696	-	-	-	-	-	-	-	-	-
Temperature (°C)	-	16.2	-	-	11.2	12	13	11	14	12	-	-	-	-	-	-	-	-	-
Turbidity (NTU)	-	11	-	-	0	13	5	2	5	21	-	-	-	-	-	-	-	-	-
Dis. Oxygen (mg/l)	-	-	-	-	10.16	2.87	3.08	0.71	0.36	0.61	-	-	-	-	-	-	-	-	-

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

**Groundwater Results for Metals and Miscellaneous Parameters**  
**Year 5 Semi-Annual Report**  
**Main Plant Area Groundwater Monitoring Program - Watervliet, New York**

Well I.D:	RW-5																							
	Investigation:		Y1 R1		Y1 R2		Y1 R3		Y1 R4		Y2 R2		Y2 R4		Y3 R1		Y3 R2		Y4 R1		Y4 R2		Y5 R1	
	GW ICM	Dec-94	Feb-00	Jun-00	Sep-00	Dec-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04	Dec-04	Jun-05	Dec-05	Jun-06	Dec-06	Jun-07	Dec-07	Jun-08	Dec-08	Jun-09	Dec-09
<b>Metals (µg/l)</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>
Aluminum	780000	31100	7480	5460	6220	11800	4110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	<100	<5.4	-	-	-	<3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	2200	41.1	-	-	-	153	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	130000	221	61.8	49	61.7	83	14.4	88.6	8.0	28	12	8.7	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	35000	4460	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	320	913	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	130000	3350	48.8	149	128	244	267	178	80.8	148	81.1	83.5	-	-	-	-	-	-	-	-	-	-	-	-
<b>Miscellaneous</b>																								
Fluoride (mg/l)	-	69.3	13	14.4	16	13.6	10.6	10.1	12.2	10.8	6.98	7.11	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate (mg/l NO <sub>3</sub> -N)	1500	60.9	3.2	5.58	3.74	4.6	0.58	2.37	3.8	2.4	2.25	1.77	-	-	-	-	-	-	-	-	-	-	-	-
Sulfate (mg/l)	-	242	35	29.5	55.7	35.4	86.6	33.3	64.9	44.7	33.4	40.1	-	-	-	-	-	-	-	-	-	-	-	-
pH (standard units)	2.06	4.99	7.1	7.1	7	7.1	7.0	7.3	7.8	7.5	7.3	7.7	-	-	-	-	-	-	-	-	-	-	-	-
SC (µmhos/cm)	-	1420	1410	1180	1110	1210	1550	1217	1140	1513	1714	1902	-	-	-	-	-	-	-	-	-	-	-	-
Temperature (°C)	-	13.5	15.7	14.9	14.0	17.1	14.9	16.0	15.5	17	15	16	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity (NTU)	-	3	999	796	626	533	285	294	5	103	50	65	-	-	-	-	-	-	-	-	-	-	-	-
Dis. Oxygen (mg/l)	-	9.81	11.59	-	7.19	11.03	8.34	1.45	3.70	0.03	0.69	1.12	-	-	-	-	-	-	-	-	-	-	-	-

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Well I.D:	OW-12											
	Y1 R1 Feb-00 Total	Y1 R2 Jun-00 Total	Y1 R3 Sep-00 Total	Y1 R4 Dec-00 Total	Y2 R2 Jun-01 Total	Y2 R4 Dec-01 Total	Y3 R1 Jun-02 Total	Y3 R2 Dec-02 Total	Y4 R1 Jun-03 Total	Y4 R2 Dec-03 Total	Y5 R1 Jun-04 Total	
Investigation: Sample Date:												
<b>Metals (µg/l)</b>												
Aluminum	89.7	212	110	1030	398	165	-	-	-	-	-	
Antimony	<5.4	2.3	-	-	<3.4	-	<3.2	<2.5	3.2	<4.9	<5.7	
Barium	314	301	-	-	73	-	-	-	-	-	-	
Chromium	16.1	<2.6	95	97.1	160	7.3	128	80.6	105	136	110	
Manganese	16800	-	-	-	-	-	-	-	-	-	-	
Molybdenum	-	7	-	-	<5	-	-	-	-	-	-	
Nickel	4.4	5.2	11.4	10	5.3	5.0	6.0	3.1	2.1	<2.5	<2.7	
<b>Miscellaneous</b>												
Fluoride (mg/l)	0.56	0.91	0.78	0.96	1.24	0.84	0.82	0.98	0.94	1.32	0.98	
Nitrate (mg/l NO <sub>3</sub> -N)	3.52	4.1	6.97	3.12	3.36	1.12	1.11	1.64	4.65	3.79	4.62	
Sulfate (mg/l)	81	101	93.9	73.3	70.5	27.2	41.9	46.4	81.5	57.8	79.5	
pH (standard units)	6.8	6.8	6.8	6.7	6.8	6.7	6.8	6.6	6.9	6.9	7.3	
SC (µmhos/cm)	1010	893	944	876	930	980	754	992	1374	1034	1248	
Temperature (°C)	14.6	15.2	16.2	13.5	16.0	17.3	17.0	16	14	15	14	
Turbidity (NTU)	128	684	4	695	74	10	22	10	12	2	6	
Dis. Oxygen (mg/l)	10.43	11.69	-	7.54	12.58	10.87	5.01	0.66	0.06	0.82	0.76	

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

**Groundwater Results for Metals and Miscellaneous Parameters**  
**Year 5 Semi-Annual Report**  
**Main Plant Area Groundwater Monitoring Program - Watervliet, New York**

Well I.D:	OW-13																				
	Investigation:		Y1 R1		Y1 R4		Y2 R2		Y2 R4		Y3 R1		Y3 R2		Y4 R1		Y4 R2		Y5 R1		
	Sample Date:		Feb-00	Dec-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04	Dec-04	Jun-05	Dec-05	Jun-06	Dec-06	Jun-07	Dec-07	Jun-08	Dec-08	
<b>Metals (µg/l)</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	
Aluminum	46.7	237	375	95.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	<5.4	-	<3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	375	-	353	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	3.5	9.5	5.3	<3.5	10.6	<3.6	50.9	<5.5	<2.3	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	5750	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	12.4	-	8.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	3.9	6.2	4.2	<0.6	6.9	<1.0	1.6	<2.4	<2.7	-	-	-	-	-	-	-	-	-	-	-	-
<b>Miscellaneous</b>																					
Fluoride (mg/l)	<u>4.46</u>	<u>4.42</u>	<u>3.25</u>	<u>4.3</u>	<u>3.66</u>	<u>3.73</u>	<u>4.55</u>	<u>4.33</u>	<u>3.41</u>	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate (mg/l NO <sub>3</sub> -N)	0.39	<0.02	<0.02	<0.02	0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Sulfate (mg/l)	1.1	22.9	8.4	<1	6.3	9.6	16.9	49.6	36.9	-	-	-	-	-	-	-	-	-	-	-	-
pH (standard units)	6.8	6.6	7.1	6.8	6.9	6.8	6.7	6.8	7.4	-	-	-	-	-	-	-	-	-	-	-	-
SC (µmhos/cm)	1380	1120	1080	842	929	1184	1254	1415	1440	-	-	-	-	-	-	-	-	-	-	-	-
Temperature (°C)	11.7	13.4	15.7	15.0	15	14	13	14	12	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity (NTU)	147	25	10	10	27	19	10	7	12	-	-	-	-	-	-	-	-	-	-	-	-
Dis. Oxygen (mg/l)	10.03	7.11	14.13	11.70	4.19	0.60	0.92	0.22	0.33	-	-	-	-	-	-	-	-	-	-	-	-

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Well I.D.:	OW-14																	
	Y1 R1		Y1 R2		Y2 R2		Y2 R4		Y3 R1		Y3 R2		Y4 R1		Y4 R2		Y5 R1	
	Feb-00	Jun-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04									
Investigation:	Total		Total		Total		Total		Total		Total		Total		Total		Total	
Sample Date:	Total		Total		Total		Total		Total		Total		Total		Total		Total	
<b>Metals (µg/l)</b>																		
Aluminum	53.3	251	506	189	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	<5.4	-	<3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	318	256	645	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	5	<2.6	10.3	<3.5	4.6	<3.6	<5.2	<5.5	<2.3	-	-	-	-	-	-	-	-	-
Manganese	3440	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	<2.5	-	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	3.6	2.5	14.3	<0.6	5.6	<1.0	<1.0	<2.4	<2.7	-	-	-	-	-	-	-	-	-
<b>Miscellaneous</b>																		
Fluoride (mg/l)	1.19	1.1	0.8	<u>2.52</u>	1.04	1.41	<u>2.46</u>	1.22	0.68	-	-	-	-	-	-	-	-	-
Nitrate (mg/l NO <sub>3</sub> -N)	0.06	<0.02	<0.02	<0.02	0.33	<0.02	0.04	0.03	<0.02	-	-	-	-	-	-	-	-	-
Sulfate (mg/l)	15.4	2.8	3.7	1.9	9.4	4.5	24.6	12.4	9.0	-	-	-	-	-	-	-	-	-
pH (standard units)	7	6.7	7.1	7.0	7.0	6.9	<u>6.3</u>	6.9	7.5	-	-	-	-	-	-	-	-	-
SC (µmhos/cm)	1310	650	1190	1180	973	1261	854	1123	1423	-	-	-	-	-	-	-	-	-
Temperature (°C)	11.5	16.5	13.7	14.6	14	14	12	13	11	-	-	-	-	-	-	-	-	-
Turbidity (NTU)	50	14	55	10	26	21	12	4	6	-	-	-	-	-	-	-	-	-
Dis. Oxygen (mg/l)	9.92	15.44	15.16	11.93	4.36	0.96	0.33	0.06	9.8	-	-	-	-	-	-	-	-	-

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "-" indicates analysis not performed.

Table 4-1 (continued)

Groundwater Results for Metals and Miscellaneous Parameters  
 Year 5 Semi-Annual Report  
 Main Plant Area Groundwater Monitoring Program - Watervliet, New York

Page 36 of 36

Well I.D:	PZ-16																					
	Investigation:		Y1 R2		Y1 R3		Y1 R4		Y2 R2		Y2 R4		Y3 R1		Y3 R2		Y4 R1		Y4 R2		Y5 R1	
	Sample Date:		Jun-00	Total	Sep-00	Total	Dec-00	Total	Jun-01	Total	Dec-01	Total	Jun-02	Total	Dec-02	Total	Jun-03	Total	Dec-03	Total	Jun-04	Total
<b>Metals (µg/l)</b>																						
Aluminum	16500		4450		682		606		17200		-		-		-		-		-		-	
Antimony	<1.7		11.9		2.7		<3.4		<10		-		-		-		-		-		-	
Barium	173		335		30		41.9		392		28.8		22.0		14.7		22.4		14.5		14.5	
Chromium	64.1		14.6		5		<3.6		85.1		7.2		<3.6		<5.2		<5.5		<2.3		<2.3	
Molybdenum	50.1		4.4		27.5		72.4		11.7		42.9		37.4		41.6		43.8		38.1		38.1	
Nickel	122		305		18.4		11.2		219		19.5		5.4		<1.0		<2.4		<2.7		<2.7	
<b>Miscellaneous</b>																						
TPH (mg/l)	-		-		0.053		0.18		1.3		-		-		-		-		-		-	
pH (standard units)	6.6		6.7		6.6		6.6		6.7		6.4		6.4		5.7		6.6		6.6		6.6	
SC (µmhos/cm)	608		682		555		754		401		478		629		531		609		543		543	
Temperature (°C)	12.6		14.4		8.2		12.5		12.9		14		10		10		12		10		10	
Turbidity (NTU)	165		>999		10		244		>999		50		22		28		26		10		10	
Dis. Oxygen (mg/l)	12.85		-		9.68		12.25		11.52		5.93		1.86		2.75		0.14		0.16		0.16	

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.  
 "- " indicates analysis not performed.

Table 4-2

**Groundwater Results for TPHs  
Year 5 Semi-Annual Report  
Main Plant Area Groundwater Monitoring Program - Watervliet, New York**

<u>Investigation</u>	<u>Date</u>	<u>MW-6</u>	<u>MW-15</u>	<u>MW-16</u>	<u>MW-17</u>	<u>MW-19</u>	<u>MW-20</u>	<u>MW-B</u>
Ph. I RFI	Dec-94	<1000	-	-	-	-	-	12,000
Ph. II RFI	Dec-96	<1000	<1000	R	R	<1000	-	<1000
Y1 R1	Mar-00	890	-	-	<1000	220	-	2,400
Y1 R3	Sep-00	60	-	-	<100	-	-	140
Y1 R4	Dec-00	320	-	-	<100	-	-	96
Y2 R1	Mar-01	2,600	38	25	64	90	570	-
Y2 R2	Jun-01	120	-	-	<100	29	<100	180
Y2 R3	Sep-01	110	-	-	37	43	18	270
Y2 R4	Dec-01	130	-	-	300	56	940	46
Y3 R1	Jun-02	400	70	40	20	220	100	1,090
Y3 R2	Dec-02	2,200	<100	<100	<100	100	<100	1,300
Y4 R1	Jun-03	350	<100	<100	<100	<100	<100	1,300
Y4 R2	Dec-03	500	<100	<100	<100	<100	<100	2,800
Y5 R1	Jun-04	510	<100	<100	<100	<100	<100	5,100

All concentrations are presented in microgram per liter ( $\mu\text{g/l}$ ).

"R" indicates data rejected.

" - " indicates analysis not performed

"<" indicates constituent not detected at the detection limit noted.

Table 4-3

**Groundwater Results for PCBs  
Year 5 Semi-Annual Report  
Main Plant Area Groundwater Monitoring Program - Watervliet, New York**

Investigation: Sample Date:	Phase I Dec-94	Phase II Dec-96	Y1 R1 Feb-00	Y1 R2 Jun-00	Y1 R3 Sep-00	Y1 R4 Dec-00	Y2 R2 Jun-01	Y2 R4 Dec-01	Y3 R1 Jun-02	Y3 R2 Dec-02	Y4 R1 Jun-03	Y4 R2 Dec-03	Y5 R1 Jun-04
<b>Aroclor 1254</b>	(µg/l)												
MW-1	<1.0	<1.0	<0.066	<0.065	<0.065	<0.065	-	-	-	-	-	-	-
MW-1B	<u>1.1</u>	<1.0	<0.067	<0.065	<0.065	<0.065	-	-	-	-	-	-	-
MW-2	<1.0	<1.0	<0.066	<0.065	<0.065	<0.065	-	-	-	-	-	-	-
MW-2B	<1.0	<1.0	<0.066	<0.065	<0.065	<0.065	-	-	-	-	-	-	-
MW-14	<1.0	<1.0	<u>0.43</u>	<u>0.613</u>	<u>1.2</u>	<u>0.69</u>	<u>1.9</u>	<u>1.3</u>	<u>0.41</u>	<u>0.43</u>	<u>0.34</u>	<u>0.46</u>	<u>0.43</u>
MW-20	-	-	-	<0.065	<0.065	<0.065	-	-	-	-	-	-	-
MW-22	-	-	-	<0.065	<0.065	<0.065	-	-	-	-	-	-	-
H-4S	<5.0	<1.0	<0.067	<0.065	<0.508	<0.508	<0.065	-	<0.065	<0.065	<0.065	<0.065	<0.065
H-4D	<1.0	<1.0	<0.065	<0.065	<0.065	<0.065	<0.065	<0.065	<0.065	<0.065	<0.065	<0.065	<0.065
<b>Aroclor 1260</b>	(µg/l)												
MW-1	<1.0	<1.0	<0.066	<0.065	<0.065	<0.065	-	-	-	-	-	-	-
MW-1B	<1.0	<1.0	<0.067	<0.065	<0.065	<0.065	-	-	-	-	-	-	-
MW-2	<1.0	<1.0	<0.066	<0.065	<0.065	<0.065	-	-	-	-	-	-	-
MW-2B	<1.0	<1.0	<0.066	<0.065	<0.065	<0.065	-	-	-	-	-	-	-
MW-14	<1.0	<1.0	<0.065	<0.065	<0.065	<0.065	<0.065	<0.065	<0.065	<0.065	<0.065	<0.065	<0.065
MW-20	-	-	-	<0.065	<0.065	<0.065	-	-	-	-	-	-	-
MW-22	-	-	-	<0.065	<0.065	<0.065	-	-	-	-	-	-	-
H-4S	<u>2.1</u>	<1.0	<u>5.2</u>	<u>0.29</u>	<u>0.61</u>	<u>0.29</u>	<u>2.8</u>	-	<u>0.28</u>	<u>0.91</u>	<u>0.23</u>	<u>0.41</u>	<u>0.37</u>
H-4D	<1.0	<1.0	<0.065	<0.065	<u>0.33</u>	<0.065	<u>0.058</u>	<u>0.089</u>	<0.065	<0.065	<0.065	<u>0.025</u>	<u>0.028</u>

Underlined values in red indicate exceedances of the NYSDEC Water Quality Regulations.

" < " = not detected at the noted detection limit.

" - " = analysis not performed.

Aroclor 1016, 1221, 1232, 1242 and 1248 were not detected in any of the samples.

Appendix A – Field Data Summary, Year 5, Round 1



**RealCo**  
**Main Plant Groundwater Monitoring Program**

Sample Location: MW-1B      Sample Date: 6-8-04      Sample Time: 0848  
 Sampler(s) Name: J. FRISONI / M. WILSEY      Weather Conditions: SUNNY 70°F

Field Observation(s)/Well Condition: GOOD, 2" DIAM

**Field Measurements**

Static Water Level	11.38
LNAPL	ND
Well Depth	40.21

3 vols = 14 Gal

	Volume 1	Volume 2	Volume 3
Pre-purge:	8.31	8.41	8.46
pH	7.8	7.8	7.8
Specific Conductance	1114	1040	1014
Temperature	13	12	13
Turbidity	110	14	15
Dissolved Oxygen	1.72	1.26	1.03

Comments: 3 vols purged w/ submersible pump @ 1 Gal/min

000051



RealCo  
Main Plant Groundwater Monitoring Program

Sample Location: MW-2B    Sample Date: 6-8-04    Sample Time: 1401  
 Sampler(s) Name: J. FRISONE / M. WILSEY    Weather Conditions: SUNNY 77°F

Field Observation(s)/Well Condition: GOOD, 2" DIAM

Field Measurements

Static Water Level	11.90
LNAPL	NO
Well Depth	47.98

3 vol = 18 Gal

	Volume 1	Volume 2	Volume 3	SAMPLE
Pre-purge:	909	915		1401
pH	11.9	11.9	pH	9.6
Specific Conductance	2136	1412	Specific Conductance	926
Temperature	13	13	Temperature	15
Turbidity	>999	692	Turbidity	>999
Dissolved Oxygen	4.38	2.71	Dissolved Oxygen	1.97

Comments: --purged dry w/ submersible @ 1 Gal/min  
 - approx. 9 gals removed

**RealCo**  
**Main Plant Groundwater Monitoring Program**

Sample Location: MW-3      Sample Date: 6-3-04      Sample Time: 1037  
 Sampler(s) Name: J. FRISONE/A. DEMARCO      Weather Conditions: SUNNY 65°F  
 Field Observation(s)/Well Condition: GOOD, 2" DIAM

**Field Measurements**

Static Water Level	14.41
LNAPL	ND
Well Depth	21.95

3 vol = 14L

	Volume 1	Volume 2	Volume 3	VOL 4
Pre-purge:	1011			1026
pH	6.9	6.9	6.9	6.9
Specific Conductance	943	942	942	944
Temperature	11	11	11	11
Turbidity	8	4	4	2
Dissolved Oxygen	4.40	3.50	2.71	2.25

Comments: - 5 v/s purged w/peristaltic pump @ 1L/min

VOL 5 @ 1036  
 PH = 6.9  
 Spec. Cond. = 945  
 Temp = 11  
 Turbidity = 2  
 D.O. = 1.65



000000

RealCo  
Main Plant Groundwater Monitoring Program

Sample Location: MW-3B    Sample Date: 6-8-04    Sample Time: 1330  
 Sampler(s) Name: J. FRISONI / A. DE MARCO    Weather Conditions: SUNNY 79°F  
 Field Observation(s)/Well Condition: Good, 2" DIAM

Field Measurements

Static Water Level	15.35
LNAPL	ND
Well Depth	52.35

3 vol = 19 Gallons

	Volume 1	Volume 2	Volume 3	SAMPLE
Pre-purge:	946	952	958	1329
pH	8.4	8.5		8.7
Specific Conductance	456	456		963
Temperature	16	15		17
Turbidity	232	106		212
Dissolved Oxygen	7.71	7.36		2.80

Comments: -Purged dry w/ Submersible pump @ 1 Gal/min  
 - Approx 7 gallons removed



000053

**RealCo**  
**Main Plant Groundwater Monitoring Program**

Sample Location: MW-4      Sample Date: 6-3-04      Sample Time: 1323  
 Sampler(s) Name: J. FRISONE / A. DE MARCO      Weather Conditions: SUNNY 70°F  
 Field Observation(s)/Well Condition: Good, 2" DIAM

**Field Measurements**

Static Water Level	13.68
LNAPL	ND
Well Depth	19.92

3 vol = 12 L

	Volume 1	Volume 2	Volume 3	VOL 4
Pre-purge:	1301	1305	1309	1313
pH	7.5	7.5	7.4	7.4
Specific Conductance	612	610	609	611
Temperature	12	11	11	11
Turbidity	3	2	2	2
Dissolved Oxygen	8.6	6.46	4.95	3.95

**Comments:**  
 VOL 5 @ 1321  
 PH = 7.4  
 Spec. Cond. = 612  
 Temp. = 11°C  
 Turbidity = 2  
 D.O. = 3.12

- 5 vols purged w/peristaltic pump @ 1L/min



000057



**RealCo**  
**Main Plant Groundwater Monitoring Program**

Sample Location: MW-5    Sample Date: 6-2-04    Sample Time: 1140  
 Sampler(s) Name: J. FRISONE/A. DE MARCO    Weather Conditions: FRY CLOUDY 60°F

Field Observation(s)/Well Condition: Good, 2" diam

000070

**Field Measurements**

Static Water Level	9.75
LNAPL	NO
Well Depth	20.06

3 vol = 19L

	Volume 1	Volume 2	Volume 3	Volume 4
Pre-purge:	1110	1117	1124	1131
pH	7.8	7.9	7.8	7.8
Specific Conductance	1112	1140	1140	1143
Temperature	11	11	11	11
Turbidity	96	21	3	2.0
Dissolved Oxygen	2.90	2.25	1.25	0.84

Comments: 4 vols purged w/peristaltic pump @ 1L/min



RealCo  
Main Plant Groundwater Monitoring Program

Sample Location: MW-5B Sample Date: 6-8-04 Sample Time: 1456  
 Sampler(s) Name: J. FRISOWE / M. WILSEY Weather Conditions: SUNNY & SF

Field Observation(s)/Well Condition: Good, 2" Diam

Field Measurements

Static Water Level	<u>11.49</u>
LNAPL	<u>ND</u>
Well Depth	<u>61.07</u>

3 vols = 24 Gal

	Volume 1	Volume 2	Volume 3
Pre-purge:	<u>1127</u>	<u>1135</u>	<u>1456</u>
pH	<u>8.9</u>	<u>9.0</u>	<u>9.1</u>
Specific Conductance	<u>1621</u>	<u>1624</u>	<u>1680</u>
Temperature	<u>16</u>	<u>14</u>	<u>16</u>
Turbidity	<u>7999</u>	<u>973</u>	<u>&gt;999</u>
Dissolved Oxygen	<u>1.41</u>	<u>0.98</u>	<u>1.20</u>

Comments: Purged well dry w/ Submersible pump @ 1 GPM

Approx. 12 gallons removed



000055

**RealCo**  
**Main Plant Groundwater Monitoring Program**

Sample Location: MW-6    Sample Date: 6-2-04    Sample Time: 1220  
 Sampler(s) Name: J. FRISONÉ/A. DE MARCO    Weather Conditions: Cloudy 60°F

Field Observation(s)/Well Condition: Good, 2" DIAM

**Field Measurements**

Static Water Level	12.10
LNAPL	ND
Well Depth	18.47

3 vol = 12 L

000071

	Volume 1	Volume 2	Volume 3	Volts
Pre-purge:	1202	1206	1210	1214
pH	7.2	7.4	7.4	7.4
Specific Conductance	110	115	112	111
Temperature	10	10	9	9
Turbidity	32	14	10	9
Dissolved Oxygen	2.00	0.75	0.70	0.46

Comments: 4 vols purged w/peristaltic pump @ 1L/min



RealCo  
Main Plant Groundwater Monitoring Program

Sample Location: MW-6B    Sample Date: 6-8-04    Sample Time: 1241  
 Sampler(s) Name: J. FRISONE / M. WILSEY    Weather Conditions: SUNNY 85°F  
 Field Observation(s)/Well Condition: GOOD, 2" DIAM

Field Measurements

Static Water Level	12.92
LNAPL	ND
Well Depth	65.41

3 vols = 26 gal

	Volume 1	Volume 2	Volume 3	SAMPLE
Pre-purge:	1204	1213	1222	1230
pH	8.3	7.9	7.8	7.8
Specific Conductance	1622	1656	1654	1671
Temperature	15	15	15	15
Turbidity	232	162	212	168
Dissolved Oxygen	1.03	0.84	0.81	0.73

Comments: Piped dry w/ Submersible Pump @ 1 GPM  
 Approx 25 gal removed  
 Allowed well to recover before sampling



**RealCo**  
**Main Plant Groundwater Monitoring Program**

Sample Location: MW-8B      Sample Date: 6-7-04      Sample Time: 0915  
 Sampler(s) Name: J. FRISONE / A. DEMARCO      Weather Conditions: CLOUDY 55°F

Field Observation(s)/Well Condition: GOOD, 2" DIAM

000072

**Field Measurements**

Static Water Level	18.93
LNAPL	ND
Well Depth	45.34

3 vol = 49L

	Volume 1	Volume 2	Volume 3
Pre-purge:			
pH	7.7	7.5	7.6
Specific Conductance	1869	1905	1861
Temperature	10	10	10
Turbidity	6	76	124
Dissolved Oxygen	3.85	2.05	1.62

Comments: - 3 vols purged w/ 1/2 bailer



**RealCo**  
**Main Plant Groundwater Monitoring Program**

Sample Location: MW-11    Sample Date: 6-3-04    Sample Time: 1414  
 Sampler(s) Name: J. FRISONI/A. DEMARCO    Weather Conditions: SUN/BREEZY 70°F  
 Field Observation(s)/Well Condition: GOOD, 2" DIAM

**Field Measurements**

Static Water Level	9.00
LNAPL	NO
Well Depth	15.01

3 vols = 11L

	Volume 1	Volume 2	Volume 3	Vol 5
Pre-purge:	1350	1354	1358	1402
pH	7.4	7.5	7.6	7.7
Specific Conductance	675	926	1072	1145
Temperature	11	10	10	10
Turbidity	14	8	3	2
Dissolved Oxygen	2.95	4.81	4.351	2.60

**Comments:**  
 VOL 5 @ 1410  
 pH = 7.7  
 Spec. Cond. = 1154  
 Temp = 10  
 Turbidity = 3  
 D.O. = 1.84

- 5 vols purged w/ peristaltic pump @ 1L/min  
 - Slight petroleum scent became noticeable between 1<sup>st</sup> + 2<sup>nd</sup> volume purge  
 - no visible green present





**RealCo  
Main Plant Groundwater Monitoring Program**

Sample Location: MW-15 Sample Date: 6/1/04 Sample Time: 12:15  
 Sampler(s) Name: M. Wilsey / J. Frisore Weather Conditions: Cloudy 65°F  
 Field Observation(s)/Well Condition: Good, 2" dia

**Field Measurements**

Static Water Level	<u>4.15</u>
LNAPL	<u>ND</u>
Well Depth	<u>11.89</u>

3 vol = 15L

000073

	Volume 1	Volume 2	Volume 3
Pre-purge:	<u>1141</u>	<u>1152</u>	<u>1156</u>
pH	<u>6.8</u>	<u>6.5</u>	<u>6.2</u>
Specific Conductance	<u>4759</u>	<u>5009</u>	<u>5085</u>
Temperature	<u>13</u>	<u>13</u>	<u>12</u>
Turbidity	<u>1.2</u>	<u>5.5</u>	<u>4.9</u>
Dissolved Oxygen	<u>5.02</u>	<u>7.8</u>	<u>7.2</u>

Comments:

6/2/04 12:16

PH = 5.8

Temp = 12

Cond = 5132

D.O = 5.02

Turb. = 13

Purged 4 vol w/ peristaltic pump, lowered water level significantly, stopped purging, sample water level 8.55





**RealCo**  
**Main Plant Groundwater Monitoring Program**

Sample Location: MW-17    Sample Date: 6-2-04    Sample Time: 1045  
 Sampler(s) Name: J. FRISONI / A. DEMARCO    Weather Conditions: Cloudy 60°F  
 Field Observation(s)/Well Condition: Good, 2" DIAM

000075

**Field Measurements**

Static Water Level	4.65'
LNAPL	ND
Well Depth	13.94'

3 vol = 17L

	Volume 1	Volume 2	Volume 3	VOL#
Pre-purge:	1019	1025	1031	1037
pH	7.7	7.9	7.8	7.8
Specific Conductance	504	509	517	535
Temperature	13	13	11	11
Turbidity	43	16	16	25
Dissolved Oxygen	1.57	0.32	0.33	0.49

Comments: 4 vols. purged w/peristaltic pump @ 1 L/min



**RealCo  
Main Plant Groundwater Monitoring Program**

Sample Location: MW-18      Sample Date: 6-7-04      Sample Time: 2:51  
 Sampler(s) Name: A. D. Masco / J. FRIESE      Weather Conditions: SUNNY 70°F

Field Observation(s)/Well Condition: SUNNY 80°F, good well 4" dia.

**Field Measurements**

Static Water Level	8.94
LNAPL	ND
Well Depth	18.08

3 vol = 37 Gal

000006

	Volume 1	Volume 2	Volume 3
Pre-purge:	1.57		2.33
pH	6.9	7.2	7.2
Specific Conductance	1092	1106	1181
Temperature	15	15	14
Turbidity	98	24	22
Dissolved Oxygen	1.17	1.04	0.76
	7.2	7.1	7.2
	pH	pH	pH
	Specific Conductance	Specific Conductance	Specific Conductance
	Temperature	Temperature	Temperature
	Turbidity	Turbidity	Turbidity
	Dissolved Oxygen	Dissolved Oxygen	Dissolved Oxygen

purged 3 vol. w/ submersible pump

Sample volume @ 2:49

pH 7.2  
 Spec. cond. 1157  
 Temp 14  
 Turbidity 9  
 D.O. 0.59

0.1 gal/min

purged down to ~17 ft  
 waited for recovery to sample



**RealCo  
Main Plant Groundwater Monitoring Program**

Sample Location: MW-19    Sample Date: 6-7-04    Sample Time: \_\_\_\_\_  
 Sampler(s) Name: J. FRISONI/A. DE MARCO    Weather Conditions: SUNNY 63°F

Field Observation(s)/Well Condition: Good, 4" DIAM

**Field Measurements**

Static Water Level	10.25
LNAPL	ND
Well Depth	27.43

3 vol = 28 GAL.

000077

	Volume 1	Volume 2	Volume 3
Pre-purge:	10:35	10:45	10:55
pH	7.2	7.1	7.1
Specific Conductance	1581	1417	1347
Temperature	16	14	14
Turbidity	203	62	284
Dissolved Oxygen	1.76	0.78	0.64

Comments: SAMPLE VOLUME @ 1115    - 3 vols purged w/ submersible pump @ 1 Gal/min

pH = 7.0

Spec. Cond. = 1549

Temp. = 14

Turbidity = 135

D. O. = 0.61

**RealCo**  
**Main Plant Groundwater Monitoring Program**

Sample Location: MW-19B Sample Date: 6-2-04 <sup>AD</sup> 6/8/04 Sample Time: 14:35  
 Sampler(s) Name: J. FRISONÉ / A. DeMARCO Weather Conditions: SUNNY 68°F  
 Field Observation(s)/Well Condition: GOOD, 4" DIAM

**Field Measurements**

Static Water Level	9.83
LNAPL	ND
Well Depth	44.82

3 vol = 69 Gal

000057

	Volume 1	Volume 2	Volume 3
Pre-purge:	1225	1240	
pH	6.9	6.9	pH
Specific Conductance	3503	3529	Specific Conductance
Temperature	17	15	Temperature
Turbidity	15	4	Turbidity
Dissolved Oxygen	5.97 <del>8.3</del>	1.83	Dissolved Oxygen

well dry cast  
 12:45pm  
 w/ 30 gal down

Comments: Sampled on 6-8-04

time	14:31
pH	6.8
Spec. cond	3584
temp	16
turbidity	8
D.O.	3.26





**RealCo**  
**Main Plant Groundwater Monitoring Program**

Sample Location: MW-21    Sample Date: 6-2-04    Sample Time: 951  
 Sampler(s) Name: J. FRISONI/A. DEMARCO    Weather Conditions: CLOUDY 60°F  
 Field Observation(s)/Well Condition: GOOD, 2" DIAM, SLIGHT PETROLEUM SCENT WHEN WELL OPENED

000079

**Field Measurements**

Static Water Level	9.30
LNAPL	ND
Well Depth	19.00

3 vol = 18L

	Volume 1	Volume 2	Volume 3		VOL#
Pre-purge:	925	937	943		949
pH	7.3	7.4	7.4		7.4
Specific Conductance	1415	1420	1435	Specific Conductance	1440
Temperature	12	12	12	Temperature	12
Turbidity	22	16	3.0	Turbidity	3
Dissolved Oxygen	0.74	1.21	1.00	Dissolved Oxygen	0.38

**Comments:** - 4 vols purged w/peristaltic pump @ 1L/min  
 - Slight sheen on top between pre-purge and Volume #1





**RealCo**  
**Main Plant Groundwater Monitoring Program**

Sample Location: MW-B    Sample Date: 6-2-04    Sample Time: 1450  
 Sampler(s) Name: J. FRISONE / A. DE MARCO    Weather Conditions: PRTY SUNNY 65°F  
 Field Observation(s)/Well Condition: Good, 2" diam

000069

**Field Measurements**

Static Water Level	<u>11.38</u>
LNAPL	<u>NO</u>
Well Depth	<u>18.36</u>

3 vol = 13L

	Volume 1	Volume 2	Volume 3
Pre-purge:	<u>1427</u>	<u>1432</u>	<u>1437</u>
pH	<u>6.9</u>	<u>7.1</u>	<u>7.1</u>
Specific Conductance	<u>1394</u>	<u>1363</u>	<u>1324</u>
Temperature	<u>11</u>	<u>10</u>	<u>10</u>
Turbidity	<u>141</u>	<u>34</u>	<u>29</u>
Dissolved Oxygen	<u>0.26</u>	<u>0.24</u>	<u>0.23</u>

**Comments:** - 3 vol/s purged with peristaltic pump @ 1L/min  
 - heavy petroleum scent, visible sheen present throughout entire purge





**RealCo**  
**Main Plant Groundwater Monitoring Program**

Sample Location: H-4S    Sample Date: 6-4-04    Sample Time: 1114  
 Sampler(s) Name: J. FRISONE / A. DE MARCO    Weather Conditions: SUNNY & 50°F  
 Field Observation(s)/Well Condition: GOOD, 2" DIAM

**Field Measurements**

Static Water Level	8.62
LNAPL	NO
Well Depth	12.05

3 vols = 16L

	1050	1055	Volume 2	1101	Volume 3	Vol
Pre-purge:	1050	1055	Volume 2	1101	Volume 3	1111
pH	6.8	6.9	pH	6.9	pH	6.8
Specific Conductance	725	733	Specific Conductance	735	Specific Conductance	737
Temperature	11	11	Temperature	11	Temperature	11
Turbidity	8	3	Turbidity	3	Turbidity	3
Dissolved Oxygen	7.58	3.54	Dissolved Oxygen	2.73	Dissolved Oxygen	1.71

Comments: - 4 vols purged w/peristaltic pump @ 1L/min





**RealCo**  
**Main Plant Groundwater Monitoring Program**

Sample Location: TF-1    Sample Date: 6/1/04    Sample Time: 1119  
 Sampler(s) Name: M. Wilsey / J. FRISONE    Weather Conditions: Cloudy 65°F  
 Field Observation(s)/Well Condition: Good, 2" dia

000082

**Field Measurements**

Static Water Level	5.00
LNAPL	ND
Well Depth	14.80

3 vol = 18L

	Volume 1	Volume 2	Volume 3
Pre-purge:	1059	1111	1117
pH	7.2	7.4	7.4
Specific Conductance	2457	2581	2612
Temperature	12	12	12
Turbidity	59	3.0	1.8
Dissolved Oxygen	1.03	0.70	0.31

Comments: Purge A 3 vol w/persistHi pump @ 1 LPM







RealCo  
Main Plant Groundwater Monitoring Program

Sample Location: RW-5      Sample Date: 6-9-04      Sample Time: 1329  
 Sampler(s) Name: J. FRISONÉ / A. DE MARCO      Weather Conditions: SUNNY 90°F  
 Field Observation(s)/Well Condition: Good, 8" DIAM

Field Measurements

Static Water Level	14.68
LNAPL	N/D
Well Depth	28.18

3 vols = 106 Gal

	Volume 1	Volume 2	Volume 3
Pre-purge:	12.51	1.09	1.27
pH	7.8	pH	7.7
Specific Conductance	1623	Specific Conductance	1902
Temperature	14	Temperature	16
Turbidity	7071	Turbidity	65
Dissolved Oxygen	2.70	Dissolved Oxygen	1.12

Comments: 3 vols purged w/ submersible pump @ 2 gal/min

000000







RealCo  
Main Plant Groundwater Monitoring Program

Sample Location: OW-14    Sample Date: 6-4-04    Sample Time: 929  
 Sampler(s) Name: J. FRISONE / A. DE MARCO    Weather Conditions: SUNNY 60°F

Field Observation(s)/Well Condition: GOOD, 2" DIAM

Field Measurements

Static Water Level	13.53
LNAPL	ND
Well Depth	27.27

3 vols = 25L

	Volume 1	Volume 2	Volume 3
Pre-purge:	903		918
pH	7.4	pH	7.4
Specific Conductance	1380	Specific Conductance	1408
Temperature	18	Temperature	11
Turbidity	73	Turbidity	9
Dissolved Oxygen	5.50	Dissolved Oxygen	9.65
		Dissolved Oxygen	9.80

Comments: - 3 vols purged w/peristaltic pump @ 1L/min  
 - slight sheen at on set of pump, disappeared by the end of volume 2, slight petroleum scent at on set, disappeared by end of volume 2.



000072

**RealCo**  
**Main Plant Groundwater Monitoring Program**

Sample Location: PZ-16    Sample Date: 6-1-04    Sample Time: 1308  
 Sampler(s) Name: M. WILSEY / J. FRISONE    Weather Conditions: CLOUDY 65°F  
 Field Observation(s)/Well Condition: GOOD, 2" Dia

**000081**

**Field Measurements**

Static Water Level	4.1
LNAPL	ND
Well Depth	13.32

3 vol = 17L

	Volume 1	Volume 2	Volume 3	VOL
Pre-purge:	1236	1242	1248	1301
pH	6.6	4.3	6.5	6.6
Specific Conductance	485	893	693	543
Temperature	10.7	11.8	11	10
Turbidity	>999	168	112	10
Dissolved Oxygen	0.46	0.76	0.27	0.16
				1254
				6.6
				605
				11
				40
				0.21

Comments: Vol 5 @ 1306 - Purged 5 vol w/peristaltic pump @ 1L/min

pH = 6.6  
Spec. Cond = 538  
Temp = 10  
Turb = 19  
D.O. = 0.18



Appendix B – Quality Assurance Certifications (Case Narratives)  
Year 5, Round 1



Experience is the solution

314 North Pearl Street • Albany, New York 12207 • (518) 434-4546 • Fax (518) 434-0891

## Case Narrative

**Client: Real Co. – Watervliet, NY (Main Plant Area)**

**Case: RC 0414**

**SDG: MW-B**

<u>Sample ID</u>	<u>Laboratory Sample ID</u>	<u>Date Received</u>	<u>VTSR</u>	<u>Matrix</u>
TF-1	040601037-001	06/01/04	16:40	Water
MW-15	040601037-002	06/01/04	16:40	Water
PZ-16	040601037-003	06/01/04	16:40	Water
MW-20	040601037-004	06/01/04	16:40	Water
MW-22	040601037-005	06/01/04	16:40	Water
Equipment Blank	040601037-006	06/01/04	16:40	Water
MW-21	040603008-001	06/02/04	16:40	Water
MW-17	040603008-002	06/02/04	16:40	Water
MW-5	040603008-003	06/02/04	16:40	Water
MW-6	040603008-004	06/02/04	16:40	Water
MW-16	040603008-005	06/02/04	16:40	Water
MW-B	040603008-006	06/02/04	16:40	Water
MW-B Dup.	040603008-007	06/02/04	16:40	Water
Equipment Blank	040603008-008	06/02/04	16:40	Water
MW-8B	040607023-001	06/07/04	16:12	Water
MW-19	040607023-002	06/07/04	16:12	Water
MW-18	040607023-003	06/07/04	16:12	Water
Equipment Blank	040607023-004	06/07/04	16:12	Water

### Total Petroleum Hydrocarbons

- 1) Samples were analyzed using EPA Method 8100.
- 2) Peak area was used to calculate all values appearing in this data package.
- 3) The primary quantitation column is identified as DB5.
- 4) Sample MW-B (AES sample number 040603008-006) was used as the matrix spike and matrix spike duplicate. The recovery in the matrix spike duplicate was outside required limits due to the high level in the sample. According to the protocol, a matrix spike blank must be analyzed. A matrix spike blank was analyzed and all recoveries were within acceptable limits.

000004



Experience is the solution

314 North Pearl Street • Albany, New York 12207 • (518) 434-4546 • Fax (518) 434-0891

### Inorganics – Total Metals

- 1) The recovery for Calcium and Iron in the ICSA and the ICSAB check standards were outside the required limit. The required concentration for these analytes in the check standards is 500,000 ug/L and 200,000 ug/L, respectively. The linear range on this instrument for Calcium and Iron is 200,000 ug/L and 80,000 ug/L, respectively. At this level accurate recovery of Calcium and Iron in the check standards is not possible. No further action is required.
- 2) Sample MW-B (AES sample number 040603008-006) was used as the matrix spike and duplicate sample. All recoveries were within required limits.

### Conventionals

- 1) Sample MW-B (AES sample number 040603008-006) was used for the spike and duplicate sample for Sulfate and Fluoride. All recoveries were within acceptable limits.
- 2) Sample MW-D2 (AES sample number 040603064-006) was used for the spike and duplicate sample for Nitrate. The recovery for Nitrate in the spike was outside required 75-125 % limits. The recovery was 66 %.

“I certify that this data package is in compliance with the terms and conditions of the protocol, both technically and for completeness, to the best of my knowledge, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.”

A handwritten signature in black ink, appearing to read "V. O. O.", is written over a horizontal line. Below the line, the text "Laboratory Manager" is printed.

Date: 7/21/04

000005



Experience is the solution

314 North Pearl Street • Albany, New York 12207 • (518) 434-4546 • Fax (518) 434-0891

### Case Narrative

**Client: Real Co. – Watervliet, NY (Main Plant Area)**

**Case: RC 0416**

**SDG: H-4D**

<u>Sample ID</u>	<u>Laboratory Sample ID</u>	<u>Date Received</u>	<u>VTSR</u>	<u>Matrix</u>
MW-1	040603064-001	06/03/04	16:04	Water
MW-3	040603064-002	06/03/04	16:04	Water
OW-12	040603064-003	06/03/04	16:04	Water
MW-4	040603064-004	06/03/04	16:04	Water
MW-11	040603064-005	06/03/04	16:04	Water
MW-D2	040603064-006	06/03/04	16:04	Water
MW-D2 Dup.	040603064-007	06/03/04	16:04	Water
Equipment Blank	040603064-008	06/03/04	16:04	Water
OW-13	040604044-001	06/04/04	15:00	Water
OW-14	040604044-002	06/04/04	15:00	Water
MW-14	040604044-003	06/04/04	15:00	Water
H-4S	040604044-004	06/04/04	15:00	Water
H-4D	040604044-005	06/04/04	15:00	Water
H-4D Dup.	040604044-006	06/04/04	15:00	Water
MW-2	040604044-007	06/04/04	15:00	Water
Equipment Blank	040604044-008	06/04/04	15:00	Water

### PCB's

- 1) Samples were analyzed using EPA Method 8082.
- 2) Peak area was used to calculate all values appearing in this data package.
- 3) The primary quantitation column is identified as DB608 and the confirmation column is identified as DB5.
- 4) Please find after this narrative, a listing of the peaks used to identify and quantitate Aroclor constituents in this data package.
- 5) Sample H-4D (AES sample number 040604044-005) was used as the matrix spike and matrix spike duplicate. This sample was spiked with Aroclor 1016 and Aroclor 1260. All the recoveries were within acceptable limits.
- 6) All PCB samples were sulfur and acid cleaned prior to analysis as necessary.

000004



Experience is the solution

314 North Pearl Street • Albany, New York 12207 • (518) 434-4546 • Fax (518) 434-0891

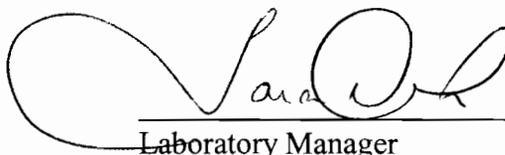
### Inorganics – Total Metals

- 1) The recovery for Calcium and Iron in the ICSEA and the ICSEB check standards were outside the required limit. The required concentration for these analytes in the check standards is 500,000 ug/L and 200,000 ug/L, respectively. The linear range on this instrument for Calcium and Iron is 200,000 ug/L and 80,000 ug/L, respectively. At this level accurate recovery of Calcium and Iron in the check standards is not possible. No further action is required.
- 2) The digested spike recovery for the element Arsenic for sample MW-D2 (AES sample number 040603064-006) was outside the required 75-125 % limits. A post digestion spike was performed and the recovery for Arsenic was outside acceptable limits. The results for this element are flagged with an “N” as specified by the protocol. This indicates possible matrix interference.

### Conventionals

- 1) Sample MW-D2 (AES sample number 040603064-006) was used for the spike sample. The recovery for Nitrate in the spike was outside required 75-125 % limits. The recovery was 66 %.
- 2) Sample MW-D2 (AES sample number 040603064-006) was used for the duplicate sample. The recovery for Fluoride in the duplicate was outside required 20 % limits. The recovery was 27.4 %.

“I certify that this data package is in compliance with the terms and conditions of the protocol, both technically and for completeness, to the best of my knowledge, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.”



\_\_\_\_\_  
Laboratory Manager

Date: 7/21/04

000005



Experience is the solution

314 North Pearl Street • Albany, New York 12207 • (518) 434-4546 • Fax (518) 434-0891

## Case Narrative

**Client: Real Co. – Watervliet, NY (Main Plant Area)**

**Case: RC 0419**

**SDG: MW-1B**

<u>Sample ID</u>	<u>Laboratory Sample ID</u>	<u>Date Received</u>	<u>VTSR</u>	<u>Matrix</u>
MW-1B	040608041-001	06/08/04	15:41	Water
MW-6B	040608041-002	06/08/04	15:41	Water
MW-3B	040608041-003	06/08/04	15:41	Water
MW-2B	040608041-004	06/08/04	15:41	Water
MW-19B	040608041-005	06/08/04	15:41	Water
MW-19B Dup.	040608041-006	06/08/04	15:41	Water
MW-5B	040608041-007	06/08/04	15:41	Water
Equipment Blank	040608041-008	06/08/04	15:41	Water
MW-4B	040610003-001	06/09/04	16:53	Water
MW-4B Dup.	040610003-002	06/09/04	16:53	Water
RW-1B	040610003-003	06/09/04	16:53	Water
RW-5	040610003-004	06/09/04	16:53	Water
Equipment Blank	040610003-005	06/09/04	16:53	Water
RW-4	040610003-006	06/09/04	16:53	Water

### Inorganics – Total Metals

- 1) The recovery for Calcium and Iron in the ICSA and the ICSAB check standards were outside the required limit. The required concentration for these analytes in the check standards is 500,000 ug/L and 200,000 ug/L, respectively. The linear range on this instrument for Calcium and Iron is 200,000 ug/L and 100,000 ug/L, respectively. At this level accurate recovery of Calcium and Iron in the check standards is not possible. No further action is required.
- 2) Samples MW-19B and MW-4B (AES sample numbers 040608041-005 and 040610003-001) were used for the matrix spike and duplicate samples. All recoveries were within required limits.

### Conventionals

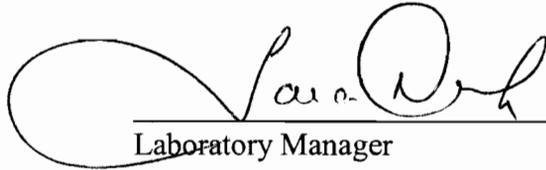
- 1) Samples MW-19B and MW-4B (AES sample numbers 040608041-005 and 040610003-001) were used for the matrix spike sample. The recovery for Nitrate in MW-4B spike was outside required 75-125 % limits. The recovery was 74 %.
- 2) Samples MW-19B and MW-4B (AES sample numbers 040608041-005 and 040610003-001) were used for the duplicate samples. All recoveries were within required limits.



**Experience is the solution**

314 North Pearl Street • Albany, New York 12207 • (518) 434-4546 • Fax (518) 434-0891

“I certify that this data package is in compliance with the terms and conditions of the protocol, both technically and for completeness, to the best of my knowledge, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.”

  
\_\_\_\_\_  
Laboratory Manager

Date: 8/3/04

000004