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2006 ANNUAL GROUNDWATER MONITORING PROGRAM EVALUATION REPORT

AKZO NOBEL POLYMER CHEMICALS LLC
2153 LOCKPORT-OLCOTT ROAD
BURT, NEW YORK

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AKZO NOBEL POLYMER CHEMICALS LLC
2153 LOCKPORT-OLCOTT ROAD
BURT, NEW YORK

JANUARY 2007
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1.0 INTRODUCTION

Akzo Nobel Polymer Chemicals, LLC (Akzo Nobel) has a Part 373 Permit, Number 9-02928-00001/0003, which required a Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) and a RCRA Facility Investigation (RFI) to determine the nature and extent of contamination associated with the Site (Site). These studies were conducted from 1994 to 2002. Based on the findings of the RFI, groundwater impacts were identified at the Site. A Corrective Measures Study (CMS) was conducted to evaluate remedial alternatives. Monitored Natural Attenuation (MNA) and institutional controls were selected as the final corrective measures for the Site. Akzo Nobel's Part 3 Permit was renewed in December 2005. The Permit authorized Akzo Nobel to implement corrective action measures to address the groundwater contamination at the Site.

The remedial goals of the corrective action are:

i) eliminate the future risk to human health posed by the contaminated soil and remaining source materials present within the industrialized area of the Facility;

ii) eliminate the future risk to human health posed by the contaminated overburden groundwater present beneath the industrialized area of the Facility; and

iii) control migration of the contaminated groundwater.

The remedial criteria of the correction action are:

i) maintain a long-term Groundwater Monitoring Program (GMP) to ensure that the concentration of contaminants continues to decline in the central area of the Facility; and

ii) continue groundwater monitoring in the perimeter wells to ensure that there is no off-Site contaminant migration.

The GMP and the effectiveness of the MNA as the selected remedy for the Site will be evaluated annually. The GMP Evaluation Report will evaluate the contaminant concentration trends and natural attenuation parameters to determine if the remedy is effective in meeting the remedial goals and permit criteria. If an annual review shows that any well or wells consistently has results of non-detect for all parameters for at last four sampling events, Akzo Nobel may request that the New York State Department of Environmental Conservation (NYSDEC) allow Akzo Nobel to modify this GMP to reduce the sampling frequency for those wells.

If concentrations of Site contaminants are observed to be increasing at any of the source area wells or contaminants are detected at any of the perimeter wells at concentrations above the 6 New York Code of Rules and Regulations (NYCRR) Part 703.5 Standards, Akzo Nobel will develop and implement an Interim Corrective Measures (ICM) as required by Module II Section 1(a)(ii).

As required in the GMP, this annual report evaluates the performance of the remedial system at the Site. This performance evaluation includes:

i) a comparison of quarterly 2006 monitoring data to determine remediation trends; and

ii) an evaluation of water level data to determine overburden and bedrock groundwater flow.

Figure 1 presents a Site Plan and Figure 2 presents the monitoring well locations. This is the first report summarizing data collected for the second, third, and fourth quarter of 2006.

2.0 GROUNDWATER QUALITY DATA

The existing monitoring well network consists of 15 groundwater monitoring wells. All monitoring wells were sampled on a quarterly basis. Groundwater samples were analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), general chemistry, and specific field parameters. The TCL VOCs were analyzed by United States Environmental Protection Agency (USEPA) SW-846 Method 8260. Analyzing for the TCL VOC list of parameters indicates if the contaminants identified at the Site were decreasing in concentration as well as if daughter-products were being produced, providing an indication of degradation of contaminants by natural attenuation. Additionally, the following natural attenuation parameters were analyzed to assess whether conditions continue to be favorable for continued degradation or if enhancement of the natural attenuation may be necessary:

i) dissolved oxygen (field measurement);

ii) iron (II) (field measurement);

iii) dissolved iron (USEPA Method SW-846 200.7 Series);

iv) manganese, dissolved (USEPA Method SW-846 200.7 Series);

v) nitrate (USEPA Method SW-846 300.0);

vi) nitrite (USEPA Method SW-846 354.1);

vii) sulfate (USEPA Method SW-846 300.0); and

viii) methane (Method RSK 175).

Analytical reports are summarized in Appendix A. Appendix D contains field measurement data.

3.0 COMPARISON OF TCL VOCs IN GROUNDWATER WITH NYCRR 703.5 GROUNDWATER STANDARDS

The analytical results comparing TCL VOCs in groundwater with NYCRR 703.5 Groundwater Standards obtained in 2006 for the 15 extraction wells are summarized briefly below.

Well	*Comparison of TCL VOCs in Groundwater with NYCRR 703.5 Groundwater Standards*	
MW-1	No results above action limits.	
MW-1B	No results above action limits.	
MW-2	Benzene (4.8 µg/L versus action limit of 1 µg/L)	05/26/06
	Benzene (16 µg/L versus action limit of 1 µg/L)	11/30/06
	Chloroethane (38 µg/L versus action limit of 5 µg/L)	05/26/06
	Chloroethane (30 µg/L versus action limit of 5 µg/L)	08/29/06
	Chloroethane (100 µg/L versus action limit of 5 µg/L)	11/30/06
MW-3*	No results above action limits	
MW-3B*	No results above action limits	
MW-4*	No results above action limits	
MW-4B*	No results above action limits	
MW-5	Acetone (100 µg/L versus action limit of 50 µg/L)	08/29/06
MW-6	No results above action limits	
MW-7	No results above action limits	
MW-8	Chloroethane (8.0 µg/L [8.1 µg/L duplicate] versus action limit of 5 µg/L)	05/26/06
MW-9*	1,1,1-Trichloroethane (21 µg/L versus action limit of 5 µg/L)	05/26/06
	1,1,1-Trichloroethane (31 µg/L [resample])	07/12/06
	1,1,1-Trichloroethane (34 µg/L versus action limit of 5 µg/L)	08/29/06
	1,1,1-Trichloroethane (19 µg/L [resample])	10/10/06)
	1,1,1-Trichloroethane (24 µg/L versus action limit of 5 µg/L)	11/30/06
MW-9B*	No results above action limits	
MW-10*	No results above action limits	
MW-10B*	No results above action limits	

Notes:
* Denotes downgradient boundary well
µg/L micrograms per liter

A summary of the analytical reports for 2006 can be found in Appendix A.

The Work Plan specifies that if the sample results from any of the downgradient boundary wells (MW-3, MW-3B, MW-4, MW-4B, MW-9, MW-9B, MW-10, and MW-10B)

indicate concentrations for any TCL VOCs above the New York State (NYS) groundwater standards in NYCRR 703.5, the well(s) will be resampled within 2 weeks of obtaining the results. Also, Akzo Nobel will immediately notify the NYSDEC that there was an exceedance at a boundary well.

MW-9 is the only specified boundary well where 1,1,1-trichloroethane was detected in all sampling programs slightly above the action limit of 5 µg/L. NYSDEC was notified of these data on July 10, 2006 (Second Quarter 2006 sample) and October 10, 2006 (Third Quarter 2006 sample). MW-9 was subsequently resampled on July 17, 2006 and October 10, 2006, respectively. Resampling data was also slightly above the action limit of 5 µg/L.

As a result of the Second and Third Quarters 2006 sampling data, discussions were held with NYSDEC, and it was determined that due to the consistent slightly elevated levels of 1,1,1-trichloroethane above NYCRR 703.5 Groundwater Standards observed in MW-9 in all quarterly sampling programs, a new well cluster designated MW-11 and MW-11B will be installed downgradient of MW-9, as depicted in Figure 2. A subsequent letter from NYSDEC to Akzo Nobel dated November 7, 2006 detailed the type of well and designated location.

4.0 MONITORED NATURAL ATTENUATION EVALUATION

Based on the findings of the RFI conducted from 1994 to 2002, groundwater impacts were identified at the Site. A CMS was conducted to evaluate remedial alternatives. MNA and institutional controls were subsequently selected as the final corrective measures for the Site.

Site groundwater MNA data were evaluated to determine whether conditions suitable for reductive dechlorination exist at the Site.

Several indicators of anaerobic conditions were measured during the groundwater sampling at the Site. Dissolved oxygen is a direct measurement of oxygen in the groundwater. Oxidation-Reduction Potential (ORP) was also measured. Methane gas was analyzed. Dissolved metals such as iron and manganese were also measured.

1,1,1-trichloroethane (1,1,1-TCA), chloroethane, and benzene have been detected above regulatory criteria at the Site. 1,1,1-TCA degrades under anaerobic conditions by reductive dechlorination to form chloroethane. During this reductive dechlorination, bacteria with the necessary enzymes are able to utilize the chlorinated compounds as an electron acceptor. 1,1,1-TCA can also be degraded aerobically although bacteria that perform this degradation pathway are rare. Chloroethane itself can be further degraded under anaerobic conditions to ethane and under aerobic conditions through 1-chloroethanol to acetaldehyde. Benzene can be degraded under aerobic conditions and also under anaerobic sulfate reducing conditions. In both cases the benzene is degraded to carbon dioxide and water.

It appears that the 1,1,1-TCA present in the source area is being degraded to chloroethane. The chloroethane will either continue to degrade under anaerobic conditions in the source area or will be degraded aerobically as it migrates towards the Site boundary. Similarly, benzene present in the source area will degrade slowly under anaerobic conditions, but will degraded much faster if it migrates to the aerobic area west of the source area. Therefore, further migration of chemicals from the source area to the boundary should speed their degradation. 1,1,1-TCA is already present in the aerobic boundary area. The three monitoring events that have occurred do not cover a long enough time period to assess whether aerobic degradation of 1,1,1-TCA is occurring in this area. Further monitoring will allow this determination to be made.

A detailed report evaluating Site MNA can be found in Appendix E.

5.0 GROUNDWATER HYDRAULICS

Appendix B presents the overburden groundwater contours for 2006 and Appendix C presents the bedrock groundwater contours for 2006. Based on the assessment of 2006 groundwater monitoring data, the direction of overburden groundwater flow was generally west-northwest. The direction of bedrock groundwater flow was generally west-southwest.

An upward gradient was observed at the MW-1/MW-2 cluster. A downward vertical gradient was observed at the MW-3/MW-3B, MW-4/MW-4B, and MW-9/MW-9B clusters. The downward vertical gradient observed on the western boundary of the Site may be the result of a nearby bedrock groundwater discharge area (Eighteen Mile Creek northwest of the Site).

6.0 CONCLUSIONS

Quarterly reports issued for the Second, Third, and Fourth Quarters of 2006 included a summary of quarterly groundwater monitoring field activities, a summary of the analytical data compared to the New York State Groundwater Standards in 6NYCRR 703.5, groundwater contour maps for both the overburden groundwater and bedrock groundwater, and an interpretation of the data.

A review of the 2006 data has concluded that:

- concentrations of TCL VOC analytes in groundwater collected from the Site monitoring well network in most cases were either not detected or detected below NYCRR 703.5 Groundwater Standards;
- due to the slightly elevated levels of 1,1,1-trichloroethane above NYCRR 703.5 Groundwater Standards observed in MW-9 in all quarterly sampling programs, a new well cluster designated MW-11 and MW-11B will be installed downgradient of MW-9, as depicted in Figure 2;
- the direction of overburden groundwater flow was generally west-northwest. The direction of bedrock groundwater flow was generally west-southwest.

  An upward gradient was observed at the MW-1/MW-2 cluster. A downward vertical gradient was observed at the MW-3/MW-3B, MW-4/MW-4B, and MW-9/MW-9B clusters. The downward vertical gradient observed on the western boundary of the Site may be the result of a nearby bedrock groundwater discharge area (Eighteen Mile Creek northwest of the Site);
- it appears that the 1,1,1-TCA present in the source area is being degraded to chloroethane. The chloroethane will either continue to degrade under anaerobic conditions in the source area or will be degraded aerobically as it migrates towards the Site boundary. Similarly, benzene present in the source area will degrade slowly under anaerobic conditions, but will degraded much faster if it migrates to the aerobic area west of the source area. Therefore, further migration of chemicals from the source area to the boundary should speed their degradation. 1,1,1-TCA is already present in the aerobic boundary area. The three monitoring events that have occurred do not cover a long enough time period to assess whether aerobic degradation of 1,1,1-TCA is occurring in this area. Further monitoring will allow this determination to be made; and

- the remedial goals of the corrective action that continue to be addressed are:
  - eliminate the future risk to human health posed by the contaminated soil and remaining source materials present within the industrialized area of the Facility;
  - eliminate the future risk to human health posed by the contaminated overburden groundwater present beneath the industrialized area of the Facility; and
  - control migration of the contaminated groundwater.

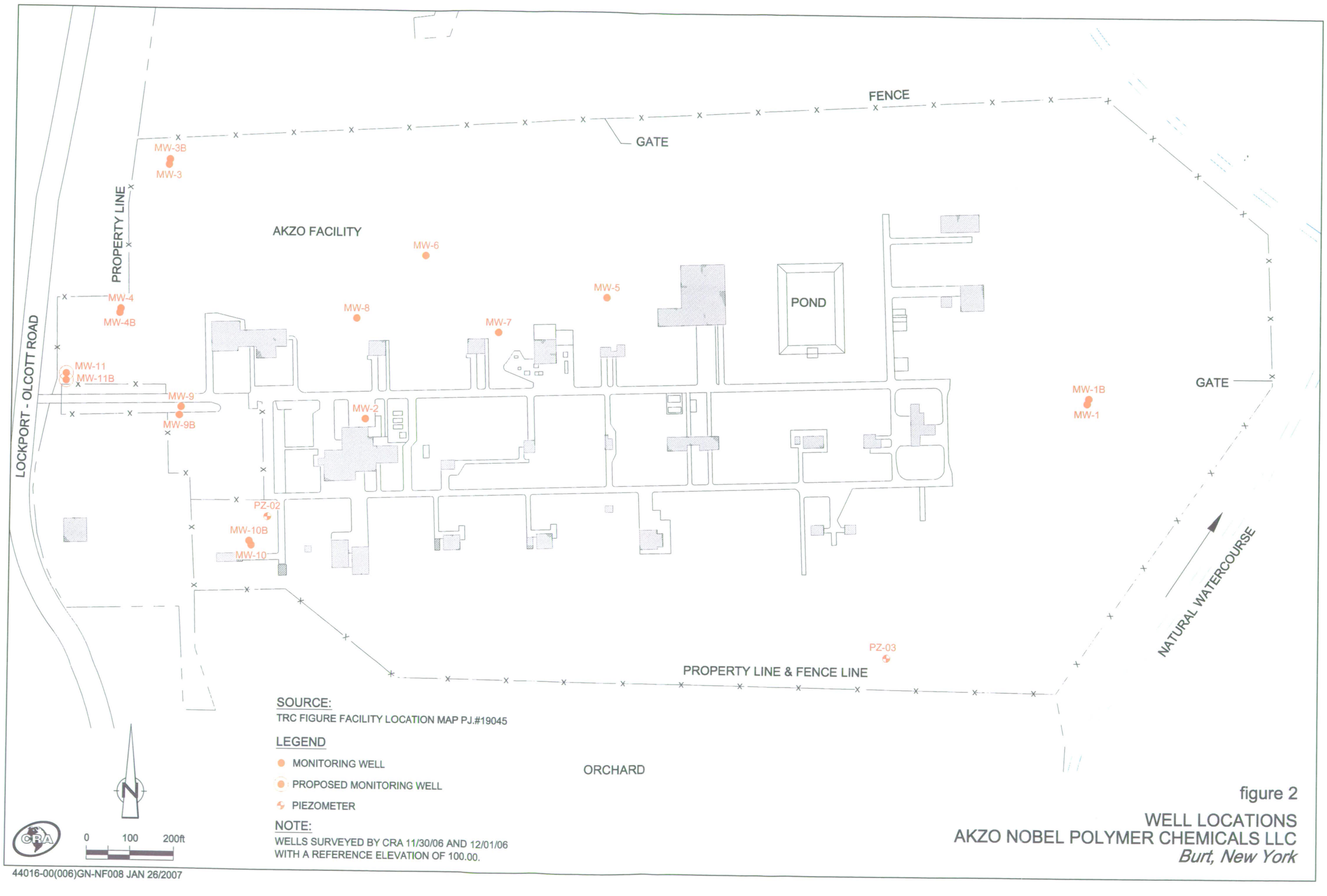
SOURCE REFERENCE

TRC SITE LOCATION MAP PJ.#19045
TOPOGRAPHIC QUADRANGLE: NEWFANE, NY, 1978

figure 1

SITE LOCATION MAP
AKZO NOBEL POLYMER CHEMICALS LLC
Burt, New York

44016-00(006)GN-NF007 JAN 25/2007



44016-00(006)GN-NF008 JAN 26/2007

figure 2

WELL LOCATIONS
AKZO NOBEL POLYMER CHEMICALS LLC
Burt, New York

APPENDIX A

ANALYTICAL REPORTS – 2006

ANALYTICAL RESULTS SUMMARY
AKZO NOBEL QUARTERLY GROUNDWATER MONITORING
BURT, NEW YORK

Parameters	Units	Action Limits 6NYCRR Part 703.5 Stds. for Analytes Sampled	MW-1 WG-44016-052506-011 5/25/2006	MW-1B WG-44016-052506-010 5/25/2006	MW-2 WG-44016-052606-017 5/26/2006	MW-3 WG-44016-052406-005 5/24/2006	MW-3B WG-44016-052406-004 5/24/2006	MW-4 WG-44016-052506-009 5/25/2006	MW-4B WG-44016-052506-008 5/25/2006	MW-5 WG-44016-052606-014 5/26/2006
Volatiles										
1,1,1-Trichloroethane	µg/L	5	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
1,1,2,2-Tetrachloroethane	µg/L	5	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U
1,1,2-Trichloroethane	µg/L	1	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U
1,1-Dichloroethane	µg/L	5	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
1,1-Dichloroethene	µg/L	5	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U
1,2-Dichloroethane	µg/L	0.6	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U
1,2-Dichloroethene (total)	µg/L	5	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U
1,2-Dichloropropane	µg/L	1	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	2.5 U	3.3 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2-Hexanone	µg/L	50	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
Acetone	µg/L	50	2.5 U	12	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	29
Benzene	µg/L	1	0.35 U	0.35 U	4.8	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
Bromodichloromethane	µg/L	50	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
Bromoform	µg/L	50	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Bromomethane (Methyl Bromide)	µg/L	5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Carbon disulfide	µg/L	-	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U
Carbon tetrachloride	µg/L	5	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
Chlorobenzene	µg/L	5	0.32 U	0.32 U	1.5	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloroethane	µg/L	5	0.32 U	0.32 U	38	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloroform (Trichloromethane)	µg/L	7	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Chloromethane (Methyl Chloride)	µg/L	-	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
cis-1,3-Dichloropropene	µg/L	0.4	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Dibromochloromethane	µg/L	50	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Ethylbenzene	µg/L	5	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Methylene chloride	µg/L	5	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
Styrene	µg/L	5	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
Tetrachloroethene	µg/L	5	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Toluene	µg/L	5	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
trans-1,3-Dichloropropene	µg/L	0.4	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Trichloroethene	µg/L	5	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Vinyl chloride	µg/L	2	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Xylene (total)	µg/L	5	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U
Gases										
Methane	µg/L	-	2.2 U	1.0 U	4300	1.0 U	57	1.0 U	1.5 U	1.0 U
Metals										
Iron (Dissolved)	µg/L	-	50.0 U	50.0 U	4370	50.0 U	53.5	50.0 U	50.0 U	50.0 U
Manganese (Dissolved)	µg/L		9.7	268	1840	11.8	26.7	12.7	60.9	3.0 U
General Chemistry										
Nitrate (as N)	mg/L	-	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.61	1.6
Nitrite (as N)	mg/L	-	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.23 J	0.050 U
Sulfate	mg/L	-	41.0	1030	92.6	162	36.4	36.8	619	38.6

Notes:
- Not analyzed.
J Estimated.
U Non-detect at associated value.
[ ] Above 6NYCRR Part 703.5 standards.

ANALYTICAL RESULTS SUMMARY
AKZO NOBEL QUARTERLY GROUNDWATER MONITORING
BURT, NEW YORK

Parameters	Units	Action Limits 6NYCRR Part 703.5 Stds. for Analytes Sampled	MW-6 WG-44016-052406-006 5/24/2006	MW-7 WG-44016-052606-012 5/26/2006	MW-8 WG-44016-052406-002 5/24/2006	MW-8 WG-44016-052406-003 5/24/2006 Duplicate	MW-9 WG-44016-052606-016 5/26/2006	MW-9B WG-44016-052606-015 5/26/2006	MW-10 WG-44016-052406-001 5/24/2006	MW-10B WG-44016-052506-007 5/25/2006
Volatiles										
1,1,1-Trichloroethane	µg/L	5	0.26 U	0.26 U	0.26 U	0.67 J	21	0.26 U	0.26 U	0.26 U
1,1,2,2-Tetrachloroethane	µg/L	5	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U
1,1,2-Trichloroethane	µg/L	1	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U
1,1-Dichloroethane	µg/L	5	0.53 J	0.27 U	2.2	2.7	4.9	0.27 U	0.27 U	1.9
1,1-Dichloroethene	µg/L	5	0.29 U	0.29 U	0.29 U	0.29 U	1.2	0.29 U	0.29 U	0.29 U
1,2-Dichloroethane	µg/L	0.6	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U
1,2-Dichloroethene (total)	µg/L	5	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U
1,2-Dichloropropane	µg/L	1	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2-Hexanone	µg/L	50	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
Acetone	µg/L	50	28	47	2.5 U	2.5 U	2.5 U	3.7 J	2.5 U	5.4
Benzene	µg/L	1	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
Bromodichloromethane	µg/L	50	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
Bromoform	µg/L	50	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Bromomethane (Methyl Bromide)	µg/L	5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Carbon disulfide	µg/L	-	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U
Carbon tetrachloride	µg/L	5	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
Chlorobenzene	µg/L	5	2.7	0.92 J	2.3	2.3	0.32 U	0.32 U	0.32 U	0.32 U
Chloroethane	µg/L	5	0.32 U	0.32 U	8.0	8.1	0.32 U	0.32 U	0.32 U	0.32 U
Chloroform (Trichloromethane)	µg/L	7	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Chloromethane (Methyl Chloride)	µg/L	-	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
cis-1,3-Dichloropropene	µg/L	0.4	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Dibromochloromethane	µg/L	50	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Ethylbenzene	µg/L	5	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Methylene chloride	µg/L	5	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
Styrene	µg/L	5	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
Tetrachloroethene	µg/L	5	0.36 U	0.36 U	0.36 U	0.36 U	0.64 J	0.36 U	0.36 U	0.36 U
Toluene	µg/L	5	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
trans-1,3-Dichloropropene	µg/L	0.4	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Trichloroethene	µg/L	5	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Vinyl chloride	µg/L	2	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Xylene (total)	µg/L	5	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U
Gases										
Methane	µg/L	-	72	440	410	--	2.2 U	6.6	1.0 U	3.1 U
Metals										
Iron (Dissolved)	µg/L	-	194	3530	2090	--	50.0 U	99.4	50.0 U	50.0 U
Manganese (Dissolved)	µg/L	-	1790	1190	1390	--	108	85.3	3.0 U	39.6
General Chemistry										
Nitrate (as N)	mg/L	-	0.050 U	0.050 U	0.050 U	--	1.8	0.050 U	17.2	0.050 U
Nitrite (as N)	mg/L	-	0.050 U	0.050 U	0.050 U	--	0.050 U	0.050 U	0.050 U	0.050 U
Sulfate	mg/L	-	99.9	95.7	76.2	--	83.7	792	51.6	84.2

Notes:
- Not analyzed.
J Estimated.
U Non detect at associated value.
[ ] Above 6NYCRR Part 703.5 standards

APPENDIX A - JULY 2006

ANALYTICAL RESULTS SUMMARY
AKZO NOBEL QUARTERLY GROUNDWATER MONITORING
BURT, NEW YORK

	Sample Location:	*MW-9*
	Sample ID:	*WG-44016-071206-01*
	Sample Date:	*7/12/2006*
Parameters	*Units*	
Volatiles		
1,1,1-Trichloroethane	µg/L	31
1,1,2,2-Tetrachloroethane	µg/L	0.48 U
1,1,2-Trichloroethane	µg/L	0.42 U
1,1-Dichloroethane	µg/L	4.6
1,1-Dichloroethene	µg/L	1.5
1,2-Dichloroethane	µg/L	0.46 U
1,2-Dichloroethene (total)	µg/L	0.70 U
1,2-Dichloropropane	µg/L	0.33 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	2.5 U
2-Hexanone	µg/L	2.4 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	2.3 U
Acetone	µg/L	2.5 U
Benzene	µg/L	0.35 U
Bromodichloromethane	µg/L	0.38 U
Bromoform	µg/L	0.26 U
Bromomethane (Methyl Bromide)	µg/L	0.28 U
Carbon disulfide	µg/L	0.48 U
Carbon tetrachloride	µg/L	0.27 U
Chlorobenzene	µg/L	0.32 U
Chloroethane	µg/L	0.32 U
Chloroform (Trichloromethane)	µg/L	0.34 U
Chloromethane (Methyl Chloride)	µg/L	0.34 U
cis-1,3-Dichloropropene	µg/L	0.36 U
Dibromochloromethane	µg/L	0.32 U
Ethylbenzene	µg/L	0.34 U
Methylene chloride	µg/L	0.44 U
Styrene	µg/L	0.31 U
Tetrachloroethene	µg/L	0.76 J
Toluene	µg/L	0.35 U
trans-1,3-Dichloropropene	µg/L	0.37 U
Trichloroethene	µg/L	0.60 J
Vinyl chloride	µg/L	0.24 U
Xylene (total)	µg/L	0.93 U

Notes:
J Estimated.
U Non-detect at associated value.
[ ] Above 6NYCRR Part 703.5 standards.

ANALYTICAL RESULTS SUMMARY
AKZO NOBEL QUARTERLY MONITORING
BURT, NEW YORK

Sample Location:			*MW-1*	*MW-1B*	*MW-2*	*MW-3*	*MW-3B*	*MW-4*	*MW-4B*	*MW-5*
Sample ID:			*WG-44016-082906-002*	*WG-44016-082906-001*	*WG-44016-082906-011*	*WG-44016-082906-006*	*WG-44016-082906-005*	*WG-44016-082906-003*	*WG-44016-082906-004*	*WG-44016-082906-016*
Sample Date:			*8/29/2006*	*8/29/2006*	*8/29/2006*	*8/29/2006*	*8/29/2006*	*8/29/2006*	*8/29/2006*	*8/29/2006*
Parameters	*Units*	***Action Limits** 6NYCRR Part 703.5 Stds. for Analytes Sampled*								
Volatiles										
1,1,1-Trichloroethane	µg/L	5	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
1,1,2,2-Tetrachloroethane	µg/L	5	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U
1,1,2-Trichloroethane	µg/L	1	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U
1,1-Dichloroethane	µg/L	5	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
1,1-Dichloroethene	µg/L	5	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U
1,2-Dichloroethane	µg/L	0.6	0.55 J	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U
1,2-Dichloroethene (total)	µg/L	5	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U
1,2-Dichloropropane	µg/L	1	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2-Hexanone	µg/L	50	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
Acetone	µg/L	50	2.5 U	5.1 U	2.5 U	2.5 U	2.5 U	3.0 U	2.5 U	500
Benzene	µg/L	1	0.35 U	0.35 U	0.99 J	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
Bromodichloromethane	µg/L	50	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
Bromoform	µg/L	50	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Bromomethane (Methyl Bromide)	µg/L	5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Carbon disulfide	µg/L	-	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U
Carbon tetrachloride	µg/L	5	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
Chlorobenzene	µg/L	5	0.32 U	0.32 U	2.2	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloroethane	µg/L	5	0.32 U	0.32 U	30	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloroform (Trichloromethane)	µg/L	7	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Chloromethane (Methyl Chloride)	µg/L	-	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
cis-1,3-Dichloropropene	µg/L	0.4	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Dibromochloromethane	µg/L	50	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Ethylbenzene	µg/L	5	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Methylene chloride	µg/L	5	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
Styrene	µg/L	5	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
Tetrachloroethene	µg/L	5	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Toluene	µg/L	5	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
trans-1,3-Dichloropropene	µg/L	0.4	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Trichloroethene	µg/L	5	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Vinyl chloride	µg/L	2	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Xylene (total)	µg/L	5	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U
Metals										
Iron (Dissolved)	µg/L	-	50.0 U	50.0 U	4030	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U
Manganese (Dissolved)	µg/L	-	3.3	258	1710	3.4	25.6	217	36.0	3.3
Dissolved Gas										
Methane	µg/L	-	26	1.0 U	2400	1.0 U	36	1.1	1.0 U	1.0 U

ANALYTICAL RESULTS SUMMARY
AKZO NOBEL QUARTERLY MONITORING
BURT, NEW YORK

Sample Location:			*MW-1*	*MW-1B*	*MW-2*	*MW-3*	*MW-3B*	*MW-4*	*MW-4B*	*MW-5*
Sample ID:			*WG-44016-082906-002*	*WG-44016-082906-001*	*WG-44016-082906-011*	*WG-44016-082906-006*	*WG-44016-082906-005*	*WG-44016-082906-003*	*WG-44016-082906-004*	*WG-44016-082906-016*
Sample Date:			*8/29/2006*	*8/29/2006*	*8/29/2006*	*8/29/2006*	*8/29/2006*	*8/29/2006*	*8/29/2006*	*8/29/2006*
Parameters	*Units*	*Action Limits 6NYCRR Part 703.5 Stds. for Analytes Sampled*								
Wet Chemistry										
Nitrate (as N)	mg/L	-	0.058 J	0.050 UJ	0.050 U	0.050 UJ	0.050 UJ	0.055 J	0.10 J	1.6
Nitrite (as N)	mg/L	-	0.050 UJ	0.050 UJ	0.050 U	0.050 UJ	0.050 UJ	0.050 UJ	0.050 UJ	0.050 U
Sulfate	mg/L	-	45.1	1410	53.1	142	29.5	46.6	562	71.9

Notes:

- Not analyzed.
J Estimated.
U Non detect at associated value.
UJ The analyte was not detected above the sample quantitation limit. The reported quantitation limit is an estimated quantity.
[ ] Above 6NYCRR Part 703.5 standards.

ANALYTICAL RESULTS SUMMARY
AKZO NOBEL QUARTERLY MONITORING
BURT, NEW YORK

Sample Location:			MW-6	MW-6	MW-7	MW-8	MW-9	MW-9B	MW-10	MW-10B
Sample ID:			WG-44016-082906-013	WG-44016-082906-014	WG-44016-082906-015	WG-44016-082906-012	WG-44016-082906-008	WG-44016-082906-007	WG-44016-082906-010	WG-44016-082906-009
Sample Date:			8/29/2006	8/29/2006	8/29/2006	8/29/2006	8/29/2006	8/29/2006	8/29/2006	8/29/2006
		Action Limits 6NYCRR Part 703.5		Duplicate						
Parameters	Units	Stds. for Analytes Sampled								
Volatiles										
1,1,1 Trichloroethane	ug/L	5	0.26 U	0.26 U	0.26 U	0.26 U	34	0.26 U	0.64 J	0.26 U
1,1,2,2 Tetrachloroethane	ug/L	5	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U
1,1,2 Trichloroethane	ug/L	1	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U
1,1-Dichloroethane	ug/L	5	0.54 J	0.59 J	0.56 J	0.86 J	4.5	0.27 U	0.27 U	1.1
1,1 Dichloroethene	ug/L	5	0.29 U	0.29 U	0.29 U	0.29 U	2.6	0.29 U	0.29 U	0.29 U
1,2 Dichloroethane	ug/L	0.6	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U
1,2-Dichloroethene (total)	ug/L	5	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U
1,2-Dichloropropane	ug/L	1	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
2-Butanone (Methyl Ethyl Ketone)	ug/L	50	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2-Hexanone	ug/L	50	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	ug/L		2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
Acetone	ug/L	50	5.6 U	6.2 U	2.8 U	2.5 U	2.5 U	2.6 U	2.5 U	2.5 U
Benzene	ug/L	1	0.35 U	0.35 U	0.88 J	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
Bromodichloromethane	ug/L	50	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
Bromoform	ug/L	50	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Bromomethane (Methyl Bromide)	ug/L	5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Carbon disulfide	ug/L	-	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U
Carbon tetrachloride	ug/L	5	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
Chlorobenzene	ug/L	5	3.4	3.4	1.4	3.9	0.32 U	0.32 U	0.32 U	0.32 U
Chloroethane	ug/L	5	0.32 U	0.32 U	0.32 U	1.1	0.32 U	0.32 U	0.32 U	0.32 U
Chloroform (Trichloromethane)	ug/L	7	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Chloromethane (Methyl Chloride)	ug/L	-	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
cis-1,3-Dichloropropene	ug/L	0.4	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Dibromochloromethane	ug/L	50	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Ethylbenzene	ug/L	5	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Methylene chloride	ug/L	5	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
Styrene	ug/L	5	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
Tetrachloroethene	ug/L	5	0.36 U	0.36 U	0.36 U	0.36 U	0.91 J	0.36 U	0.36 U	0.36 U
Toluene	ug/L	5	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
trans-1,3-Dichloropropene	ug/L	0.4	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Trichloroethene	ug/L	5	0.32 U	0.32 U	0.32 U	0.32 U	0.65 J	0.32 U	0.32 U	0.32 U
Vinyl chloride	ug/L	2	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Xylene (total)	ug/L	5	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U
Metals										
Iron (Dissolved)	ug/L	-	186	--	2750	2990	50.0 U	50.0 U	50.0 U	50.0 U
Manganese (Dissolved)	ug/L	-	3560	--	1090	1720	171	42.9	34.9	31.5
Dissolved Gas										
Methane	ug/L	-	73	--	640	240	6.1	6.2	1.0 U	5.9

ANALYTICAL RESULTS SUMMARY
AKZO NOBEL QUARTERLY MONITORING
BURT, NEW YORK

Sample Location:			MW-6	MW-6	MW-7	MW-8	MW-9	MW-9B	MW-10	MW-10B
Sample ID:			WG-44016-082906-013	WG-44016-082906-014	WG-44016-082906-015	WG-44016-082906-012	WG-44016-082906-008	WG-44016-082906-007	WG-44016-082906-010	WG-44016-082906-009
Sample Date:			8/29/2006	8/29/2006	8/29/2006	8/29/2006	8/29/2006	8/29/2006	8/29/2006	8/29/2006
				Duplicate						
Parameters	Units	Action Limits 6NYCRR Part 703.5 Stds. for Analytes Sampled								
Wet Chemistry										
Nitrate (as N)	mg/L	-	0.050 U	--	0.050 U	0.050 U	5.4	0.050 UJ	15.3	0.050 U
Nitrite (as N)	mg/L	-	0.050 U	--	0.050 U	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 U
Sulfate	mg/L	-	111	--	101	85.3	66.5	625	58.2	98.9

Notes:

- Not analyzed.
J Estimated.
U Non detect at associated value.
UJ The analyte was not detected above the sample quantitation limit. The reported quantitation limit is an estimated quantity.
[ ] Above 6NYCRR Part 703.5 standards.

APPENDIX A - NOVEMBER-DECEMBER 2006
ANALYTICAL RESULTS SUMMARY
AKZO NOBEL QUARTERLY GROUNDWATER SAMPLING
BURT, NEW YORK

Sample Location:	Action Limits	MW-1	MW-1B	MW-2	MW-3	MW-3B	MW-4
Sample ID:	6NYCRR Part 703.5	WG-44016-113006-001	WG-44016-120106-004	WG-44016-113006-011	WG-44016-113006-009	WG-44016-120106-016	WG-44016-120106-007
Sample Date:	Stds. For Analytes	11/30/2006	12/1/2006	11/30/2006	11/30/2006	12/1/2006	12/1/2006
	Samples						
Parameters	Units						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/L	5	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
1,1,2,2-Tetrachloroethane	µg/L	5	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U
1,1,2-Trichloroethane	µg/L	1	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U
1,1-Dichloroethane	µg/L	5	0.27 U	0.27 U	1.2	0.27 U	0.27 U	0.27 U
1,1-Dichloroethene	µg/L	5	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U
1,2-Dichloroethane	µg/L	0.6	0.46 U	0.46 U	0.48 J	0.46 U	0.46 U	0.46 U
1,2-Dichloroethene (total)	µg/L	5	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U
1,2-Dichloropropane	µg/L	1	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2-Hexanone	µg/L	50	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
Acetone	µg/L	50	2.5 U	8.6	2.5 U	2.5 U	2.5 U	2.5 U
Benzene	µg/L	1	0.35 U	0.35 U	16	0.35 U	0.35 U	0.35 U
Bromodichloromethane	µg/L	50	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
Bromoform	µg/L	50	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Bromomethane (Methyl Bromide)	µg/L	5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Carbon disulfide	µg/L	-	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U
Carbon tetrachloride	µg/L	5	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
Chlorobenzene	µg/L	5	0.32 U	0.32 U	2.4	0.32 U	0.32 U	0.32 U
Chloroethane	µg/L	5	0.32 U	0.32 U	100	0.32 U	0.32 U	0.32 U
Chloroform (Trichloromethane)	µg/L	7	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Chloromethane (Methyl Chloride)	µg/L	-	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
cis-1,3-Dichloropropene	µg/L	0.4	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Dibromochloromethane	µg/L	50	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Ethylbenzene	µg/L	5	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Methylene chloride	µg/L	5	0.44 U	0.44 U	0.60 U	0.44 U	0.44 U	0.44 U
Styrene	µg/L	5	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
Tetrachloroethene	µg/L	5	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Toluene	µg/L	5	0.35 U	0.35 U	0.91 J	0.35 U	0.35 U	0.35 U
trans-1,3-Dichloropropene	µg/L	0.4	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Trichloroethene	µg/L	5	0.32 U	0.41 J	0.32 U	0.32 U	0.32 U	0.32 U
Vinyl chloride	µg/L	2	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Xylene (total)	µg/L	5	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U

APPENDIX A - NOVEMBER-DECEMBER 2006
ANALYTICAL RESULTS SUMMARY
AKZO NOBEL QUARTERLY GROUNDWATER SAMPLING
BURT, NEW YORK

Parameters	Units	Action Limits 6NYCRR Part 703.5 Stds. For Analytes Samples	MW-1 WG-44016-113006-001 11/30/2006	MW-1B WG-44016-120106-004 12/1/2006	MW-2 WG-44016-113006-011 11/30/2006	MW-3 WG-44016-113006-009 11/30/2006	MW-3B WG-44016-120106-016 12/1/2006	MW-4 WG-44016-120106-007 12/1/2006
Metals								
Iron (Dissolved)	µg/L	-	50.0 U	50.0 U	6070	50.0 U	50.0 U	50.0 U
Manganese (Dissolved)	µg/L	-	19.8	20.0	2330	21.1	184	22.2
Dissolved Gas								
Methane	µg/L	-	7.9	1.0 U	2200	1.0 U	26	1.0 U
Wet Chemistry								
Nitrate (as N)	mg/L		R	R	R	R	0.050 UJ	R
Nitrite (as N)	mg/L		0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Sulfate	mg/L		47.7	1330	16.6	176	34.6	39.4

Notes
- Not analyzed.
J Estimated.
R Rejected.
U Non-detect at associated value.
UJ The analyte was not detected above the sample quantitation limit. The reported quantitation limit is an estimated quantity.

APPENDIX A - NOVEMBER-DECEMBER 2006
ANALYTICAL RESULTS SUMMARY
AKZO NOBEL QUARTERLY GROUNDWATER SAMPLING
BURT, NEW YORK

Parameters	Units	Action Limits 6NYCRR Part 703.5 Stds. For Analytes Samples	MW-4B WG-44016-120106-008 12/1/2006	MW-5 WG-44016-120106-012 12/1/2006	MW-6 WG-44016-120106-014 12/1/2006	MW-7 WG-44016-120106-013 12/1/2006	MW-8 WG-44016-120106-015 12/1/2006	MW-9 WG-44016-113006-006 11/30/2006
Volatile Organic Compounds								
1,1,1-Trichloroethane	µg/L	5	0.26 U	0.26 U	0.26 U	0.26 U	0.98 J	26
1,1,2,2-Tetrachloroethane	µg/L	5	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U
1,1,2-Trichloroethane	µg/L	1	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U
1,1-Dichloroethane	µg/L	5	0.27 U	0.27 U	0.27 U	0.27 U	2.8	3.8
1,1 Dichloroethene	µg/L	5	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	1.8
1,2-Dichloroethane	µg/L	0.6	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U
1,2 Dichloroethene (total)	µg/L	5	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U
1,2-Dichloropropane	µg/L	1	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2-Hexanone	µg/L	50	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
4 Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
Acetone	µg/L	50	2.5 U	28	2.5 U	4.4 J	36	3.3 U
Benzene	µg/L	1	0.35 U	0.35 U	0.35 U	0.59 J	0.35 U	0.35 U
Bromodichloromethane	µg/L	50	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
Bromoform	µg/L	50	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Bromomethane (Methyl Bromide)	µg/L	5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Carbon disulfide	µg/L	-	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U
Carbon tetrachloride	µg/L	5	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
Chlorobenzene	µg/L	5	0.32 U	0.32 U	1.0	1.0	2.8	0.32 U
Chloroethane	µg/L	5	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloroform (Trichloromethane)	µg/L	7	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Chloromethane (Methyl Chloride)	µg/L	-	0.34 U	0.34 U	0.52 J	0.34 U	0.34 U	0.34 U
cis-1,3-Dichloropropene	µg/L	0.4	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Dibromochloromethane	µg/L	50	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Ethylbenzene	µg/L	5	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Methylene chloride	µg/L	5	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
Styrene	µg/L	5	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
Tetrachloroethene	µg/L	5	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.64 J
Toluene	µg/L	5	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
trans-1,3-Dichloropropene	µg/L	0.4	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Trichloroethene	µg/L	5	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.55 J
Vinyl chloride	µg/L	2	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Xylene (total)	µg/L	5	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U

APPENDIX A - NOVEMBER-DECEMBER 2006
ANALYTICAL RESULTS SUMMARY
AKZO NOBEL QUARTERLY GROUNDWATER SAMPLING
BURT, NEW YORK

Parameters	Units	Action Limits 6NYCRR Part 703.5 Stds. For Analytes Samples	MW-4B WG-44016-120106-008 12/1/2006	MW-5 WG-44016-120106-012 12/1/2006	MW-6 WG-44016-120106-014 12/1/2006	MW-7 WG-44016-120106-013 12/1/2006	MW-8 WG-44016-120106-015 12/1/2006	MW-9 WG-44016-113006-006 11/30/2006
Metals								
Iron (Dissolved)	µg/L	-	50.0 U	50.0 U	50.0 U	3140	2130	50.0 U
Manganese (Dissolved)	µg/L	-	55.2	3.0 U	576	1330	1250	114
Dissolved Gas								
Methane	µg/L	-	2.4	1.0 U	54	440	120	3.8
Wet Chemistry								
Nitrate (as N)	mg/L		0.053 J	5.0 J	0.050 UJ	0.050 UJ	0.050 UJ	3.8 J
Nitrite (as N)	mg/L		0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Sulfate	mg/L		697	59.9	51.4	112	91.2	83.4

Notes:

- Not analyzed.
J Estimated.
R Rejected.
U Non-detect at associated value.
UJ The analyte was not detected above the sample quantitation limit. The reported quantitation limit is an estimated quantity.

APPENDIX A - NOVEMBER-DECEMBER 2006
ANALYTICAL RESULTS SUMMARY
AKZO NOBEL QUARTERLY GROUNDWATER SAMPLING
BURT, NEW YORK

Sample Location:		Action Limits	MW-9	MW-9B	MW-10	MW-10B
Sample ID:		6NYCRR Part 703.5	WG-44016-113006-010	WG-44016-126106-005	WG-44016-113006-002	WG-44016-120106-003
Sample Date:		Stds. For Analytes	11/30/2006	12/1/2006	11/30/2006	12/1/2006
		Samples	Duplicate			
Parameters	Units					
Volatile Organic Compounds						
1,1,1-Trichloroethane	µg/L	5	24	0.26 U	0.74 J	0.26 U
1,1,2,2-Tetrachloroethane	µg/L	5	0.48 U	0.48 U	0.48 U	0.48 U
1,1,2-Trichloroethane	µg/L	1	0.42 U	0.42 U	0.42 U	0.42 U
1,1-Dichloroethane	µg/L	5	3.7	0.27 U	0.27 U	0.62 J
1,1-Dichloroethene	µg/L	5	1.8	0.29 U	0.29 U	0.29 U
1,2-Dichloroethane	µg/L	0.6	0.46 U	0.46 U	0.46 U	0.46 U
1,2-Dichloroethene (total)	µg/L	5	0.70 U	0.70 U	0.70 U	0.70 U
1,2-Dichloropropane	µg/L	1	0.33 U	0.33 U	0.33 U	0.33 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	2.5 U	2.5 U	2.5 U	2.5 U
2-Hexanone	µg/L	50	2.4 U	2.4 U	2.4 U	2.4 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	2.3 U	2.3 U	2.3 U	2.3 U
Acetone	µg/L	50	3.1 U	2.8 J	2.5 U	2.5 U
Benzene	µg/L	1	0.35 U	0.35 U	0.35 U	0.35 U
Bromodichloromethane	µg/L	50	0.38 U	0.38 U	0.38 U	0.38 U
Bromoform	µg/L	50	0.26 U	0.26 U	0.26 U	0.26 U
Bromomethane (Methyl Bromide)	µg/L	5	0.28 U	0.28 U	0.28 U	0.28 U
Carbon disulfide	µg/L	-	0.48 U	0.48 U	0.48 U	0.48 U
Carbon tetrachloride	µg/L	5	0.27 U	0.27 U	0.27 U	0.27 U
Chlorobenzene	µg/L	5	0.32 U	0.32 U	0.32 U	0.32 U
Chloroethane	µg/L	5	0.32 U	0.32 U	0.32 U	0.32 U
Chloroform (Trichloromethane)	µg/L	7	0.34 U	0.34 U	0.34 U	0.34 U
Chloromethane (Methyl Chloride)	µg/L	-	0.34 U	0.34 U	0.34 U	0.34 U
cis-1,3-Dichloropropene	µg/L	0.4	0.36 U	0.36 U	0.36 U	0.36 U
Dibromochloromethane	µg/L	50	0.32 U	0.32 U	0.32 U	0.32 U
Ethylbenzene	µg/L	5	0.34 U	0.34 U	0.34 U	0.34 U
Methylene chloride	µg/L	5	0.44 U	0.44 U	0.44 U	0.44 U
Styrene	µg/L	5	0.31 U	0.31 U	0.31 U	0.31 U
Tetrachloroethene	µg/L	5	0.56 J	0.36 U	0.36 U	0.36 U
Toluene	µg/L	5	0.35 U	0.35 U	0.35 U	0.35 U
trans-1,3-Dichloropropene	µg/L	0.4	0.37 U	0.37 U	0.37 U	0.37 U
Trichloroethene	µg/L	5	0.51 J	0.32 U	0.32 U	0.32 U
Vinyl chloride	µg/L	2	0.24 U	0.24 U	0.24 U	0.24 U
Xylene (total)	µg/L	5	0.93 U	0.93 U	0.93 U	0.93 U

APPENDIX A - NOVEMBER-DECEMBER 2006
ANALYTICAL RESULTS SUMMARY
AKZO NOBEL QUARTERLY GROUNDWATER SAMPLING
BURT, NEW YORK

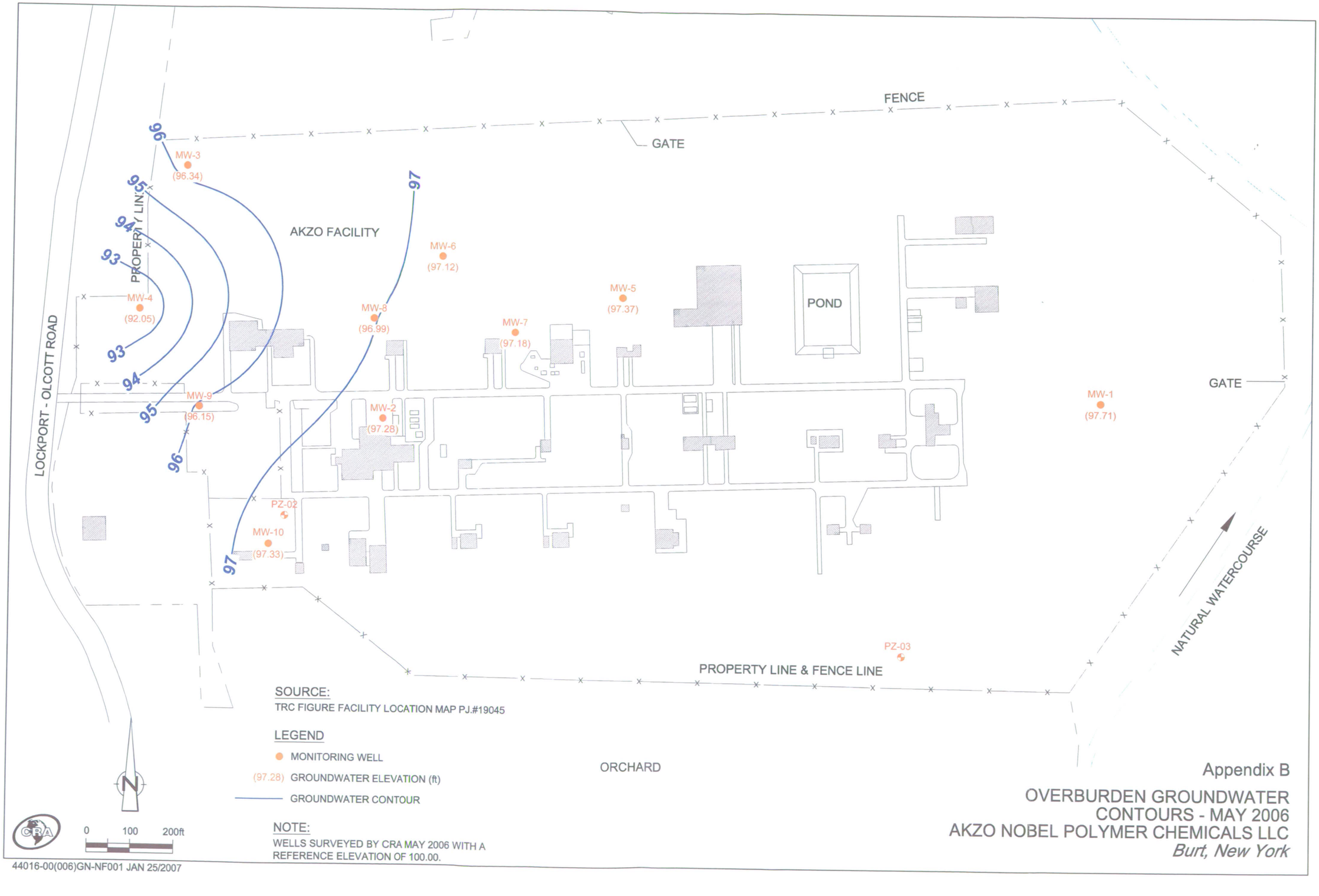
Sample Location:	Action Limits	MW-9	MW-9B	MW-10	MW-10B
Sample ID:	6NYCRR Part 703.5	WG-44016-113006-010	WG-44016-120106-005	WG-44016-113006-002	WG-44016-120106-003
Sample Date:	Stds. For Analytes	11/30/2006	12/1/2006	11/30/2006	12/1/2006
	Samples	Duplicate			
Parameters / Units					
Metals					
Iron (Dissolved) µg/L	-	--	50.0 U	50.0 U	50.0 U
Manganese (Dissolved) µg/L	-	--	39.5	3.0 U	10
Dissolved Gas					
Methane µg/L	-	--	4.6	1.0 U	3.1
Wet Chemistry					
Nitrate (as N) mg/L		--	R	12.1 J	R
Nitrite (as N) mg/L		--	0.050 U	0.050 U	0.050 U
Sulfate mg/L		--	667	69.5	113

Notes:
- Not analyzed
J Estimated
R Rejected
U Non-detect at associated value.
UJ The analyte was not detected above the sample quantitation limit. The reported quantitation limit is an estimated quantity.

B

APPENDIX B

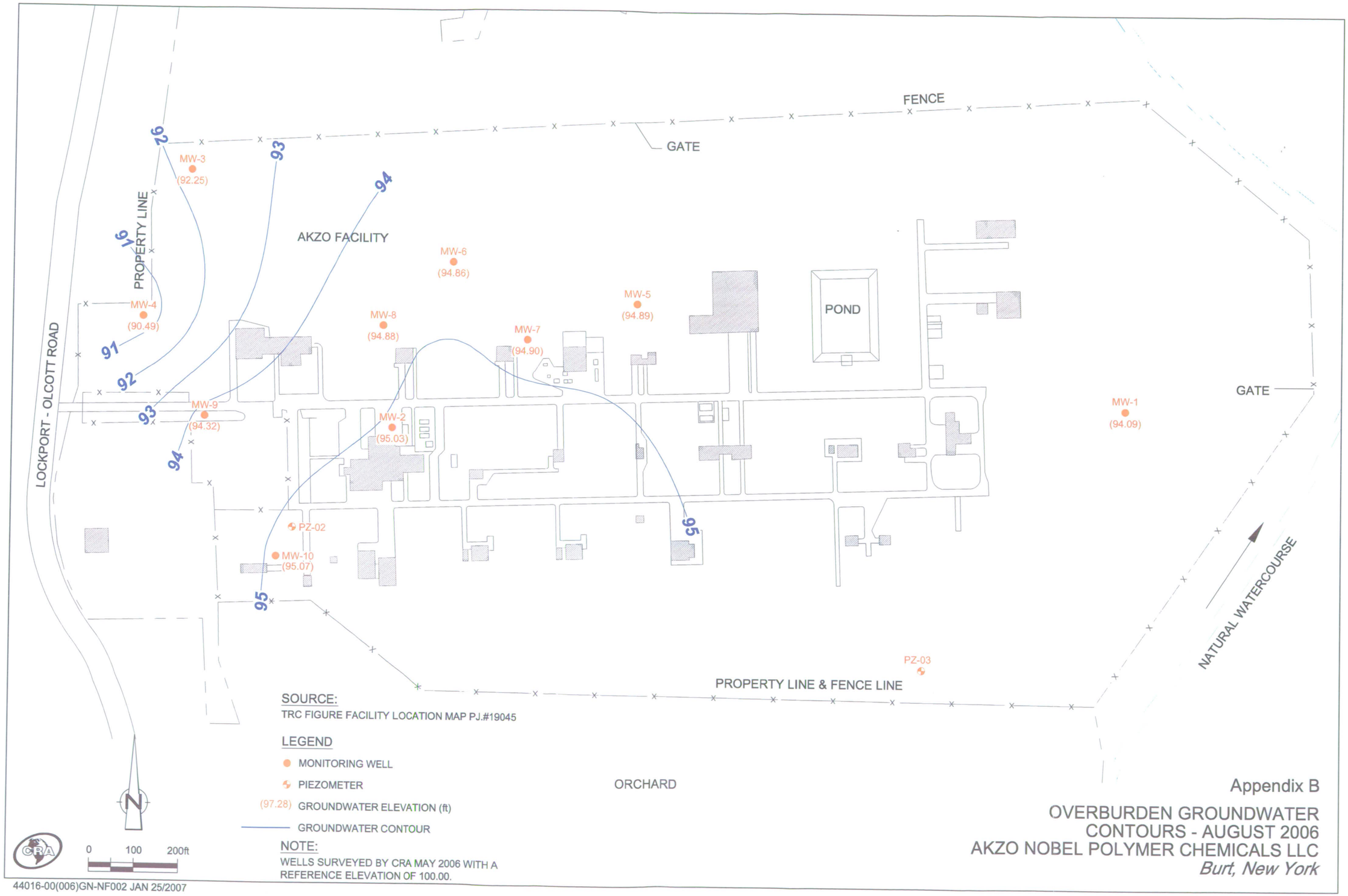
OVERBURDEN GROUNDWATER CONTOURS - 2006



Appendix B

OVERBURDEN GROUNDWATER CONTOURS - MAY 2006
AKZO NOBEL POLYMER CHEMICALS LLC

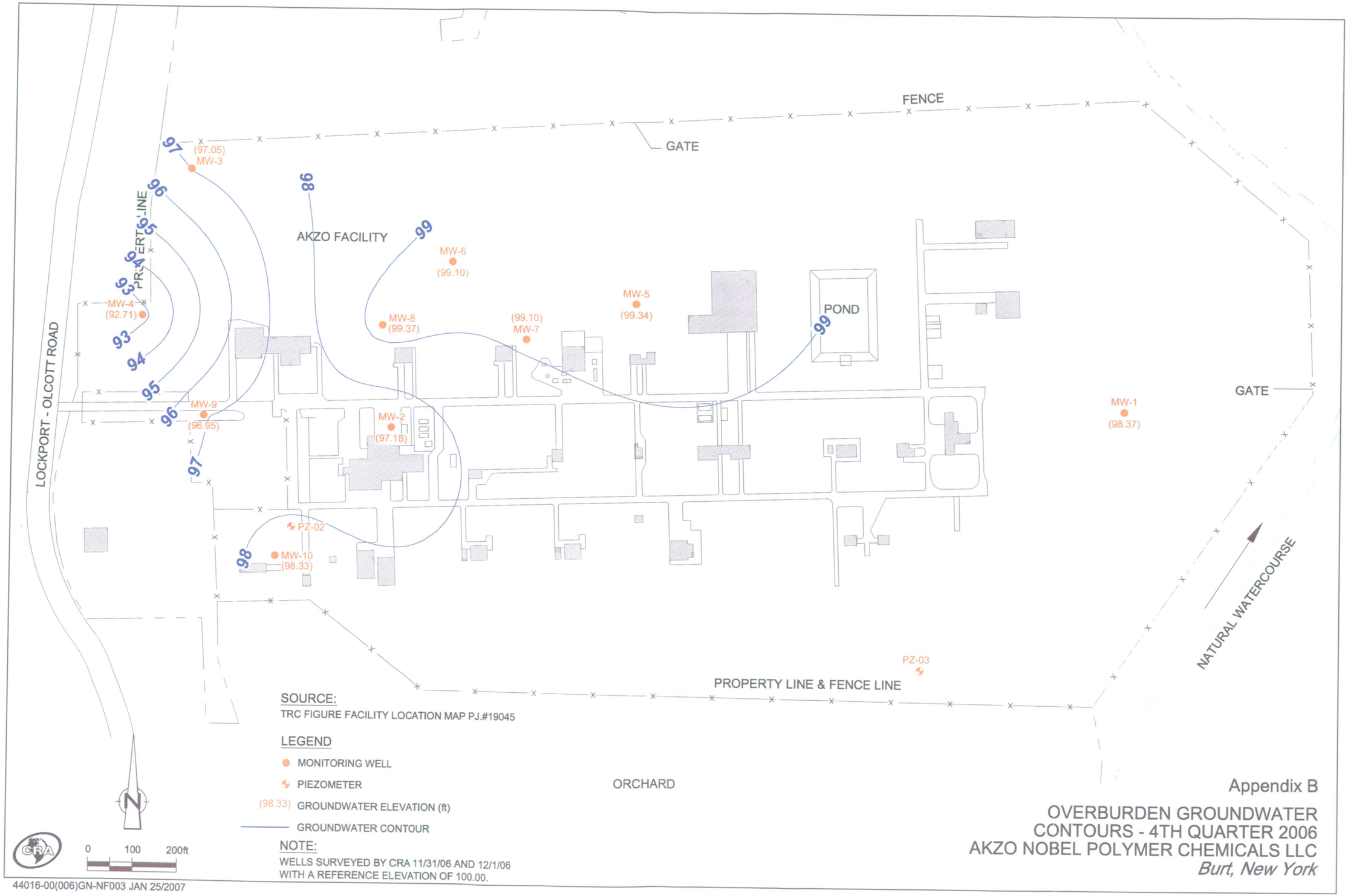
Burt, New York



Appendix B

OVERBURDEN GROUNDWATER CONTOURS - AUGUST 2006
AKZO NOBEL POLYMER CHEMICALS LLC
Burt, New York

44016-00(006)GN-NF002 JAN 25/2007



Appendix B

OVERBURDEN GROUNDWATER CONTOURS - 4TH QUARTER 2006 AKZO NOBEL POLYMER CHEMICALS LLC

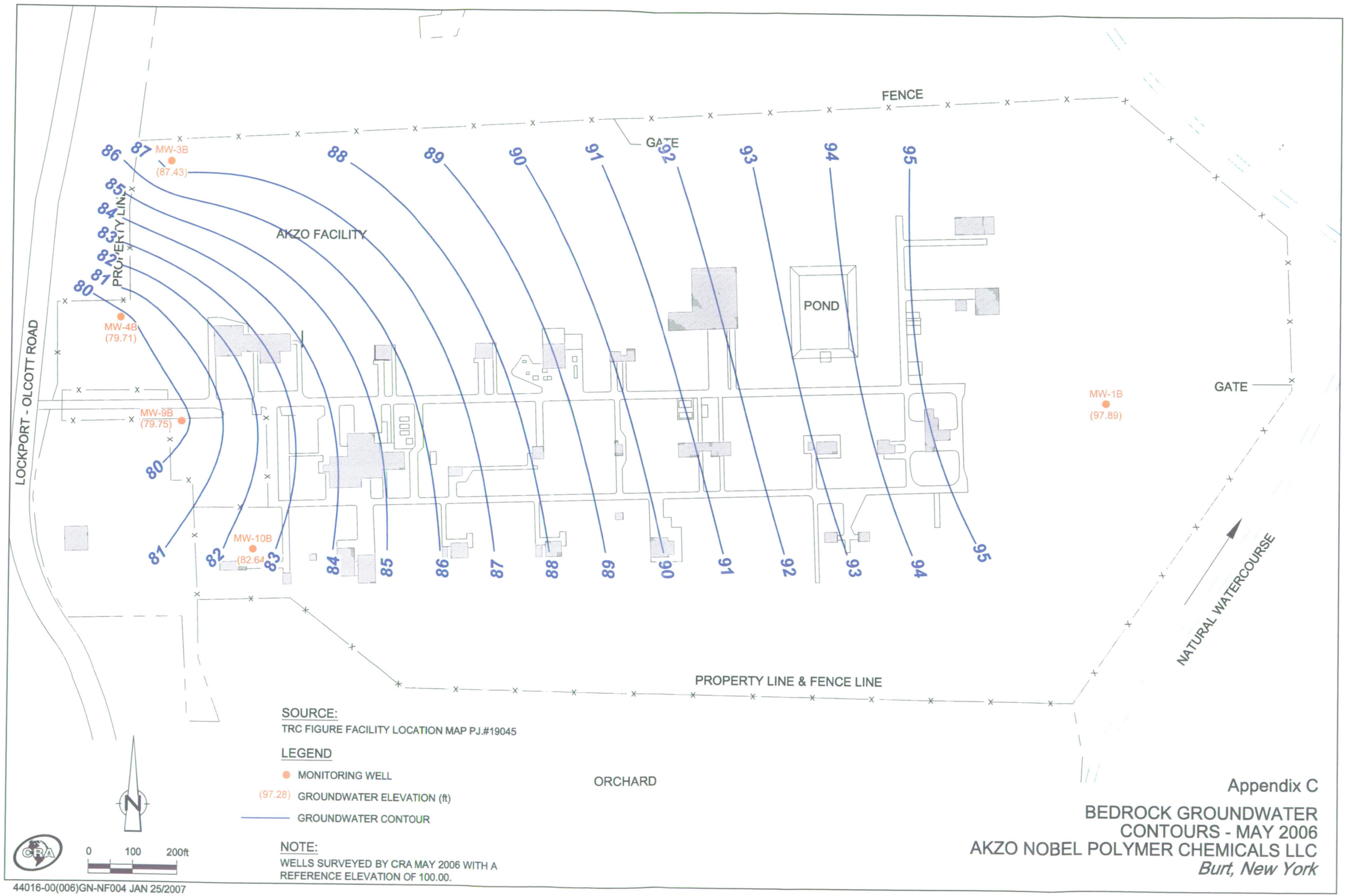
Burt, New York

44016-00(006)GN-NF003 JAN 25/2007

C

APPENDIX C

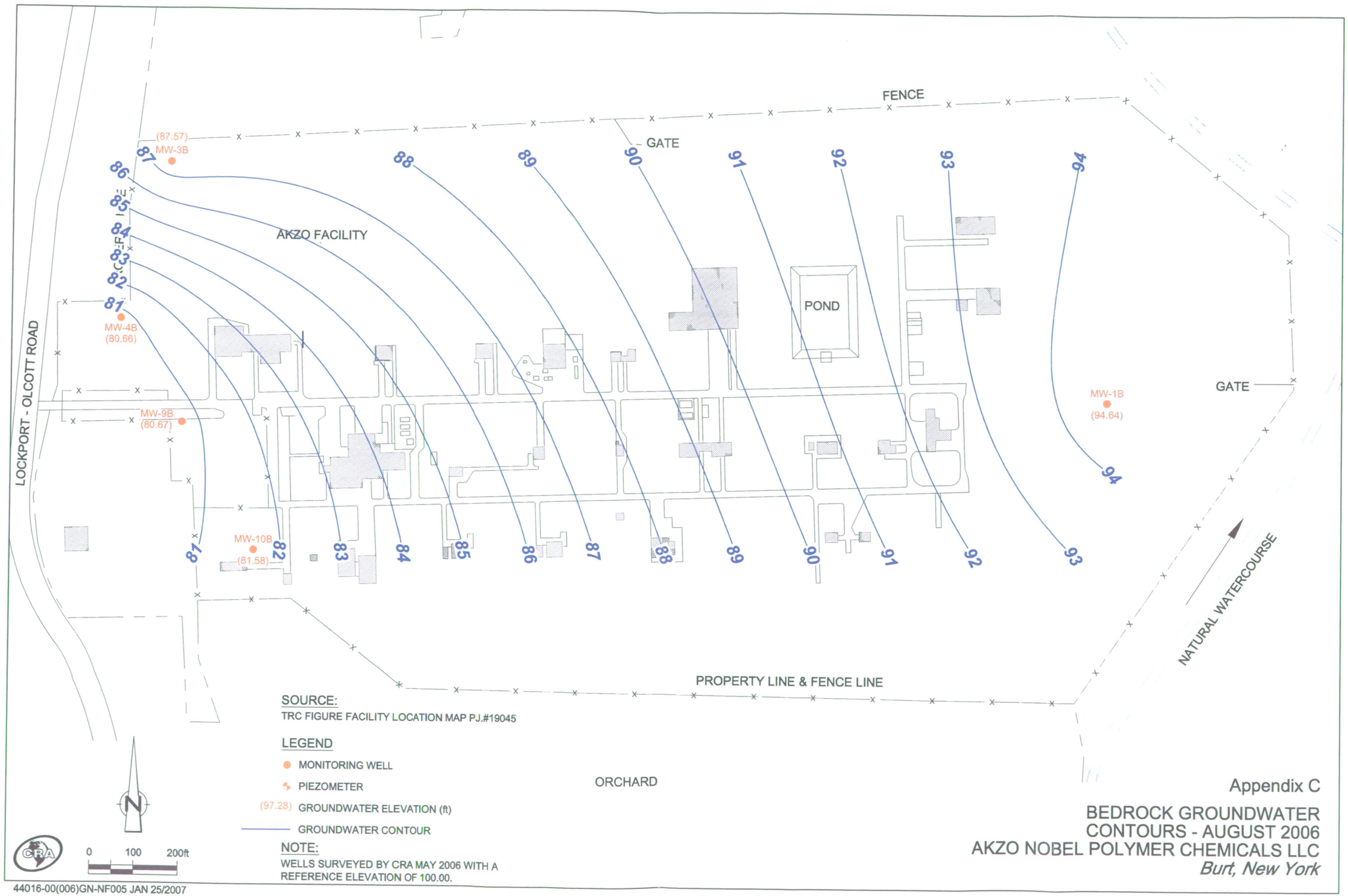
BEDROCK GROUNDWATER CONTOURS - 2006



44016-00(006)GN-NF004 JAN 25/2007

Appendix C

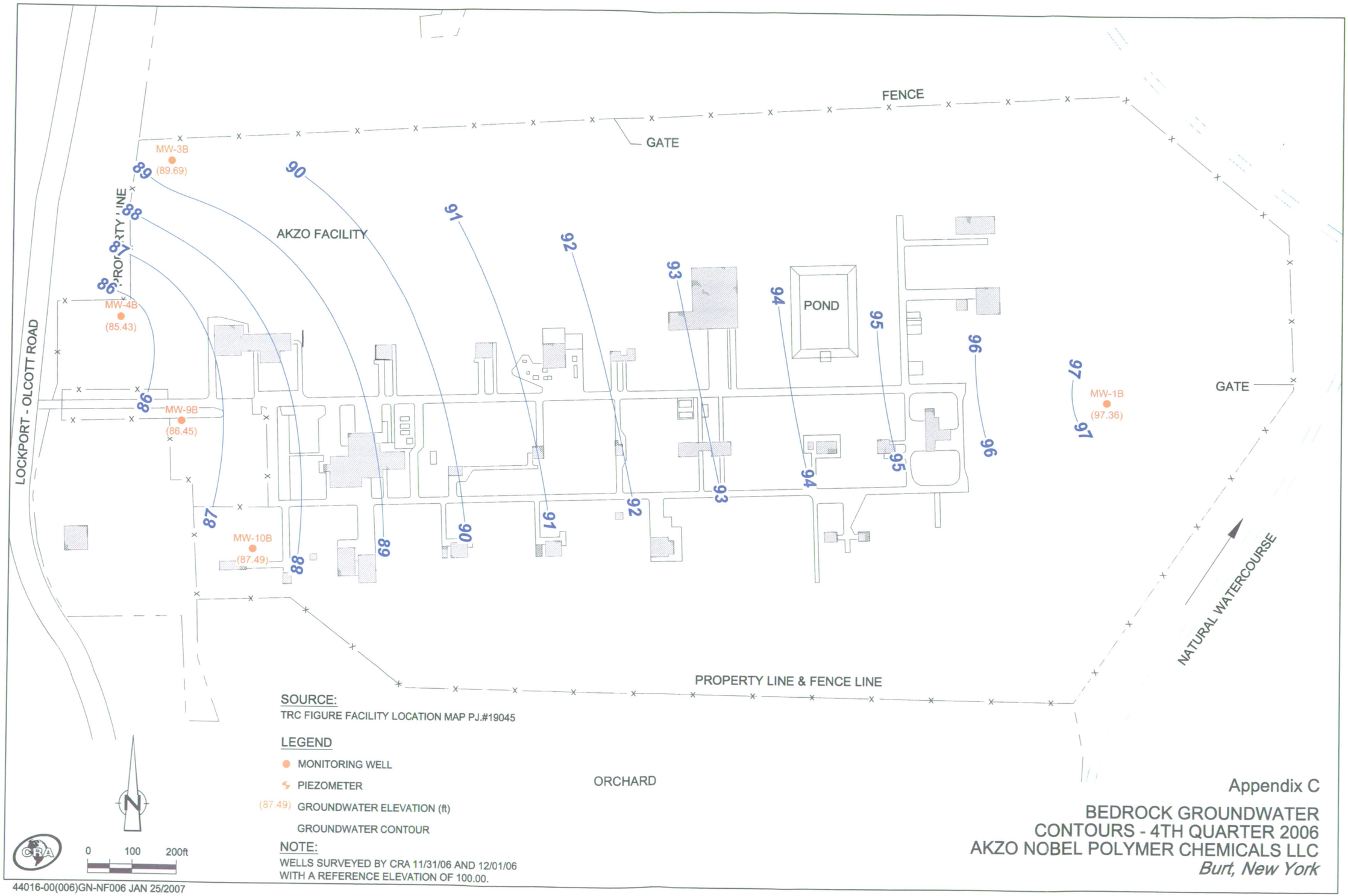
BEDROCK GROUNDWATER CONTOURS - MAY 2006
AKZO NOBEL POLYMER CHEMICALS LLC
Burt, New York



Appendix C

BEDROCK GROUNDWATER CONTOURS - AUGUST 2006
AKZO NOBEL POLYMER CHEMICALS LLC
Burt, New York

44016-00(006)GN-NF005 JAN 25/2007



Appendix C

BEDROCK GROUNDWATER
CONTOURS - 4TH QUARTER 2006
AKZO NOBEL POLYMER CHEMICALS LLC
Burt, New York

44016-00(006)GN-NF006 JAN 25/2007

APPENDIX D

FIELD MEASUREMENTS - 2006

APPENDIX D - MAY 2006

FIELD MEASUREMENTS
AKZO NOBEL QUARTERLY GROUNDWATER MONITORING
BURT, NEW YORK

Well ID	*Type*	*pH*	*Temp. °C*	*Conductivity mS/cm*	*ORP Millivolts*	*Turbidity NTU*	*Dissolved Oxygen mg/L*	*Ferrous Iron mg/L*
MW-1	Background - Overburden	7.82	12.05	0.938	73	5.3	9.02	0.04
MW-1B	Background - Bedrock	8.05	13.41	3.630	91	20	8.18	0.08
MW-2	Source Area - Overburden	7.80	14.73	0.999	-27	20	10.02	2.34
MW-3	Downgradient Boundary - Overburden	7.51	13.30	0.999	85	69	11.13	0.46
MW-3B	Downgradient Boundary - Bedrock	8.12	16.59	0.666	46	56	11.80	0.01
MW-4	Downgradient Boundary - Overburden	7.85	12.33	0.999	80	25	11.02	0.02
MW-4B	Downgradient Boundary - Bedrock	8.10	13.39	2.510	56	28	10.54	0.07
MW-5	Source Area - Overburden	7.72	13.69	0.839	58	5	10.12	0.00
MW-6	Downgradient Offset - Overburden	7.58	12.36	1.380	19	1.3	6.93	0.22
MW-7	Source Area - Overburden	7.02	12.29	1.640	-88	18	6.87	2.72
MW-8	Source Area - Overburden	7.82	12.58	0.970	-46	87	10.47	1.88
MW-9	Downgradient Boundary - Overburden	7.70	13.59	0.980	109	8	9.76	
MW-9B	Downgradient Boundary - Bedrock	8.01	19.80	1.750	85	15	6.61	0.04
MW-10	Downgradient Offset - Overburden	7.27	10.78	0.952	116	3.8	11.31	0.01
MW-10B	Downgradient Offset - Bedrock	8.05	12.83	0.955	-8	23	10.52	0.03

Notes:
mg/L = milligram/liter
mS/cm = millisiemens/centimeter
NTU = Nephelometric Turbidity Unit
ORP = Oxygen Release Potential

APPENDIX D - AUGUST 2006

FIELD MEASUREMENTS
AKZO NOBEL QUARTERLY GROUNDWATER MONITORING
BURT, NEW YORK

Well ID	Type	pH	Temp. °C	Conductivity mS/cm	ORP Millivolts	Turbidity NTU	Dissolved Oxygen mg/L	Ferrous Iron mg/L
MW-1	Background - Overburden	7.23	12.4	0.595	164	359.0	8.22	0.00
MW-1B	Background - Bedrock	7.24	12.0	3.76	163	81.0	11.21	-
MW-2	Source Area - Overburden	7.02	18.1	0.938	-102	9.4	8.2	0.00
MW-3	Downgradient Boundary - Overburden	7.37	14.6	0.899	-8	40.0	7.67	0.04
MW-3B	Downgradient Boundary - Bedrock	8.01	13.3	0.553	92	77.5	8.41	0.00
MW-4	Downgradient Boundary - Overburden	7.30	14.8	0.998	160	83.0	8.78	0.02
MW-4B	Downgradient Boundary - Bedrock	7.92	12.5	2.76	156	40.0	10.18	0.03
MW-5	Source Area - Overburden	7.12	14.6	1.46	2[illegible]	21.2	9.09	0.00
MW-6	Downgradient Offset - Overburden	7.23	15.2	1.85	-35	38.6	7.49	0.08
MW-7	Source Area - Overburden	7.22	15.2	1.75	-99	92.0	6.11	2.41
MW-8	Source Area - Overburden	7.06	15.2	1.95	-80	38.8	7.00	2.63
MW-9	Downgradient Boundary - Overburden	7.18	17.2	1.33	115	29.1	8.69	0.00
MW-9B	Downgradient Boundary - Bedrock	8.15	13.4	1.80	47	39.3	9.71	0.00
MW-10	Downgradient Offset - Overburden	7.30	13.7	0.852	104	198.0	10.7	0.31
MW-10B	Downgradient Offset - Bedrock	7.75	12.3	0.794	94	80.1	10.68	0.13

Notes:
mg/L = milligram/liter
mS/cm = millisiemens/centimeter
NTU = Nephelometric Turbidity Unit
ORP = Oxygen Release Potential

APPENDIX D - NOVEMBER 30 - DECEMBER 1, 2006

FIELD MEASUREMENTS
AKZO NOBEL QUARTERLY GROUNDWATER MONITORING
BURT, NEW YORK

Well ID	*Type*	*pH*	*Temp. °C*	*Conductivity mS/cm*	*ORP Millivolts*	*Turbidity NTU*	*Dissolved Oxygen mg/L*	*Ferrous Iron mg/L*
MW-1	Background - Overburden	6.92	13.1	0.552	19	29.9	6.79	0.02
MW-1B	Background - Bedrock	7.91	11.7	3.85	76	82.0	19.55	0.09
MW-2	Source Area - Overburden	6.39	12.7	0.882	-105	6.9	2.12	3.09
MW-3	Downgradient Boundary - Overburden	7.09	12.1	0.764	33	15.3	6.48	0.0
MW-3B	Downgradient Boundary - Bedrock	7.89	11.6	0.548	27	28.0	18.20	0.11
MW-4	Downgradient Boundary - Overburden	7.64	11.4	0.764	62	35.0	19.84	0.03
MW-4B	Downgradient Boundary - Bedrock	7.90	12.8	2.46	73	60.0	19.53	0.06
MW-5	Source Area - Overburden	6.80	10.4	1.17	129	39.0	11.09	0.00
MW-6	Downgradient Offset - Overburden	6.94	11.8	1.09	45	92.0	13.07	0.10
MW-7	Source Area - Overburden	6.84	10.7	1.91	-112	102.0	15.76	3.28
MW-8	Source Area - Overburden	7.30	12.0	1.70	-95	47.0	18.73	2.28
MW-9	Downgradient Boundary - Overburden	7.00	11.0	0.986	112	11.0	7.50	0.07
MW-9B	Downgradient Boundary - Bedrock	8.06	13.6	1.92	70	22.0	16.69	0.12
MW-10	Downgradient Offset - Overburden	6.95	13.1	0.753	36	354.0	7.07	0.00
MW-10B	Downgradient Offset - Bedrock	8.27	9.7	0.687	91	16.0	15.28	0.05

Notes:
mg/L Milligram/liter
mS/cm Millisiemens/centimeter
NTU Nephelometric Turbidity Unit
ORP Oxygen Release Potential

APPENDIX E

EVALUATION OF NATURAL ATTENUATION DATA

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MEMORANDUM

TO: Gene Dworzanski REF. NO.: 44016

FROM: Alan Weston/Sophia Dore DATE: January 26, 2007

RE: **Evaluation of Natural Attenuation Data, Akzo Nobel Polymer Chemicals, LLC, Burt, NY**

1.0 INTRODUCTION

Groundwater at the Akzo Nobel Polymer Chemicals, LLC Site in Burt, NY (Site) contains VOC in some areas. Monitored Natural Attenuation (MNA) is currently in progress at this Site.

The CRA Innovative Technology Group (ITG) was requested to review the MNA data and assess the current groundwater conditions.

2.0 BACKGROUND

1,1,1-trichloroethane (1,1,1-TCA), chloroethane, and benzene have been detected above regulatory criteria at the Site. 1,1,1-TCA degrades under anaerobic conditions by reductive dechlorination to form chloroethane. During this reductive dechlorination, bacteria with the necessary enzymes are able to utilize the chlorinated compounds as an electron acceptor. 1,1,1-TCA can also be degraded aerobically although bacteria that perform this degradation pathway are rare. Chloroethane itself can be further degraded under anaerobic conditions to ethane and under aerobic conditions through 1-chloroethanol to acetaldehyde. Benzene can be degraded under aerobic conditions and also under anaerobic sulfate reducing conditions. In both cases the benzene is degraded to carbon dioxide and water.

Several indicators of anaerobic conditions were measured during the groundwater sampling at the Site. Dissolved oxygen (DO) is a direct measurement of oxygen in the groundwater. Oxidation-Reduction Potential (ORP) was also measured. A negative ORP indicates that groundwater conditions are anaerobic while a positive ORP indicates that conditions are aerobic. Reductive dechlorination occurs best at an ORP of less than -200 mV. Methane gas was analyzed. The production of methane by anaerobic biodegradation can only occur under highly anaerobic conditions when the ORP is less than -200 mV. Therefore, when methane is produced, it can be assumed that conditions are favorable for reductive dechlorination. Dissolved metals such as iron and manganese were also measured. These metals are soluble only in their reduced forms, which suggests that groundwater conditions are anaerobic (ORP less than 0 mV). Nitrate and nitrite were also measured. At ORP values of less than +300 mV, nitrate is converted to nitrite and then to nitrogen gas. Therefore under conditions favorable for reductive dechlorination, nitrate levels are likely to be low, since any nitrate present would have been converted to nitrogen gas.

3.0 EVALUATION OF SITE MNA DATA

Site groundwater MNA data were evaluated to determine whether conditions suitable for reductive dechlorination exist at the Site.

Redox Conditions

In most of the wells monitored the MNA data showed that conditions were likely aerobic. Methane gas is produced only under highly anaerobic conditions and significant levels of methane gas were found only in wells MW-2, MW-7 and MW-8. Similarly high levels of dissolved iron and manganese were found only in these three wells. Therefore it appears that an anaerobic zone exists in the source area stretching from well MW-2 to well MW-8 in the north and well MW-7 to the north-east. Conditions at well MW-6 appear to be more aerobic but some methane and dissolved iron and manganese were detected therefore well MW-6 appears to be on the northern boundary of the anaerobic zone. Conditions at well MW-5 were highly aerobic, which suggests that the anaerobic zone does not extend past well MW-7. Conditions in the anaerobic zone appear to be sulfate reducing/methanogenic. Reductive dechlorination occurs at sulfate reducing and methanogenic reduction potentials, therefore conditions in this zone are favorable for the degradation of chloroethanes.

The DO and OPR measurements taken in the field are in basic agreement with the findings described above. Negative ORP values were measured consistently at wells MW-2, MW-7 and MW-8 and positive ORP values were measured at the remaining wells. However, the negative ORP values were higher than would have been expected based on the levels of methane and dissolved metals present. The dissolved oxygen levels were much higher than would be expected. 10.02 mg/L dissolved oxygen was measured at well MW-2 in May 2006. The production of methane and the presence of dissolved iron and manganese would not be expected if dissolved oxygen were this high. The measurement of ORP and DO is conducted with a probe that is submersed in the well. The probes are sensitive to motion in the water and to particulate matter. The detection of degradation products such as methane and dissolved metals, however, is less sensitive to transient conditions in the wells. Therefore the degradation product and metals data were used to assess anaerobic conditions rather than the DO and ORP data.

Degradation Products

Chloroethane is formed when 1,1,1-TCA is degraded by reductive dechlorination. The presence of chloroethane suggests that reductive dechlorination of 1,1,1-TCA has occurred in areas of the Site that are anaerobic.

Chloroethane was detected in well MW-2 during all three monitoring events during 2006. Conditions at well MW-2, which is located in the source area, appeared to be highly anaerobic as discussed above. Therefore it is likely that the 1,1,1-TCA was degraded to chloroethane by reductive dechlorination. Anaerobic degradation of chloroethane is slow, therefore a transient accumulation of chloroethane would be expected to occur in the source area. However, the chloroethane will degrade over time by an anaerobic metabolism. Since the flow of groundwater from the source area is towards the aerobic areas to the west, it is more likely that the chloroethane

will be degraded by the faster, aerobic mechanisms once it migrates with the groundwater to the west. Since aerobic degradation of chloroethane is a faster mechanism, it is expected that chloroethane will not be detected at the boundary wells, and the analytical data supports this conclusion, since chloroethane has not been detected in any of the boundary wells.

Benzene was detected in samples from well MW-2 during the May and December. As discussed above, sulfate reducing conditions appear to exist at well MW-2. Benzene can be degraded under sulfate reducing conditions, however, the degradation tends to be slow. Aerobic degradation of benzene is much faster. Like the chloroethane migration described above, the benzene is likely to migrate with the groundwater into the aerobic area to the west and be degraded there by aerobic microorganisms. Therefore benzene should also not be detected at the boundary wells. The analytical data supports this conclusion, since benzene has not been detected in any of the boundary wells.

1,1,1-TCA was detected in samples from well MW-9, one of the downgradient boundary wells, during all three sampling events. As discussed above, conditions at well MW-9 are highly aerobic. 1,1,1-TCA degrades most readily under anaerobic conditions but aerobic degradation of 1,1,1-TCA to carbon dioxide is possible. After only three quarters of monitoring there is not yet enough data to determine whether aerobic degradation of 1,1,1-TCA is occurring in this area.

4.0 CONCLUSIONS

It appears that the 1,1,1-TCA present in the source area is being degraded to chloroethane. The chloroethane will either continue to degrade under anaerobic conditions in the source area or will be degraded aerobically as it migrates towards the Site boundary. Similarly, benzene present in the source area will degrade slowly under anaerobic conditions, but will degraded much faster if it migrates to the aerobic area west of the source area. Therefore further migration of chemicals from the source area to the boundary should speed their degradation. 1,1,1-TCA is already present in the aerobic boundary area. The three monitoring events that have occurred do not cover a long enough time period to assess whether aerobic degradation of 1,1,1-TCA is occurring in this area. Further monitoring will allow this determination to be made.