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GROUNDWATER MONITORING PLAN

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

MARCH 2006
REF. NO. 44016 (1)

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1.0 INTRODUCTION

1.1 BACKGROUND

The Akzo Nobel Polymer Chemicals, LLC (Akzo Nobel) owns and operates a former chemical production facility (Site or Facility) located in Burt, New York. The Facility is subject to the requirements of 6 NYCRR Part 373 - Hazardous Waste Management Facilities. Akzo Nobel has a Part 373 Permit, which required them to conduct 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 Facility. 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 373 Permit Number 9-02928-00001/00003 was renewed in December of 2005. The permit authorizes Akzo Nobel to implement corrective action measures to address the groundwater contamination at the Site.

This Groundwater Monitoring Plan details the sampling and analysis of groundwater to be conducted at the Site in order to evaluate the effectiveness of the MNA in order to meet the requirements of the Part 373 Permit.

1.1.1 SITE DESCRIPTION

The Akzo Nobel property is located at 2153 Lockport-Olcott Road in Burt, New York. A Site Location Map is provided as Figure 1. Akzo Nobel formerly produced organic peroxides at this Facility. The property is 350 acres in size. The former production portion of the Site is 30 acres in size. A Site Layout is provided as Figure 2.

Chemical production was discontinued in April 2003. The facility remains in operation as a warehouse and distribution center.

1.2 REMEDIAL GOALS

As stated in Section C of Module II of the Permit, 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.

1.3 REMEDIAL CRITERIA

As stated in Section C of Module II of the Permit, the remedial criteria of the corrective action are:

- i) Maintain a long-term groundwater monitoring program 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.

2.0 SAMPLING AND ANALYSIS PLAN

2.1 MONITORING WELL NETWORK

The existing monitoring well network consists of 15 groundwater monitoring wells. The following table summarizes monitoring well details. Monitoring well locations are shown on Figure 3.

| <i>Well ID</i> | <i>Purpose</i> | <i>Unit</i> | <i>Approximate Depth (ft)¹</i> |
|----------------|-----------------------|-------------|---|
| MW-1 | Background | Overburden | 17.96 |
| MW-1B | Background | Bedrock | 47.08 |
| MW-2 | Source Area | Overburden | 11.11 |
| MW-3 | Downgradient Boundary | Overburden | 16.78 |
| MW-3B | Downgradient Boundary | Bedrock | 37.18 |
| MW-4 | Downgradient Boundary | Overburden | 16.04 |
| MW-4B | Downgradient Boundary | Bedrock | 40.93 |
| MW-5 | Source Area | Overburden | 15.03 |
| MW-6 | Downgradient Offset | Overburden | 17.32 |
| MW-7 | Source Area | Overburden | 17.32 |
| MW-8 | Source Area | Overburden | 18.21 |
| MW-9 | Downgradient Boundary | Overburden | 17.35 |
| MW-9B | Downgradient Boundary | Bedrock | 42.20 |
| MW-10 | Downgradient Offset | Overburden | 17.6 |
| MW-10B | Downgradient Offset | Bedrock | 46.6 |

2.2 ANALYTES AND SAMPLING FREQUENCY

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

- Dissolved Oxygen (field measurement);
- Iron (II) (field measurement);

¹ Well depths must be verified prior to sampling.

- Dissolved Iron (USEPA Method SW-846 200.7 Series);
- Manganese, Dissolved (USEPA Method SW-846 200.7 Series);
- Nitrate (USEPA Method SW-846 300.0);
- Nitrite (USEPA Method SW 846-354.1);
- Sulfate (USEPA Method SW-846 300.0); and
- Methane (Method RSK 175).

2.3 TECHNICAL APPROACH AND FIELD ACTIVITIES

Prior to groundwater sample collection a static water level measurement will be taken at each well. The static water level will be measured to the nearest 0.01 foot from a designated location from the top of the well casing which has been previously surveyed and identified. Each well will be purged of a minimum three to five well volumes based on the static water level (USEPA Convention). Purging is considered complete once sediment free groundwater is obtained and the specific conductance, temperature, turbidity, and pH of the groundwater stabilize. Groundwater stabilization has occurred if three consecutive well volume measurements of temperature and specific conductivity are approximately plus or minus 10 percent and if the pH values are within 1 pH unit of the last three value averages, and groundwater turbidity values are less than 5 nephelometric turbidity unit (NTU) (Guidance Value Only).

If stabilization of the field parameters has not occurred within the first five well volumes removed, purging and monitoring will continue until eight well volumes have been purged. Should the well be purged to dryness before a minimum of three well volumes has been removed, the well will be considered purged and ready for sampling upon sufficient recharge.

Groundwater sampling will commence once the well has recovered a minimum of 95 percent of the original static water level. Should the well not recover within 24 hours of completion of purging, the well will be sampled and the percentage of recovery noted in the field report. Groundwater samples will be collected using dedicated and disposable Teflon and or stainless steel bailers. Sample bottles will be filled in the following order:

1. Field parameters including pH, temperature, conductivity, ORP, turbidity and dissolved oxygen
2. TCL VOCs
3. Methane
4. Nitrate, Nitrite, and Sulfate, and

5. Dissolved Metals

Groundwater samples to be analyzed for TCL VOCs and methane will be transferred from the bailer into a 40 milliliters (mL) vial preserved with 10 mL of hydrochloric acid (HCL). The vials will be topped with a Teflon-lined cap. Three 40-ml vials will be collected for TCL VOC analysis and three 40-ml vials will be collected for methane analysis.

Nitrate, nitrite and sulfate samples will be collected together in one 500-ml high-density polyethylene (HDPE) bottle with no preservative. The dissolved manganese and iron samples will be first filtered through a 0.45-micron filter prior to placing the sample in a 500-ml HDPE bottle preserved with nitric acid.

All samples will be placed in a cooler on ice and shipped to the analytical laboratory via overnight courier or hand delivered under standard chain of custody procedures.

The following information will be recorded in a logbook for each sample collected:

- i) monitoring well identification;
- ii) date and time of sampling;
- iii) static water level;
- iv) results of stabilization measurements;
- v) results of field measurements;
- vi) number of well volumes purged;
- vii) visual observations; and
- viii) analytical parameters.

3.0 QUALITY ASSURANCE

3.1 QA/QC SAMPLES

The QA/QC protocol for this project will be in accordance with Part 373 Appendix IX II-A.

- Duplicate Samples – Duplicate samples help to evaluate field precision. Duplicate samples will be collected at a rate of 5 percent per matrix for this assignment or one duplicate for every 20 samples collected. Where fewer than 20 samples are collected per matrix, one duplicate sample will be collected and analyzed.
- Trip Blanks – Trip blanks are used to determine if any on-Site atmospheric contaminants are seeping into the sample vials or if any cross contamination of samples is occurring during shipment or storage of sample containers. Trip blanks are prepared prior to the sampling events in the actual sample containers and are kept with the investigation samples throughout the sampling event. They are handled and transported in the same manner as the samples collected that day and are then packaged for shipment with other samples sent for analysis. At no time after their preparation are the sample containers opened before they reach the laboratory.

Trip blanks consist of two 40-mL Teflon-lined septum vials, which have been filled with distilled water. Trip blanks will accompany each sample shipment to be analyzed for volatile organics.

- Field Blanks – Field blanks are used to determine if the equipment decontamination procedures have been sufficient. A field blank consists of a group of laboratory-cleaned sample containers that are transported empty into the field. At the field location, distilled water is passed through the pre-cleaned and/or decontaminated sampling equipment and placed into the empty group of containers for analysis. Field blanks are not collected when samples are collected directly into the sample container (i.e., the sample container is used as the collection device).
- Matrix Spike/Matrix Spike Duplicates (MS/MSD) – MS/MSDs are used to assess laboratory accuracy and precision. For the laboratory to perform a MS/MSD analysis, the laboratory must be supplied with one additional 40-mL volatile organic analyte (VOA) for aqueous volatile organic analysis. MS/MSDs are performed at the same frequency (one in 20 samples) as field duplicates.

The sample(s) to be utilized for matrix spike/matrix spike duplicate analysis will be collected from areas where contamination is suspected to be present. The sample label will note that the sample is to be used for matrix spike/matrix spike duplicate analysis by the laboratory.

The following table summarizes the samples that will be collected at each quarterly sample event.

| <i>Type of Sample</i> | <i>Number of Samples</i> | <i>Location</i> |
|---|------------------------------------|------------------|
| Groundwater Samples | | |
| TCL VOCs | 15 - 1 per well per sample event | All wells |
| Nitrate, Nitrite, Sulfate | 15 - 1 per well per sample event | All wells |
| Methane | 15 - 1 per well per sample event | All wells |
| Dissolved Metals (Iron and Manganese) | 15 - 1 per well per sample event | All wells |
| QA/QC Samples | | |
| MS/MSD | 1 per sample event | Source Area Well |
| Trip Blank | 1 per day per sample event | NA |
| Field Duplicate | 1 per sample event | Perimeter Well |
| Field Blank | 1 per sample event | NA |
| Field Parameters | | |
| Temperature, pH, Conductivity, ORP, Turbidity, Dissolved Oxygen | Measured in the field at each well | All wells |
| Iron (II) | Measured in the field at each well | All wells |

3.2 DOCUMENTATION

Each sample submitted for analysis will be properly documented to ensure timely, correct, and complete analysis for all parameters requested, and to support use of analytical data in potential enforcement actions. Sample documentation will include sample labels and Chain of Custody Records.

Field data will be entered into a bound notebook. Each page shall be initialed, signed, and dated by the individual responsible for recordkeeping. All relevant data, which includes sample code, locations, names of sampling personnel, and date, will also be provided in a separate field sample key.

3.3 DATA REPORTING

Data deliverables will be in accordance with Part 373 Appendix ix II-A.

A CD-ROM will accompany the hardcopy of the data submitted by the laboratory. The diskette or diskettes will contain all information relevant on one sample delivery group, and will accompany the hardcopy package for the Sample Delivery Group.

All physical and chemical data will be presented in the Groundwater Monitoring Reports in both tabular and graphical formats.

3.4 DATA REDUCTION PROCEDURES

For this project, the equations that will be employed in reducing data are found in the appropriate chapters of SW-846, Third Edition. All calculations are checked at the conclusion of each operating day. Errors are noted and corrections are made, but the original notations are crossed out legibly.

Quality control data (e.g., surrogates, MS, and MSD) will be compared to the method acceptance criteria. Data considered to be acceptable will be entered into the laboratory computer system. Data summaries will be sent to the Laboratory QA Officer for review. If approved, data are logged into the project database format. Unacceptable data shall be appropriately qualified in the project report. Case narratives will be prepared which will include information concerning data that fell outside acceptance limits and any other anomalous conditions encountered during sample analysis.

3.5 DATA VALIDATION

Data validation will be conducted in accordance with "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", USEPA-540/R-99/008, October 1999. The data assessment will include a review of the technical holding time and all batch and matrix QC. This will include rinse blanks (if collected), field duplicates, MS/MSD, surrogate recoveries, method blanks, and laboratory control samples (LCS) results. Assessment of analytical and in-house data will include checks on data consistency by looking for comparability of duplicate analyses, adherence to accuracy and precision control criteria, and anomalously high or

low parameter values. The results of these data validations will be reported to the project manager, noting any discrepancies and their effect upon acceptability of the data.

Data validation reports will summarize the samples reviewed, any nonconformance with the established criteria, and validation actions (including data qualifiers). Data qualifiers will be consistent with the validation guidelines and will consist of the following:

- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ - The analyte was not detected above the sample reporting limit; however, the reporting limit is approximate.
- U - The sample was analyzed for, but was not detected above the sample-reporting limit.
- R - The sample result is rejected due to serious deficiencies. The presence or absence of the analyte cannot be verified.

4.0 SUPPORT PLANS

4.1 HEALTH AND SAFETY PLAN (HASP)

A HASP for Akzo Nobel Polymer Chemicals, LLC has been prepared and is included in this Groundwater Monitoring Plan as Appendix A. Contractors performing the groundwater monitoring program will be expected to prepare and implement a HASP meeting the requirements of 29 CFR 1910.120 (Hazardous Operations and Emergency Response).

4.2 WASTE MANAGEMENT PLAN

All wastes that are generated during the Groundwater Monitoring Program will be stored, transported, and disposed in accordance with all applicable State and Federal regulations. Every effort will be made to minimize the amount and toxicity of wastes generated. It is anticipated that the following wastes will be generated during the investigation:

- i) Well Development and Purge Water: Wastewater will be generated during well development and well purging. This water will be collected in closed-top drums for storage and will be characterized for off-Site disposal;
- ii) Decontamination Fluids: Decontamination fluids, primarily water, may be generated during sampling activities to assure equipment is properly cleaned between locations. Decontamination waters will be collected in closed top drums along with purge waters. Every effort will be made to minimize the amount of decontamination fluids generated by using dedicated and/or disposable equipment; and
- iii) Used Personal Protection Equipment (PPE) and Other Domestic Trash: Used PPE and other domestic trash will be generated during the sampling events. It will be treated as non-hazardous waste and discarded in the appropriate municipal waste dumpster or compactor located on the Site.

All waste manifests, bills of lading and other related paperwork will be maintained in the project files. All waste will be stored, transported, and disposed in accordance with applicable Federal and State rules and regulations.

Akzo Nobel will be responsible for preparing waste profiles and manifests or bills of lading for all waste shipments.

5.0 REPORTING OF MONITORING RESULTS

Quarterly groundwater monitoring reports will be submitted to the New York State Department of Environmental Conservation (NYSDEC) at the addresses specified in Module 1 Section H of the Permit. One copy will be submitted at the Bureau of Radiation and Hazardous Site Management Chief and one copy will be submitted to the Regional Hazardous Materials Engineer at the following addresses:

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
625 Broadway
Albany, New York 12233-7252
ATTN: Chief, Bureau of Radiation and Hazardous Site Management

New York State Department of Environmental Conservation
Region 9
270 Michigan Avenue
Buffalo, New York 14203-2999
ATTN: Regional Hazardous Materials Engineer

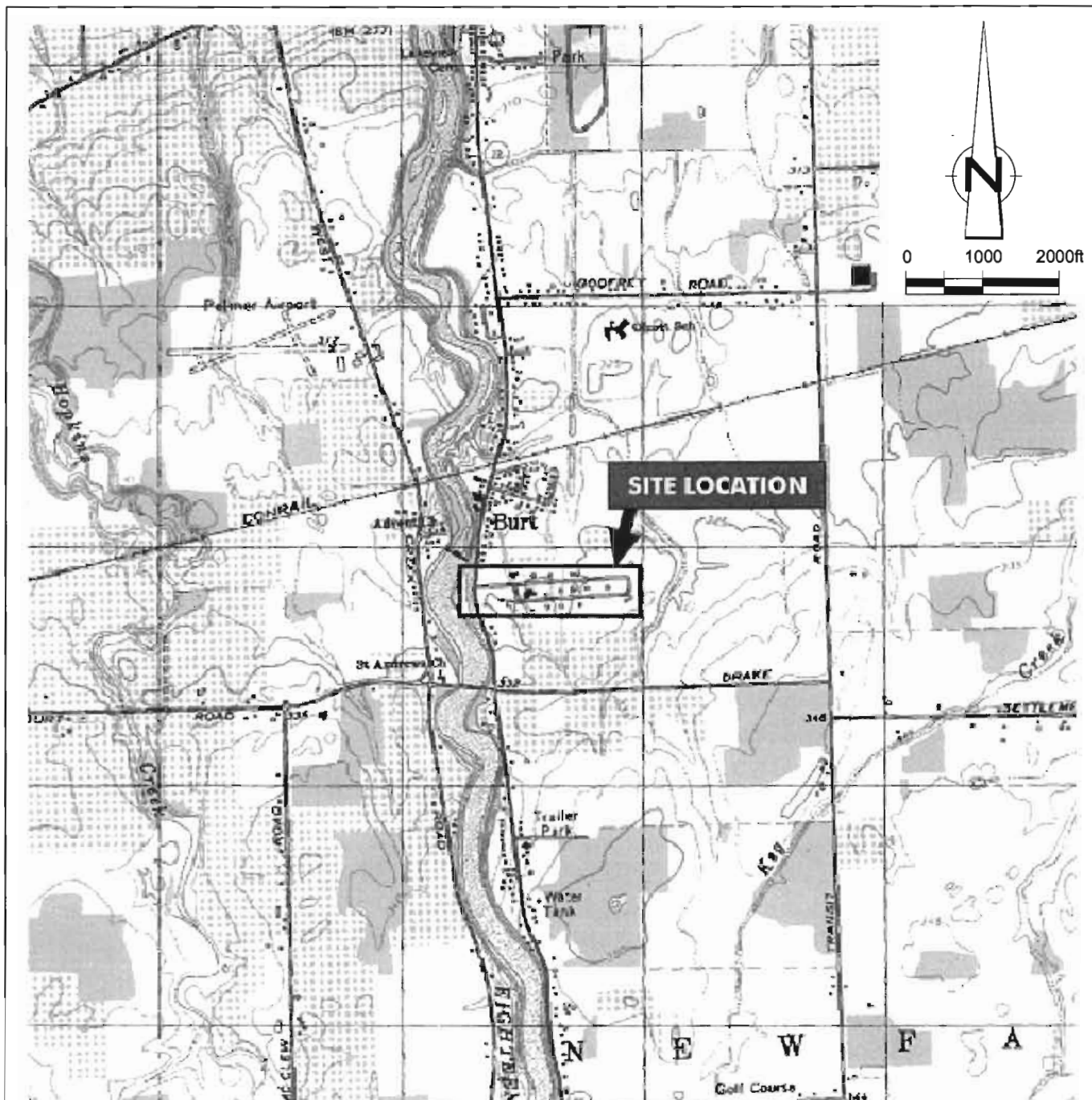
The quarterly reports will include a summary of quarterly groundwater monitoring field activities, copies of field sampling forms, a summary of the analytical data compared to the NYS groundwater standards in 6 NYCRR 703.5, groundwater contour maps for both the overburden groundwater and bedrock groundwater, radial diagrams depicting changes in contaminant concentrations and natural attenuation parameters, and an interpretation of the data.

The groundwater monitoring program and the effectiveness of MNA as the selected remedy for the Site will be evaluated annually. A Groundwater Monitoring Program Evaluation Report will be submitted annually to the NYSDEC detailing the findings for the year. The 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 least four sampling events, Akzo Nobel may request that the NYSDEC allow Akzo Nobel to modify this Groundwater Monitoring Plan 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 NYCRR Part 703.5 Standards, Akzo Nobel will develop and implement an interim corrective measures study (ICM) as required by Module II Section 1(a)(ii).

As long as MNA continues to be an effective corrective measure for the Site, groundwater monitoring will be conducted until the Termination Criteria in Module II Section 1(a)(iii) of the permit are met. Termination monitoring and Post Termination monitoring will be conducted in accordance with Module II Sections 2 and 4 of the permit.



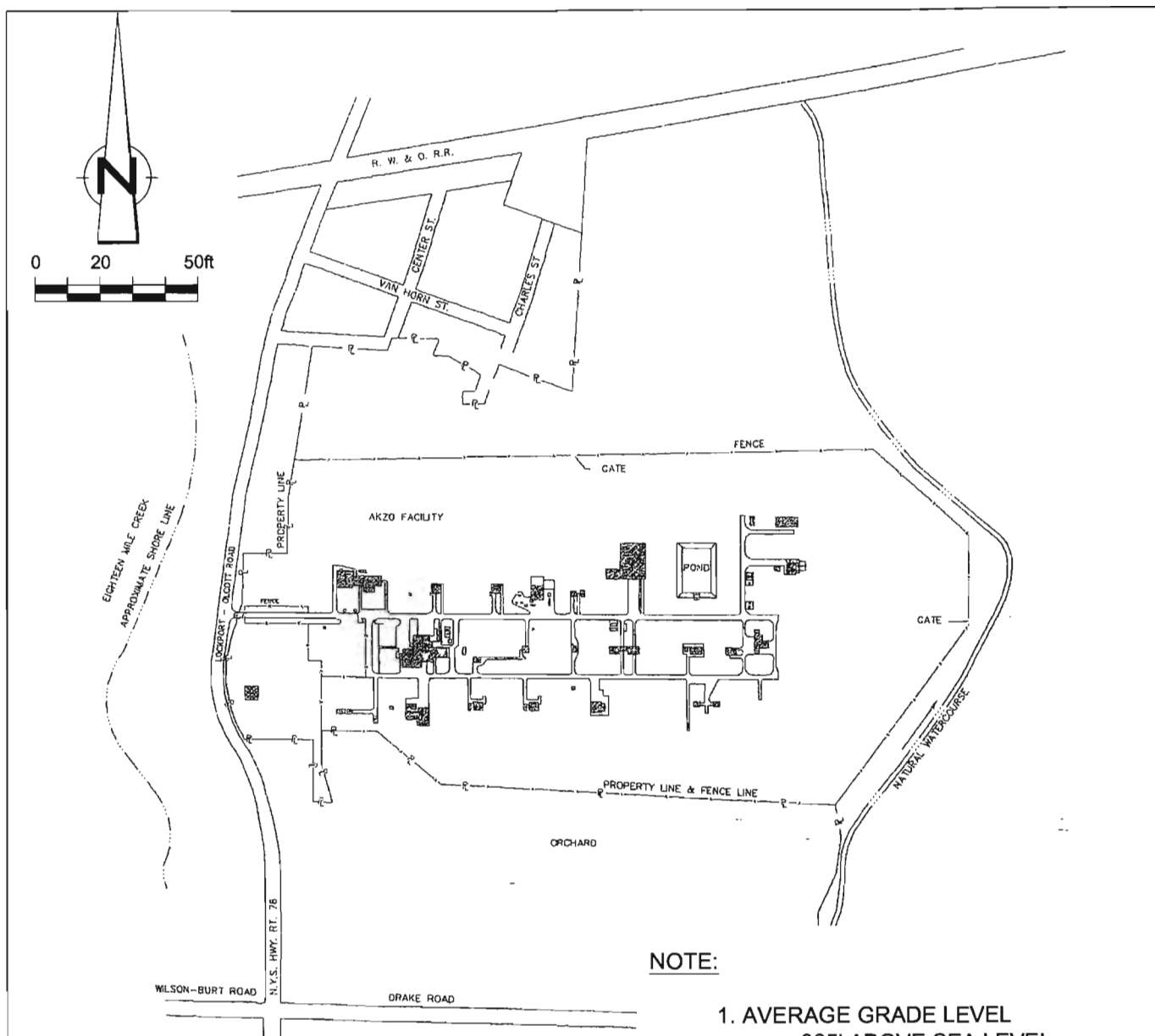
SOURCE REFERENCE

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

figure 1

SITE LOCATION MAP
AKZO NOBEL POLYMER CHEMICALS LLC
BURT, NEW YORK





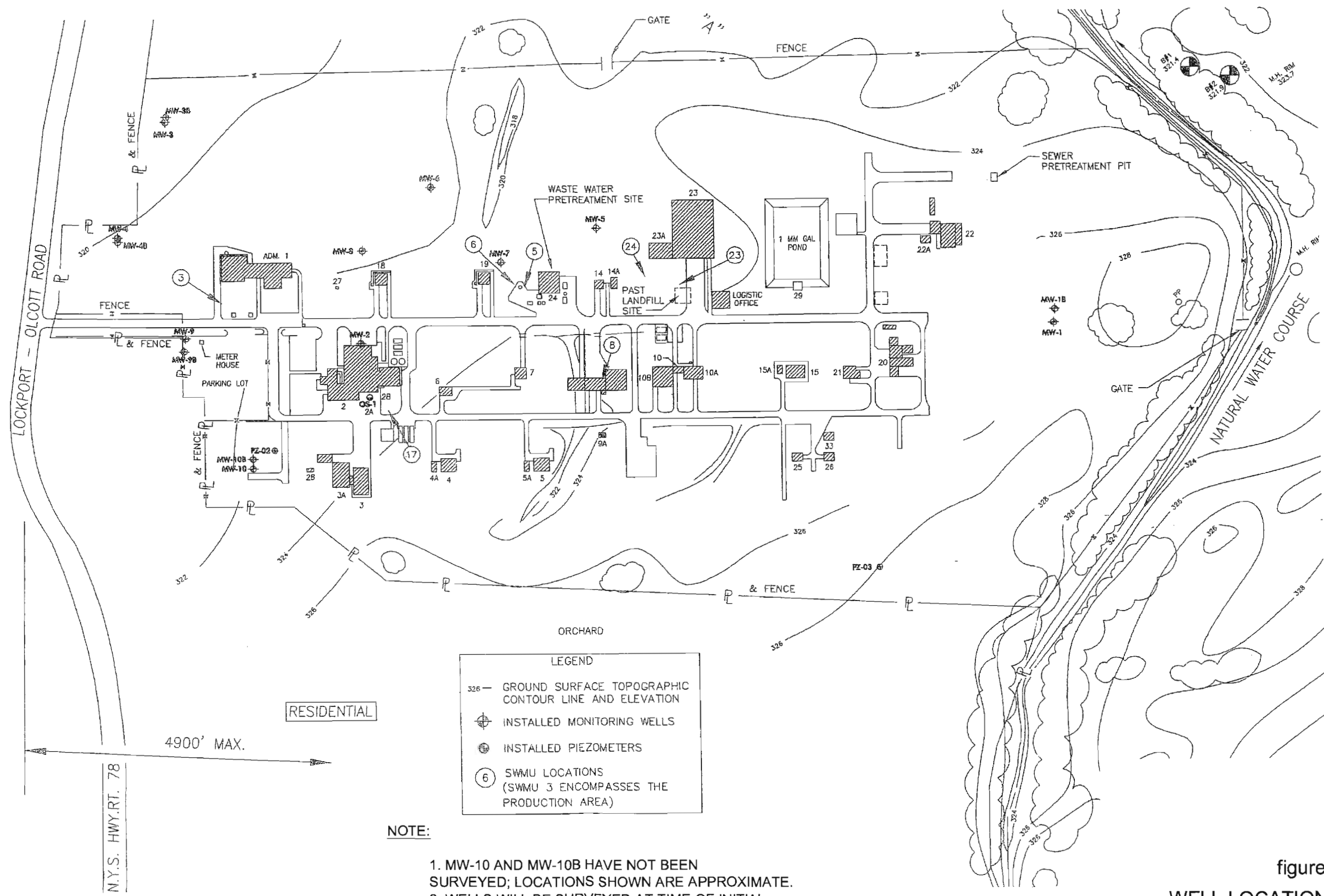
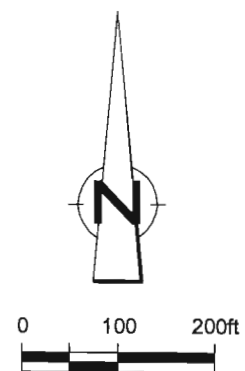
SOURCE REFERENCE

TRC FIGURE FACILITY LOCATION MAP PJ.#19045

figure 2



SITE LAYOUT
AKZO NOBEL POLYMER CHEMICALS LLC
BURT, NEW YORK



NOTE:

1. MW-10 AND MW-10B HAVE NOT BEEN SURVEYED; LOCATIONS SHOWN ARE APPROXIMATE.
2. WELLS WILL BE SURVEYED AT TIME OF INITIAL SAMPLING.

figure 3
WELL LOCATIONS
AKZO NOBEL POLYMER CHEMICALS LLC
BURT, NEW YORK



SOURCE REFERENCE:
TRC FIGURE WELL LOATIONS PJ#19045