Arch Chemicals, Inc.
c/o Arxada
100 Mckee Road
Rochester, NY 14611-2013
USA

December 19, 2023

Mr. Joshuah Klier
Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 8
6274 East Avon-Lima Road
Avon, New York 14414-9519

Subject: Interim Site Management Plan (ISMP), Arch Chemicals (Site #828018a) 100 McKee Rd., Rochester, NY

Dear Mr. Klier:

Enclosed is an electronic copy of the subject plan. The plan is submitted with modifications based on final comments received from the NYSDEC on December 13, 2023.

Should you have any questions regarding this ISMP please don't hesitate to contact us.

Sincerely,

Warner Golden
Associate Director EHS
Arxada

Matt Dillon
Director of Operations
Arxada

cc: Jean Robert Jean, US EPA Region 2
David Pratt, NYSDEC-DER
Christopher Budd, NYSDOH-BEEI
Julia Kenney, NYSDOH-BEEI
Justin Deming, NYSDOH-BEEI
Sean Keenan, MCDES
Ken Smith, MCDES
Luke Ferruzza, Arxada
David Harris, Arxada
Mark Stelmack, MACTEC
Nelson Breton, MACTEC
Eric Thompson, MACTEC
Sean Carter, Matrix Environmental Technologies, Inc.
Steven Marchetti, Matrix Environmental Technologies, Inc.
Pat Bliek, Matrix Environmental Technologies, Inc.

NYSDEC SITE – OLIN CORPORATION – CHEMICALS GROUP (NOW KNOWN AS ARCH CHEMICALS, INC and as ARXADA)

MONROE COUNTY

ROCHESTER, NEW YORK

INTERIM SITE MANAGEMENT PLAN

NYSDEC Site Number: *828018A*

Prepared for:

Arch Chemicals, Inc

Prepared by:

MACTEC E&G (PC)

511 Congress Street, Portland, Maine

Revisions to Final Approved Site Management Plan:

Revision No.	Date Submitted	Summary of Revision	NYSDEC Approval Date

DECEMBER 2023

CERTIFICATION STATEMENT

I Nelson Breton certify that I am currently a Qualified Environmental Professional as in defined in 6 NYCRR Part 375 and that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

_____ QEP

___12/18/2023_____DATE

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OLIN CORPORATION – CHEMICALS GROUP (NOW KNOWN AS ARCH CHEMICALS, INC/ARXADA)

MONROE COUNTY

ROCHESTER, NEW YORK

SITE MANAGEMENT PLAN

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List of Acronyms

AS	Air Sparging
ASP	Analytical Services Protocol
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CAMP	Community Air Monitoring Plan
C/D	Construction and Demolition
CFR	Code of Federal Regulation
CLP	Contract Laboratory Program
COC	Certificate of Completion
CO2	Carbon Dioxide
CP	Commissioner Policy
DER	Division of Environmental Remediation
DUSR	Data Usability Summary Report
EC	Engineering Control
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Approval Program
ERP	Environmental Restoration Program
EWP	Excavation Work Plan
GHG	Greenhouse Gas
GWE&T	Groundwater Extraction and Treatment
HASP	Health and Safety Plan
IC	Institutional Control
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules and Regulations
O&M	Operation and Maintenance
OM&M	Operation, Maintenance and Monitoring
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
P.E. or PE	Professional Engineer
PFAS	Per- and Polyfluoroalkyl Substances
PID	Photoionization Detector
POTW	Publicly Owned Treatment Works
PRP	Potentially Responsible Party
PRR	Periodic Review Report
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QEP	Qualified Environmental Professional
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan

RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RP	Remedial Party
RSO	Remedial System Optimization
SAC	State Assistance Contract
SCG	Standards, Criteria and Guidelines
SCO	Soil Cleanup Objective
SMP	Site Management Plan
SOP	Standard Operating Procedures
SOW	Statement of Work
SPDES	State Pollutant Discharge Elimination System
SSD	Sub-slab Depressurization
SVE	Soil Vapor Extraction
SVI	Soil Vapor Intrusion
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leachate Procedure
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program

ES EXECUTIVE SUMMARY

The following provides a brief summary of the controls implemented for the Site, as well as the inspections, monitoring, maintenance and reporting activities required by this Interim Site Management Plan (ISMP):

Site Identification:	Site No.828018A Arch Rochester Facility (also known as Arxada), 100 McKee Road Rochester, New York

Institutional Controls:	1. The property may be used for industrial use;
	2. No current environmental easement has been completed for the site.
	3. All ECs must be inspected at a frequency and in a manner defined in the ISMP.
Engineering Controls:	1. Groundwater Extraction and Treatment System
	2. Cover system composed of asphalt or at least one foot of clean fill overlying potentially impacted soils, consistent with the Record of Decision (ROD)

Inspections:	Frequency
1. Extraction Well Network and Treatment System	Quarterly
Monitoring:	
1. Extraction Well Network and Treatment System	Semi Annual
2. Groundwater and Surface Water Sampling and reporting	Semi Annual
Maintenance:	
1. Extraction System Maintenance	To be determined
Reporting:	
1. Groundwater extraction system data and maintenance updates	Quarterly
2. Surface Water and Groundwater Monitoring Program	Semi-Annual

Further descriptions of the above requirements are provided in detail in the latter sections of this Interim Site Management Plan.

1.0 INTRODUCTION

1.1 General

This Interim Site Management Plan (ISMP) is a required element of the remedial program for the former Olin Corporation – Chemicals Group (currently known as Arch Chemicals, Inc., which is owned and operated by Arxada) located at 100 McKee Road in the City of Rochester, Monroe County, New York (hereinafter referred to as the "Site"). See Figure 1.1. The Site is currently in the New York State (NYS) Inactive Hazardous Waste Disposal Site Remedial Program, Site No. 828018A, which is administered by New York State Department of Environmental Conservation (NYSDEC or Department).

The Olin Corporation entered into an Order on Consent for the Site listed on August 11, 2003, with the NYSDEC to remediate the site. A figure showing the site location and boundaries of this site is provided in Figure 1.1. At the time of submission of this ISMP, the Environmental Easement has not been finalized. The NYSDEC issued Records of Decision (ROD) in 2002 and 2019 respectively.

Remedial action with respect to the NYSDEC issued RODs is ongoing and is not yet complete. As a result, contamination remains at the site and is hereafter referred to as "remaining contamination". Engineering Controls (ECs) have been incorporated into the site remedy to control exposure to remaining contamination to ensure protection of public health and the environment. At this time, an Institutional Control (IC) in the form of an Environmental Easement has not been granted to the NYSDEC, but when complete, will be in compliance with this ISMP and all ECs and ICs placed on the site. Consistent with the consent order, the IC will require the submission of periodic certifications of the ICs and ECs to the NYSDEC, allow usage of the site for industrial purposes, restrict the use of groundwater for either potable or process water without adequate water quality treatment

as approved by the NYSDEC, and will be in compliance with the final NYSEDC approved Site Management Plan (SMP).

This ISMP was prepared to manage contamination at the site and off-site in accordance with ECL Article 71, Title 36. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the future Environmental Easement and the grantor's successors and assigns. This ISMP may only be revised with the approval of the NYSDEC.

It is important to note that:

- This ISMP details the site-specific implementation procedures that are required by the consent order, record of decision, and the future environmental easement. Failure to properly implement the ISMP is a violation of the Consent Order, which is grounds for revocation of the Certificate of Completion (COC).
- Failure to comply with this ISMP is also a violation of Environmental Conservation Law, 6 NYCRR Part 375 and the Order on Consent Site #828018A for the site, and thereby subject to applicable penalties.

All reports associated with the site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State. A list of contacts for persons involved with the site is provided in Appendix A of this ISMP.

This ISMP was prepared by MACTEC Engineering & Geology, PC (MACTEC) on behalf of Arch, in accordance with the requirements of the NYSDEC's DER-10 ("Technical Guidance for Site Investigation and Remediation"), dated May 3, 2010, with the most recent revision of April 9, 2019, and the guidelines provided by the NYSDEC. This ISMP addresses the means for implementing the ICs and/or ECs that will be required by the Environmental Easement for the site.

1.2 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. The NYSDEC can also make changes to the ISMP or request revisions from the

remedial party. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, upgrades to or shutdown of a remedial system, post-remedial removal of contaminated sediment or soil, or other significant change to the site conditions. In accordance with the Environmental Easement for the site, the NYSDEC project manager will provide a notice of any approved changes to the ISMP and append these notices to the ISMP that is retained in its files.

1.3 Notifications

Notifications will be submitted by the property owner to the NYSDEC, as needed, in accordance with NYSDEC's DER – 10 for the following reasons:

1. 60-day advance notice of any proposed changes in site use that are required under the terms of the Order on Consent, 6 NYCRR Part 375 and/or Environmental Conservation Law.
2. 7-day advance notice of any field activity associated with the remedial program.
3. 15-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan. If the ground-intrusive activity qualifies as a change of use as defined in 6 NYCRR Part 375, the above mentioned 60-day advance notice is also required.
4. Notice within 48 hours of any damage or defect to the foundation, structures or EC that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect.
5. Notice within 48 hours of any non-routine maintenance activities.
6. Verbal notice by noon of the following day of any emergency, such as a fire; flood; or earthquake that reduces or has the potential to reduce the effectiveness of ECs in place at the site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
7. Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action submitted to the NYSDEC within 45 days describing and documenting actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the site or the responsibility for implementing this ISMP will include the following notifications:

8. At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser/Remedial Party has been provided with a copy of the Order of Consent, and all approved work plans and reports, including this ISMP.

9. Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing to the NYSDEC.

Table 1 on the following page includes contact information for the above notifications. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix A.

Table 1: Notifications*

Name	Contact Information	Required Notification**
NYSDEC Project Manager – Joshuah Klier	(585) 226-5357 Joshuah.Klier@dec.ny.gov	All Notifications
NYSDEC Project Manager's Supervisor – David Pratt	(585) 226-5449 David.Pratt@dec.ny.gov	All Notifications
NYSDOH Project Manager – Christopher Budd	(518) 402-1769 Christopher.Budd@health.ny.gov	Notifications 4, 6, and 7
Site Environmental Specialist – Luke Ferruzza	(585) 434-6008 luke.ferruzza@arxada.com	All Notifications
Qualified Environmental Professional - Nelson Breton (CT LEP, ME LG)	(207) 712-8020 Nelson.Breton@wsp.com	All Notifications

* Note: Notifications are subject to change and will be updated as necessary.

** Note: Numbers in this column reference the numbered bullets in the notification list in this section

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 Site Location and Description

The site is located in Rochester, Monroe County, New York and consists of several parcels, including section-block-lot numbers 120.37-1-1, 120.29-1-5, and 120.37-1-2.001 on the Monroe County Tax Map. The combined area of those parcels is approximately 15-acres and is bounded by Sun Environmental Corp. to the north, the former American Recycling and Manufacturing facility, now owned by Arch, to the south, a rail line owned and operated by Rochester Southern Railroad to the east, and McKee Road to the west (see Figure 2.1 – Site Plan and Onsite Monitoring Network). The adjoining parcel to the south known as 58 McKee Road, while currently owned by Arch, is not included in the consent order or record of decision. Additional off-site surface water and groundwater monitoring locations are detailed in Figures 2.2 and 2.3. The owner and operator of the site parcel(s) at the time of issuance of this ISMP is/are:

Arch Chemicals, Inc.

2.2 Physical Setting

2.2.1 Land Use

The Site consists of the following: an active chemical manufacturing facility along with associated warehousing and shipping facilities. The Site is zoned industrial and is currently utilized for industrial purposes. Site occupants include Arch.

The properties adjoining the Site and, in the neighborhood, surrounding the Site primarily include industrial or vacant properties.

2.2.2 Geology

Glacial and postglacial deposits comprise the undisturbed surficial material overlying bedrock present at the Site. Fine to coarse sand with silt and trace gravel, with varying degrees of sorting is the primary material described at the Site. Local fill, interpreted as recompacted soil or sediment from a local source, overlies the undisturbed material. This report refers to the undisturbed sediment and fill as overburden. Overburden thickness ranges from approximately 10 to 20 feet across the Site.

Lockport Dolomite bedrock underlies the overburden. The bedrock surface elevation ranges from approximately 520 to 525 feet above mean sea level (ft amsl). A fractured upper bedrock zone ranges in thickness from 10 to 40 feet (or 10 to 60 feet below ground surface [bgs]). Fractures within the upper zone appear to be primarily near horizontal. Below the upper zone, the bedrock becomes less fractured and more competent. A geologic cross section is shown in Figure 2.4. Site specific boring logs are provided in Appendix B.

2.2.3 Hydrogeology

Groundwater flow occurs primarily in the saturated portions of the overburden and the uppermost 10 feet of bedrock. No significant barrier to flow between the overburden and the upper bedrock has been identified. However, the degree of hydraulic communication between the overburden and bedrock units may vary locally due to heterogeneities in the shallow bedrock.

The ambient groundwater table in the overburden is generally less than 10 feet bgs throughout the property. Overburden groundwater is present at the Site but is absent in areas west and southwest towards the Erie Barge Canal (the canal). The presence of a non-engineered stormwater infiltration basin along the railroad right-of-way east of the Arch Site likely serves as a recharge area that raises the water table at the eastern side of the property. Other factors that influence flow include bedrock surface topography, the

location of the canal, the nature and distribution of water-bearing fractures, and flow direction in bedrock.

Historical groundwater contours indicate that overburden groundwater flows primarily west and south from the facility toward the canal and Buffalo Road. An easterly and southeasterly flow component is also present along the east and the southeast corner of the Site. Groundwater in shallow and deeper bedrock flows primarily toward the west and south.

Overburden groundwater contours suggest a southerly horizontal component of flow near the southern boundary of the facility. However, when compared to shallow bedrock groundwater elevations, a larger magnitude downward vertical gradient is apparent, indicating the dominant flow path for overburden groundwater is to the underlying bedrock. Groundwater levels are monitored and reported semi-annually as a part of the monitoring program for the Site.

Hydraulic conductivity estimates calculated from the Phase I RI (ABB-ES, 1995) for the water bearing zones range as follows:

- Overburden: 1.9×10^{-5} to 7.7×10^{-3} centimeters per second (cm/sec)
- Shallow bedrock: 4.0×10^{-5} to 1.17×10^{-2} cm/sec
- Deeper bedrock: 1×10^{-6} to 2.4×10^{-4} cm/sec.

While the overburden and shallow bedrock ranges are similar, experience with pumping well operations at this Site over the past 40 years indicates that the transmissivity of the shallow bedrock is noticeably greater than the saturated overburden zone.

Groundwater contour maps for overburden, bedrock, and deep bedrock are shown in Figure 2.5, 2.6, and 2.7 respectively. Monitoring well and extraction well construction details are provided in Table 2. Groundwater elevation data from November 2022 is

provided in Table 3. Groundwater monitoring well construction logs are provided in Appendix B.

2.3 Investigation and Remedial History

The following narrative provides a remedial history timeline and a brief summary of the available project records to document key investigative and remedial milestones for the Site. Full titles for each of the reports referenced below are provided in Section 8.0 - References.

The Olin Corporation (known as Arch and owned by Arxada) Industrial use of the site began in 1948, when Genesee Research, a fully owned subsidiary of the Puritan Company, established a manufacturing facility for automotive specialty products (e.g., brake fluids, polishes, anti-freeze, and specialty organic chemicals). In 1954, Mathieson Chemical Corporation acquired Puritan and merged with Olin Industries to become Olin Mathieson Chemical Corporation. Production of brake fluid and anti-freeze continued until the early 1960s, when production of specialty organic chemicals, such as Zinc Omadine® and chlorinated pyridines (chloropyridines) began. In 1969, Olin Mathieson changed its name to Olin Corporation (Olin) and in 1999, Olin spun off its specialty chemicals business to form an independent company known as Arch Chemicals, Inc. (Arch) (NYSDEC, 2019a).

The Arch Rochester Facility is a manufacturer of chloropyridines. The primary product line is Omadine® biocides, used in anti-dandruff shampoos and by the metalworking industry. Other products include more than 60 specialty organic chemicals used in personal care products, crop protection, rubber and plastic additives, and the textile industry (NYSDEC, 2019a).

The Site has been the subject of various environmental investigations since site contaminants were identified in wells operated by neighboring facilities in 1981. Initial efforts to address these impacts involved the conversion of perimeter overburden monitoring wells on the south/southeast corner of the property to extraction wells. Additional investigations through the 1980s resulted in the conversion of five bedrock

monitoring wells to extraction wells, including BR-2, BR-3, BR-5A, BR-6, and BR-7A. Following those initial evaluation and remedial efforts, additional evaluation was completed including, but not limited to, a groundwater investigation conducted in 1990, a two-phase remedial investigation (RI) conducted in 1994-96 (ABB 1995a 1995b, 1997a a 1997b), and an FS conducted in 2000 (Harding Lawson 2000).

The first Consent Order was executed in August 1993, between the former Olin Corporation for the implementation of aa Remedial Investigation (RI) and Feasibility Study (FS) (NYSDEC, 1993). Between 1993 and 1997 a multi-phase remedial investigation was completed. The investigation identified the transport of chloropyridines offsite to the Dolomite Products Quarry in the Town of Gates and the Erie Canal. In 1999 three bedrock extraction wells were added to the existing groundwater extraction system (EPA 2005). The results of the remedial investigation are detailed in the January 2000 Feasibility Study (2000 Harding Lawson Associates). By 2002 the overburden extraction wells were found to be ineffective and were no longer in use as extraction wells. At this point the bedrock extraction well network consisted of BR-5A, BR-6A, BR-7A, BR-9, PW-10, PW-11, and PW-12. Several of these wells were taken out of service over the years due to failure or poor performance. (At the beginning of 2023, six extraction wells were in service and consisted of BR-127, BR-7A, BR-9, PW-13, PW-15, and PW-16). Arch entered into a new Consent Order with the NYSDEC to implement the requirements of the NYSDEC's Record of Decision (ROD) in August 2003 (NYSDEC 2003).

The 2002 ROD identified two separate operable units that require separate remedies, these include the onsite contaminated soil and bedrock, referred to as OU-1 and the contaminated groundwater, underlying the site and extending offsite, as OU-2. The elements of the required remedial action in the 2002 ROD included the continued operation vertical groundwater extraction wells, the installation an overburden groundwater interceptor trench along the southeast/south perimeter of the plant property and the installation and operation of an offsite bedrock pumping well adjacent to the southeast comer of the Gates Dolomite quarry (located about 4000 feet southwest of the site).

Groundwater extraction system operations, maintenance, and upgrades have occurred as needed and are based on performance metrics that have been communicated with the NYSDEC through quarterly performance reports and annual monitoring reports. Extracted groundwater is conveyed by pipeline to a treatment system prior to discharge to the Monroe County Pure Waters Publicly Owned Treatment Works (POTW). Additionally, an updated risk evaluation demonstrated that potential exposure risks at the quarry are below levels of concern and the NYSDEC indicated that installation of the downgradient extraction well near the Dolomite Products Quarry on Buffalo Road was no longer required (NYSDEC, 2003).

In 2019 the NYSDEC issued the second ROD for the Site detailing updated elements to the selected remedy. The 2019 ROD combined the two operable units detailed in the 2002 ROD into a single operable unit. These elements include the following:

- Implementation of a remedial design program to facilitate the construction, operation, optimization, maintenance of the remedial program.
- The installation of up to two horizontal groundwater extraction wells beneath the Site to enhance the existing groundwater extraction and treatment system.
- Maintenance of the existing remedial site cover system in areas not occupied by buildings to allow for industrial usage of the site.
- The elimination of the requirements for an off-site extraction well adjacent to the Quarry and the overburden interceptor trench.
- Provision of a financial assurance using one or more of the financial instruments in 6 NYCRR 373-2.8 in the value anticipated for the selected remedy.
- Institutional controls in the form of an environmental easement which requires the completion of periodic certifications of the institutional and engineering controls in place, the use and development of the property for industrial usage, restriction of groundwater extraction for potable or process

water usage without prior water quality treatment, and compliance with the site management plan.

- The completion of a Site Management Plan including an institutional and engineering control plan.
- The completion of a monitoring plan to assess the performance and effectiveness of the site remedy.
- An operation and Maintenance plan to ensure continued operation and maintenance, optimization, monitoring, inspection, and reporting of the components of the remedy (NYSDEC, 2019b).

The remedy called for the installation of up to two HW's to improve groundwater capture at the western property boundary and to increase contaminant mass removal rates. The installation of a single HW through the primary source area underneath the facility was completed in 2021.Variable rate and constant rate pumping tests were completed to evaluate HW performance, zone of influence, and treatment options, as reported in the March 2023 Well Installation and Completion Report (MACTEC, 2023a). Further evaluation of the HW was proposed in the April 4, 2023, Pilot Test Work Plan for Groundwater Extraction and Treatment at HW-1 (MACTEC, 2023b). With the addition of HW-1, a groundwater extraction and treatment system will be designed to reduce contaminant concentrations in groundwater and limit migration of these contaminants. Results of these performance evaluations of the existing HW will help to determine whether a second HW is technically feasible to meet remedial goals.

2.4 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for the Site as listed in the Record of Decision dated March 2019, which supersedes the 2002 ROD, are as follows:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of, volatiles from contaminated groundwater.

RAOs for Environmental Protection

- Prevent the discharge of contaminants to surface water.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

2.5 Remaining Contamination

2.5.1 Soil

Figures 2.8 and 2.9 summarize the results of soil samples collected that exceed the restricted industrial use SCOs at the site. Exposure to remaining soil contamination will

continue to be managed through engineering controls. Institutional controls will be put in place to ensure compliance with the RAOs detailed in section 2.4.

2.5.2 Groundwater and Surface Water

Tables 4, 5, and 6 and Figures 2.10 and 2.11 summarize the results of the latest groundwater and surface water sampling event, completed in November 2022 (MACTEC, 2023c).

2.5.3 Soil Vapor

A series of soil vapor intrusion investigations have been completed both on and off-site with results reported to the NYSDEC between 2006 and 2009.The findings for these investigations indicate that VOCs and chloropyridines related to past releases at the Arch facility do not pose a significant exposure risk and are summarized in Appendix D.

3.0 INSTITUTIONAL AND ENGINEERING CONTROL PLAN

Institutional controls will be developed with the submission of an environmental easement as required in the 2019 ROD. As described in the ROD the environmental easement will:

- require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3).
- allow the use and development of the controlled property for industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws.
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH.
- require compliance with the Department approved Site Management Plan.

An engineering control plan will also be prepared after the new HW and groundwater treatment system are fully operational.

4.0 MONITORING AND SAMPLING PLAN

The current monitoring program consists of semi-annual sampling events for groundwater and surface water as described in the semi-annual monitoring reports (MACEC, 2023c). The program was initiated in the 1990's and has been modified since that time. The current sampling and analysis schedule is provided in Table 7. Following the completion of the ECs, Arch will prepare and submit a sampling and monitoring plan to the NYSDEC for approval.

5.0 OPERATION AND MAINTENANCE PLAN

Currently, the operation and maintenance of engineering controls at the site are detailed in quarterly progress reports submitted to the NYSDEC. These reports include details of maintenance and performance of the current extraction well network. Report of extraction system performance is also included in the semi-annual monitoring reports that are submitted to the NYSDEC.

An operations and maintenance plan will be submitted to the NYSDEC for approval after the new HW and groundwater treatment system are fully operational.

6.0 PERIODIC ASSESSMENTS/EVALUATIONS

6.1 Climate Change Vulnerability Assessment

Increases in both the severity and frequency of storms/weather events, an increase in sea level elevations along with accompanying flooding impacts, shifting precipitation patterns and wide temperature fluctuation, resulting from global climactic change and instability, have the potential to significantly impact the performance, effectiveness and protectiveness of a given site and associated remedial systems. Vulnerability assessments provide information so that the site and associated remedial systems are prepared for the impacts of the increasing frequency and intensity of severe storms/weather events and associated flooding.

This section provides a summary of vulnerability assessments that will be conducted for the site during periodic assessments, and briefly summarizes the vulnerability of the site and/or engineering controls to severe storms/weather events and associated flooding.

Because the Site and surrounding area is fairly flat and the surrounding properties urbanized, the Site is considered fairly resilient to climate change. The site is also not located in an area mapped by the Federal Emergency Management Administration as prone to flooding during either 100 or 500-year events. However, a vulnerability assessment will be conducted annually as part of the annual inspection after the new HW and groundwater treatment system is fully operational. This assessment will include an evaluation of the of remediation systems for the following vulnerabilities:

- Site Drainage and Storm Water Management
- Energy usage
- Emissions

6.2 Green Remediation Evaluation

NYSDEC's DER-31 Green Remediation requires that green remediation concepts and techniques be considered during all stages of the remedial program including site management, with the goal of improving the sustainability of the cleanup and summarizing the net environmental benefit of any implemented green technology. This section of the ISMP provides a summary of any green remediation evaluations to be completed for the site during site management, and as reported in the Periodic Review Report (PRR, including:

- Land and/or ecosystems
- Water Usage
- Waste Generation
- Energy usage
- Emissions

6.2.1 Timing of Green Remediation Evaluations

For major remedial system components, green remediation evaluations and corresponding modifications will be undertaken as part of a formal Remedial System Optimization (RSO), or at any time that the NYSDEC project manager feels appropriate, e.g. during significant maintenance events or in conjunction with storm recovery activities.

Modifications resulting from green remediation evaluations will be routinely implemented and scheduled to occur during planned/routine operation and maintenance activities. Reporting of these modifications will be presented in the PRR.

6.2.2 Frequency of System Checks, Sampling and Other Periodic Activities

Transportation to and from the Site, use of consumables in relation to visiting the

Site in order to conduct system checks and/or collect samples, and shipping samples to a laboratory for analyses have direct and/or inherent energy costs. The schedule and/or means of these periodic activities have been prepared so that these tasks can be accomplished in a manner that does not impact remedy protectiveness but reduces expenditure of energy or resources.

6.2.3 Metrics and Reporting

Information on energy usage, solid waste generation, transportation and shipping, water usage and land use and ecosystems will be recorded to facilitate and document consistent implementation of green remediation during site management and to identify corresponding benefit. Green remediation evaluation and reporting will be initiated after the after the new HGEW and groundwater treatment system are fully operational.

7.0. REPORTING REQUIREMENTS

The current reporting of Site activities includes quarterly progress reports submitted to the NYSDEC detailing current and planned remediation activities. Additionally, semi-annual reports detailing the surface water and groundwater monitoring program, as well as the extraction system performance and optimization efforts are submitted to NYSDEC.

A schedule of monitoring and inspection reports, Periodic Review Reports and certification of institutional and engineering controls will be developed for approval after the new HW and groundwater treatment system are fully operational.

8.0 REFERENCES

EPA, 2005. Document of Environmental Indicator Determination, RCRA Corrective Action Environmental Indicator (EI) RCIS Code (CA750) Migration of Contaminated Groundwater Under Control, Signed September 26, 2005.

NYSDEC, 1987. Order on Consent, Index No. C8-0003-85-06, between the Department and Olin Corporation, executed on April 1987.

NYSDEC, 1993. Order on Consent, Index No. B8-0343-90-08, between the Department and Olin Corporation, executed on August 23, 1993.

NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).

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TABLES

Table 2:
Monitoring and Extraction Well Construction Details

Arch Chemicals
Rochester, New York

WELL	Borehole or Screen Diameter (ft)	Top of Monitored Interval (ft	Bottom of Monitored Interval (ft bgs)	Screen Length (ft)	Depth into Rock (ft)	Measuring Point Elevation (ft	Screen Material	Monitored Zone
B-1	1.5	5.5	15.5	10	0.00	537.75	PVC	Overburden
B-10	1.5	3	13	10	0.00	538.8	PVC	Overburden
B-12	2	4.3	14.3	10	-2.00	537.12	PVC	Overburden
B-13	2	4.7	14.7	10	-2.00	537.07	PVC	Overburden
B-14	2	7	17	10	-2.00	537.95	PVC	Overburden
B-15	2	4	14	10	-3.00	535.29	PVC	Overburden
B-16	2	3.5	13.5	10	-2.00	536.21	PVC	Overburden
B-17	2	11.6	16	4.4	-0.50	538.74	Stainless	Overburden
B-2	1.5	6	16	10	0.00	539.02	PVC	Overburden
B-3	1.5	5	15	10	0.00	541.81	PVC	Overburden
B-4	1.5	11	21	10	0.00	542.87	PVC	Overburden
B-5	1.5	7	17	10	0.00	540.21	PVC	Overburden
B-6	1.5	6	16	10	0.00	537.31	PVC	Overburden
B-7	1.5	9	19	10	0.00	541.11	PVC	Overburden
B-8	1.5	4.5	14.5	10	0.00	538.88	PVC	Overburden
B-9	1.5	2	12	10	0.00	535.55	PVC	Overburden
BR-1	3	16.3	22.8	6.5	8.50	537.28	None	Bedrock
BR-102	3.8	22	54	32	34.10	539.43	None	Bedrock
BR-103	3.8	13	45.2	32.2	34.40	533.19	None	Bedrock
BR-104	3.8	21	40	19	21.20	537.56	None	Bedrock
BR-105	3.8	19	45.5	26.5	30.50	536.9	None	Bedrock
BR-105D	2	70	79.6	9.6	64.20	536.49	PVC	Deep Bedrock
BR-106	3.8	18	44.9	26.9	31.70	535.74	None	Bedrock
BR-107	3.8	19	40.2	21.2	23.40	536.32	None	Bedrock
BR-108	3.8	18	41.5	23.5	29.00	540.58	None	Bedrock
BR-111	3.8	14.5	45	30.5	33.00	540.42	None	Bedrock
BR-111D	2	55	64.6	9.6	52.10	540.34	PVC	Deep Bedrock
BR-112A	3.8	12.5	40	27.5	29.50	547.72	None	Bedrock
BR-112D	2	50	59.6	9.6	48.60	547.91	PVC	Deep Bedrock
BR-113	3.8	11	45	34	36.00	543.02	None	Bedrock
BR-113D	2	57	66.6	9.6	57.60	542.93	PVC	Deep Bedrock
BR-114	3.8	19.5	39.6	20.1	23.10	539.77	None	Bedrock
BR-116	3.8	30.4	62.6	32.2	33.10	545.38	None	Bedrock
BR-117	3.8	4.5	50	45.5	48.10	547.61	None	Bedrock
BR-118	3.8	9.1	50	40.9	45.50	547.79	None	Bedrock
BR-119D	3.8	74	110	36	91.50	567.06	None	Deep Bedrock

Updated : RJO 5/31/23
Checked by:NB 6/7/23

Table 2:
Monitoring and Extraction Well Construction Details

Arch Chemicals
Rochester, New York

WELL	Borehole or Screen Diameter (ft)	Top of Monitored Interval (ft	Bottom of Monitored Interval (ft bgs)	Screen Length (ft)	Depth into Rock (ft)	Measuring Point Elevation (ft	Screen Material	Monitored Zone
BR-120D	3.8	65.4	90.4	25	84.40	557.43	None	Deep Bedrock
BR-121D	3.8	62	92	30	88.00	554.79	None	Deep Bedrock
BR-122D	3.8	50.2	80	29.8	56.50	552.34	None	Deep Bedrock
BR-123D	3.8	60	94.5	34.5	71.50	553.62	None	Deep Bedrock
BR-124D	3.8	82	115	33	92.00	537.45	None	Deep Bedrock
BR-2D	3	67.5	82.6	15.1	67.90	537.26	None	Deep Bedrock
BR-3	3.8	17	27	10	14.70	538.27	None	Bedrock
BR-3D	3	71.5	86.5	15	74.20	537.67	None	Deep Bedrock
BR-4	5.8	17.5	50	32.5	37.50	539.03	None	Bedrock
BR-5	3.8	13	43	30	32.50	536.3	None	Bedrock
BR-5A	3.8	12.5	32	19.5	21.50	536.35	Core	Bedrock
BR-6	3.8	16	56	40	43.00	537.75	None	Bedrock
BR-6A	5.8	18	57	39	44.00	540.9	None	Bedrock
BR-7	3.8	17	65.7	48.7	51.70	539.1	None	Bedrock
BR-7A	3.8	19	62.5	43.5	48.50	539.12	Core	Bedrock
BR-8	3.8	18	38	20	23.00	539.72	None	Bedrock
BR-9	6	21	54.1	33.1	34.20	542.17	None	Bedrock
C-1	2	5.8	10.8	5	0.00	539.05	Stainless	Overburden
C-3	2	6.5	11.5	5	0.00	541.63	Stainless	Overburden
C-4	2	7	12	5	0.00	540.82	Stainless	Overburden
C-5	2	6.3	11.3	5	0.00	539.63	Stainless	Overburden
E-1	NR	3.3	8.3	5	-0.20	535.01	Stainless	Overburden
E-2	2	7.7	11.7	4	0.00	538.32	Stainless	Overburden
E-3	2	5	10	5	0.00	536.59	Stainless	Overburden
E-4	2	7	12	5	0.00	538.69	Stainless	Overburden
E-5	2	4.2	9.2	5	0.00	539.31	Stainless	Overburden
EC-1	2	14	19	5	3.00	539.99	Stainless	Ovb/ Bedrock
EC-2	2	6.2	11.2	5	2.20	542	Stainless	Overburden
MW-103	2	6	9	3	-1.30	533.25	PVC	Overburden
MW-104	2	9	18.6	9.6	-0.20	537.54	PVC	Overburden
MW-105	2	9	18.6	9.6	4.20	536.91	PVC	Ovb/Bedrock
MW-106	2	10	19.6	9.6	6.40	535.44	PVC	Ovb/Bedrock
MW-107	2	6	15.7	9.7	-1.10	536.29	PVC	Overburden
MW-108	2	8	17.6	9.6	5.10	540.69	PVC	Ovb/Bedrock
MW-114	2	5.8	15.5	9.7	-1.00	539.69	PVC	Overburden
N-1	2	5.5	10.5	5	0.00	537.17	Stainless	Overburden

Updated : RJO 5/31/23
Checked by:NB 6/7/23

Table 2:
Monitoring and Extraction Well Construction Details

Arch Chemicals
Rochester, New York

WELL	Borehole or Screen Diameter (ft)	Top of Monitored Interval (ft	Bottom of Monitored Interval (ft bgs)	Screen Length (ft)	Depth into Rock (ft)	Measuring Point Elevation (ft	Screen Material	Monitored Zone
N-2	2	5.1	10.1	5	0.00	537.33	Stainless	Overburden
N-3	2	6	11	5	-0.30	537.38	Stainless	Overburden
PW11	4	18.5	48.5	30	31.50	538.17	Stainless	Bedrock
PW12	3.8	18	44.5	26.5	29.00	537.49	None	Bedrock
PZ-101	2	9	18.6	9.6	-0.70	542.95	PVC	Overburden
PZ-102	2	23	31	8	13.80	540.89	PVC	Bedrock
PZ-103	2	20	29.3	9.3	15.90	540.22	PVC	Bedrock
PZ-104	2	17	25	8	11.70	537.21	PVC	Bedrock
PZ-105	2	23	32.4	9.4	16.50	536.93	PVC	Bedrock
PZ-106	2	20	29.4	9.4	16.30	537.21	PVC	Bedrock
PZ-107	2	16	25.6	9.6	15.40	538.39	PVC	Bedrock
PZ-108	2	6	11.6	5.6	-0.60	536.56	PVC	Overburden
S-1	0	2.9	12.9	10	-1.60	537.49	Stainless	Overburden
S-2	4	2.5	11.7	9.2	-2.60	537.15	PVC	Overburden
S-3	NR	1	11	10	-2.00	537.19	Stainless	Overburden
W-1	NR	6.1	16.1	10	-0.50	537.78	Stainless	Overburden
W-2	NR	8.5	18.5	10	0.10	540.32	Stainless	Overburden
W-3	4	9.4	18.5	9.1	0.00	542.64	PVC	Overburden
W-4	4	7.8	17	9.2	-1.30	541.1	PVC	Overburden
W-5	NR	4.9	14.9	10	-0.10	538.53	Steel	Overburden
W-6	NR	7.3	12.3	5	-0.40	538.99	Stainless	Overburden

Notes:
BGS = Below ground Surface
ft = feet
ft amsl = Feet above mean sea level
Stainless = Stainless Steel
NR = Not Reported

Updated : RJO 5/31/23
Checked by:NB 6/7/23

Table 3
Groundwater Elevation Measurements - Fall 2022
Arch Chemicals
Rochester, NY

Sample Location		Zone	Date	Depth to water	Casing Elevation	GW Elevation
B-1	On-Site	OB	11/10/2022	9.65	537.75	528.10
B-10	On-Site	OB	11/10/2022	8.87	538.80	529.93
B-15	On-Site	OB	11/10/2022	5.59	535.29	529.70
B-16	Off-Site	OB	11/10/2022	5.74	536.21	530.47
B-17	On-Site	OB	11/10/2022	8.41	538.74	530.33
B-2	On-Site	OB	11/10/2022	10.71	539.02	528.31
B-4	On-Site	OB	11/10/2022	20.02	542.87	522.85
B-5	On-Site	OB	11/10/2022	13.51	540.21	526.70
B-7	On-Site	OB	11/10/2022	15.11	541.11	526.00
B-8	On-Site	OB	11/10/2022	9.67	538.88	529.21
BR-1	On-Site	BR	11/10/2022	7.74	537.28	529.54
BR-102	On-Site	BR	11/10/2022	DRY	539.43	DRY
BR-103	Off-Site	BR	11/10/2022	2.39	533.19	530.80
BR-104	Off-Site	BR	11/10/2022	11.83	537.56	525.73
BR-105	Off-Site	BR	11/10/2022	23.67	536.90	513.23
BR-105D	Off-Site	BR deep	11/10/2022	25.38	536.49	511.11
BR-106	Off-Site	BR	11/10/2022	23.65	535.74	512.09
BR-108	Off-Site	BR	11/10/2022	28.97	540.58	511.61
BR-111	Off-Site	BR	11/10/2022	29.38	540.42	511.04
BR-111D	Off-Site	BR	11/10/2022	29.40	540.34	510.94
BR-112D	Off-Site	BR deep	11/10/2022	36.90	547.91	511.01
BR-113	Off-Site	BR	11/10/2022	31.90	543.02	511.12
BR-113D	Off-Site	BR deep	11/10/2022	31.91	542.93	511.02
BR-114	Off-Site	BR	11/10/2022	14.42	539.77	525.35
BR-116	Off-Site	BR	11/10/2022	29.55	545.38	515.83
BR-116D	Off-Site	BR deep	11/10/2022	39.95	545.22	505.27
BR-117	Off-Site	BR	11/10/2022	37.60	547.61	510.01
BR-117D	Off-Site	BR deep	11/10/2022	48.25	547.16	498.91
BR-118	Off-Site	BR	11/10/2022	24.70	547.79	523.09
BR-118D	Off-Site	BR deep	11/10/2022	47.60	547.93	500.33
BR-122D	Off-Site	BR deep	11/10/2022	45.72	552.34	506.62
BR-123D	Off-Site	BR deep	11/10/2022	46.00	553.62	507.62
BR-124D	Off-Site	BR deep	11/10/2022	33.50	537.45	503.95
BR-126	Off-Site	BR	11/10/2022	10.37	537.90	527.53
BR-127	On-Site	BR	11/10/2022	5.57	536.05	530.48
BR-3	On-Site	BR	11/10/2022	NM	538.20	NM
BR-3D	On-Site	BR deep	11/10/2022	0.65	537.67	537.02
BR-4	On-Site	BR	11/10/2022	11.91	539.03	527.12

Created By: RJO 5-31-23
Checked By: NB 6-7-23

Table 3
Groundwater Elevation Measurements - Fall 2022
Arch Chemicals
Rochester, NY

Sample Location		Zone	Date	Depth to water	Casing Elevation	GW Elevation
BR-5	On-Site	BR	11/10/2022	5.84	536.30	530.46
BR-5A	On-Site	pumping well	11/10/2022	5.60	536.35	530.75
BR-6A	On-Site	BR	11/10/2022	12.67	540.90	528.23
BR-7	On-Site	BR	11/10/2022	18.40	539.10	520.70
BR-7A	On-Site	pumping well	11/10/2022	26.85	539.12	512.27
BR-8	On-Site	BR	11/10/2022	12.89	539.72	526.83
BR-9	On-Site	pumping well	11/10/2022	44.52	542.17	497.65
C-5	On-Site	OB	11/10/2022	9.87	539.63	529.76
CANAL	Off-Site	SW	11/10/2022	37.47	544.79	507.32
E-2	On-Site	OB	11/10/2022	NM	538.32	NM
E-3	On-Site	OB	11/10/2022	4.74	536.59	531.85
E-5	On-Site	OB	11/10/2022	6.50	539.31	532.81
EC-2	Off-Site	BR	11/10/2022	DRY	542.00	Dry
MW-103	Off-Site	OB	11/10/2022	3.00	533.25	530.25
MW-104	Off-Site	OB	11/10/2022	9.94	537.54	527.60
MW-105	Off-Site	OB	11/10/2022	DRY	536.91	Dry
MW-106	Off-Site	OB	11/10/2022	13.55	535.44	521.89
MW-114	Off-Site	OB	11/10/2022	11.45	539.69	528.24
MW-127	On-Site	OB	11/10/2022	5.95	536.87	530.92
MW-16	Off-Site	BR	11/10/2022	NM	536.79	NM
MW-3	Off-Site	OB	11/10/2022	NM	535.89	NM
MW-G6	Off-Site	OB	11/10/2022	NM	534.65	NM
MW-G8	Off-Site	OB	11/10/2022	8.29	534.25	525.96
MW-G9	Off-Site	OB	11/10/2022	11.04	536.60	525.56
N-2	On-Site	OB	11/10/2022	NG	537.33	NM
N-3	On-Site	OB	11/10/2022	8.02	537.38	529.36
NESS-E	Off-Site	BR deep	11/10/2022	NM	540.31	NM
NESS-W	Off-Site	BR deep	11/10/2022	NM	543.04	NM
PW-12	On-Site	BR	11/10/2022	6.91	537.49	530.58
PW-13	On-Site	pumping well	11/10/2022	24.52	536.13	NM
PW-14	On-Site	pumping well	11/10/2022	9.90	537.03	527.13
PW-15	On-Site	pumping well	11/10/2022	25.57	538.32	512.75
PW-16	On-Site	pumping well	11/10/2022	20.70	539.32	518.62
PW-17	On-Site	pumping well	11/10/2022	19.48	NS	NA
PZ-101	Off-Site	BR	11/10/2022	18.29	542.95	524.66
PZ-102	Off-Site	BR	11/10/2022	19.71	540.89	521.18
PZ-103	Off-Site	BR	11/10/2022	14.81	540.20	525.39
PZ-104	Off-Site	BR	11/10/2022	15.24	536.85	521.61
PZ-105	On-Site	BR	11/10/2022	10.87	536.93	526.06
PZ-106	On-Site	BR	11/10/2022	9.52	537.24	527.72

Created By: RJO 5-31-23
Checked By: NB 6-7-23

Table 3
Groundwater Elevation Measurements - Fall 2022
Arch Chemicals
Rochester, NY

Sample Location		Zone	Date	Depth to water	Casing Elevation	GW Elevation
PZ-107	On-Site	BR	11/10/2022	8.00	538.39	530.39
PZ-109	On-Site	BR	11/10/2022	8.26	538.59	530.33
PZ-110	On-Site	BR	11/10/2022	13.99	NS	NA
PZ-111	On-Site	BR	11/10/2022	NM	NS	NM
W-5	On-Site	OB	11/10/2022	NM	538.53	NM

NM = Not Measured
NA = Not Applicable
NS = No Survey

Created By: RJO 5-31-23
Checked By: NB 6-7-23

TABLE 4
Groundwater Sampling Analytical
Chloropyridines - Fall 2022

ARCH ROCHESTER
ROCHESTER, NEW YORK

LOCATION:	B-15		B-16		BR-105		BR-105D		BR-106		BR-126		BR-127		BR-5A		BR-6A		BR-7A	
SAMPLE DATE:	11/15/2022		11/15/2022		11/14/2022		11/14/2022		11/15/2022		11/15/2022		11/14/2022		11/16/2022		11/14/2022		11/18/2022	
QC TYPE:	FS		FS		FS		FS		FS		FS		FS		FS		FS		FS	
SELECTED CHLOROPYRIDINES BY SW-846 Method 8270D (µg/L)																				
2,6-Dichloropyridine	9.13	J	325		167	J	11.2		10,000	U	228		966	U	26.1		1,480		4,850	U
2-Chloropyridine	6.28	J	848		1,680		41.4		48,800		953		11,700		12.9		5,650		42,300	
3-Chloropyridine	9.66	U	100	U	196	U	6.8	J	10,000	U	80	U	966	U	9.62	U	400	U	4,850	U
4-Chloropyridine	9.66	U	100	U	196	U	9.72	U	10,000	U	80	U	966	U	9.62	U	400	U	4,850	U
p-Fluoroaniline	9.66	U	100	U	196	UJ	9.72	UJ	10,000	U	80	U	966	UJ	9.62	U	400	UJ	4,850	U
Pyridine	9.66	UJ	100	UJ	196	U	9.72	U	10,000	UJ	80	UJ	966	U	9.62	UJ	653		4,850	UJ

Notes:

U = Compound not detected; value represents sample quantitation limit.

J = Estimated value

J- = Estimated with a potential low bias

J+ = Estimated with a potential high bias

µg/L = micrograms per Liter

FS = Field sample

Prepared by: WCG 3/29/23
Checked by: JAR 3/30/23

TABLE 4
Groundwater Sampling Analytical
Chloropyridines - Fall 2022

ARCH ROCHESTER
ROCHESTER, NEW YORK

LOCATION:	BR-8		BR-9		MW-106		MW-127		PW12		PW13		PW14		PW15		PW16		PW17	
SAMPLE DATE:	11/17/2022		11/17/2022		11/15/2022		11/14/2022		11/16/2022		11/16/2022		11/15/2022		11/16/2022		11/17/2022		11/16/2022	
QC TYPE:	FS		FS		FS		FS		FS		FS		FS		FS		FS		FS	
SELECTED CHLOROPYRIDINES BY SW-846 Method 8270D (µg/L)																				
2,6-Dichloropyridine	45,500	U	2,020	U	10,000	U	47.6	J	9.62	U	4,550	U	536	J+	10,000	U	20,000	U	4,190	
2-Chloropyridine	529,000		12,400		58,100		10	UJ	25.1		30,900		6,590		73,600		146,000		27,300	
3-Chloropyridine	45,500	U	2,020	U	10,000	U	10	UJ	9.62	U	4,550	U	800	U	10,000	U	20,000	U	2,300	
4-Chloropyridine	45,500	U	2,020	U	10,000	U	10	UJ	9.62	U	4,550	U	800	U	10,000	U	20,000	U	4,550	U
p-Fluoroaniline	45,500	U	2,020	U	10,000	U	10	UJ	6.68		4,550	U	800	UJ	10,000	U	20,000	U	4,550	U
Pyridine	49,500	J-	2,020	UJ	10,000	UJ	10	UJ	9.62	UJ	4,550	UJ	800	UJ	10,000	UJ	20,000	UJ	4,660	J-

Notes:

U = Compound not detected; value represents sample quantitation limit.

J = Estimated value

J- = Estimated with a potential low bias

J+ = Estimated with a potential high bias

µg/L = micrograms per Liter

FS = Field sample

Prepared by: WCG 3/29/23
Checked by: JAR 3/30/23

TABLE 4
Groundwater Sampling Analytical
Chloropyridines - Fall 2022

ARCH ROCHESTER
ROCHESTER, NEW YORK

LOCATION:	PZ-101		PZ-102		PZ-103		PZ-104		PZ-105		PZ-106		PZ-107	
SAMPLE DATE:	11/17/2022		11/17/2022		11/17/2022		11/15/2022		11/14/2022		11/15/2022		11/16/2022	
QC TYPE:	FS		FS		FS		FS		FS		FS		FS	
SELECTED CHLOROPYRIDINES BY SW-846 Method 8270D (µg/L)														
2,6-Dichloropyridine	12.8	J+	20,000	U	13,500	J+	193	J	1,540		1,120		302	
2-Chloropyridine	14.5		188,000		352,000		1,460		10,700		17,400		2,270	
3-Chloropyridine	9.5	U	20,000	U	20,000	U	200	U	800	U	1,000	U	172	U
4-Chloropyridine	9.5	U	20,000	U	20,000	U	200	U	800	U	1,000	U	172	U
p-Fluoroaniline	9.5	U	20,000	U	20,000	U	200	U	800	UJ	1,000	U	172	U
Pyridine	9.5	UJ	20,000	UJ	20,000	UJ	200	UJ	800	U	648	J-	172	UJ

Notes:

U = Compound not detected; value represents sample quantitation limit.

J = Estimated value

J- = Estimated with a potential low bias

J+ = Estimated with a potential high bias

µg/L = micrograms per Liter

FS = Field sample

Prepared by: WCG 3/29/23
Checked by: JAR 3/30/23

TABLE 5
Groundwater Analytical - VOCs - Fall 2022

ARCH ROCHESTER
ROCHESTER, NEW YORK

LOCATION:	B-15	B-16	BR-105	BR-105D	BR-106	BR-126	BR-127	BR-5A	BR-6A	BR-7A	BR-8
SAMPLE DATE:	11/15/2022	11/15/2022	11/14/2022	11/14/2022	11/15/2022	11/15/2022	11/14/2022	11/16/2022	11/14/2022	11/18/2022	11/17/2022
QC TYPE:	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS
VOCs By SW-846 Method 8260C (µg/L)											
1,1,1-Trichloroethane	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	4 UJ	2 U	20 UJ
1,1,2,2-Tetrachloroethane	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	4 UJ	2 U	20 UJ
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	4 UJ	2.24	20 UJ
1,1,2-Trichloroethane	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	4 UJ	2 U	20 UJ
1,1-Dichloroethane	2 U	2 U	2 U	2 U	2.62 J-	2 U	2 U	2 U	4 UJ	1.78 J	20 UJ
1,1-Dichloroethene	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	4 UJ	2 U	20 UJ
1,2,3-Trichlorobenzene	5 U	5 U	5 U	5 U	5 UJ	5 U	5 U	5 U	10 UJ	5 U	50 UJ
1,2,4-Trichlorobenzene	5 U	5 U	5 U	5 U	5 UJ	5 U	5 U	5 U	6.36 J-	5 U	50 UJ
1,2-Dibromo-3-chloropropane	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	20 UJ	10 U	100 UJ
1,2-Dibromoethane	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	4 UJ	2 U	20 UJ
1,2-Dichlorobenzene	2 U	1.71 J	3.82	2 U	63.2 J-	2 U	4.06	2 U	4.77 J-	58.4	336 J-
1,2-Dichloroethane	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	4 UJ	2 U	20 UJ
1,2-Dichloropropane	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	4 UJ	2 U	20 UJ
1,3-Dichlorobenzene	2 U	2 U	2 U	2 U	4.19 J-	2 U	1.91 J	2 U	4 UJ	19.7	102 J-
1,4-Dichlorobenzene	2 U	2.12	2 U	2 U	5.39 J-	2 U	3.07	2 U	4 UJ	12.7	59.9 J-
1,4-Dioxane	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	20 UJ	10 U	100 UJ
2-Butanone	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	20 UJ	10 U	100 UJ
2-Hexanone	5 U	5 U	5 U	5 U	5 UJ	5 U	5 U	5 U	10 UJ	5 U	50 UJ
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	5 UJ	5 U	5 U	5 U	10 UJ	5 U	50 UJ
Acetic acid, methyl ester	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	4 UJ	2 UJ	20 UJ
Acetone	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 U	20 UJ	10 U	100 UJ
Benzene	1 U	1.23	1.09	3.59	16.4 J-	2.02	1.08	0.577 J	7.82 J-	3.76	24.8 J-
Bromochloromethane	5 U	5 U	5 U	5 U	5 UJ	5 U	5 U	5 U	10 UJ	5 U	50 UJ
Bromodichloromethane	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	4 UJ	2 U	20 UJ
Bromoform	5 U	5 U	5 U	5 U	5 UJ	5 U	5 U	5 U	10 UJ	5 U	50 UJ
Bromomethane	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	4 UJ	2 U	20 UJ
Carbon disulfide	2 U	2 U	1.45 J	7.5	5.59 J-	2 U	1.61 J	2 U	4 UJ	9.24	43 J-
Carbon tetrachloride	2 U	2 U	2 U	2 U	2 UJ	2 U	3.29	2 U	4 UJ	2 U	20 UJ
Chlorobenzene	2 U	4.08	8.64	2 U	190 J-	2 U	4.18	2 U	54.6 J-	100	700 J-
Chloroethane	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	4 UJ	2 U	20 UJ
Chloroform	2 U	2 U	2 U	2 U	2 UJ	2 U	46.8	1.55 J	6.53 J-	2 U	20 UJ

Prepared by: WCG 3/29/23
Checked by: JAR 3/30/23

TABLE 5
FALL 2022 GROUNDWATER MONITORING RESULTS
VOLATILE ORGANIC COMPOUNDS

ARCH ROCHESTER
ROCHESTER, NEW YORK

LOCATION:	B-15	B-16	BR-105	BR-105D	BR-106	BR-126	BR-127	BR-5A	BR-6A	BR-7A	BR-8
SAMPLE DATE:	11/15/2022	11/15/2022	11/14/2022	11/14/2022	11/15/2022	11/15/2022	11/14/2022	11/16/2022	11/14/2022	11/18/2022	11/17/2022
QC TYPE:	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS
VOCs By SW-846 Method 8260C (µg/L)											
Chloromethane	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	2.26 J-	2 U	20 UJ
cis-1,2-Dichloroethene	2 U	2 U	3.22	5.04	2 UJ	2 U	1.1 J	2 U	7.63 J-	20.8	20 UJ
cis-1,3-Dichloropropene	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	4 UJ	2 U	20 UJ
Cyclohexane	10 UJ	10 UJ	10 UJ	6.43 J	10 UJ	10 UJ	10 UJ	10 UJ	20 UJ	10 UJ	100 UJ
Dibromochloromethane	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	4 UJ	2 U	20 UJ
Dichlorodifluoromethane	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	4 UJ	2 UJ	20 UJ
Ethylbenzene	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	4 UJ	2 U	20 UJ
Isopropylbenzene	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	4 UJ	2 U	20 UJ
Methyl cyclohexane	2 UJ	2 UJ	2 UJ	4.74 J	2 UJ	2 UJ	2 UJ	2 UJ	4 UJ	2 UJ	20 UJ
Methyl Tertbutyl Ether	2 U	2 U	2 U	2 U	1.23 J-	2 U	2 U	2 U	4 UJ	2 U	20 UJ
Methylene chloride	5 U	5 U	5 U	5 U	5 UJ	5 U	9.14	5 U	45.2 J-	5 U	50 UJ
Styrene	5 U	5 U	5 U	5 U	5 UJ	5 U	5 U	5 U	10 UJ	5 U	50 UJ
Tetrachloroethene	2 U	2 U	2 U	2 U	2 UJ	2 U	2.31	2 U	4 UJ	2 U	20 UJ
Toluene	2 U	2 U	2 U	2 U	2.77 J-	2 U	1.05 J	2 U	157 J-	6.38	144 J-
trans-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	6.94 J-	2 U	20 UJ
trans-1,3-Dichloropropene	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	4 UJ	2 U	20 UJ
Trichloroethene	2 U	2 U	2 U	2 U	2 UJ	2 U	2.93	2 U	18 J-	2 U	20 UJ
Trichlorofluoromethane	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	4 UJ	2 U	20 UJ
Vinyl chloride	2 U	2 U	2 U	2 U	2 UJ	2 U	1.53 J	2 U	321 J-	19.8	20 UJ
Xylene, o	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	4 UJ	2 U	20 UJ
Xylenes (m&p)	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	4.06 J-	2 U	20 UJ

Notes:

U = Compound not detected; value represents sample quantitation limit.

J = Estimated value

J- = Estimated with a potential low bias

µg/L = micrograms per Liter

FS = Field sample

TABLE 5
FALL 2022 GROUNDWATER MONITORING RESULTS
VOLATILE ORGANIC COMPOUNDS

ARCH ROCHESTER
ROCHESTER, NEW YORK

LOCATION:	BR-9	MW-106	MW-127	PW12	PW13	PW14	PW15	PW16	PW17	PZ-101	PZ-102
SAMPLE DATE:	11/17/2022	11/15/2022	11/14/2022	11/16/2022	11/16/2022	11/15/2022	11/16/2022	11/17/2022	11/16/2022	11/17/2022	11/17/2022
QC TYPE:	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS
VOCs By SW-846 Method 8260C (µg/L)											
1,1,1-Trichloroethane	2 U	5 U	2 U	2 U	2 U	20 U	10 U	10 U	2 U	2 U	10 U
1,1,2,2-Tetrachloroethane	2 U	5 U	2 U	2 U	2 U	20 U	10 U	10 U	2 U	2 U	10 U
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)	16.8	5 U	2 U	2 U	1.64 J	20 U	10 U	10 U	2 U	2 U	10 U
1,1,2-Trichloroethane	2 U	5 U	2 U	2 U	2 U	20 U	10 U	10 U	2 U	2 U	10 U
1,1-Dichloroethane	5.94	5 U	2 U	2 U	2.71	20 U	10 U	10 U	2 U	2 U	10 U
1,1-Dichloroethene	2 U	5 U	2 U	2 U	2 U	20 U	10 U	10 U	2 U	2 U	10 U
1,2,3-Trichlorobenzene	5 U	12.5 U	5 U	8.37	5 U	50 U	14.4 J	25 U	5 U	5 U	25 U
1,2,4-Trichlorobenzene	5 U	12.5 U	5 U	39.3	5 U	50 U	63.7	25 U	5 U	5 U	25 U
1,2-Dibromo-3-chloropropane	10 U	25 U	10 U	10 U	10 U	100 U	50 U	50 U	10 U	10 U	50 U
1,2-Dibromoethane	2 U	5 U	2 U	2 U	2 U	20 U	10 U	10 U	2 U	2 U	10 U
1,2-Dichlorobenzene	38	32.1	2 U	3.67	68.6	20 U	10.8	220	1.39 J	2 U	193
1,2-Dichloroethane	2 U	5 U	2 U	2 U	2 U	20 U	10 U	10 U	2 U	2 U	10 U
1,2-Dichloropropane	2 U	5 U	2 U	2 U	2 U	20 U	10 U	10 U	2 U	2 U	10 U
1,3-Dichlorobenzene	9.06	5 U	2 U	18.8	17.2	20 U	15.2	66.9	2 U	2 U	34
1,4-Dichlorobenzene	4.67	5 U	2 U	8.74	10.7	20 U	38.5	11.5	2 U	2 U	15
1,4-Dioxane	10 U	25 U	10 U	10 U	10 U	100 U	50 U	50 U	10 U	10 U	50 U
2-Butanone	10 UJ	25 U	10 U	10 U	10 U	100 UJ	50 U	50 U	10 U	7.07 J	50 U
2-Hexanone	5 UJ	12.5 U	5 U	5 U	5 U	50 UJ	25 U	25 U	5 U	5 U	25 U
4-Methyl-2-pentanone	5 U	12.5 U	5 U	5 U	5 U	50 U	25 U	25 U	5 U	5 U	25 U
Acetic acid, methyl ester	2 UJ	5 UJ	2 UJ	2 UJ	2 UJ	20 UJ	10 UJ	10 UJ	2 UJ	2 UJ	10 UJ
Acetone	10 UJ	25 UJ	10 UJ	10 U	10 U	100 UJ	50 U	50 U	10 U	34.2	50 U
Benzene	4.61	8.92	1 U	0.726 J	5.63	10 U	18.4	13.3	1.12	1 U	19.7
Bromochloromethane	5 U	12.5 U	5 U	5 U	5 U	50 U	25 U	25 U	5 U	5 U	25 U
Bromodichloromethane	2 U	5 U	2 U	2 U	2 U	20 U	10 U	10 U	2 U	2 U	10 U
Bromoform	5 U	12.5 U	5 U	5 U	5 U	50 U	25 U	25 U	5 U	5 U	25 U
Bromomethane	2 UJ	5 U	2 U	2 U	2 U	20 U	10 U	10 U	2 U	2 U	10 U
Carbon disulfide	1.14 J	3.28 J	2 U	2 U	4.71	20 U	88.7	5.12 J	2 U	2 U	25.2
Carbon tetrachloride	2 U	5 U	2 U	2 U	2 U	20 U	42.9	10 U	2 U	2 U	10 U
Chlorobenzene	48.3	184	2 U	30.6	101	20 U	31.2	512	2.4	2 U	429
Chloroethane	2 U	5 U	2 U	2 U	2 U	20 U	10 U	10 U	2 U	2 U	10 U
Chloroform	2 U	5 U	1.58 J	1.01 J	1.34 J	225	568	10 U	1.58 J	2 U	22.8

Prepared by: WCG 3/29/23
Checked by: JAR 3/30/23

TABLE 5
FALL 2022 GROUNDWATER MONITORING RESULTS
VOLATILE ORGANIC COMPOUNDS

ARCH ROCHESTER
ROCHESTER, NEW YORK

LOCATION:	BR-9	MW-106	MW-127	PW12	PW13	PW14	PW15	PW16	PW17	PZ-101	PZ-102
SAMPLE DATE:	11/17/2022	11/15/2022	11/14/2022	11/16/2022	11/16/2022	11/15/2022	11/16/2022	11/17/2022	11/16/2022	11/17/2022	11/17/2022
QC TYPE:	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS
VOCs By SW-846 Method 8260C (µg/L)											
Chloromethane	2 U	5 U	2 U	2 U	2 U	20 U	10 U	10 U	2 U	2 U	10 U
cis-1,2-Dichloroethene	91.9 J-	5 U	2 U	2 U	26.3	20 U	5.1 J	10 U	2 U	2 U	10 U
cis-1,3-Dichloropropene	2 U	5 U	2 U	2 U	2 U	20 U	10 U	10 U	2 U	2 U	10 U
Cyclohexane	10 UJ	25 UJ	10 UJ	10 UJ	10 UJ	100 UJ	50 UJ	50 UJ	10 UJ	10 UJ	50 UJ
Dibromochloromethane	2 U	5 U	2 U	2 U	2 U	20 U	10 U	10 U	2 U	2 U	10 U
Dichlorodifluoromethane	2 UJ	5 U	2 U	2 U	2 U	20 U	10 U	10 UJ	2 U	2 UJ	10 UJ
Ethylbenzene	2 U	5 U	2 U	2.07	2 U	20 U	10 U	10 U	2 U	2 U	10 U
Isopropylbenzene	2 U	5 U	2 U	2 U	2 U	20 U	10 U	10 U	2 U	2 U	10 U
Methyl cyclohexane	1.22 J	5 UJ	2 UJ	2 UJ	2 UJ	20 UJ	10 UJ	10 UJ	2 UJ	2 UJ	10 UJ
Methyl Tertbutyl Ether	2 U	5 U	2 U	2 U	2 U	20 U	10 U	10 U	2 U	2 U	10 U
Methylene chloride	5 U	12.5 U	5 U	5 U	5 U	50 U	18.1 J	25 U	6.29	5 U	25 U
Styrene	5 U	12.5 U	5 U	5 U	5 U	50 U	25 U	25 U	5 U	5 U	25 U
Tetrachloroethene	2 U	5 U	2 U	1.67 J	2 U	21.4	82.3	10 U	2.99	2 U	10 U
Toluene	1.93 J	2.51 J	2 U	10.6	3.71	20 U	22.5	19	2 U	2 U	32.4
trans-1,2-Dichloroethene	2 U	5 U	2 U	2 U	2 U	20 U	10 U	10 U	2 U	2 U	10 U
trans-1,3-Dichloropropene	2 U	5 U	2 U	2 U	2 U	20 U	10 U	10 U	2 U	2 U	10 U
Trichloroethene	2 U	5 U	2 U	2 U	2 U	14.1 J	63.5	10 U	2 U	2 U	10 U
Trichlorofluoromethane	2 U	5 U	2 U	2 U	2 U	20 U	10 U	10 U	2 U	2 U	10 U
Vinyl chloride	79.8 J-	5 U	2 U	2 U	23.4	20 U	8.79 J	10 U	1.03 J	2 U	10 U
Xylene, o	2 U	5 U	2 U	3.76	2 U	20 U	10 U	10 U	2 U	2 U	10 U
Xylenes (m&p)	2 U	5 U	2 U	3.79	2 U	20 U	10 U	10 U	2 U	2 U	10 U

Notes:

U = Compound not detected; value represents sample quantitation limit.

J = Estimated value

J- = Estimated with a potential low bias

µg/L = micrograms per Liter

FS = Field sample

Prepared by: WCG 3/29/23
Checked by: JAR 3/30/23

TABLE 5
FALL 2022 GROUNDWATER MONITORING RESULTS
VOLATILE ORGANIC COMPOUNDS

ARCH ROCHESTER
ROCHESTER, NEW YORK

LOCATION:	PZ-103	PZ-104	PZ-105	PZ-106	PZ-107
SAMPLE DATE:	11/17/2022	11/15/2022	11/14/2022	11/15/2022	11/16/2022
QC TYPE:	FS	FS	FS	FS	FS
VOCs By SW-846 Method 8260C (µg/L)					
1,1,1-Trichloroethane	10 U	2 U	2 UJ	200 U	400 U
1,1,2,2-Tetrachloroethane	10 U	2 U	2 UJ	200 U	400 U
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)	10 U	2 U	2 UJ	200 U	400 U
1,1,2-Trichloroethane	10 U	2 U	2 UJ	200 U	400 U
1,1-Dichloroethane	10 U	2 U	2 UJ	200 U	400 U
1,1-Dichloroethene	10 U	2 U	2 UJ	200 U	400 U
1,2,3-Trichlorobenzene	25 U	5 U	5 UJ	500 U	1,000 U
1,2,4-Trichlorobenzene	25 U	5 U	5 UJ	500 U	1,000 U
1,2-Dibromo-3-chloropropane	50 U	10 U	10 UJ	1,000 U	2,000 U
1,2-Dibromoethane	10 U	2 U	2 UJ	200 U	400 U
1,2-Dichlorobenzene	441	2 U	4.18 J-	200 U	400 U
1,2-Dichloroethane	10 U	2 U	2 UJ	200 U	400 U
1,2-Dichloropropane	10 U	2 U	2 UJ	200 U	400 U
1,3-Dichlorobenzene	112	2 U	2 UJ	200 U	400 U
1,4-Dichlorobenzene	73.4	2 U	1.28 J-	200 U	400 U
1,4-Dioxane	50 U	10 U	10 UJ	1,000 U	2,000 U
2-Butanone	50 U	10 U	10 UJ	1,000 U	2,000 U
2-Hexanone	25 U	5 U	5 UJ	500 U	1,000 U
4-Methyl-2-pentanone	25 U	5 U	5 UJ	500 U	1,000 U
Acetic acid, methyl ester	10 UJ	2 UJ	2 UJ	200 UJ	400 UJ
Acetone	50 U	10 UJ	10 UJ	1,000 UJ	2,000 U
Benzene	15.3	0.901 J	6.08 J-	100 U	200 U
Bromochloromethane	25 U	5 U	5 UJ	500 U	1,000 U
Bromodichloromethane	10 U	2 U	2 UJ	200 U	400 U
Bromoform	25 U	5 U	5 UJ	500 U	1,000 U
Bromomethane	10 U	2 U	2 UJ	200 U	400 U
Carbon disulfide	29.7	2 U	1.64 J-	263	1,400
Carbon tetrachloride	10 U	2 U	2 UJ	200 U	400 U
Chlorobenzene	547	3.78	59.1 J-	200 U	400 U
Chloroethane	10 U	2 U	2 UJ	200 U	400 U
Chloroform	10 U	2.18	2 UJ	6,280	25,600

Prepared by: WCG 3/29/23
Checked by: JAR 3/30/23

TABLE 5
FALL 2022 GROUNDWATER MONITORING RESULTS
VOLATILE ORGANIC COMPOUNDS

ARCH ROCHESTER
ROCHESTER, NEW YORK

LOCATION:	PZ-103	PZ-104	PZ-105	PZ-106	PZ-107
SAMPLE DATE:	11/17/2022	11/15/2022	11/14/2022	11/15/2022	11/16/2022
QC TYPE:	FS	FS	FS	FS	FS
VOCs By SW-846 Method 8260C (µg/L)					
Chloromethane	10 U	2 U	2 UJ	200 U	400 U
cis-1,2-Dichloroethene	10 U	2 U	2 UJ	181 J	959
cis-1,3-Dichloropropene	10 U	2 U	2 UJ	200 U	400 U
Cyclohexane	50 UJ	10 UJ	10 UJ	1,000 UJ	2,000 UJ
Dibromochloromethane	10 U	2 U	2 UJ	200 U	400 U
Dichlorodifluoromethane	10 UJ	2 U	2 UJ	200 U	400 U
Ethylbenzene	10 U	2 U	2 UJ	200 U	400 U
Isopropylbenzene	10 U	2 U	2 UJ	200 U	400 U
Methyl cyclohexane	10 UJ	2 UJ	2 UJ	200 UJ	400 UJ
Methyl Tertbutyl Ether	10 U	2 U	2 UJ	200 U	400 U
Methylene chloride	25 U	5 U	5 UJ	500 U	3,890
Styrene	25 U	5 U	5 UJ	500 U	1,000 U
Tetrachloroethene	10 U	2 U	2 UJ	214	1,200
Toluene	38.2	2 U	2 UJ	200 U	332 J
trans-1,2-Dichloroethene	10 U	2 U	2 UJ	200 U	400 U
trans-1,3-Dichloropropene	10 U	2 U	2 UJ	200 U	400 U
Trichloroethene	10 U	1.05 J	2 UJ	394	318 J
Trichlorofluoromethane	10 U	2 U	2 UJ	200 U	400 U
Vinyl chloride	10 U	2 U	2 UJ	572	635
Xylene, o	10 U	2 U	2 UJ	200 U	400 U
Xylenes (m&p)	10 U	2 U	2 UJ	200 U	400 U

Notes:

U = Compound not detected; value represents sample quantitation limit.

J = Estimated value

J- = Estimated with a potential low bias

µg/L = micrograms per Liter

FS = Field sample

Prepared by: WCG 3/29/23
Checked by: JAR 3/30/23

TABLE 6
Surface Water Sampling Analytical

CHLOROPYRIDINES - Fall 2022

ARCH ROCHESTER
ROCHESTER, NEW YORK

LOCATION:	QD-1		QO-2		QO-2S1		QS-4	
SAMPLE DATE:	11/18/2022		11/18/2022		11/18/2022		11/18/2022	
QC TYPE:	FS		FS		FS		FS	
SELECTED CHLOROPYRIDINES BY SW-846 Method 8270D (µg/L)								
2,6-Dichloropyridine	9.52	U	9.5	U	9.62	U	6.91	J
2-Chloropyridine	9.52	U	9.5	U	9.62	U	11.9	
3-Chloropyridine	9.52	U	9.5	U	9.62	U	9.58	U
4-Chloropyridine	9.52	U	9.5	U	9.62	U	9.58	U
p-Fluoroaniline	9.52	U	9.5	U	9.62	U	9.58	U
Pyridine	9.52	UJ	9.5	UJ	9.62	UJ	9.58	UJ

Notes:

U = Compound not detected; value represents sample quantitation limit.

J = Estimated value

µg/L = micrograms per Liter

Prepared by: WCG 3/29/23
Checked by: JAR 3/30/23

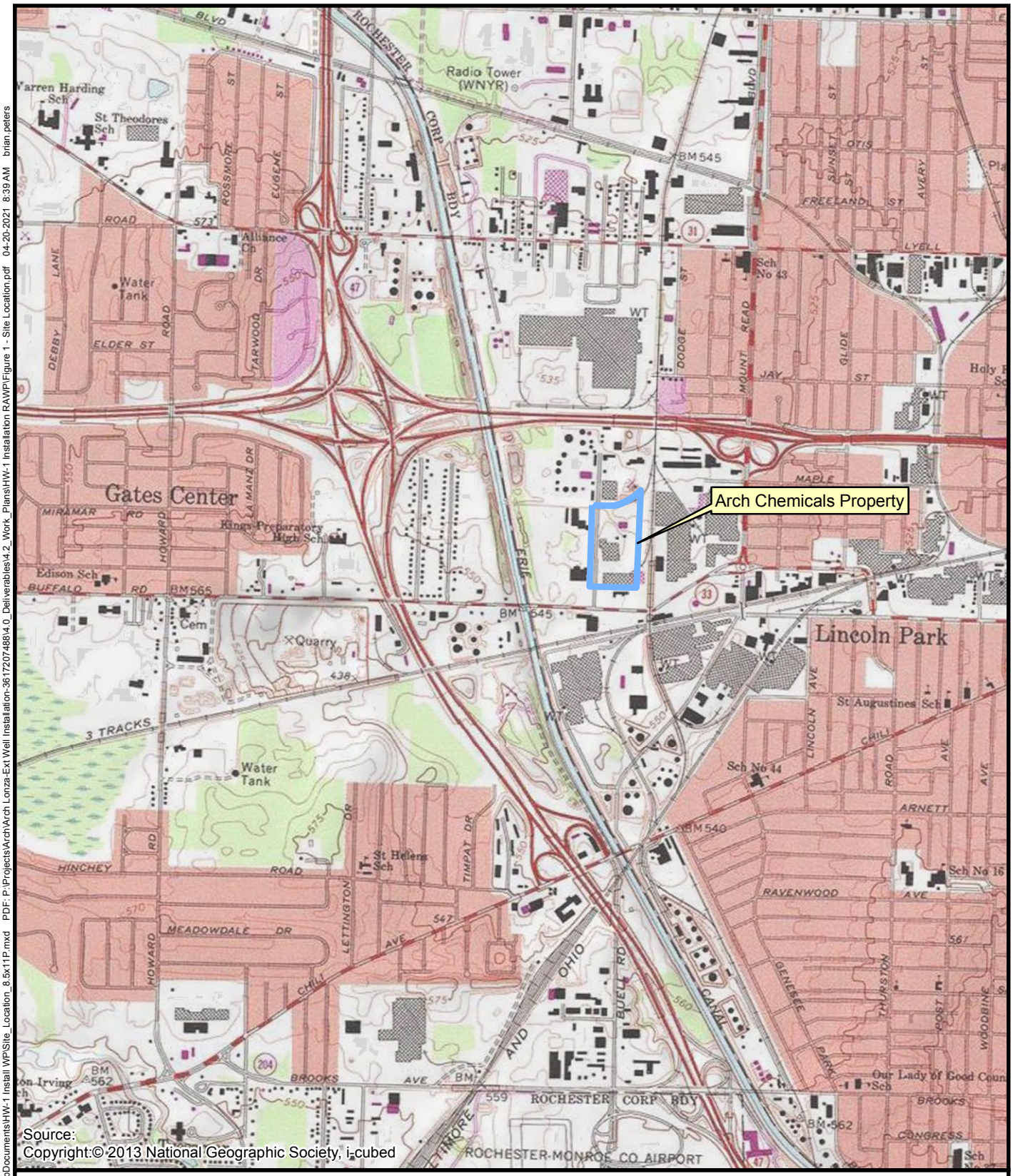
TABLE 7
2023 SAMPLING SCHEDULE
ARCH CHEMICALS, INC.
ROCHESTER, NEW YORK

Table 7 : Monitoring Schedule 2023

ARCH CHEMICALS, INC.						**2023**					
MONITORING PROGRAM						**SPRING**		**FALL**		**TOTAL**	
	Well	***zone***	***area***	***Frequency/Parameters***	***Purpose***	***Pyridines***	***VOCs***	***Pyridines***	***VOCs***	***Pyridines***	***VOCs***
OFF-SITE	BR-105	BR	RG&E ROW	semi-annual monitoring, VOCs & PYR	perimeter sentinel/trend monitoring	1	1	1	1	2	2
MONITORING	BR-105D	BR deep	RG&E ROW	semi-annual monitoring, VOCs & PYR	perimeter sentinel/trend monitoring	1	1	1	1	2	2
	MW-106	OB	AID-HOSP	semi-annual monitoring, VOCs & PYR	perimeter sentinel/trend monitoring	1	1	1	1	2	2
	BR-106	BR	AID-HOSP	semi-annual monitoring, VOCs & PYR	perimeter sentinel/trend monitoring	1	1	1	1	2	2
	BR-112D	BR deep	NYSDOT	annual monitoring, PYR	trend monitoring	1				1	0
	BR-113D	BR deep	NYSDOT	annual monitoring, PYR	trend monitoring	1				1	0
	MW-114	OB	Irish Propane	annual monitoring, VOCs & PYR	trend monitoring	1	1			1	1
	BR-114	BR	Irish Propane	annual monitoring, VOCs & PYR	trend monitoring	1	1			1	1
	BR-117D	BR deep	QUARRY	annual monitoring, PYR	trend monitoring	1				1	0
	BR-118D	BR deep	QUARRY	annual monitoring, PYR	trend monitoring	1				1	0
	BR-122D	BR deep	QUARRY	annual monitoring, PYR	trend monitoring	1				1	0
	BR-123D	BR deep	QUARRY	annual monitoring, PYR	trend monitoring	1				1	0
	PZ-101	BR	AID-HOSP	semi-annual monitoring, VOCs & PYR	perimeter sentinel/trend monitoring	1	1	1	1	2	2
	PZ-102	BR	AID-HOSP	semi-annual monitoring, VOCs & PYR	perimeter sentinel/trend monitoring	1	1	1	1	2	2
	PZ-103	BR	AID-HOSP	semi-annual monitoring, VOCs & PYR	perimeter sentinel/trend monitoring	1	1	1	1	2	2
ON-SITE	PZ-104	BR	ON-SITE	semi-annual monitoring, VOCs & PYR	perimeter sentinel/trend monitoring	1	1	1	1	2	2
MONITORING	PZ-105	BR	ON-SITE	semi-annual monitoring, VOCs & PYR	trend monitoring	1	1	1	1	2	2
	PZ-106	BR	ON-SITE	semi-annual monitoring, VOCs & PYR	trend monitoring	1	1	1	1	2	2
	PZ-107	BR	ON-SITE	semi-annual monitoring, VOCs & PYR	perimeter sentinel/trend monitoring	1	1	1	1	2	2
	BR-126	BR	ON-SITE	semi-annual monitoring, VOCs & PYR	trend monitoring	1	1	1	1	2	2
	BR-127	pumping well	ON-SITE	semi-annual monitoring, VOCs & PYR	mass removal/trend monitoring	1	1	1	1	2	2
	BR-3	BR	ON-SITE	annual monitoring, VOCs & PYR	trend monitoring	1	1			1	1
	BR-8	BR	ON-SITE	semi-annual monitoring, VOCs & PYR	trend monitoring	1	1	1	1	2	2
	BR-9	pumping well	ON-SITE	semi-annual monitoring, VOCs & PYR	mass removal/trend monitoring	1	1	1	1	2	2
	BR-5A	BR	ON-SITE	semi-annual monitoring, VOCs & PYR	trend monitoring	1	1	1	1	2	2
	BR-6A	BR	ON-SITE	semi-annual monitoring, VOCs & PYR	trend monitoring	1	1	1	1	2	2
	BR-7A	pumping well	ON-SITE	semi-annual monitoring, VOCs & PYR	mass removal/trend monitoring	1	1	1	1	2	2
	B-16	OB	ON-SITE	semi-annual monitoring, VOCs & PYR	continue until replaced by trench	1	1	1	1	2	2
	B-17	OB	ON-SITE	annual monitoring, VOCs & PYR	trend monitoring	1	1			1	1
	B-7	OB	ON-SITE	annual monitoring, VOCs & PYR	trend monitoring	1	1			1	1
	B-15	OB	ON-SITE	semi-annual monitoring, VOCs & PYR	perimeter sentinel/trend monitoring	1	1	1	1	2	2
	E-3	OB	ON-SITE	annual monitoring, VOCs & PYR	trend monitoring	1	1			1	1
	MW-127	OB	ON-SITE	semi-annual monitoring, VOCs & PYR	perimeter sentinel/trend monitoring	1	1	1	1	2	2
	PW10	OB/BR	ON-SITE	semi-annual monitoring, VOCs & PYR	abandoned spring 2021- no longer in use						
	PW12	BR	ON-SITE	semi-annual monitoring, VOCs & PYR	trend monitoring	1	1	1	1	2	2
	PW13	pumping well	ON-SITE	semi-annual monitoring, VOCs & PYR	mass removal/trend monitoring	1	1	1	1	2	2
	PW14	OB/BR	ON-SITE	semi-annual monitoring, VOCs & PYR	trend monitoring	1	1	1	1	2	2
	PW15	pumping well	ON-SITE	semi-annual monitoring, VOCs & PYR	mass removal/trend monitoring	1	1	1	1	2	2
	PW16	pumping well	ON-SITE	semi-annual monitoring, VOCs & PYR	mass removal/trend monitoring	1	1	1	1	2	2
	PW17	pumping well	ON-SITE	semi-annual monitoring, VOCs & PYR	mass removal/trend monitoring	1	1	1	1	2	2
QUARRY/CANAL	QS-4	quarry seep	QUARRY	semi-annual monitoring, PYR	trend monitoring	1		1		2	0
MONITORING	QD-1	quarry ditch	DITCH	semi-annual monitoring, PYR	trend monitoring	1		1		2	0
	QO-2	quarry outfall	DITCH	semi-annual monitoring, PYR	trend monitoring	1		1		2	0
	QO-2S1	canal at outfall	CANAL	semi-annual monitoring, PYR	surface water monitoring	1		1		2	0
TOTAL SAMPLES						43	33	31	27	74	60

Notes:
RG&E ROW = Rochester Gas and Electric Right of Way
N/F = now or formerly
AID-HOSP = Aid to Hospitals
NYSDOT = New York State Department of Transportation
On-site Well PW17 was taken out of service as a pumping well October 2022

FIGURES



Legend

Arch Property Boundary

0 1,000 2,000 Feet

N

Figure 1.1 Site Location Map

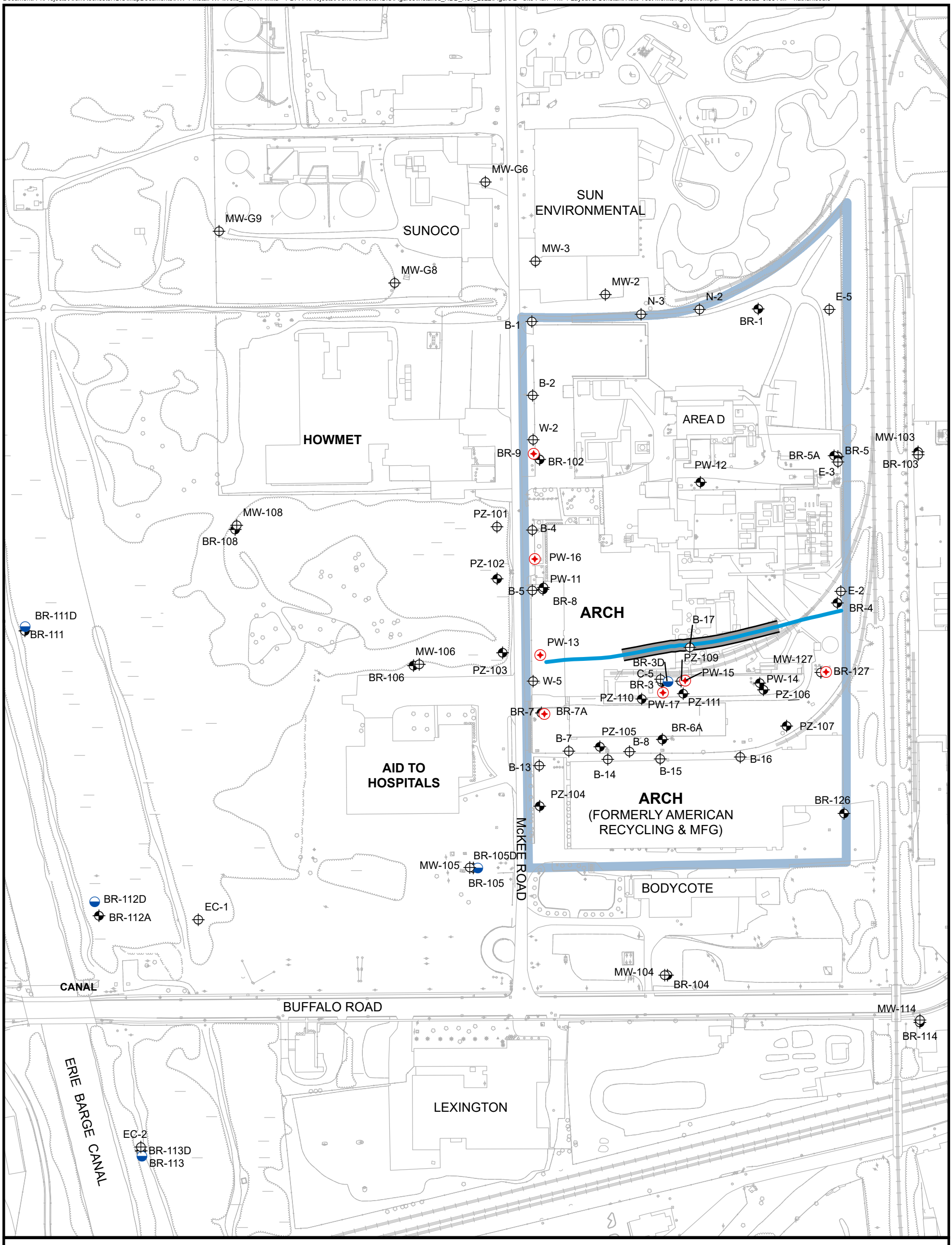
MACTEC

Prepared/Date: BRP 04-20-21 | Checked/Date: NMB 04-20-21

Arch Chemicals
Rochester, New York

Document: P:\Projects\Arch\Rochester\GIS\MapDocuments\HW-1 Install WP\Site_Location_8.5x11P.mxd PDF: P:\Projects\Arch\Arch Lonza-Ext Well Installation-36172074881\4.0_Deliverables\4.2_Work_Plans\HW-1 Installation RAWP\Figure 1 - Site Location.pdf 04-20-2021 8:39 AM brian.peters

Document: P:\Projects\Arch\Rochester\GIS\MapDocuments\HW-1 Install WP\Wells_11x17P.mxd PDF: P:\Projects\Arch\Rochester\GIS\Figures\Installed_HDD_Nov_2022\Figure 2 - Site Plan - Hw-1 Layout & Constant Rate Test Monitoing Network.pdf 12-12-2022 9:36 AM nathan.soule



Legend

- Existing Extraction Well
- Overburden Monitoring Well
- Bedrock Monitoring Well
- Deep Bedrock Monitoring Well
- Installed HGEW Borehole and Well
- Approximate HGEW Well Screen Interval
- Property Owned by Arch

Figure 2.1
Site Plan and Onsite Monitoring Network

Arch Chemicals
Rochester, NY

MACTEC

Prepared/Date: RJO 12-12-22	Checked/Date: AH 1-6-23

Legend

Property Owned by Arch Chemicals, Inc.

Monitoring Well

NOTES

1. Source - Topographic Quadrangle 7.5-Minute Series

N

0 250 500 Feet

MACTEC

Prepared/Date: NES 04/10/23	Checked/Date: NMB 04/10/23

I-390

ERIE BARGE CANAL

ALCOA

ARCH

BUFFALO RD. BUSINESS CENTER

MW-103/BR-103

MW-108/BR-108

PZ-102

BR-111/BR-111D

BR-106/MW-106

PZ-103

MW-16

AID TO HOSPITALS

BR-126

BR-112A/BR-112D

MW-105/BR-105

MW-104/BR-104

BUFFALO ROAD

MW-114/BR-114

12-6

CUMBERLAND FARMS PETROLEUM TERMINAL

OW-105

NESS-W

NESS-E

BR-113/BR-113D

8-8

7-6

11-8

LEXINGTON

GENERAL RAIL SIGNAL CO.

9-6

RW-1

10-6

13-4

OW-102A

OW-103

Morey

BR-122D

PFAUDLER

HOWARD ROAD

DOLOMITE PRODUCTS QUARRY

BR-117/BR-117D

BR-121D (Abandoned)

BR-118/BR-118D

BR-123D

ERIE BARGE CANAL

I-390

BR-116/BR-116D

BR-120D (Abandoned)

BR-119D (Abandoned)

BR-124D

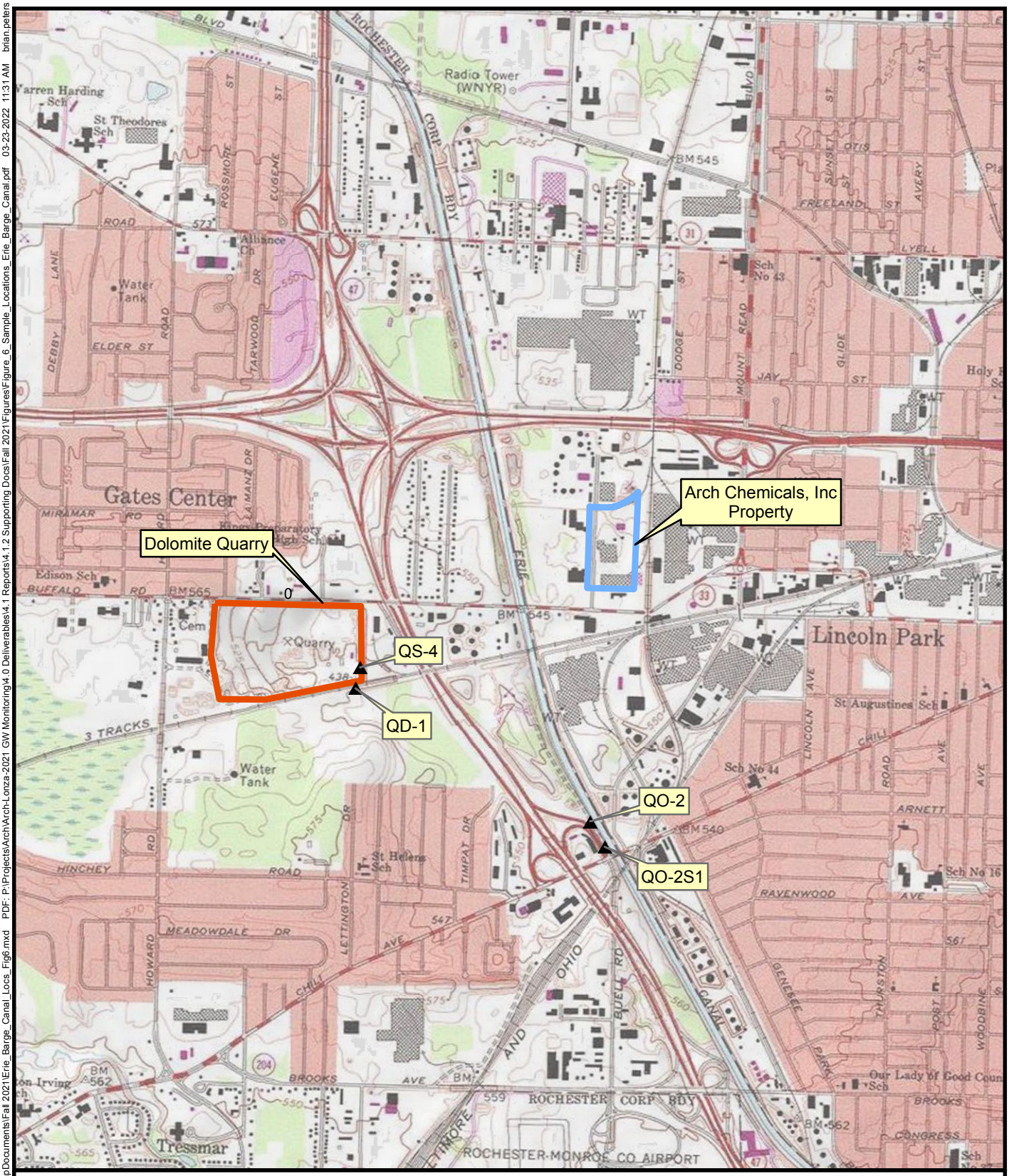
LETTINGTON DRIVE

Figure 2.2

Off-Site Groundwater Monitoring Well Locations

Arch Chemicals, Inc.
Rochester, NY

Document: P:\Projects\Arch\Rochester\GIS\MapDocuments\Fall 2022\Arch_OffsiteWells_Fig1.mxd PDF: P:Projects\Arch\Arxada Rochester 2022 GW Monitoring-36162261971\4.0_Deliverables\4.1_Reports\4.1.2 Supporting Docs\Fall 2022\Figures\Figure_1_Off_Site_Loc.pdf 4/10/2023 10:26 AM nathan.soule


Arch Chemicals, Inc Property
Dolomite Quarry
QS-4
QD-1
QO-2
QO-2S1
Gates Center
Lincoln Park
Tressmar
Radio Tower (WNYR)
Quarry
Water Tank
ROCHESTER-MONROE CO AIRPORT
ROCHESTER CORP BDY
3 TRACKS
Topographic map: Copyright:© 2013 National Geographic Society, i-cubed
0 1,000 2,000 Feet
N
Legend
Arch Chemicals, Inc. Property
Dolomite Quarry Boundary
Surface Water Sample Location
Figure 2.3
Off-Site Surface Water Sampling Locations
Arch Chemicals, Inc.
Rochester, NY
MACTEC
Prepared/Date: BRP 03-23-22
Checked/Date: JAR 03-28-23
Document: P:\Projects\Arch\Rochester\GIS\MapDocuments\Fall 2021\Erie_Barge_Canal_Locs_Fig6.mxd PDF: P:\Projects\Arch\Arch-Lonza-2021 GW Monitoring\4.0 Deliverables\4.1 Reports\4.1.2 Supporting Docs\Fall 2021\Figures\Figure_6_Sample_Locations_Erie_Barge_Canal.pdf 03-23-2022 11:31 AM brian.peters

A

A'

Approximate Warehouse Footprint

Western Loading Dock

Elevation Western Port: 537.2

Steel Vault

PW-13

BP-1

BP-2

B-17

BP-5

BP-6

BR-4

Elevation Eastern Port: 537.1

Steel Vault

Typical Static Water Level

Overburden:
Reworked Native fill overlying native unconsolidated sediment
Primarily Sand to Sandy Silt

Elevation Western End of Screen: 517.0

Elevation Eastern End of Screen: 519.5

Elevation Center of Screened Interval: 515.1

Dolomite Bedrock:
Upper bedrock is weathered with primarily near-horizontal fracturing With depth, Bedrock generally contains less fractures and becomes more competent

Elevation, Feet (AMSL)

550 545 540 535 530 525 520 515 510 505 500 495 490 485 480 475 470

0 25 50 75 100 125 150 175 200 225 250 275 300 325 350 375 400 425 450 475 500 525 550 575 600 625 650 675 700 725 750

Horizontal
Distance Along Transect (ft)

Notes:

HW-1 well location and screened interval shown are approximate See well construction details and Directional Data Report for final construction details

Soil Boring and monitoring well construction is shown at approximate locations

Schematic has 5 times vertical exaggeration

Static water level elevation represents typical site conditions

Legend:

- Typical static water level
- Inferred Overburden/bedrock interface
- Bedrock Monitoring or Extraction Well with open borehole
- Overburden Monitoring well with screened interval
- Soil Boring
- Approximate HW-1 borehole
- Approximate HW-1 well screen interval

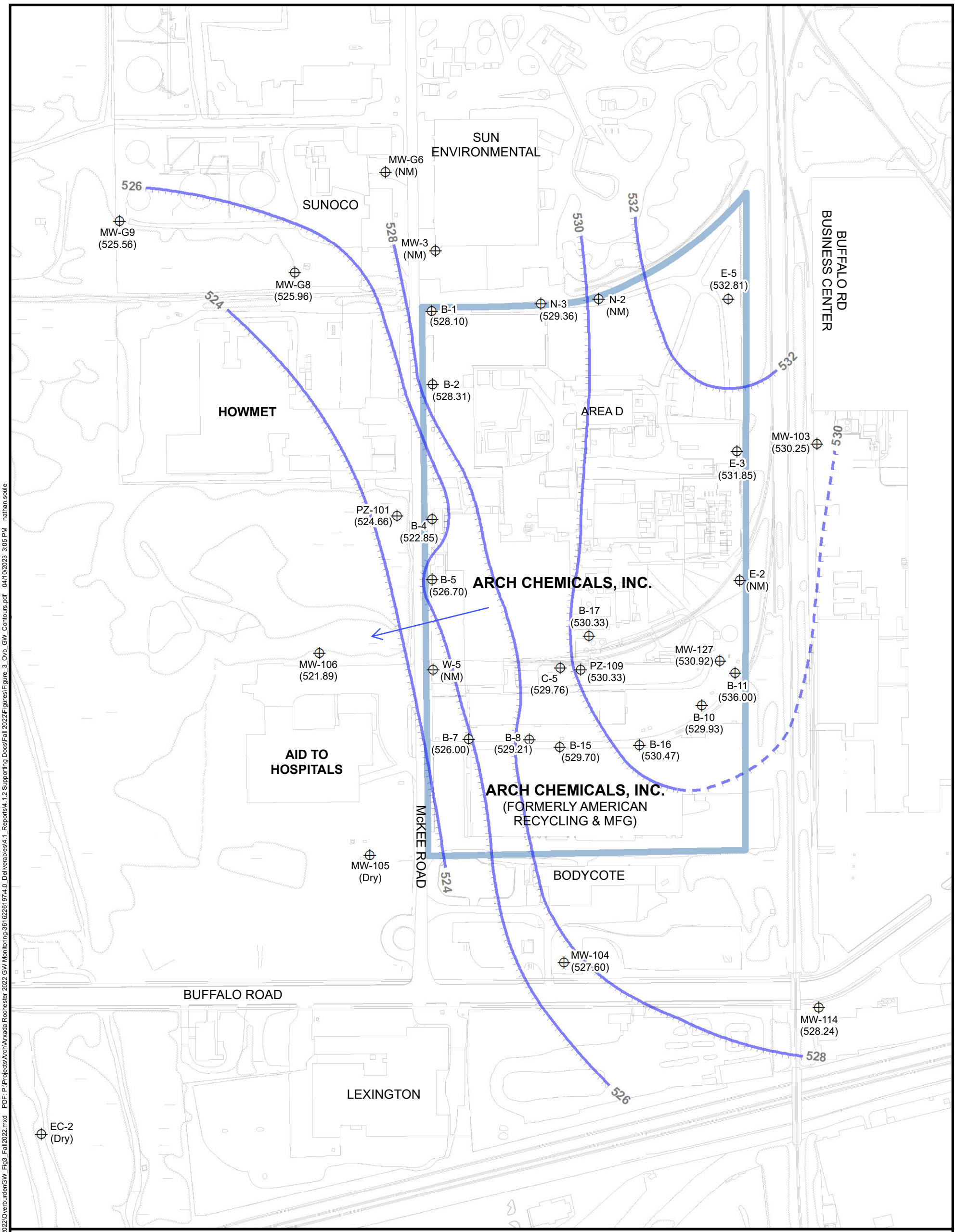
Prepared/Date: RJO 12/1/22
Checked/Date: AH 1/6/23

Arch Chemicals
Rochester, New York
Project 3616226199

MACTEC

Figure 2.4: Conceptualized Geologic Cross Section with HGEW
ISMP May 2023

HW-1Schematic-ArchRochesterb.ai



NOTES:
1. Water Levels Measured on November 10, 2022
2. Dashed Contours Reflect Uncertainty
3. NM = Not Measured

Legend

MW-104 (527.60) — Piezometric Elevation (Feet MSL) at Well or Piezometer

Property Owned by Arch Chemicals, Inc.

Interpreted Groundwater Flow Direction

528 — Overburden Piezometric Elevation Contour (Feet MSL)

0 100 200 Feet

N

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Prepared/Date: NES 04/10/23 | Checked/Date: NMB 04/10/23

Figure 2.5
Fall 2022
Overburden Groundwater Potentiometric Contours

Arch Chemicals, Inc.
Rochester, NY

SUNOCO
SUN ENVIRONMENTAL
BUFFALO RD BUSINESS CENTER
BR-1 (529.54)
526
528
530
522
HOWMET
515
AREA D
BR-9 (497.65)
BR-102 (DRY)
BR-5A (530.75)
BR-5 (530.46)
BR-103 (530.80)
BR-108 (511.61)
PW-12 (530.58)
PW-16 (NM)
N/F GENERAL CIRCUITS
PZ-102 (521.18)
BR-8 (526.83)
ARCH CHEMICALS INC.
BR-111 (511.04)
PZ-103 (525.39)
BR-4 (527.12)
BR-106 (512.09)
PW-13 (NM)
BR-3 (NM)
PW-14 (527.13)
BR-127 (530.48)
PZ-110 (NA)
PW-15 (NM)
PZ-106 (527.72)
BR-7 (520.70)
BR-7A (512.27)
PW-17 (NM)
PZ-107 (530.39)
BR-6A (528.23)
AID TO HOSPITALS
PZ-105 (526.06)
ARCH CHEMICALS, INC.
(FORMERLY AMERICAN RECYCLING & MFG)
BR-126 (527.53)
PZ-104 (NM)
McKEE ROAD
BR-105 (513.23)
BODYCOTE
BR-112A (NM)
BR-104 (525.73)
CANAL (507.32)
BUFFALO ROAD
BR-114 (525.35)
N/F IRISH PROPANE
ERIE BARGE CANAL
LEXINGTON
BR-113 (511.12)

Document: P:\Projects\Arch\Rochester\GIS\MapDocuments\Fall 2022\Figures\Figure_4_Bdrk_GW_Contours.pdf 04/11/2023 1:27 PM nathan.soule
PDF: P:\Projects\Arch\Arxada Rochester 2022 GW Monitoring-361622619\4.0_Deliverables\4.1_Reports\4.1.2 Supporting Docs\Fall 2022\BedrockGW_Fig4_Fall2022.mxd

Legend

BR-114 (525.35) Piezometric Elevation (Feet MSL) at Well or Piezometer

Interpreted Groundwater Flow Direction

516 Bedrock Piezometric Elevation Contour (Feet MSL)

0 150 300 Feet

N

NOTES:

1. Water Levels Measured on November 10, 2022
2. Dashed Contours Reflect Uncertainty

MACTEC

Prepared/Date: NES 04/11/23	Checked/Date: NMB 04/11/23

Figure 2.6
Fall 2022
Bedrock Groundwater Potentiometric Contours

Arch Chemicals, Inc.
Rochester, NY

Legend

- Bedrock Well ('D' Designates Deep Well)
- 500 — Deep Bedrock Elevation Contour (MSL)
- Interpreted Groundwater Flow Direction
- Property Owned by Arch Chemicals, Inc.
- BR-116D (510.02) Piezometric Elevation (Feet MSL) at Deep Bedrock Well

NOTES:

1. Water Levels Measured on November 10, 2022
2. Dashed Contours Reflect Uncertainty
3. Wells BR-105D, BR2D and BR-3D not used in contouring

0 250 500 Feet

N

MACTEC

Prepared/Date: NES 04/10/23
Checked/Date: NMB 04/10/23

I-390

ERIE BARGE CANAL

HOWMET

ARCH

BR-2D (537.26)

BR-3D (537.02)

BUFFALO RD. BUSINESS CENTER

AID TO HOSPITALS

BR-105D (511.11)

BR-112D (511.01)

BUFFALO ROAD

CUMBERLAND FARMS PETROLEUM TERMINAL

NESS-W (NM)

NESS-E (NM)

LEXINGTON

BR-113D (511.02)

GENERAL RAIL SIGNAL CO.

DOLOMITE PRODUCTS QUARRY

BR-122D (506.62)

PFAUDLER

BR-117D (498.91)

BR-118D (500.33)

BR-123D (507.62)

BR-116D (505.27)

BR-124D (503.95)

LETTINGTON DRIVE

500 502 504 506 508 510

Figure 2.7
Fall 2022
Deep Bedrock Groundwater Potentiometric Contours

Arch Chemicals, Inc.
Rochester, NY

Document: P:\Projects\Arch\Rochester\GIS\MapDocuments\Fall 2022\Deep_BedrockGW_Fig5_Fall2022.mxd PDF: P:\Projects\Arch\Arxada Rochester 2022 GW Monitoring-361622619 7\4.0_Deliverables\4.1_Reports\4.1.2 Supporting Docs\Fall 2022\Figures\Figure_5_Deep_Bdrk_GW_Contours.pdf 04/10/2023 12:19 PM nathan.soule

X:\US\USPWM100-PLD2\Project\Projects\Arch\Rochester\GIS\MapDocuments\ISMP2023 PDF:X:\US\USPWM100-PLD2\Project\Projects\Arch\Arch 2023 Remediation-3616236234\4.0_Deliverables\4.2_Work_Plans\ISMP\figures 10/3/2023 12:53 PM ryan.ordung

Soil Cleanup Objectives (SCOs) (ppm)		
Benzo(a)pyrene	1.0	Restricted Industrial
Indeno(1,2,3-cd)Pyrene	11	Restricted Industrial
Mercury	5.7	Restricted Industrial

SS-117
Mercury - 7.2 ppm

SS-103
Mercury - 214 ppm

SS-111
Benzo(a)pyrene - 4 J ppm

SS-104
Benzo(a)pyrene - 1.1 ppm

SS-110
Benzo(a)pyrene - 27 ppm
Indeno(1,2,3-cd)Pyrene - 15 ppm

SS-106
SS-115
SS-114
SS-105
SS-116
SS-103
SS-117
SS-111
SS-104
SS-108
SS-113
SS-112
SS-110
SS-102
SS-101
SS-109
SS-107

Note:
Surface Soil Locations and exceedances are sourced from remedial investigations completed between 1994-1997. Locations are approximate and surface cover types may have been changed in some locations since sampling occurred.

N
0 100 200 Feet

Legend:
- Surface Soil Sample Location
- Site Features
- Property Boundary Subject to ROD
- Crushed Stone or Gravel
- Landscaping
- Pavement or Buildings

Prepared/Date: RJO 10-3-23 | Checked/Date: NMB 12-18-23

Figure 2.8
Historic Surface Soil Sample Results Exceeding SCOs
Remedial Investigation Reports 1994-1997

Arch Chemicals
Rochester, NY

X:\US\USPWM100-PLD2\Project\Projects\Arch\Rochester\GIS\MapDocuments\ISMP2023 PDF:X:\US\USPWM100-PLD2\Project\Projects\Arch\Arch 2023 Remediation-3616236234\4.0_Deliverables\4.2_Work_Plans\ISMP\figures 10/3/2023 12:53 PM ryan.ordung

Soil Cleanup Objectives (SCOs) (mg/kg)		
1,1-Dichloroethene (1,1-DCE)	0.33	Groundwater Protection
Chloroform	0.37	Groundwater Protection
Carbon Tetrachloride	0.76	Groundwater Protection
Methylene Chloride (MeCl)	0.05	Groundwater Protection
Trichlorethene (TCE)	0.47	Groundwater Protection
Tetrachloroethene (PCE)	1.3	Groundwater Protection
Benzo(a)pyrene	1.0	Restricted Industrial
2-Chloropyridine	0.9	March 2002 ROD
3-Chloropyridine	0.8	March 2002 ROD

T-141

SB-2
Benzo(a)pyrene - 5.1 ppm

T-121
T-119
T-106
T-120
T-122
T-124
SB-2
T-123
T-128
T-132
T-130
T-131
T-153
T-161
T-129
T-160
T-158
T-152
T-135
T-134
T-133
T-159
T-139
T-137
T-138
T-151
T-136
T-140

T-135	12 ft	12 ft	18 ft
MeCl	0.89	2.4 J	ND
Acetone	NA	0.3	NA
Chloroform	1.4	2.3 J	380
Carbon Tetrachloride	ND	ND	4,200
TCE			73
PCE			520
4-chloropyridine	ND	ND	1,100
3-chloropyridine	2.8	ND	ND
2-chloropyridine	75	3.5	300
2,6-Dichloropyridine			170

T-152	4 ft
Chloroform	0.57 J
2,6-Dichloropyridine	14
2-chloropyridine	12 to 20
3-chloropyridine	2.9

T-136	10 ft
MeCl	2.8
1,1-DCE	0.91
Chloroform	1.0
2-chloropyridine	67

T-133	14 ft
MeCl	0.35
Chloroform	5.8
Chloropyridines	47.9

T-151	8 ft
MeCl	0.22
Chloroform	0.66
2,6-dichloropyridine	9.5
2-chloropyridine	51

T-134	4 ft	12 ft
1-1-DCE	ND	1.5
Chloroform	ND	3.0
Carbon Tetrachoride	1.2	9.2
Chloropyridines (Tot)	42	56.8

Note:
Sub-Surface Soil Locations and exceedances are sourced from remedial investigations completed between 1994-1997. Locations are approximate and surface cover types may have been changed in some locations since sampling occured.

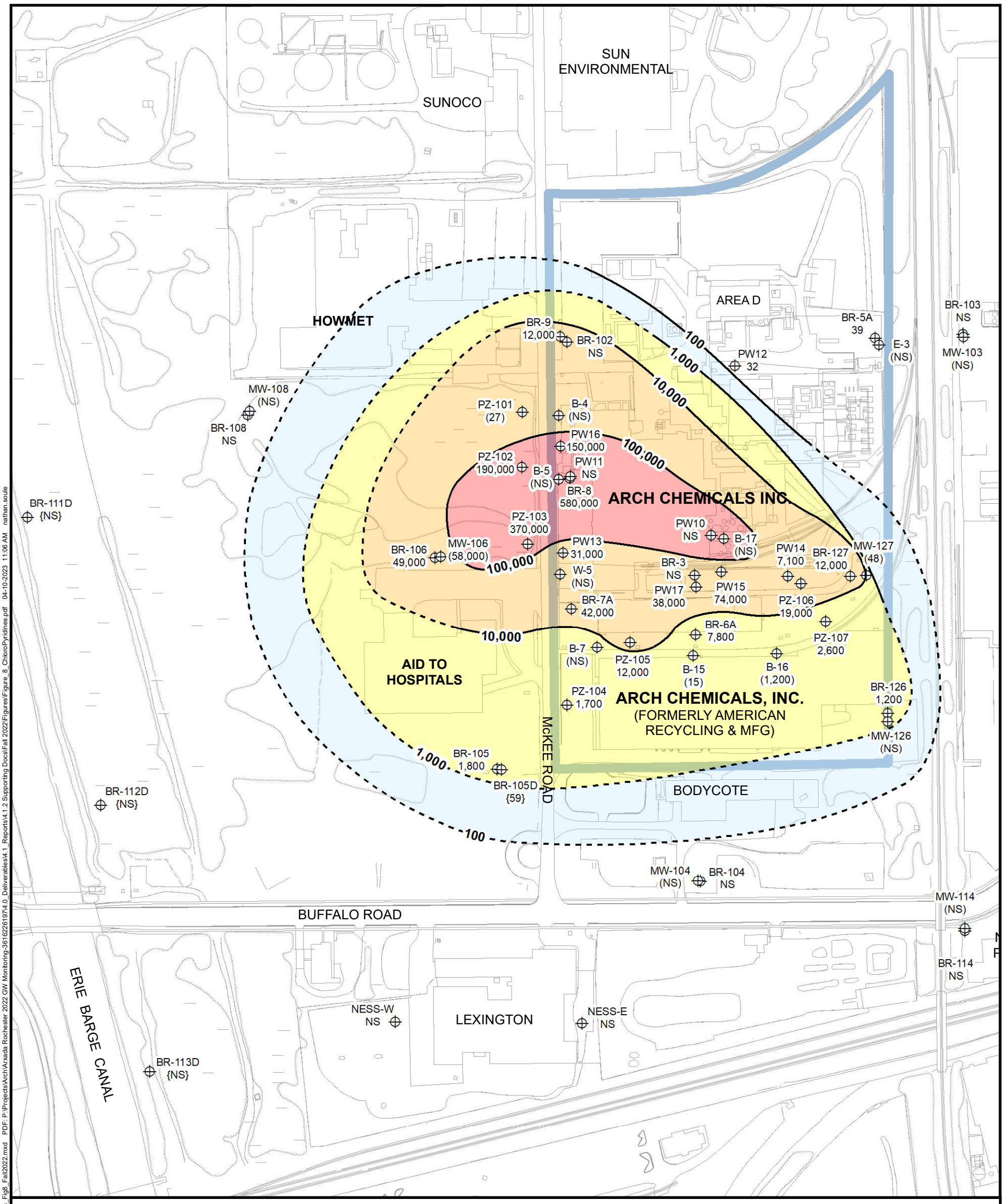
Legend:
- Sub-Surface Soil Borings
- Site Features
- Property Boundary Subject to ROD
- Crushed Stone or Gravel
- Landscaping
- Pavement or Buildings

N
0 100 200 Feet

Prepared/Date: RJO 10-3-23 | Checked/Date: NMB 12-18-23

Figure 2.9
Historic Sub-Surface Soil Sample Results
Exceeding SCOs
Remedial Investigation Reports 1994-1997

Arch Chemicals
Rochester, NY



Legend

MW-106 (58,000) — Monitoring Location with Concentration

Property Owned by Arch Chemicals, Inc.

100 — Chloropyridine Concentration Contour

{1000} Deep Bedrock Well
(1000) Overburden Well
1000 Bedrock Well
NS Not Sampled
ND Not Detected

0 100 200 Feet

N

MACTEC

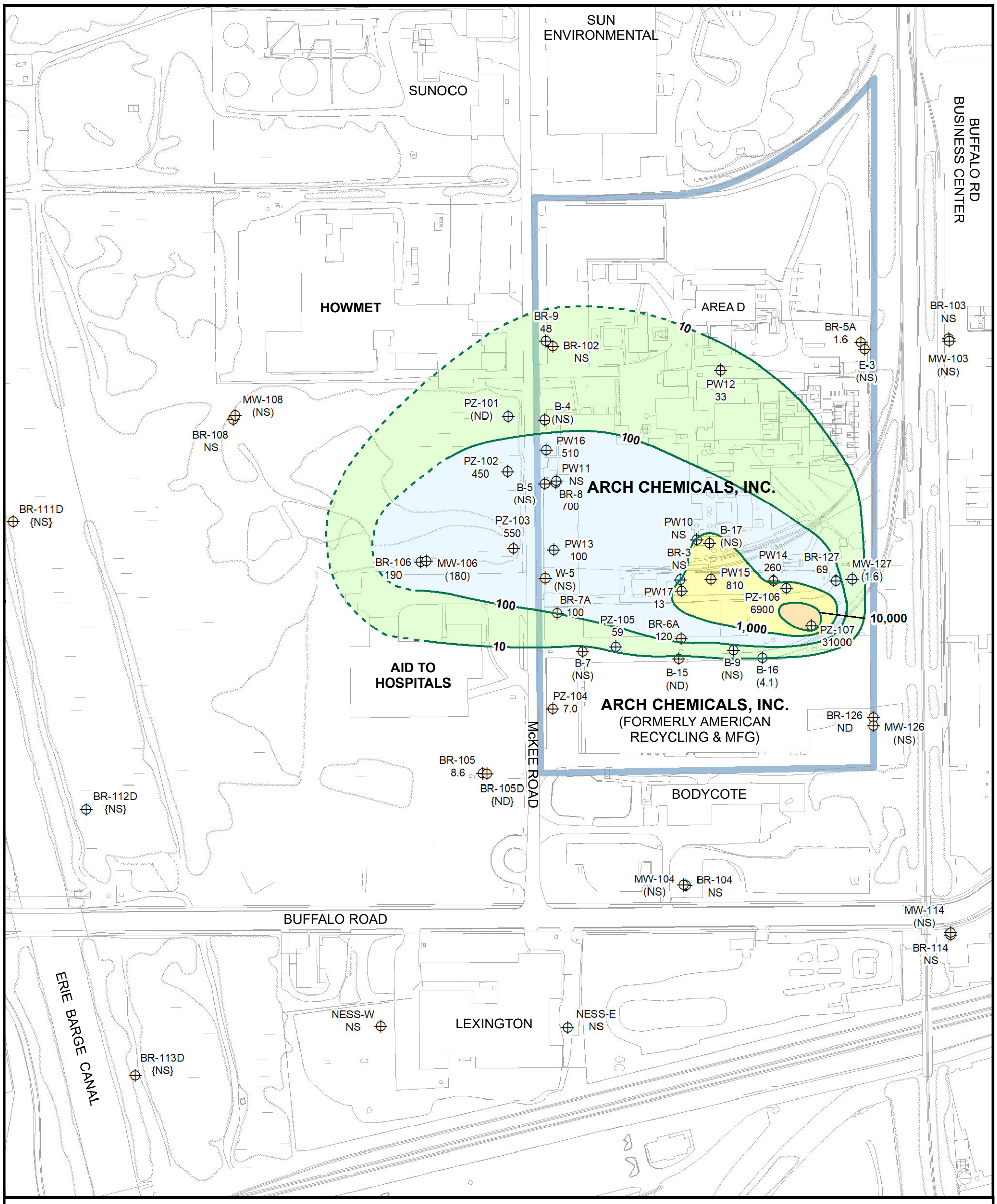
NOTES:

1. Samples Collected November 2022
2. Selected chloropyridines consist of 2,6-dichloropyridine, 2-chloropyridine, 3-chloropyridine, 4-chloropyridine, and P-fluoroaniline.
3. Concentration contours represented for Bedrock Wells and selected Overburden and Deep Bedrock Wells.
4. Dashed concentration contours represent inferences from historical analytical results.
5. Concentrations are in µg/L.

Prepared/Date: NES 04-10-23	Checked/Date: NMB 04-10-23

Figure 2.10
Fall 2022
Selected Chloropyridine Concentration Contours

Arch Chemicals, Inc.
Rochester, NY



Legend

BR-127 89 — Monitoring Location with Concentration

100 — VOC Concentration Contour

Property Owned by Arch Chemicals, Inc.

{1000} Deep Bedrock Well
(1000) Overburden Well
1000 Bedrock Well
NS Not Sampled
ND Not Detected

0 100 200 Feet

N

MACTEC

NOTES:

1. Samples Collected November 2022
2. Select VOCs consist of Carbon tetrachloride, Methylene chloride Chloroform, TCE, PCE, and Chlorobenzene.
3. Concentration contours represented for Bedrock Wells and selected Overburden and Deep Bedrock Wells.
4. Dashed concentration contours represent inferences from historical analytical results.
5. Concentrations are in µg/L

Prepared/Date: NES 04-10-23	Checked/Date: JMB 04-10-23

Figure 2.11
Fall 2022
Selected Volatile Organic Compound Concentration Contours

Arch Chemicals, Inc.
Rochester, NY

APPENDIX A – LIST OF SITE CONTACTS

Name	Phone/Email Address
Site Owner: Matt Dillon - (Site Manager/Arch))	Brendan.Dillon@Arxada.com
Qualified Environmental Professional: Nelson Breton	207 712-8020 Nelson.Breton@wsp.com
NYSDEC DER Project Manager: Joshuah Klier	(585) 226-5357 Joshuah.Klier@dec.ny.gov
NYSDEC DER Project Manager's Supervisor: David Pratt	(585) 226-5449 David.Pratt@dec.ny.gov
NYSDOH Project Manager: Christopher Budd	(518) 402-1769 Christopher.Budd@health.ny.gov

APPENDIX B – Soil and Bedrock Boring Logs and Well Construction Details

SOIL BORING LOG	BORING NO.: **BR-101**	PROJECT NO.: 7311-02	PAGE 1 OF 3
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT 350		DRILLER: R. SCHEFFER	DATE STARTED: 10/14/93 COMPLETED: 10/14/93
METHOD: HSA	AUGER SIZE: 4.25" I.D.	PID METER: 10.6 ev	FID METER: OVA-108 PROTECTION LEVEL: MOD D
GROUND ELEV.: 538.2	SOIL DRILLED: 15.5' FT.	ROCK DRILLED: CORE: 26.5' ROLLER BIT: 2.0'	TOTAL DEPTH: 44.0'
LOGGED BY: B. JOHNSON		CHECKED BY: NB	DATE: 9/6/94

DEPTH (FT.)	SAMPLE NUMBER	BLOWS PER 6-INCHES	PEN. / REC.	GRAPHIC LOG	SAMPLE DESCRIPTION	USCS CLASSIF.	MONITORING (PPM) PID	FID	OTHER
0									
1	S-1	18-14-5-6	2.0 / 0.5		0'-2.0' Brown and Gray Gravelly SAND, fine to medium, little Silt, trace coarse Sand, dry.	GP	0	1	
2									
3	S-2	3-2-3-3	2.0 / 2.0		2.0'-4.0' Dark Brown SILT, little fine Sand, trace Organics (rootlets and flakes), very soft, moist.	ML	0.6	300	
4									
5	S-3	1-4-5-7	2.0 / 2.0		4.0'-6.0' Dark Brown SILT, trace Organics, wet, some Gray spots and Red Silty fine Sand at 5.5'to 5.7'.	ML	1.0	300	
6									
7	S-4	2-4-7-7	2.0 / 1.2		6.0'-8.0' Brown Silty SAND, fine, little medium to coarse Sand, trace fine subrounded Gravel, saturated.	SM	1.0	50	
8									
9	S-5	3-6-9-10	2.0 / 1.3		8.0'-10.0' Similar to above, no Red horizon present.	SM	0	10	
10									
11	S-6	9-10-19-23	2.0 / 1.5		10.0-12.0'Similar to above, with little fine Gravel and coarse Sand.	SM	25	800	
12									
13	S-7	8-32-15-21	2.0 / 0.8		12.0'-14.0'Brown Silty SAND, fine, little coarse to medium Sand, fractured rock, saturated.	SM	5	250	
14									
15	S-8	5-8-50	2.0 / 0.5		14.0'-15.5'Brown SILT, little fine Sand, Some fractured Rock, saturated.	ML/GM	300	>10000	
					Refusal with augers at 15.5'				

ROCK CORE LOG	BORING NO.: **BR-101**	PROJECT NO.: 7311-03	PAGE 2 OF 3
PROJECT NAME: OLIN ROCHESTER RI	DRILLING CONTRACTOR: MARCOR OF NEW YORK		
DRILL RIG TYPE: CANTERRA CT-350	DRILLER: R. SCHEFFER	DATE STARTED: 11/01/93 COMPLETED: 11/02/93	
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev	FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 538.2	SOIL DRILLED: 15.5 FT.	ROCK DRILLED: (CORED: 26.5' ROLLER BIT: 2.0')	TOTAL DEPTH: 44.0'
LOGGED BY: E. SHEPARD / N. BRETON	CHECKED BY: N.B.	DATE: 9/6/94	

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. / REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
17									See soil boring log for BR-101 for soil descriptions from 0'-15.5'		
17.5									Roller cone drill from 15.5'to 17.5' Grout		
18	R-1	NA	1.5' / 1.5'	100		nat nat	0° 0°	slight slight	Light gray finely crystalline, medium bedded, DOLOMITE with interbedded shale. Lockport FM	652	200
19		3				nat nat	0° 0°	slight none		18	20
20		4				nat	0°	slight		1.4	20
21						nat	30°	moderate			
	R-2	4	5.0' / 4.5'	76		nat	30°	slight	Anastomosing shale stringers at 21.5' and 22.0'	21	50
22		4				nat	35°	moderate		52	20
23		6				nat	0°	slight		13	20
24		5							shale stringers and partings	0.7	15
25		5				nat	0°	slight		0.3	15
26	R-3	4	5.3' / 5.3'	94		nat nat	40° 0°	slight slight		0.7	20
27		4							shale partings - 27.3'-27.9'	0	10
28		5				nat nat nat	10° 0° 30°	slight moderate slight		0	10
29		5				nat	0°	slight		0	20
30						nat	0°	slight			
	R-4	4	5.0' / 4.5'	69						0	20
31		5				mech nat nat mech	0° 0°	slight slight	shale stringers and partings - 30.2' - 32.3' (occasionally anastamosing)	0.6	10

ROCK CORE LOG	BORING NO.: **BR-101**	PROJECT NO.: 7311-03	PAGE 3 OF 3
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 11/01/93 COMPLETED: 11/02/93
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 538.2	SOIL DRILLED: 15.5 FT.	ROCK DRILLED: (CORED: 26.5' ROLLER BIT: 2.0')	TOTAL DEPTH: 44.0'
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N.B.	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
32	R-4	5	5.0 / 4.5	69		nat	0°	slight	Light gray finely crystalline, medium bedded, DOLOMITE with interbedded shale.	1.7	20
33						nat	0°	slight			
		4				nat	0°	slight	Lockport FM Shale stringers at 33.5'- 34.0' (anastamosing)	0	20
34											
		5								10	20
35						nat	10°	slight			
		4				mech				7.6	20
36											
	R-5	5	5.0 / 5.0	98						10	50
37											
		4								1.7	20
38											
		4				mech				0.6	20
39						mech					
		4							Slightly porous w/ pits < 0.5 mm in size.	0.7	10
40											
		3				nat	0°	slight		1.7	10
41											
	R-6	3	5.0 / 3.2	64						0.7	10
42						nat	0°	slight			
						nat	0°	slight			
		4				nat	0°	slight		1.0	10
43											
		4								0.6	10
44											
45									End of boring at 44.0' below ground surface.		
									Note: Lost approximately 1700 gallons of drilling water to formation during coring.		
46									nat - Interpreted natural break or fracture		
47									mech - Interpreted mechanical break		
48											

SOIL BORING LOG	BORING NO.: BR-102	PROJECT NO.: 7311-02	PAGE 1 OF 5
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT 350		DRILLER: R. SCHEFFER	DATE STARTED: 10/13/93 COMPLETED: 10/13/93
METHOD: HSA	AUGER SIZE: 4.25" I.D.	PID METER: 10.6 ev	FID METER: OVA-108 PROTECTION LEVEL: MOD D
GROUND ELEV.: 540.2	SOIL DRILLED: 20.2 FT.	ROCK DRILLED: CORE: 32.0' ROLLER BIT: 1.8'	TOTAL DEPTH: 54.0'
LOGGED BY: B. JOHNSON		CHECKED BY: N.B.	DATE: 9/6/94

DEPTH (FT.)	SAMPLE NUMBER	BLOWS PER 6-INCHES	PEN. / REC.	GRAPHIC LOG	SAMPLE DESCRIPTION	USCS CLASSIF.	MONITORING (PPM) PID	FID	OTHER
0					Auger without sampling to 1.0'; Asphalt from 0.0' to 0.3'.				
1					1.0'-2.0' Red/brown, sandy SILT; fine, trace coarse and medium Sand, moist, dense.	ML	0	3	
2	S-1	7-9-10-24	2.0 / 1.3						
3					3.0'-5.0' Red/brown, SILT, some fine Sand, little to trace fine Gravel (subrounded), trace medium Sand, trace clay, dry to moist	ML	0	2	
4	S-2	17-22-23-45	2.0 / 2.0						
5					5.0'-7.5' Similar to above with thin (< 0.1") silty fine Sand layers, moist	ML	0	0	
6	S-3	11-17-27-33	2.0 / 1.2						
7					7.5'-8.3' Red/brown, silty fine SAND, trace medium to coarse Sand, saturated at tip of spoon,	SM	0	0	
8	S-4	9-20-50 (for 0.3')	1.3 / 0.8		8.3'-9.0' No sampling; Auger through cobble size material to 9.0'	GM			
9					9.0'-11.0' Red/brown SAND, fine, some coarse to fine gravel, little to trace Silt, saturated voids in fine sandy material.	GP	0	0	
10	S-5	17-50-61-43	2.0 / 1.0						
11					11.0'-12.8' Light brown, fine SAND, little to trace Silt, trace coarse Gravel and medium to coarse Sand, Saturated	SP	0	0	
12	S-6	12-21-30-50 (for 0.3')	1.8 / 1.0		12.8'-13.0' No sampling; Auger through cobble size material	GP			
13					13.0'-15.0' Light brown SAND, fine, some fine to coarse Gravel, little silt, trace medium to coarse Sand, Saturated	SW	0	1.0	
14	S-7	8-21-28-28	2.0 / 1.0						
15	S-8								

SOIL BORING LOG	BORING NO.: **BR-102**	PROJECT NO.: 7311-02	PAGE 2 OF 5

PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT 350		DRILLER: R. SCHEFFER	DATE STARTED: 10/13/93 COMPLETED: 10/13/93
METHOD: HSA	AUGER SIZE: 4.25" I.D.	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: MOD D
GROUND ELEV.: 540.2	SOIL DRILLED: 20.2 FT.	ROCK DRILLED: CORE: 32.0' ROLLER BIT: 1.8'	TOTAL DEPTH: 54.0'
LOGGED BY: B. JOHNSON		CHECKED BY: WB.	DATE: 9/6/94

DEPTH (FT.)	SAMPLE NUMBER	BLOWS PER 6-INCHES	PEN. / REC.	GRAPHIC LOG	SAMPLE DESCRIPTION	USCS CLASSIF.	MONITORING (PPM) PID	FID	OTHER
16	S-8	8-18-21-27	2.0 / 1.2		15.0'-17.0' Light brown gravelly SAND, fine to medium, saturated	GP	0	0	
17					17.0'-19.0' Brown SAND, fine to coarse, little to some fine to coarse Gravel, trace Silt, saturated (Note: primary water bearing material appears to be fine to medium Sand at 18.5')	SW	0	0	
18	S-9	15-27-32-50	2.0 / 1.7						
19					19.0'-19.9' Brown gravelly SAND, fine to coarse, trace to little Silt, saturated	GW	0	0	
20	S-10	15-50/ (for 0.4')	0.9 / 0.7		19.9'-20.2' No sampling; Auger past spoon refusal depth into bedrock				
21					Refusal with augers at 20.2' below ground surface				

ROCK CORE LOG	BORING NO.: **BR-102**	PROJECT NO.: 7311-02	PAGE 3 OF 5
PROJECT NAME: OLIN ROCHESTER RI	DRILLING CONTRACTOR: MARCOR OF NEW YORK		
DRILL RIG TYPE: CANTERRA CT-350	DRILLER: R. SCHEFFER	DATE STARTED: 11/03/93 COMPLETED: 11/03/93	
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev	FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 540.2	SOIL DRILLED: 20.0 FT.	ROCK DRILLED: (CORED: 32.0' ROLLER BIT: 2.0')	TOTAL DEPTH: 54.0'
LOGGED BY: E. SHEPARD / N. BRETON	CHECKED BY: NB	DATE: 9/6/94	

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. / REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
21									See soil boring log for BR-102 for soil descriptions from 0'-20'. Roller cone drill from 20.0'to 22.0' Grout		
22						nat	0	moderate	Light gray finely crystalline, medium bedded, DOLOMITE with interbedded shale.	0	10
		5				nat	5°	moderate			
23	R-1		2.0 / 1.9'	88					Lockport FM		
		5				nat	0°	slight	22.5' - 23.0' - Shale stringers (anastamosing)	0	18
24						nat	0°	slight			
		5				mech			Mostly uneven bedding throughout Run # R-2. Occasional partings	0	18
25						nat	0°	moderate			
		5								0	10
26						nat	0°	moderate			
	R-2	4	5.0' / 4.3'	66						0	20
27						nat	0°	slight			
		5				nat	0°	slight		0	20
28									27.7' - Shale parting		
		5				nat	0°	slight		0	30
29											
		5				nat	10°	none	Subhorizontal; more evenly bedded (29.0' - 30.3')	0	15
30						nat	0°	none			
		5								0	20
31						nat	0°	slight	Mostly uneven laminae until 36.2'. Anastamosing shale stringers common.		
	R-3	5	5.0' / 4.8'	80						0	18
32						nat	0°	slight			
		4				mech				0	15
33						nat	0°	slight			
		4				nat mech	0°/ 90°	slight		0	8
34											
		4				nat	0°	slight		0	8
35	R-4		5.0' / 4.5'	64		nat	0°	slight			
		4				nat	0°	slight		0	10

ROCK CORE LOG	BORING NO.: **BR-102**	PROJECT NO.: 7311-02	PAGE 4 OF 5
PROJECT NAME: OLIN ROCHESTER RI	DRILLING CONTRACTOR: MARCOR OF NEW YORK		
DRILL RIG TYPE: CANTERRA CT-350	DRILLER: R. SCHEFFER	DATE STARTED: 11/03/93 COMPLETED: 11/03/93	
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev	FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 540.2	SOIL DRILLED: 20.0 FT.	ROCK DRILLED: (CORED: 32.0' ROLLER BIT: 2.0')	TOTAL DEPTH: 54.0'
LOGGED BY: E. SHEPARD / N. BRETON	CHECKED BY: NB	DATE: 9/6/94	

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
36		5				mech			Light gray finely crystalline, medium bedded, DOLOMITE with interbedded shale. Lockport FM.	0	15
37						nat	0°	none			
		4	5.0' / 4.5'	64		nat	0°	slight		0	10
	R-4					nat	0°	slight			
38						nat	0°	moderate			
		4				nat	0°	slight	Mostly even bedded laminations (36.2' - 38.2')	0	5
39						nat	0°	slight			
		5							Subhorizontal fractures along shale partings.	0	0
40						nat	0°	slight			
						nat	0°	slight			
		5							Highly fractured (40.1' - 41.0')	0	0
41						nat	0°	slight			
	R-5	5	5.0' / 4.9'	78					Occasional shale stringers (41.1' - 42.5')	0	5
42											
						nat	0°	slight			
		4								0	8
43						nat	5°	none			
						nat	5°	none			
		5								0	0
44						nat	0°	slight			
		3							Mostly even bedding (44.0' - 49.0') in Run # R-6. Fewer shale stringers	0	10
45						nat	0°	slight			
						nat	45°	none			
		4								0	8
46						nat	5°	slight	Shale parting zone (46.2' - 46.3')		
			5.0' / 4.9'	84		nat	0°	none			
	R-6	4								0	8
47						nat	0°	slight			
		5								0	5
						nat	0°	slight			
48						nat	0°	slight			
						nat	0°	slight			
		3				nat	0°	slight		0	10
49						nat	0°	slight			
		3								0	8
50						nat	0°	none	Vugs (< 5 mm in size) with possible gypsum mineralization (50.7' - 50.8')		
		4				nat	0°	slight		0	10
			5.0' / 4.8'	86					Fracture along 5 to 10 mm size vug (51.7')		
51	R-7					nat	0°	slight			
		4				nat	45°	slight		0	8

ROCK CORE LOG	BORING NO.: BR-102	PROJECT NO.: 7311-02	PAGE 5 OF 5
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 11/03/93 COMPLETED: 11/03/93
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 540.2	SOIL DRILLED: 20.0 FT.	ROCK DRILLED: (CORED: 32.0' ROLLER BIT: 2.0')	TOTAL DEPTH: 54.0'
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N.B.	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
52											
		4	5.0'			nat	0°	slight	Light gray finely crystalline,		
						nat	0°	slight	medium bedded, DOLOMITE with	0	8
53	R-7		4.8'	86					interbedded shale.		
						nat	0°	slight	Lockport FM.		
		3								0	8
						mech					
54									End of boring at 54.0' below ground surface.		

Note:
Approximately 1400 gallons of water used during coring.

nat - Interpreted natural fracture or break

mech - Interpreted mechanical break

ROCK CORE LOG	BORING NO.: **BR-103**	PROJECT NO.: 7311-03	PAGE 1 OF 3
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 11/15/93 COMPLETED: 11/16/9
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 533.19	SOIL DRILLED: 10.8 FT.	ROCK DRILLED: (CORED: 32.2' ROLLER BIT: 2.0')	TOTAL DEPTH: 45.0
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: NB	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. / REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
12									See boring log for MW-103 for soil descriptions from 0' - 10.8'. Roller cone drill from 10.8'to 12.8' Grout		
13		4				nat	30°	slight	Light gray finely crystalline, medium bedded, DOLOMITE with interbedded shale.	0	0
		4	2.2 / 2.2	69		nat	0°	slight		0	0
14	R-1					mech			Lockport FM		
						nat	0°	slight			
		1				mech				0	0
15						mech			14.8' - 15.2' - Vugs up to 1 cm size.		
		4				nat	20°	slight		0	0
						mech					
16						nat	10°	slight			
						nat	0°	slight			
		5				nat	0°	slight		0	0
						nat	0°	slight			
17						nat	0°	slight	16.3' - 18.0' - Shale stringers and partings; uneven bedding		
	R-2	5	5.0 / 4.9	60		mech					
						nat	0°	slight		0	0
18						mech					
						nat	0°	slight	18.2' 18.6' - Shale stringers		
		4				nat	0°	slight		0	0
19											
						mech					
		4								0	0
20						nat	20°	slight			
		4								0	0
21						nat	40°	slight	19.5' - 22.5' - Numerous shale stringers; uneven bedding		
						nat	0°	slight			
		5								0	0
22						mech					
			5.1 / 5.0	70		nat	0°	slight			
	R-3	4								0	0
23						nat	0°	slight			
						mech					
		4								0	0
24						mech			22.5' - 25.0' More even bedding; some shale stringers		
						nat	0°	slight			
						nat	0°	slight			
		4				nat	60°	slight		0	0
25						nat	0°	slight			
						mech					
		4				nat	0°	slight			
			5.0 / 4.7	62		nat	0°	slight		6.0	40
26	R-4					mech					
						mech					
						nat	10°	moderate			
		4				nat	0°	slight		3.6	20

ROCK CORE LOG	BORING NO.: **BR-103**	PROJECT NO.: 7311-03	PAGE 2 OF 3
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 11/15/93 COMPLETED: 11/16/93
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 533.19	SOIL DRILLED: 10.8 FT.	ROCK DRILLED: (CORED: 32.2' ROLLER BIT: 2.0')	TOTAL DEPTH: 45.0'
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N.B.	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
28	R-4	4	5.0 / 4.7	62		nat	10°	slight	Light gray finely crystalline, medium bedded, DOLOMITE with interbedded shale. Lockport FM		
						mech					
		5				nat	0°	slight			
						nat	0°	slight			
						nat	0°	moderate			
29									28.7' Weathered fracture along shale parting		
		4				mech					
30						mech					
		5				nat	0°	slight			
31											
		4				mech					
32	R-5		4.0 / 3.9	60		nat	0°	moderate			
		4									
33						mech					
						mech					
		4				mech					
34						mech					
		10							33.0' - 35.5' Mostly mechanical breaks		
35						mech					
						mech			Mostly even bedding to end of boring. ↓↓↓↓↓↓↓↓↓↓↓↓↓		
		10									
36						mech					
		10									
37	R-6		6.0 / 5.6	80							
		15									
38											
		10				nat	0°	slight			
						mech					
39						nat	0°	slight			
		10									
40						mech					
		10									
41						mech					
	R-7	0	5.4 / 5.0	94							
42						nat	0°	slight			
						nat	0°	slight			
		10									

ROCK CORE LOG	BORING NO.: **BR-103**	PROJECT NO.: 7311-03	PAGE 3 OF 3
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 11/15/93 COMPLETED: 11/16/93
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev	FID METER: OVA-108 PROTECTION LEVEL: D
GROUND ELEV.: 533.19	SOIL DRILLED: 10.8 FT.	ROCK DRILLED: (CORED: 32.2' ROLLER BIT: 2.0')	TOTAL DEPTH: 45.0'
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: NB	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
43											
44	R-7	10	5.4 / 5.0	94		nat nat nat	0° 0° 40°	slight slight slight	Light gray finely crystalline, medium bedded, DOLOMITE with interbedded shale. Lockport FM		
		0				nat	0°	slight			
45									End of boring at 45.0' below ground surface Note: Lost 450 gallons of water during rock coring. nat - Interpreted natural core break mech Interpreted mechanical core break		

SOIL BORING LOG	BORING NO.: MW-104/BR-104	PROJECT NO.: 7311-02	PAGE 1 OF 4
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT 350		DRILLER: R. SCHEFFER	DATE STARTED: 12/21/93 COMPLETED: 1/4/94
METHOD: HSA/DR.& WASH	AUGER SIZE: 4.25" I.D.	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: MOD D
GROUND ELEV.: 537.5	SOIL DRILLED: 18.6' FT.	ROCK DRILLED: CORE: 19.2' ROLLER BIT: 2.0'	TOTAL DEPTH: 39.8'
LOGGED BY: E. SHEPHARD		CHECKED BY: NB.	DATE: 9/6/94

DEPTH (FT.)	SAMPLE NUMBER	BLOWS PER 6-INCHES	PEN. / REC.	GRAPHIC LOG	SAMPLE DESCRIPTION	USCS CLASSIF.	MONITORING (PPM) PID	FID	OTHER
0					NOTE: Soil data from 2'-8.5' from MW-104 Soil data from 8.5'-18.6' from BR-104.				
1					0.0'-2.0' Auger through gravel drive, no sample taken.				
2									
3	S-1	4-4-8-22	2.0 / 1.0		2.0'-2.3' Black to Dark Brown SAND, coarse, some Gravel, moist. 2.3'-3.0' Light Brown SAND, fine, some Silt, moist.	GW SM	0	0	
4									
5	S-2	4-4-29-32	2.0 / 1.5		4.0'-4.4' Similar to above 4.4'-5.5' Reddish Brown to orange brown SAND, medium to coarse, little to some Silt, trace Gravel.	SM SM	0	0	
6									
7	S-3	12-24-32-44	2.0 / 1.3		6.0'-6.7' Similar to above. 6.7'-7.3' Reddish Brown SAND, fine, little to some Silt.	SM SM	0	0	
8									
9	S-4	50/0.5'	0.5' / 0.5'		8.0'-8.5' Similar to above. Hit refusal at 8.5' on boulder; Continued soil sampling at BR-104 (see below)	SM	0	0	
10					- Augered w/o sampling from 0' to 10' in BR-104. Sampling continued from 10'.				
11	S-5	11-20-26-27	2.0 / 1.7		10.0'-12.0' Light Brown SAND, fine to medium, little to some Silt.	SM	0	0	
12									
13	S-6	6-7-15-26	2.0 / 1.7		12.0'-14.0' Light Brown SAND, fine, some Silt, wet.	SM	0	0	
14									
15	S-7	14-24-38-25	2.0 / 1.2		14.0'-14.4' Similar to above. 14.0'-14.9' Brown SAND, coarse, little Silt, trace Gravel. 14.9'-15.2' Brown SAND, medium to coarse.	SM SP SW	0	0	

SOIL BORING LOG	BORING NO.: **BR-104/MW-104**	PROJECT NO.: 7311-03	PAGE 2 OF 4

PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT 350		DRILLER: R. SCHEFFER	DATE STARTED: 10/26/93 COMPLETED: 1/4/94
METHOD: HSA	AUGER SIZE: 4.25" I.D.	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: MOD D
GROUND ELEV.: 537.5	SOIL DRILLED: 18.6'	ROCK DRILLED:CORE: 19.2' ROLLER BIT: 2.0'	TOTAL DEPTH: 39.8'
LOGGED BY: E. SHEPHARD		CHECKED BY: N.B.	DATE: 9/6/94

DEPTH (FT.)	SAMPLE NUMBER	BLOWS PER 6-INCHES	PEN. / REC.	GRAPHIC LOG	SAMPLE DESCRIPTION	USCS CLASSIF.	MONITORING PID	MONITORING FID	MONITORING OTHER
16									
17	S-8	25-17-38-32	2.0 / 1.5		16.0'-18.0' Similar to above.	SW	NA	NA	
18									
18.8					Refusal with augers at 18.8' Water encountered at 9.4' Remainder of boring cored (see rock core log for BR-104)				

ROCK CORE LOG	BORING NO.: **BR-104**	PROJECT NO.: 7311-03	PAGE 3 OF 4
PROJECT NAME: OLIN ROCHESTER RI	DRILLING CONTRACTOR: MARCOR OF NEW YORK		
DRILL RIG TYPE: CANTERRA CT-350	DRILLER: R. SCHEFFER	DATE STARTED: 01/12/94 COMPLETED: 01/12/94	
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev	FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 537.56	SOIL DRILLED: 18.6 FT.	ROCK DRILLED: (CORED: 19.2' ROLLER BIT: 2.0')	TOTAL DEPTH: 39.8'
LOGGED BY: E. SHEPARD / N. BRETON	CHECKED BY: NB	DATE: 9/6/94	

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. / REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
19									See soil boring log for MW/BR-104 for soil descriptions from 0'-18.6'		
									Roller cone drill from 18.6'- 20.6'		
20									Grout		
21						nat	90°	slight	Light gray finely crystalline, medium bedded, DOLOMITE with interbedded shale. Lockport FM		
		4				nat	0°	slight		0	20
22						nat	0°	slight			
		3				nat	0°	slight	20.8' - 0.2' long fracture at rock surface	6.7	100
23						nat	15°	slight	- 22.8' - Fracture along shale parting		
		3				nat	0°	slight		5.0	60
24						nat	0°	slight			
		4							- 24.6' - 1" size vug showing possible gypsum mineralizaton	0	20
25	R-1		9.0 / 8.3	88		nat	0°	moderate	24.8' - 0.5" size vug		
		3								0	20
26						mech			Note: Little to no fractures from 25' to 28'; anastamosing shale stringers present		
		3								0	20
27											
		3							- 27.5' - 0.7" size vug	13	100
28						nat	0°	slight	- 28.2' - Fracture along shale parting		
		3								0	100
29						nat	0°	slight			
		3								0	50
30											
		3				nat	0°	moderate	- 30.5'-30.8' - Fractures along shale partings	0	50
31						nat	0°	moderate			
		3	10.1 / 10.0	90		nat	0°	slight		0	50
32	R-2					nat	0°	slight	Note: Mostly uneven bedding from 29.8' to 36.8'		
		3				nat	0°	slight		0	0
33											
		3				nat	0°	slight		0	0

ROCK CORE LOG	BORING NO.: BR-104	PROJECT NO.: 7311-03	PAGE 4 OF 4
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 01/12/93 COMPLETED: 01/12/9
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev	FID METER: OVA-108 PROTECTION LEVEL: D
GROUND ELEV.: 537.56	SOIL DRILLED: 18.6 FT.	ROCK DRILLED: (CORED: 19.2' ROLLER BIT: 2.0')	TOTAL DEPTH: 39.8
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N.B.	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
34		3				nat	0°	slight	Light gray finely crystalline, medium bedded, DOLOMITE with interbedded shale.	0	0
35		3							Lockport FM	0	0
36		3				nat	0°	slight		0	0
37	R-2	3	10.1 / 10.0	90		nat	0°	slight	- 36.8' - 39.8' - More even bedding with fewer shale stringers than above.	0	0
38		3				mech			- 37.7' - Shale parting - 38.3' - Shale partings	0	0
39		3				mech nat nat mech	 10° 10°	 slight slight		0	0
40									End of boring at 39.8' below ground surface Note: Lost 800 gallons of water during rock coring. nat - Interpreted natural core break mech Interpreted mechanical core break		

ROCK CORE LOG	BORING NO.: **BR-105**	PROJECT NO.: 7311-03	PAGE 1 OF 2
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 12/06/93 COMPLETED: 12/06/93
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 536.9	SOIL DRILLED: 15.0 FT.	ROCK DRILLED: (CORED: 25.5' ROLLER BIT: 5.0')	TOTAL DEPTH: 45.5'
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N.B.	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. / REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
19									See boring log for MW-105 for soil descriptions from 0'-15'. Roller cone drill from 15.0'to 20.0' Grout		
20	R-1	3	1.0 / 0.6	50		nat nat	0° 0°	slight slight	Light gray finely crystalline, medium bedded, DOLOMITE with interbedded shale. Lockport FM	0	15
21		3				nat nat	10° 0°	slight slight		0	15
22		4				nat nat	20° 0°	slight slight		0	80
23	R-2	3	5.0 / 4.3	58		nat nat nat	0° 0° 5°	slight moderate moderate		0	80
24		4				nat	5°	moderate		0	115
25		4				nat nat nat	10° 0° 0°	slight moderate slight		0	115
26		4				nat	0°	slight	26.2' - Highly fractured along shale partings	0.8	20
27		4				nat nat	0° 0°	slight slight		0	20
28	R-3	4	5.0 / 4.1	64		nat	0°	slight	28.0' - Highly fractured along shale partings 28.7' - 28.9' - Same as above (highly fractured)	0	20
29		4				nat	0°	slight	29.6' - 30.0' - Highly fractured along shale parting	0.8	15
30		4				nat nat	0° 0°	slight slight		1.8	15
31		3				nat	0°	slight		0	15
32	R-4	3	5.0 / 4.8	80		nat nat nat	0° 0° 0°	slight slight slight	31.9' - 33.3'- Fractured along shale partings	0	10
33		4				nat	0°	slight		0.8	10

ROCK CORE LOG	BORING NO.: **BR-105**	PROJECT NO.: 7311-03	PAGE 2 OF 2
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 12/06/93 COMPLETED: 12/06/9
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 536.9	SOIL DRILLED: 15.0 FT.	ROCK DRILLED: (CORED: 25.5' ROLLER BIT: 5.0')	TOTAL DEPTH: 45.5
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N.B	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
34		3	5.0 / 4.8	80		nat	0°	slight	Light gray finely crystalline, medium bedded, DOLOMITE with interbedded shale. Lockport FM	0	10
35	R-4					nat	30°	slight			
		3				nat	30°	moderate			
						nat	0°	slight		0	10
36						nat	0°	slight	34.0'-34.05' - Wedge shaped vug cutting 1/3 way into core.		
		3							34.7'-34.9' - 30° fractures along shale rich zone.	0.8	10
37						nat	0°	slight			
		3				nat	0°	slight	37.1'-37.2' - 0.5" size vug with apparent gypsum mineralization.	0	10
38			5.0 / 5.0	91		nat	0°	slight	37.5' 0.2" size vug		
	R-5	3								0.8	10
39						nat	0°	slight			
		3								0	10
40						nat	0°	moderate			
		3								0.8	15
41									41.0'-45.5' - More even bedding with occasional shale stringers		
		3				nat	0°	slight			
42											
		3				nat	0°	moderate	42.8'-43.0' - Weathered fracture along shale laminae.		
43			4.5 / 4.5	93		nat	0°	slight			
	R-6	3				nat	0°	slight			
44											
		4							44.5'-45.5' - slightly porous with small 0.1" size vugs.		
						nat	0°	slight			
45		3				nat	0°	slight			
									End of boring at 45.5' below ground surface.		

Note: Approximately 1950 gallons lost during coring.

nat - interpreted natural fracture or core break

mech - interprteted mechnical core break

ROCK CORE LOG	BORING NO.: **BR-105D**	PROJECT NO.: 7311-03	PAGE 1 OF 6

PROJECT NAME: OLIN ROCHESTER RI	DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350	DRILLER: R. SCHEFFER	DATE STARTED: 12/09/93 COMPLETED: 12/21/93
METHOD: CORE / BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 536.7 / SOIL DRILLED: 15.4 FT.	ROCK DRILLED: (CORED: 92.6'* ROLLER BIT: 2.0')	TOTAL DEPTH: 110.0'
LOGGED BY: E. SHEPARD / N. BRETON	CHECKED BY: N-B	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
16									See Boring log for MW-105 for soil descriptions from 0' to 15'. Roller cone drill from 15.4'to 17.4' Grout		
17											
17.4'											
18	R-1	2	2.0 / 1.7	0		nat	0°	slight	Light gray finely crystalline, medium bedded, DOLOMITE with interbedded shale. Lockport FM	0	50
19		4				nat	10°	slight		0	50
20		5				nat	50°	slight	17.4'-19.1' - Vertical fracture	0	50
21		6				nat	0°	slight	20.1'-20.7' - Vertical fracture (slightly weathered)	0	50
22	R-2	5	5.0 / 5.0	64		nat mech	10°	moderate	Fractures are subhorizontal and along shale partings which dip from 0° to 30° in run R-2.	0	60
23		5				nat	15°	slight		0	20
24		6				nat	0°	moderate		0	50
25		5				nat mech	0°	slight	Uneven bedding and shale stringers is present in Run R-3. Fractures along shale stringers dip from 0° to 10° in Run R-3.	0	50
26		3				mech				0	15
27	R-3	3	5.0 / 4.7	64		nat mech nat nat nat	0° 30° 0° 0°	slight slight slight slight		0	10
28		3				nat	0°	slight		0	10
29		3				nat	0°	slight		0	10
30	R-4	NA	1.0 / 0.4	0		nat nat	10° 10°	slight slight	Drill bit hung up in Run R-4. Discontinued rock coring at 30.4'.	NA	NA
									Air hammer drilled from 30.4' to 45.8'		

ROCK CORE LOG	BORING NO.: BR-105D	PROJECT NO.: 7311-03	PAGE 2 OF 6
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 12/09/93 COMPLETED: 12/21/9
METHOD: AIR HAMMER	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev	FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 536.7	SOIL DRILLED: 15.4 FT.	ROCK DRILLED: (CORED: 92.6'* ROLLER BIT: 2.0')	TOTAL DEPTH: 110.
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N.B.	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. / REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
31		15' per hour or 4 min. per foot without sampling.							Light gray finely crystalline, medium bedded, DOLOMITE with interbedded shale. Lockport FM		
32											
33									Air hammer drilling performed from 30.4' to 45.8'.		
34											
35											
36											
37											
38											
39											
40											
41											
42											
43											
44											
45									Rock coring continued from 45.8'		
46	R-5	NA	0.7 / 0.7	100					- - - - - - - - - - - - - - - - - - - -	0	0
47									- - Core bit hung up at 46.5'- - - -		

ROCK CORE LOG	BORING NO.: **BR-105D**	PROJECT NO.: 7311-03	PAGE 3 OF 6
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 12/09/93 COMPLETED: 12/21/93
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 536.7	SOIL DRILLED: 15.4 FT.	ROCK DRILLED: (CORED: 92.6'* ROLLER BIT: 2.0')	TOTAL DEPTH: 110.0'
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N.B	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. / REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
47		15' per hour or 4 min. per foot without sampling.							Light gray finely crystalline, medium bedded, DOLOMITE with interbedded shale. Lockport FM		
48											
49									Continued air hammer drilling from 46.5' to 50.5'.		
50											
51		4				mech			More evenly bedded; bedding dip ranges from 0° to 5°.	0	10
		4	2.5 / 2.5	74					No water lost in Run R-6.	0	10
52	R-6					nat	0°	slight			
		4				nat	30°	slight		0	10
53		4				nat	0°	slight	50 gallons of water lost in coring Run R-7.	0	10
54						nat	0°	slight			
		4								0	10
55						mech					
		4				nat	0°	slight		0	10
56											
	R-7	3	7.0 / 6.5	87		nat	0°	slight		0	15
57											
		4								0	15
58						nat	0°	slight			
						nat	0°	slight			
						nat	30°	slight			
		3								0	10
59						nat	30°	slight			
		4				nat	10°	slight		0	10
60											
		4				mech			Fractures in Run R-8 are along shale partings. Bedrock becoming more shale rich with depth.	0	15
61						nat	0°	slight			
	R-8	4	10.0 / 10.2	88		nat	0°	slight		0	15
62						nat	0°	slight			
						mech				0	15
63		4									

ROCK CORE LOG	BORING NO.: **BR-105D**	PROJECT NO.: 7311-03	PAGE 4 OF 6
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 12/09/93 COMPLETED: 12/21/9
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 536.7	SOIL DRILLED: 15.4 FT.	ROCK DRILLED: (CORED: 92.6'* ROLLER BIT: 2.0')	TOTAL DEPTH: 110.
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N.B.	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. / REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
63		3				nat	0°	slight	Light gray finely crystalline, medium bedded, DOLOMITE with interbedded shale.	0	15
64						nat	0°	slight	Lockport Fm.		
		4								0	15
65						nat	0°	moderate	65.0'- 65.2'- Trace small (< 0.1") vugs.		
		3								0	10
66									Lost 50 gallons of water coring		
	R-8	3	10.0 / 10.2	88		nat	0°	slight	Run R-8	0	15
67						nat	0°	slight			
		4				nat	0°	slight		0	15
68						nat	0°	slight			
		3								0	15
69						nat	0°	slight			
						nat	0°	slight			
70									- - - - - - - - - - - - - - - - - - - -		
		3				nat	0°	slight	Graditional contact - Gates member Lockport Fm. (increase in shale content and shale bedding thickness)	0	10
71											
		3				nat	0°	slight	Lost 50 gallons of water coring Run R-9	0	10
72											
		4				nat	0°	slight		0	10
73						nat	0°	slight			
		3								0	15
74						nat	0°	slight	74.2'- fracture along appararent calcite or gypsum lens. Lens is 0.02" thick.		
	R-9	3	10.0 / 9.8	90		nat	0°	slight		0	10
75						nat	0°	moderate	75.0'-75.3'- vugs (< 0.1") and weathered fractures.		
		3								0	10
76						nat	0°	slight	76.0'- fracture along 0.02" thick calcite or gypsum lens.		
		3								0	10
77						nat	0°	slight	76.9'- 0.2" size vug with apparent gypsum mineralization.		
		3				nat	0°	slight		0	15
78											
		4				nat	0°	slight		0	10
79											

ROCK CORE LOG	BORING NO.: **BR-105D**	PROJECT NO.: 7311-03	PAGE 5 OF 6
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 12/09/93 COMPLETED: 12/21/93
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 536.7	SOIL DRILLED: 15.4 FT.	ROCK DRILLED: (CORED: 92.6'* ROLLER BIT: 2.0')	TOTAL DEPTH: 110.0'
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N.B	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
79	R-9	3				nat	0°	moderate	Gray finely crystalline, medium bedded, DOLOMITE with interbedded shale.	0	20
80						nat	0°	slight			
		3							Lockport Fm. (Gates member)	0	15
81						nat	15°	slight	79.4'- Fracture along 0.02" thick calcite or gypsum lens.		
		3								0	20
82											
		3				nat	0°	slight		0	10
83											
		4								0	25
84						nat	0°	slight			
		3								0	10
85	R-10		10.0 / 10.2	93		nat	0°	slight			
		3								0	20
86											
		3							Even breaks; little to no weathering apparent.	0	10
87						nat	0°	slight			
		3				nat	0°	slight		0	15
88						nat	0°	slight			
		3								0	10
89											
		3				nat	0°	slight		0	10
90											
		3							Bedding dip angle between 0° and 5° in Run R-11.	0	25
91											
		3								0	40
92						nat	0°	slight			
	R-11	3	10.0 / 9.8	96						0	10
93						nat	0°	slight			
		3				nat	0°	slight	93.2'- Fracture along 0.02" thick calcite or gypsum lens.	0	20
94											
		3				nat	0°	slight		0	15
95											

ROCK CORE LOG	BORING NO.: **BR-105D**	PROJECT NO.: 7311-03	PAGE 6 OF 6
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 12/09/93 COMPLETED: 12/21/9
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev	FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 536.7	SOIL DRILLED: 15.4 FT.	ROCK DRILLED: (CORED: 92.6'* ROLLER BIT: 2.0')	TOTAL DEPTH: 110.
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: NB	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. / REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
95		3				nat	0°	slight	Dark gray finely crystalline, medium bedded, DOLOMITE with interbedded shale.	0	25
96						nat	0°	slight	Lockport Fm. (Gates member)		
		3				nat	0°	slight		0	40
97									Trace of small pits or vugs (less than 0.05" in size) throughout Run R-11 (90'-100')		
	R-11	3	10.0 / 9.8	96		nat	0°	slight		0	10
98						nat	0°	slight	50 gallons of water lost during coring for Run R-11.		
		3				nat	10°	slight		0	20
99						nat	0°	slight	99.0' - Fracture along calcite or gypsum lens.		
		3				nat	0°	slight		0	15
100						nat	0°	slight	Even bedding dominant in Run R-12; Bedding dips from 0° to 5°.		
		3				nat	0°	slight		0	50
101						nat	0°	slight			
		3								0	150
102						nat	0°	slight			
		3				nat	0°	slight		0	50
103						nat	10°	slight	103.0' - Fracture along calcite or gypsum lens.		
		3				nat	0°	slight		0	25
104						nat	0°	slight			
		3				nat	0°	slight		0	50
105	R-12		10.0 / 9.8	92							
		3								0	25
106						nat	0°	slight			
		3							Note: Approximately 220 gallons of water lost during coring BR-105D.	0	50
107											
		3				nat	0°	slight	nat - interpreted natural fracture or core break	0	100
108									mech - intrepreted mechanical core break		
		3				nat	0°	slight		0	150
109											
		3				nat	0°	slight		0	50
110									End of Boring at 110.0' below ground surface.		

ROCK CORE LOG	BORING NO.: **BR-106**	PROJECT NO.: 7311-03	PAGE 1 OF 2
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 01/11/94 COMPLETED: 01/11/94
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 535.7	SOIL DRILLED: 13.2 FT.	ROCK DRILLED: (CORED: 26.9' ROLLER BIT: 5.2')	TOTAL DEPTH: 45.3'
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N.B	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. / REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
17									See soil boring log for MW-106 for soil descriptions from 0'-13.2'		
									Roller cone drill from 13.2'to 18.4'		
18									Grout		
18.4											
		4				nat	0°	slight	Light gray, finely crystalline,		
19						mech			medium bedded, DOLOMITE with interbedded shale.	0	0
						nat	0°	slight	Lockport FM		
		4							19.4'-19.5'- Shale stringers	0	0
20						nat	0°	slight	dominant.		
						nat	0°	slight			
		3								0	0
21						mech					
	R-1	4	6.9 / 6.5	83						0	0
22											
		3								0	0
23						nat	0°	moderate	23.0'- Weathered fracture along shale laminae.		
						nat	0°	slight			
		3								0	0
24											
						nat	0°	slight			
		3				nat	0°	slight		0	0
25						nat	0°	slight			
		3								0	0
26						mech					
						nat	0°	slight			
		3								0	0
27						nat	0°	slight			
		3				nat	0°	slight		0	0
28						nat	0°	slight			
			10.0 / 10.0			nat	0°	slight			
	R-2	4		80						0	0
29						nat	0°	slight	28.7' and 28.9' - Two 0.2" size vugs		
						nat	0°	slight	with gypsum mineralization.		
		3								0	0
30						nat	0°	slight			
		3				nat	0°	slight		0	0
31						nat	0°	slight			
						nat	90°	slight			
		3				nat	20°	slight		0	0

ROCK CORE LOG	BORING NO.: **BR-106**	PROJECT NO.: 7311-03	PAGE 2 OF 2
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 01/11/94 COMPLETED: 01/11/9
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev	FID METER: OVA-108 PROTECTION LEVEL: D
GROUND ELEV.: 535.7	SOIL DRILLED: 13.2 FT.	ROCK DRILLED: (CORED: 26.9' ROLLER BIT: 5.2')	TOTAL DEPTH: 45.3
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N.B.	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. / REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
32											
33		3				nat	0°	slight	Light gray, finely crystalline, medium bedded, DOLOMITE with interbedded shale. Lockport FM	0	0
34	R-2	3	10.0 / 10.0	80		nat	0°	moderate		0	0
35		3				nat nat	0° 0°	moderate slight	33.3'-35.5'- Irregularly shaped shale rich lenses (spotty appearance)	0	0
36		3				nat	60°	slight	34.3'-34.8'- Highly fractured; Sub-vertical and subhorizontal orientation.	0	0
37		3				nat nat nat	0° 0° 0°	slight slight slight	35.3'-35.7'- Near vertical parting with calcite or gypsum mineralization.	0	0
38		3							35.7'-40.7' - Few fractures; Evenly bedded.	0	0
39		3				nat	0°	slight		0	0
40	R-3	3	10.0 / 9.4	91		nat	0°	slight	41.3'-41.5'- slightly porous with	0	0
41		3				nat	0°	slight	0.1" size vugs.	0	0
42		3				nat nat	0° 0°	slight slight		0	0
43		3				nat nat	0° 0°	slight slight	43.0'- Fracture along shale parting zone.	0	0
44		3				mech				0	0
45		3				mech			End of boring at 45.3' below ground surface.	0	0
45.3											

Note: Approximately 700 gallons of water lost during coring.

nat - interpreted natural fracture or core break.

mech - interpreted mechanical core break.

ROCK CORE LOG	BORING NO.: **BR-107**	PROJECT NO.: 7311-03	PAGE 1 OF 2
PROJECT NAME: OLIN ROCHESTER RI	DRILLING CONTRACTOR: MARCOR OF NEW YORK		
DRILL RIG TYPE: CANTERRA CT-350	DRILLER: R. SCHEFFER	DATE STARTED: 01/15/94 COMPLETED: 01/15/94	
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev	FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 536.3	SOIL DRILLED: 16.8 FT.	ROCK DRILLED: (CORED: 21.2' ROLLER BIT: 2.0')	TOTAL DEPTH: 40.0'
LOGGED BY: E. SHEPARD / N. BRETON	CHECKED BY: N.B	DATE: 9/6/94	

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. / REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
17									See boring log for MW-107 for soil descriptions from 0'-16.8'		
18									Roller cone drill from 13.2'to 18.4'		
18.8									Grout		
19	R-1	4	1.2 / 1.2	75		nat	0°	slight			
						nat	0°	slight	Light gray, finely crystalline, medium bedded, DOLOMITE with interbedded shale.	0	0
20						nat	0°	slight	Lockport FM		
		4				nat	0°	slight	18.8'-25.0'- Mostly uneven bedding	0	0
21						nat	0°	slight			
		4				nat		moderate	21.2'-21.4'- Weathered fractured zone.	0	0
22						nat	0°	moderate			
	R-2	4	5.0 / 4.7	58		nat	0°	slight	22.0'- Weathered fracture along shale parting.	0	0
						nat	0°	slight			
23						nat	0°	slight	22.8'-23.0'- Vertical fracture		
		5				nat	20°	high			
						nat	0°	slight	23.1'-23.2'- Highly weathered zone; Fractured along shale stringers.	0	0
24						nat	20°	slight			
						nat	0°	slight	23.6'- 1" long / 0.5" wide vug with		
		4				nat	20°	slight	gypsum mineralization.	0	0
25						mech					
		4				mech			Run R-3 - Mostly even bedding; less fractured and weathered.	0	0
26											
		5				nat	0°	slight		0	0
27											
	R-3	4	5.0 / 4.6	80						0	0
28						nat	0°	moderate			
						mech					
		4								0	0
29						nat	0°	slight			
						nat	0°	slight			
		4								0	0
30						nat	0°	slight			
		4								0	0
	R-4		5.0 / 5.2	100							
31						nat	0°	slight			
		4								0	0

ROCK CORE LOG	BORING NO.: **BR-107**	PROJECT NO.: 7311-03	PAGE 2 OF 2
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 01/15/94 COMPLETED: 01/15/9
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 536.3	SOIL DRILLED: 16.8 FT.	ROCK DRILLED: (CORED: 21.2' ROLLER BIT: 2.0')	TOTAL DEPTH: 40.0
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N.B.	DATE: 9/6/9

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. / REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
32		4							Light gray, finely crystalline, medium bedded, DOLOMITE with interbedded shale. Lockport FM	0	0
33	R-4	4	5.0 / 5.2	100						0	0
34						nat	0°	slight			
		4				nat	0°	slight		0	0
35											
		3				nat	0°	slight	35.3' - Fracture along 0.1" thick shale stringer.	0	0
36											
		3							36.3'-36.9'- Slightly porous with vugs less than 0.1" in size.	0	0
37						mech					
	R-5	4	5.0 / 4.9	80		nat	0°	slight		0	0
38											
		3								0	0
39						nat	0°	slight			
		4				mech			39.7'-40.0'- Mostly shale in thicker beds	0	0
40									End of boring at 40.0' below ground surface		

Note: Approximately 575 gallons of water lost during coring

nat - interpreted natural fracture or core break

mech - interpreted mechanical core break

ROCK CORE LOG	BORING NO.: BR-108	PROJECT NO.: 7311-03	PAGE 1 OF 2
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 01/07/94 COMPLETED: 01/07/94
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 538.4	SOIL DRILLED: 12.5 FT.	ROCK DRILLED: (CORED: 23.5' ROLLER BIT: 5.0')	TOTAL DEPTH: 41.0'
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N.B	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
16									See boring log for MW-108 for soil descriptions from 0'-12.5'		
									Roller cone drill from 12.5'to 17.5'		
17									Grout		
17.5											
18		4	2.5 / 2.3	76		nat	0°	slight	Light gray, finely crystalline,		
						nat	0°	slight	medium bedded, DOLOMITE with		
						mech			interbedded shale.		
	R-1								Lockport FM	0	0
19						nat	0°	slight	17.9'-18.1'- Fractures along shale		
		4				nat	0°	slight	stringers.	0	0
20						nat	0°	slight			
		4								0	0
21						nat	0°	slight			
		3				nat	0°	slight		0	0
22						nat	0°	slight			
		3								0	0
						nat	0°	slight	22.8' - Fracture along shale parting		
23						nat	0°	slight	23.4' - 0.3" size vug with gypsum		
		3							mineralization	0	0
						nat	0°	slight			
24						nat	0°	slight			
		3				nat	0°	moderate	24.5' - Fracture along shale parting	0	0
			10.0 / 9.8	82		nat	0°	slight	(weathered)		
25	R-2										
		3				nat	0°	slight		0	0
						nat	0°	slight			
26											
		3				mech				0	0
						nat	0°	slight			
27									27.0'-27.2'- Highly fractured;		
						nat	0°	moderate	Some mechanical breaks possible.		
		3								0	0
						nat	0°	moderate	27.8'-28.0'- Fractured irregular		
28						nat	0°	slight	pattern of core breaks; Weathered		
		3				nat	0°	slight	28.5'- Fractured along shale	0	0
									stringers and/or partings.		
29						nat	0°	slight			
		3								0	0
30						nat	0°	slight			
		3								0	0

ROCK CORE LOG	BORING NO.: **BR-108**	PROJECT NO.: 7311-03	PAGE 2 OF 2
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 01/07/94 COMPLETED: 01/07/9
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev	FID METER: OVA-108 PROTECTION LEVEL: D
GROUND ELEV.: 538.4	SOIL DRILLED: 12.5 FT.	ROCK DRILLED: (CORED: 23.5' ROLLER BIT: 5.0')	TOTAL DEPTH: 41.0
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N.B.	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
31		4				nat	0°	slight	Light gray, finely crystalline, medium bedded, DOLOMITE with interbedded shale.	0	0
32						nat	30°	slight	Lockport FM		
		3								0	0
33									Mostly even bedding throughout Run R-3 (30'-37')		
						nat	0°	slight			
		3				nat	0°	moderate	33.6'-33.9'- fractured along shale partings; slightly to moderately weathered.	0	0
			7.0			nat	0°	slight			
34	R-3		—	74		nat	0°	slight			
			6.3								
		3								0	0
35						nat	10°	slight	35.2'- Fracture along shale laminae		
		3				nat	0°	slight		0	0
36											
						nat	0°	slight			
		3								0	0
37											
		3							Mostly even bedding throughout Run R-4 (37'-41')	0	0
38						nat	0°	slight	37.9'- Fracture along shale parting		
		3								0	0
			4.0								
39	R-4		—	100		nat	0°	slight			
			4.0								
		3								0	0
40											
		3				nat	0°	slight	40.4'- Shale laminae stringers in distinct 1" thick zone.	0	0
41											
									End of boring at 41.0' below ground surface.		
									Note: Approximately 600 gallons of water lost during coring.		
									nat - interpreted natural fracture or core break		
									mech - interpreted mechanical core break		

SOIL BORING LOG	BORING NO.: MW-103	PROJECT NO.: 7311-02	PAGE 1 OF 1
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT 350		DRILLER: R. SCHEFFER	DATE STARTED: 11/10/93 COMPLETED: 11/10/93
METHOD: HSA	AUGER SIZE: 4.25" I.D.	PID METER: 10.6 ev	FID METER: OVA-108 PROTECTION LEVEL: MOD D
GROUND ELEV.: 533.3	SOIL DRILLED: 10.8' FT.	ROCK DRILLED: (CORED \ ROLLER BIT) NONE FT.	TOTAL DEPTH: 10.8'
LOGGED BY: J. ROSENBLUM		CHECKED BY: NB,	DATE: 9/6/94

DEPTH (FT.)	SAMPLE NUMBER	BLOWS PER 6-INCHES	PEN. / REC.	GRAPHIC LOG	SAMPLE DESCRIPTION	USCS CLASSIF.	MONITORING (PPM) PID	FID	OTHER
0					Auger through 1.0' of concrete and pavement				
1	S-1	17-16	1.0 / 1.0		1.0'-2.0' Brown Silty SAND, fine, coarse Gravel, Dry.	SM	0	0	
2									
3	S-2	4-4-5-6	2.0 / 0.5		2.0'-4.0' Gray to Light Brown Silty SAND, fine, some Gravel, moist.	SM	0	0	
4									
5	S-3	4-12-16-17	2.0 / 1.6		4.0'-6.0' Light Brown Silty SAND, fine, medium dense, moist.	SM	0	0	
6									
7	S-4	21-50/0.5'	1.5 / 1.0		6.0'-8.0' Light Brown Silty SAND, fine, dense to very dense, some Rock fragments at 8.0'	SM	0	0	
8									
9	S-5	20-50/0.5'	1.5 / 1.5		8.0'-10.0' Similar to above, dense to very dense.	SM	0	0	
10									
11					NOTES: Rufusal with augers at 10.8'				
12					Groundwater measured at 7.3' During drilling.				
13					Initial auger refusal at 5.6' Exploration moved 6.0' north where final installation of MW-103 was achieved.				
14									
15									

SOIL BORING LOG	BORING NO.: MW-105	PROJECT NO.: 7311-02	PAGE 1 OF 1
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT 350		DRILLER: R. SCHEFFER	DATE STARTED: 11/16/93 COMPLETED: 11/17/93
METHOD: HSA	AUGER SIZE: 4.25" I.D.	PID METER: 10.6 ev	FID METER: OVA-108 PROTECTION LEVEL: MOD D
GROUND ELEV.: 536.9	SOIL DRILLED: 14.4 FT.	ROCK DRILLED: ROLLER BIT: 5.0'	TOTAL DEPTH: 19.4
LOGGED BY: E. SHEPHARD		CHECKED BY: N.B.	DATE: 9/6/94

DEPTH (FT.)	SAMPLE NUMBER	BLOWS PER 6-INCHES	PEN. / REC.	GRAPHIC LOG	SAMPLE DESCRIPTION	USCS CLASSIF.	MONITORING (PPM) PID	FID	OTHE
0									
1	S-1	3-4-20-24	2.0 / 1.5		0.0'-0.8' Dark Brown to Black SAND, fine, some Organics, Moist. 0.8'-2.0' Light Brown SAND, fine to coarse, some Gravel, dry.	SW	0	0	
2									
3	S-2	3-5-10-10	2.0 / 1.6		2.0'-2.2' Similar to above. 2.2'-3.6' Brown to Reddish Brown SAND, fine, some Silt, poorly graded, dry.	SW SM	0	0	
4									
5	S-3	4-10-20-15	2.0 / 1.8		4.0'-4.4' Similar to above. 4.4'-5.6' Tan to Light Brown SAND, fine dry. 5.6'-5.8' Gray SAND, fine, some Silt, dry.	SM SM SM	0	0	
6									
7	S-4	4-10-26-52	2.0 / 2.0		6.0'-6.6' Similar to above. 6.6'-7.9' Tan to Light Brown SAND, fine, some Silt, moist. 7.9'-8.0' Similar to above with trace Gravel.	SM SM SM	0	0	
8									
9	S-5	17-35-50/0.5'	1.5 / 1.5		8.0'-10.0' Similar to above.	SM	0	0	
10									
11	S-6	15-50/ 0.4'	0.9 / 0.9		10.0'-10.9' Brown SAND, fine, some silt, trace Gravel, poorly graded moist.	SM	0	0	
12									
13	S-7	4-9-13-30	2.0 / 1.6		12.0'-14.0' Gray SAND, fine, some Silt, poorly graded, wet.	SM	0	0	
14					14.0'-14.3' Gray SAND, fine to coarse, some silt, rock fragments, wet.	GM	0	0	
15	S-8	50/ 0.3'	2.0 / 0.3		Refusal with augers at 14.4' Roller cone drill to 19.4'				
19.4									

SOIL BORING LOG	BORING NO.: MW-106	PROJECT NO.: 7311-02	PAGE 1 OF 1

PROJECT NAME: OLIN ROCHESTER RI	DRILLING CONTRACTOR: MARCOR OF NEW YORK
DRILL RIG TYPE: CANTERRA CT 350	DRILLER: D. BOOKER — DATE STARTED: 12/7/93 COMPLETED: 12/7/93
METHOD: HSA — AUGER SIZE: 4.25" I.D.	PID METER: 10.6 ev — FID METER: OVA-108 — PROTECTION LEVEL: MOD D
GROUND ELEV.: 535.4 — SOIL DRILLED: 14.4' FT.	ROCK DRILLED: ROLLER BIT: 5.4' — TOTAL DEPTH: 19.8'
LOGGED BY: E. Shepard	CHECKED BY: NB. — DATE: 9/6/94

DEPTH (FT.)	SAMPLE NUMBER	BLOWS PER 6-INCHES	PEN. / REC.	GRAPHIC LOG	SAMPLE DESCRIPTION	USCS CLASSIF.	MONITORING (PPM) PID	FID	OTHER
0									
1	S-1	3-4-6-7	2.0 / 0.5		0.0'-2.0' Dark Brown SAND, fine, some Silt, trace Organics, moist.	SM	0	8	
2									
3	S-2	7-15-18-17	2.0 / 2.0		2.0'-4.0' Light Brown to Reddish Brown, SAND, fine, some Silt, trace Organics, trace Gravel, moist.	SM	0	3	
4									
5	S-3	11-39-50 / 5"	2.0 / 0.7		4.0'-6.0' Similar to above.	SM	0	2	
6									
7	S-4	11-33-50 (for 0.4')	2.0 / 1.3		6.0'-8.0' Light Brown SAND, fine, little to some Silt, dry.	SM	0	2	
8									
9	S-5	12-31-45-50 (for 0.4')	2.0 / 1.3		8.0'-10.0' Similar to above, moist.	SM	0	3	
10									
11	S-6	13-25-50 (for 0.5')	1.5 / 1.2		10.0'-12.0' Brown to Grayish Brown SAND, fine to medium, some Silt, trace rock fragments, moist.	SM	0	5	
12									
13	S-7	15-20-25-50 (for 0.4')	2.0 / 1.5		12.0'-14.0' Grayish Brown SAND, fine, some Silt, trace rock fragments, wet.	SM	0	100	
14	S-8	50 / 5"	0.4 / 0.4		14.0'-14.4' Similar to above.	GM	0	30	
15					Auger refusal at 14.4' Roller cone drill from 14.4'-19.8'				

SOIL BORING LOG	BORING NO.: MW-107	PROJECT NO.: 7311-02	PAGE 1 OF 2
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT 350		DRILLER: R. SCHEFFER	DATE STARTED: 11/8/93 COMPLETED: 11/8/93
METHOD: HSA	AUGER SIZE: 4.25" I.D.	PID METER: 10.6 ev	FID METER: OVA-108 PROTECTION LEVEL: MOD D
GROUND ELEV.: 536.3	SOIL DRILLED: 16.8' FT.	ROCK DRILLED: (CORE \ ROLLER BIT): NONE FT.	TOTAL DEPTH: 16.8'
LOGGED BY: E. SHEPHARD		CHECKED BY: N.B.	DATE: 9/6/94

DEPTH (FT.)	SAMPLE NUMBER	BLOWS PER 6-INCHES	PEN. / REC.	GRAPHIC LOG	SAMPLE DESCRIPTION	USCS CLASSIF.	MONITORING (PPM) PID	FID	OTHER
0									
1	S-1	24-14-11-12	2.0 / 1.5		0.0'-2.0' Brown Silty SAND, fine, trace Organics, dry.	SM	0	0	
2									
3	S-2	6-11-50 (for 0.4')	2.0 / 1.1		2.0'-4.0' Brown Sand, fine to coarse, some Silt, dry. (Concrete fragments in spoon)	SM	0	0	
4									
5	S-3	1-5-50 (for 0.4')	2.0 / 1.1		4.0'-4.6' Gray SILT, trace Sand. 4.6'-6.1' Light Brown SAND, fine, trace Organics, dry.	ML SM	0	0	
6									
7	S-4	5-13-17-10	2.0 / 1.5		6.0'-8.0' Light Brown SAND, fine, trace Silt, moist.	SP	0	0	
8									
9	S-5	8-20-35-50	2.0 / 1.5		8.0'-9.0' Similar to above. 9.0'-9.2' Rock fragments (shale) 9.2'-9.5' Light Brown SAND, fine to coarse, trace Silt, dry.	SP GW GW	0	0	
10									
11	S-6	35-50 (for 0.4')	2.0 / 1.0		10.0'-11.0' Red to Brown SAND, medium to coarse, trace rock fragments, dry.	GW	0	0	
12									
13	S-7	3-9-13-34	2.0 / 1.5		12.0'-12.8' Similar to above, wet. 12.8'-13.5' Gray Silty SAND, fine, trace medium to coarse Sand, wet.	GW SM	0	0	
14									
15	S-8	21-30-23-50	2.0 / 1.2		14.0'-16.0' Gray Silty SAND, fine, little medium to coarse Sand trace Rock fragments, saturated.	SM	0	0	

SOIL BORING LOG	BORING NO.: MW-107	PROJECT NO.: 7311-03	PAGE 2 OF 2

PROJECT NAME: OLIN ROCHESTER RI	DRILLING CONTRACTOR: MARCOR OF NEW YORK
DRILL RIG TYPE: CANTERRA CT 350	DRILLER: R. SCHEFFER — DATE STARTED: 11/8/93 COMPLETED: 11/8/93
METHOD: HSA — AUGER SIZE: 4.25" I.D.	PID METER: 10.6 ev — FID METER: OVA-108 — PROTECTION LEVEL: MOD D
GROUND ELEV.: 536.3 — SOIL DRILLED: 16.8' FT.	ROCK DRILLED: (CORE \ ROLLER BIT) NONE FT. — TOTAL DEPTH: 16.8'
LOGGED BY: E. SHEPHARD	CHECKED BY: NB. — DATE: 9/6/94

DEPTH (FT.)	SAMPLE NUMBER	BLOWS PER 6-INCHES	PEN. / REC.	GRAPHIC LOG	SAMPLE DESCRIPTION	USCS CLASSIF.	MONITORING PID	MONITORING FID	MONITORING OTHER
16	S-9	50/ ¬	0.5		16.0'-16.5' Similar to above, Rock fragments	SM	0	0	
17		| (for 0.4')	0.2		REFUSAL WITH SPOON AT 16.8'				
18									
19									
20									
21									
22									
22									
23									
24									
25									
26									
27									
28									
29									
30									

SOIL BORING LOG	BORING NO.: MW-108	PROJECT NO.: 7311-02	PAGE 1 OF 1
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT 350		DRILLER: R. SCHEFFER	DATE STARTED: 12/15/93 COMPLETED: 12/15/93
METHOD: HSA	AUGER SIZE: 4.25" I.D.	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: MOD D
GROUND ELEV.: 538.1	SOIL DRILLED: 12.5' FT.	ROCK DRILLED: ROLLER BIT: 12.5'-17.5'	TOTAL DEPTH: 17.5'
LOGGED BY: E. SHEPHARD		CHECKED BY: NB	DATE: 9/6/94

DEPTH (FT.)	SAMPLE NUMBER	BLOWS PER 6-INCHES	PEN. / REC.	GRAPHIC LOG	SAMPLE DESCRIPTION	USCS CLASSIF.	MONITORING (PPM) PID	FID	OTHER
0									
1	S-1	13-25-9-7	2.0 / 1.4		0'-0.3' Dark Brown to Black SAND, fine, trace Organics (Topsoil). 0.3'-1.0' Black SAND, medium to coarse, some Silt, trace ash like material	SM	0	0	
2									
3	S-2	5-5-5-10	2.0 / 1.8		2.0'-2.6' Dark Brown SAND, fine to medium, dry. 2.6'-3.8' Light Brown SAND, fine, dry.	SP	0	0	
4									
5	S-3	5-10-40-22	2.0 / 1.7		4.0'-6.0' Brown SAND, fine, some Silt, trace medium Sand, dry.	SM	0	0	
6									
7	S-4	12-22-34-52	2.0 / 2.0		6.0'-8.0' Similar to above, trace Gravel, dry.	SM	0	0	
8									
9	S-5	15-50/0.3'	0.9 / 0.9		8.0'-8.9' Similar to above	SM	0	0	
10									
11	S-6	26-38-37-41	2.0 / 1.6		10.0'-11.6' Similar to above, trace rock fragments, moist.	SM	0	0	
12	S-7	50/0.4'	0.5 / 0.2		12.0'-12.2' Brown SAND, fine, some Silt, moist.	SM	0	0	
13					Split Spoon refusal at 12.5' Roller cone drilled in rock from 12.5' to 17.5'				
14									
15									

WELL INSTALLATION DIAGRAM

WELL NO.: **BR-102**

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 540.21

REFERENCE POINT ELEVATION: 540.21

DATE INSTALLED: 11 / 03 / 93

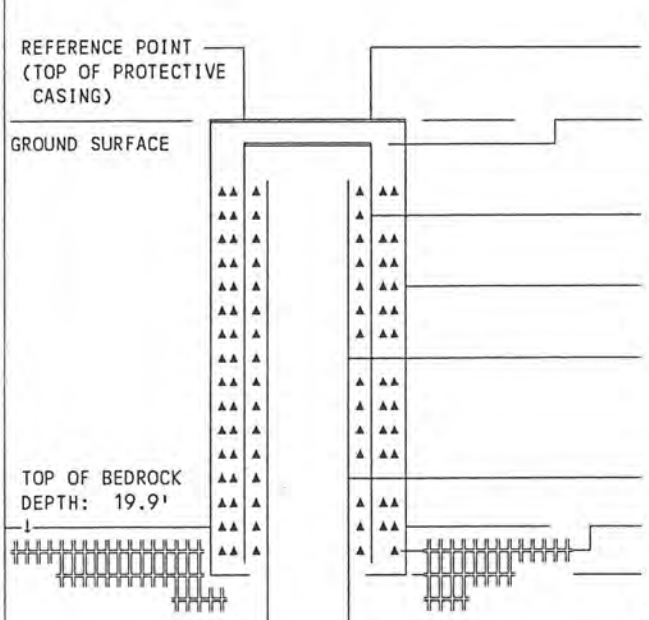
DRILLING METHOD: DRIVEN CASING \ CORE

CORE HOLE DIA.: 3.8 - INCH

RIG GEOLOGIST: E. SHEPARD

INITIAL WATER LEVEL DEPTH: 24.83'(RF)

DATE: 01 / 17 / 94



FLUSH MOUNTED PROTECTIVE CASING - STICKUP = 0.0'

TOP OF STEEL CASING DEPTH: 0.7'

OUTSIDE DIAMETER OF STEEL CASING: 6-INCH

BOREHOLE DIAMETER: 10-INCH

CORE HOLE DIAMETER: 3.8-INCH

TYPE OF BACKFILL: CEMENT\BENTONITE GROUT

DEPTH TO BOTTOM OF 6" CASING: 22.0'

DEPTH TO BOTTOM OF ROCK SOCKET AND CEMENT\BENTONITE BACKFILL: 22.0'

ROCK CORE HOLE DIAMETER: 3.8-INCH

DEPTH TO BOTTOM OF OPEN CORE HOLE: 54.0'

ABB ENVIRONMENTAL SERVICES, INC.

WELL INSTALLATION DIAGRAM

WELL NO.: **BR-103**

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 533.19

REFERENCE POINT ELEVATION: 533.19

DATE INSTALLED: 11 / 16 / 93

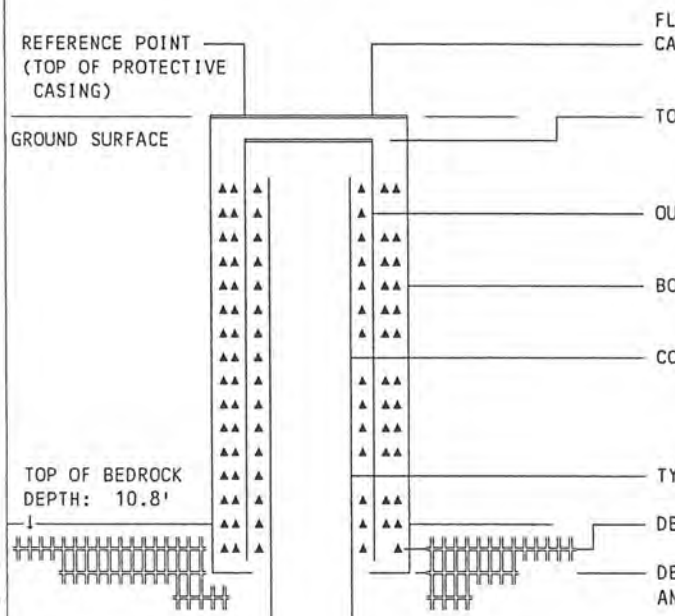
DRILLING METHOD: DRIVEN CASING \ CORE

CORE HOLE DIA.: 3.8 - INCH

RIG GEOLOGIST: E. SHEPARD

INITIAL WATER LEVEL DEPTH: 5.50'(RF)

DATE: 01 / 20 / 94



FLUSH MOUNTED PROTECTIVE CASING - STICKUP = 0.0'

TOP OF STEEL CASING DEPTH: 0.6'

OUTSIDE DIAMETER OF STEEL CASING: 6-INCH

BOREHOLE DIAMETER: 10-INCH

CORE HOLE DIAMETER: 3.8-INCH

TYPE OF BACKFILL: CEMENT\BENTONITE GROUT

DEPTH TO BOTTOM OF 6" CASING: 12.8'

DEPTH TO BOTTOM OF ROCK SOCKET AND CEMENT\BENTONITE BACKFILL: 12.8'

ROCK CORE HOLE DIAMETER: 3.8-INCH

DEPTH TO BOTTOM OF OPEN CORE HOLE: 45.0'

ABB ENVIRONMENTAL SERVICES, INC.

WELL INSTALLATION DIAGRAM

WELL NO.: **BR-104**

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 537.56

REFERENCE POINT ELEVATION: 537.56

DATE INSTALLED: 01 / 12 / 94

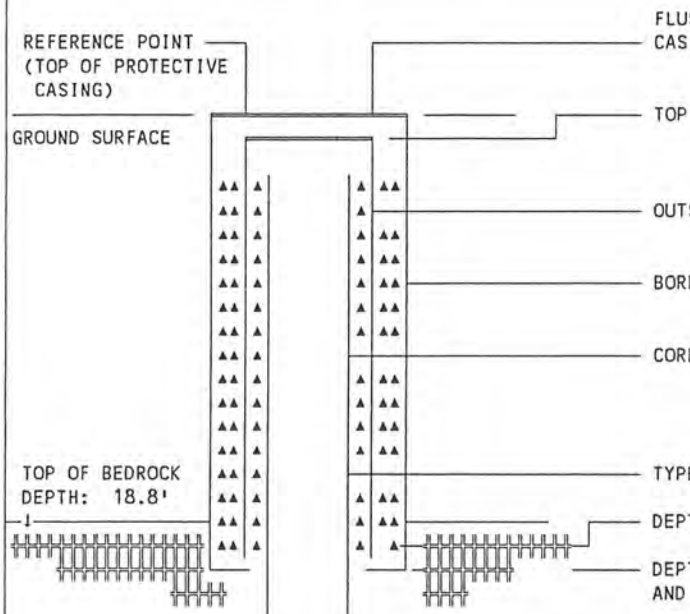
DRILLING METHOD: DRIVEN CASING \ CORE

CORE HOLE DIA.: 3.8 - INCH

RIG GEOLOGIST: E. SHEPARD

INITIAL WATER LEVEL DEPTH: 17.10'(RF)

DATE: 01 / 26 / 94



FLUSH MOUNTED PROTECTIVE CASING - STICKUP = 0.0'

TOP OF STEEL CASING DEPTH: 0.7'

OUTSIDE DIAMETER OF STEEL CASING: 6-INCH

BOREHOLE DIAMETER: 10-INCH

CORE HOLE DIAMETER: 3.8-INCH

TYPE OF BACKFILL: CEMENT\BENTONITE GROUT

DEPTH TO BOTTOM OF 6" CASING: 20.8'

DEPTH TO BOTTOM OF ROCK SOCKET AND CEMENT\BENTONITE BACKFILL: 20.8'

ROCK CORE HOLE DIAMETER: 3.8-INCH

DEPTH TO BOTTOM OF OPEN CORE HOLE: 39.8'

ABB ENVIRONMENTAL SERVICES, INC.

WELL INSTALLATION DIAGRAM

WELL NO.: **BR-105**

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 536.90

REFERENCE POINT ELEVATION: 536.90

DATE INSTALLED: 12 / 14 / 93

DRILLING METHOD: DRIVEN CASING \ CORE

CORE HOLE DIA.: 3.8 - INCH

RIG GEOLOGIST: E. SHEPARD

INITIAL WATER LEVEL DEPTH: 26.10'(RF)

DATE: 01 / 17 / 94

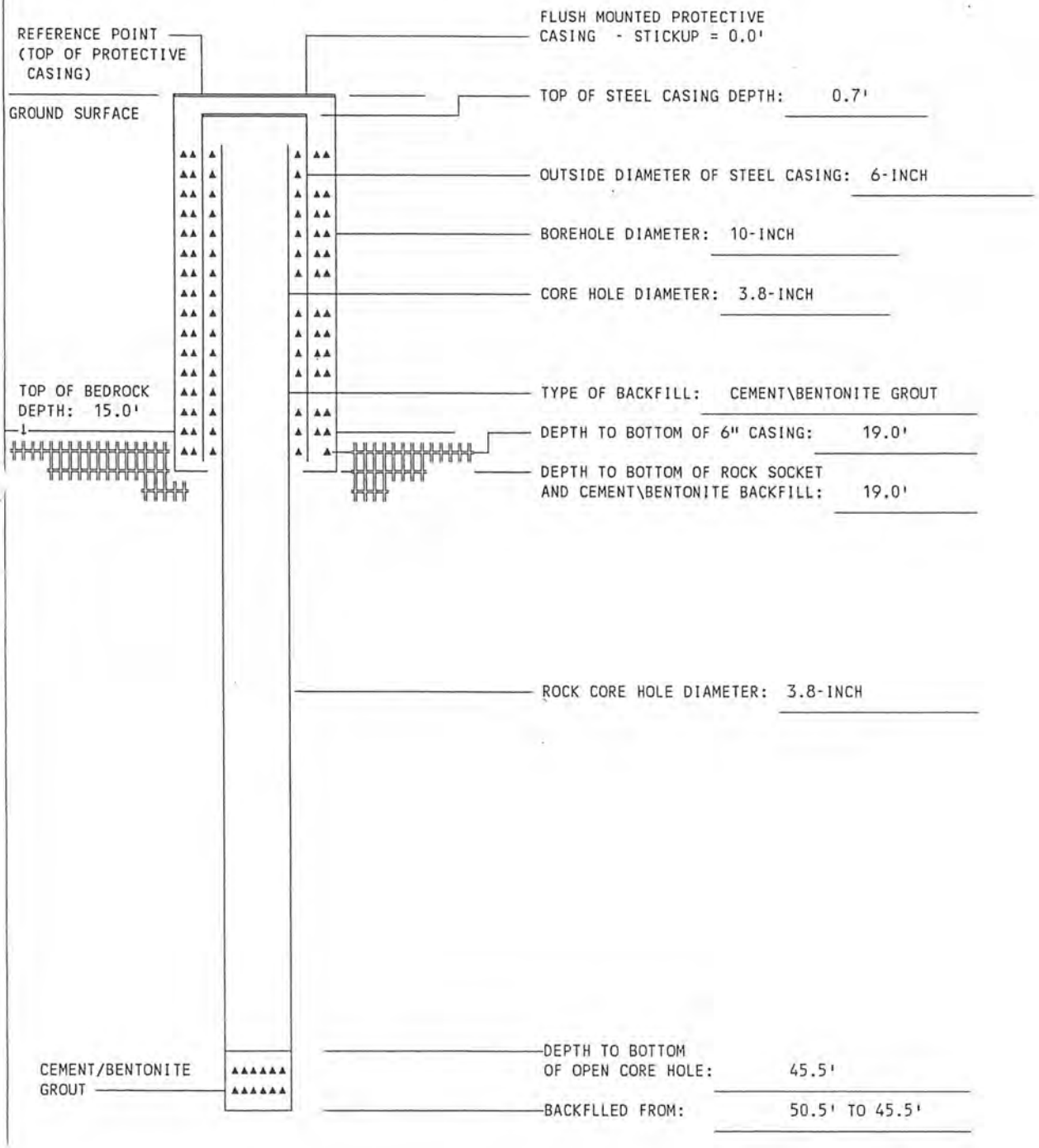


ABB ENVIRONMENTAL SERVICES, INC.

WELL INSTALLATION DIAGRAM

WELL NO.: **BR-105D**

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 536.69

REFERENCE POINT ELEVATION: 536.69

DATE INSTALLED: 01 / 19 / 94

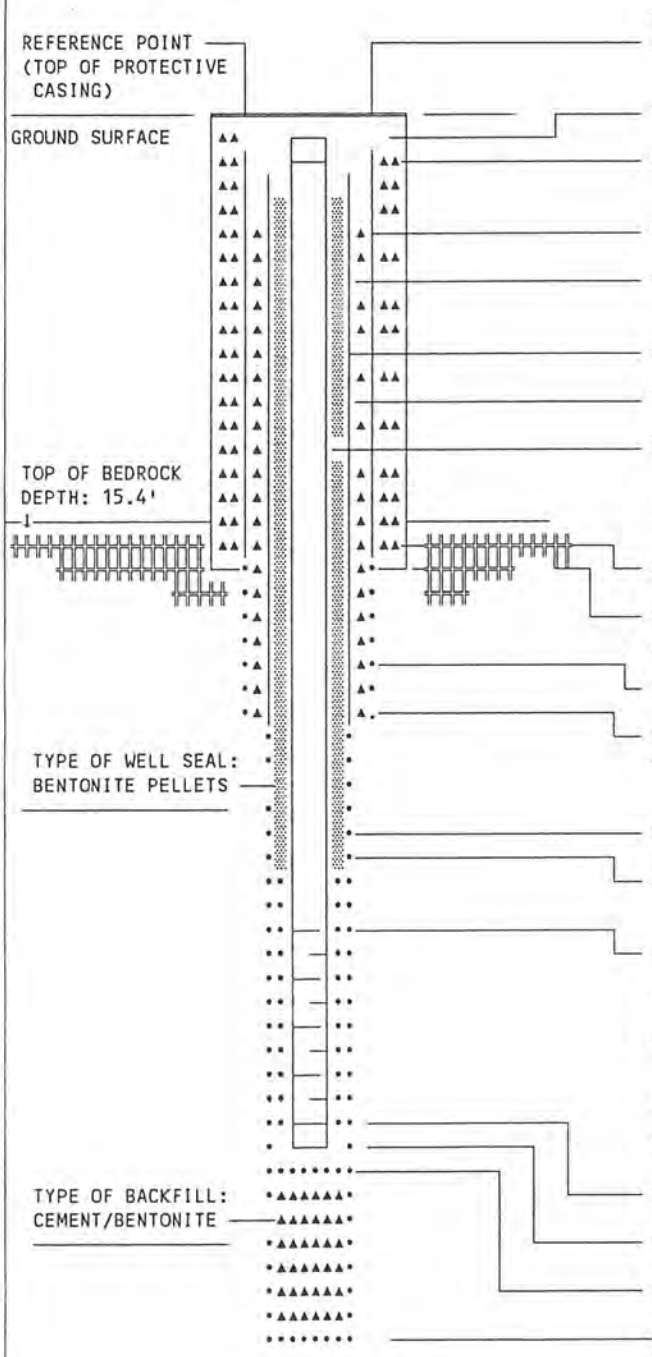
DRILLING METHOD: DRIVEN CASING / CORE

CORE HOLE DIA.: 3.8 - INCH

RIG GEOLOGIST: E. SHEPARD / N.BRETON

INITIAL WATER LEVEL DEPTH: 33.20'(RF)

DATE: 02 / 04 / 94



FLUSH MOUNTED PROTECTIVE CASING - STICKUP = 0.0'

TOP OF PVC RISER DEPTH: 0.2'

BOREHOLE DIAMETER: 10 - INCH

OUTSIDE DIAMETER OF STEEL CASING: 6 - INCH

OUTSIDE DIA. OF INNER STEEL CASING: 4 - INCH

CORE HOLE DIAMETER: 3.8-INCH

TYPE OF BACKFILL: CEMENT\BENTONITE GROUT

WELL RISER ID: 2.0 - INCH

TYPE OF WELL RISER: SCH 40 PVC

DEPTH TO BOTTOM OF 6" CASING: 17.4'

DEPTH TO BOTTOM OF ROCK SOCKET AND CEMENT\BENTONITE BACKFILL: 17.4'

BOREHOLE DIA. (REAMED): 5 7/8 - INCH (TO 50.5')

DEPTH TO BOTTOM OF 4 - INCH STEEL CASING: 50.5'

ROCK CORE HOLE DIAMETER: 3.8-INCH (TO 109.6')

DEPTH TO TOP OF SAND PACK: 68.0'

DEPTH TO TOP OF WELL SCREEN: 70.0'

TYPE OF WELL SCREEN: SCH 40 PVC

WELL SCREEN ID: 2.0 - INCH

LENGTH OF WELL SCREEN: 9.6'

TYPE OF SAND PACK: PENN SILICA # 1

DEPTH TO BOTTOM OF WELL SCREEN: 79.6'

DEPTH TO BOTTOM OF SEDIMENT TRAP: 80.0'

DEPTH TO TOP OF CEMENT/BENTONITE: 81.3'

DEPTH TO BOTTOM OF CORE HOLE: 109.6'

ABB ENVIRONMENTAL SERVICES, INC.

WELL INSTALLATION DIAGRAM

WELL NO.: **BR-106**

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 535.74

REFERENCE POINT ELEVATION: 535.74

DATE INSTALLED: 01 / 11 / 94

DRILLING METHOD: DRIVEN CASING \ CORE

CORE HOLE DIA.: 3.8 - INCH

RIG GEOLOGIST: E. SHEPARD

INITIAL WATER LEVEL DEPTH: 24.90'(RF)

DATE: 01 / 17 / 94

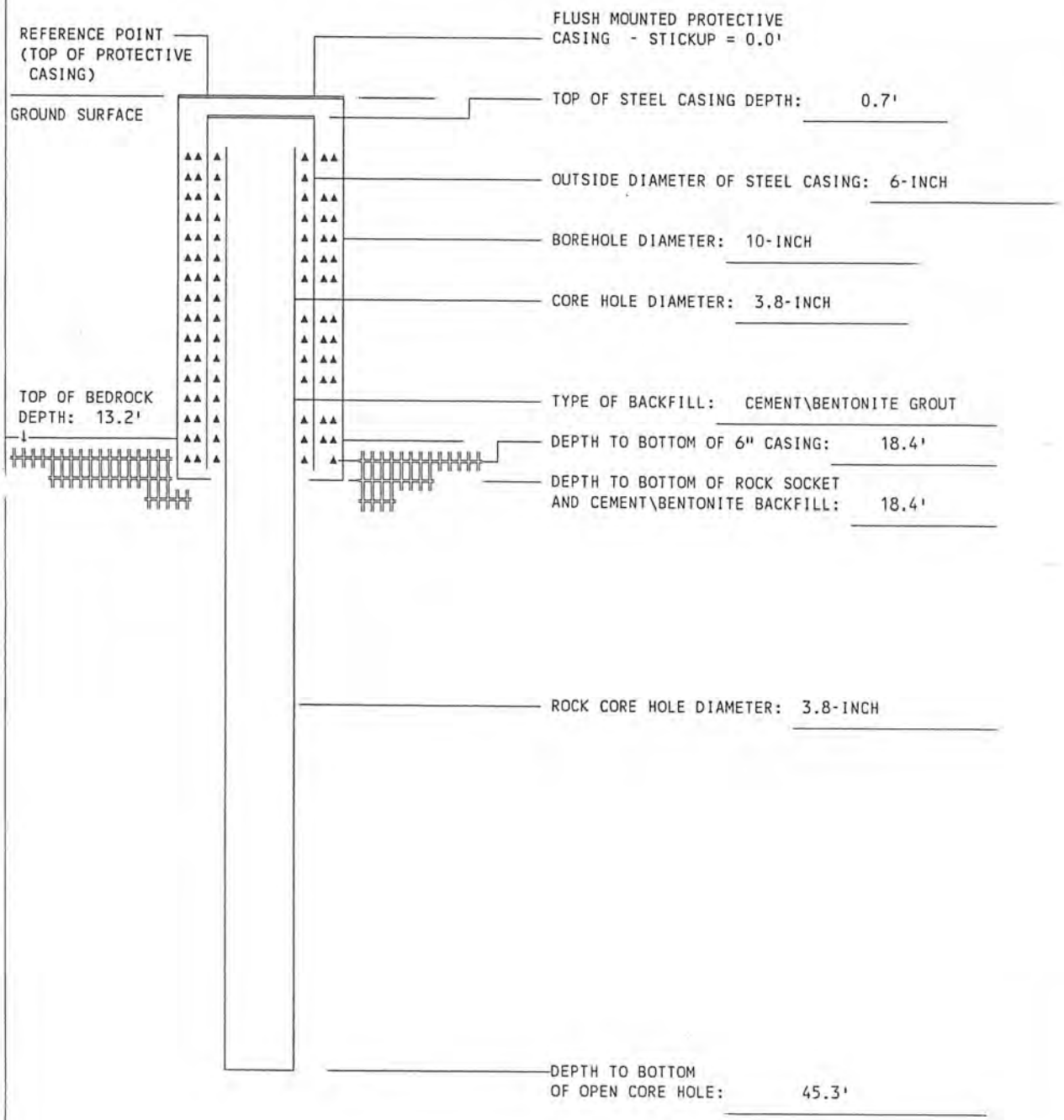


ABB ENVIRONMENTAL SERVICES, INC.

WELL INSTALLATION DIAGRAM

WELL NO.: **BR-107**

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 536.32

REFERENCE POINT ELEVATION: 536.32

DATE INSTALLED: 11 / 15 / 94

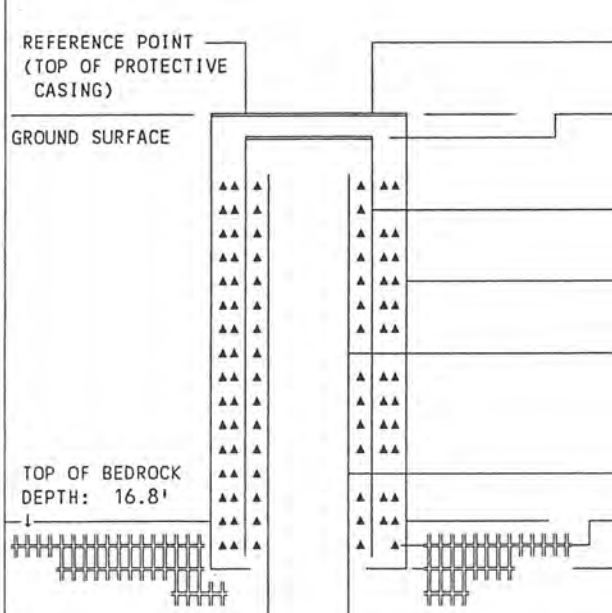
DRILLING METHOD: DRIVEN CASING \ CORE

CORE HOLE DIA.: 3.8 - INCH

RIG GEOLOGIST: E. SHEPARD

INITIAL WATER LEVEL DEPTH: 22.40'(RF)

DATE: 01 / 21 / 94



FLUSH MOUNTED PROTECTIVE CASING - STICKUP = 0.0'

TOP OF STEEL CASING DEPTH: 0.5'

OUTSIDE DIAMETER OF STEEL CASING: 6-INCH

BOREHOLE DIAMETER: 10-INCH

CORE HOLE DIAMETER: 3.8-INCH

TYPE OF BACKFILL: CEMENT\BENTONITE GROUT

DEPTH TO BOTTOM OF 6" CASING: 18.8'

DEPTH TO BOTTOM OF ROCK SOCKET AND CEMENT\BENTONITE BACKFILL: 18.8'

ROCK CORE HOLE DIAMETER: 3.8-INCH

DEPTH TO BOTTOM OF OPEN CORE HOLE: 40.0'

ABB ENVIRONMENTAL SERVICES, INC.

WELL INSTALLATION DIAGRAM

WELL NO.: **BR-108**

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 538.40

REFERENCE POINT ELEVATION: 540.58

DATE INSTALLED: 01 / 07 / 94

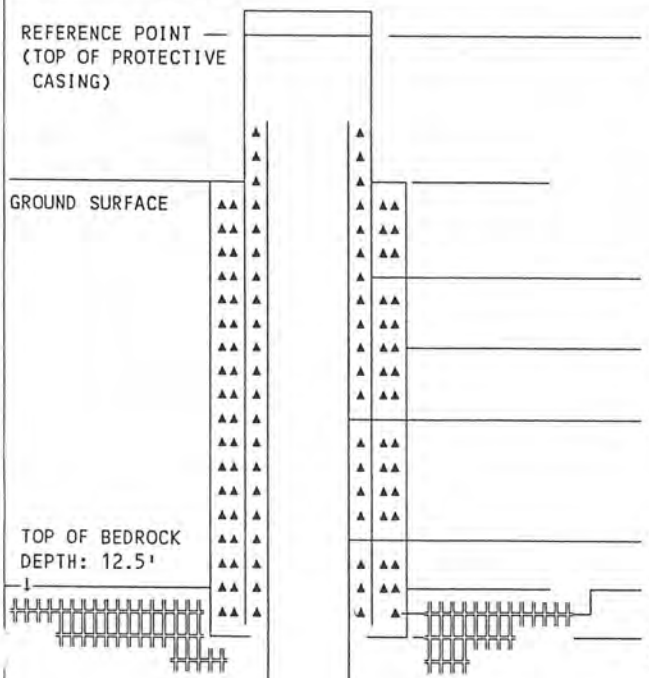
DRILLING METHOD: DRIVEN CASING \ CORE

CORE HOLE DIA.: 3.8 - INCH

RIG GEOLOGIST: E. SHEPARD

INITIAL WATER LEVEL DEPTH: 28.91'(RF)

DATE: 01 / 18 / 94



PROTECTIVE CASING STICKUP: 2.2'

OUTSIDE DIAMETER OF STEEL CASING: 6-INCH

BOREHOLE DIAMETER: 10-INCH

CORE HOLE DIAMETER: 3.8-INCH

TYPE OF BACKFILL: CEMENT\BENTONITE GROUT

DEPTH TO BOTTOM OF 6" CASING: 17.5'

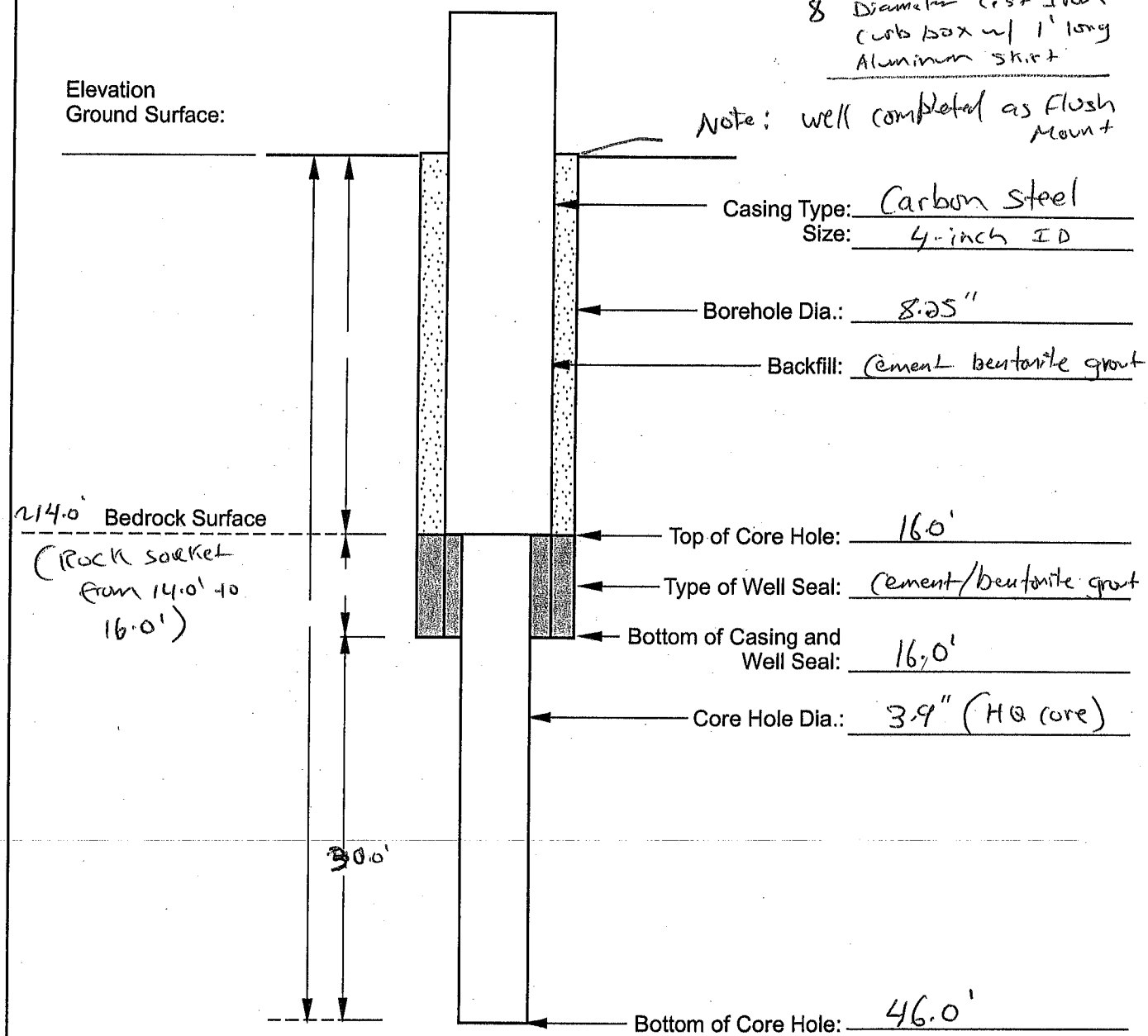
DEPTH TO BOTTOM OF ROCK SOCKET AND CEMENT\BENTONITE BACKFILL: 17.5'

ROCK CORE HOLE DIAMETER: 3.8-INCH

DEPTH TO BOTTOM OF OPEN CORE HOLE: 41.0'

ABB ENVIRONMENTAL SERVICES, INC.

Well: BR-126



prepared by: N. Breton

WELL CONSTRUCTION DETAILS
ARCH ROCHESTER
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Soil Boring Log

Boring/Well No.: BR-12-6

Project No.:	Project Name: **Arch Rochester**		
Client Name: **Arch Chemicals**	Logged By: NMB	Protection Level: D	Ground Elevation:
Drilling Contractor: Nothnagle	Drilling Method: 4.25" HSA		
Driller's Name: N. Short			
Bit Type/Size: 4.25" HSA	Soil Drilled: 12.5'	Chkd By:	Start Date: 3/2/05 Finish Date: 3/2/05
Screen (ft): —	Riser (ft.): —	Diam. (ID):	Material: None PI Meter:: TE-580B
Core Interval (to/from)(ft.):	Total Depth:	Water Level (BGS):	Ground Elevation:

Depth (feet) Below Ground Surface	Sampling Number:	Sample Depth:	CLP/Screening:	Recovery:	PID (ppm):	Soil/Rock Water Discharge Description:	Soil Class:	Blow Counts/6"	Well Data:
2					0.0	0-1' Dark brown fine to medium sand some gravel, frozen, Loose, Fill 1'-5' Reddish brown fine to medium sand, little gravel moist loose Fill			
4									
5						Reddish brown fine to medium sand, trace coarse grtrace gravel, poorly sorted, some silt, wet, Fill	SM	1 1 2 3	
6	S-1	5'-7'	NA	1.0'	0.0				
7						7'-10' Same as above except saturated			
8									
10						Gray fine to medium sand, little silt uniformly graded (well sorted), loose, saturated,	SP	2 3 6 9	
12						12.5' Bedrock surface inferred (difficulty advancing augers. Advance through fractured rock to 14.0'			
14						Continue log on Rock Coring log after seating casing in Rocket Socket at 16.0' bgs.			

See Rock Core Logs on Pages 2 and 3

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ROCK CORING LOG

Project: **Arch Rochester**		Boring/Well No.: BR-106		Project No. : 36160360009
Client: **Arch Chemicals**	Driller's Name: Neal Short	Logged by: NMB	Checked by:	Ground Elev.:
Drilling Contractor: Nathnagle	Protection Level: D	Rig Type: CME 85	Start Date: 3/3/05	Finish Date: 3/3/05
Drilling Method: wire-line core	Bit Type/Size: HQ - 3.9" OD	P.I.D. (eV): 11.8	Casing Size: 4"	Auger Size:
Ground Elev.:	Soil Drilled: 14.0' (Rock Socket to 16')	Core Interval (to/from)(ft): 16.0' - 31.0'		

Depth (feet) Below GRD Sort.	Sample No. & Penetration/ Recovery (feet)	RQD (%):	Graphic Log	Core Breaks Type:	Core Breaks Dip:	Weathered Condition:	Pid Reading (ppm):	FID Reading (ppm):	Rock Description and Comments on Drilling
16									Light Gray fine grained Crystalline Dolomite with Interbedded shale (occasional stylolites and shale stringers) Lockport Fm
17	Run #1 57"/60"	53			10° 0° 0° 0°		0.0		
18					0° 0°				
19					0°				
20					0° 0°				- 20.3'-20.7' - Highly fractured
21									
22	Run #2 60"/60"	90			0° 0° 15°		0.0		
23					0°-10° 0°-10°				- 23.3' - 1/2" diameter vug
24									
25					20°				
26					20°				
27	Run #3 60"/60"	80			0°		0.0		- 26.6' - 1" diameter vug
28					0° 0° 0°				
29					20° 10° 0°	weathered			
30					0°	weathered			
31					~30° ~35° 10°	weathered			

ROCK CORING LOG

Project:		Boring/Well No.:		Project No. :
Arch Rochester		BR-126		36/6036009
Client: Arch Chemicals	Driller's Name: Neel Short	Logged by: NMB	Checked by:	Ground Elev.:
Drilling Contractor: Nothnagle	Protection Level: D	Rig Type: CME 85	Start Date: 3/3/05	Finish Date: 3/3/05
Drilling Method: wire-line core	Bit Type/Size: HQ - 3.9" OD	P.I.D. (eV): 11.8	Casing Size: 4"	Auger Size:
Ground Elev.:	Soil Drilled: 14.0' (160' to Rock surface)	Core Interval (to/from)(ft): 31.0' - 46.0'		

Depth (feet) Below GRD Sort.	Sample No. & Penetration/ Recovery (feet)	RQD (%):	Graphic Log	Core Breaks Type:	Core Breaks Dip:	Weathered Condition:	Pid Reading (ppm):	FID Reading (ppm):	Rock Description and Comments on Drilling
									Continued:
32	Run # 4	90			10°				Light gray fine grained crystalline dolomite with interbedded shale (occasional stylolites and shale stringers) Lockport Fm
33	58"/60"				10°		0.0		
34					10°	slight			
35					10°	slight			
36					10°	slight			
			0		5°-10°				-36.1' - 1/2" diameter vug
37	Run # 5	73			5°-10° 100° 15°	moderate			
38					10°				
39	59"/60"				10° 10° 10°				- small vertical break @ 39.9'
40					0° 0°				
41					15°	moderate			
42	Run # 6	83			10°	slight			
43					5°	slight			
44	60"/60"				10° 0°	slight			44-44.3' small vertical break
45					10°				
46					10°	slight			End of Bore hole @ 46.0' bgs

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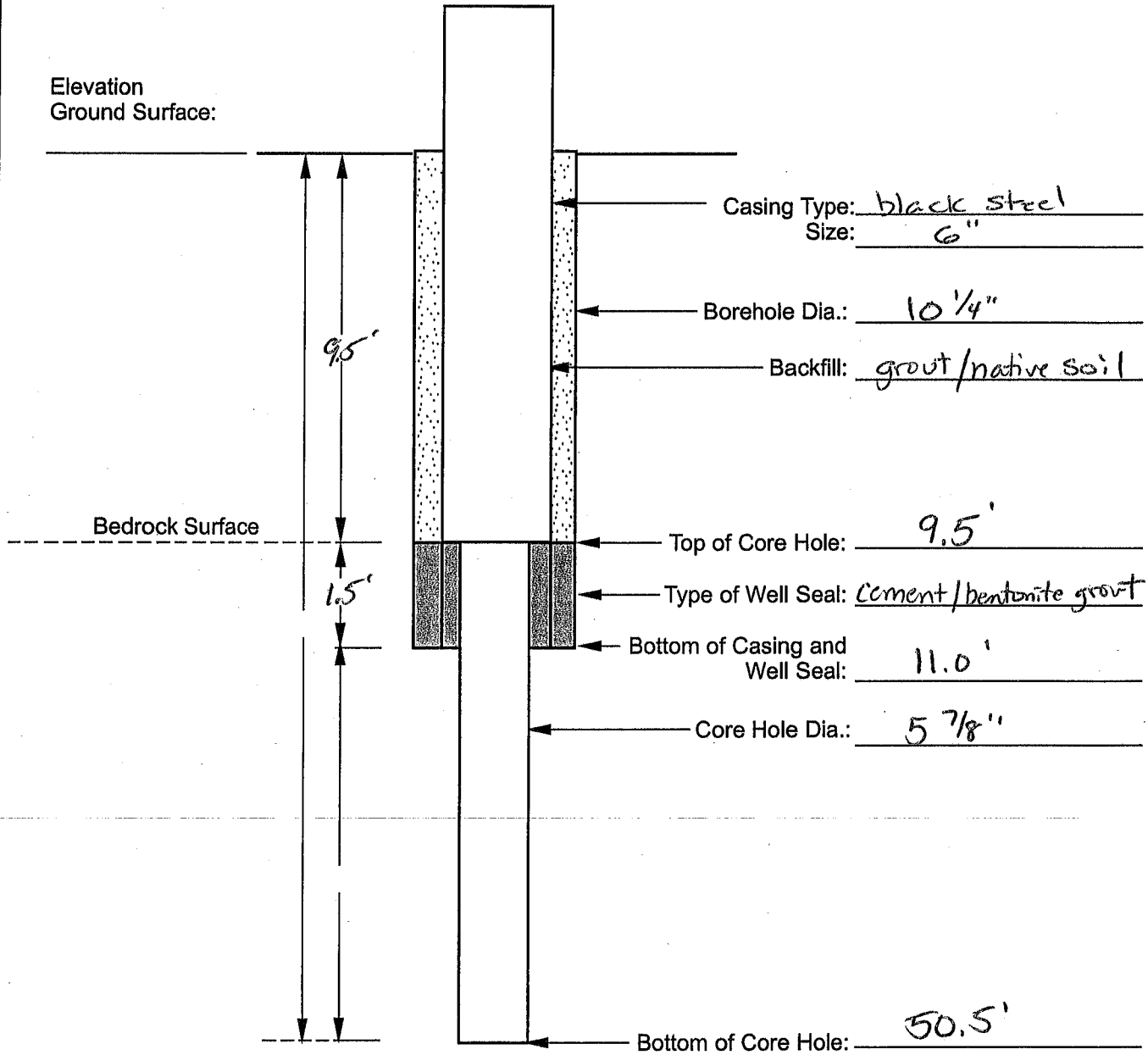
Well: BR-127



WELL CONSTRUCTION DETAILS
ARCH ROCHESTER
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ROCK CORING LOG

Project:		Boring/Well No.:		Project No. :
Arch Rochester		BR-127		
Client: **Arch Chemicals**	Driller's Name: NEAL SHORT	Logged by: M. SCHAEFFER	Checked by: MJB	Ground Elev.:
Drilling Contractor: NOTHNAGLE DRILLING	Protection Level: D	Rig Type: CME-75	Start Date: 11/1/04	Finish Date:
Drilling Method: WIRELINE CORE	Bit Type/Size: HQ (3.8" CORE HOLE)	P.I.D. (eV): 11.7	Casing Size:	Auger Size:
Ground Elev.:	Soil Drilled: 9.0'	Core Interval (to/from)(ft): 9.0' - 50'		

Depth (feet) Below GRD Sort.	Sample No. & Penetration/ Recovery (feet)	RQD (%):	Graphic Log	Core Breaks Type:	Core Breaks Dip:	Weathered Condition:	Pid Reading (ppm):	FID Reading (ppm):	Rock Description and Comments on Drilling
									Seat + grout 6" steel casing 11' bgs
9									
10	R-1 9.0'-10.5'								grout
11	R-2								grout to 10.9'
12	10.5'-15.5'								gray bedded dolomite finely crystalline w/ interbedded shale
13		76			10°-15°		BKgd		near horizontal fractures along shale bedding planes (wavy)
14	5.0'								small voids at ~ 12' and 13.3'
15									losing some drill water
16									
17	R-3 15.5'-20.5'				0°-5°				wavy breaks along shaly lamina
18		83					BKgd		
19	5.0								
20					10°-15°				
21									

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ROCK CORING LOG

Project: **Arch Rochester**		Boring/Well No.: BR-127		Project No. :
Client: **Arch Chemicals**	Driller's Name:	Logged by: M. SCHAEFFER	Checked by:	Ground Elev.:
Drilling Contractor: NOTHNAGLE DRILLING	Protection Level:	Rig Type:	Start Date:	Finish Date:
Drilling Method: WIRELINE CORE	Bit Type/Size: HQ (3.8 COREHOLE)	P.I.D. (eV): 11.7	Casing Size:	Auger Size:
Ground Elev.:	Soil Drilled: 9.0'	Core Interval (to/from)(ft):		

Depth (feet) Below GRD Sort.	Sample No. & Penetration/ Recovery (feet)	RQD (%):	Graphic Log	Core Breaks Type:	Core Breaks Dip:	Weathered Condition:	Pid Reading (ppm):	FID Reading (ppm):	Rock Description and Comments on Drilling
21	R-4				0°-10°				fractures along shaley lamina
22	20.5'-								
23	25.5'	96			0-5°		BKgd		
24	5.0								
25				mech	10°-15°				
26	R-5								fractures along shaley lamina
27	25.5'-								
28	30.5'	84			0°-5°		BKgd		
29	5.0'								
30				mech					
31	R-6								31.2' - 2" gray clay in fracture
32		82							31.5'- 34.5' shaley lamina / stringers
33	30.5'- 35.5'				0°-10°		BKgd		~~Fracs~~ increase
34									
35				mech					

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ROCK CORING LOG

Project: Arch Rochester			Boring/Well No.: BR-127		Project No. :
Client: Arch Chemicals		Driller's Name:	Logged by: M.S.	Checked by: NMB	Ground Elev.:
Drilling Contractor:		Protection Level:	Rig Type:	Start Date:	Finish Date:
Drilling Method:	Bit Type/Size:		P.I.D. (eV):	Casing Size:	Auger Size:
Ground Elev.:	Soil Drilled:	Core Interval (to/from)(ft):			

Depth (feet) Below GRD Sort.	Sample No. & Penetration/ Recovery (feet)	RQD (%):	Graphic Log	Core Breaks Type:	Core Breaks Dip:	Weathered Condition:	Pid Reading (ppm):	FID Reading (ppm):	Rock Description and Comments on Drilling
36	R-7								Shaly lamina / stringers decreased
37	35.5'-								
38	40.5'	85			0°-5°		Bkgd		
39	5.0								
40				mech					
41	R-8								Vugs / stylolites 40.5'-40.9'
42	40.5'-								wavy breaks along stylolite /
43	45.5'	82			0°-5°		Bkgd		shaly lamina
44									
45	5.0			mech					
46	R-9								gray clay in 1.5" seam at 46.3'
47	45.5'-								
48	50.5'	82			10°-20°		Bkgd		wavy breaks along shaly lamina/ stylolites
49	5.0								
50				mech	5°-10°				EOB 50.5'

WELL INSTALLATION DIAGRAM

WELL NO.: **MW-103**

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 533.25

REFERENCE POINT ELEVATION: 533.25

DATE INSTALLED: 11 / 10 / 93

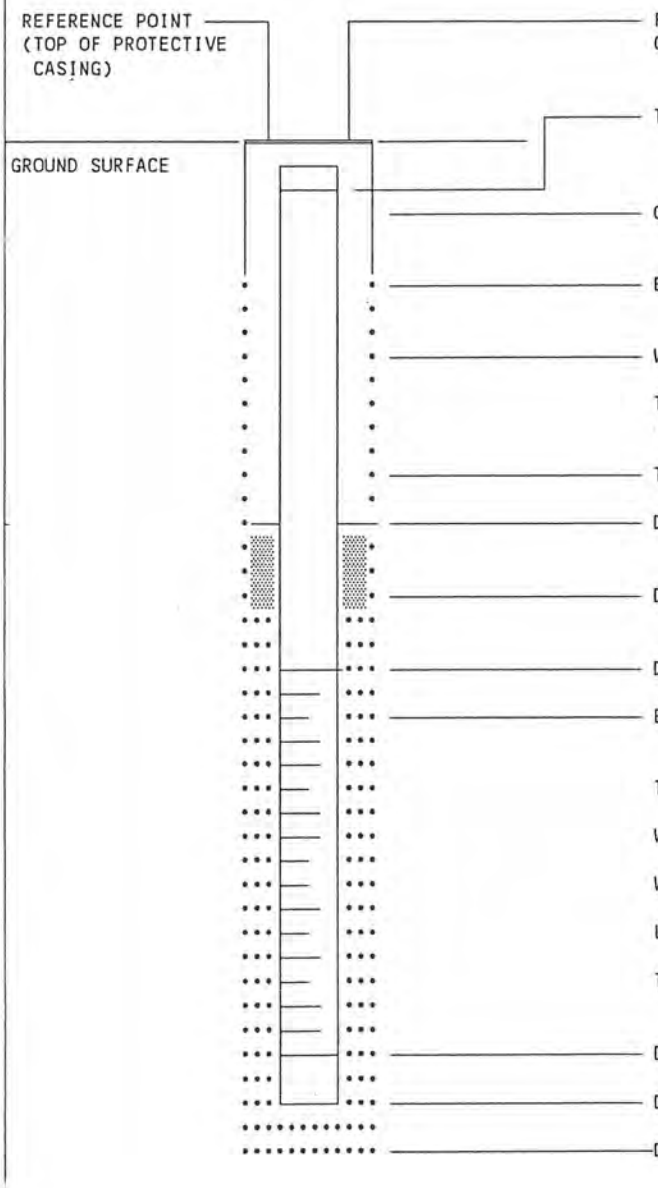
DRILLING METHOD: HSA

AUGER ID: 4.25 - INCH

RIG GEOLOGIST: J. ROSENBLUM

INITIAL WATER LEVEL DEPTH: 3.98'(RF)

DATE: 01 / 19 / 94



FLUSH MOUNTED PROTECTIVE CASING - STICKUP = 0.0'

TOP OF PVC RISER DEPTH: 0.3'

OUTSIDE DIAMETER OF STEEL PROTECTIVE CASING: 8 - INCH

BOREHOLE DIAMETER: 8.25 - INCH

WELL RISER ID: 2.0-INCH

TYPE OF WELL RISER: SCH 40 PVC

TYPE OF BACKFILL: PENN SILICA # 1 SAND (FOR DRAINAGE)

DEPTH TO TOP OF BENTONITE PELLET SEAL: 1.6'

DEPTH TO TOP OF SAND PACK: 3.6'

DEPTH TO TOP OF WELL SCREEN: 5.6'

BOREHOLE DIAMETER: 8.25 - INCH

TYPE OF WELL SCREEN: SCH 40 PVC

WELL SCREEN ID: 2.0-INCH

WELL SLOT SIZE: 0.010-INCH

LENGTH OF WELL SCREEN: 3.0'

TYPE OF SAND PACK: PENN SILICA # 1

DEPTH TO BOTTOM OF WELL SCREEN: 8.6'

DEPTH TO BOTTOM OF SEDIMENT TRAP: 8.6'

DEPTH OF BOREHOLE: 10.8'

ABB ENVIRONMENTAL SERVICES, INC.

WELL INSTALLATION DIAGRAM

WELL NO.: **MW-104**

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 537.54

REFERENCE POINT ELEVATION: 537.54

DATE INSTALLED: 01 / 04 / 94

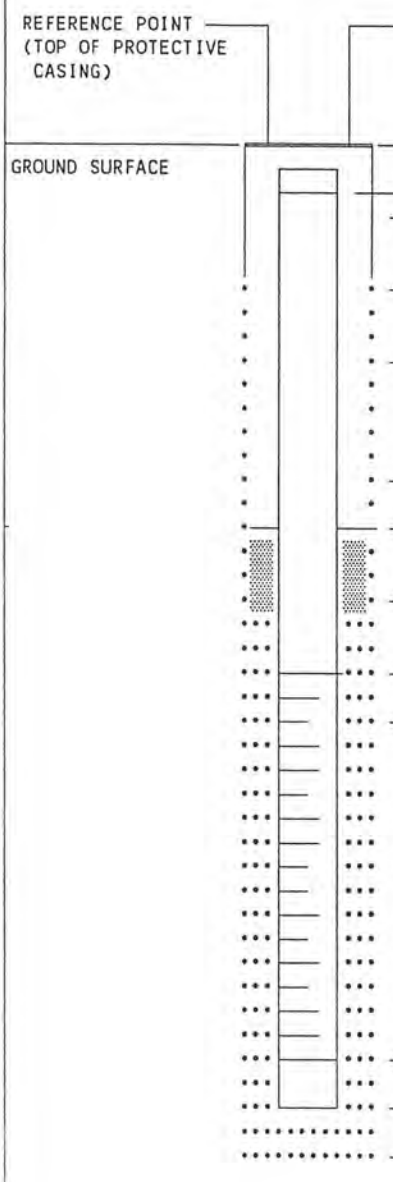
DRILLING METHOD: HSA

AUGER ID: 4.25 - INCH

RIG GEOLOGIST: E. SHEPARD

INITIAL WATER LEVEL DEPTH: 13.00'(RF)

DATE: 01 / 26 / 94



- FLUSH MOUNTED PROTECTIVE CASING - STICKUP = 0.0'
- TOP OF PVC RISER DEPTH: 0.6'
- OUTSIDE DIAMETER OF STEEL PROTECTIVE CASING: 8 - INCH
- BOREHOLE DIAMETER: 8.25 - INCH
- WELL RISER ID: 2.0-INCH
- TYPE OF WELL RISER: SCH 40 PVC
- TYPE OF BACKFILL: PENN SILICA # 1 SAND (FOR DRAINAGE)
- DEPTH TO TOP OF BENTONITE PELLET SEAL: 4.6'
- DEPTH TO TOP OF SAND PACK: 6.6'
- DEPTH TO TOP OF WELL SCREEN: 8.6'
- BOREHOLE DIAMETER: 8.25 - INCH
- TYPE OF WELL SCREEN: SCH 40 PVC
- WELL SCREEN ID: 2.0-INCH
- WELL SLOT SIZE: 0.010-INCH
- LENGTH OF WELL SCREEN: 9.6'
- TYPE OF SAND PACK: PENN SILICA # 1
- DEPTH TO BOTTOM OF WELL SCREEN: 18.2'
- DEPTH TO BOTTOM OF SEDIMENT TRAP: 18.6'
- DEPTH OF BOREHOLE: 19.0'

ABB ENVIRONMENTAL SERVICES, INC.

WELL INSTALLATION DIAGRAM

WELL NO.: **MW-105**

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 536.91

REFERENCE POINT ELEVATION: 536.91

DATE INSTALLED: 11 / 17 / 93

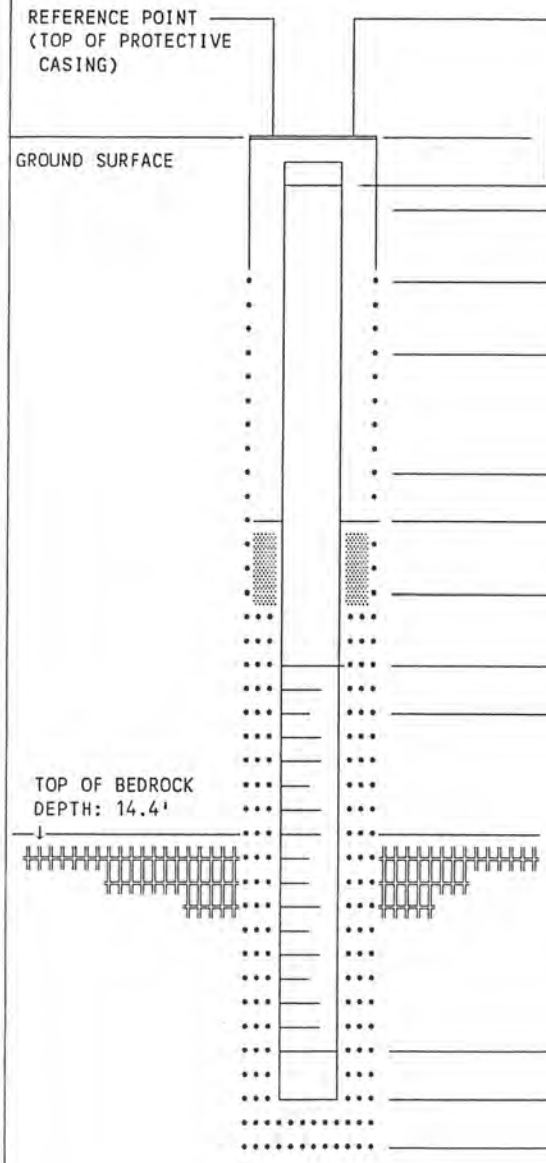
DRILLING METHOD: HSA

AUGER ID: 4.25 - INCH

RIG GEOLOGIST: E. SHEPARD

INITIAL WATER LEVEL DEPTH: DRY

DATE: 01 / 17 / 94



FLUSH MOUNTED PROTECTIVE CASING - STICKUP = 0.0'

TOP OF PVC RISER DEPTH: 0.4'

OUTSIDE DIAMETER OF STEEL PROTECTIVE CASING: 8 - INCH

BOREHOLE DIAMETER: 8.25 - INCH

WELL RISER ID: 2.0-INCH

TYPE OF WELL RISER: SCH 40 PVC

TYPE OF BACKFILL: PENN SILICA # 1 SAND (FOR DRAINAGE)

DEPTH TO TOP OF BENTONITE PELLET SEAL: 5.2'

DEPTH TO TOP OF SAND PACK: 7.4'

DEPTH TO TOP OF WELL SCREEN: 9.4'

BOREHOLE DIAMETER: 8.25 - INCH

TYPE OF WELL SCREEN: SCH 40 PVC

WELL SCREEN ID: 2.0-INCH

WELL SLOT SIZE: 0.010-INCH

LENGTH OF WELL SCREEN: 9.6'

TYPE OF SAND PACK: PENN SILICA # 1

DEPTH TO BOTTOM OF WELL SCREEN: 19.0'

DEPTH TO BOTTOM OF SEDIMENT TRAP: 19.4'

DEPTH OF BOREHOLE: 19.4'

ABB ENVIRONMENTAL SERVICES, INC.

WELL INSTALLATION DIAGRAM

WELL NO.: **MW-106**

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 535.44

REFERENCE POINT ELEVATION: 535.44

DATE INSTALLED: 12 / 07 / 93

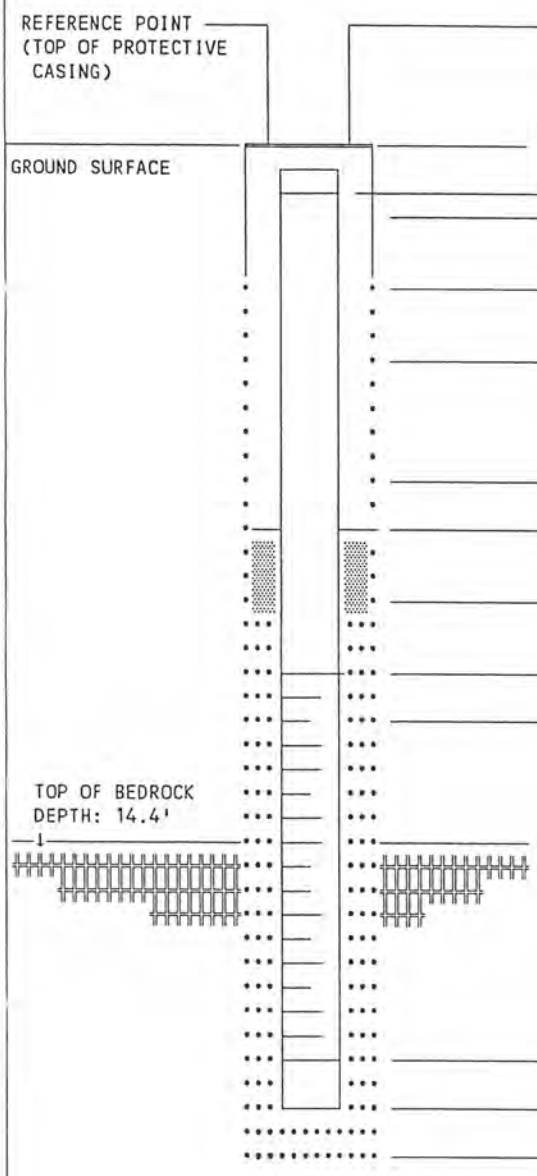
DRILLING METHOD: HSA

AUGER ID: 4.25 - INCH

RIG GEOLOGIST: E. SHEPARD

INITIAL WATER LEVEL DEPTH: 12.10'(RF)

DATE: 01 / 17 / 94



FLUSH MOUNTED PROTECTIVE CASING - STICKUP = 0.0'

TOP OF PVC RISER DEPTH: 0.5'

OUTSIDE DIAMETER OF STEEL PROTECTIVE CASING: 8 - INCH

BOREHOLE DIAMETER: 8.25 - INCH

WELL RISER ID: 2.0-INCH

TYPE OF WELL RISER: SCH 40 PVC

TYPE OF BACKFILL: PENN SILICA # 1 SAND (FOR DRAINAGE)

DEPTH TO TOP OF BENTONITE PELLET SEAL: 5.8'

DEPTH TO TOP OF SAND PACK: 7.8'

DEPTH TO TOP OF WELL SCREEN: 9.8'

BOREHOLE DIAMETER: 8.25 - INCH

TYPE OF WELL SCREEN: SCH 40 PVC

WELL SCREEN ID: 2.0-INCH

WELL SLOT SIZE: 0.010-INCH

LENGTH OF WELL SCREEN: 9.6'

TYPE OF SAND PACK: PENN SILICA # 1

DEPTH TO BOTTOM OF WELL SCREEN: 19.4'

DEPTH TO BOTTOM OF SEDIMENT TRAP: 19.8'

DEPTH OF BOREHOLE: 19.8'

ABB ENVIRONMENTAL SERVICES, INC.

WELL INSTALLATION DIAGRAM

WELL NO.: MW-107

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 536.29

REFERENCE POINT ELEVATION: 536.29

DATE INSTALLED: 11 / 08 / 93

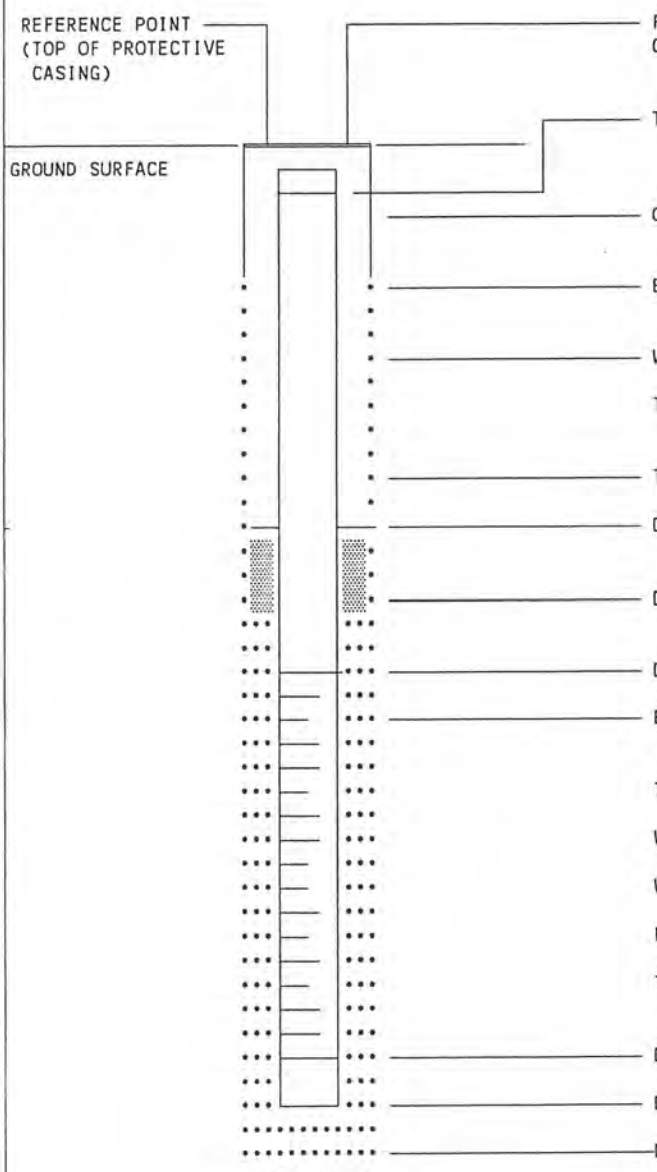
DRILLING METHOD: HSA

AUGER ID: 4.25 - INCH

RIG GEOLOGIST: E. SHEPARD

INITIAL WATER LEVEL DEPTH: 11.18'(RF)

DATE: 01 / 18 / 94



FLUSH MOUNTED PROTECTIVE CASING - STICKUP = 0.0'

TOP OF PVC RISER DEPTH: 0.5'

OUTSIDE DIAMETER OF STEEL PROTECTIVE CASING: 8 - INCH

BOREHOLE DIAMETER: 8.25 - INCH

WELL RISER ID: 2.0-INCH

TYPE OF WELL RISER: SCH 40 PVC

TYPE OF BACKFILL: PENN SILICA # 1 SAND (FOR DRAINAGE)

DEPTH TO TOP OF BENTONITE PELLET SEAL: 2.3'

DEPTH TO TOP OF SAND PACK: 4.3'

DEPTH TO TOP OF WELL SCREEN: 6.3'

BOREHOLE DIAMETER: 8.25 - INCH

TYPE OF WELL SCREEN: SCH 40 PVC

WELL SCREEN ID: 2.0-INCH

WELL SLOT SIZE: 0.010-INCH

LENGTH OF WELL SCREEN: 9.6'

TYPE OF SAND PACK: PENN SILICA # 1

DEPTH TO BOTTOM OF WELL SCREEN: 16.0'

DEPTH TO BOTTOM OF SEDIMENT TRAP: 19.3'

DEPTH OF BOREHOLE: 16.8'

ABB ENVIRONMENTAL SERVICES, INC.

WELL INSTALLATION DIAGRAM

WELL NO.: **MW-108**

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 538.10

REFERENCE POINT ELEVATION: 540.80

DATE INSTALLED: 12 / 15 / 93

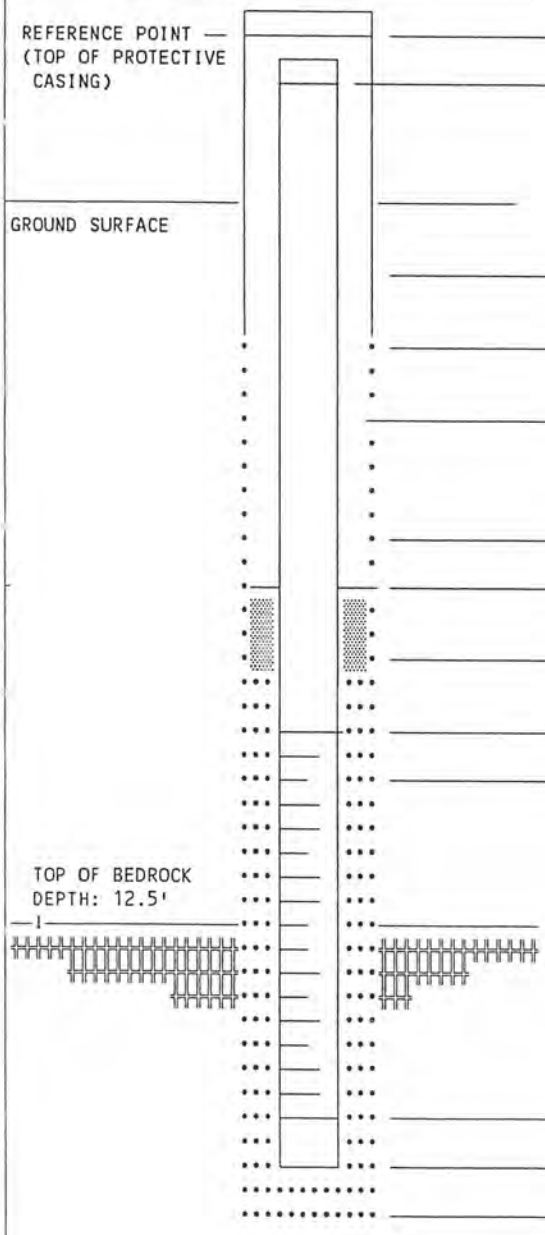
DRILLING METHOD: HSA

AUGER ID: 4.25 - INCH

RIG GEOLOGIST: E. SHEPARD

INITIAL WATER LEVEL DEPTH: 19.99'(RF)

DATE: 01 / 18 / 94



PROTECTIVE CASING STICKUP: 2.7'

PVC STICKUP: 2.6'

OUTSIDE DIAMETER OF STEEL PROTECTIVE CASING: 4 - INCH

BOREHOLE DIAMETER: 8.25 - INCH

WELL RISER ID: 2.0-INCH

TYPE OF WELL RISER: SCH 40 PVC

TYPE OF BACKFILL: VOLCLAY GROUT

DEPTH TO TOP OF BENTONITE PELLET SEAL: 3.3'

DEPTH TO TOP OF SAND PACK: 5.5'

DEPTH TO TOP OF WELL SCREEN: 7.5'

BOREHOLE DIAMETER: 8.25 - INCH

TYPE OF WELL SCREEN: SCH 40 PVC

WELL SCREEN ID: 2.0-INCH

WELL SLOT SIZE: 0.010-INCH

LENGTH OF WELL SCREEN: 9.6'

TYPE OF SAND PACK: PENN SILICA # 1

DEPTH TO BOTTOM OF WELL SCREEN: 17.1'

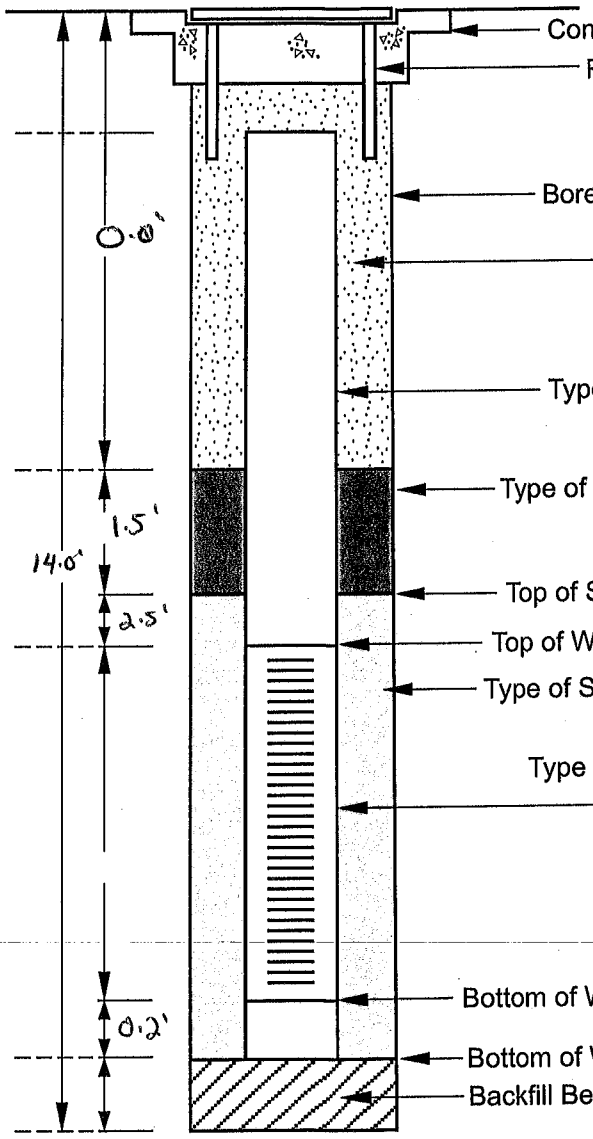
DEPTH TO BOTTOM OF SEDIMENT TRAP: 17.5'

DEPTH OF BOREHOLE: 17.5'

ABB ENVIRONMENTAL SERVICES, INC.

Well: MW-126

Elevation
Ground Surface:



Concrete Pad

Road Box: 8" cast iron w/ Aluminum skirt. 1' long (8" ID).

Borehole Dia.: 8.25"

Backfill: None

Type of Riser: 2-inch ID schedule 40 PVC

Type of Well Seal: Bentonite chips

Top of Sand Pack

Top of Well Screen

Type of Sand Pack: No. "00" Morie Filter

Type of Screen: Schedule 40 PVC-2" ID

Slot Size: 0.010"

Bottom of Well Screen

Bottom of Well Sump

Backfill Below Sump: NONE

prepared by: N. Breton

WELL CONSTRUCTION DETAILS
ARCH ROCHESTER
FEASIBILITY STUDY
ROCHESTER, NY

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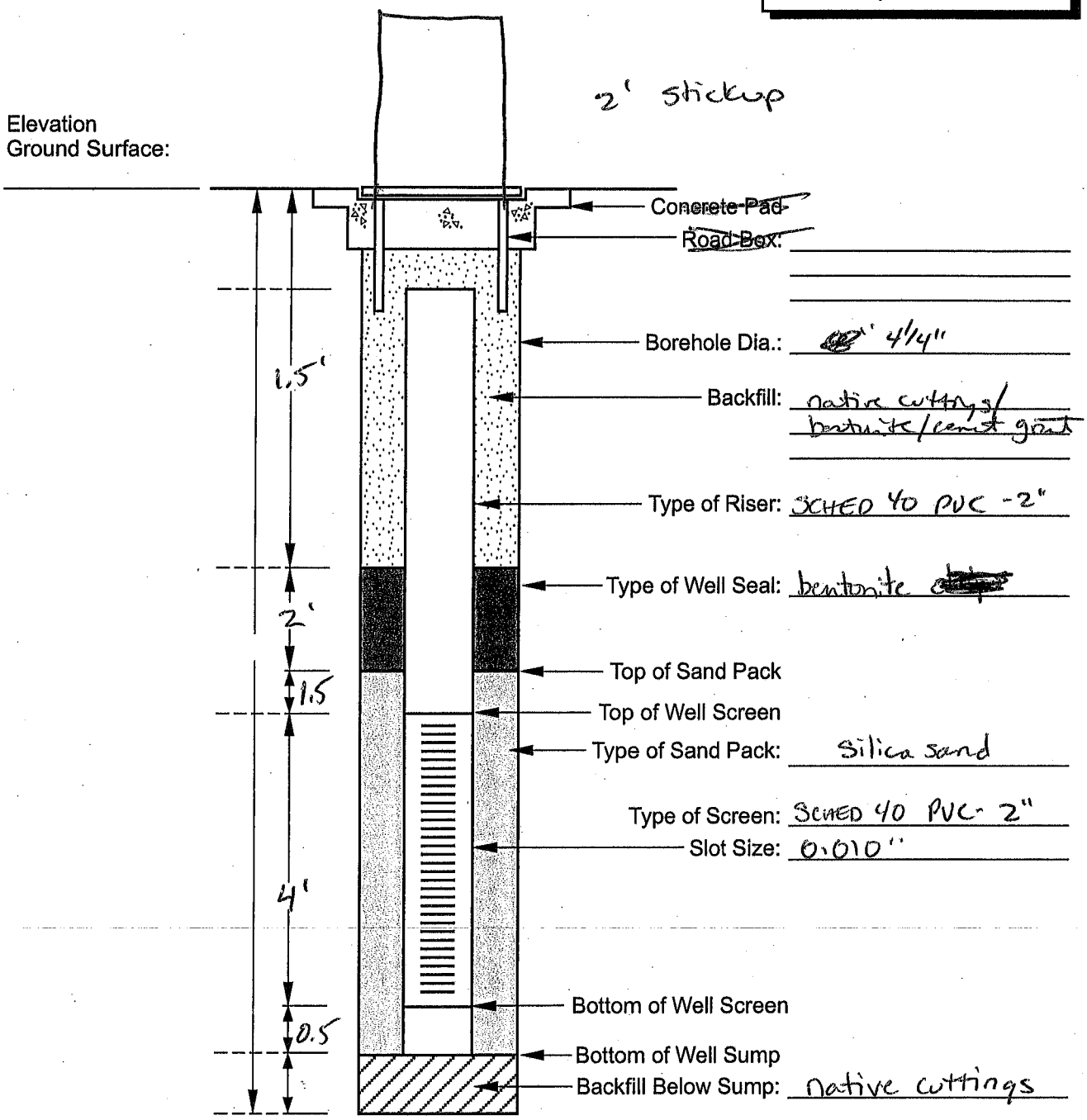
Well: MW-127



WELL CONSTRUCTION DETAILS
ARCH ROCHESTER
FEASIBILITY STUDY
ROCHESTER, NY

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WELL INSTALLATION DIAGRAM

Renamed PW12

WELL NO.: BR-101

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 538.20

REFERENCE POINT ELEVATION: 540.65

DATE INSTALLED: 11 / 02 / 93

DRILLING METHOD: DRIVEN CASING \ CORE

CORE HOLE DIA.: 3.8 - INCH

RIG GEOLOGIST: B. JOHNSON / E. SHEPARD

INITIAL WATER LEVEL DEPTH: 11.80' (RF)

DATE: 01 / 17 / 94

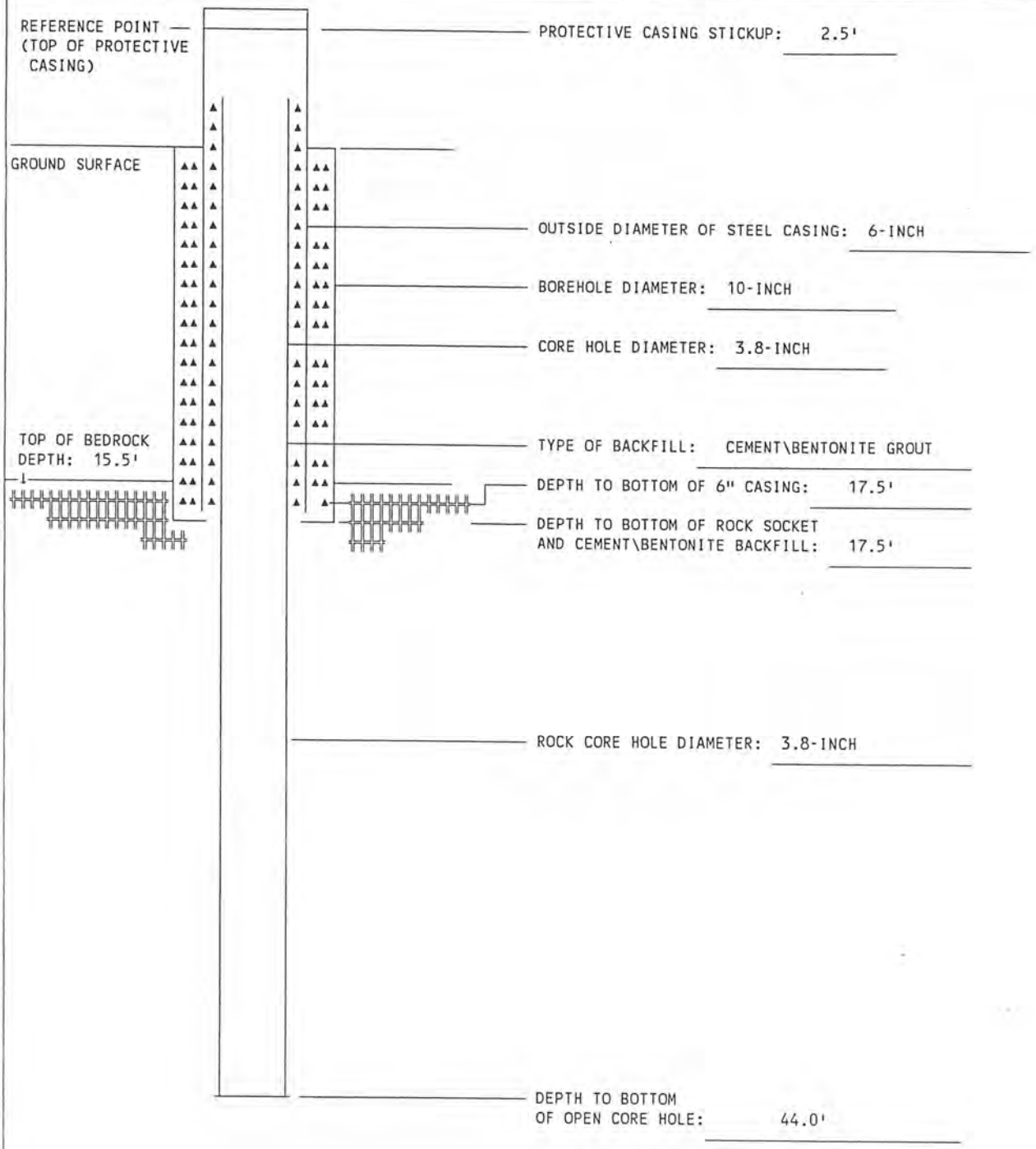
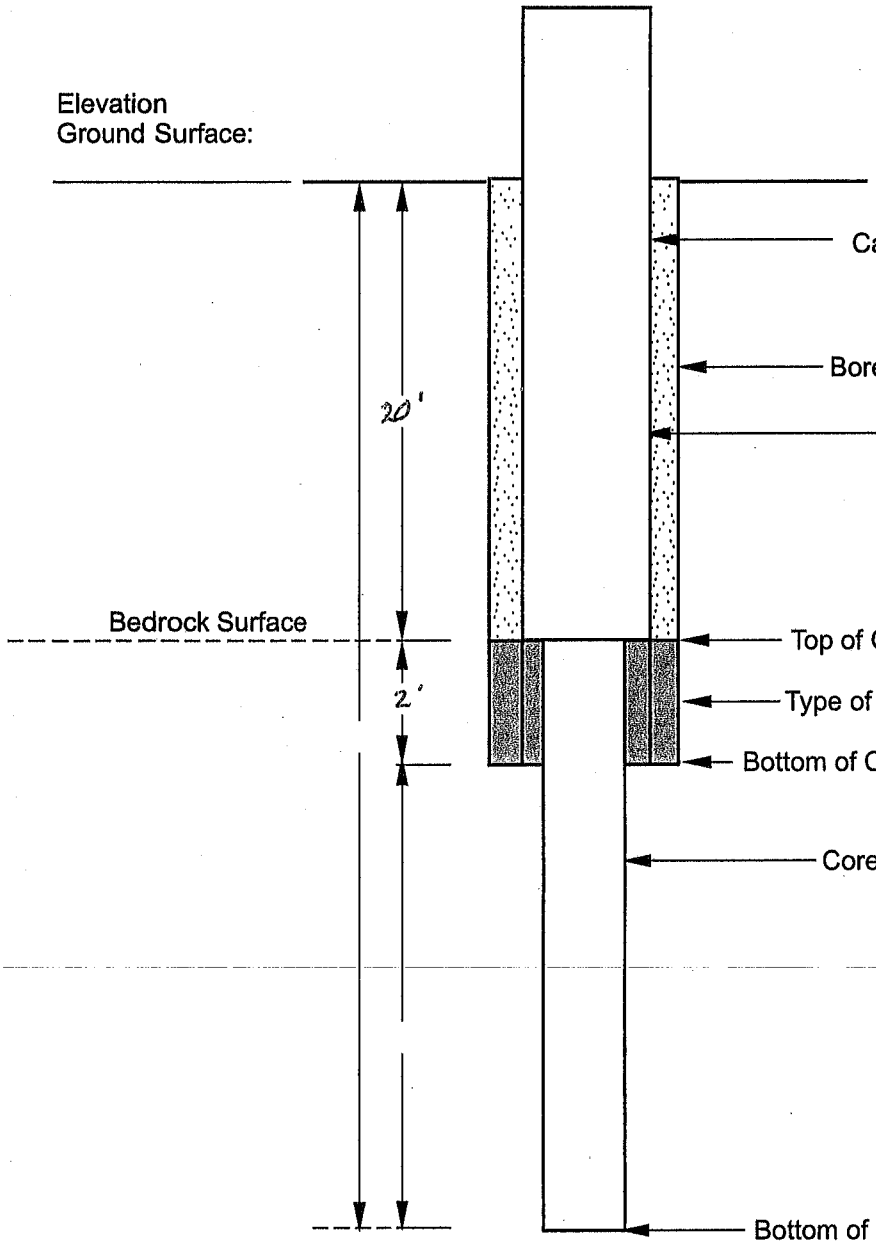


ABB ENVIRONMENTAL SERVICES, INC.

Well: PW-13



Casing Type: black steel pipe
Size: 6 inch ID steel

Borehole Dia.: 12"

Backfill: grout / native soil

Top of Core Hole: 20'

Type of Well Seal: cement / bentonite grout

Bottom of Casing and Well Seal: 22'

Core Hole Dia.: 5 7/8"

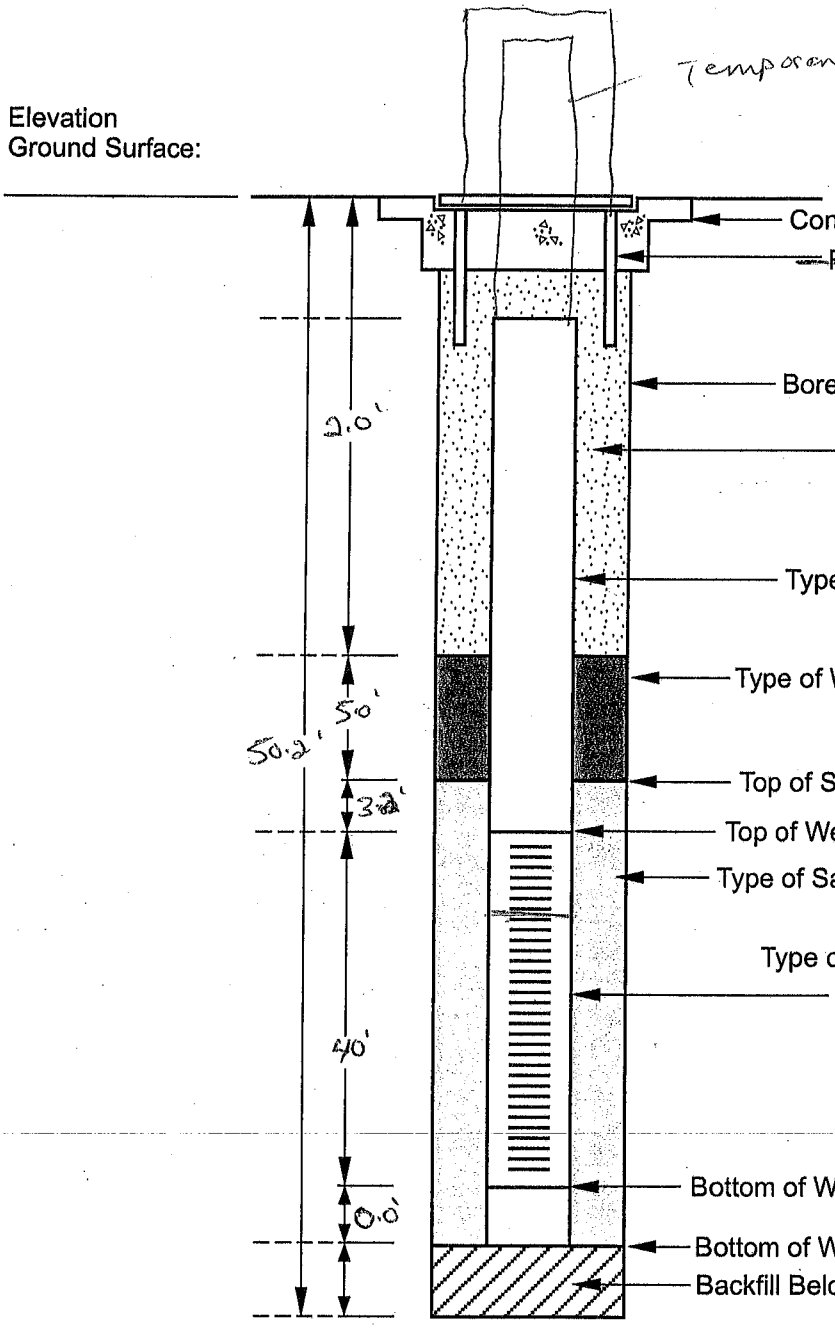
Bottom of Core Hole: 50'

WELL CONSTRUCTION DETAILS
ARCH ROCHESTER
FEASIBILITY STUDY
ROCHESTER, NY

MACTEC

W2004039c.cdr

Well: PW-14



Concrete Pad
Road Box: (NB)

Borehole Dia.: 8.25"

Backfill: ~~Cement~~ (NB)
Cement Grout

Type of Riser: 6" ID Sch 40 stainless steel NO. 305

Type of Well Seal: Bentonite chips

Top of Sand Pack

Top of Well Screen 40.2' bgs

Type of Sand Pack: #1 Morie grade silica
#00 Morie grade silica

Type of Screen: Sch 40 6" SO stainless

Slot Size: 0.030" - wirewound
(20.2'-50.2')
0.010" - wirewound
(10.2'-20.2')

Bottom of Well Screen 50.2' (total depth)

Bottom of Well Sump

Backfill Below Sump: NONE

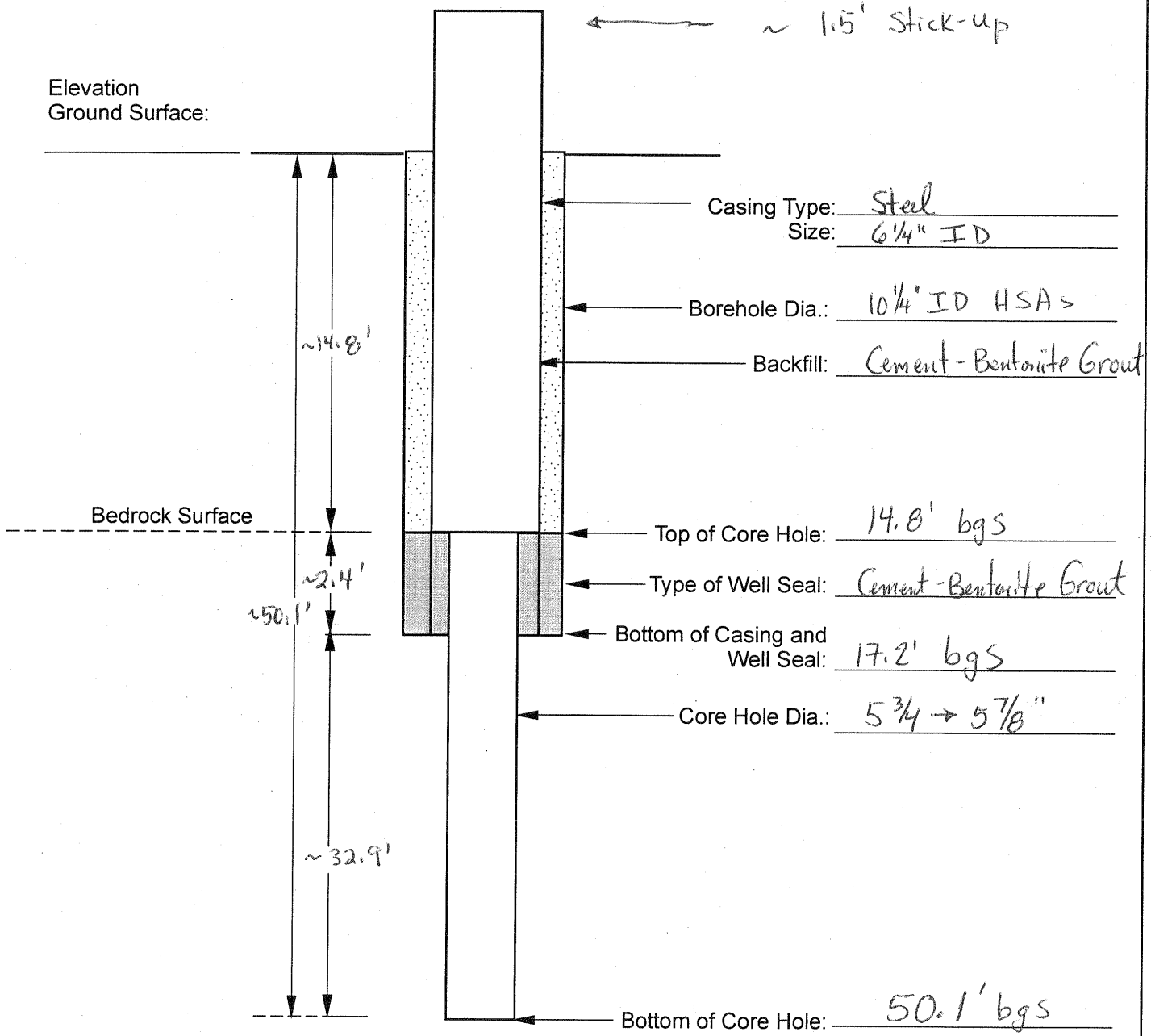
Note: #00 Morie sand from 7' to 17' bgs
#1 Morie sand from 17' to 50.2' bgs

WELL CONSTRUCTION DETAILS
ARCH ROCHESTER
FEASIBILITY STUDY
ROCHESTER, NY

MACTEC

W2004039b.cdr

Well: PW 15

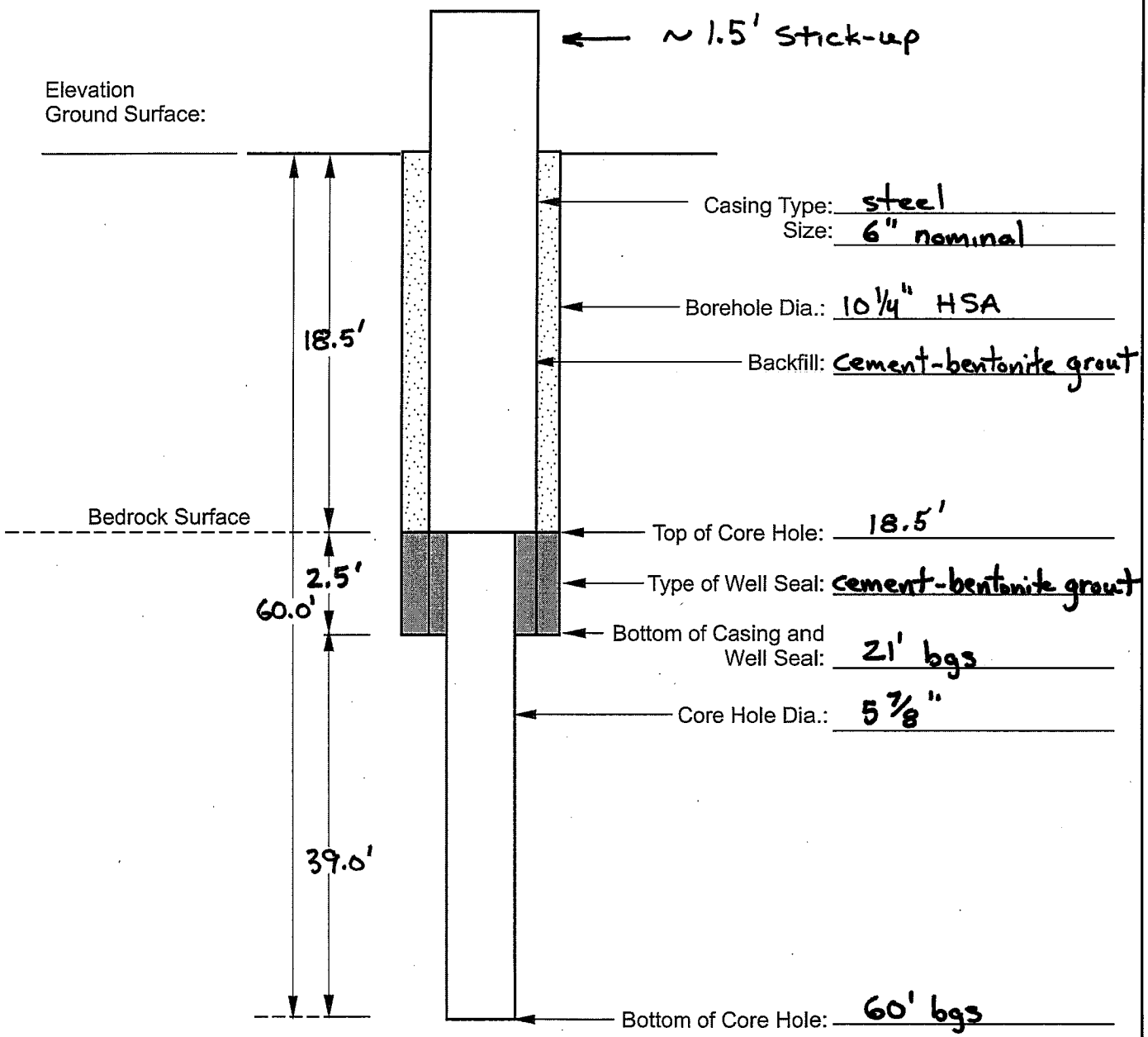


Completed by: TLL 06/2007
Checked by: MMS 07/06/07

WELL CONSTRUCTION DETAILS
ARCH ROCHESTER
ROCHESTER, NY
MACTEC

W2004039c2.cdr

Well: PW-16



prepared by: JEB 11/8/2010
checked by: MMB 11/8/2010

WELL CONSTRUCTION DETAILS
ARCH ROCHESTER
ROCHESTER, NY

MACTEC

W2004039c2.cdr

WELL CONSTRUCTION DIAGRAM
ARCH CHEMICALS/LONZA
ROCHESTER, NY

LOCATION ID: PW-17

Project Name:	Arch Chemical/Lonza			Date Started: 9/27/2012	Date Completed: 9/27/2012
Project Location:	Rochester, NY			Logged By: TD Longley	
Project Number:	3616106029	Task Number	.02.01	Checked By:	Checked Date:
Subcontractor:	Nothnagle	Drilling Method:	see below		
Development Method:	Pump & Surge	Development Date:			
Bucking Posts/Ballards:	No				

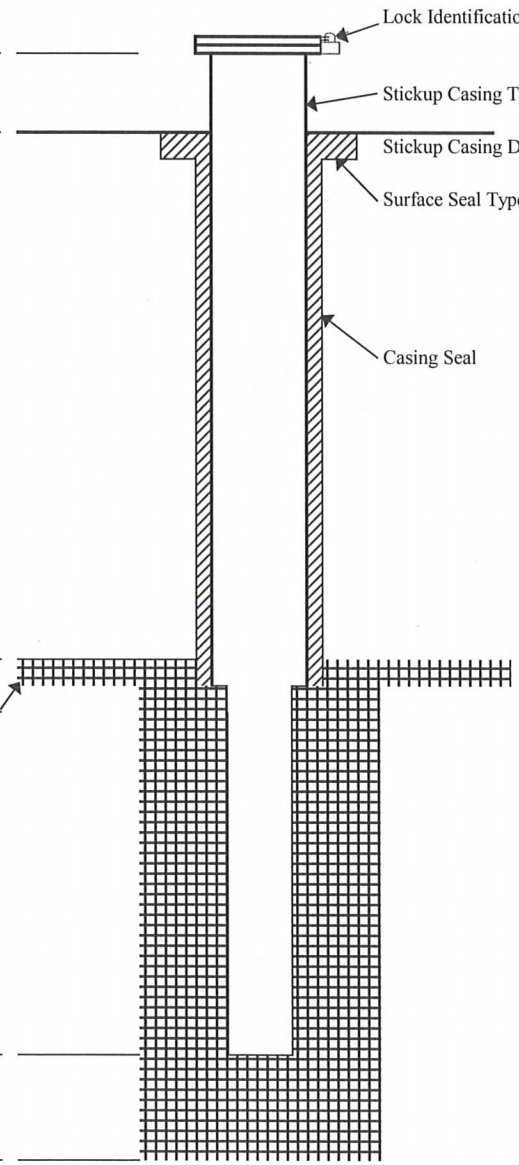
Notes: Well was drilled with 14" augers to rock, a permanent 8" casing was grouted 1.9' into bedrock (to 18.6'), and a 7-7/8" open hole was air hammered to 36 feet below ground surface

Measuring Point Information

Measuring Point (MP) Type: Ground Surface (GS)

MP Elevation (ft):

Item	Depth BMP (ft)	Elevation (ft)	Description
Stickup			
GS Elevation	0'		
Top of Bedrock	16.7'		
Bottom of Casing	18.6'		
Bottom of Open Hole	36'		
Bottom of Exploration	36'		



NOT TO SCALE

amec

511 Congress Street, Portland Maine 04101

WELL INSTALLATION DIAGRAM

WELL NO.: **PZ-101**

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 540.50

REFERENCE POINT ELEVATION: 543.15

DATE INSTALLED: 10 / 26 / 93

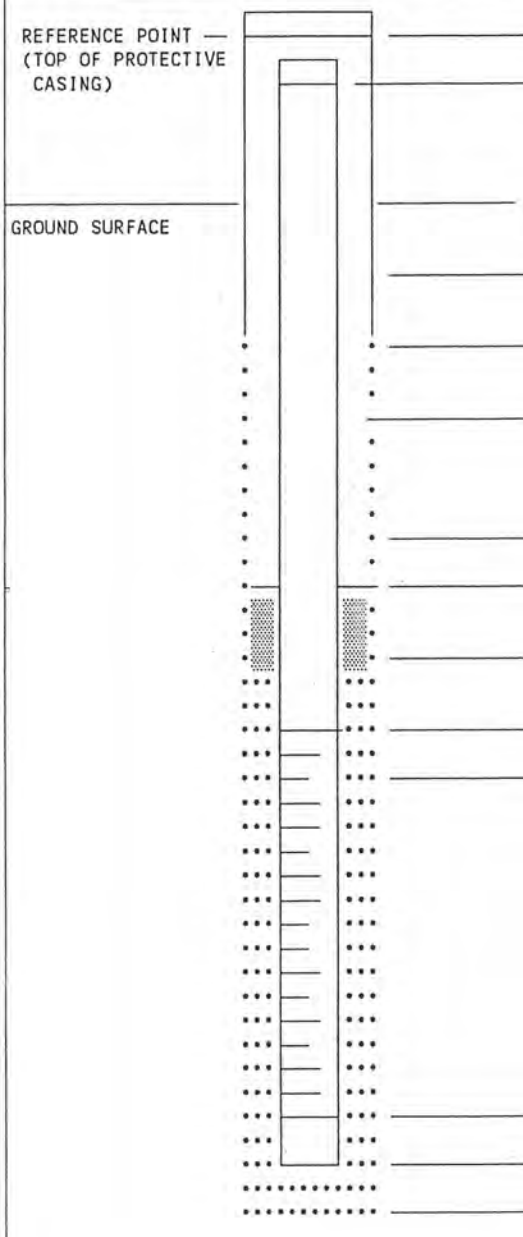
DRILLING METHOD: HSA

AUGER ID: 4.25 - INCH

RIG GEOLOGIST: B. JOHNSON

INITIAL WATER LEVEL DEPTH: 15.36'(RF)

DATE: 01 / 17 / 94



PROTECTIVE CASING STICKUP: 2.7'

PVC STICKUP: 2.5'

OUTSIDE DIAMETER OF STEEL PROTECTIVE CASING: 4 - INCH

BOREHOLE DIAMETER: 8.25 - INCH

WELL RISER ID: 2.0-INCH

TYPE OF WELL RISER: SCH 40 PVC

TYPE OF BACKFILL: PENN SILICA # 1 SAND (FOR DRAINAGE)

DEPTH TO TOP OF BENTONITE PELLET SEAL: 5.0'

DEPTH TO TOP OF SAND PACK: 7.3'

DEPTH TO TOP OF WELL SCREEN: 9.4'

BOREHOLE DIAMETER: 8.25 - INCH

TYPE OF WELL SCREEN: SCH 40 PVC

WELL SCREEN ID: 2.0-INCH

WELL SLOT SIZE: 0.010-INCH

LENGTH OF WELL SCREEN: 9.6'

TYPE OF SAND PACK: PENN SILICA # 1

DEPTH TO BOTTOM OF WELL SCREEN: 19.0'

DEPTH TO BOTTOM OF SEDIMENT TRAP: 19.4'

DEPTH OF BOREHOLE: 20.4'

ABB ENVIRONMENTAL SERVICES, INC.

SOIL BORING LOG	BORING NO.: PZ-101	PROJECT NO.: 7311-02	PAGE 1 OF 2
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT 350		DRILLER: R. SCHEFFER	DATE STARTED: 10/26/93 COMPLETED: 10/26/93
METHOD: HSA	AUGER SIZE: 4.25" I.D.	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 540.5	SOIL DRILLED: 20.4' FT.	ROCK DRILLED: (CORED \ ROLLER BIT) NONE FT.	TOTAL DEPTH: 20.4'
LOGGED BY: B. JOHNSON		CHECKED BY: NB	DATE: 9/6/94

DEPTH (FT.)	SAMPLE NUMBER	BLOWS PER 6-INCHES	PEN. / REC.	GRAPHIC LOG	SAMPLE DESCRIPTION	USCS CLASSIF.	MONITORING (PPM) PID	FID	OTHER
0									
1	S-1	5-10-10-21	2.0 / 1.3		0.0'-2.0' - Brown, Silty SAND, fine to coarse, trace to little fine Gravel, trace organics, (concrete in tip of spoon) moist.	SM	0	2	
2					2.0' - 3.0' - Similar to above, some concrete.	SM			
3	S-2	17-32-20-25	2.0 / 1.5		3.0' - 4.0' - Reddish-brown SAND, fine, little to some silt, trace to little medium and coarse Sand, dry.	SM	0	30	
4									
5	S-3	11-18-19-17	2.0 / 1.6		4.0' - 6.0' - Reddish brown Silty SAND, fine, trace to little medium Sand, trace coarse Sand and fine Gravel, dry to moist at 6.0'.	SM	0	4	
6					6.0' - 6.4' - Brown SAND, fine, some Silt, little medium to coarse Sand, trace Organics (roots).	SM			
7	S-4	6-12-23-24	2.0 / 1.8		6.4' - 8.0' - Brown to gray Silty Sand, fine, little coarse Sand, trace medium Sand and fine Gravel, moist.	SM	0	4	
8									
9	S-5	10-16-21-21	2.0 / 2.0		8.0' - 10.0'- Reddish-brown Silty SAND, fine, little coarse and medium Sand, trace fine Gravel, moist.	SM	0	2	
10									
11	S-6	10-50 (FOR 0.4')	0.9 / 0.9		10.0'-10.9' - Similar to above, wet and saturated at 10.5'.	SM	NA	NA	
12									
13	S-7	28-25-20-29	2.0 / 1.1		12.0'-14.0' - Brown SAND, fine some coarse Sand, little to some fine fine Gravel, trace to little Silt, trace medium Sand, poorly graded, saturated	SP	0	2	
14									
15	S-8	6-16-19-28	2.0 / 1.4		14.0'-16.0' - Brown SAND, fine to coarse, little Silt, grading to: fine SAND and little medium to coarse Sand, little Silt, trace fine Gravel, saturated.	SM	0	0	

SOIL BORING LOG	BORING NO.: PZ-101	PROJECT NO.: 7311-02	PAGE 2 OF 2
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT 350		DRILLER: R. SCHEFFER	DATE STARTED: 10/26/93 COMPLETED: 10/26/93
METHOD: HSA	AUGER SIZE: 4.25" I.D.	PID METER: 10.6 ev	FID METER: OVA-108 PROTECTION LEVEL: D
GROUND ELEV.: 540.5	SOIL DRILLED: 20.4' FT.	ROCK DRILLED: (CORED \ ROLLER BIT) NONE FT.	TOTAL DEPTH: 20.4'
LOGGED BY: B. JOHNSON		CHECKED BY: NB	DATE: 9/6/94

DEPTH (FT.)	SAMPLE NUMBER	BLOWS PER 6-INCHES	PEN. / REC.	GRAPHIC LOG	SAMPLE DESCRIPTION	USCS CLASSIF.	MONITORING (PPM) PID	FID	OTHER
16									
17	S-9	43-40-40-43	2.0 / 1.6		16.0'-18.0'- Gray Silty SAND, fine, trace medium and coarse Sand, trace Gravel (fine), grading to more silt with depth, little fine Sand trace fine Gravel, saturated.	SM	1.2	300	
18									
19	S-10	25-43-50 (for 0.3')	1.3 / 1.0		18.0'-20.0'- Gray SILT, trace fine Gravel (subrounded) trace medium and coarse Sand, thin silty fine Sand lenses near bottom of sample.	ML	1.9	250	
20					Note: At tip of spoon FID readings jumped from 10 ppm to 150 ppm.				
20.4'									
21					Spoon refusal at 19.3'. Auger w/o sampling to refusal at 20.4'. Bedrock fragments observed.				
					Note: 1) Refusal with spoon first encountered at 10.9'. Boring moved 3' northwest and sampling continued from 12.0'.				

WELL INSTALLATION DIAGRAM

WELL NO.: **PZ-102**

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 539.10

REFERENCE POINT ELEVATION: 541.11

DATE INSTALLED: 01 / 14 / 94

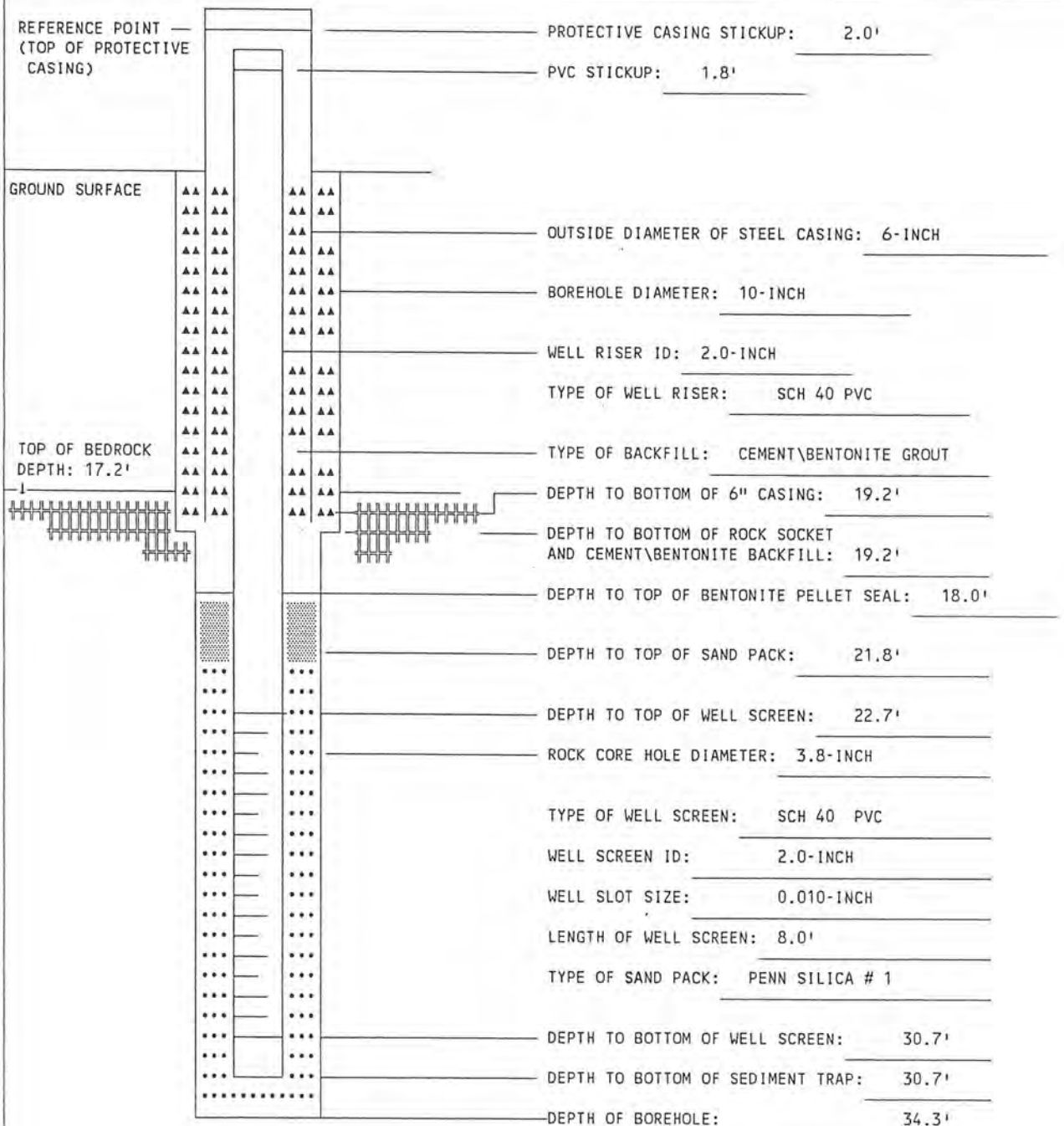
DRILLING METHOD: HSA \ ROCK CORE

CORE HOLE DIA.: 3.8 - INCH

RIG GEOLOGIST: E. SHEPARD

INITIAL WATER LEVEL DEPTH: 26.00'(RF)

DATE: 01 / 17 / 94



PROTECTIVE CASING STICKUP: 2.0'

PVC STICKUP: 1.8'

OUTSIDE DIAMETER OF STEEL CASING: 6-INCH

BOREHOLE DIAMETER: 10-INCH

WELL RISER ID: 2.0-INCH

TYPE OF WELL RISER: SCH 40 PVC

TYPE OF BACKFILL: CEMENT\BENTONITE GROUT

DEPTH TO BOTTOM OF 6" CASING: 19.2'

DEPTH TO BOTTOM OF ROCK SOCKET AND CEMENT\BENTONITE BACKFILL: 19.2'

DEPTH TO TOP OF BENTONITE PELLET SEAL: 18.0'

DEPTH TO TOP OF SAND PACK: 21.8'

DEPTH TO TOP OF WELL SCREEN: 22.7'

ROCK CORE HOLE DIAMETER: 3.8-INCH

TYPE OF WELL SCREEN: SCH 40 PVC

WELL SCREEN ID: 2.0-INCH

WELL SLOT SIZE: 0.010-INCH

LENGTH OF WELL SCREEN: 8.0'

TYPE OF SAND PACK: PENN SILICA # 1

DEPTH TO BOTTOM OF WELL SCREEN: 30.7'

DEPTH TO BOTTOM OF SEDIMENT TRAP: 30.7'

DEPTH OF BOREHOLE: 34.3'

ABB ENVIRONMENTAL SERVICES, INC.

SOIL BORING LOG	BORING NO.: PZ-102	PROJECT NO.: 7311-02	PAGE 1 OF 4
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT 350		DRILLER: R. SCHEFFER	DATE STARTED: 10/25/93 COMPLETED: 10/25/93
METHOD: HSA	AUGER SIZE: 4.25" I.D.	PID METER: 10.0 ev	FID METER: OVA-108 PROTECTION LEVEL: MOD D
GROUND ELEV.: 539.1	SOIL DRILLED: 17.2' FT.	ROCK DRILLED:CORED: 15.1'	ROLLER BIT: 2.0' TOTAL DEPTH: 34.3'
LOGGED BY: B. JOHNSON		CHECKED BY: N.B	DATE: 9/6/94

DEPTH (FT.)	SAMPLE NUMBER	BLOWS PER 6-INCHES	PEN. / REC.	GRAPHIC LOG	SAMPLE DESCRIPTION	USCS CLASSIF.	MONITORING (PPM) PID	FID	OTHER
0									
1	S-1	4-8-6-8	2.0 / 1.2		0.0'-1.0' Dark Brown Silty SAND, fine trace organics, moist.	SM	0	0	
2					1.0'-2.0' Brown to Rust SAND, medium to coarse, some fine Sand, trace to little fine gravel, moist. (dry coal fragments present)	SW			
3	S-2	5-14-17-16	2.0 / 1.0		2.0'-4.0 Tan to rust SILT, little to some fine Sand, trace fine Gravel, dry.	ML	0	2	
4									
5	S-3	6-17-22-20	2.0 / 1.5		4.0'-6.0' Brown to rust Silty SAND, fine, trace to little fine to coarse Gravel, trace medium to coarse Sand, dry to moist (Organics in the form of roots are present)	SM	0	4	
6									
7	S-4	7-13-16-21	2.0 / 1.6		6.0'-6.2' Topsoil Silty SAND, fine, trace Organics, moist.	SM	0	15	
8					6.2'-8.0' Red to Brown Silty SAND, fine, little coarse Sand, fine Gravel, trace medium Sand, moist to wet. (Organics and mottles present)	SM			
9	S-5	8-20-19-17	2.0 / 1.8		8.0'-8.3' Similar to above. 8.3'-10.0' Light Brown Silty SAND, fine, little fine Sand, fine Gravel, trace medium Sand, wet to saturated.	SM SM	0	7	
10									
11	S-6	10-18-20-27	2.0 / 1.4		10.0'-12.0' Light Brown SAND, fine, trace to little coarse Gravel, trace medium to coarse Sand, poorly graded, saturated.	SP	0	4	
12									
13	S-7	17-23-31-31	2.0 / 1.7		12.0'-13.3' Similar to above. 13.3'-14.0' Gray SAND, fine, some Silt, fractured rock, trace medium to coarse Sand, saturated.	SP SM	0	125	
14									
15	S-8	14-12-17-21	2.0 / 1.2		14.0'-16.0' Similar to above, trace to little medium to coarse Sand.	SM	0	4	

SOIL BORING LOG	BORING NO.: PZ-102	PROJECT NO.: 7311-03	PAGE 2 OF 4
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT 350		DRILLER: R. SCHEFFER	DATE STARTED: 10/25/93 COMPLETED: 10/25/93
METHOD: HSA	AUGER SIZE: 4.25" I.D.	PID METER: 10.6 ev	FID METER: OVA-108 PROTECTION LEVEL: MOD D
GROUND ELEV.: 539.1	SOIL DRILLED: 17.2' FT.	ROCK DRILLED: CORE: 15.1' ROLLER BIT: 2.0'	TOTAL DEPTH:34.4'
LOGGED BY: B. JOHNSON		CHECKED BY: N.B.	DATE: 9/6/94

DEPTH (FT.)	SAMPLE NUMBER	BLOWS PER 6-INCHES	PEN. / REC.	GRAPHIC LOG	SAMPLE DESCRIPTION	USCS CLASSIF.	MONITORING PID	MONITORING FID	MONITORING OTHER
16					16.0'-16.2' Similar to above	SM	0	125	
17	S-9	1-13-50/0.2'	1.2 / 1.0		16.2'-16.5' Gray SAND, coarse to medium, some fine Sand and Silt, saturated.	SM			
18					16.5'-17.2' Gray Silty SAND, fine, trace medium to coarse Sand, saturated.	SM			
19									
20									
21									
22									
22									
23									
24									
25									
26									
27									
28									
29									
30									

Notes:

Refusal with augers at 17.2'

Water level measured at 8.5' during drilling.

ROCK CORE LOG	BORING NO.: PZ-102	PROJECT NO.: 7311-02	PAGE 3 OF 4
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 11/04/93 COMPLETED: 11/04/93
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 539.10	SOIL DRILLED: 17.2 FT.	ROCK DRILLED: (CORED: 15.1' ROLLER BIT: 2.0')	TOTAL DEPTH: 34.3'
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: NJB	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. / REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
18									See soil boring log for PZ-102 for soil descriptions from 0'-17.2'		
									Roller cone drill from 17.2'to 19.2'		
19									Grout		
19.2											
	R-1	2	0.7 / 0.7						Light gray, finely crystalline, medium bedded, DOLOMITE with interbedded shale.	0	40
20		5							Lockport FM	1.6	30
21						nat	20°	slight	Run R-2 - Shale stringers common throughout.		
		5				nat	0°	slight		0	50
22			5.1 / 4.8	84							
	R-2	5				nat	0°	slight		0	30
23						nat	10°	slight			
		4								0	20
						nat mech	0°	none			
24						nat	0°	slight			
		5				mech				6.2	70
25											
		5							Run R-3 - Shale stringers common throughout.	0	10
26						nat	0°	slight			
		3								0	10
27											
			5.0 / 4.8			nat	20°	slight			
	R-3	4		88		nat	20°	slight		0	15
28											
		3				nat	30°	slight		0	10
						nat mech	0°	slight			
29						mech					
		4				nat mech	20°	slight		0	10
30											
		4				nat mech mech	0°	moderate		0	10
31			4.3 / 4.2			mech					
	R-4	4		40		nat mech	0°	slight		0	18
32						nat	10°	slight			
						nat	0°	slight			
		4				nat	0°	slight		0	8

ROCK CORE LOG	BORING NO.: PZ-102	PROJECT NO.: 7311-02	PAGE 4 OF 4

PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 11/04/93 COMPLETED: 11/04/93
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 539.10	SOIL DRILLED: 17.2 FT.	ROCK DRILLED: (CORED: 15.1' ROLLER BIT: 2.0')	TOTAL DEPTH: 34.3'
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N.B.	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
33											
	R-4	4	4.3	40		nat	0°	slight	Light gray, finely crystalline, medium bedded, DOLOMITE with interbedded shale. Lockport FM	0	8
34		3	4.2			nat	0°	slight		0	10
34.3											
35									End of boring at 34.3' below ground surface.		

Note: Approximately 300 gallons of water lost during coring.

nat - interpreted natural fracture or core break

mech - interpreted mechanical core break

WELL INSTALLATION DIAGRAM

WELL NO.: **PZ-103**

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 537.80

REFERENCE POINT ELEVATION: 540.34

DATE INSTALLED: 12 / 21 / 93

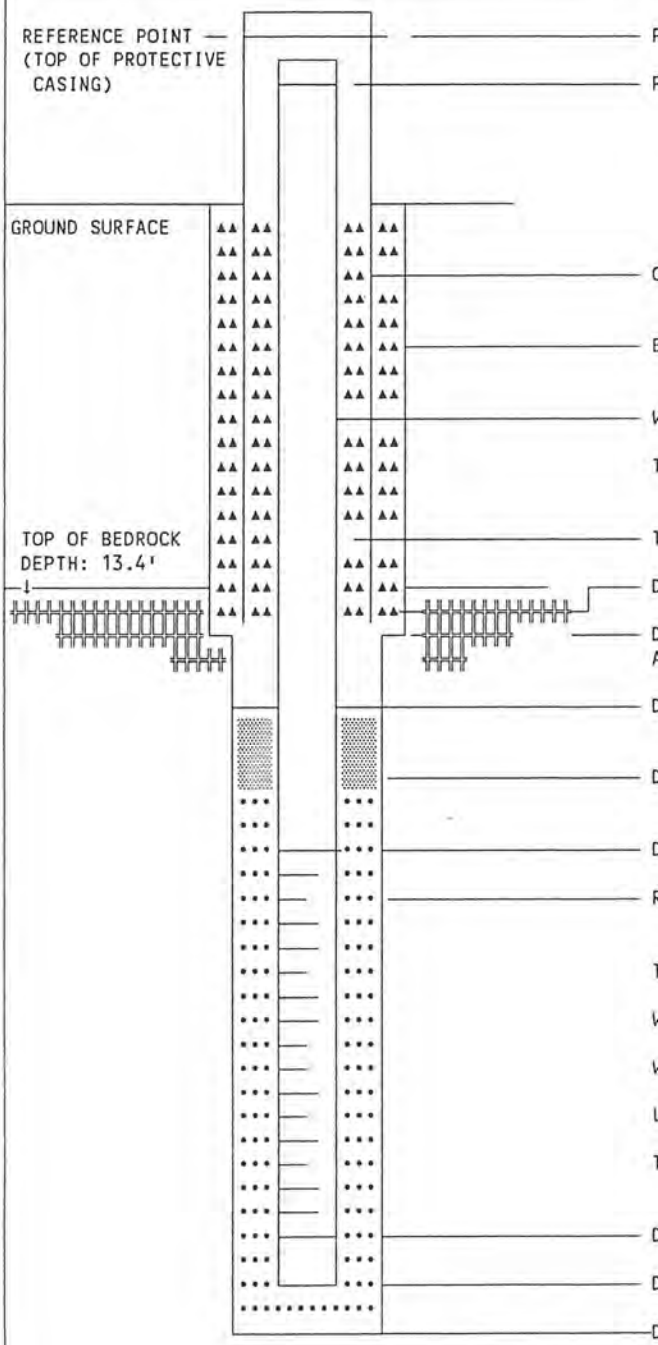
DRILLING METHOD: HSA \ ROCK CORE

CORE HOLE DIA.: 3.8 - INCH

RIG GEOLOGIST: E. SHEPARD

INITIAL WATER LEVEL DEPTH: 12.65'(RF)

DATE: 01 / 17 / 94



PROTECTIVE CASING STICKUP: 2.5'

PVC STICKUP: 2.4'

OUTSIDE DIAMETER OF STEEL CASING: 6-INCH

BOREHOLE DIAMETER: 10-INCH

WELL RISER ID: 2.0-INCH

TYPE OF WELL RISER: SCH 40 PVC

TYPE OF BACKFILL: CEMENT\BENTONITE GROUT

DEPTH TO BOTTOM OF 6" CASING: 15.4'

DEPTH TO BOTTOM OF ROCK SOCKET AND CEMENT\BENTONITE BACKFILL: 15.4'

DEPTH TO TOP OF BENTONITE PELLET SEAL: 14.5'

DEPTH TO TOP OF SAND PACK: 16.8'

DEPTH TO TOP OF WELL SCREEN: 19.8'

ROCK CORE HOLE DIAMETER: 3.8-INCH

TYPE OF WELL SCREEN: SCH 40 PVC

WELL SCREEN ID: 2.0-INCH

WELL SLOT SIZE: 0.010-INCH

LENGTH OF WELL SCREEN: 9.3'

TYPE OF SAND PACK: PENN SILICA # 1

DEPTH TO BOTTOM OF WELL SCREEN: 29.1'

DEPTH TO BOTTOM OF SEDIMENT TRAP: 29.8'

DEPTH OF BOREHOLE: 30.0'

ABB ENVIRONMENTAL SERVICES, INC.

SOIL BORING LOG	BORING NO.: PZ-103	PROJECT NO.: 7311-02	PAGE 1 OF 3
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT 350		DRILLER: R. SCHEFFER	DATE STARTED: 10/18/93 COMPLETED: 10/19/93
METHOD: HSA	AUGER SIZE: 4.25" I.D.	PID METER: 10.6 ev FID METER: OVA-108	PROTECTION LEVEL: MOD D
GROUND ELEV.: 537.8	SOIL DRILLED: 13.35 FT.	ROCK DRILLED: CORE: 15.0' ROLLER BIT: 2.0'	TOTAL DEPTH: 30.0'
LOGGED BY: B. JOHNSON		CHECKED BY: NB	DATE: 9/6/94

DEPTH (FT.)	SAMPLE NUMBER	BLOWS PER 6-INCHES	PEN. / REC.	GRAPHIC LOG	SAMPLE DESCRIPTION	USCS CLASSIF.	MONITORING (PPM) PID	FID	OTHER
0									
1	S-1	13-15-30-20	2.0 / 1.2		0.0'-2.0' Brown Silty SAND, fine to coarse, some fine gravel, dry.	GM	0	30	
2									
3	S-2	6-6-7-6	2.0 / 1.5		2.0'-4.0' Dark Brown to Black Silty SAND, trace Organics and ash, moist.	SM	0	30	
4									
5	S-3	5-10-10-14	2.0 / 2.0		4.0'-6.0' Brown SAND, fine, some silt, trace fine Gravel, medium and coarse Sand, moist. 5.3'-5.5' Light Brown SAND, fine, trace to little Silt.	SM	0	15	
6									
7	S-4	5-10-10-10	2.0 / 1.3		6.0'-8.0' Brown to Reddish Brown with light gray Silty SAND, fine, trace to little medium Sand, trace coarse Sand, fine Gravel and Clay, moist. to wet.	SM	NR	NR	
8									
9	S-5	2-2-12-17	2.0 / 1.3		8.0'-9.0' Similar to above, (less coarse) wet to saturated. 9.0'-9.2' Light Gray cemmented SAND, fine, some to little Silt, dry. 9.2'-10.0' Light Gray SAND, fine, some to little Silt, trace medium to coarse Sand, moist to wet.	SM	0	125	
10									
11	S-6	7-19-49-40	2.0 / 1.2		10.0'-12.0' Light Gray Silty SAND, fine, trace medium Sand, some Rock fragments, saturated.	GM	0	250	
12									
13	S-7	10-34-50/0.4'	1.4 / 1.0		12.0'-13.35' Gray fractured Rock and Silty Sand, fine.	GM	1.3	125	
14					Notes: Refusal with augers at 13.35' Water level observed at 8.0' during drilling				
15									

ROCK CORE LOG	BORING NO.: PZ-103	PROJECT NO.: 7311-02	PAGE 2 OF 3
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 11/03/93 COMPLETED: 11/04/93
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev	FID METER: OVA-108 PROTECTION LEVEL: D
GROUND ELEV.: 537.8	SOIL DRILLED: 13.4 FT.	ROCK DRILLED: (CORED: 15.0' ROLLER BIT: 2.0')	TOTAL DEPTH: 34.3'
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: NB	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
14									See soil boring log for PZ-103 for soil descriptions from 0'-13.4'		
									Roller cone drill from 13.4'to 15.4'		
15									Grout		
15.4											
16	R-1	4	1.6 / 1.6	81		gravel			Light gray, finely crystalline, medium bedded, DOLOMITE with interbedded shale.	0	10
						nat	20°	moderate			
17		3				nat	0°	moderate	Lockport FM	0	15
		5				nat	0°	moderate	Run R-2 - Shale partings common throughout.	0	9
18											
		4								0	20
19						nat	0°	moderate			
	R-2	5	5.0 / 4.4	84		nat	0°	moderate		0	6
20						nat	50°	moderate			
						nat	0°	slight			
		4								0	8
21											
		4				mech				0	5
22											
		4				nat	0°	slight		0	10
23											
		5				nat	0°	slight		0	5
24						nat	0°	slight			
	R-3	5	5.0 / 5.1	96		nat	0°	slight		0	5
25						mech			25.2'- Mechanical break along shale parting.		
		5								0	8
26						nat	0°	slight			
		4								0	5
27											
		5				nat	30°	slight		0	10
	R-4		3.4 / 3.3	72		nat	0°	slight			
28		5				mech					
						nat	0°	moderate		0	10

ROCK CORE LOG	BORING NO.: PZ-103	PROJECT NO.: 7311-02	PAGE 3 OF 3
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 11/03/93 COMPLETED: 11/04/93
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 537.8	SOIL DRILLED: 13.4 FT.	ROCK DRILLED: (CORED: 15.0' ROLLER BIT: 2.0')	TOTAL DEPTH: 34.3'
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: NB	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. / REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
29											
	R-4	4	3.4 / 3.3	72		nat	0°	none	Light gray, finely crystalline, medium bedded, DOLOMITE with interbedded shale.	0	8
30						nat	0°	slight			
		1				mech					
31.4						nat	0°	slight	Lockport FM	0	8
31									End of boring at 30.4' below ground surface		

Note: Approximately 700 gallons of water lost during coring

nat - interpreted natural fracture or core break

mech - interpreted mechanical core break

WELL INSTALLATION DIAGRAM

WELL NO.: **PZ-104**

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 537.21

REFERENCE POINT ELEVATION: 537.21

DATE INSTALLED: 01 / 14 / 94

DRILLING METHOD: HSA \ ROCK CORE

CORE HOLE DIA.: 3.8 - INCH

RIG GEOLOGIST: E. SHEPARD

INITIAL WATER LEVEL DEPTH: 15.70'(RF)

DATE: 01 / 17 / 94

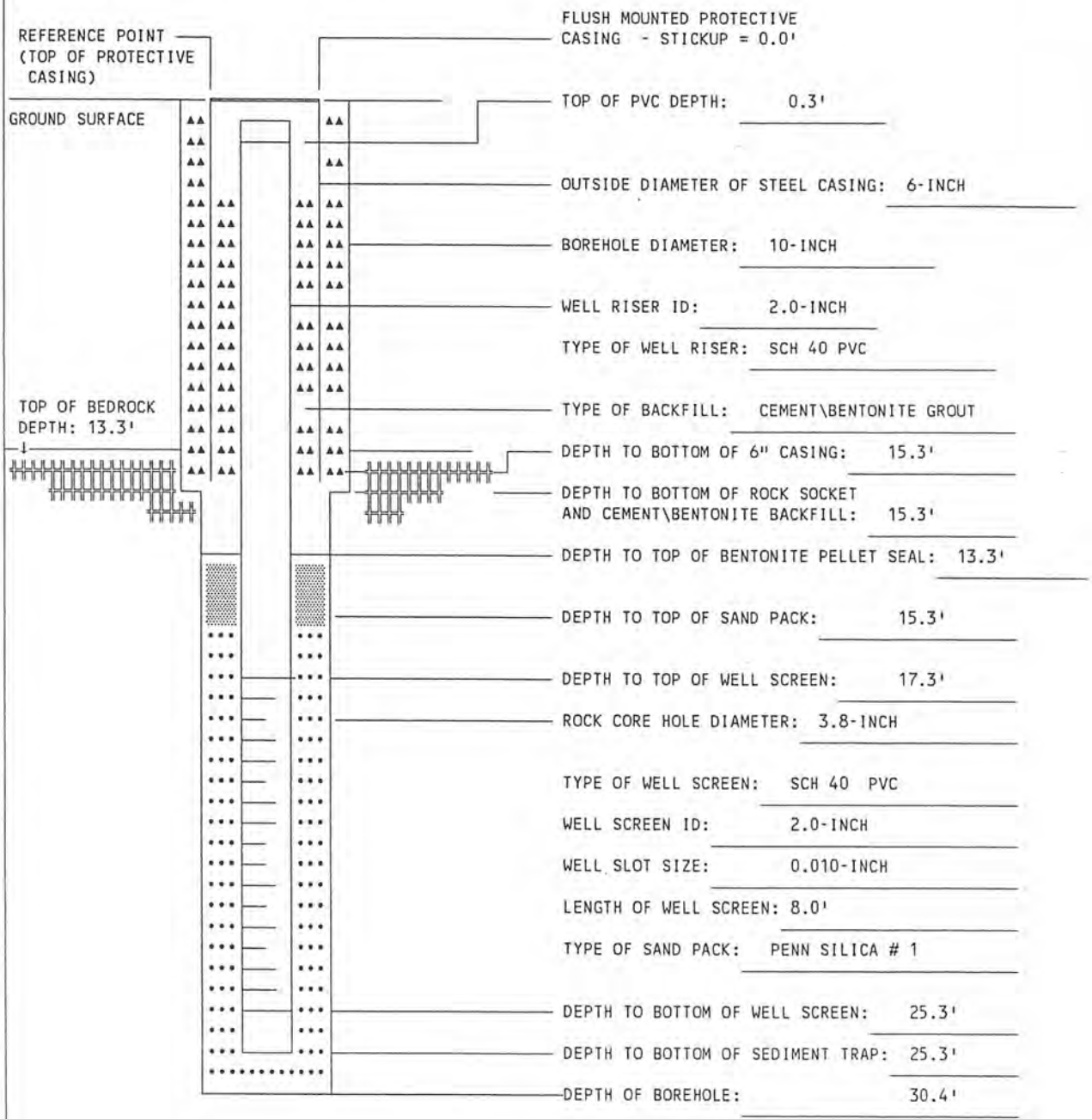


ABB ENVIRONMENTAL SERVICES, INC.

SOIL BORING LOG	BORING NO.: PZ-104	PROJECT NO.: 7311-02	PAGE 1 OF 3
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT 350		DRILLER: R. SCHEFFER	DATE STARTED: 10/22/93 COMPLETED: 10/22/93
METHOD: HSA	AUGER SIZE: 4.25" I.D.	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: MOD D
GROUND ELEV.: 537.2	SOIL DRILLED: 13.4 FT.	ROCK DRILLED: CORE: 15.1' ROLLER BIT: 1.9'	TOTAL DEPTH: 30.4'
LOGGED BY: B. JOHNSON		CHECKED BY: N.B.	DATE: 9/6/94

DEPTH (FT.)	SAMPLE NUMBER	BLOWS PER 6-INCHES	PEN. / REC.	GRAPHIC LOG	SAMPLE DESCRIPTION	USCS CLASSIF.	MONITORING (PPM) PID	FID	OTHER
0					AUGER THROUGH 0.5' OF GRAVEL AND ASPHALT				
1	S-1	13-10-14	1.5 / 1.0		0.5'-1.5' Light Gray to Brown Silty SAND, little fine to coarse Gravel, dry, poorly graded.	SM	0	50	
2					1.5'-2.0' Brown and Red SAND, fine to medium, little Silt.	SP			
3	S-2	7-7-5-5	2.0 / 1.5		2.0'-2.5' Similar to above.	SP			
					2.5'-4.3' Brown SILT, some fine Sand, little to some coarse Sand, trace medium Sand, fine Gravel, moist. (Ash or Slag observed)	ML	0	30	
4					4.3'-4.5' Topsoil, Silty SAND, fine, trace Organics.	SM			
5	S-3	1-4-4-8	2.0 / 1.6		4.5'-6.7' Reddish Brown with light tan SAND, fine, little to some Silt, trace medium to coarse Sand, moist.	SM	0	4	
6									
7	S-4	3-4-10-12	2.0 / 1.8		6.7'-8.0' Brown Gravelly SAND, fine to coarse, little Silt, dry.	GM	0	25	
8									
9	S-5	7-14-20-18	2.0 / 1.3		8.0'-10.0' Similar to above.	GM	0	125	
10					10.0'-10.5' Similar to above.	GM			
11	S-6	8-8-13-16	2.0 / 1.0		10.5'-11.5' Gray Silty SAND, fine, some fine to coarse Gravel, trace medium to coarse Sand, Moist.	GM	0	25	
					11.5'-12.0' Similar to above, saturated.	GM			
12									
13	S-7	2-11-50/0.4	1.4 / 1.0		12.0'-13.4' Similar to above with Rock fragments in tip of spoon.	GM	0	80	
14					Notes:				
					Refusal with augers at 13.4'				
15					Water level measured at 11.5' during drilling				

ROCK CORE LOG	BORING NO.: PZ-104	PROJECT NO.: 7311-02	PAGE 2 OF 3
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 11/05/93 COMPLETED: 11/05/93
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev	FID METER: OVA-108 PROTECTION LEVEL: D
GROUND ELEV.: 537.2	SOIL DRILLED: 13.4 FT.	ROCK DRILLED: (CORED: 15.0' ROLLER BIT: 2.0')	TOTAL DEPTH: 30.4'
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: NB	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. / REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
14									See soil boring log for PZ-104 for soil descriptions from 0'-13.4'		
									Roller cone drill from 13.4'to 15.4'		
15									Grout		
15.4											
16		5				nat	10°	moderate	Light gray, finely crystalline,		
						nat	10°	moderate	medium bedded, DOLOMITE with interbedded shale.	0	30
									Lockport FM		
17		4				nat	10°	moderate		0	20
						nat	10°	moderate			
	R-1		4.0 / 3.5	55		nat	10°	slight	Run R-1 - Shale partings common throughout. Moderately weathered		
18		5				nat	10°	moderate		0	15
						nat	30°	moderate			
						nat	0°	moderate		0	15
19		5				nat	0°	moderate high			
20		4				mech			Run R-2 - Shale partings common throughout. Moderately weathered	0	0
						mech					
										0	0
21		5									
						nat	10°	moderate		0	0
22		5				mech					
			5.0 / 4.7	62		nat	0°	slight			
	R-2					nat	10°	moderate		0	0
23		4				mech					
						nat	10°	moderate		0	0
24		4				nat	0°	moderate			
						nat	5°	slight			
25		6				nat	30°	slight	Run R-3 - Shale partings common throughout. Moderately weathered	0	10
						mech					
										0	8
26		6				nat	0°	moderate			
			6.0 / 5.9	85		nat	0°	moderate			
	R-3									0	10
27		5				nat	0°	moderate			
						nat	0°	moderate			
										0	10
28		4				nat	0°	moderate			
						nat	10°	slight			
										0	5

ROCK CORE LOG	BORING NO.: PZ-104	PROJECT NO.: 7311-02	PAGE 3 OF 3
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 11/05/93 COMPLETED: 11/05/93
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev	FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 537.2	SOIL DRILLED: 13.4 FT.	ROCK DRILLED: (CORED: 15.0' ROLLER BIT: 2.0')	TOTAL DEPTH: 30.4'
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N.B.	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. / REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
29											
	R-3	4	6.0	85		nat	0°	slight	Light gray, finely crystalline, medium bedded, DOLOMITE with interbedded shale.	0	5
30			5.9			nat	0°	slight			
		4							Lockport FM	0	10
30.4											
31									End of boring at 30.4' below ground surface.		

Note: Approximately 1100 gallons of water lost during coring.

nat - interpreted natural fracture or core break

mech - interpreted mechanical core break

WELL INSTALLATION DIAGRAM

WELL NO.: **PZ-105**

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 537.00

REFERENCE POINT ELEVATION: 539.58

DATE INSTALLED: 12 / 21 / 93

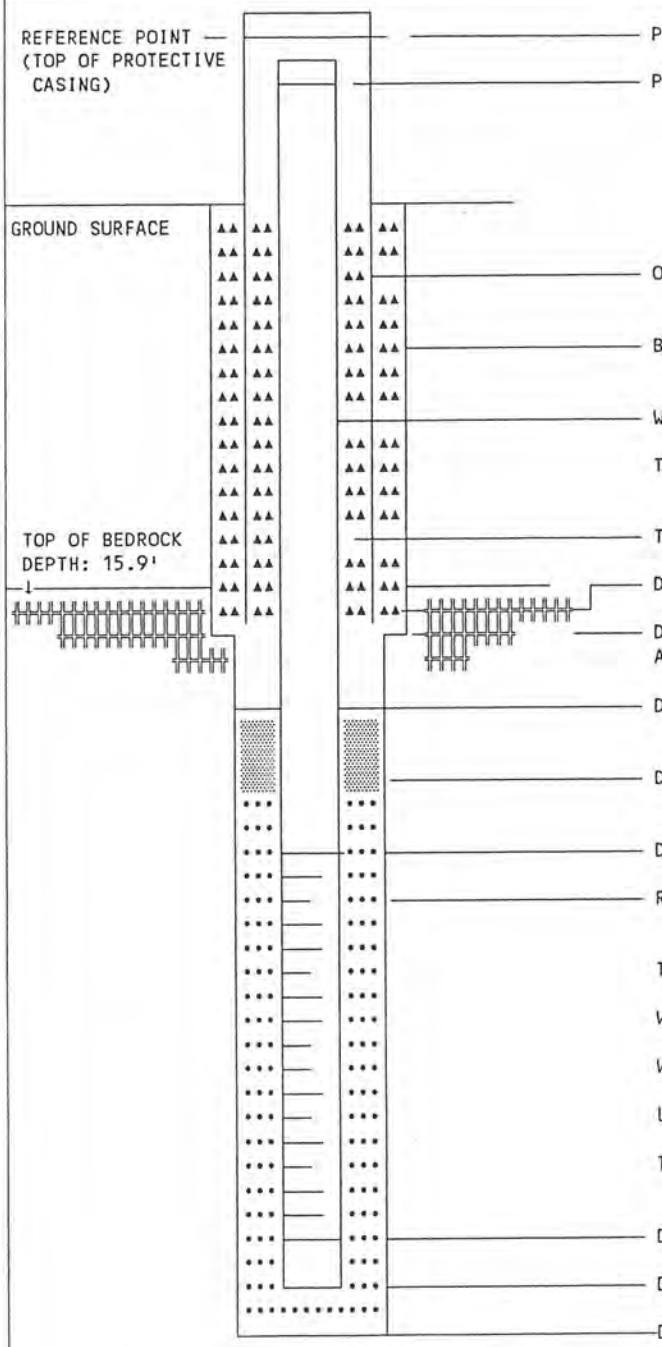
DRILLING METHOD: HSA \ ROCK CORE

CORE HOLE DIA.: 3.8 - INCH

RIG GEOLOGIST: N. BRETON

INITIAL WATER LEVEL DEPTH: 13.00'(RF)

DATE: 01 / 17 / 94



PROTECTIVE CASING STICKUP: 2.6'

PVC STICKUP: 2.3'

OUTSIDE DIAMETER OF STEEL CASING: 6-INCH

BOREHOLE DIAMETER: 10-INCH

WELL RISER ID: 2.0-INCH

TYPE OF WELL RISER: SCH 40 PVC

TYPE OF BACKFILL: CEMENT\BENTONITE GROUT

DEPTH TO BOTTOM OF 6" CASING: 17.2'

DEPTH TO BOTTOM OF ROCK SOCKET AND CEMENT\BENTONITE BACKFILL: 18.0'

DEPTH TO TOP OF BENTONITE PELLET SEAL: 18.8'

DEPTH TO TOP OF SAND PACK: 21.2'

DEPTH TO TOP OF WELL SCREEN: 23.2'

ROCK CORE HOLE DIAMETER: 3.8-INCH

TYPE OF WELL SCREEN: SCH 40 PVC

WELL SCREEN ID: 2.0-INCH

WELL SLOT SIZE: 0.010-INCH

LENGTH OF WELL SCREEN: 9.4'

TYPE OF SAND PACK: PENN SILICA # 1

DEPTH TO BOTTOM OF WELL SCREEN: 32.6'

DEPTH TO BOTTOM OF SEDIMENT TRAP: 32.9'

DEPTH OF BOREHOLE: 32.9'

ABB ENVIRONMENTAL SERVICES, INC.

SOIL BORING LOG	BORING NO.: PZ-105	PROJECT NO.: 7311-02	PAGE 1 OF 3
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT 350		DRILLER: R. SCHEFFER	DATE STARTED: 10/11/93 COMPLETED: 10/12/93
METHOD: HSA	AUGER SIZE: 4.25" I.D.	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: MOD D
GROUND ELEV.: 537.0	SOIL DRILLED: 15.9' FT.	ROCK DRILLED: CORE: 14.9' ROLLER BIT: 2.1'	TOTAL DEPTH: 32.9'
LOGGED BY: B. JOHNSON		CHECKED BY: N.B.	DATE: 9/6/94

DEPTH (FT.)	SAMPLE NUMBER	BLOWS PER 6-INCHES	PEN. / REC.	GRAPHIC LOG	SAMPLE DESCRIPTION	USCS CLASSIF.	MONITORING PID	MONITORING FID	(PPM) OTHER
0									
1	S-1	12-10-15-32	2.0 / 1.2		0'-0.3 Topsoil, Brown Silty SAND, fine, Organics, dry. 0.3'-1.5' Light Brown to Gray Gravelly SAND, coarse, angular, little to some fine to medium Sand, trace to little Silt, dry.	SM GW	0 0	0 3	
2					1.5'-2.0' Brown SAND, fine to medium, trace to little Silt, dry.	SW	0	0	
3	S-2	18-21-16-20	2.0 / 1.0		2.0'-3.9' Brown SAND, fine to medium, little fine Sand and Silt. 3.9'-4.0' Dark Brown Silty SAND, fine, moist.	GW SM	NA	NA	
4									
5	S-3	6-8-8-18	2.0 / 0.5		4.0'-6.0' Light Brown and Red Silty SAND, fine, moist.	SM	NA	NA	
6									
7	S-4	9-35-25-23	2.0 / 0.0		6.0'-8.0' No recovery after two attempts (cobble(s) at tip of spoon)				
8					8.0'-10.0' Brownish Red and Dark Brown Silty SAND, fine, little coarse Sand, fine Gravel, trace to little Silt and medium Sand, saturated, poorly graded.	SM			
9	S-5	20-44-21-16	2.0 / 1.2		(9.5'-9.7') Dark Brown SAND lens, medium to coarse, little fine Sand, trace, Silt. (water bearing soils)		1.0	0	
10									
11	S-6	6-9-14-19	2.0 / 1.5		10.0'-12.0' Brown Silty SAND, fine, trace to little medium to coarse Sand, little fine Sand, trace Silt, saturated	SM	2.5	110	
12									
13	S-7	12-6-9-14	2.0 / 1.2		12.0'-14.0' Dark Brown Silty SAND, fine, saturated, Dilatent.	SM	0	8	
14									
15	S-8	5-19-20-50/ (0.4')	1.6 / 1.9		14.0'-15.9' Brown Silty SAND, fine, trace fine angular Gravel, saturated, Dilatent. 15.9'-16.0' Auger to top of rock Refusal with augers at 15.9'	SM	0	110	

ROCK CORE LOG	BORING NO.: PZ-105	PROJECT NO.: 7311-02	PAGE 2 OF 3
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 11/01/93 COMPLETED: 11/01/93
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 537.0	SOIL DRILLED: 15.9 FT.	ROCK DRILLED: (CORED: 15.1' ROLLER BIT: 2.0')	TOTAL DEPTH: 33.0
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N.B	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. / REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
15									See soil boring log for PZ-105 for soil descriptions from 0'-15.9'		
16									Roller cone drill from 15.9'to 17.9'		
17.9									Grout		
19	R-1		1.1 / 1.1	100		nat	0°	slight	Light gray, finely crystalline, medium bedded, DOLOMITE with interbedded shale. Lockport FM	0	10
20	R-2	3	5.0 / 4.9	80		nat	0°	slight	Run R-2 - Vugs common throughout measuring up to 0.4" in size.	0.6	180
21		4				nat nat	0° 0°	slight slight		0	40
22		5				nat nat nat	0° 0° 40°	slight slight moderate	21.9'-22.1' - Vertical fracture (2" long)	0	20
23		3				nat	0°	slight		0	50
24		5				nat	10°	slight	23.8'-24.0' - Shale partings present along stringers.	0.6	20
25	R-3	5	5.0 / 5.1	80		nat	0°	slight	Run R-3 - Shale stringers common; no vugs observed.	0	20
26		3				nat nat	0° 0°	slight moderate		0	50
27		4				nat nat	0° 0°	slight slight		0.7	20
28		5				nat	0°	slight		0	50
29		3				nat	20°	slight		0	50
30	R-4	4	4.0 / 4.0	73		nat nat nat	0° 20° 0°	slight slight slight		0	20
		4								0	50

ROCK CORE LOG	BORING NO.: PZ-105	PROJECT NO.: 7311-02	PAGE 3 OF 3

PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 11/01/93 COMPLETED: 11/01/93
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 537.0	SOIL DRILLED: 15.9 FT.	ROCK DRILLED: (CORED: 15.1' ROLLER BIT: 2.0')	TOTAL DEPTH: 33.0'
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N-B	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. / REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
31		3	4.0 / 4.0	73		nat	0°	slight	Light gray, finely crystalline, medium bedded, DOLOMITE with interbedded shale.	0	20
32	R-4					nat	0°	moderate	Lockport FM		
		4								0	20
33									End of boring at 33.0' below ground surface.		

Note: Approximately 400 gallons of water lost during coring

nat - interpreted natural fracture or core break

mech - interpreted mechanical core break

WELL INSTALLATION DIAGRAM

WELL NO.: **PZ-106**

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 535.00

REFERENCE POINT ELEVATION: 537.45

DATE INSTALLED: 12 / 21 / 93

DRILLING METHOD: HSA \ ROCK CORE

CORE HOLE DIA.: 3.8 - INCH

RIG GEOLOGIST: N. BRETON

INITIAL WATER LEVEL DEPTH: 12.50'(RF)

DATE: 01 / 17 / 94

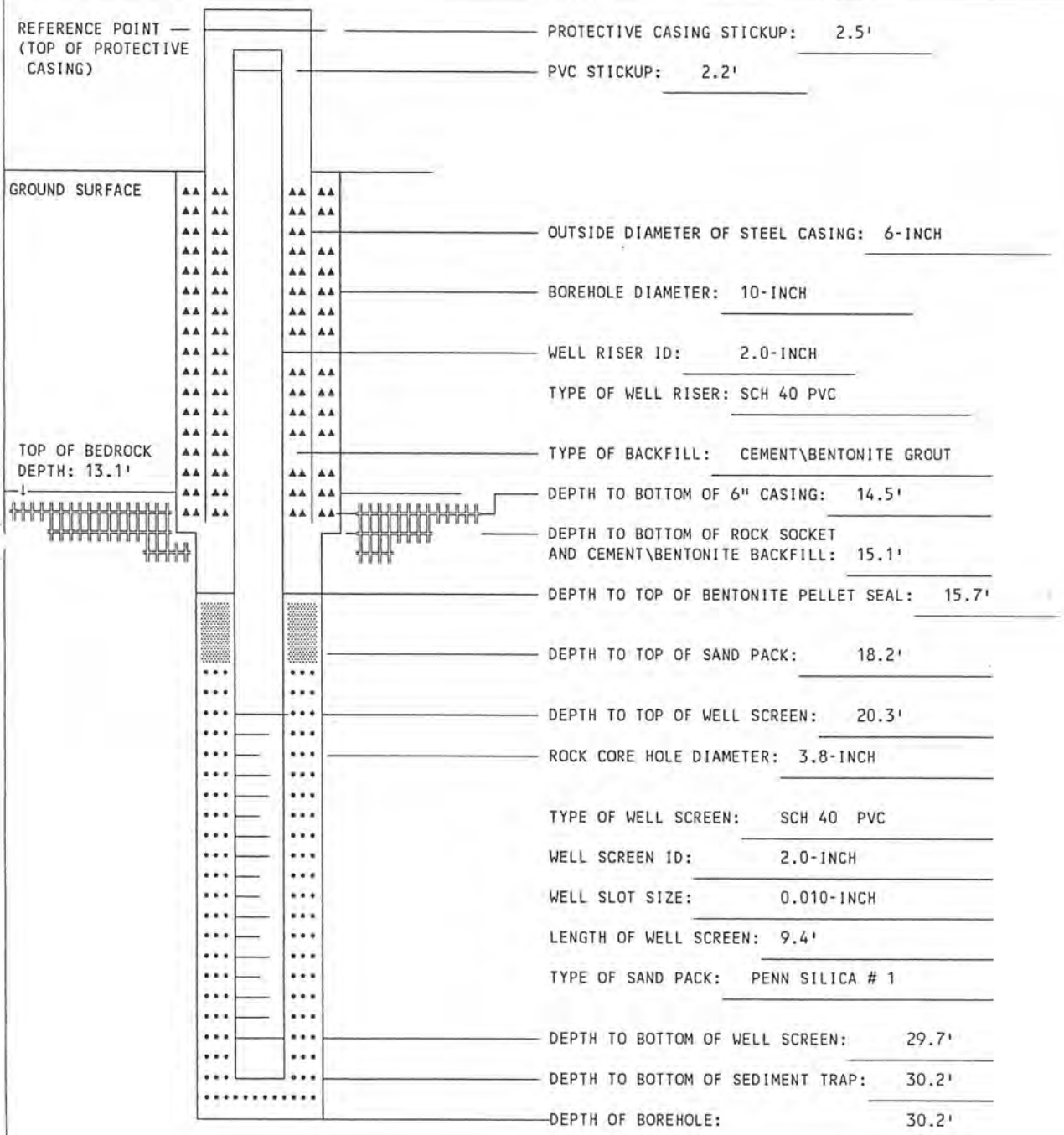


ABB ENVIRONMENTAL SERVICES, INC.

SOIL BORING LOG	BORING NO.: PZ-106	PROJECT NO.: 7311-02	PAGE 1 OF 3

PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT 350		DRILLER: R. SCHEFFER	DATE STARTED: 10/08/93 COMPLETED: 10/08/93
METHOD: HSA	AUGER SIZE: 4.25" I.D.	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: MOD D
GROUND ELEV.: 535.0	SOIL DRILLED: 13.2' FT.	ROCK DRILLED: CORE: 15.1' ROLLER BIT: 1.9'	TOTAL DEPTH: 30.2'
LOGGED BY: B. JOHNSON		CHECKED BY: NB	DATE: 9/6/94

DEPTH (FT.)	SAMPLE NUMBER	BLOWS PER 6-INCHES	PEN. / REC.	GRAPHIC LOG	SAMPLE DESCRIPTION	USCS CLASSIF.	MONITORING (PPM) PID	FID	OTHER
0									
1	S-1	9-9-7-6	2.0 / 1.5		0.0'-0.7' Brown to Black Silty SAND, fine, trace Organics.	SM	0	115	
2					0.7'-2.0' Dark Gray Silty SAND, fine to medium, little to some coarse Sand, trace fine Gravel, moist to wet.	SM			
3	S-2	3-5-4-4	2.0 / 0.8		2.0'-4.0' Similar to above.	SM	0	80	
4									
5	S-3	4-11-29-29	2.0 / 1.2		4.0'-4.3' Similar to above 4.3'-4.8' Red to Brown Silty SAND, fine, trace to little medium to coarse SAND, trace fine Gravel. moist.	SM SM	0	85	
6					4.8'-6.0' Dark Gray and Red Brown SAND, fine to medium, some Silt, saturated.	SM			
7	S-4	10-19-13-14	2.0 / 1.4		6.0'-8.0' Red to Brown SAND, fine, little medium Sand and Silt, trace fine Gravel and coarse Sand, saturated poorly graded.	SP	0	35	
8									
9	S-5	14-11-24-18	2.0 / 1.6		8.0'-8.3' Similar to above 8.3'-10.0' Dark Gray SAND, medium to coarse , little fine Sand, trace to little Silt, trace fine Gravel, saturated.	SP SW	0	15	
10									
11	S-6	14-18-18-23	2.0 / 1.5		10.0'-12.0' Dark Gray SAND, medium to coarse, little fine Sand and Silt, trace fine to coarse Gravel, saturated.	SW	0	10	
12									
13	S-7	40-27-50 (for 0.1')	1.1 / 1.0		12.0'-13.1' Dark Gray to light Brown SAND medium to coarse, little fine Sand and Silt, trace fine to coarse Gravel, saturated.	SW	15	30	
13.1									
14									

Notes:
Refusal with augers at 13.2'
Water measured at 4.8' during drilling

Cobbles noted at 6.0'
Water added to prevent heaving sand inside augers.

ROCK CORE LOG	BORING NO.: PZ-106	PROJECT NO.: 7311-02	PAGE 2 OF 3
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 10/28/93 COMPLETED: 10/28/93
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 535.0	SOIL DRILLED: 13.2 FT.	ROCK DRILLED: (CORED: 15.0' ROLLER BIT: 2.0')	TOTAL DEPTH: 30.2'
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N.B.	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. / REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
14									See soil boring log for PZ-106 for soil descriptions from 0'-13.2'		
									Roller cone drill from 13.2'to 15.2'		
15									Grout		
15.2											
	R-1	5	1.0 / 1.0	79		nat	0°	slight	Light gray, finely crystalline, medium bedded, DOLOMITE with interbedded shale. Lockport FM	0	40
16											
		3				nat	0°	slight	Run R-2 - Occasional vugs	14	20
17											
		2				nat	0°	moderate	17.5'-17.7' - Noticeably weathered and fractured.	18	150
18											
	R-2	3	5.0 / 4.5	75		nat	0°	slight		8	70
19									19.2'- Vug		
		3				nat	0°	moderate		6	100
20											
		4				nat nat	0° 0°	moderate moderate	20.5'- Highly fractured along shale partings 20.6' - Vug	70	50
21											
		4								10	50
22						nat	0°	slight			
		3								5	90
23						nat	0°	moderate	23.1'-23.2'- Weathered and fractured along shale partings.		
	R-3	3	5.0 / 5.0	95		nat	0°	moderate	23.9'-24.0'- Weathered and fractured along shale partings.	0	15
24						nat	0°	slight			
		3				nat	0°	slight		5	20
25											
		2				nat	0°	slight		23	175
26											
		2				nat	0°	slight		30	70
27											
	R-4	2	4.0 / 3.8	83						40	80
28						nat	0°	slight			
		2								10	30

ROCK CORE LOG	BORING NO.: PZ-106	PROJECT NO.: 7311-02	PAGE 3 OF 3
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 10/28/93 COMPLETED: 10/28/93
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev	FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 535.0	SOIL DRILLED: 13.2 FT.	ROCK DRILLED: (CORED: 15.0' ROLLER BIT: 2.0')	TOTAL DEPTH: 30.2'
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: NB	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
29											
	R-4	2	4.0	83		nat	0°	slight	Light gray, finely crystalline, medium bedded, DOLOMITE with interbedded shale.	7	30
30			3.8			nat	0°	slight	Lockport FM		
31									End of boring at 30.2' below ground surface		

Note: Approximately 80 gallons of water lost during coring.

nat - interpreted natural fracture or core break

mech - interpreted mechanical core break

WELL INSTALLATION DIAGRAM

WELL NO.: PZ-107

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 536.40

REFERENCE POINT ELEVATION: 538.64

DATE INSTALLED: 10 / 28 / 93

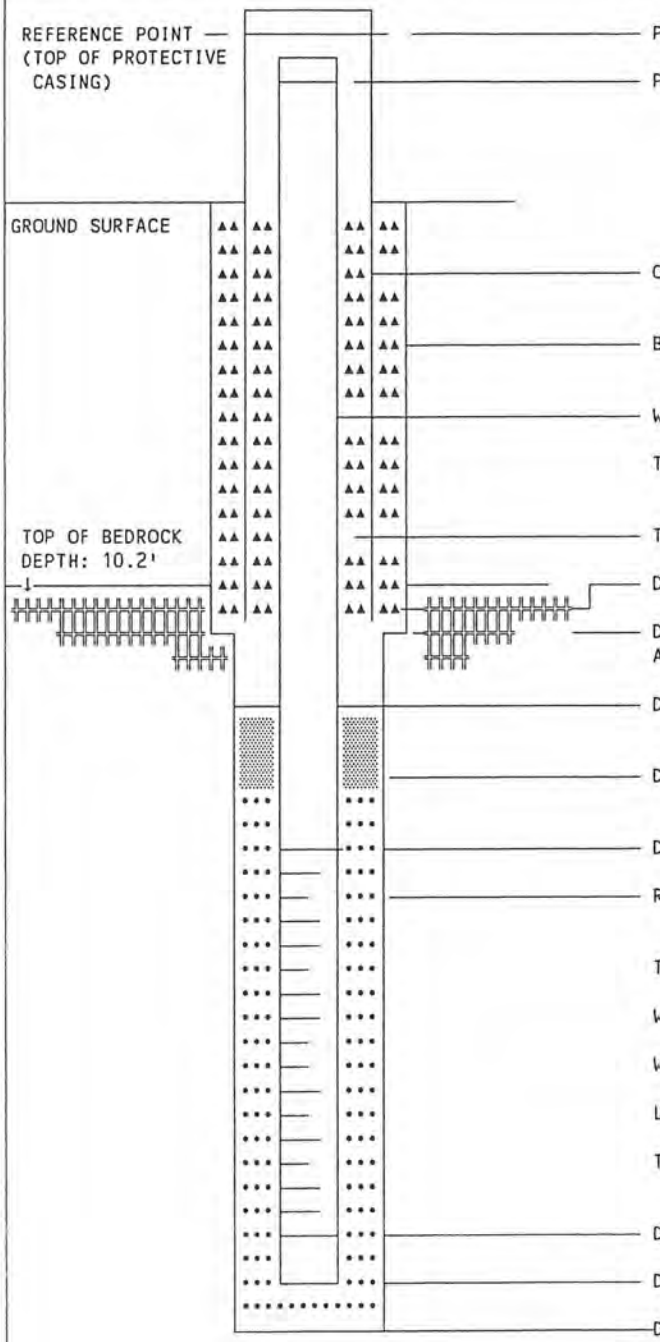
DRILLING METHOD: HSA \ ROCK CORE

CORE HOLE DIA.: 3.8 - INCH

RIG GEOLOGIST: E. SHEPARD

INITIAL WATER LEVEL DEPTH: 7.10'(RF)

DATE: 01 / 17 / 94



PROTECTIVE CASING STICKUP: 2.2'

PVC STICKUP: 2.0'

OUTSIDE DIAMETER OF STEEL CASING: 6-INCH

BOREHOLE DIAMETER: 10-INCH

WELL RISER ID: 2.0-INCH

TYPE OF WELL RISER: SCH 40 PVC

TYPE OF BACKFILL: CEMENT\BENTONITE GROUT

DEPTH TO BOTTOM OF 6" CASING: 11.7'

DEPTH TO BOTTOM OF ROCK SOCKET AND CEMENT\BENTONITE BACKFILL: 12.2'

DEPTH TO TOP OF BENTONITE PELLET SEAL: 12.5'

DEPTH TO TOP OF SAND PACK: 14.5'

DEPTH TO TOP OF WELL SCREEN: 15.5'

ROCK CORE HOLE DIAMETER: 3.8-INCH

TYPE OF WELL SCREEN: SCH 40 PVC

WELL SCREEN ID: 2.0-INCH

WELL SLOT SIZE: 0.010-INCH

LENGTH OF WELL SCREEN: 9.6'

TYPE OF SAND PACK: PENN SILICA # 1

DEPTH TO BOTTOM OF WELL SCREEN: 25.1'

DEPTH TO BOTTOM OF SEDIMENT TRAP: 25.5'

DEPTH OF BOREHOLE: 30.2'

ABB ENVIRONMENTAL SERVICES, INC.

SOIL BORING LOG	BORING NO.: PZ-107	PROJECT NO.: 7311-02	PAGE 1 OF 3

PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT 350		DRILLER: D. Bucher	DATE STARTED: 10/27/93 COMPLETED: 10/27/93
METHOD: HSA	AUGER SIZE: 4.25" I.D.	PID METER: 10.6 ev / FID METER: OVA-108	PROTECTION LEVEL: MOD D
GROUND ELEV.: 536.4	SOIL DRILLED: 10.2' FT.	ROCK DRILLED: CORE: 15.0' ROLLER BIT: 2.0'	TOTAL DEPTH: 27.2'
LOGGED BY: B. JOHNSON		CHECKED BY: N-B	DATE: 9/6/94

DEPTH (FT.)	SAMPLE NUMBER	BLOWS PER 6-INCHES	PEN. / REC.	GRAPHIC LOG	SAMPLE DESCRIPTION	USCS CLASSIF.	MONITORING (PPM) PID	FID	OTHER
0									
1	S-1	5-7-9-10	2.0 / 1.7		0.0'-0.8' Brown Topsoil, Silty Sand, fine, medium Sand, moist, Rootlets and Peat present.	SM/PT	0	0	
2					0.8'-2.0' Red to Brown, Silty SAND, fine, trace to little angular coarse Gravel, trace medium to coarse Sand, moist.	SM			
3	S-2	3-4-4-5	2.0 / 1.5		2.0'-4.0' Light brown to red, Silty SAND, fine, trace Clay, trace fine Gravel, moist, slightly plastic.	SM	0	1.0	
4									
5	S-3	1-5-7-7	2.0 / 1.6		4.0'-5.3' Brown, Silty SAND, fine, trace to little medium to coarse Sand, fine to coarse angular Gravel, moist.	SM	1.5	100	
6					5.3'-6.0' Brown Silty SAND, fine, little medium Sand, trace coarse Sand and Gravel, saturated.	SP			
7	S-4	4-15-9-10	2.0 / 1.5		6.0'-6.5' Similar to above, Light Brown with yellow spots.	SP	NA	NA	
8					6.5'-7.0' Light Brown Gravelly SAND, fine to medium Sand, some Silt, saturated.	GM			
9	S-5	7-14-22-50	2.0 / 0.5		7.0'-8.0' Brown SAND, fine to medium, little Silt, saturated.				
10					8.0'-10.0' Silty SAND and Sand, fine to medium, in alternating thin layers, saturated.	SM	1.0	700	
10.2'					10.0'-10.2' Yellow Brown SAND, fine to medium, some Silt, trace to some coarse Sand, saturated.	SM	2.0	250	
11	S-6	50 for 0.2'	0.2 / 0.2		Spoon refusal at 10.2'				
12					Water level (initial) at 5.3'				
13					ADDITIONAL NOTES: FID hits at 4'to 6' in saturated soil only.				
14									
15									

ROCK CORE LOG	BORING NO.: PZ-107	PROJECT NO.: 7311-02	PAGE 2 OF 3
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 10/27/93 COMPLETED: 10/27/93
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev	FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 536.4	SOIL DRILLED: 10.2 FT.	ROCK DRILLED: (CORED: 15.2' ROLLER BIT: 1.8')	TOTAL DEPTH: 27.2'
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N.B	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
11									See soil boring log for PZ-107 for soil descriptions from 0'-10.2'		
									Roller cone drill from 10.2'to 12.0'		
12									Grout		
		3.5							Light gray, finely crystalline, medium bedded, DOLOMITE with interbedded shale.		
13									Lockport FM		
		9							12.0'- 13.7'- Core not recovered; interpret top of recovered core as 13.7' below ground surface.		
14	R-1		4.4	35		mech				0	80
		8	2.7			nat	30°	slight		0	5
						nat	0°	slight			
15						nat	0°	slight			
		4.3				nat	0°	slight		3.5	30
16						nat	45°	slight			
		2								5	40
16.4											
17		3				nat	0°	slight	Run R-2 - Slightly to moderately weathered fractures parallel to bedding and along shale partings	NA	10
						nat	0°	slight		NA	40
18		3				nat	0°	moderate			
						nat	0°	moderate		NA	NA
19		2				nat	0°	moderate			
	R-2		5.6	96						NA	NA
20		3	5.5			mech					
										0	40
21		2				nat	0°	slight			
										NA	NA
22											
	R-3	NA	0.7	NA		mech			Run R-3 - Mostly mechanical breaks; Difficulty with core jamming. Had abandon run at 22.7'	3.5	30
22.7			0.7								
23						nat	0°	slight			
		2				nat	0°	slight		20	150
				4.5							
24	R-4			4.4							
		2								9	100
						nat	0°	slight			
25											
		3				nat	0°	high	25.2'-25.4' - Soft weathered zone		
						nat	0°	slight		5	125

ROCK CORE LOG	BORING NO.: PZ-107	PROJECT NO.: 7311-02	PAGE 3 OF 3
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT-350		DRILLER: R. SCHEFFER	DATE STARTED: 10/27/93 COMPLETED: 10/27/93
METHOD: CORE	BIT SIZE: HQ (3.8" O.D.)	PID METER: 10.6 ev	FID METER: OVA-108	PROTECTION LEVEL: D
GROUND ELEV.: 536.4	SOIL DRILLED: 10.2 FT.	ROCK DRILLED: (CORED: 15.2' ROLLER BIT: 1.8')	TOTAL DEPTH: 27.2'
LOGGED BY: E. SHEPARD / N. BRETON		CHECKED BY: N.B.	DATE: 9/6/94

DEPTH (FT.)	RUN NO.	DRILLING RATE (FT/MIN)	PEN. / REC.	RQD (%)	GRAPHIC LOG	CORE BREAKS TYPE	CORE BREAKS DIP	WEATHERED CONDITION	ROCK DESCRIPTION AND COMMENTS ON DRILLING	MONITORING PID	MONITORING FID
26											
	R-4	3	4.5 / 4.4	85		nat nat	0° 0°	slight slight	Light gray, finely crystalline, medium bedded, DOLOMITE with interbedded shale. Lockport FM	2	50
27											
27.2											
28									End of boring at 27.2' below ground surface Notes: Approximately 750 gallons of water lost during coring nat - interpreted natural fracture or core break mech - interpreted mechanical core break In Run R-4 a 1.5" size piece of core was discolored brown. FID and PID readings over this piece measured 400 and 27 ppm respectively.		

WELL INSTALLATION DIAGRAM

WELL NO.: **PZ-108**

PROJECT NAME: OLIN ROCHESTER RI

PROJECT NO.: 7311-03

GROUND ELEVATION: 536.56

REFERENCE POINT ELEVATION: 536.56

DATE INSTALLED: 10 / 21 / 93

DRILLING METHOD: HSA

AUGER ID: 4.25 - INCH

RIG GEOLOGIST: B. JOHNSON

INITIAL WATER LEVEL DEPTH: 4.30'(RF)

DATE: 01 / 17 / 94

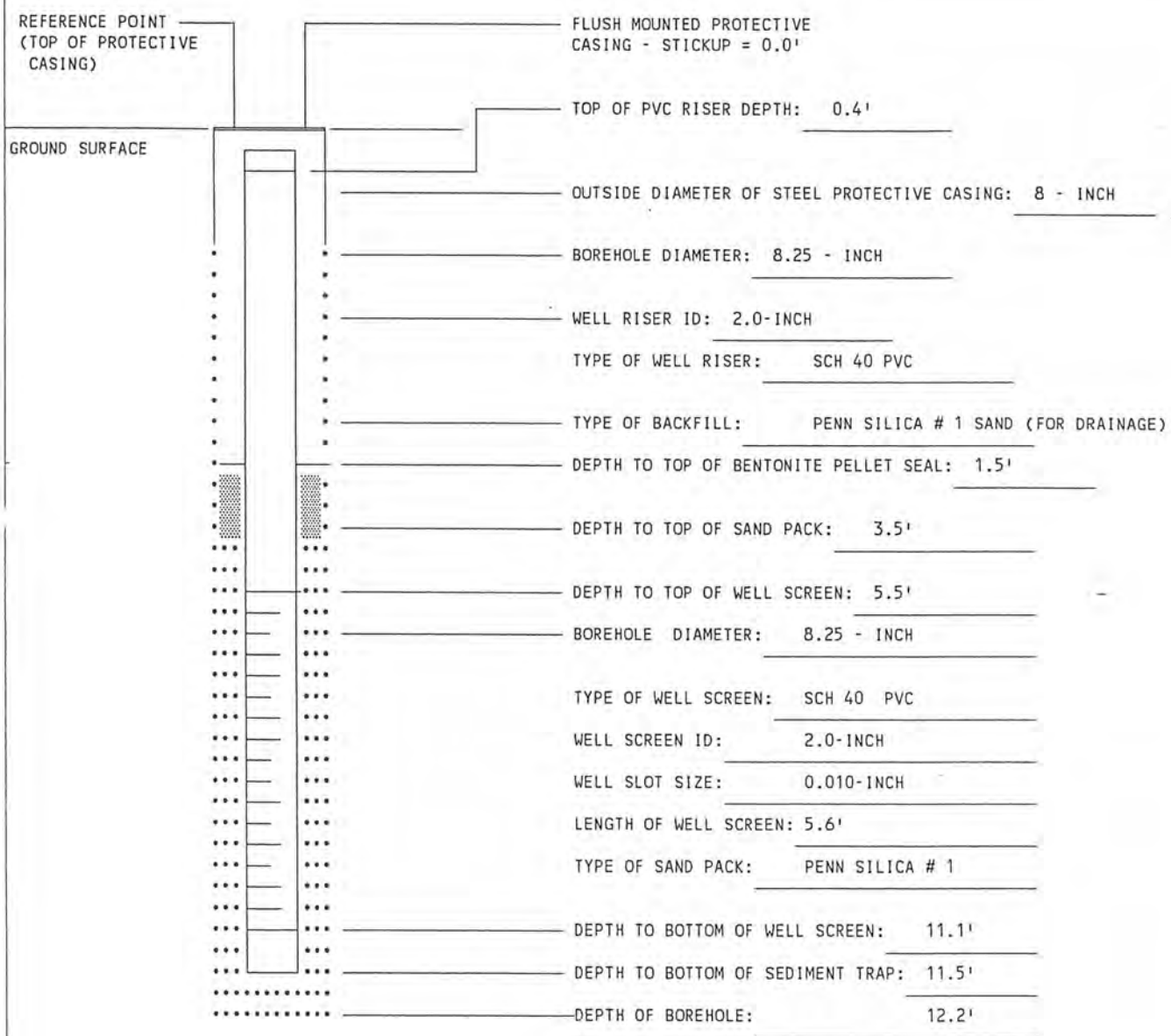


ABB ENVIRONMENTAL SERVICES, INC.

SOIL BORING LOG	BORING NO.: PZ-108	PROJECT NO.: 7311-02	PAGE 1 OF 1
PROJECT NAME: OLIN ROCHESTER RI		DRILLING CONTRACTOR: MARCOR OF NEW YORK	
DRILL RIG TYPE: CANTERRA CT 350		DRILLER: R. SCHEFFER	DATE STARTED: 10/22/93 COMPLETED: 10/22/93
METHOD: HSA	AUGER SIZE: 4.25" I.D.	PID METER: 10.6 ev	FID METER: OVA-108 PROTECTION LEVEL: MOD D
GROUND ELEV.: 536.6	SOIL DRILLED: 12.2' FT.	ROCK DRILLED: NONE	TOTAL DEPTH: 12.2'
LOGGED BY: B. JOHNSON		CHECKED BY: NB.	DATE: 9/6/94

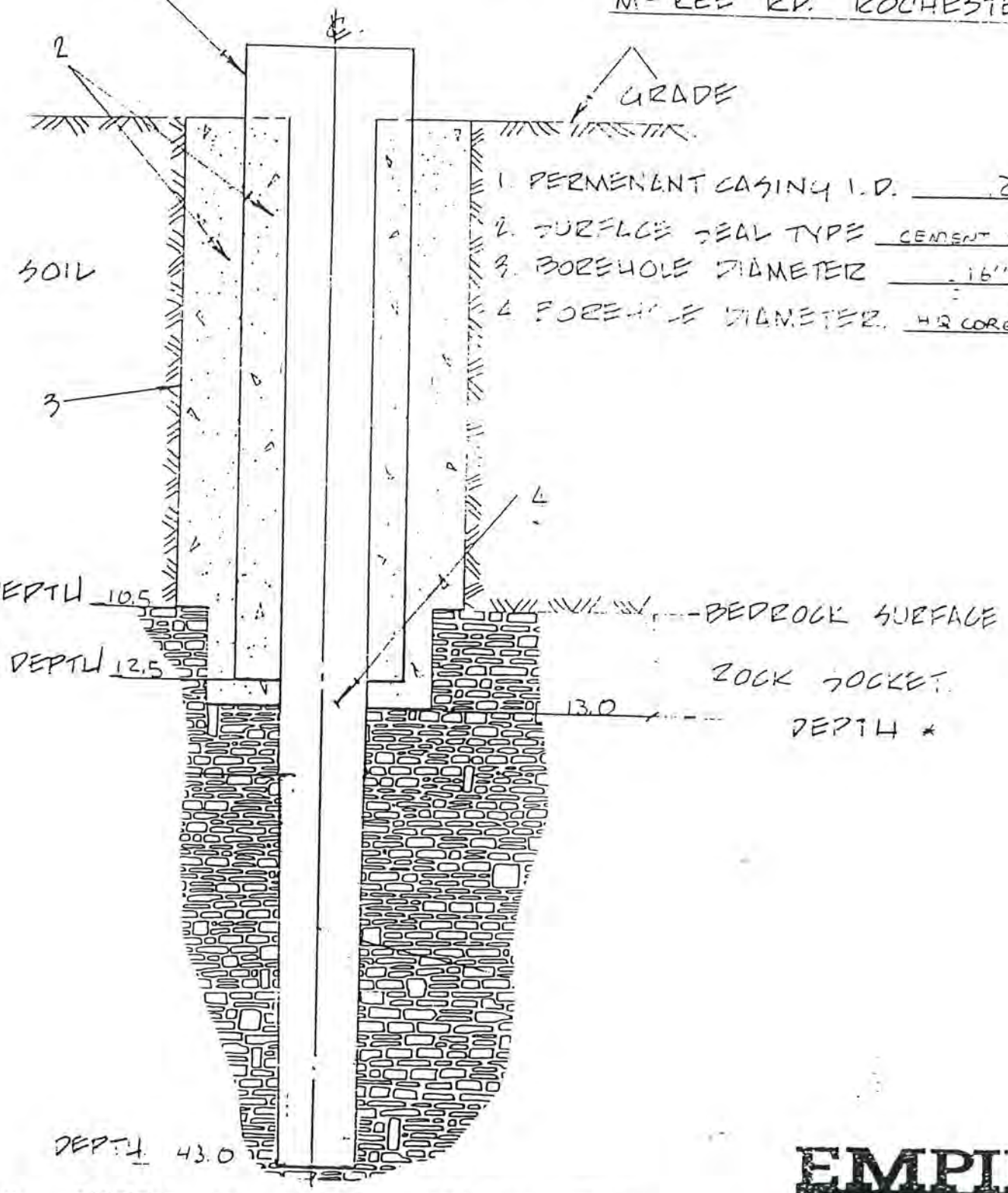
DEPTH (FT.)	SAMPLE NUMBER	BLOWS PER 6-INCHES	PEN. / REC.	GRAPHIC LOG	SAMPLE DESCRIPTION	USCS CLASSIF.	MONITORING (PPM) PID	FID	OTHER
0									
1	S-1	3-6-11-11	2.0 / 2.0		0.0'-0.3' Topsoil, Brown Silty SAND, fine trace medium to coarse Sand, moist, Organics present.	SM	0	0	
2					0.3'-2.0' Brown to Red Silty SAND, fine, trace to little medium to coarse Sand, fine Gravel, dry to moist.	SM			
3	S-2	5-5-6-8	2.0 / 1.8		2.0'-4.0' Brown to Red Silty SAND, trace medium Sand, moist. (piece of coal at 2.5')	SM	0	2	
4									
5	S-3	3-8-11-13	2.0 / 1.7		4.0'-4.4' Similar to above.	SP			
					4.4'-4.7' Brown Silty SAND, fine, trace Clay, little fine Grave, moist to wet.		NA	NA	
6					4.7'-6.0' Red to Brown SAND, fine, trace to little Silt, wet to saturated.				
7	S-4	5-7-10-14	2.0 / 1.0		6.0'-8.0' Reddish Brown SAND, fine, some Silt, saturated.	SM	NA	NA	
8									
9	S-5	4-8-6-13	2.0 / 1.0		8.0'-9.0' Similar to above.	SM			
					9.0'-10.0' Dark Gray to Black SAND, fine, little to some Silt, trace fine to coarse Gravel, saturated.	SM	0	50	
10									
11	S-6	6-9-15-35	0.9 / 0.4		10.0'-12.0' Brown and Gray Silty SAND, fine, little medium to coarse SAND, trace fine Gravel, saturated, (Rock in tip of spoon)	SM	0	10,000	
12									
13					REFUSAL WITH AUGERS AT 12.2' WATER TABLE ENCOUNTERED AT 5.0'				
14									
15									

BEDROCK WELL COMPLETION REPORT:

WELL BR-5 JOB. BD 89 074

PROJECT OLIN CORP.

McKEE RD. ROCHESTER, N.Y.



1. PERMENANT CASING I.D. 2"
2. SURFACE SEAL TYPE CEMENT GROUT
3. BOREHOLE DIAMETER 16"
4. BOREHOLE DIAMETER HQ CORE SIZE

* DEPTH IN FEET BELOW GRADE

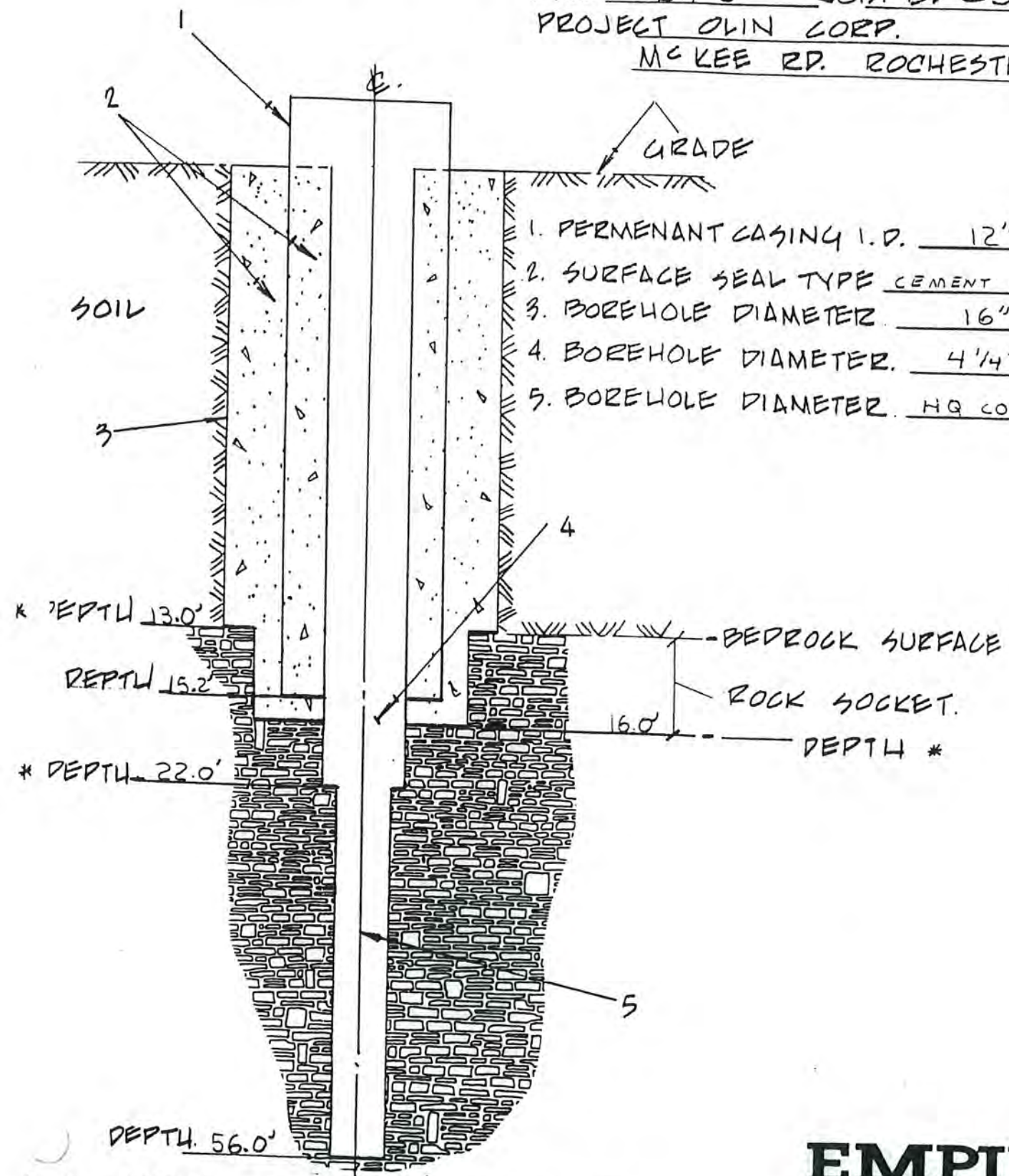
EMPIRE SOILS INVESTIGATIONS INC.

BEDROCK WELL COMPLETION REPORT;

WELL BR-6 JOB. BD 89 074

PROJECT OLIN CORP.

McKEE RD. ROCHESTER, N.Y.



1. PERMENANT CASING I.D. 12"
2. SURFACE SEAL TYPE CEMENT GROUT
3. BOREHOLE DIAMETER 16"
4. BOREHOLE DIAMETER. 4 1/4"
5. BOREHOLE DIAMETER. HQ CORE SIZE

* DEPTH IN FEET BELOW GRADE

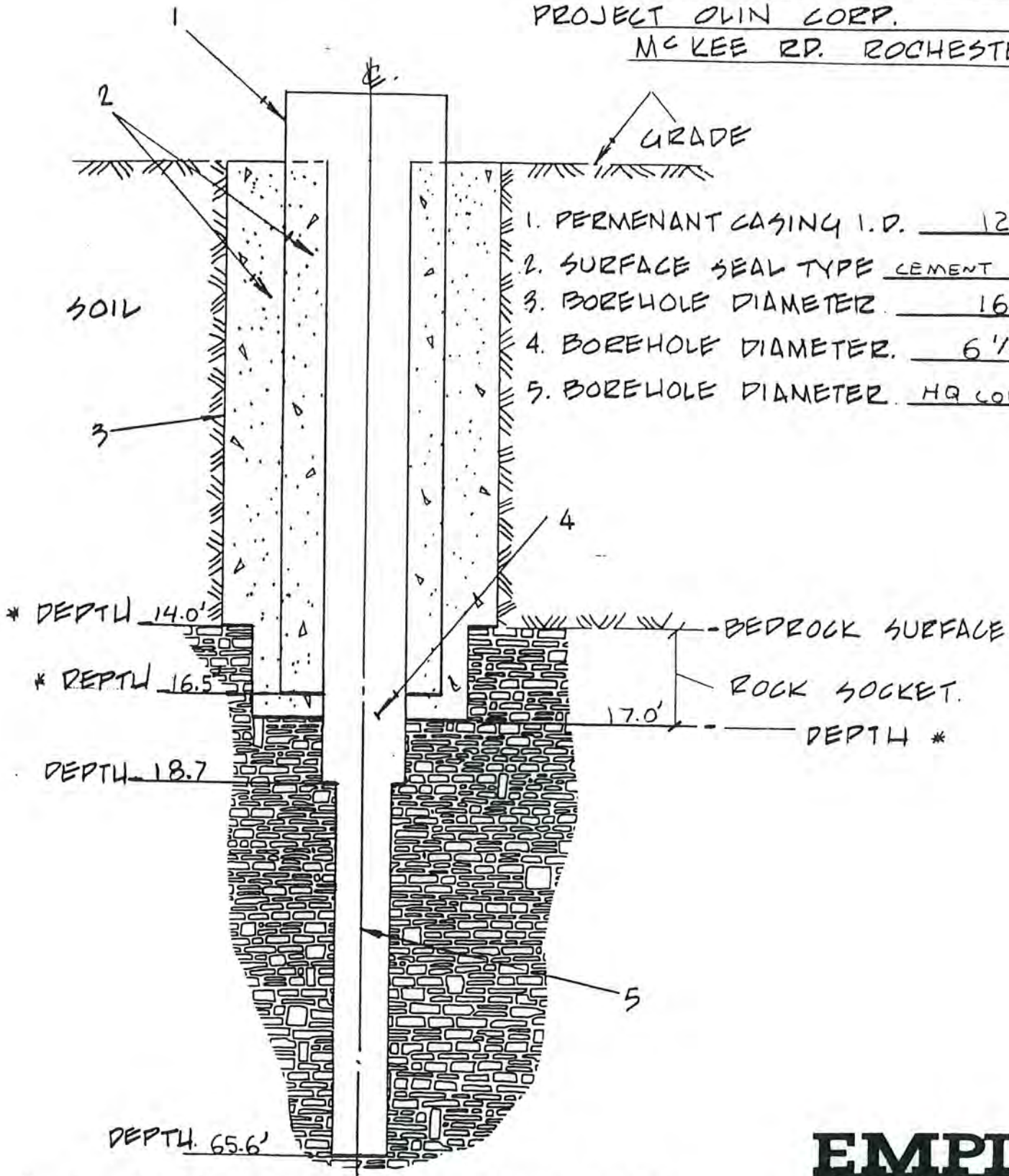
EMPIRE
SOILS INVESTIGATIONS INC.
S-5167 S. Park Avenue, Hamburg, NY 14075

BEDROCK WELL COMPLETION REPORT:

WELL BR-7 JOB. BD 89 074

PROJECT OLIN CORP.

McKEE RD. ROCHESTER, N.Y.



1. PERMENANT CASING I.D. 12"
2. SURFACE SEAL TYPE CEMENT GROUT
3. BOREHOLE DIAMETER 16"
4. BOREHOLE DIAMETER. 6 1/4"
5. BOREHOLE DIAMETER HQ CORE SIZE

* DEPTH IN FEET BELOW GRADE

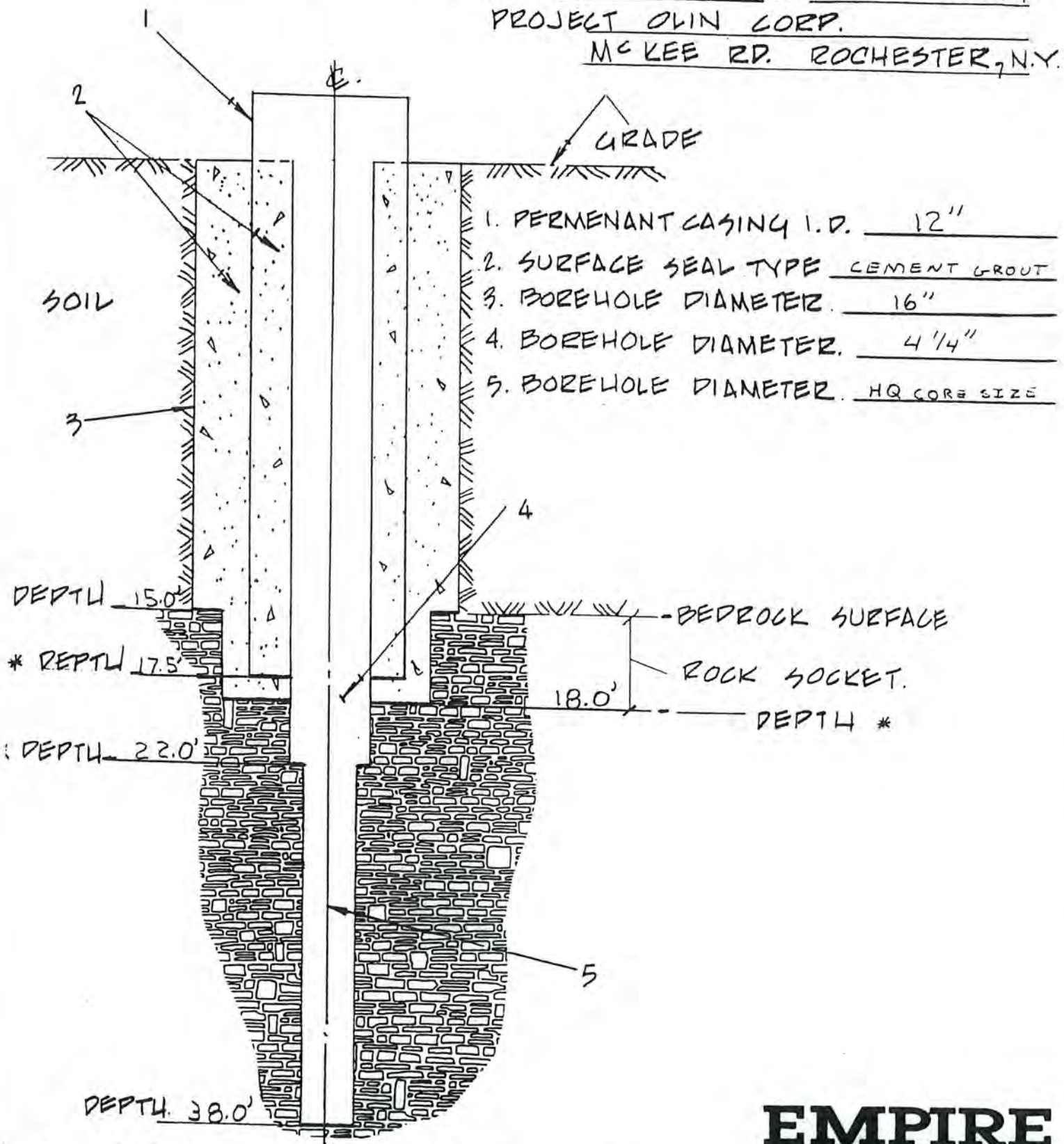
EMPIRE SOILS INVESTIGATIONS INC.
S-5167 S. Park Avenue, Hamburg, NY 14075

BEDROCK WELL COMPLETION REPORT:

WELL BR-8 JOB. BD 89 074

PROJECT OLIN CORP.

McKEE RD. ROCHESTER, N.Y.



1. PERMENANT CASING I.D. 12"
2. SURFACE SEAL TYPE CEMENT GROUT
3. BOREHOLE DIAMETER. 16"
4. BOREHOLE DIAMETER. 4 1/4"
5. BOREHOLE DIAMETER. HQ CORE SIZE

* DEPTH IN FEET BELOW GRADE

EMPIRE
SOILS INVESTIGATIONS INC.
S-5167 S. Park Avenue, Hamburg, NY 14075

EMPIRE SOILS INVESTIGATIONS INC.

-BORING LOG-

PROJECT Olin Chemical
McKee Road
Rochester, New York

BORING No. BR-4
SHEET 1 OF 1
FILE No. BD-89-074

DEPTH (FT.)	BLOWS PER 0.5 FT.	SAMPLE NUMBER	SAMPLE DEPTH (FT.)	N-VALUE OR ROD (%)	% RECOVERY	DEPTH (FT.)	LEGEND	SOIL & ROCK DESCRIPTIONS	REMARKS
29								Previously Drilled by another Driller	
30								Light Gray DOLOMITE, hard, sound, thin bedded	
31			Run #1					Fractures along Shale or Styolitic partings, trace vugs	
32			30.0'-40.0'	36%	100%				
33								vugs -Shale bed	
34								Fractures along Shale or Styolitic partings	
35									
36				91%	100%			Possible drilling related fractures	
37								Becomes thick bedded	
38								Possible drilling related fractures	
39									
40								Fracture along Styolitic partings slight weathering	
41								Light Gray DOLOMITE, hard, sound, thick bedded-massive, trace fractures along Styolitic parting trace vugs	
42			Run #2						
43			40.0'-50.0'	96%	100%			Zone of small vugs	
44								Fracture along Styolitic parting slight weathering	
45									
46									
47								Possible drilling related fracture no weathering	
48								trace vertical vugs	
49									
50								Boring complete at 50.0'	
51									

REMARKS: BR-4 was previously drilled to 30.0'

BORING No. BR-4

EMPIRE SOILS INVESTIGATIONS INC.

- -BORING LOG-

PROJECT Olin Chemical
McKee Road
Rochester, New York

BORING No. BR-5
SHEET 1 OF 2
FILE No. BD-89-074

DEPTH (FT.)	BLOWS PER 0.5 FT.	SAMPLE NUMBER	SAMPLE DEPTH (FT.)	N-VALUE OR RQD (%)	% RECOVERY	DEPTH (FT.)	LEGEND	SOIL & ROCK DESCRIPTIONS	REMARKS
1-26			Run #1 2.0'-5.0'					SOIL	
			Run #2 5.0'-13.0'					TOP OF ROCK 10.5'	
								Rock Socket 10.5-13.0'	
								12" casing set at 12.5'	
								Bottom of rock socket	
			Run #3 13.0'-20.6'	63%	96%			Fractures along Styolitic or Shale partings	
								Light gray DOLOMITE, hard, slightly weathered, thick bedded, fracture along Styolitic or Shale partings	
								Zone of highly fractured rock	
								Fracture along Styolitic or Shale partings	
								Possible drilling related fractures	
								(becomes sound)	
			Run #4 20.6'-23.0'	100%	100%			Fracture along Styolitic parting slight-none weathering	
								Fracture slightly weathered	
			Run #5					Fractures no weathering, possible drilling breaks	

REMARKS:

BORING No. BR-5

EMPIRE SOILS INVESTIGATIONS INC.

-BORING LOG-

PROJECT Olin Chemical
McKee Road
Rochester, New York

BORING No. BR-5
SHEET 2 OF 2
FILE No. BD-89-074

DEPTH (FT.)	BLOWS PER 0.5 FT.	SAMPLE NUMBER	SAMPLE DEPTH (FT.)	N-VALUE OR RQD (%)	% RECOVERY	DEPTH (FT.)	LEGEND	SOIL & ROCK DESCRIPTIONS	REMARKS
26								Zone of Highly fractured rock, thin Shale bed, weathered	
27			Run #5 23.0'- 31.0'	82%	100%			Possible drilling break Fracture at Shale parting, slightly weathered	
28								Possible drilling related fractures	
29								Fracture at Styolitic parting	
30								Fracture at Styolitic partings, slightly weathered	
31								Possible drilling related fracture, no weathering	
32			Run #6 31.0'- 33.0'	100%	100%			Possible drilling related fracture, no weathering	
33			Run #7 33.0'- 43.0'	94%	99%				
34									
35								Fracture slight-no weathering, possible drilling related fracture	
36									
37									
38									
39									
40									
41								Fracture along Styolitic partings, slight weathering	
42								Possible drilling related fracture	
43								Boring Complete at 43.0'	
44									

REMARKS:

BORING No. BR-5

EMPIRE SOILS INVESTIGATIONS INC.

-BORING LOG-

PROJECT Olin Chemical
McKee Road
Rochester, New York

BORING No. BR-6
SHEET 1 OF 3
FILE No. BD-89-074

DEPTH (FT.)	BLOWS PER 0.5 FT.	SAMPLE NUMBER	SAMPLE DEPTH (FT.)	N-VALUE OR RQD (%)	% RECOVERY	DEPTH (FT.)	LEGEND	SOIL & ROCK DESCRIPTIONS	REMARKS
1–10			Run #1 1.0'- 10.7'					SOIL	
11–16			Run #2 10.7'- 16.2'					TOP OF ROCK 13.0' Rock Socket 13.0-16.2' Casing set at 15.2' Bottom of Rock Socket 16.2'	
17–26			Run #3 16.5'- 26.0'	78%	94%			Fracture at Styolitic parting weathered Light Gray DOLOMITE, hard, weathered-sound, thin to thick bedded, fracture at Styolitic partings. Fracture at Styolitic partings weathered	Lost water at 25.0'

REMARKS:

BORING No. BR-6

EMPIRE SOILS INVESTIGATIONS INC

-BORING LOG-

PROJECT Olin Chemical
McKee Road
Rochester, New York

BORING No. BR-6
SHEET 2 OF 3
FILE No. BD-89-074

DEPTH (FT.)	BLOWS PER 0.5 FT.	SAMPLE NUMBER	SAMPLE DEPTH (FT.)	N-VALUE OR RQD (%)	% RECOVERY	DEPTH (FT.)	LEGEND	SOIL & ROCK DESCRIPTIONS	REMARKS
26								Fracture, very weathered	
27			Run #4 26.0'-36.0'	70%	99%			Fracture at Styolitic parting, possible drilling related, slightly weathered	
28								Fracture at Styolitic parting, weathered	
29								Fracture at Styolitic parting, slightly weathered	
30								Possible drilling related	
31								Fracture at Styolitic parting, slightly weathered	
								Possible drilling related fracture	
32								Fracture at Styolitic parting, weathered	
								Possible drilling related fracture	
								Fracture, weathered	
33								Fracture at Styolitic parting	
34									
								Fracture at Calcite filled vug	
35								Fracture at Shale parting, weathered	
36			Run #5 36.0'	86%	96%				Calcite Zone 34.0'-38.5'
37								Fracture, slight weathering	
								Fracture at thin Shale, red	
38								Possible drilling break	
39								Fracture at Shale parting, very weathered	Shale inclusions in rock 39.2-39.5'
40								Possible drilling fracture	Shale inclusions at 40.9-41.2'
41								Fracture at Shale partings	
42								Fracture at Shale parting	
43									
44									
45								Fracture at Shale parting, trace vugs throughout 44.5'-46.0'	
46			Run #6 46.0'-56.0'	94%	100%				
47								Fracture at Styolitic parting	
48									
49									
50								Possible drilling related fractures	
51									
52									

REMARKS:

EMPIRE SOILS INVESTIGATIONS INC.

-BORING LOG-

PROJECT Olin Chemical
McKee Road
Rochester, New York

BORING No. BR-6
SHEET 3 OF 3
FILE No. BD-89-074

DEPTH (FT.)	BLOWS PER 0.5 FT.	SAMPLE NUMBER	SAMPLE DEPTH (FT.)	N-VALUE OR RQD (%)	% RECOVERY	DEPTH (FT.)	LEGEND	SOIL & ROCK DESCRIPTIONS	REMARKS
52									
53								Drilling related breaks	
54								Calcite fill vug, possible drilling related fracture	
55								Fracture at Shale parting	
56								Boring Complete at 56.0'	
57									
58									

REMARKS:

BORING No. BR-6

EMPIRE SOILS INVESTIGATIONS INC.

-BORING LOG-

PROJECT Olin Chemical
McKee Road
Rochester, New York

BORING No. BR-7
SHEET 1 OF 3
FILE No. BD-89-074

DEPTH (FT.)	BLOWS PER 0.5 FT.	SAMPLE NUMBER	SAMPLE DEPTH (FT.)	N-VALUE OR RQD (%)	% RECOVERY	DEPTH (FT.)	LEGEND	SOIL & ROCK DESCRIPTIONS	REMARKS
1-7								SOIL	
7.6									3-7/8" Roller Bit to 7.6' in grout
14.0								TOP OF ROCK 14.0'	
			Run #1 7.6'-17.6'					Rock Socket 14.0-17.0'	
16.5								Casing set at 16.5'	
17.6			Run #2 17.6'-18.2'	0%	75%			Highly fractured rock	
18.2			Run #3 18.2'-18.7'	58%	100%			Possible drilling related fracture Light gray DOLOMITE, hard, bedded-thick bedded, some fractures along Shale or Sytolitic partings	6-1/4" Roller Bit to 18.7' Hole caving in at 19.0'
18.7			Run #4 18.7'-27.2'	90% over all 84% Top 94% Bottom 4.0'	98%			Possible drilling related fracture Fracture along Styolitic or Shale parting Slight-none weathering Possible drilling related fracture	
25								Zone highly fractured rock Fracture along Styolitic partings	
26									

REMARKS:

BORING No. BR-7

EMPIRE SOILS INVESTIGATIONS INC

BORING LOG

PROJECT Olin Chemical
McKee Road
Rochester, New York

BORING No. BR-7
SHEET 2 OF 3
FILE No. BD-89-074

DEPTH (FT.)	BLOWS PER 0.5 FT.	SAMPLE NUMBER	SAMPLE DEPTH (FT.)	N-VALUE OR ROD (%)	% RECOVERY	DEPTH (FT.)	LEGEND	SOIL & ROCK DESCRIPTIONS	REMARKS
26									
27								Fractures along Styolitic partings	
28			Run #5 27.2'-31.2'	73%	93%			Fractures along Styolitic parting or Shale partings	
29									
30								Possible drilling related fractures	
31								Possilbe void	Lost water at 31.0'
32			Run #6 31.2'-34.5'	43%	90%			Highly fractured along Styolitic or Shale parting	
33									
34								Fractured along Styolitic parting Possible drilling related, slight-no weathering	
35			Run #7 34.5'-37.0'	92%	100%			Possible drilling related fracture	
36									
37								Fracture along Styolitic or Shale partings	
38			Run #8 37.0'-46.3'	78% Top 4.6' 75% Bottom 3.7' 98%	91%			Zone of highly fractured rock, fracture along Shale partings	
39									
40									
41								Possible drilling related fracture slight-no weathering	
42									
43									
44									
45									
46									
47			Run #9 46.3'-55.6'	92%	107%				
48								Possilbe drilling related fractures no weathering	
49								Calcite in fracture	Calcite Zone 48.3'-51.5'
50								Calcite in fracture	
51								Possible drilling related fracture Calcite in fracture	
52								Fracture along Styolitic parting, slight weathering	

REMARKS:

EMPIRE SOILS INVESTIGATIONS INC

-BORING LOG-

PROJECT Olin Chemical
McKee Road
Rochester, New York

BORING No. BR-7
SHEET 3 OF 3
FILE No. BD-89-074

DEPTH (FT.)	BLOWS PER 0.5 FT.	SAMPLE NUMBER	SAMPLE DEPTH (FT.)	N-VALUE OR RQD (%)	% RECOVERY	DEPTH (FT)	LEGEND	SOIL & ROCK DESCRIPTIONS	REMARKS
52								Possible drilling related fracture	
53									
54								Fracture along Shale parting	
55								Possible drilling related fracture	
56									
57								Possilbe drilling related fracture, few at partings, no weathering	
58									
59									
60								Fraacture along Shale partings	
								Trace vugs Calcite filled	
61									Calcite Zone 60.0'-65.6'
62									
63								Possible drilling related fractures	
64									
65									
66								Boring Complete at 65.6'	
67									
68									
69									
70									

REMARKS:

EMPIRE SOILS INVESTIGATIONS INC.

-BORING LOG-

PROJECT Olin Chemical
McKee Road
Rochester, New York

BORING No. BR-8
SHEET 1 OF 2
FILE No. BD-89-074

DEPTH (FT.)	BLOWS PER 0.5 FT.	SAMPLE NUMBER	SAMPLE DEPTH (FT.)	N-VALUE OR RQD (%)	% RECOVERY	DEPTH (FT.)	LEGEND	SOIL & ROCK DESCRIPTIONS	REMARKS
1-10			Run #1 2.8'- 10.7'					SOIL	
11-14			Run #2 10.7'- 20.2'						
15								TOP OF ROCK 15.0'	
15-18								Rock Socket 15.0' to 18.0'	
17								Casing set at 17.5'	
18								BOTTOM OF ROCK SOCKET 18.0'	
19-20				0%	74%			Zone of highly Fractured Rock Light Gray DOLOMITE, hard, weathered, thin-thick bedded, fractured at Shale and Styolitic partings.	
21-26			Run #3 20.2'- 26.0'	81%	97%			Fracture at Styolitic parting Slight weather to weathered	

REMARKS:

EMPIRE SOILS INVESTIGATIONS INC.

-BORING LOG-

PROJECT Olin Chemical
McKee Road
Rochester, New York

BORING No. BR-8
SHEET 2 OF 2
FILE No. BD-89-074

DEPTH (FT.)	BLOWS PER 0.5 FT.	SAMPLE NUMBER	SAMPLE DEPTH (FT.)	N-VALUE OR ROD (%)	% RECOVERY	DEPTH (FT.)	LEGEND	SOIL & ROCK DESCRIPTIONS	REMARKS
26									
27			Run #4 26.0'-28.0'	70%	98%			Fracture at Styolitic or Shale parting Slight weathering	
28			Run #5 28.0'-36.0'	80%	98%			Fractured at Styolitic parting, slight weathering	
29									
30								Fractured at Shale parting, weathered	
31								Void, very weathered	Lost water at 31.5'
32								Fractured at Styolitic or Shale partings Zone of small vugs	
33								Zone highly weathered (Becoming sound)	
34									
35								Fracture at Styolitic parting Slight - no weathering Possible drilling related fracture	
36									
37								Possible drilling related fractures	
38								Boring Complete at 38.0'	
39									
40									

REMARKS:

APPENDIX C – EXCAVATION WORK PLAN (EWP)
ARCH ROCHESTER PLANT SITE
ROCHESTER NEW YORK

C-1 NOTIFICATION

All groundbreaking work or other activities will require notification to document activities and the restoration of the engineering control. At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the NYSDEC contacts listed in the table below.

Table C1 includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information.

Table C1: Notifications*

NYSDEC Project Manager: Joshuah Klier	(585) 226-5357 Joshuah.Klier@dec.ny.gov
NYSDEC NYSDEC Regional Hazardous Waste Remediation Engineer: David Pratt	(585) 226-5449 David.Pratt@dec.ny.gov
NYSDOH Project Manager: Christopher Budd	(518) 402-1769 Christopher.Budd@health.ny.gov
NYSDOH Regional Chief Public Health Specialist: Justin Deming	(518) 402-7896 Justin.Deming@health.ny.gov
Site Environmental Specialist: Luke Ferruzza	(585) 434-6008 luke.ferruzza@arxada.com
Qualified Environmental Professional: Nelson Breton	(207) 712-8020 Nelson.Breton@wsp.com

* Note: Notifications are subject to change and will be updated as necessary.

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent of excavation, plans/drawings for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated, any modifications of truck routes, and any work that may impact an engineering control;
- A summary of environmental conditions anticipated to be encountered in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work, and submittals (e.g., reports) to the NYSDEC documenting the completed intrusive work;
- A summary of the applicable components of this EWP;
- A statement that the work will be performed in compliance with this EWP, 29 CFR 1910.120 and 29 CFR 1926 Subpart P;
- A copy of the contractor's health and safety plan (HASP), in electronic format, if it differs from the HASP provided in Appendix [x] of this ISMP
- Identification of disposal facilities for potential waste streams; and
- Identification of sources of any anticipated backfill, along with the required request to import form and all supporting documentation including, but not limited to, chemical testing results.

The NYSDEC project manager will review the notification and may impose additional requirements for the excavation that are not listed in this EWP. The alteration, restoration and modification of engineering controls must conform with Article 145 Section 7209 of the Education Law regarding the application professional seals and alterations.

C-2 SOIL SCREENING METHODS

Visual, olfactory, and instrument-based (e.g. photoionization detector) soil screening will be performed during all excavations into known or potentially contaminated

material (remaining contamination) or a breach of the cover system. A qualified environmental professional (QEP) as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State will perform the screening. Soil screening will be performed when invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the Certificate of Completion.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal and material that requires testing to determine if the material can be reused on-site as soil beneath a cover or if the material can be used as cover soil. Further discussion of off-site disposal of materials and on-site reuse is provided in Section [6] of this EWP.

C-3 SOIL STAGING METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales or compost filter socks will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected, and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by the NYSDEC.

C-4 MATERIALS EXCAVATION AND LOAD-OUT

A qualified environmental professional (QEP) as defined in 6 NYCRR Part 375, a PE who is licensed and registered in New York State, or a qualified person who directly

reports to a PE who is licensed and registered in New York State will oversee all invasive work and the excavation and load-out of all excavated material.

The owner of the property and remedial party (if applicable) and its contractors are responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this iSMP is posed by utilities or easements on the site. A site utility stakeout will be completed for all utilities prior to any ground intrusive activities at the site.

Consistent with section C-9, the top one foot of material will be segregated from the material so cover may be preserved. Any media observed to be grossly contaminated must be segregated and characterized for disposal. Grossly contaminated is defined in DER-10 as "soil, sediment, surface water or groundwater which contains sources or substantial quantities of mobile contamination in the form of NAPL that is identifiable either visually, through strong odor, by elevated contaminant vapor levels or is otherwise readily detectable without laboratory analysis". Regarding odors, and media exhibiting strong factory odors OR exceeding a PID reading of 25 ppm will be considered grossly contaminated.

Loaded vehicles leaving the site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements). Trucks transporting contaminated soil must have either tight-fitting opaque covers that are secured on the sides and/or back, or opaque covers that are locked on all sides. If staging of excavated soil is required those materials will be staged on polyethylene sheeting or other approved material.

A truck wash will be operated on-site, when appropriate as determined by the QEP. The qualified environmental professional will be responsible for ensuring that all outbound

trucks will be washed at the truck wash before leaving the site until the activities performed under this section are complete. Truck wash waters will be collected and disposed of off-site in an appropriate manner. Alternatively, truck was waters may be discharged to the on-site pretreatment facility as described in Section C-8, Fluids Management.

Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials. Material accumulated from the street cleaning and egress cleaning activities will be disposed off-site at a permitted landfill facility in accordance with all applicable local, State, and Federal regulations.

C-5 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the site will be secured with either tight-fitting opaque covers that are secured on the sides and/or back, or opaque covers that are locked on all sides. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

When transport of excavated materials offsite is required, descriptions and mapped routes for truck transport of excavated material will be provided in the notification to the NYSDEC for approval prior to the start of excavation activities. All trucks loaded with site

materials will exit the vicinity of the site using only approved truck routes. The approved routes will be the most appropriate route and take into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

C-6 MATERIALS DISPOSAL OFF-SITE

All material excavated and removed from the site will be treated as contaminated and regulated material, unless approved otherwise, and will be transported and disposed off-site in a permitted facility in accordance with all local, State and Federal regulations. If disposal of material from this site is proposed for unregulated off-site disposal (e.g. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC project manager. Unregulated off-site management of materials from this site will not occur without formal NYSDEC project manager approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, (e.g. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C&D debris recovery facility) Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report

(until such time that a PRR is provided, this information will be reported as part of ongoing quarterly remediation update reports to the NYSDEC). This documentation will include, but will not be limited to: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled consistent with 6 NYCRR Parts 360, 361, 362, 363, 364 and 365.Material that does not meet Unrestricted SCOs is prohibited from being taken to a New York State C&D debris recovery facility (6 NYCRR Subpart 360-15 registered or permitted facility).

C-7 MATERIALS REUSE ON-SITE

'Reuse on-site' means reuse on-site of material that originates at the site and which does not leave the site during the excavation. Material reuse on-site will comply with the requirements of NYSDEC DER-10 Section 5.4(e)4.

Prior to the reuse of materials on-site, a reuse plan will be submitted for approval to the NYSDEC. The following topics should be covered in the materials re-use plan:

- Procedure for determining if reuse is appropriate
- Sampling (methods and analytical)
- Stockpile segregation scheme for on-site reuse including containment methods for excavated material
- Size of stockpiles, location (figure)

The qualified environmental professional as defined in 6 NYCRR part 375 will ensure that procedures defined for materials reuse in this EWP are followed and that unacceptable material (i.e. contaminated) does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for reuse on-site will be placed below the demarcation layer or impervious surface, and will not be reused within the cover system or within landscaping berms. Contaminated on-site material may only be used beneath the site cover as backfill for subsurface utility lines with prior

approval from the DEC project manager. Grossly contaminated media may never be returned to the ground surface.

Proposed materials for reuse on-site must be sampled for full suite analytical parameters including per- and polyfluoroalkyl substances (PFAS) and 1,4-dioxane. The sampling frequency will be in accordance with DER-10 Table 5.4(e)10 unless prior approval is obtained from the NYSDEC project manager for modification of the sampling frequency. The analytical results of soil/fill material testing must meet the site use criteria presented in NYSDEC DER-10 Appendix 5 – Allowable Constituent Levels for Imported Fill or Soil for all constituents listed, and the NYSDEC Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances [April 2023 or latest version] guidance values. Approvals for modifications to the analytical parameters must be obtained from the NYSDEC project manager prior to the sampling event.

Soil/fill material for reuse on-site will be segregated and staged as described in Sections 2 and 3 of this EWP. The anticipated size and location of stockpiles will be provided in the 15-day notification to the NYSDEC project manager. Stockpile locations will be based on the location of site excavation activities and proximity to nearby site features. Material reuse on-site will comply with requirements of NYSDEC DER-10 Section 5.4(e)4. Any modifications to the requirements of DER-10 Section 5.4(e)4 must be approved by the NYSDEC project manager.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused on-site.

C-8 FLUIDS MANAGEMENT

All liquids to be removed from the site, including but not limited to, excavation dewatering, decontamination waters and groundwater monitoring well purge and development waters, will be handled, transported and disposed off-site at a permitted

facility in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, and will be managed off-site, unless prior approval is obtained from NYSDEC.

Liquid waste may also be treated at the on-site water treatment facility. Approval to treat and discharge these waters is subject to specific discharge permit conditions and approvals from the Monroe County publicly owned treatment works (POTW).

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

C-9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the Record of Decision. The existing cover system is comprised of either a paved surface or layer of clean fill at least one foot thick. Although not currently present in unpaved areas, a demarcation layer, consisting of orange snow fencing material will be placed under the new cover to provide a visual reference to the top of the remaining contamination zone, the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this ISMP. See Figure C-1 for a map of current cover types.

Soil cover systems will be restored with a minimum of 1 foot of soil meeting restricted industrial SCOs placed over a demarcation layer. Where landscaping is present, with the upper 6 inches of soil should be of sufficient quality to maintain a vegetative layer.

Paved surfaces or hard cover systems will be restored with asphalt or concrete and will have a minimum of 6 inches of asphalt or concrete including subbase material. Existing soil cover systems established by the removal of hard cover, must demonstrate with data, a minimum of 1 foot of soil meeting restricted industrial SCOs., placed over the demarcation layer. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the remaining contamination.

Existing soil cover systems established by the removal of hard cover, must demonstrate with data, a minimum of 1 foot of soil meeting restricted industrial SCOs and the upper 6 inches of soil of sufficient quality to maintain a vegetative layer. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in an updated ISMP.

C-10 BACKFILL FROM OFF-SITE SOURCES

The requirements for backfill used at the site shall be consistent with the backfill requirements provided in DER-10. All materials proposed for import onto the site will be approved by the QEP, as defined in 6 NYCRR Part 375, and will be in compliance with provisions in this EWP prior to receipt at the site. A Request to Import/Reuse Fill or Soil form, which can be found at http://www.dec.ny.gov/regulations/67386.htmlhttp://www.dec.ny.gov/regulations/67386.html, will be prepared and submitted to the NYSDEC project manager allowing a minimum of 5 business days for review. A copy of the form is presented in Appendix C1 of this EWP.

Material from industrial sites, spill sites, other environmental remediation sites, or potentially contaminated sites will not be imported to the site.

All imported soils will meet the backfill and cover soil quality standards established in 6 NYCRR 375-6.7(d) and DER-10 Appendix 5 for industrial use. Soils that meet 'general' fill requirements under 6 NYCRR Part 360.13, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC project manager. Soil material will be sampled for the full suite of analytical parameters, including PFAS and 1, 4-dioxane. Solid waste will not be imported onto the site.

Trucks entering the site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

C-11 STORMWATER POLLUTION PREVENTION

For excavations less than one acre, procedures for stormwater pollution prevention should be specified in the excavation notification to NYSDEC. For construction projects exceeding one acre, the notification will reference applicable sections of the Stormwater Pollution Prevention Plan (SWPP) that conforms to the requirements of the NYSDEC Division of Water guidelines and NYS regulations.

Sediment control barriers, including straw barriers and hay bale dikes, silt fences, or compost filter socks will be installed and inspected once a week and after every storm event. The installation of these sediment control devices will be implemented consistent with the SWPP. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by the NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the sediment control devices and hay bale check functional.

All undercutting or erosion of the sediment control devices shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged sediment control devices due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible,

they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

Erosion control measures consistent with NY State Standards and Specification for Erosion and Sediment Control. Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

C-12 EXCAVATION CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be immediately suspended until sufficient equipment is mobilized to address the condition. The NYSDEC project manager will be promptly notified of the discovery.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes [TAL metals, TCL volatiles and semi-volatiles (including 1,4-dioxane), TCL pesticides and PCBs, and PFAS], unless the site history and previous sampling results provide sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC project manager for approval prior to sampling. Any tanks will be closed as per NYSDEC regulations and guidance.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone within two hours to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will also be included in the Periodic Review Report.

C-13 COMMUNITY AIR MONITORING PLAN

Prior to the start of excavation activities, a Community Air Monitoring Plan (CAMP) that is in conformance with DER-10 will be required, specifically Appendix 1A and 1B, included in this EWP as Appendix C2. The CAMP at a minimum will include:

- Details of the perimeter air monitoring program
- Action levels to be used
- Air monitoring methods
- Analytes measured and instrumentation to be used
- A figure of the location(s) of all air monitoring instrumentation. A figure showing specific locations must be presented for monitoring stations based on generally prevailing wind conditions, with a note that the exact locations to be monitored on a given day will be established based on the daily wind direction

Air sampling stations will be adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and at least two downwind monitoring stations. No sensitive receptors, including schools, day care centers, or residential areas are located adjacent to the site.

Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers the same or next business day along with the reason for the exceedance, corrective actions, and effectiveness of the corrective action.

Attached in Appendix B is the CAMP guidance document. An alternate CAMP may be proposed with the excavation notification.

C-13A: Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when

potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 part-per-million, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be pre-determined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.

- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 micrograms per cubic meter, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 micrograms per cubic meter or less at the monitoring point.

- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

C-13B: Special Requirements for Indoor Work with Co-Located Facilities

Unless a self-contained, negative-pressure enclosure with proper emission controls will encompass the work area, all individuals not directly involved with the planned work must be absent from the room in which the work will occur. Monitoring requirements shall be as stated above under "Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures" except that in this instance "nearby/occupied structures" would be adjacent occupied rooms. Additionally, the location of all exhaust vents in the room and their discharge points, as well as potential

vapor pathways (openings, conduits, etc.) relative to adjoining rooms, should be understood and the monitoring locations established accordingly. In these situations, it is strongly recommended that exhaust fans or other engineering controls be used to create negative air pressure within the work area during remedial activities. Additionally, it is strongly recommended that the planned work be implemented during hours (e.g. weekends or evenings) when building occupancy is at a minimum.

C-14 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site. Specific odor control methods to be used on a routine basis will be included in the excavation notification. If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the remedial party's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. Any other odor control measures deemed necessary will be proposed in the excavation notification. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

C-15 DUST CONTROL PLAN

Particulate monitoring must be conducted according to the Community Air Monitoring Plan (CAMP) provided in Section 13. If particulate levels at the site exceed the thresholds listed in the CAMP or if airborne dust is observed on the site or leaving the site, the dust suppression techniques listed below will be employed. The remedial party will also take measures listed below to prevent dust production on the site.

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved using a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

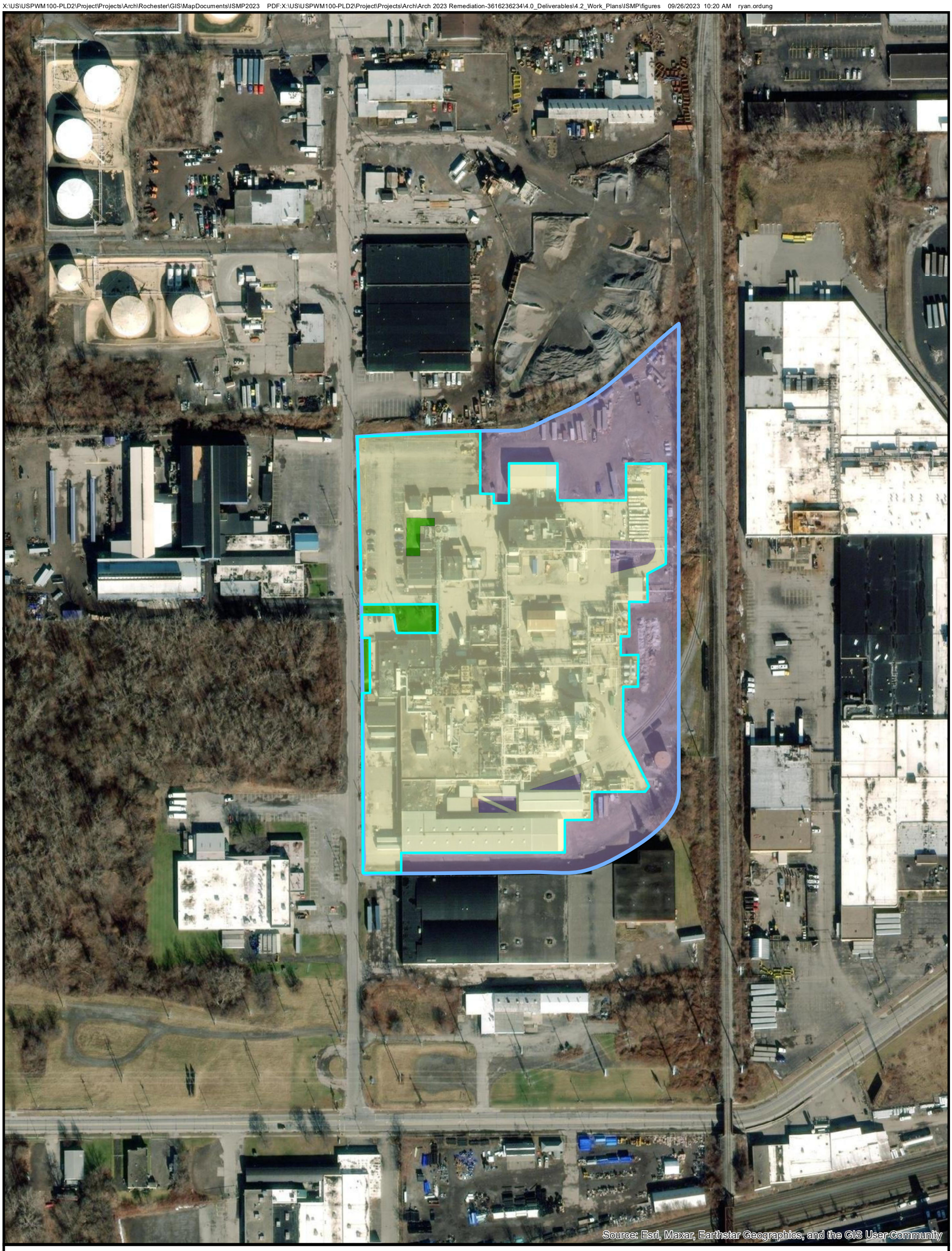
C-16 OTHER NUISANCES

A plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during all remedial work.

A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

Figures

X:\US\USPWM100-PLD2\Project\Projects\Arch\Rochester\GIS\MapDocuments\ISMP2023 PDF:X:\US\USPWM100-PLD2\Project\Projects\Arch\Arch 2023 Remediation-3616236234\4.0_Deliverables\4.2_Work_Plans\ISMP\figures 09/26/2023 10:20 AM ryan.ordung



Note:
Shaded area indicates existing cover types subject to Excavation Work Plan requirements. Cover type extents are approximate and cover type should be verified prior to any subsurface excavation to ensure compliance with engineering control requirements of the 2019 ROD.

Legend:
- Arch_Property_Boundary
- Crushed Stone or Gravel
- Landscaping
- Pavement or Buildings

0 100 200 Feet

N

Prepared/Date: RJO 9-26-23 | Checked/Date: NMB 12-18-23

Figure C1
Engineering Control Cover Types

Arch Chemicals
Rochester, NY

APPENDIX C1

NYSDEC Request to Import-Reuse Fill Form

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Request to Import/Reuse Fill or Soil

This form is based on the information required by DER-10, Section 5.4(e). Use of this form is not a substitute for reading the applicable Technical Guidance document.

SECTION 1 – SITE BACKGROUND

The allowable site use is: Choose an item

Have Ecological Resources been identified? Choose an item

Is this soil originating from the site? Choose an item

How many cubic yards of soil will be imported/reused? Choose an item

If greater than 1000 cubic yards will be imported, enter volume to be imported:

SECTION 2 – MATERIAL OTHER THAN SOIL

Is the material to be imported gravel, rock or stone? Choose an item

Does it contain less than 10%, by weight, material that would pass a size 10 sieve? Choose an item

Does it contain less than 10%, by weight, material that would pass a size 100 sieve? Choose an item

Is this virgin material from a permitted mine or quarry? Choose an item

Is this material recycled concrete or brick from a DEC registered processing facility? Choose an item

SECTION 3 - SAMPLING

Provide a brief description of the number and type of samples collected in the space below:

Example Text: 5 discrete samples were collected and analyzed for VOCs. 2 composite samples were collected and analyzed for SVOCs, Inorganics & PCBs/Pesticides.

If the material meets requirements of DER-10 section 5.4(e)5 (other material), no chemical testing needed.

SECTION 3 CONT'D - SAMPLING

Provide a brief written summary of the sampling results or attach evaluation tables (compare to DER-10, Appendix 5):

Example Text: Arsenic was detected up to 17 ppm in 1 (of 5) samples; the allowable level is 16 ppm.

If Ecological Resources have been identified use the "If Ecological Resources are Present" column in Appendix 5.

SECTION 4 – SOURCE OF FILL

Name of person providing fill and relationship to the source:

Location where fill was obtained:

Identification of any state or local approvals as a fill source:

If no approvals are available, provide a brief history of the use of the property that is the fill source:

Provide a list of supporting documentation included with this request:

The information provided on this form is accurate and complete.

_____ _____

Signature Date

_____

Print Name

_____

Firm

Revised August 2014

APPENDIX C2

Community Air Monitoring Plan (CAMP) Guidance Document

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

APPENDIX D

Summary of Soil Vapor Intrusion Investigations

Appendix D
Summary of Soil Vapor Instrusion Investigations

Arch Chemicals Inc.
Rochester, New York

Year(s)	Facility	Summary	Conclusion
2006	HOWMET (formerly Firth Rixson) and Arch warehouse (formerly American Recycling & Manufacturing[ARM]) (Indoor Air and Sub-slab Soil Vapor)	The majority of VOCs were detected in both indoor air and sub-slab soil vapor. Three chemicals were found to both exceed background and/or guideline values and pose risks in excess of the NYSDOH point of departure of 1E-06 for cancer risk or HI of 1 for non-cancer risk: * American Recycling and Manufacturing (now Arch) – 1,3-butadiene * Firth Rixson (now HOWMET) – benzene and 1,4-dichlorobenzene	Comparison of soil gas and indoor air data for these compounds suggests that soil gas is not the sole, or even the primary source of these compounds in indoor air. Detected levels of indoor air of each of these chemicals are well below OSHA PELs. [1]
2006 -2008	Arch - 3 annual events (Indoor Air and Sub-slab Soil Vapor)	The following chemicals may be present in indoor air as a result of soil gas intrusion, exceed background and/or guideline values, and pose risks in excess of the NYSDOH point of departure of 1E-06 for cancer risk or HI of 1 for non-cancer risk: **Office Area:** 2-chloropyridine / **Warehouse Area:** 2-chloropyridine, 2,6-dichloropyridine, chloroform, methylene chloride, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene, / **Production Area**: 2-chloropyridine, 2,6-dichloropyridine, carbon tetrachloride, and chloroform.	Comparison of soil gas and indoor air data for these compounds suggests that the primary source of these compounds in indoor air at the Office Area and Warehouse Area is not soil gas. Identification of the source of chemicals in indoor air at the Production Area, particularly for chloropyridine compounds, is confounded by the fact that chloropyridine compounds are produced in this facility. For chemicals that are associated with current activities, all are well below their applicable worker protection thresholds. Indoor air quality is monitored annually by Arch as part of its industrial health and safety program. [2,3,4]
2008 and 2009	Arch- Perimeter of Property (soil vapor only)	Chloropyridines and VOCs were detected in four samples collected in 2007 and eight samples collected in 2009 along the western and southern property boundaries	Analytical results from soil vapor sampling conducted in August 2009 are generally consistent with the results obtained from the November 2007 sampling event, and confirm the conclusions from the 2007 study that VOCs and chloropyridines related to past releases at the Arch facility do not pose a significant exposure risk to neighboring properties via the vapor intrusion pathway. [5]

1-"Vapor Intrusion Sampling at Firth Rixson and ARM", Arch Chemicals, Inc. Rochester Plant Site Rochester, New York, Prepared by MACTEC Engineering & Consulting, Inc. June 2006.
2-"2006 Onsite Vapor Intrusion Sampling" , Arch Chemicals, Inc. Rochester Plant Site Rochester, New York, Prepared by MACTEC Engineering & Consulting, Inc. May 2006.
3-"2007 Onsite Vapor Intrusion Sampling" , Arch Chemicals, Inc. Rochester Plant Site Rochester, New York, Prepared by MACTEC Engineering & Consulting, Inc. June 2007
4-"2008 Onsite Vapor Intrusion Sampling" , Arch Chemicals, Inc. Rochester Plant Site Rochester, New York, Prepared by MACTEC Engineering & Consulting, Inc. May 2008
5-Technical Memoranda dated January 8, 2008 and October 26, 2009 prepared by MACTEC Engineering & Consulting, Inc. for Arch Chemicals, Inc.