ACTION PLAN

Soil Remediation

Eagle Comtronics, Inc.
Clay, New York

July 1992

O'BRIEN & GERE
ENGINEERS, INC.

2665.003

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SOIL REMEDIATION

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O'BRIEN & GERE ENGINEERS, INC.
5000 BRITTONFIELD PARKWAY
SYRACUSE, NEW YORK 13221

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SECTION 1 - INTRODUCTION

1.01 Background

The Eagle Comtronics site is an approximate eighteen (18) acre site located on Waterhouse Road in Clay, New York. The facility is engaged in the manufacture of electronic components for the cable television industry and includes offices and a separate 12,000 square foot assembly building. The facility is surrounded by agricultural properties and some residential homes. The residential homes and the Eagle Comtronics facility are all served by municipal water and sewer service. A site location map is provided as Figure 1.

Previous investigations, initially conducted by a third party as a routine environmental assessment, have identified volatile organic compound (VOC) contamination on the property. The contamination is suspected to result from a one time, unknown spill of waste solvents formerly used in the manufacturing process. In response to these findings, Eagle Comtronics retained O'Brien & Gere Engineers, Inc. to conduct further investigations to define the potential extent of contamination. These investigations initially consisted of the installation and sampling of ground water monitoring wells which focused on the alleged spill area and areas down-gradient. In addition, a soil boring program was completed in the spill area. These site investigations confirmed that a localized area of concern exists for shallow soil and ground water contamination with VOCs. The results of these investigations are presented in detail in the O'Brien & Gere Report entitled Preliminary Hydrogeologic Site Assessment - Eagle Comtronics, Inc. - October 1989, which was submitted to the New York State Department of Environmental Conservation (NYSDEC).

These investigations have generated sufficient information to allow implementation of a remedial program to immediately address source contamination issues, allowing for rapid and focused remediation at the source area.

1.02 Objective

The objective of this Action Plan is to provide a basis for implementing a voluntary remedial program for the impacted source area soils. The remedial program consists of a source control system for the area. Given that the previous hydrogeologic and soil investigations have defined the nature, source, and extent of contamination, it is a logical approach to allow rapid site remediation to take place to minimize impacts to the environment.

1.03 Action Plan Format

This Action Plan outlines work tasks, health and safety and sampling activities associated with the remedial work tasks. Section 2 presents a summary of the site specific information which forms the basis for the remedial program described in Section 3. Figures are presented following the text.

SECTION 2 - SUMMARY OF AVAILABLE INFORMATION

2.01 Site Description

The Eagle Comtronics facility is located in an upland area approximately 1500 feet west of the Clay Marsh. The site has two structures; an administration building and a separate 12,000 square foot assembly building. The structures are separated by a paved parking area. A site map is presented as Figure 2. The alleged source area is located at the southwestern corner of the assembly building, on the southern side of the building. The soil boring program has defined the area of impacted soils horizontally to be approximately 15 feet by 30 feet and vertically to a depth of about 4 feet.

2.02 Site Characteristics

The shallow on-site geology within 15 feet of the ground surface is comprised of 5-10 feet of reddish brown fine to medium sand overlying a dense reddish brown glacial till comprised of silt, clay, fine sand, and embedded gravel.

In June 1989, the site was initially investigated through a third party environmental assessment. During this assessment, shallow monitoring wells MW-1, MW-2, and MW-3 were installed and sampled. This sampling revealed detectable concentrations of VOCs in ground water. In July 1989, O'Brien & Gere installed and sampled four additional shallow ground water monitoring wells; MW-4, MW-5, MW-6, and MW-7. This sampling also revealed detectable concentrations of VOCs in ground water. In April 1990, two deep ground water monitoring wells were installed to the top of the bedrock. Sampling of these wells also revealed detectable

concentrations of VOCs in ground water. In addition, a grid based soil boring program was completed in the alleged source area near the assembly building. Sampling revealed VOCs to be present within soils near the assembly building. The results of these efforts can be summarized as follows:

- Contaminants detected in the source area soils include; 1,1,1-trichloroethane, trichloroethylene, tetrachloroethylene, and toluene.
- The extent of the impacted soils in the source area has been defined horizontally as an approximate 15 foot by 30 foot area, and vertically to approximately 4 feet.

SECTION 3 - ACTION PLAN

3.01 Remedial Objective

This Action Plan presents a plan to address the defined VOC contamination within source area soils shown on Figure 2. The objective of the remedial measure proposed in this document is to mitigate the impact to the environment from identified soil contaminants. A program to monitor the effectiveness of these efforts is also proposed.

To accomplish the stated objective, the program will use the technology of *ex situ* soil venting. This technology has been proven effective in removing VOCs from unsaturated soils (EPA, 1991). The proposed remedial program controls on-site contamination while minimizing the generation of hazardous waste residuals, consistent with the preference for permanent remedies under SARA. The proposed remedial program in all likelihood will remediate the source of contamination, thereby preventing further impacts to ground water. To address concerns regarding ground water and to document the effectiveness of these efforts, a program to monitor ground water quality will be undertaken. This monitoring will document the expected reduction of contaminant concentrations in ground water due to the removal of VOCs from contaminated soil which continues to serve as a source. It should be noted that the historical sampling data from the site monitoring wells indicates that concentrations of VOCs in ground water are decreasing with time. Further, ground water is not used at the site and there are no known users of ground water in the area. These factors suggest that remediation of the source area soils will

effectively reduce the potential for exposure to contaminants at the site, both through contaminated soil and through contaminated ground water.

3.02 Action Plan Execution

This section outlines the series of tasks and activities that will be performed during the remediation. A general overview of the technology is presented first, followed by a description of the proposed system, discussions of system operating and monitoring activities, air discharge issues, and reporting issues. A plan of the system is provided as Figure 3.

3.02.01 Technology Description

Ex situ soil venting, or soil vapor extraction technology, has been demonstrated to be effective in the remediation of VOCs from unsaturated soil (EPA, 1991). Soil venting is a promising new technology for site remediation that has gained acceptance throughout New York State. *Ex situ* soil venting includes the excavation and stockpiling of contaminated soils and installation of vapor removal systems within the soils. The vapor removal systems are ducted to a header which is in turn connected to a vacuum blower. The blower is operated at such a rate whereby a negative pressure gradient is induced through the soil pile, thus extracting VOCs from the soil matrix.

3.02.02 System Description

The proposed system, shown in Figure 3, will consist of the required components to extract vapor phase VOCs from the excavated soil. As previously mentioned, an approximate 15 foot by 30 foot by 4 foot volume of soil has been identified for remediation from the subject area. Assuming soil bulking upon excavation and the potential for encountering additional contaminated soil, a conservative estimate is that approximately 100 cubic yards of soil will be treated. Due to the restrictive nature of the sub-surface soils it may be necessary to add a bulking agent to the soil to facilitate acceptable vapor flow rates. These measures will be implemented as required based on conditions observed in the field. Prior to excavation, a soil storage area will be constructed. The area will measure approximately 12 feet by 45 feet. This area will provide separation of contaminated soil from uncontaminated soil during treatment. The area will be constructed by clearing the selected location as required. Native soil in the area will be graded and compacted as required. Next, a 2 to 3 foot earthen perimeter berm will be constructed from uncontaminated soil. After grading and compaction, a 6 inch layer of sand will be placed within the bermed area, followed by a chemical resistant bottom liner placed over the sand and earthen berm. The deployment of the liner will include the use of solvent welding techniques along the edges of the sheeting. The objective will be to form one single liner. Once the bottom is complete, contaminated soil will be excavated into the area.

During excavation of soil into the storage area, extraction pipes will be placed horizontally into the soil pile. The extraction pipes will consist of 4 inch diameter 0.010 slotted Schedule 40 PVC pipe, each with a filter fabric wrap. The purpose of the filter fabric wrap will be to minimize fines entering the system. It is anticipated that three 45 foot extraction pipes will be required for the system. The pipes shall be placed into the pile as shown on Figure 3. Following soil excavation the top and sides of the pile will be covered with a chemical resistant liner.

The slotted pipes will connect to a solid pipe header which will in turn connect to a skid or trailer mounted vapor extraction system. A dual header system will be installed such that the flow of air through the pile can be periodically reversed to maximize removal efficiencies. The vapor extraction system will include a cyclone type separator, a mist eliminator pad, a disposable filter unit, and a blower.

A constant drive blower will apply a vacuum to the system. Valves will be used to vary overall system vacuum. The exhausted vapors will be discharged to the atmosphere through a 4 inch diameter, 20 foot high exhaust stack.

The system will include instrumentation for system vacuum, pressure drop of moisture, fines removal equipment, discharge pressure, system inlet and exhaust temperature, and exhaust sampling port.

3.02.03 Post Excavation Sampling and Excavation Backfill

To confirm that all contaminated soil has been excavated and placed into the storage area, a post excavation soil sampling program will be performed. A grid based pattern will be used to collect samples from the excavation bottom and sidewalls. Samples will be analyzed for VOCs using EPA method 8010/8020. Sample results will be compared to applicable cleanup criteria to confirm that impacted soils are excavated for treatment.

After all contaminated soil has been excavated, the excavation will be filled with clean backfill.

3.02.04 System Operation and Monitoring

The system is expected to operate for an approximate one to two year period. The actual time the system will operate will be based on the specific removal rates and efficiencies obtainable from the system. At system start-up, the exhausted vapors will be monitored for the first 12 hours of operation for the following parameters: volatile organics using a photoionizing detector (PID), temperature, exhaust velocity, percent oxygen, explosive level, system vacuum, discharge pressure, condensate volume collected, and induced vacuum within the subject area. In addition, samples of the exhausted vapors will be collected at run times 1-2 hours, 7-8 hours, and 23-24 hours. The samples will be collected using appropriate NIOSH methods and analyzed for VOCs.

Initially, the system will be operated continuously to provide maximum withdrawal of soil gas from the soil pile. During this operation, the exhaust

gas will be monitored as discussed above. If the concentrations are found to be decreasing to levels within one order-of-magnitude of the method detection limit, the system operation may be altered to 8 hours on, 16 hours off per day. This operating method will allow the soil gas to equilibrate with the soil prior to withdrawal, providing equal mass removal at lower operating costs. The system will operate until a point where it is considered that the cost for the system's operations is not justified by the comparative effectiveness of the system. The system's effectiveness will be determined by the mass of compounds removed over a measured period of time. If the operating cost to remove the mass of compounds is deemed economically unjustified, the system operation will cease.

After the initial 12 hours of operation, the system will be monitored monthly for the above operating parameters without stack sampling until the remediation is complete. The stack sampling results obtained during start up will be correlated to volatile organics as measured by the PID. Moisture, or condensate, will be collected and managed appropriately.

Periodically during system operation, a core sample of the soil pile will be collected and analyzed for VOCs using EPA method 8010/8020. This information, in addition to the stack sampling results, will monitor the overall effectiveness of the system.

At the conclusion of the remediation, confirmatory soil samples will be collected to confirm that the remedial program is complete. Treated soil will be disposed of on-site.

3.02.05 Air Discharges

The proposed system will discharge directly to the atmosphere. This exhaust stream, anticipated to be approximately 200 cubic feet per minute, will contain VOCs removed from the excavated soils. The anticipated air discharges will be evaluated using the appropriate limits as contained in Part 212 of the New York State Air Pollution Control Requirements. Air cleaning is not expected to be required since New York State Air Regulations do not stipulate a degree of air cleaning for less than 1 to 10 pounds per hour emission rate potentials of class B rated compounds.

Expected air toxic emissions will be examined using the most recent draft version of the New York State Air Guide-1, Guidelines for the Control of Toxic Ambient Air Contaminants, 1991 Draft edition. The maximum acceptable ambient levels for the VOCs of concern will be used as criteria for determining the need for air cleaning equipment on the blower discharge. Air dispersion modeling will be performed to assess the potential levels of VOCs in the ambient air. Screening air dispersion models will be used for this evaluation.

This information will be used in order to obtain a permit to construct/certificate to operate from NYSDEC Division of Air Resources.

3.02.06 Reporting

Upon the completion of the remedial program, results will be compiled into a report which will address the following issues:

- System operation and performance

- Analytical results
- Removal efficiency
- Contaminant transport through soils
- Monitoring program results

3.03 Work Area Details and Health and Safety

The purpose of this section is to discuss those site control and health and safety issues which must be implemented during the execution of the proposed remedial program.

3.03.01 Site Control

A temporary chain link fence will be placed around the treatment area. This procedure should minimize the potential for direct contact exposure of uninvolved parties.

Significant runon/runoff is not expected during the project. Runon/ runoff control measures, such as gutters or trenching, will be implemented as required based on field conditions.

An area inside the fence will serve as the final personnel decontamination zone. The area will have separate zones for final personnel decontamination. The primary personnel contamination reduction zone will be within the decontamination pad where boots, coveralls, gloves and other personal protective equipment will be removed and decontaminated or disposed as appropriate.

3.03.02 Site Operations Facilities Design

Facilities constructed on-site will be designed and maintained during their use to minimize any potential release of contaminants to the environment. Additional measures will be implemented as necessary based on field conditions.

3.03.03 Site Security

Site security will be maintained at all times. Site security will be maintained through the use of temporary chain link fence. The fence line will be posted, "Warning Hazardous Work Area Do Not Enter Unless Authorized". A log to identify personnel site entry and exit, site visitors and security incidents will be maintained. Select portions of the fence may be covered with a visual barrier. Access to the work area will be provided through a secure gate.

3.03.04 Worker Health and Safety

A site specific Health and Safety Plan (HASP) for the remedial program will be developed prior to construction by OBG Technical Services. The Health and Safety Plan shall present the minimum health and safety requirements for personnel engaged in site activities. Subcontractors involved in the site activities will also be required to develop their own Health and Safety Plans which will at least meet the minimum Health and Safety requirements presented in the OBG Technical Services HASP. The Health and Safety Plan will be developed in accordance with 29 CFR 1910.120.

Included in the Health and Safety Plan will be worker health and safety guidelines, air monitoring procedures, decontamination procedures for personnel and equipment, and equipment to be used at site for decontamination purposes.

3.03.05 Ambient Air Quality Monitoring

Field activities associated with the IRM may release airborne vapors from the site. Monitoring will be performed to document releases and to ensure personnel involved in the project are equipped with and are wearing the proper personal protective equipment.

To quantitatively document air emissions leaving the site, ambient air sampling both upwind and downwind of the work area will be completed using a portable photoionization detector. The ambient air monitoring program will include monitoring with a combustible gas indicator and oxygen meter. Specifications for the monitoring equipment and activities will be detailed in the site specific Health and Safety Plan.

3.04 Monitoring Program

An remedial monitoring program has been developed to:

1. monitor ground water quality and the effectiveness of the remedial program in preventing further impacts to ground water from the suspected source area;
2. monitor the effectiveness of the soil remediation program; and
3. monitor downgradient ground water quality.

To accomplish the first goal of the monitoring program, the monitoring program will use the existing monitoring well at the source area of the site. Monitoring well MW-1 will be sampled on an annual basis to document a decrease in source area VOCs. Monitoring well sampling will consist of VOC sampling using EPA method 8010/8020. In order to provide a consistent basis by which to evaluate ground water chemistry, the data will be subject to statistical analyses. The statistical method chosen will be selected using the criteria incorporated into both state and federal TSDF compliance monitoring programs [40 CFR 264.99(c) and 6 NYCRR 373.2.6(8)(ii)].

To accomplish the second goal of the monitoring program, post remediation soil sampling will be conducted. A soil sampling program will be conducted to determine if the source area soils have been remediated to applicable levels. This will prevent further impacts to ground water.

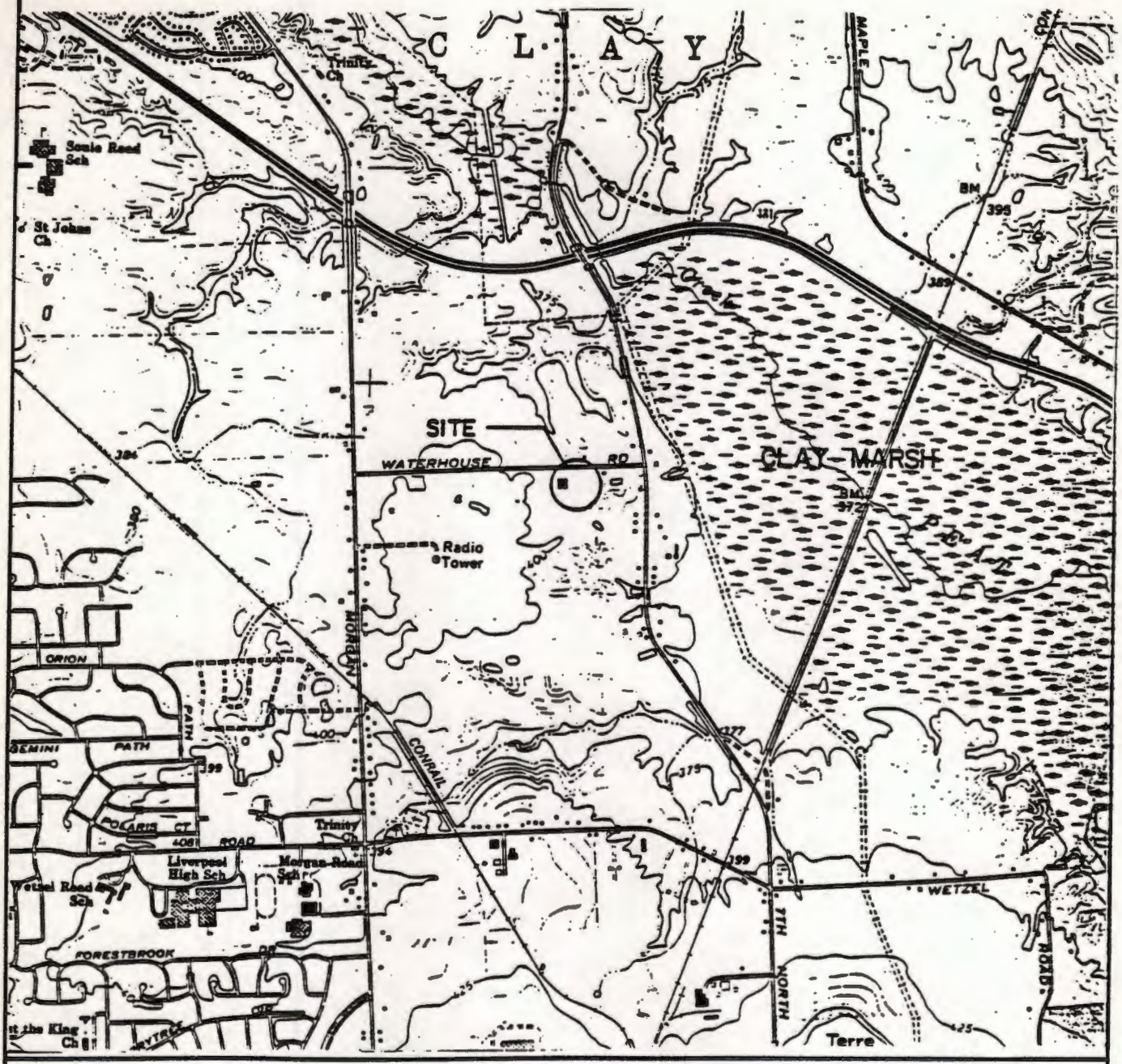
The third goal of the monitoring program will be to monitor downgradient ground water quality. To accomplish this task, the site wells MW-2, MW-3, and MW-6 will be sampled annually for VOCs. The upgradient well MW-4 will also be sampled to provide information on the upgradient water quality. These data will be compiled in a log for reporting purposes.

REFERENCES

United States Environmental Protection Agency, Soil Vapor Extraction Technology Reference Handbook EPA 540/2-91/003, February 1991

Figures

FIGURE 1



EAGLE COMTRONICS INC.
CLAY, NEW YORK

QUADRANGLE LOCATION

SITE LOCATION MAP

0 2000 4000

SCALE IN FEET

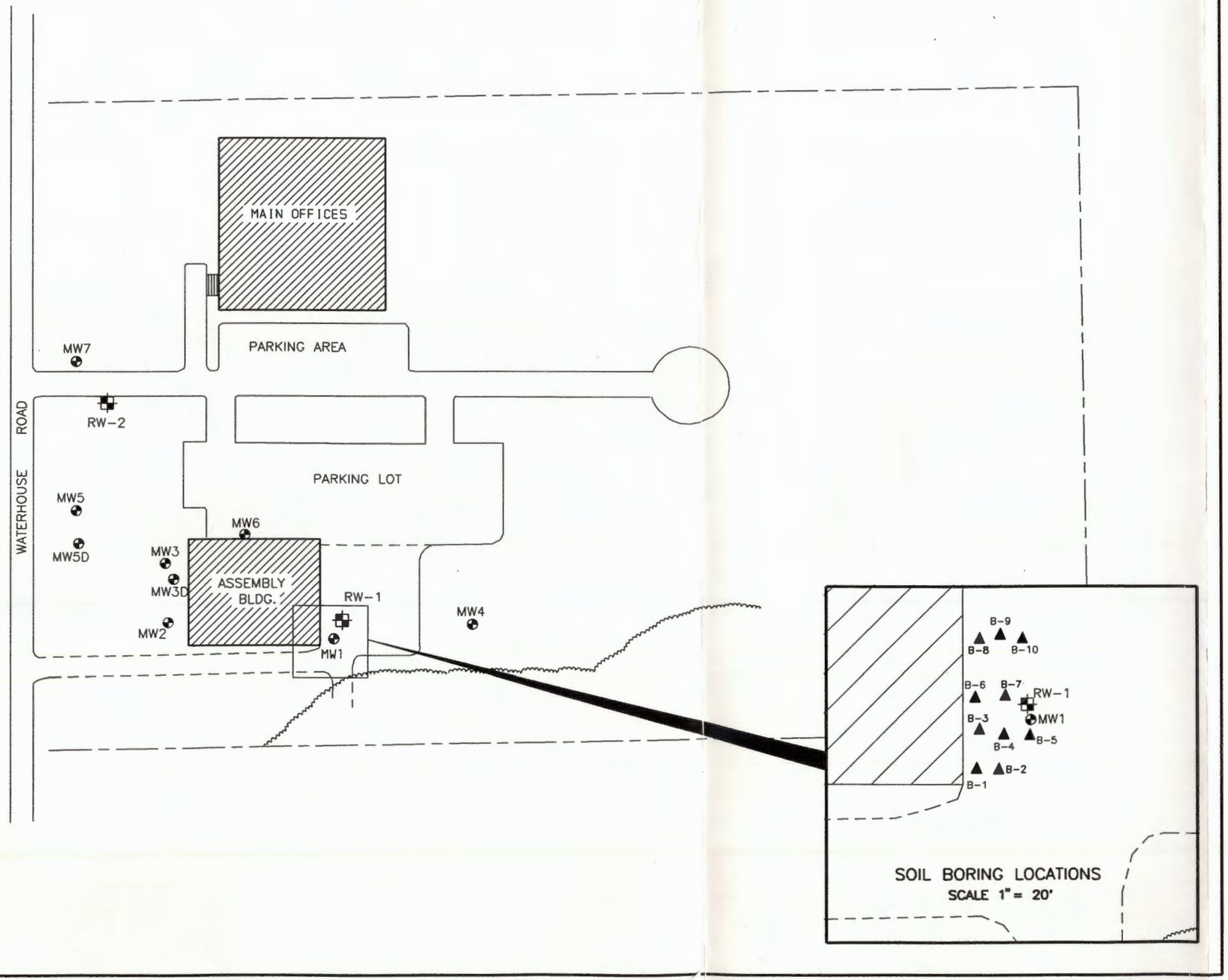
THIS MAP ADAPTED FROM THE BREWERTON, NEW YORK 7.5 MIN. U.S.G.S. QUADRANGLE MAP

O'BRIEN & GERE
ENGINEERS INC.
SYRACUSE, NEW YORK

FIGURE 2

EAGLE COMTRONICS INC.
CLAY, NEW YORK

SITE MAP



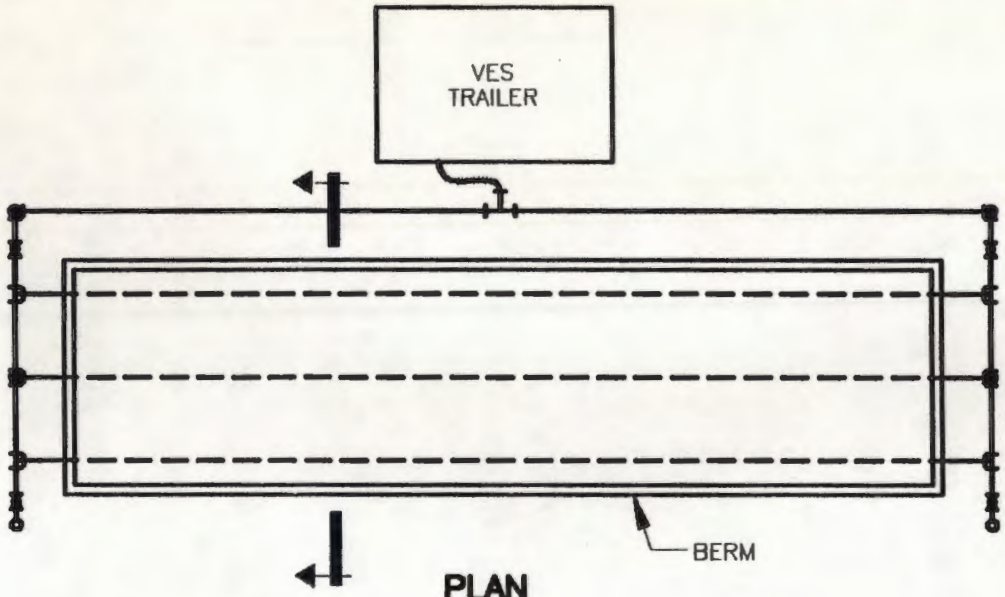
LEGEND:

- PROPERTY LINE
- MONITORING WELL LOCATION
- RECOVERY WELL LOCATION
- TREE LINE
- SOIL BORING

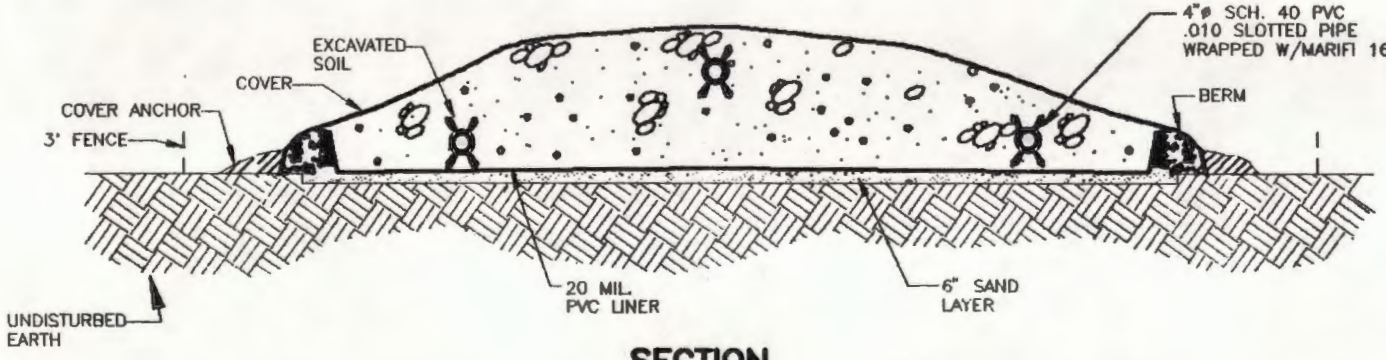
0 100 200
SCALE IN FEET

O'BRIEN & GERE
ENGINEERS INC.
Syracuse , New York

FIGURE 3



PLAN
NOT TO SCALE



SECTION
NOT TO SCALE

LEGEND:

- 4"SCH 40 PVC (SOLID)
- 4"SCH 40 PVC (.010 SLOTTED W/ MARIFI WRAP)
- BALL VALVE
- OPEN TO ATMOSPHERE

EX SITU SOIL VENTING SYSTEM
(CONCEPTUAL)

O'BRIEN & GERE ENGINEERS INC.