CERTIFICATION

This Remedial Work Plan, required by Section I.C of the Voluntary Cleanup Agreement (Index No. B8-0508-97-02) between Combustion Engineering (C-E) and the New York State Department of Environmental Conservation (NYSDEC), has been prepared for the Taylor Instruments Site located at 95 Ames Street, Rochester, New York. The report outlines the remedial actions proposed for the Site. With the exception of Appendix J (Off-Site Groundwater Monitoring Plan, prepared by Haley & Aldrich of New York on behalf of Sybron Corporation), this document has been prepared by Harding Lawson Associates under the responsible charge of the undersigned Professional Engineer.

Ricky A. Ryan 4/26/00

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REMEDIAL WORK PLAN

TAYLOR INSTRUMENTS SITE
95 AMES STREET
ROCHESTER, NEW YORK

Prepared for:

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LIST OF ACRONYMS

1,1-DC-E	1,1-dichloroethene
μg/L	micrograms per liter
ABB	Asea Brown Boveri, Ltd.
ARAR	Applicable or Relevant and Appropriate Requirement
BDAT	best demonstrated available technology
bls	below land surface
BR	bedrock
c-1,2-DCE	cis-1,2-dichloroethene
C&D	construction and demolition
CB	catchbasin
C-E	Combustion Engineering
cfm	cubic feet per minute
cy	cubic yard
DPVE	dual-phase vacuum extraction
FIR	final investigative report
ft/day	feet per day
ft^2/day	square feet per day
gpm	gallons per minute
HASP	health and safety plan
High Acres	WMI's High Acres Subtitle D Landfill located in Perinton, New York
HLA	Harding Lawson Associates
HRC™	hydrogen release compound
LDR	land disposal restrictions
LTTD	low temperature thermal desorption
MCHD	Monroe County Health Department
MCPW	Monroe County Pure Waters
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MNA	monitored natural attenuation
Model City	WMI's Model City Subtitle C Landfill located in Model City, New York
NA	natural attenuation
NYSDOH	New York State Department of Health
NYSDEC	New York State Department of Environmental Conservation

LIST OF ACRONYMS *(Continued)*

PDI	Pre-Design Investigation
PID	photoionization detector
ppm	parts per million
PVC	polyvinyl chloride
RAO	remedial action objectives
RCRA	Resource Conservation and Recovery Act
ROI	radius of influence
RWP	remedial work plan
SCG	standards, criteria and guidance
Site	Former Taylor Instruments Site
SVOC	semivolatile organic compound
SVE/VE	soil vapor extraction/vapor extraction
Sybron	Sybron Corporation
t-1,2-DCE	trans-1,2-dichloroethene
TAGM	technical administrative guidance memorandum
TCE	trichloroethene
TCLP	toxicity characteristic leaching procedure
Tech Memo #6	Draft Technical Memorandum #6
TT	test trenching
USEPA	Unites States Environmental Protection Agency
UST	underground storage tank
VCA	voluntary cleanup agreement
VOC	volatile organic compound
VSI	Voluntary Site Investigation Report
WMI	Waste Management, Inc.

1.0 INTRODUCTION

The Former Taylor Instruments Site (Site) is located at 95 Ames Street, Rochester, New York. The Site, approximately 14 acres in size, is unoccupied and located in a mixed industrial, commercial, and residential neighborhood (Figure 1-1). Portions of the Site are contaminated with volatile organic compounds (VOCs) and mercury.

The Taylor Brothers Company (later Taylor Instruments Company) developed and operated the majority of the Site between 1904 and 1968. During this time, the facility produced mercury-filled glass instruments. In 1968, Taylor Instruments Facility merged with the Ritter-Pfaudler Company to form Sybron Corporation (Sybron). Taylor Instruments operated as a division of Sybron until 1983 when it was purchased by Combustion Engineering, Inc. (C-E). C-E continued to operate the Taylor Instruments facility until 1990 when Asea Brown Boveri, Ltd. (ABB) acquired C-E. ABB closed the facility between 1991 and 1993. All but one building at the Site were demolished in 1995 and 1996.

1.1 PROJECT OVERVIEW

On November 6, 1997, the New York State Department of Environmental Conservation (NYSDEC) and C-E entered into a Voluntary Cleanup Agreement (VCA, Agreement Index Number B8-0508-97-02). The goal of the VCA was to establish a framework within which C-E would implement the Investigative and Remedial Work Plans (RWP). After these Work Plans have been approved by NYSDEC and after the work has been implemented pursuant to the provisions of the VCA, C–E will be released from claims, actions, suits, and proceedings by NYSDEC as a result of the existing contamination at the Site. Under the agreement, C-E has investigated the Site and proposed remedial goals for VOCs and mercury, which NYSDEC has accepted. The agreement also provides a schedule for certain work tasks to be performed. On November 16, 1998, C-E entered into a Settlement Agreement with Sybron as a result of which C-E will lead any on-site remedial work and Sybron will lead any off-site remedial work. C-E remains the party responsible to NYSDEC for the performance of the VCA provisions.

The 1999 Final Investigative Report (FIR), which was submitted to NYSDEC, New York State Department of Health (NYSDOH), and Monroe County Health Department (MCHD) on April 2, 1999, and which was subsequently approved by NYSDEC on June 18, 1999, describes the nature and extent of contamination at the Site.

The FIR determined that mercury and trichloroethene (TCE) are the principal Site contaminants in subsurface soils. The FIR concluded that VOCs were being released to groundwater from two subsurface soil areas within the Site. These areas correspond to the locations of former TCE storage and distribution facilities. For ease of reference, they were called the North and South TCE Areas. VOCs present in groundwater include TCE and related chlorinated hydrocarbons thought to be present largely as the result of natural biodegradation of TCE.

The FIR also concluded that on-site storm sewers contained sediment that had been a past source of mercury contamination to off-site Monroe County Pure Waters (MCPW) combined sewers. A separate work plan for the remediation of the on-site sewers has been submitted and approved by MCPW and NYSDEC and was completed in November 1999 as an interim action. C–E is currently monitoring selected on-site locations to demonstrate the effectiveness of these actions.

The purpose of this RWP is to describe the selected on-site remedial actions proposed for the Site, thereby fulfilling Section I.C.3. of the VCA. A Groundwater Monitoring Plan has been prepared by Haley and Aldreich of New York on behalf of Sybron to investigate off-site groundwater conditions. This plan is included as Appendix J.

During the implementation of the RWP, if contamination is discovered that was not discussed in the FIR or in any of the prior reports, it will be reported to NYSDEC immediately. It is anticipated that NYSDEC will require C-E to investigate the nature and extent of such newly discovered contamination and, in the event that remediation is required to allow the contemplated uses of the Site to proceed, it is anticipated that NYSDEC will require the RWP to be revised to remediate such newly discovered contamination; thereby, meeting the requirement discussed in Section I.C.3.iii. of the VCA.

1.2 PREVIOUS INVESTIGATIONS AND RELATED DOCUMENTS

The documents listed below contain relevant material that was used in developing and selecting remedial actions for the Site and in the preparation of this RWP. All Site related documents can be found in the document repository established at the Arnett Branch Library, Rochester, New York.

1.2.1 Facility Decontamination and Demolition

All former site structures except for a metal storage building at the northeast corner of the property (Building 60) were demolished in 1995 and 1996. Demolition was conducted with NYSDEC's oversight and included removal of building footings and shallow (down to approximately 2 feet below land surface [bls]) subsurface utilities. Demolition debris was properly characterized and disposed of at approved off-site facilities. Final grading was completed in April 1996 and consisted of adding 0.5 to 2 feet of gravel subbase and then paving with 0.5 foot of asphalt.

1.2.2 Technical Memorandum #6

Draft Technical Memorandum #6 (Tech Memo #6) was prepared to identify and evaluate potential remedial action alternatives for the Site. The evaluation was conducted for a range of potential cleanup goals for mercury- and TCE-contaminated soil at the Site. The Tech Memo #6 was submitted to NYSDEC on November 8, 1997.

1.2.3 Pre-Design Investigation

The Pre-Design Investigation (PDI) was a two component program that consisted of collecting soil and groundwater data. These data were used to evaluate remedial actions in this RWP. The first component, Test Trenching, as described in Section 2.1.1, was used to better define the extent of mercury in soil to be excavated. The second component, TCE Source Characterization, was used to better define the distribution of TCE contamination in the North and South TCE Areas. Data from the PDI was supplied to NYSDEC via letter report on November 20, 1998. The PDI data is included in Appendix A.

1.2.4 Final Investigative Report (FIR)

The FIR is a comprehensive compilation of all investigation work performed at the Site and presents the current contamination conditions, which were used for purposes of remedial evaluation and selection. The FIR was submitted to NYSDEC on April 2, 1999, and approved by NYSDEC on June 18, 1999. The FIR fulfilled the requirement of Section I.B.1. of the VCA.

1.3 REMEDIAL ACTION OBJECTIVES

The overall objective of the remediation will be to return the Site to a condition that will support its reasonable future use for continued commercial or industrial use. It is the intention of C-E that the Site be redeveloped for commercial or industrial use in the future with assistance from the Economic Development Office of the City of Rochester. Wherever feasible and technically practicable, this includes meeting and achieving all applicable Standards, Criteria, and Guidance (SCGs) in remediated soil and groundwater. The Remedial Action Objectives (RAO) for this Site are:

- Provide for the attainment of soil SCGs to the extent practicable;
- Provide for the attainment, over time, of the groundwater SCGs at the Site, to the extent practicable;
- Mitigate and/or reduce the on-site impacts of contaminated groundwater on human health and the environment;
- Eliminate to the extent practicable, the potential for human, animal, and or wildlife exposure to soil containing site-related contaminants; and
- Contain, treat, and or dispose of contaminated soil, including buried debris, in a manner consistent with State and Federal regulation and guidance.

On-site storm sewers have been identified by MCPW as a historical source of mercury contamination to MCPW's combined sewer system. As a result, specific RAOs for the on-site storm sewers were developed. These RAOs are as follows:

- Remove existing accumulations of mercury-contaminated sediment from the on-site storm sewers; and
- Minimize future entry of mercury-contaminated soil/sediment from entering the on-site storm sewers.

1.4 CLEANUP GOALS

The cleanup goals are specific, measurable targets to be achieved during remediation and are designed to achieve the RAOs. The goal of the remedial effort is to meet TAGM 4046 cleanup goals for all contaminants of concern in Site soils, with the exception of Mercury which is discussed in more detail below. The goal of the remedial effort also is to meet Class GA standards for all contaminants of concern in Site groundwater.

The primary on-site contaminants of concern are Mercury in soil and TCE in soil and groundwater. Discussions in the remaining sections of this RWP focus on remedy selections for these primary contaminants of concern with the understanding that these remedies will address all contaminants of concern in association with the cleanup goals stated above.

1.4.1 Mercury

1.4.1.1 Soil

The cleanup goals for mercury-contaminated soil that have been approved by NYSDEC are 10 milligrams per kilogram (mg/kg) total mercury from 0 to 1 foot bls and 100 mg/kg total mercury for depths greater than 1 foot bls (relevant correspondence contained in Appendix B).

1.4.1.2 Groundwater

The FIR concluded that mercury does not appear to be migrating off-site in groundwater at levels above Class GA groundwater standards. Recent groundwater monitoring associated with the Pre-Remedy Monitoring Program confirms the low to non-detectable concentrations of mercury in groundwater. Since remediation of mercury in soils will remove the principal source for potential future impact to groundwater, no mercury-based groundwater actions are proposed within this RWP.

1.4.2 Volatile Organic Compounds

1.4.2.1 Soil

All TCE soil concentrations above the Technical Administrative Guidance Memorandum (TAGM) level of 0.7 mg/kg are the focus of remedial efforts for VOCs.

1.4.2.2 Groundwater

The long-term goal is to meet Class GA groundwater standards for the entire Site, if technically practicable. The proposed remedy will provide a downward trend in detected contaminant concentrations using a combination of active, passive, and enhanced biodegradation remedial technology approaches.

1.4.3 On-Site Storm Sewers

The goals for the on-site storm sewers are; 1) eliminate the remaining connections to MCPW's combined sewer on Ames Street, 2) ensure that no mercury-containing sediment is present within the on-site sewers draining to MCPW's combined sewer on Hague Street, 3) replace on-site clay tile storm sewers, and 4) ultimately provide adequate infrastructure for current site drainage until the Site can be redeveloped in accordance with the City of Rochester Building Codes, On-Site Storm Sewers Remedial Work Plan (Harding Lawson Associates [HLA], 1999).

An On-Site Storm Sewers Remedial Work Plan to rehabilitate on-site storm sewers was approved by MCPW on June 15, 1999. NYSDEC's comments on the On-Site Storm Sewers Remedial Work Plan were received on June 22, 1999. This work was initiated on July 12, 1999, and was completed in November 1999 as an interim action. This work was conducted at the request of MCPW as an interim measure, so that cleaning of off-site sewers can proceed in the near future. The On-Site Storm Sewers Remedial Work Plan and approval letters are contained in Appendix C. C-E is currently monitoring selected on-site locations to demonstrate the effectiveness of these actions.

1.5 WORK PERFORMED FOR THE PLANNING OF REMEDIAL DESIGN

1.5.1 Dual-Phase Vacuum Extraction Pilot Test

As part of the remedial design planning, a dual-phase vapor extraction (DPVE) pilot test was performed at the Site in May 1999. The purpose of the test was to determine if DPVE is an appropriate remedy to achieve soil clean-up goals for TCE and to gather information necessary to design a DPVE remedial system. The test evaluated groundwater and soil vapor response during operation of a DPVE system under various operating conditions. Results from the pilot test will serve as the basis for design of a full-scale DPVE treatment system. The DPVE Pilot Scale Test Evaluation Report was submitted to NYSDEC on July 16, 1999. A copy of the DPVE Test Report is contained in Appendix D.

1.5.2 Pre-Remedy Monitoring Program

A Pre-Remedy Monitoring Program is on-going to establish baseline groundwater contamination conditions prior to remedial activities. The Pre-Remedy Monitoring consists of tri-annual groundwater monitoring of select on-site groundwater monitoring wells. These data were used in the evaluation of the remedial actions contained in this RWP. Results for the first three events (May 1999, September 1999, January 2000) have been submitted to NYSDEC. All groundwater monitoring data collected to date during the Pre-Remedy Monitoring Program and previous events is contained in Appendix E.

1.6 WORK PLAN ORGANIZATION

This RWP is organized into five major sections. The first section is this introduction, which includes background information about all work conducted at the Site to date. Section 2.0 presents a summary of the selection of remedial actions for mercury and VOCs at the Site in order to achieve the RAOs for the Site. Section 3.0 presents permitting and planning requirements that are an integral part of implementing the remedial action, as well as details regarding compliance and performance monitoring. Section 4.0 presents the proposed schedule for implementing the remedial actions, and Section 5.0 presents references. All figures can be found following Section 5.0.

2.0 SELECTED REMEDIAL ACTIONS

Remedial actions for mercury and TCE remediation are presented in this section. The remedial actions presented were developed to meet the RAOs presented in Section 1.0, and are:

- Protective of human health and the environment;
- Consistent with applicable guidance and standards;
- Achievable within the constraints of implementing remedial technologies; and
- Appropriate for the projected future Site use.

The data sources that were used as the basis for remedial planning, evaluation, and selection of the recommended actions were:

- NYSDEC TAGMs;
- Tech Memo #6;
- Pre-Design Investigation Data (Mercury Trenching and TCE Source Characterization) (Appendix A);
- DPVE Pilot Test Data (Appendix D);
- Pre-Remedy Monitoring Data (Appendix E); and
- Soil boring logs (FIR).

2.1 REMEDIATION OF MERCURY-CONTAMINATED SOIL

Remedial actions for Site soil exceeding the approved clean-up goals for mercury are presented in the following subsections.

2.1.1 Summary of Current Conditions

The horizontal and vertical extent of the mercury-contaminated soil at the Site was delineated by 56 soil borings conducted during 1996 (Voluntary Site Investigation [VSI], 1996), visual observations made during building demolition activities, the test pits excavated during the 1997 mercury soil gas investigation, and 11 test trenches excavated as part of the 1998 PDI. Site investigation activities indicated that the mercury-contaminated soil exceeding cleanup goals is predominately associated with the mercury-containing glass shard waste fill present in the northwest quadrant of the Site. Glass shards have been observed as shallow as immediately below the asphalt pavement and subbase covering the Site. The glass shards appear as distinct layers in the soil horizon and range in thickness from 2 inches to 2 feet thick. The glass shard fill area has not been observed at depths greater than 5 feet bls (FIR, HLA 1999).

The following conclusions are drawn from observational and analytical data collected during the Site investigation programs.

- Soil and waste material exceeding 100 mg/kg total mercury is generally associated with the glass shard waste layer and soil within 1 foot above and below the glass shard waste layer. The large eastern area shown on Figure 2-1 is associated with a former contaminated utility tunnel. Fourteen of the 21 samples collected during the Test Trenching (TT) from the glass shard waste layer exceeded 100 mg/kg, while 6 of the 14 samples collected 1 foot above the shard layer exceeded 100 mg/kg total mercury.

- The soil greater than 1 foot below the shard layer generally does not contain mercury concentrations greater than 100 mg/kg. Only 2 out of 18 samples collected 1 foot below the shard layer during the TT contained mercury concentrations greater than 100 mg/kg.
- In general, the glass shard waste does not exhibit hazardous characteristics as defined by the Toxicity Characteristic Leaching Procedure (TCLP). Twenty-eight samples were analyzed for TCLP-mercury and TCLP-lead. Of these samples collected during the TT, five exceeded the hazardous characteristic regulatory level. One sample exceeded the regulatory level for mercury, and five samples exceeded the regulatory level for lead. Four of the five TCLP-lead hazardous samples were collected from the glass shard waste layers, and all were associated with elevated mercury levels.
- Site soils will not likely exceed TCLP regulatory levels for arsenic, barium, cadmium, chromium, selenium, and silver. Seven samples were analyzed via TCLP extraction for these metals and none exceeded their respective regulatory level.

The interpreted areal extent of mercury in soil at concentrations above the cleanup goals is shown on Figure 2-1. This interpretation supersedes Figure 4-4 and Table 4-2 presented in the FIR. The basis for the refinement was additional review of the 1998 test trenching logs (Appendix F) and analytical data collected in the areas of TT-2 and TT-7 (Appendix A). Additional review of the test trenching logs revealed that glass shard waste was not observed at TT-2, Station 2+10 to 2+72 (end of trench), and TT-7, Station 0+0 to 0+24. Additional review of the analytical results in the areas of TT-2 and TT-7 revealed total mercury concentrations less than the cleanup goal (boring BS-23 - total mercury concentration less than 100 mg/kg and test trench sample TT070302X - total mercury concentration less than 100 mg/kg) in the vicinity of TT-2, Station 2+10 to 2+72 (end of trench), and TT-7, Station 0+0 to 0+24. Based on this information, the extent of mercury contamination in soils above the cleanup goals was revised as shown on Figure 2-1. The estimated volume calculation based upon the revised areal extent of mercury-contaminated soil above the cleanup goal is 7,355 cubic yards (cy). Volume calculations are contained in Appendix F.

The final extent of soil removal will be determined during remedial activities and will be based on confirmation sampling results. The interpreted extent of mercury contamination greater than the cleanup goals, as shown in Figure 2-1, is intended to be used as a planning basis for remedial activities.

2.1.2 Remedies for Mercury-Contaminated Soil

An initial evaluation of remedial alternatives was completed and submitted as an attachment to Tech Memo #6 in November 1997. Data collected during the PDI in 1998 better defined areas of contaminated soils and provided a basis from which technologies could be developed and evaluated for their effectiveness in meeting remedial action objectives. As discussed in Tech Memo #6, there are no full-scale in-situ treatment technologies suitable for the type of mercury found at the Site.

The Tech Memo #6 remedial alternative evaluation carried forward the remedies listed below.

- On-Site Retorting/Recycling - Excavation and treatment by a mobile unit that treats soil to non-hazardous limits;

- Off-Site Retorting - Excavation and transportation to an off-site treatment facility that treats soil to non-hazardous limits;
- Landfilling - Excavation and transportation of contaminated soil to a landfill; and
- Capping - A low permeability cover system.

As discussed in Tech Memo #6, there are a number of well-established ex-situ methods for treating or disposing of excavated mercury-contaminated soils. Most prominent are direct disposal of mercury-contaminated soil and, to a lesser extent, treatment technologies. Direct disposal of mercury-contaminated soil in a regulated disposal facility is the most widely used technology for mercury-contaminated soil. Direct disposal of high-mercury hazardous soil is not permitted in the United States due to land disposal restrictions (LDRs). In accordance with Resource Conservation and Recovery Act (RCRA) regulations, hazardous material containing mercury at concentrations greater than 260 mg/kg is required to be treated using the best demonstrated available technology (BDAT) before land disposal. The U.S. Environmental Protection Agency (USEPA) identified retorting as the BDAT for the treatment of hazardous soil with mercury greater than 260 mg/kg. Capping would leave soil above the cleanup goal in place and is eliminated from further consideration as a final remedy in this RWP. Institutional controls are described in Section 3.6.

The remedies recommended in this RWP were selected because each has sufficient performance data available and is proven effective, has quantifiable costs, and is commercially mature.

2.1.2.1 Classification of Excavated Mercury-Contaminated Soil

Analyses of applicable State and Federal regulations were performed to identify those applicable to characterize the mercury-contaminated soil for remediation. In 1994, C-E's interpretation of the classification of mercury-related wastes at the Site were submitted to NYSDEC. In July 1995, Mr. Mike Kahlil of NYSDEC's Region 8 office endorsed C-E's classification approach such that remaining material removed from the Site is not a listed hazardous waste because, to the extent it contains mercury, that mercury most likely was released during or after the instrument manufacturing process rather than as commercial-grade mercury (Appendix G). On this basis, all future hazardous waste determinations will be made based on TCLP results.

For soil excavated from the areas targeted for mercury remediation, it is anticipated that there will be three types of waste classifications to be applied. The main basis used for estimating the quantities and types of soil is the test trenching data, which is considered a conservative (biased high) estimate because samples were taken in-situ from shard bearing trench walls whenever possible.

The three waste classes of soil that will potentially be found in the areas to be excavated, as shown on Figure 2-1, are:

- High-mercury hazardous soil - greater than 0.2 milligrams per liter (mg/L) for TCLP mercury (i.e., soil that fails RCRA Hazardous Characteristic testing) and contains greater than or equal to 260 mg/kg total mercury.
- Low-mercury hazardous soil - greater than 0.2 mg/L for TCLP mercury (i.e., soil that fails RCRA Hazardous Characteristic testing) and contains less than 260 mg/kg total mercury; and

- Non-hazardous soil - less than 0.2 mg/L TCLP mercury.

The 260 mg/kg total mercury concentration is from the Land Ban Standards promulgated by USEPA. Pass or fail determination for TCLP will also be made for lead, that was detected in excavated soils. Based upon the extensive testing of soils within the area to be remediated, Table 2-1 shows the estimated volumes of excavated soil that will fall within each soil classification.

Table 2-1
Estimated Excavated Soil Volumes

Classification	Percentage	Cubic Yards
High-Mercury Hazardous Soil	5	370
Low-Mercury Hazardous Soil	0	0
Lead Hazardous Soil	20	1,471
Non-Hazardous Soil	55	4,043
Non-Hazardous Construction Debris	20	1,471
Total	100	7,355

2.1.2.2 Remedy for High-Mercury Hazardous Soil

The on-site treatment technologies, retorting and recycling, were removed from consideration as the final remedy due to their limited treatment capacities; high cost; additional liability associated with lengthy soil handling on site, which would increase the risk of mercury recontaminating the on-site storm sewer system; and a concern that a longer term above-ground treatment technology may not be appropriate in the mixed commercial, industrial, residential neighborhood.

The selected remedy for high-mercury hazardous soil is direct excavation followed by off-site retorting at the Mercury Waste Solutions retorting facility in Union Grove, Wisconsin. Retorting has been identified by the USEPA as the BDAT for treating high-mercury materials whose concentrations are above Land Ban Criteria of 260mg/kg for total mercury. Proposed haul routes to the retorting facility are included in Appendix H.

2.1.2.3 Remedy for Low-Mercury/Lead Hazardous Soil

The on-site treatment technologies, retorting and recycling, were removed from consideration as the final remedy due to their limited treatment capacities, high cost, the additional liability of lengthy soil handling on site, which would increase the risk of mercury recontaminating the on-site storm sewer system, and a concern that a longer-term above ground treatment technology may not be appropriate in the mixed commercial, industrial, residential neighborhood.

The remedy for low-mercury and/or lead hazardous soil will consist of excavation, transportation off site, pretreatment stabilization, and disposal at the Waste Management's Inc. (WMI) Model City Subtitle C landfill located in Model City, New York (referred to hereafter as Model City).

During the PDI, no soil that failed the RCRA Hazardous Characteristic Leaching (TCLP) Test for mercury contained total mercury concentrations less than 260 mg/kg. Therefore, no low-mercury hazardous soil is anticipated. However, approximately 1,471 cy of soil (20 percent of the 7,355 cy to be excavated) is expected to fail the TCLP test for lead. This soil, and any which contain less than 260 mg/kg of total mercury that fail the TCLP test for mercury, will be transported to the WMI landfill in Model City for pretreatment and landfilling.

2.1.2.4 Remedy for Non-Hazardous Soil

The remedy for non-hazardous mercury soil will consist of excavation, off-site transportation, and disposal at the WMI High Acres Subtitle D Landfill located in Perinton, New York (referred to hereafter as High Acres). Some of this soil, if the concentration is less than 100 mg/kg total mercury, may be used as on-site backfill at depths greater than 1 foot bls.

2.1.2.5 Construction Debris and Rubble

During building demolition, only bricks and concrete from the exterior of the building (i.e., material which never came into contact with industrial processes) were classified as uncontaminated construction and demolition (C&D) debris. Some of this exterior C&D debris was left on site and used as fill. Some of this C&D debris is present within the mercury areas to be remediated. When a large volume of construction debris and rubble is uncovered, it will be left in place or excavated and then reused for backfill. For example, building footers and construction rubble and debris, if found in place and found not to be in contact with glass shards, will be left in place. If any are found to be in contact with a glass shard layer, they will be removed and sampled for disposition.

2.1.3 Remedy Description and Design Basis

2.1.3.1 Excavation and Landfilling

Excavation and various disposition options were selected as the preferred remedy for mercury-contaminated soil. The estimated volume of excavation is 7,355 cy as discussed in Section 2.1.1 and as represented by the areas on Figure 2-1. The areas shown on Figure 2-1 are to be excavated in lifts that are 50 feet by 50 feet by 4 feet deep. Approximately 21 excavation lifts will be required.

Soil from approximately 0 to at least 1 foot bls was removed in mercury-contaminated areas during demolition activities and replaced by asphalt and gravel subbase. Therefore, it is anticipated that the top 1 foot of the Site achieves the cleanup goal of 10 mg/kg. This will be visually verified during excavation activities. In addition, the bottom few inches of gravel will be excavated along with the underlying soil within a specific excavation limit. Gravel that is mixed with contaminated soil will be segregated and managed as soil. The current asphalt surface, from approximately 0 to 0.5 foot bls, will be excavated and segregated for appropriate disposition from defined areas in Figure 2-1. The existing gravel base that is currently from approximately 0.5 to 2.0 feet bls will be excavated, segregated, and temporarily stored on site, and then reused as backfill material. Excavation of soil and construction debris will begin within the areas shown on Figure 2-1 immediately below the gravel base.

2.1.3.2 Confirmatory Sampling

The volume of a lift is estimated to be approximately 370 cy. Soil will be excavated from each lift by a track hoe. One grab sample will be taken for confirmatory sampling from each sidewall (four samples total), and one grab sample will be taken from the floor of each lift for confirmatory sampling. These five samples will be analyzed for total mercury by USEPA Method 7471. Once the results indicate soil concentrations below the remedial goals for mercury, the floor sample will be analyzed for VOCs by

USEPA Method 8260B, for semivolatile organic compounds (SVOCs) USEPA Method 8270B, and TAGM 4046 metals. The analytical results will be submitted to NYSDEC upon receipt. A Jerome Mercury Vapor Analyzer will be utilized to field screen soil samples for mercury vapors and to direct subsurface excavation activities. It is anticipated that the vertical extent of excavation will be determined by confirmatory floor sampling and, the lateral extent of excavation will be determined by confirmatory sidewall sampling. When shard layers are encountered during excavation, particular care will be taken to remove and segregate this material from other excavated materials. The volume of material excavated from each lift will be segregated on site to await disposition sampling and subsequent determination of final disposal class as shown in Table 2-1.

It is anticipated that there will be approximately 30 cy of soil that are potentially contaminated with both TCE and mercury due to an overlapping area of contamination. This overlapping area can be seen on Figures 2-1 and 2-2 in the vicinity of BR-5. Five TCE samples, one sample from the floor and one sample from each sidewall, will be analyzed by USEPA Method 8260B in the excavation for this area. Mercury samples will also be collected in this area, as described earlier in this section.

When the sidewall of a lift extends beyond the perimeter of an excavation area additional analyses will be performed (excavation areas are shown on Figure 2-1). These additional analyses will be done on one grab soil sample from the sidewall of each lift that extends beyond the boundary of the excavation area. The soil will be sampled and analyzed for VOCs by USEPA Method 8260B, for SVOCs USEPA Method 8270B, and TAGM 4046 metals. The analytical results will be submitted to NYSDEC upon receipt.

2.1.3.3 Disposition Sampling

The excavated soil will be placed in an on-site roll-off box, trailer, or bermed area until the disposition analytical results indicates final disposal classification. To make this classification, two disposition composite samples will be collected from each lift (370 cy of excavated material) as described in Section 2.1.3.1 and field screened with a Jerome Mercury Vapor Analyzer. Each sample will then be analyzed for total mercury by USEPA Method 7471, TCLP mercury and TCLP lead. The extraction method utilized for mercury and lead will be USEPA TCLP Extraction Method 1311. Mercury will be analyzed utilizing USEPA Method 7470, and Lead will be analyzed utilizing USEPA Method 6010B. In the area of overlapping mercury-contaminated soil and TCE-contaminated soil, two additional composite samples will also be collected for TCE analyses by USEPA Method 8260B.

2.1.3.4 Backfill and Closure

The excavation will be discontinued after confirmatory sampling along the perimeter of the three mercury remediation areas indicate total mercury concentrations below 100 mg/kg. Fill material will be brought onto the Site for backfill of the excavation. In addition, the excavated gravel base described in Section 2.1.3 will also be utilized as backfill. This backfill material will be compacted to an appropriate compaction standard to ensure the Site will be suitable for potential future industrial or commercial development. The gravel base that will be placed on top of the backfill will be surveyed and graded to reestablish an adequate slope and geometry for the catchment areas. New asphalt pavement will be placed on top of the compacted gravel base to match the existing asphalt grade.

2.2 REMEDIATION OF VOLATILE ORGANIC COMPOUNDS IN SOIL AND SHALLOW GROUNDWATER

All TCE soil concentrations above the TAGM level of 0.7 mg/kg are the focus of remedial efforts for VOCs. The long-term goal for groundwater is to meet Class GA groundwater standards for the entire Site. The short-term criteria (approximately 2 years) to track effectiveness of the remediation of VOCs in groundwater is to demonstrate a downward trend in VOC concentrations achieved using a combination of active, passive, and enhanced biodegradation remedial technology approaches. The focal point for remedial actions for VOCs will be the North and South TCE Areas. A description of these two areas is contained in Section 4.0 of the FIR and Section 1.0 of this RWP. A periodic review of remedial performance and cost effectiveness will be conducted on which to base decisions as to whether the remedial system should continue to be operated, turned off, or whether to evaluate possible steps to enhance remedial operations.

2.2.1 Summary of Current Conditions

Beneath the asphalt paving and the subbase, subsurface site soils are made up of unconsolidated soils (overburden) consisting of glacially deposited sand, silt, and gravel. The overburden at the Site varies from about 14 to 30 feet thick, generally thickening towards the northwest corner. Generally, the lowermost soil unit consists of basal till that is typically gray brown, well graded and very dense. It is generally encountered beginning at 12 to 14 feet bls.

Overlying the basal till is a soil unit interpreted to be ablation till. These soils are brown and not as gray as the basal till, well graded sandy till with some silty clay, rounded gravel, and highly weathered rock (sandstone) clasts. This material is not as dense as the underlying till.

The uppermost soil unit is comprised of fill and disturbed soils. The fill varies from disturbed native soils to native soils mixed with metal, wood, glass shards, etc. Construction activities, such as excavation for structures, demolition, utilities and storage tanks, have disturbed the native soils to various depths. Depth of the upper soil unit ranges from 2 to 5 feet thick.

Groundwater is present within the overburden at depths of 6 to 7 feet bls. Flow direction is generally from southwest to northeast. Groundwater flow velocities are estimated to range from 5 to 10 feet per year within the basal and ablation till, respectively.

Previous investigations, discussed earlier in Section 1.2.4, have established the locations of two separate TCE areas, which are the focus for active remedial actions. These areas are identified as the North and South TCE Areas (Figure 2-2). Both areas are centered around historical storage activities of TCE.

The North TCE Area is associated with the former location of an aboveground TCE storage tank that served as a distribution point for TCE (Figure 2-2). The highest levels of contaminants in soil (5,900 mg/kg) have been found in the upper 4 to 5 feet of unsaturated soils and decrease with depth. The depth of contamination can be attributed to releases from the aboveground TCE storage tank, as well as associated piping. The location of the contaminants is consistent with surface spills of the TCE followed by infiltration into the subsurface soil, resulting in related groundwater contamination.

The South TCE Area is associated with the former locations of two TCE underground storage tanks (USTs), distribution piping, and one floor sump (Figure 2-2). The highest levels of contaminants in soils (5,000 mg/kg) have been found in deeper saturated soils from 8 to 20 feet bls. Much lower levels were found in the upper 8 feet of soil, which is primarily unsaturated soils. Table 2-2 visually depicts the distribution of contaminants in relation to depth.

Shallow groundwater movement has carried TCE from the two source areas to downgradient areas. After evaluating the data and the conceptual model for how different areas came to be contaminated (i.e., North TCE Area from surface spills in and near an aboveground TCE storage tank, South Area's releases from an underground TCE tank, and secondary contamination through groundwater movement in areas downgradient of the North and South TCE Areas), the following remedial approach was selected (as shown on Figure 2-2).

1. Within the source areas where TCE/VOC levels are the highest, active remediation through excavation and DPVE (North TCE Area) and DPVE (South TCE Area) will be the remedy.

2. In areas downgradient of the North and South TCE Areas, Monitored Natural Attenuation (MNA) will be the remedy.

2.2.2 Remedy Evaluation and Selection

An initial evaluation of remedial alternatives was completed and submitted as an attachment to Tech Memo #6 in November 1997. Data collected during the PDI in 1998 better defined areas of contaminated soils and provided a basis from which remedies could be developed and evaluated for their effectiveness in meeting RAOs. The remedies in this RWP were selected because each has sufficient performance data available, is proven effective, is commercially mature, and has quantifiable costs.

The Tech Memo #6 remedial alternative evaluation carried forward the remedies listed below:

- Landfilling - Excavation, transportation, and disposal of soil to an off-site landfill;
- Low temperature thermal desorption (LTTD) - Excavation and on-site treatment by heated air stripping to treat soil to non-hazardous limits;
- Soil vapor extraction/vapor extraction (SVE/VE) - In-situ treatment of soil to non-hazardous limits; and
- Capping - A low permeability cover system.

Additional remedies, not included in the Tech Memo #6, were also evaluated as part of this RWP including enhanced biodegradation, MNA, and DPVE. DPVE is an in-situ treatment remedy, very similar to SVE/VE, except that it is applicable for the remediation of both groundwater and soil, and has a radius of influence that is typically larger than SVE/VE. Enhanced biodegradation is the addition of a slurry-injected commercial product that enhances the biodegradation processes of TCE. MNA is the screening and monitoring of groundwater for the occurrence of biodegradation at the Site.

Excavation and off-site disposal have been chosen to remediate the shallow more highly contaminated North TCE Area soil, while DPVE has been chosen for contaminated soil and groundwater and saturated zone soil at the South and North TCE Area. Enhanced biodegradation is chosen as a follow-up remedy to DPVE (if needed). MNA is chosen for groundwater that is slightly contaminated with TCE.

Table 2-2
TCE DISTRIBUTION WITHIN SOIL

South TCE Area

Depth (ft bls)	B-250 Results (mg/kg)	B-251 Results (mg/kg)	B-252 Results (mg/kg)	B-253 Results (mg/kg)	B-254 Results (mg/kg)	B-255 Results (mg/kg)	B-256 Results (mg/kg)	B-257 Results (mg/kg)	B-258 Results (mg/kg)	B-259 Results (mg/kg)	B-260 Results (mg/kg)	B-261 Results (mg/kg)	B-262 Results (mg/kg)	B-263 Results (mg/kg)	B-264 Results (mg/kg)	B-269 Results (mg/kg)	B-270 Results (mg/kg)	B-271 Results (mg/kg)	B-272 Results (mg/kg)	B-273 Results (mg/kg)	B-274 Results (mg/kg)
2				4.4																	
4	11	5.5												21							
6																					0.2
8		2700		3000	6.1		7.8				4100						11	0.9	3.2	0.2	
10	16								0.2	27		7.1	4.6	26	15	11					
12			2.8	44	4.1	29					100						58	1.8			
14								1.8		45						94					
16	5000	5.1		6.3			46				77			3400					4.3	4.6	0.2
18					120				0.2	86							71				
20	150		4.5			2.1						8.5	2.2	120	11			0.7			

North TCE Area

Depth (ft bls)	B-201 Results (mg/kg)	B-202 Results (mg/kg)	B-203 Results (mg/kg)	B-204 Results (mg/kg)	B-205 Results (mg/kg)	B-206 Results (mg/kg)	B-207 Results (mg/kg)	B-208 Results (mg/kg)	B-209 Results (mg/kg)	B-210 Results (mg/kg)	B-211 Results (mg/kg)	B-212 Results (mg/kg)	B-213 Results (mg/kg)	B-214 Results (mg/kg)	B-215 Results (mg/kg)	B-216 Results (mg/kg)
2	5900	2100													0.4	
4			19					630	31					59		
6				0.3												
8								32						1.2		
10	1	2.5		1.3	0.2		0.2								0.2	
12						20										
14			9.3										2.6			0.2
16									0.24	2.1	0.3	0.3				
18	4.6							3								
20		4.3		9				2.6						1		
22			39				2.3									
24					0.2	0.2			11	3.9	0.3	0.4	4.4		0.2	2.5

Blank Cells = no samples collected at that depth

Shaded Cells indicate approximate depth of saturated soils

Note: Data reported herein was collected during the Pre-Design Investiagation, TCE Source Characterization, in 1998 to further delineate the extent of TCE contamination in the North and South TCE areas.

LTTD was eliminated due to the additional liability associated with lengthy soil handling on site which could increase the risk of mercury recontaminating the on-site storm sewer system, and a concern that a longer term above-ground treatment technology may not be appropriate in the mixed commercial, industrial, and residential neighborhood. Capping would not remediate TCE soil above the cleanup limit and thus was eliminated as a final remedy.

As provided in the VCA, C-E plans to perform the formal Deed Recordation within thirty (30) days of receipt of NYSDEC's approval of the Final Engineering Report for the Site.

2.2.2.1 Remedy for the South Trichloroethene Area

The remedy selected for the South TCE Area consists of DPVE within the source area and MNA in downgradient areas. If needed, enhanced biodegradation will be used as a follow up to DPVE once DPVE reaches asymptotic levels of contaminant removal.

2.2.2.2 Remedy for the North Trichloroethene Area

The remedy selected for the North TCE Area will consist of soil excavation of the upper 4 feet of material that exceeds 0.7 mg/kg TCE and off-site treatment or disposal of excavated material. DPVE will be implemented within the source area following excavation. If needed, enhanced biodegradation will be used as a follow up to DPVE once DPVE reaches asymptotic levels of contaminant removal. MNA will be utilized for areas of lesser contamination. Impacts of active treatment, enhanced biodegradation, and natural attenuation will be monitored through a groundwater monitoring program.

2.2.3 Remedy Description and Design Basis

2.2.3.1 Dual-phase Vacuum Extraction

A DPVE pilot test was conducted in May 1999 to evaluate the performance of this technology at the Site and to collect operational data needed to design a full-scale system. The pilot test was operated a total of 103 hours at extraction vacuums of 15 and 20 inches of mercury. Based upon the pilot test data, groundwater flowrates are expected to be between 0.30 to 0.55 gallons per minute (gpm) from each planned extraction well for a total DPVE system groundwater extraction rate of 6.6 to 12.1 gpm based on 22 extraction wells. System vapor flowrates are expected to range from 20 to 30 cubic feet per minute (cfm) from each of the 22 extraction wells for a total DPVE system vapor flowrate of 440 to 660 cfm. These rates will increase slightly with the use of vapor vent wells.

The planned extraction well spacing is based on the observed vapor radius of influence (ROI) from the pilot test, and the drawdown needed to dewater the subsurface to enable vapor to flow throughout the contaminated soils. The observed ROIs for vapor and groundwater were 20 to 30 feet and 60 to 70 feet, respectively. The extraction wells will be spaced based on a 20-foot radius of influence as shown on Figure 2-2.

Groundwater contaminant concentrations are initially expected to be in the order of 700 mg/L for TCE based on the sampling data collected in May 1999. This data was collected from an extraction well which was used for the DPVE pilot test and monitored before and after the test. This well is located within the South TCE Area. The treatment equipment will be designed to strip contaminants from the groundwater to meet local discharge requirements.

The DPVE treatment system will consist of a vacuum extraction pump, air water separator, equalization tank, air stripper, and various transfer pumps. Carbon treatment for vapor discharge will be added, if required to meet New York air quality standards (Figure 2-3). Groundwater extracted will pass through an air stripper prior to discharge to MCPW. Twenty-two extraction wells will be installed approximately 20 to 30 feet bls using hydraulic spun casing method within the target area based on a 20-foot ROI as shown in Figure 2-2. A detail of the extraction wells is shown in Figure 2-4.

Because the Site is currently covered by an asphalt surface, approximately twenty-one vapor vent wells will be installed near the extraction wells to allow air flow to the subsurface (Figure 2-2). These wells will be screened to mimic extraction well screening depths. These wells will also provide subsurface monitoring points within the treatment zone.

The DPVE and treatment system will be housed in a treatment building. The final location will be determined based on future site development plans. Electric service will be brought to the system and the effluent will be tied into the MCPW combined sewer along Hague Street. A potable water supply will also be installed at the system location for cleaning purposes.

2.2.3.2 Monitored Natural Attenuation

Monitored Natural Attenuation (MNA) is a recognized and valid remedial measure which tracks naturally occurring contaminant reduction that is caused by physical geochemical and/or biological processes. In order to be an acceptable remedial process, MNA usually must be combined with an active (typically source control) remedial activity. For this Site, MNA is being proposed in conjunction with active overburden and bedrock remediation, including overburden excavation, DPVE and enhanced biodegradation, and source area bedrock groundwater extraction and treatment.

Site characterization data has been collected to support the use of MNA as a component of the Site remedy. As discussed in USEPA Directive 9200.4-17P, lines of evidence are used to provide levels of confidence that natural attenuation is occurring. The first line of evidence supports MNA as a valid remedial process at this Site. This line of evidence relies on direct, empirical evidence, such as, "Historical groundwater and/or soil chemistry data that demonstrates a clear and meaningful trend of decreasing contaminant mass and/or concentration over time at appropriate monitoring or sampling points."

Groundwater contaminant data provides evidence of decreasing contaminant concentrations over time at source area wells. TCE is used for further discussion since TCE concentration are much higher than associated VOCs. Figure 2-5 has shown steady decreases in TCE concentrations for OB-4 from 550,000 micrograms per liter (μg/L) in September 1997 to 40,000 μg/L in January 2000. Likewise, TCE concentrations declined from 120,000 μg/L in September 1997 to 22,000 μg/L in January 2000 for OB-5. The TCE concentrations in OB-5 increased to 86,000 μg/L in September 1999; however, the overall trend is still declining. Concentration declines have also been observed in bedrock wells BR-4 from 27,000 μg/L in October 1997 to 4,500 μg/L in January 2000, and from 12,000 μg/L in October 1997 to 1,900 μg/L in January 2000 for BR-5 (see Figure 2-6). The groundwater contaminant plumes in both the North and South TCE Areas for overburden and bedrock groundwater are also stable. This is evidenced by groundwater concentrations in all downgradient wells continuing to decline or remaining relatively consistent with time, as seen on Figures 2-5 and 2-6. See Appendix E for data tables summarizing groundwater data.

Expanded monitoring (in terms of both locations and monitoring parameters (see Section 3.0) will allow verification of the extent to which MNA is occurring. It should also allow estimates to be made of the rate at which the three combined remedial processes will reduce VOCs to the site-specific goals. A scoring matrix outlined in *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, EPA/600/R-98/128, (September 1998) was used to evaluate the level of evidence observed at the Site based on site-specific bioparameter data. The scoring places the Site within USEPA's classification system at a level indicating limited evidence.

The presence of TCE-daughter products due to contaminant degradation has also been observed in all source wells, as seen in groundwater monitoring results presented in Appendix E of the RWP. OB-4 has shown the presence of cis-1,2-DCE, trans-1,2-DCE, 1,1-DCE, and vinyl chloride. BR-5 has shown the presence of cis-1,2-DCE trans-1,2-DCE, 1,1-DCE, and vinyl chloride. MNA is proposed as one component of the overall remedy to address contaminated media surrounding the source areas and is considered most appropriate for implementation when used in conjunction with other remediation measures such as source reduction and groundwater extraction.

MNA will be implemented as one component of the overall remedy for both the North and South TCE Areas through a sampling program where all on-site wells will be sampled and analyzed for VOCs, as described in Section 3.3.1. The effectiveness of MNA as a remedy will be evaluated based on continued declines in VOC groundwater contamination. Biodegradation parameters will be collected during future site groundwater sampling events, as discussed in Section 3.0 of this RWP, to monitor the performance of contaminant degradation and to continue the refinement of the site conceptual model for the North and South TCE Areas. If it is determined from review of monitoring data after implementation of the RWP that MNA, combined with the other components of the approved remedy, is not effectively reducing groundwater contamination then enhanced biodegradation will be used as the contingency remedy. A discussion of this technology is provided below.

2.2.3.3 Enhanced Biodegradation

Enhancement of the biodegradation processes will be implemented as a follow up contingency remedy to DPVE, if necessary. The product that will be used is a Hydrogen Release Compound (HRC™). HRC™ is a proprietary, environmentally safe, food quality, polylactate ester that is formulated to release lactic acid upon hydration. The material acts as a food source for natural microbes and enhance the capability of Natural Attenuation (NA). The HRC™ enhances naturally occurring organisms and thus enhances the bioremediation processes.

The HRC™ is injected into the subsurface, as a slurry, through small diameter injection wells. Based on subsurface conditions and volume of HRC™ needed to treat the soils, a well ROI of 10 feet for the injection wells is anticipated. It is anticipated that one treatment event will be sufficient to reduce contaminant levels to the cleanup goal of 0.7 mg/kg in subsurface soils; however, performance monitoring would be conducted to validate this assumption. The effectiveness of the HRC™ in enhancing biodegradation and reducing contaminant levels would be monitored over several months.

2.2.3.4 Excavation and Landfilling

Shallow contaminated soils that exceed 0.7 mg/kg TCE will be excavated from the North TCE Area. This area of excavation should address shallow soils above 0.7 mg/kg, as shown by the data contained in Table 2-2. The depth of the excavation is estimated to be 4 feet bls but will be determined by confirmatory floor sampling. The soils will be removed in lifts 50 feet by 50 feet by 4 feet deep, which is estimated to be 370 cy per lift. Material below the water table, if present, will be addressed using DPVE and MNA.

Soils containing TCE levels above 420 mg/kg will be transported to a licensed thermal treatment facility for pretreatment and final disposal. Soils containing above 60 mg/kg, which is the Land Ban Standard promulgated by USEPA, and below 420 mg/kg will be transported to Model City for pretreatment and disposal. Soil containing less than 60 mg/kg will be transported to High Acres and disposed as non-hazardous waste, based on approval of a contained-in-determination request on February 22, 2000 by Mr. Mike Kaminski of NYSDEC.

The Site is currently covered with asphalt pavement, which will be removed prior to excavation activities. The 0.5-foot asphalt surface will be segregated for appropriate disposition. The gravel base below the asphalt will be segregated and temporarily stored on site, and then reused as backfill material.

2.2.3.5 Confirmatory Sampling

After the contaminated soil has been excavated, confirmatory samples will be collected from within the excavation to verify soil above the site cleanup level has been removed. A total of five grab samples will be collected; one from each sidewall and one from the excavation floor. These samples will be analyzed for total VOCs using USEPA Method 8260B. Sampling of the exterior wall of a lift that extends beyond the perimeter of an excavation area is described in Section 2.1.3.2. Once the results indicate soil concentrations below the remedial goal for TCE, the outermost (perimeter) sidewall samples, as well as the floor sample, will then be analyzed for VOCs, SVOCs, and metals in accordance with Section 2.1.3.2.

2.2.3.6 Disposition Sampling

As soil is excavated, it will be segregated into three potential waste streams, as mentioned above, and managed accordingly. Field screening equipment will be used to monitor and make decisions as to how the soils will be handled. Grab samples will be collected from the excavated soils at regular intervals and screened with a photoionization detector (PID). These screened samples will be used to decide how the soils are segregated.

Excavated soils will be placed in on-site rolloff boxes, trailers, or bermed areas. Disposition composite samples will be collected at a frequency of two per 370 cy. Two composite disposition samples will be collected from each of the segregated stockpiles as discussed above, unless the volume of any exceeds 370 cy which will increase the number by the mentioned frequency.

It is anticipated that the soils in the TCE/mercury overlap area will contain non-hazardous levels of mercury, based on previous investigative data discussed in Section 1.2.4. Since a portion of the soils to be excavated overlaps into the area containing mercury-contaminated soils, disposition composite samples will be analyzed for total VOCs using USEPA Method 8260B, total mercury by USEPA Method 7471, TCLP mercury and TCLP lead. The extraction method utilized for mercury and lead will be USEPA TCLP Extraction Method 1311. Mercury analysis will utilize USEPA Method 7470 and Lead analysis will utilize USEPA Method 6010B. If the soils contain hazardous levels of mercury, then the soils will be managed accordingly. Transportation of rolloffs from the Site will follow approved routes and will be coordinated to minimize impact to the surrounding community. Proposed haul routes to each facility are included in Appendix H.

2.2.3.7 Backfill and Closure

Clean fill material will be brought into the Site and used as backfill. In addition, the excavated gravel base described earlier will be utilized as backfill. This backfill material will be compacted to an appropriate compaction standard to ensure the Site will be suitable for potential future development. The gravel base that will be placed on top of the backfill will require surveying and extensive grading to reestablish the slope and geometry of the current catchment areas. New asphalt pavement will be placed on top of the compacted gravel base to match the existing asphalt grade.

2.3 REMEDIATION OF VOLATILE ORGANIC COMPOUNDS IN BEDROCK GROUNDWATER

2.3.1 Summary of Current Conditions

Bedrock underlying the Site has been mapped as the Lockport dolomite. Regionally, this formation consists of flat to very gentle dipping medium- to thick-bedded fine-grained dolomite with interbedded shales. Bedrock cores collected during the installation of six site monitoring wells have described the rock as light gray dolomite with fine-grained texture and subhorizontal breaks or fractures.

Groundwater is present in bedrock fractures and joints. It is likely that the frequency of fractures is greatest in the upper 20 feet of the rock due to influences of weathering and glacial loading/unloading. Potentiometric levels in on-site bedrock wells range from about 9 to 22 feet bls. Depth to bedrock varies from about 14 to 30 feet near the northwest corner of the Site.

The bedrock water level data cannot readily be plotted due to the large variation in elevation heads and the limited number of wells. The head data appears to be bi-modally distributed possibly reflecting differing elevations of water bearing fractures. A plot of both sets indicates a general decrease in bedrock piezometric head towards the north. The absence of contaminants at the southwest corner of the site (BR-6) and their presence in wells along the north and east site perimeter also support a supposition that bedrock flow is generally towards the north. However, to confirm the validity of the conceptual model, three deep bedrock monitoring wells will be installed, as shown on Figure 2-2. The wells will be installed as open hole bedrock wells. Each well will be drilled at least 50 feet into bedrock with casing installed 40 feet into bedrock. Final depths will be determined in the field based on evidence of water-bearing fractures encountered during drilling.

Contaminant concentrations of 4,500 µg/L and 1,900 µg/L of TCE have been reported in monitoring wells BR-4 and BR-5, respectively. Both monitoring wells are located in the areas targeted for active remediation. There have also been much lower concentrations of DCE detected in both wells, as well as vinyl chloride in BR-5. The presence of these TCE daughter compounds, along with decreases in contaminant concentrations over time, indicates biodegradation is occurring within the bedrock aquifer (Figure 2-6). These results represent the most recent data available during the preparation of the RWP. The most recent data, along with historic groundwater monitoring results, are presented in Figure 2-6 of the RWP.

Groundwater results presented on Figures 2-5 and 2-6 in the RWP for overburden and bedrock groundwater, respectively, demonstrate a significant decrease in contaminant concentrations with respect to depth. Contaminant levels in bedrock groundwater are in the range of 70 to 98 percent lower than levels in associated overburden source wells. With the remediation of the overburden sources – through DPVE and excavation – and the pumping of the bedrock source area extraction wells, continued reduction in contaminant concentrations is expected in bedrock monitoring wells.

2.3.2 Remedy for Bedrock Groundwater (North and South Trichloroethene Areas)

The selected remedy for bedrock groundwater in both the North and South TCE Areas is extraction and treatment. Groundwater extraction wells will be installed immediately downgradient of both the North and South TCE Areas to capture contaminated groundwater as shown in Figure 2-2. The collection system will remove the maximum contaminant mass practicable and provide hydraulic containment in the source areas. The goal is to decrease contaminant levels both at the North and South TCE Areas, as well as the downgradient perimeter monitoring wells over time.

2.3.3 Remedy Description and Design Basis

The initial bedrock extraction system at the North and South TCE Areas consists of a single extraction well. The wells will be installed as close as practical to the north (downgradient) of each target area at the locations identified on Figure 2-2. Each well will be drilled at least 30 feet into bedrock. Final depths will be determined in the field based on evidence of water-bearing fractures encountered during drilling. HLA will use packer testing, or another approved and acceptable method to NYSDEC, for completing pumping wells within bedrock to ensure the wells are completed within bedrock flow zones. In addition, bedrock monitoring wells will be installed downgradient of each source area to monitor the performance of each extraction well and to monitor bedrock groundwater. Groundwater data will be collected from these wells to monitor the performance of the proposed remedies.

Each extraction well will consist of 6-inch diameter stainless-steel wirebound well screen and solid riser. The well will be constructed in a bedrock drill hole with a minimum diameter of 10 inches. A separate 1-inch polyvinyl chloride (PVC) stilling piezometer will be constructed alongside the pumping well within the same drill hole. A solid steel outer casing will be set approximately 2 feet into rock. A typical bedrock well installation profile is shown in Figure 2-7.

Bedrock well yields and radius of influence can vary greatly depending on the type, orientation, and connectivity of fractures that are encountered. Hydraulic properties, developed from bedrock extraction wells at similar sites in Rochester, indicate that a single well should be sufficient to ensure capture of bedrock groundwater from beneath each source area. However, actual well performance will have to be determined through pumping tests and direct observation of drawdown response to ensure that remedial action objectives are being met. Monitoring wells will be constructed as open hole bedrock wells with solid casings grouted 2 feet into bedrock as a protective riser.

After installation of the extraction and monitoring wells, pumping tests will be completed at each area to determine well performance and aquifer response. The tests will consist of a minimum 12-hour pumping interval to determine well performance and aquifer response. Additional extraction and/or monitoring wells will be installed if test data does not indicate a likelihood of complete capture beneath each source area during conditions of sustained pump operation.

The extraction wells are expected to be pumped at flow rates between 1 and 10 gpm each to achieve capture. Initial system pumping rates will be determined from the pumping test data. Each well will be fitted with a submersible pump. Flow from each well will be separately metered and sent to the treatment system.

2.4 REMEDIATION OF ON-SITE STORM SEWERS

The remedial actions for on-site storm sewers are contained in Appendix C. At the request of MCPW, this work was completed in November 1999 as an interim action to remediate on-site storm sewers so that off-site sewer cleaning can proceed. It is anticipated, that subject to favorable performance monitoring, this action will be the final action for on-site storm sewers.

2.4.1 Summary of On-Site Storm Sewers Remedial Work Plan

HLA submitted the On-Site Storm Sewers Remedial Work Plan to NYSDEC and MCPW on June 3, 1999. An approval letter from MCPW for the work plan, with modifications, dated June 15, 1999, was received. NYSDEC comments on the On-Site Sewers Remedial Work Plan were received in a letter dated June 22, 1999. The work outlined in the On-Site Storm Sewers Remedial Work Plan was completed in November 1999. C-E is currently monitoring selected on-site location to demonstrate the effectiveness of these actions (Appendix C).

2.4.2 Design Basis

The considerations for choosing the selected remedy for on-site storm sewers were eliminating significant accumulations of sediment from the sewers and creating a closed sewer system that would further prevent any sediment from entering the system. To meet the RAOs listed in Section 1.3, a variety of technologies to remediate the on-site storm sewers were evaluated. The technologies evaluated consisted of cleaning, ex-situ and in-situ pipe rehabilitation techniques, and excavation and replacement of the existing system.

2.4.3 Remedy Description and Installation

The selected remedy for on-site storm sewers consists of manhole installation, sewers cleaning, pressure testing, video inspection recording, rerouting lines B and F, pipebursting, and miscellaneous excavation. The On-Site Storm Sewers Remedial Work Plan consists of two phases of construction.

2.4.3.1 Phase I Construction

Three manholes were installed along Lines A, D, and E at the western property boundary, adjacent to Hague Street. These will allow capture of cleaning water and sediment (during construction) and prevent entry into the Hague Street combined sewer main (Figure 2-8).

The pressure cleaning moved water, debris, and sediment to a manhole where the water was collected and pumped to a large tank. The debris and sediment was removed and stored temporarily on site. The manhole was isolated so that the water and debris could not move further downstream.

Pressure testing the existing PVC pipe to ensure it was tight allowed the identification of any leaking sections which will be repaired or replaced, thereby eliminating the possibility of groundwater and sediment from entering those sections of pipe.

2.4.3.2 Phase II Construction

All clay tile pipe (approximately 1,200 feet excluding Lines B and F) and some sections of PVC pipe that failed pressure testing were rehabilitated and replaced by pipebursting. Pipebursting and replacement eliminates the future potential for sediment and groundwater infiltration into these storm sewers. A watertight seal was made where the new pipe enters an existing manhole or catchbasin.

Pipebursting is an in-situ technique that allows for the rehabilitation of existing sections of pipe to occur with minimal excavation. A bursting tool, or missile, contains a pneumatic hammer that is advanced in an existing section of piping pulling the replacement pipe into place. Pipebursting allows for the installation of the same size pipe or a larger diameter pipe.

Rehabilitation of existing brick catchbasins and manholes was performed by utilizing a spray-on epoxy resin after the manholes and catchbasins were cleaned and the replacement pipes were in place. The spray created a thin coating of cementitous material that eliminates the infiltration of sediment and groundwater in older brick manholes. Required maintenance of the spray-on epoxy costing planned for the existing brick manholes will be discussed in the O&M plan.

Storm sewer lines B and F were formerly connected to the Ames Street combined sewer. These laterals were abandoned. The connections were terminated at the property boundary and an impermeable barrier was installed across the bedding material. Catchbasin CB-1 (Line B) was rerouted to C-5 in Line A, and CB-16 (Line F) was rerouted to CB-15 in Line E.

2.4.4 Reporting

A Final Engineering Report was submitted to NYSDEC in January 2000 to document all work performed as part of the On-Site Storm Sewers Remedial Work Plan. This reporting requirement is listed in Section I.E of the VCA. A post construction evaluation of the effectiveness of the sewers remedy will be conducted using sampling data collected as detailed in Section 3.4.2.

2.5 SITE SECURITY

An 8-foot high chain-link fence currently surrounds the Site on the northern and western boundaries and the gates are locked when the Site is unoccupied. A 6-foot high ornamental metal fence is located on the eastern and southern site boundaries. HLA constructed a 8-foot high chain-link fence behind this ornamental fence in October 1999. Only qualified personnel with the appropriate training and authorization will be allowed on site during remedial activities. Other visitors may be allowed on site with authorization from HLA.

2.6 ENVIRONMENTAL PROTECTION

During all remedial activities, the on-site sewer grates will be covered with a heavy geotextile fabric, allowing flow of water while trapping sediment. After the excavation activities are completed, the fabric will be replaced with clean fabric. Protective measures for on-site workers are listed in the Health and Safety Plan (HASP) (Appendix I). Transportation of soil will occur in covered trailers or roll-off boxes and will be transported by licensed waste haulers. The transportation of soil will occur during off-peak traffic times to ensure the hauling does not interfere with local traffic. The anticipated haul routes are contained in Appendix H.

2.7 SUMMARY OF COMPLIANCE WITH REMEDIAL SELECTION CRITERIA

This section summarizes the compliance of the proposed remedies with the selection criteria found in TAGM 4030. The remedies selected for the Former Taylor Instruments Facility (Site) consist of the following:

- Excavation, transportation, and off-site stabilization and landfilling of metal- (including mercury) and VOC- (including TCE) contaminated soils;
- Recovery and treatment of VOC-contaminated soil and groundwater by DPVE coupled with air stripping;
- Excavation, transportation, and off-site treatment by retorting of high-mercury hazardous soil;
- Excavation, transportation, and off-site incineration of VOC- contaminated soil greater than 420 mg/kg VOCs;
- Natural attenuation of VOC-contaminated soil and groundwater by MNA;
- Groundwater monitoring to monitor remedial progress;
- Institutional controls (restrictions on future land use); and
- Assessment of Off-Site Groundwater Conditions (Appendix J).

2.7.1 Compliance with ARARs and New York SCGs

The proposed remedial action will comply with Applicable or Relevant and Appropriate Requirements (ARARs) and New York SCGs for the Site by providing for the attainment of the groundwater and soil SCGs over time, to the extent practicable, with the exception of mercury in soil. For mercury, a site-specific cleanup goal of 10 mg/kg from 0 to 1 foot bls and 100 mg/kg from 1 foot bls and deeper was agreed upon by NYSDEC and C-E (Appendix B of the RWP). The proposed remedial actions will mitigate and/or reduce the on-site impacts of contaminated groundwater on human health and the environment; eliminating to the extent practicable, the potential for human, animal, and or wildlife exposure to soil containing site-related contaminants. The proposed remedial action will contain, treat, and/or dispose of contaminated soil, including buried debris, in a manner consistent with State and Federal regulation and guidance. The primary Site contaminants of concern are mercury in soil and TCE in soil and groundwater. The RWP focuses on remedy selections for these primary contaminants of concern with the understanding that these remedies will address all contaminants of concern.

2.7.2 Overall Protection of Human Health and the Environment

Because of the lack of environmental receptors, no significant environmental impacts are anticipated from the implementation of this remedial alternative. Soil with mercury concentrations above the cleanup goal and shallow TCE contaminated soil in the North TCE area are to be excavated and treated or disposed off site, thereby reducing potential for future migration of contaminants and meeting Site remedial action objectives. High mercury hazardous soil will be treated off-site by retorting. VOC contaminated soil greater than 420 mg/kg will be incinerated off-site. All other excavated soil will be landfilled. DPVE will provide a measure of hydraulic control and groundwater capture in areas of highly contaminated groundwater, thereby reducing contaminant migration while reducing TCE concentrations in groundwater.

Risks to the community and worker safety during remediation are low because it is anticipated that the only additional techniques (to those used in a typical excavation project) that will be needed are: dust suppression, runoff control, and the use of HAZWOPER (Hazardous Waste Operations and Emergency Response) trained remedial construction workers. Continuous air monitoring for mercury and organic vapors, as well as dust, is intended to prevent exposures to on-site workers, as well as the community during excavation. The specific air monitoring to be carried out during remedial activities is discussed in the site-specific HASP (Appendix I, RWP). Dust suppression techniques will be employed to control dust generation and engineering controls will be employed to control the entrainment of site-related contaminants in runoff and/or vapor concentrations as necessary.

The mercury cleanup goals for the Site are protective of Human Health and the Environment after remediation because of the following:

- After remediation, the only potentially complete exposure pathway at the site from residual contaminants will be for on-site utility/construction workers and environmental sampling personnel. Both potential exposures will be of a periodic nature. Utility/construction workers will be protected through implementation of a Soil Management Plan prior to any future underground repair work and/or commercial or industrial development at the Site (the Soil Management Plan will be submitted with the Final Engineering Report). Similarly, the environmental personnel will be protected by health and safety related measures listed in the site-specific HASP. These Plans will insure that proper health and safety-related measures will be implemented with respect to future activities.

- Soil with mercury concentrations above the cleanup goal will have been excavated, retorted if required, and disposed off site, thereby reducing the potential for future migration of contaminants at the site retorted, if required.

- Off-site landfilling is a containment technology, which will control the mobility of contaminants. Since site-related mercury is relatively immobile, the potential for future migration from a secure landfill is minimal.

- Future development at the site will be restricted to commercial and/or industrial (i.e., no residential or daycare) use as stipulated in the VCA. In addition, deed restriction and/or other institutional controls will prohibit new buildings from having basements (i.e., slab-on grade type construction).

- The established institutional controls will require C-E or future property owners to continue the institutional or engineering controls discussed above.

- Access to all on- and off-site monitoring wells, extraction wells, vent wells, and remediation equipment will be restricted to authorized environmental personnel for the purposes of site inspection, operations, maintenance, monitoring and related activities.

2.7.3 Short-Term Effectiveness

Minor short-term impacts to the community that are anticipated during implementation of this alternative are traffic noise and increased truck traffic.

Traffic: Increased truck traffic is expected along major commercial routes leading from the site to I-490 for a period of approximately 12 weeks. Efforts will be made to minimize the impacts by concentrating traffic to business hours, limiting it to major commercial thoroughfares, and by keeping the period of such disruption to the minimum time necessary for implementation of the remedy.

Air: Air monitoring is intended to prevent exposures to the community, as well as the on-site workers, during excavation. The specific dust monitoring to be used during soil excavation is contained in the site-specific HASP (Appendix I, RWP). Dust suppression techniques will be employed to control dust generation, if required. Monitoring of mercury and organic vapors will also occur as discussed in the HASP. Off-gases from the DPVE are to be monitored prior to discharge to the atmosphere to ensure those applicable SCGs are met.

On-Site Worker Protection: During remediation, based on C-E's experience at the time the facility was demolished, it is anticipated that the only additional techniques (to those used in a typical excavation project) that will be needed are: dust suppression, runoff control and the use of HAZWOPER trained remedial construction workers. Continuous air monitoring for mercury and organic vapors, as well as dust, will be used with the intention of preventing exposures to on-site workers and the local community during excavation. The specific air monitoring to be carried out during remedial activities is discussed in the site-specific HASP (Appendix I, RWP).

Because of the lack of environmental receptors, no significant environmental impacts are anticipated from implementation of the proposed remedies.

2.7.4 Long-Term Effectiveness

Contaminated soil in excess of the cleanup goal will be transported off site for stabilization and disposal or treatment in accordance with applicable regulations. Institutional controls will be implemented to restrict future site use to industrial/commercial applications. Off-site landfilling and stabilization is a containment technology, which will control the mobility of contaminants. Since mercury is relatively immobile the potential for future migration from a secure landfill is minimal. Transport and disposal of contaminated soil off site will permanently eliminate exposure to contaminated soil and groundwater. Off-site treatment by retorting will remove mercury from excavated soil. Off-site incineration will remove organics from the soil. Institutional controls would effectively control access to contaminated soil and groundwater. DPVE has been shown to be effective in recovering contaminated groundwater and air stripping is proven to be effective in treating TCE to meet discharge standards.

The remedial goal for mercury in soil is expected to be met within the three-month time estimated as necessary to perform the excavation. While it is more difficult to estimate when the remedial goal for TCE, as well as other VOCs, in soil and groundwater will be met, it is currently estimated that the remedial goal for soil and groundwater will be achieved within 3-5 years. This goal will be met through the combined effects of excavation in the North TCE Area, and DPVE in the North and South TCE Areas. Further, it is anticipated that groundwater downgradient from the North and South TCE Areas will attain groundwater standards within 3-5 years due to reduction of contamination in these source areas as well as the effects of natural attenuation processes. The remedial progress for VOCs in all areas will be monitored and evaluated through groundwater monitoring and remedial system performance data. Time estimates will be confirmed as monitoring and performance data become available.

2.7.5 Reduction of Toxicity, Mobility, or Volume

Excavated soil will be transported off site for disposal in a landfill, or treatment by retorting or incineration depending on the waste classification. Off-site landfilling is a containment technology that will control the mobility of contaminants. Retorting and thermal incineration pretreatment reduces the toxicity of soil prior to landfilling. DPVE will create a measure of hydraulic control, reducing contaminated groundwater mobility, and will reduce VOC concentrations in soil. Air stripping will permanently reduce VOC concentrations in treated groundwater. Containment and stabilization of material at an off-site disposal facility is irreversible. Because DPVE removes VOCs from soil and air stripping removes VOCs in groundwater, treatment is permanent. Retorting and thermal incineration of soil is recognized by USEPA to be an appropriate pretreatment method prior to landfilling.

2.7.6 Implementability

Excavation and off-site disposal at a licensed facility are reliable and proven remediation practices. Site preparation and excavation services are well developed, reliable, and readily available. DPVE is a well-developed, reliable technology that has been used at numerous hazardous waste sites. DPVE Pilot-testing has been performed at the Site and this data is being used in designing a site-specific DPVE system. Retorting and thermal incineration of soil are recognized by USEPA to be appropriate pretreatment methods prior to landfilling.

Remedial performance monitoring will monitor the remedial effectiveness of DPVE capture and removal rates as well as the effects of Natural Attenuation. Remedial performance monitoring will involve periodic sampling of groundwater from monitoring wells. Soil samples will be analyzed during excavation to confirm that soil in excess of the cleanup goal has been excavated. MNA parameters will be collected as part of the remedial performance monitoring.

Contractors to perform construction services are readily available, and several are to be included in a competitive bid process. Local Contractors are readily available to conduct site preparation and excavation activities. Off-site disposal facilities will provide transportation of contaminated soils from the site. The capacity of the landfills selected is adequate to contain the anticipated volume of soil requiring off-site disposal. Drillers are available to install DPVE wells. Licensed off-site retorting facilities are available.

2.7.7 Cost

Estimated $3.7 million.

2.7.8 State Acceptance

C-E anticipates State acceptance.

2.7.9 Community Acceptance

Community acceptance will be evaluated during the public comment period. Based on C-E's experience with community acceptance during the construction activities at the time the facility was demolished, C-E believes the community is interested in seeing the site remediated and restored to a beneficial and acceptable commercial or industrial use.

3.0 COMPLIANCE MONITORING PLAN AND REQUIRED PERMITS

3.1 REMEDIAL GOALS FOR MERCURY IN SOIL

The remedial goals for mercury are to remediate soil above 10 milligrams per kilogram (mg/kg) total mercury from 0 to 1 foot bls and 100 mg/kg total mercury for depths greater than 1 foot bls (relevant correspondence contained in Appendix B). Mercury in soil will be remediated by excavation, transportation, and landfilling or retorting. The three mercury areas where remediation is expected to occur are shown on Figure 2-1.

3.1.1 Measurement of Remediation for Mercury in Soil

For mercury-contaminated soil, remediation will be measured by confirmatory soil sampling once excavation has been completed as described in Section 2.1.3. A variety of sampling will be performed as part of the excavation of the three mercury areas to be remediated. Once excavation in a lift is thought to be complete, a representative grab sample will be collected from each of the perimeter side walls, and one grab sample will be collected from the bottom of the lift. The soil will be analyzed for total mercury by Method 7470. If the mercury soil concentration of the floor sample is below the remedial goal for mercury then this sample will be analyzed for VOCs by USEPA Method 8260B, for SVOCs USEPA Method 8270B, and TAGM 4046 metals. The confirmatory sampling will be guided by visual inspection for shard layers and by using the Jerome Mercury Vapor Analyzer to take mercury vapor readings inside each lift. Once the results indicate soil below the remedial goals for mercury, the outermost (perimeter) sidewall sample will also be analyzed for VOCs, SVOCs, and metals in accordance with Section 2.1.3.2. Excavation will occur beyond the boundaries of the three areas identified on Figure 2-1 if confirmation samples indicates soil is present above the remedial goals.

The excavation of the soil and subsequent restoration of the Site will require a permit from the City of Rochester Building Department. Dust monitoring and suppression (as required) will be performed during the excavation as outlined in the HASP.

3.2 REMEDIAL GOALS FOR TRICHLOROETHENE IN SOIL

The Remedial Goal for TCE in soil is to remediate TCE soil concentrations above the TAGM level of 0.7 mg/kg to the extent that such remediation is technically practicable. The following remedial approach was selected for TCE contaminated soil as shown on Figure 2-2.

1. Within the North and South TCE Areas where TCE/VOC levels are the highest, active remediation through excavation, and DPVE (North TCE Area) and DPVE (South TCE Area) will be the remedy.

2. In areas downgradient of the North and South TCE Areas, MNA will be the remedy.

3.2.1 Measurement of Remediation for Trichloroethene in Soil

For TCE-contaminated soil, remedial progress will be measured through groundwater and DPVE system performance monitoring, as discussed in Section 3.3.1. Following excavation and during DPVE operation, a decrease in TCE in groundwater concentrations over time will be indicative of a decrease in soil concentration since the soils are the source of dissolved-phase TCE contamination to groundwater.

3.3 REMEDIAL GOALS FOR TRICHLOROETHENE IN GROUNDWATER

The long-term goal is to meet Class GA groundwater standards for the entire Site to the extent technically practicable. Perimeter and interior monitoring wells will be used to track the effectiveness of the remediation. Overall achievement of the goal will be accomplished by using a combination of active, passive, and enhanced biodegradation remedial technology approaches. Deed restrictions will prevent the use of on-site groundwater until this water meets Class GA groundwater standards.

3.3.1 Measurement of Remediation for Trichloroethene in Groundwater

To monitor the effectiveness of the DPVE treatment system, performance and confirmatory sampling will be conducted. Media sampled during performance monitoring will include samples from wells within the remediated area, groundwater treatment system influent and effluent samples, and system effluent vapor samples. The data will be used to evaluate decreases in groundwater contaminant levels within the treated area, to track VOC mass removed, and to determine when extraction of VOC mass has reached asymptotic levels. Once the VOC mass removal has reached this asymptotic level and it is determined the continued DPVE operations are no longer cost effective or that the RAOs have been achieved, a request to shut down the system will be submitted to NYSDEC.

The effectiveness of enhanced biodegradation (through the use of HRC™) as a follow up to DPVE and MNA will be monitored by using existing monitoring wells and installing additional on-site monitoring wells downgradient of the source area plumes, as shown on Figure 2-2. These wells will be monitored to provide performance data and will also serve as an early indicator regarding overall remedial performance. Samples will be collected quarterly for the first two years and semiannually for the next five years from background monitoring wells, newly installed wells in the leading edge and downgradient of each source area plume, and from downgradient site perimeter monitoring wells. Since active remediation will be occurring, the chemical composition of the overburden matrices, as related to natural biodegradation indicator parameters, will change. Therefore, analyses for indicator parameters from source area wells will not be necessary during active remediation, but these wells will continue to be monitored for VOC concentrations. Background monitoring wells will be analyzed for alkalinity, chloride, and carbon dioxide. Leading edge and downgradient source wells will be analyzed for alkalinity; chloride; ethane, ethene, and methane; carbon dioxides, iron, nitrate, nitrite, sulfate, sulfide, and total organic carbon. Downgradient site perimeter monitoring wells will also be sampled for the above-mentioned parameters. All wells will be sampled for VOCs and analyzed in the field for dissolved oxygen, pH, temperature, and oxygen reduction potential.

Bedrock monitoring wells will be placed downgradient of the bedrock pumping wells at select locations. These wells will be used to monitor contaminant conditions in bedrock as remedial efforts progress.

Coordination of on-site and off-site groundwater sampling and depth-to-water measurements of bedrock wells will occur. They will also serve as an early indicator regarding performance of the remedial bedrock extraction system.

Site groundwater monitoring events will be conducted quarterly for the first two years and semi-annually for the next five years. These events will include selected wells within the remediated areas and all perimeter monitoring wells. Final decisions regarding shut down of the remedial system will be based on the most recent year of monitoring data. All on-site wells will be analyzed for VOCs using USEPA Method 8260B. A Post Construction Monitoring Plan will be submitted as a part of the final engineering report.

3.4 ON-SITE STORM SEWERS

3.4.1 Remedial Goals for On-Site Storm Sewers

The goals for the on-site sewers are to eliminate the remaining connections to MCPW's combined sewer on Ames Street, ensure that no mercury-contaminated sediment is present within the on-site sewers draining to MCPW's combined sewer on Hague Street, replace on-site clay tile storm sewers, and ultimately provide adequate infrastructure for current site drainage until the Site can be redeveloped in accordance with the City of Rochester Building Codes, On-Site Storm Sewers Remedial Work Plan (HLA, 1999).

3.4.2 Measurement of Remediation for On-Site Storm Sewers

Post-construction monitoring for effectiveness will consist of sampling each of the four manholes adjacent to the western property boundary along Hague Street. The sewer water and sediment will be sampled and then analyzed for total mercury in sediment by USEPA Method 7471 and total mercury in water by USEPA Method 7470. HLA will sample the water and sediment quarterly for two years starting in January 2000. If analytical results are acceptable, then this action will be considered final.

3.5 PERMITTING

The roles and responsibilities of C-E and NYSDEC, with respect to the cleanup of the Site, are specifically discussed in the VCA. As stipulated in Section XII.E.2. of the VCA, C-E is not required to apply for, or to be granted, permits from NYSDEC to perform the on-site remediation proposed in this RWP. C-E must meet the intent and requirements of any applicable permits as typically required by NYSDEC regulation.

Permits will be required from the City of Rochester and MCPW to construct and operate the remedial system and will be obtained prior to initiation of any on-site construction work. The permits required will consist of the following:

- Building Permit (city) and
- Sewer Usage Permit (MCPW).

A remedial construction contractor will work with the appropriate departments within the City of Rochester and MCPW to obtain the necessary permits and provide a schedule construction of events. Groundwater and vapor samples will also be collected from the treatment system effluents and analyzed for compliance with the Sewer Usage Permit.

3.6 INSTITUTIONAL CONTROLS AND DEED RESTRICTIONS

In accordance with Section X of the VCA, C-E proposes the following Institutional Controls and Deed Restrictions that will remain in force so long as Site conditions exist that are above the site cleanup goals:

- Future development will continue to be restricted to commercial and/or industrial (i.e. no residential or daycare) use as stipulated in the VCA.
- Deed restriction and/or other institutional control will prohibit future buildings constructed on the site from having basements (i.e. slab on grade type construction).
- Establishment of a deed restriction prohibiting the use of the groundwater beneath the site unless it underwent treatment that would render it safe for drinking water or industrial purposes.
- Installation of passive vapor barriers beneath all new buildings on the site to ensure that potential soil VOC vapors do not pose a health risk.
- Implementation of a soil management plan prior to any future commercial and/or industrial development at the Site. This plan would address the proper health and safety-related measures, monitoring, and soils management associated with any future excavation or construction activity.
- Access to all Site monitoring wells, extraction wells, vent wells and remediation equipment will be restricted to authorized environmental personnel for the purposes of site inspection, operations, maintenance, monitoring, and related activities.
- As provided in the VCA, C-E will perform the formal Deed Recordation within thirty (30) days of receipt of NYSDEC's approval of the Final Engineering Report for the Site.
- Establishment of a provision requiring C-E or future property owners to continue the necessary institutional or engineering controls identified herein.

4.0 PROPOSED IMPLEMENTATION SCHEDULE

Figure 4-1 presents a forecasted schedule for implementing the proposed remedial activities for mercury and VOC contamination at the Site. Upon receipt of approval from NYSDEC of the remedies proposed in this RWP, the initial tasks will include public notice and comment periods. During this time, preparation of design drawings and specifications that will be used for procurement of remedial contractors and equipment will also occur. Construction activities are tentatively estimated to take six months; however, this schedule will be better known as procurement of contractors is completed. Following completion of remedial construction activities, a Final Engineering Report that will document the as-built conditions, as well as operations and maintenance requirements, will be prepared. If NYSDEC approval for this Plan is received by February 18, 2000, startup of the DPVE system and initiation of performance monitoring is expected to occur during the last quarter of calendar year 2000.

ID	Task Name	Duration	Start	Finish
1	**Remedial Schedule**	**345 days**	**Thu 1/6/00**	**Fri 12/15/00**
2	**Remedial Work Plan (RWP) Finalization**	**41 days**	**Wed 4/26/00**	**Mon 6/5/00**
3	NYSDEC Final Review and Approval	6 days	Wed 4/26/00	Mon 5/1/00
4	Publication in Environmental Notice Bulletin	2 days	Mon 5/1/00	Tue 5/2/00
5	Public Comment	30 days	Tue 5/2/00	Wed 5/31/00
6	Final RWP	1 day	Mon 6/5/00	Mon 6/5/00
7	**Remedial Design**	**89 days**	**Thu 1/6/00**	**Mon 4/3/00**
8	Drilling	64 days	Thu 1/6/00	Thu 3/9/00
9	Excavation Program	64 days	Mon 1/31/00	Mon 4/3/00
10	Conveyance/Treatment System	64 days	Tue 1/25/00	Tue 3/28/00
11	**Procurement**	**56 days**	**Tue 4/11/00**	**Mon 6/5/00**
12	Drilling	21 days	Tue 5/16/00	Mon 6/5/00
13	Excavation Program	43 days	Mon 4/24/00	Mon 6/5/00
14	Conveyance/Treatment System	56 days	Tue 4/11/00	Mon 6/5/00
15	**Remedial Construction (estimated)**	**134 days**	**Mon 6/5/00**	**Mon 10/16/00**
16	Drilling	70 days	Mon 6/5/00	Sun 8/13/00
17	Excavation Program	103 days	Mon 6/5/00	Fri 9/15/00
18	Conveyance/Treatment System	70 days	Tue 8/8/00	Mon 10/16/00
19	Final Engineering Report to NYSDEC	60 days	Tue 10/17/00	Fri 12/15/00

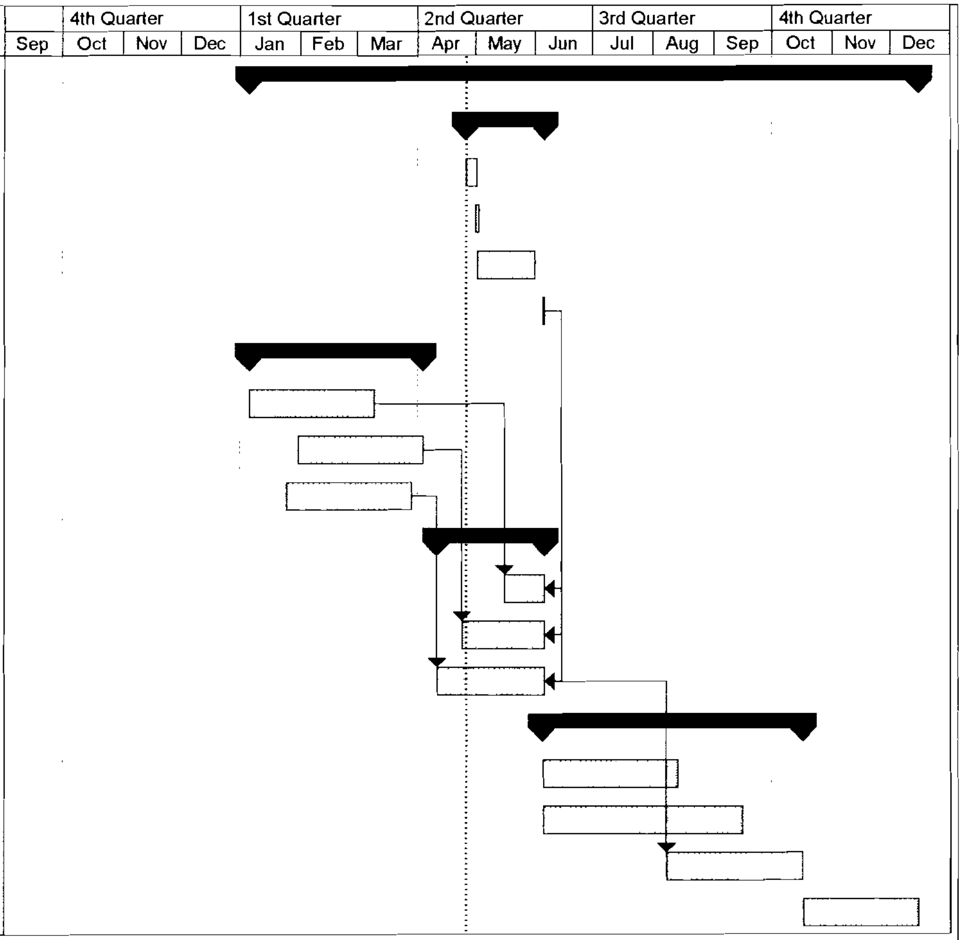

Figure 4-1
Taylor Instruments Site

Task	☐	Milestone	◆	Rolled Up Split	· · · ·	External Tasks	▨
Split	· · · ·	Summary	▬	Rolled Up Milestone	◇	Project Summary	▬
Progress	▬	Rolled Up Task	☐	Rolled Up Progress	▬		

5.0 REFERENCES

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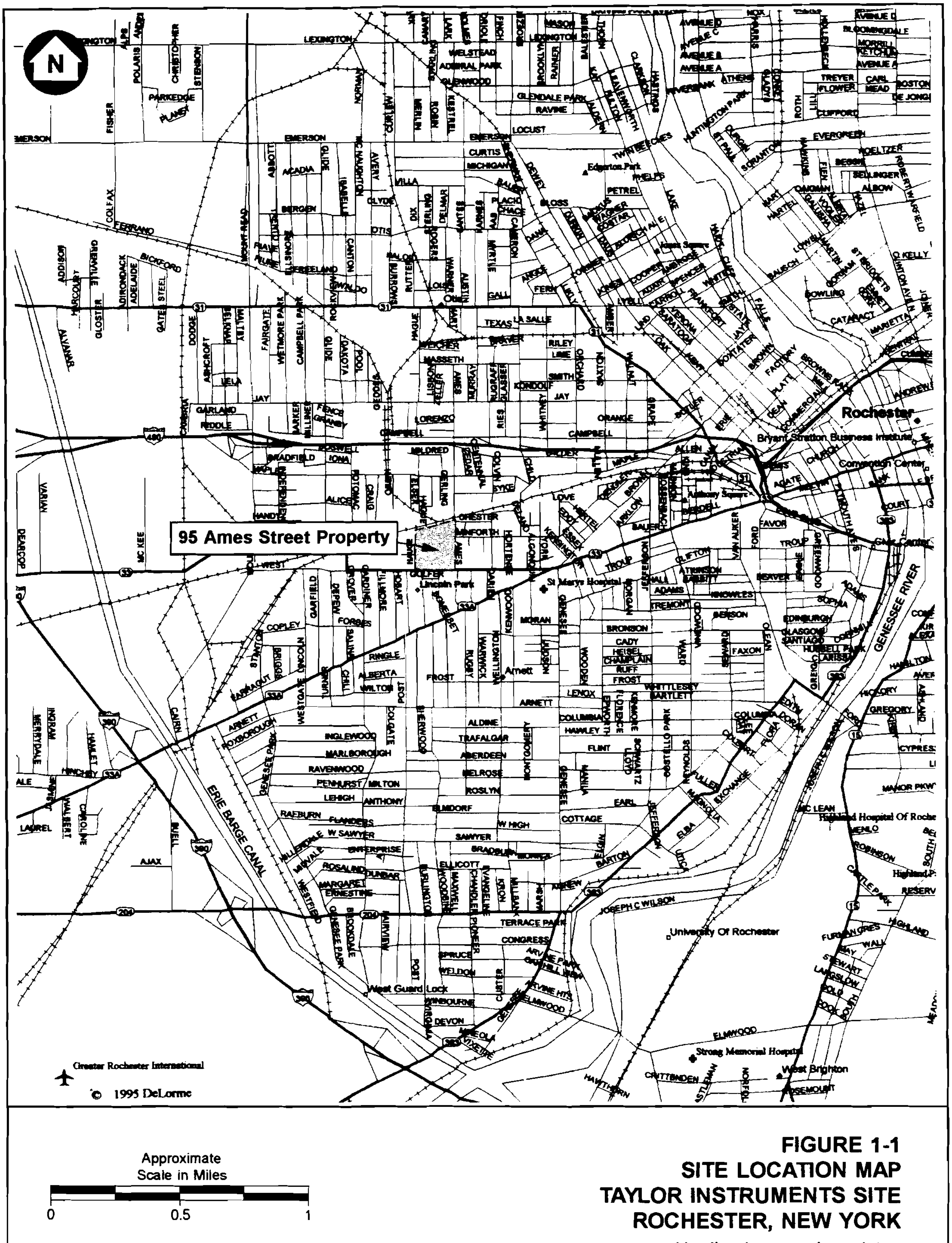
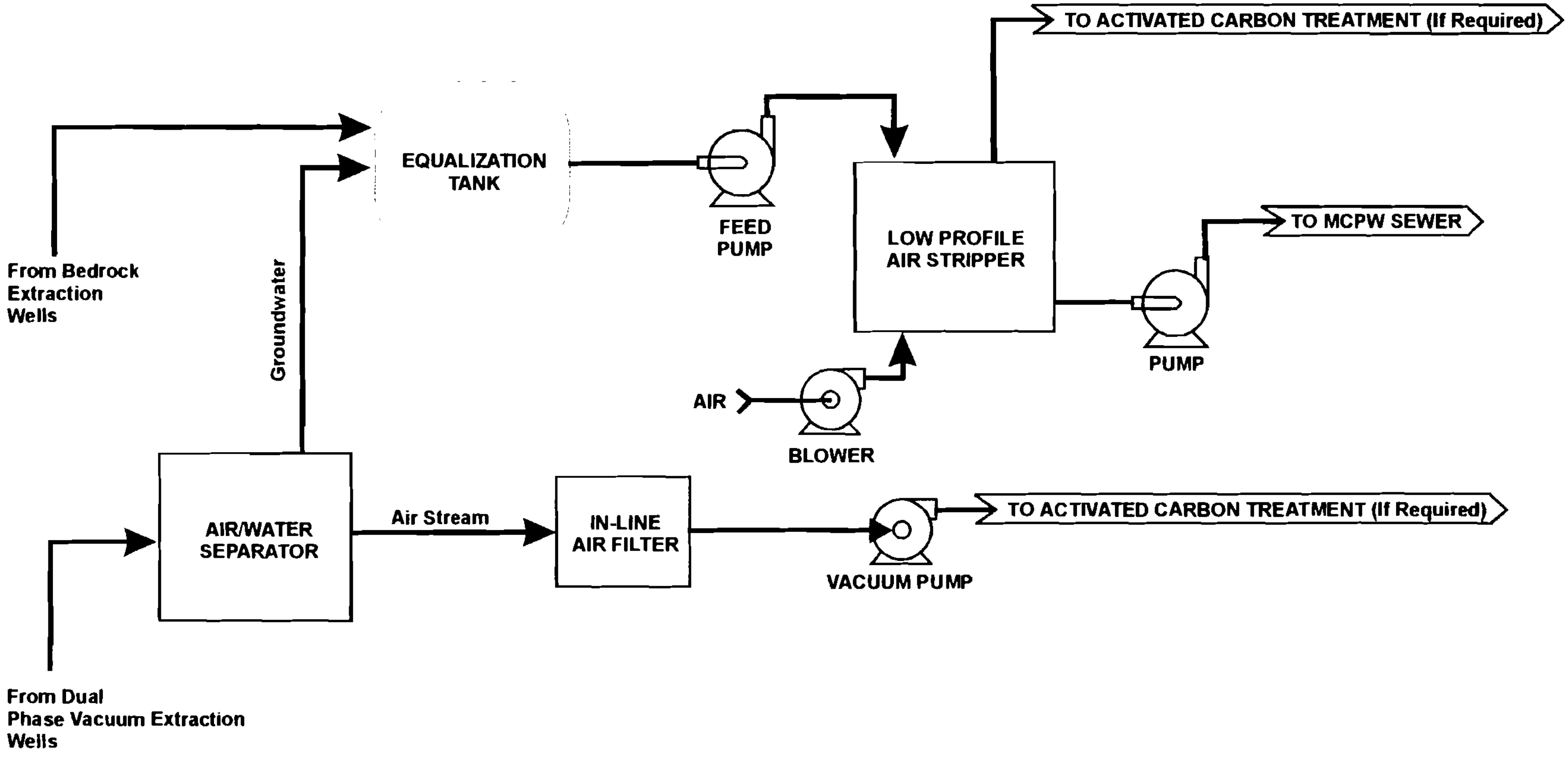


FIGURE 1-1
SITE LOCATION MAP
TAYLOR INSTRUMENTS SITE
ROCHESTER, NEW YORK

Harding Lawson Associates

W9902004



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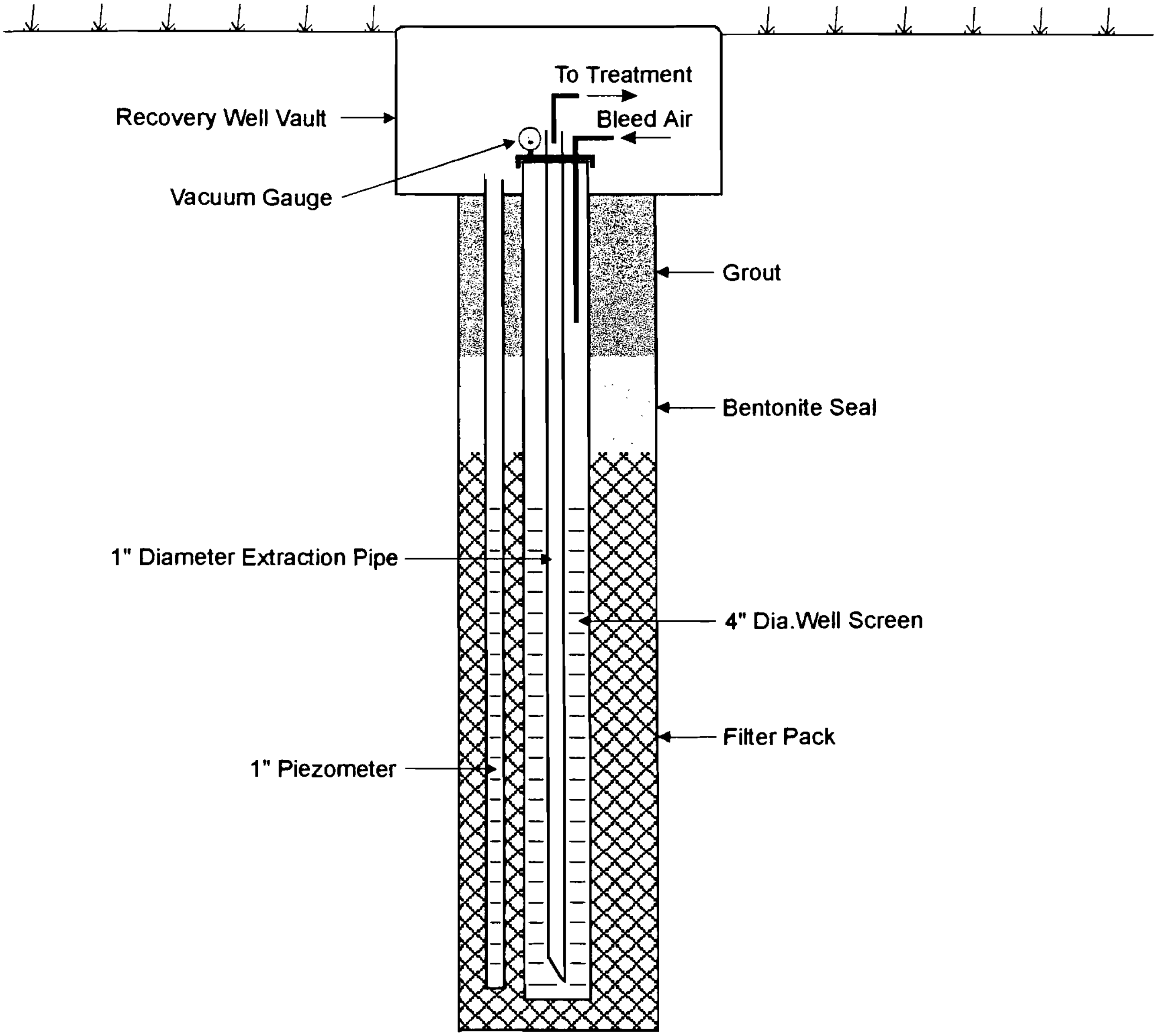
Engineering and
Environmental Services

Extraction and Treatment System Process Flow Diagram
Remedial Work Plan
Taylor Instruments Site
Rochester, New York

FIGURE
2-3

DRAWN	JOB NUMBER	FILE NUMBER	DATE	REVISED DATE
BGF	44836	W9908001(b)	8/99	8/99



Not To Scale

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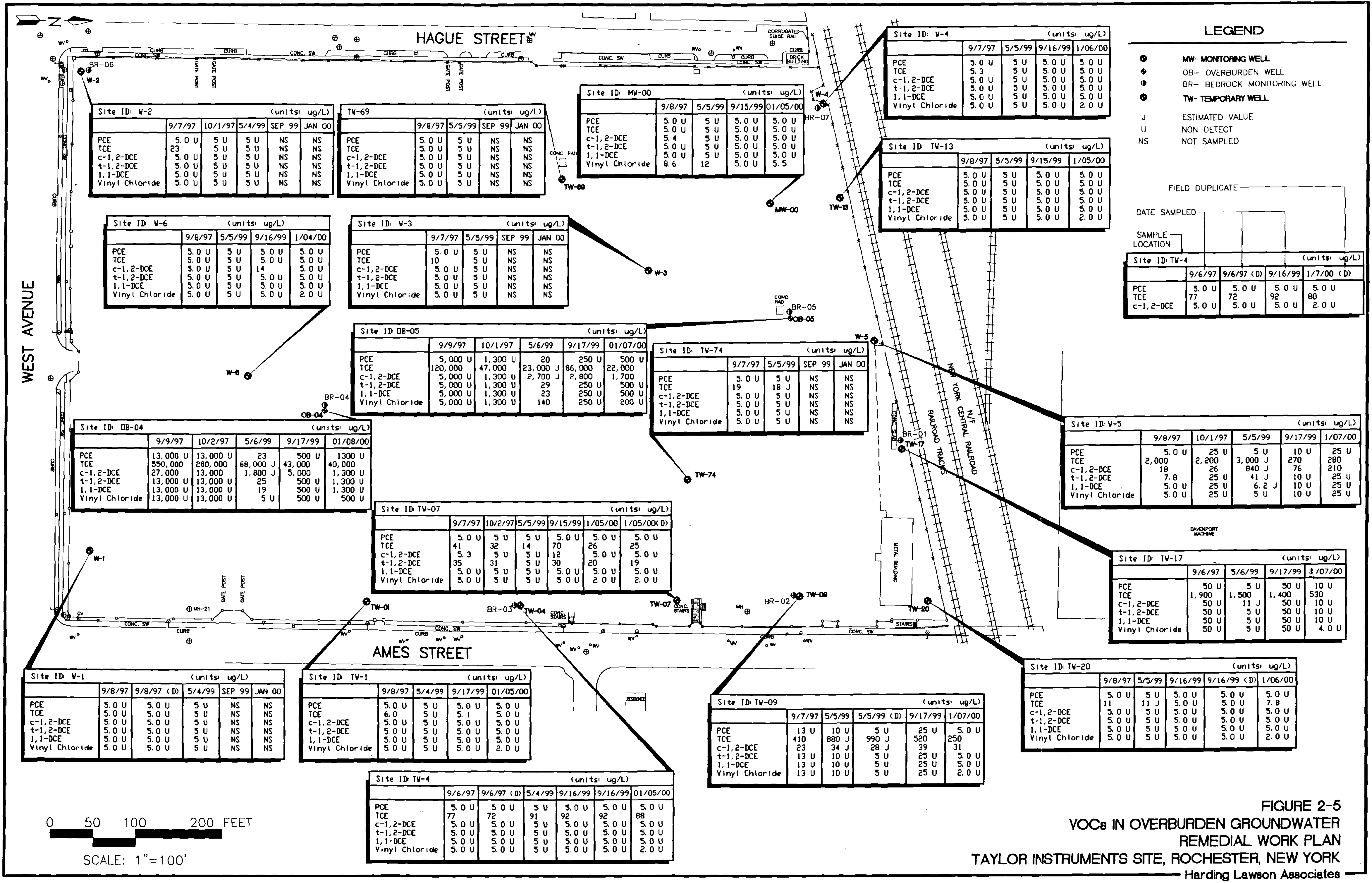
Engineering and
Environmental Services

Typical Section DPVE Well Diagram
Remedial Work Plan
Taylor Instruments Site
Rochester, New York

FIGURE
2-4

DRAWN	JOB NUMBER	FILE NUMBER	DATE	REVISED DATE
BGF	44836	W9908001	8/99	9/99



LEGEND

- ● MW- MONITORING WELL
- ◆ OB- OVERBURDEN WELL
- ⊕ BR- BEDROCK MONITORING WELL
- ● TW- TEMPORARY WELL

J ESTIMATED VALUE
U NON DETECT
NS NOT SAMPLED

SAMPLE LOCATION
DATE SAMPLED
FIELD DUPLICATE

Site ID: TW-4 (units: ug/L)

	9/6/97	9/6/97 (D)	9/16/99	1/7/00 (D)
PCE	5.0 U	5.0 U	5.0 U	5.0 U
TCE	77	72	92	80
c-1,2-DCE	5.0 U	5.0 U	5.0 U	2.0 U

Site ID: W-2 (units: ug/L)

	9/7/97	10/1/97	5/4/99	SEP 99	JAN 00
PCE	5.0 U	5 U	5 U	NS	NS
TCE	23	5 U	5 U	NS	NS
c-1,2-DCE	5.0 U	5 U	5 U	NS	NS
t-1,2-DCE	5.0 U	5 U	5 U	NS	NS
1,1-DCE	5.0 U	5 U	5 U	NS	NS
Vinyl Chloride	5.0 U	5 U	5 U	NS	NS

TW-69 (units: ug/L)

	9/8/97	5/5/99	SEP 99	JAN 00
PCE	5.0 U	5 U	NS	NS
TCE	5.0 U	5 U	NS	NS
c-1,2-DCE	5.0 U	5 U	NS	NS
t-1,2-DCE	5.0 U	5 U	NS	NS
1,1-DCE	5.0 U	5 U	NS	NS
Vinyl Chloride	5.0 U	5 U	NS	NS

Site ID: MW-00 (units: ug/L)

	9/8/97	5/5/99	9/15/99	01/05/00
PCE	5.0 U	5 U	5.0 U	5.0 U
TCE	5.0 U	5 U	5.0 U	5.0 U
c-1,2-DCE	5.4	5 U	5.0 U	5.0 U
t-1,2-DCE	5.0 U	5 U	5.0 U	5.0 U
1,1-DCE	5.0 U	5 U	5.0 U	5.0 U
Vinyl Chloride	8.6	12	5.0 U	5.5

Site ID: W-4 (units: ug/L)

	9/7/97	5/5/99	9/16/99	1/06/00
PCE	5.0 U	5 U	5.0 U	5.0 U
TCE	5.3	5 U	5.0 U	5.0 U
c-1,2-DCE	5.0 U	5 U	5.0 U	5.0 U
t-1,2-DCE	5.0 U	5 U	5.0 U	5.0 U
1,1-DCE	5.0 U	5 U	5.0 U	5.0 U
Vinyl Chloride	5.0 U	5 U	5.0 U	2.0 U

Site ID: TW-13 (units: ug/L)

	9/8/97	5/5/99	9/15/99	1/05/00
PCE	5.0 U	5 U	5.0 U	5.0 U
TCE	5.0 U	5 U	5.0 U	5.0 U
c-1,2-DCE	5.0 U	5 U	5.0 U	5.0 U
t-1,2-DCE	5.0 U	5 U	5.0 U	5.0 U
1,1-DCE	5.0 U	5 U	5.0 U	5.0 U
Vinyl Chloride	5.0 U	5 U	5.0 U	2.0 U

Site ID: W-6 (units: ug/L)

	9/8/97	5/5/99	9/16/99	1/04/00
PCE	5.0 U	5 U	5.0 U	5.0 U
TCE	5.0 U	5 U	5.0 U	5.0 U
c-1,2-DCE	5.0 U	5 U	14	5.0 U
t-1,2-DCE	5.0 U	5 U	5.0 U	5.0 U
1,1-DCE	5.0 U	5 U	5.0 U	5.0 U
Vinyl Chloride	5.0 U	5 U	5.0 U	2.0 U

Site ID: W-3 (units: ug/L)

	9/7/97	5/5/99	SEP 99	JAN 00
PCE	5.0 U	5 U	NS	NS
TCE	10	5 U	NS	NS
c-1,2-DCE	5.0 U	5 U	NS	NS
t-1,2-DCE	5.0 U	5 U	NS	NS
1,1-DCE	5.0 U	5 U	NS	NS
Vinyl Chloride	5.0 U	5 U	NS	NS

Site ID: OB-05 (units: ug/L)

	9/9/97	10/1/97	5/6/99	9/17/99	01/07/00
PCE	5,000 U	1,300 U	20	250 U	500 U
TCE	120,000	47,000	23,000 J	86,000	22,000
c-1,2-DCE	5,000 U	1,300 U	2,700 J	2,800	1,700
t-1,2-DCE	5,000 U	1,300 U	29	250 U	500 U
1,1-DCE	5,000 U	1,300 U	23	250 U	500 U
Vinyl Chloride	5,000 U	1,300 U	140	250 U	200 U

Site ID: TW-74 (units: ug/L)

	9/7/97	5/5/99	SEP 99	JAN 00
PCE	5.0 U	5 U	NS	NS
TCE	19	18 J	NS	NS
c-1,2-DCE	5.0 U	5 U	NS	NS
t-1,2-DCE	5.0 U	5 U	NS	NS
1,1-DCE	5.0 U	5 U	NS	NS
Vinyl Chloride	5.0 U	5 U	NS	NS

Site ID: OB-04 (units: ug/L)

	9/9/97	10/2/97	5/6/99	9/17/99	01/08/00
PCE	13,000 U	13,000 U	23	500 U	1300 U
TCE	550,000	280,000	68,000 J	43,000	40,000
c-1,2-DCE	27,000	13,000	1,800 J	5,000	1,300 U
t-1,2-DCE	13,000 U	13,000 U	25	500 U	1,300 U
1,1-DCE	13,000 U	13,000 U	19	500 U	1,300 U
Vinyl Chloride	13,000 U	13,000 U	5 U	500 U	500 U

Site ID: W-5 (units: ug/L)

	9/8/97	10/1/97	5/5/99	9/17/99	1/07/00
PCE	5.0 U	25 U	5 U	10 U	25 U
TCE	2,000	2,200	3,000 J	270	280
c-1,2-DCE	18	26	840 J	76	210
t-1,2-DCE	7.8	25 U	41 J	10 U	25 U
1,1-DCE	5.0 U	25 U	6.2 J	10 U	25 U
Vinyl Chloride	5.0 U	25 U	5 U	10 U	25 U

Site ID: TW-07 (units: ug/L)

	9/7/97	10/2/97	5/5/99	9/15/99	1/05/00	1/05/00(D)
PCE	5.0 U	5 U	5 U	5.0 U	5.0 U	5.0 U
TCE	41	32	14	70	26	25
c-1,2-DCE	5.3	5 U	5 U	12	5.0 U	5.0 U
t-1,2-DCE	35	31	5 U	30	20	19
1,1-DCE	5.0 U	5 U	5 U	5.0 U	5.0 U	5.0 U
Vinyl Chloride	5.0 U	5 U	5 U	5.0 U	2.0 U	2.0 U

Site ID: TW-17 (units: ug/L)

	9/6/97	5/6/99	9/17/99	1/07/00
PCE	50 U	5 U	50 U	10 U
TCE	1,900	1,500	1,400	530
c-1,2-DCE	50 U	11 J	50 U	10 U
t-1,2-DCE	50 U	5 U	50 U	10 U
1,1-DCE	50 U	5 U	50 U	10 U
Vinyl Chloride	50 U	5 U	50 U	4.0 U

Site ID: W-1 (units: ug/L)

	9/8/97	9/8/97 (D)	5/4/99	SEP 99	JAN 00
PCE	5.0 U	5.0 U	5 U	NS	NS
TCE	5.0 U	5.0 U	5 U	NS	NS
c-1,2-DCE	5.0 U	5.0 U	5 U	NS	NS
t-1,2-DCE	5.0 U	5.0 U	5 U	NS	NS
1,1-DCE	5.0 U	5.0 U	5 U	NS	NS
Vinyl Chloride	5.0 U	5.0 U	5 U	NS	NS

Site ID: TW-1 (units: ug/L)

	9/8/97	5/4/99	9/17/99	01/05/00
PCE	5.0 U	5 U	5.0 U	5.0 U
TCE	6.0	5 U	5.1	5.0 U
c-1,2-DCE	5.0 U	5 U	5.0 U	5.0 U
t-1,2-DCE	5.0 U	5 U	5.0 U	5.0 U
1,1-DCE	5.0 U	5 U	5.0 U	5.0 U
Vinyl Chloride	5.0 U	5 U	5.0 U	2.0 U

Site ID: TW-09 (units: ug/L)

	9/7/97	5/5/99	5/5/99 (D)	9/17/99	1/07/00
PCE	13 U	10 U	5 U	25 U	5.0 U
TCE	410	880 J	990 J	520	250
c-1,2-DCE	23	34 J	28 J	39	31
t-1,2-DCE	13 U	10 U	5 U	25 U	5.0 U
1,1-DCE	13 U	10 U	5 U	25 U	5.0 U
Vinyl Chloride	13 U	10 U	5 U	25 U	2.0 U

Site ID: TW-20 (units: ug/L)

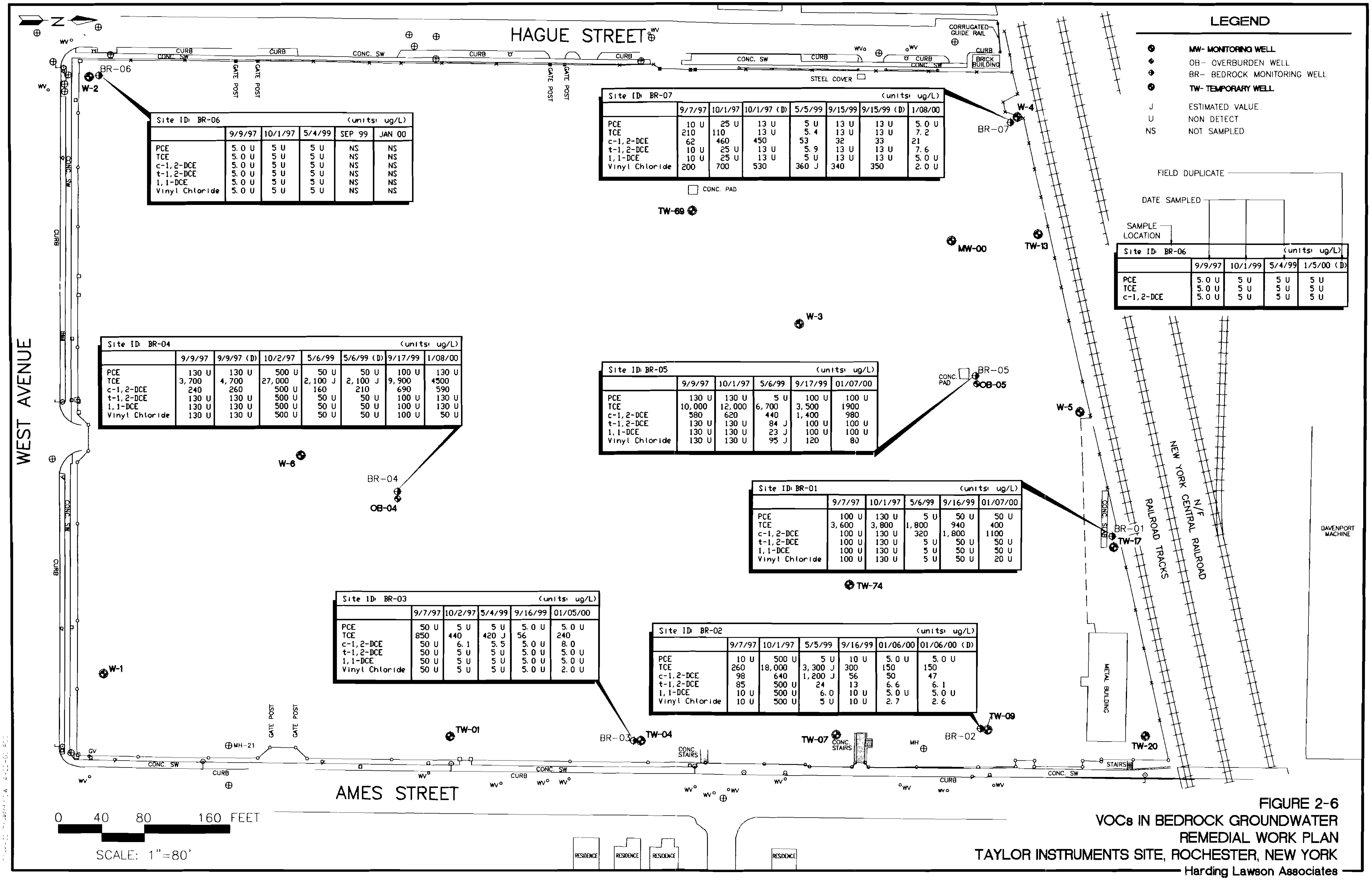
	9/8/97	5/5/99	9/16/99	9/16/99 (D)	1/06/00
PCE	5.0 U	5 U	5.0 U	5.0 U	5.0 U
TCE	11	11 J	5.0 U	5.0 U	7.8
c-1,2-DCE	5.0 U	5 U	5.0 U	5.0 U	5.0 U
t-1,2-DCE	5.0 U	5 U	5.0 U	5.0 U	5.0 U
1,1-DCE	5.0 U	5 U	5.0 U	5.0 U	5.0 U
Vinyl Chloride	5.0 U	5 U	5.0 U	5.0 U	2.0 U

Site ID: TW-4 (units: ug/L)

	9/6/97	9/6/97 (D)	5/4/99	9/16/99	9/16/99	01/05/00
PCE	5.0 U	5.0 U	5 U	5.0 U	5.0 U	5.0 U
TCE	77	72	91	92	92	88
c-1,2-DCE	5.0 U	5.0 U	5 U	5.0 U	5.0 U	5.0 U
t-1,2-DCE	5.0 U	5.0 U	5 U	5.0 U	5.0 U	5.0 U
1,1-DCE	5.0 U	5.0 U	5 U	5.0 U	5.0 U	5.0 U
Vinyl Chloride	5.0 U	5.0 U	5 U	5.0 U	5.0 U	2.0 U

FIGURE 2-5
VOCs IN OVERBURDEN GROUNDWATER
REMEDIAL WORK PLAN
TAYLOR INSTRUMENTS SITE, ROCHESTER, NEW YORK

Harding Lawson Associates



Site ID: BR-06					(units: ug/L)
	9/9/97	10/1/97	5/4/99	SEP 99	JAN 00
PCE	5.0 U	5 U	5 U	NS	NS
TCE	5.0 U	5 U	5 U	NS	NS
c-1,2-DCE	5.0 U	5 U	5 U	NS	NS
t-1,2-DCE	5.0 U	5 U	5 U	NS	NS
1,1-DCE	5.0 U	5 U	5 U	NS	NS
Vinyl Chloride	5.0 U	5 U	5 U	NS	NS

Site ID: BR-07							(units: ug/L)
	9/7/97	10/1/97	10/1/97 (D)	5/5/99	9/15/99	9/15/99 (D)	1/08/00
PCE	10 U	25 U	13 U	5 U	13 U	13 U	5.0 U
TCE	210	110	13 U	5.4	13 U	13 U	7.2
c-1,2-DCE	62	460	450	53	32	33	21
t-1,2-DCE	10 U	25 U	13 U	5.9	13 U	13 U	7.6
1,1-DCE	10 U	25 U	13 U	5 U	13 U	13 U	5.0 U
Vinyl Chloride	200	700	530	360 J	340	350	2.0 U

Site ID: BR-04							(units: ug/L)
	9/9/97	9/9/97 (D)	10/2/97	5/6/99	5/6/99 (D)	9/17/99	1/08/00
PCE	130 U	130 U	500 U	50 U	50 U	100 U	130 U
TCE	3,700	4,700	27,000	2,100 J	2,100 J	9,900	4500
c-1,2-DCE	240	260	500 U	160	210	690	590
t-1,2-DCE	130 U	130 U	500 U	50 U	50 U	100 U	130 U
1,1-DCE	130 U	130 U	500 U	50 U	50 U	100 U	130 U
Vinyl Chloride	130 U	130 U	500 U	50 U	50 U	100 U	50 U

Site ID: BR-05					(units: ug/L)
	9/9/97	10/1/97	5/6/99	9/17/99	01/07/00
PCE	130 U	130 U	5 U	100 U	100 U
TCE	10,000	12,000	6,700	3,500	1900
c-1,2-DCE	580	620	440	1,400	980
t-1,2-DCE	130 U	130 U	84 J	100 U	100 U
1,1-DCE	130 U	130 U	23 J	100 U	100 U
Vinyl Chloride	130 U	130 U	95 J	120	80

Site ID: BR-01					(units: ug/L)
	9/7/97	10/1/97	5/6/99	9/16/99	01/07/00
PCE	100 U	130 U	5 U	50 U	50 U
TCE	3,600	3,800	1,800	940	400
c-1,2-DCE	100 U	130 U	320	1,800	1100
t-1,2-DCE	100 U	130 U	5 U	50 U	50 U
1,1-DCE	100 U	130 U	5 U	50 U	50 U
Vinyl Chloride	100 U	130 U	5 U	50 U	20 U

Site ID: BR-03					(units: ug/L)
	9/7/97	10/2/97	5/4/99	9/16/99	01/05/00
PCE	50 U	5 U	5 U	5.0 U	5.0 U
TCE	850	440	420 J	56	240
c-1,2-DCE	50 U	6.1	5.5	5.0 U	8.0
t-1,2-DCE	50 U	5 U	5 U	5.0 U	5.0 U
1,1-DCE	50 U	5 U	5 U	5.0 U	5.0 U
Vinyl Chloride	50 U	5 U	5 U	5.0 U	2.0 U

Site ID: BR-02						(units: ug/L)
	9/7/97	10/1/97	5/5/99	9/16/99	01/06/00	01/06/00 (D)
PCE	10 U	500 U	5 U	10 U	5.0 U	5.0 U
TCE	260	18,000	3,300 J	300	150	150
c-1,2-DCE	98	640	1,200 J	56	50	47
t-1,2-DCE	85	500 U	24	13	6.6	6.1
1,1-DCE	10 U	500 U	6.0	10 U	5.0 U	5.0 U
Vinyl Chloride	10 U	500 U	5 U	10 U	2.7	2.6

LEGEND

MW- MONITORING WELL
OB- OVERBURDEN WELL
BR- BEDROCK MONITORING WELL
TW- TEMPORARY WELL

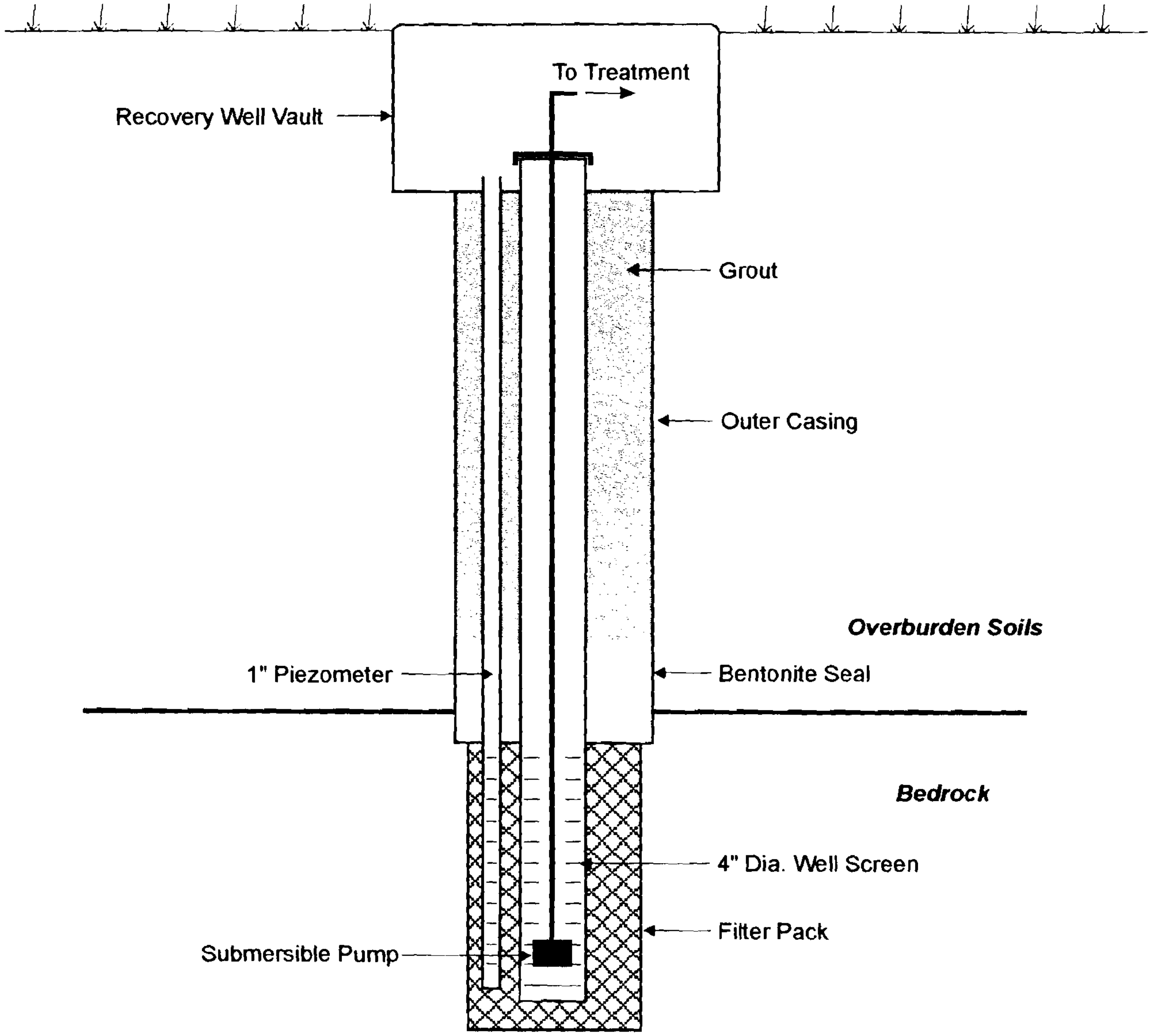
J	ESTIMATED VALUE
U	NON DETECT
NS	NOT SAMPLED

FIELD DUPLICATE
DATE SAMPLED
SAMPLE LOCATION

Site ID: BR-06				(units: ug/L)
	9/9/97	10/1/99	5/4/99	1/5/00 (D)
PCE	5.0 U	5 U	5 U	5 U
TCE	5.0 U	5 U	5 U	5 U
c-1,2-DCE	5.0 U	5 U	5 U	5 U

FIGURE 2-6
VOCs IN BEDROCK GROUNDWATER
REMEDIAL WORK PLAN
TAYLOR INSTRUMENTS SITE, ROCHESTER, NEW YORK

Harding Lawson Associates



Not To Scale

Harding Lawson Associates
Engineering and
Environmental Services

Typical Section Bedrock Well Diagram
Remedial Work Plan
Taylor Instruments Site
Rochester, New York

FIGURE
2-7

DRAWN	JOB NUMBER	FILE NUMBER	DATE	REVISED DATE
BGF	44836	W9908001a	8/99	8/99

APPENDIX A

PRE-DESIGN INVESTIGATION RESULTS

Harding Lawson Associates

HLA

November 20, 1998

Mr. David Pratt, P.E.
New York State Department of Environmental Conservation
6274 East Avon-Lima Road
Avon, NY 14414

Re: Taylor Instruments Site
Pre-Design Investigation Results

Dear Mr. Pratt:

In accordance with our letter to you of September 10, 1998 (Draft) enclosed are analytical results and an exploration location map from the on-site pre-design investigations completed to date.

Specifically with respect to the VOC source area delineation work, we believe it will be to our mutual benefit to meet and discuss the data and its implications on remedial design. Prior to the session we would provide you with interpretive materials which integrate results from recent and previous investigations and engineering evaluations.

If this is agreeable to you please contact me to discuss potential meeting dates.

Sincerely,

HARDING LAWSON ASSOCIATES

Geoffrey Knight
Project Manager

cc: M.J. Peachy, NYSDEC
D. Napier, NYSDOH
J. Albert, MCHD

Engineering and
Environmental Services

1400 Centerpoint Boulevard, Suite 158, Knoxville, TN 37932 423/531-1922 Fax 423/531-8226

Page: 1A of 3A
Date: 11/19/98

SUMMARY OF TCE RESULTS
Pre-Design Investigation
Taylor Instruments Facility
Rochester, New York

SITE	DATE	DEPTH (ft)	RESULT TYPE	Trichloroethene (ug/kg)
B201	09/09/98	2.00	Prim	5900000
B201	09/09/98	10.00	Prim	1000
B201	09/09/98	18.00	Prim	4600
B202	09/09/98	2.00	Prim	2100000
B202	09/09/98	10.00	Prim	2500
B202	09/09/98	20.00	Prim	4300
B203	09/10/98	4.00	Prim	19000
B203	09/10/98	14.00	Prim	9300
B203	09/10/98	22.00	Prim	39000
B204	09/10/98	6.00	Prim	330
B204	09/10/98	10.00	Prim	1300
B204	09/10/98	20.00	Prim	9000
B205	09/10/98	10.00	Prim	<200 U
B205	09/10/98	24.00	Prim	<200 U
06	09/11/98	12.00	Prim	20000
B206	09/11/98	24.00	Prim	240
B207	09/11/98	10.00	Prim	<200 U
B207	09/11/98	22.00	Prim	2300
B208	09/14/98	4.00	Prim	630000
B208	09/14/98	8.00	Prim	32000
B208	09/14/98	18.00	Prim	3000
B208	09/14/98	24.00	Prim	2600
B209	09/14/98	4.00	Prim	31000
B209	09/14/98	16.00	Prim	<200 U
B209	09/14/98	24.00	Prim	11000
B210	09/15/98	16.00	Prim	2100
B210	09/15/98	24.00	Prim	3900
B211	09/15/98	16.00	Prim	340
B211	09/15/98	24.00	Prim	250
B212	09/15/98	16.00	Prim	320
B212	09/15/98	24.00	Prim	400
B213	09/28/98	14.00	Prim	2600
B213	09/28/98	24.00	Prim	4400 J
B214	09/28/98	4.00	Prim	59000 J

lues represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

For RCL TCEOFF

SUMMARY OF TCE RESULTS
Pre-Design Investigation
Taylor Instruments Facility
Rochester, New York

SITE	DATE	DEPTH (ft)	RESULT TYPE	Trichloroethene (ug/kg)
B214	09/28/98	8.00	Prim	1200 J
B214	09/28/98	20.00	Prim	950 J
B215	09/29/98	2.00	Prim	370
B215	09/29/98	10.00	Prim	<200 U
8215	09/29/98	24.00	Prim	<200 U
B216	09/29/98	14.00	Prim	240
B216	09/29/98	24.00	Prim	2500
B217	09/29/98	14.00	Prim	<200 U
B217	09/29/98	24.00	Prim	3000
B250	09/16/98	4.00	Prim	11000
B250	09/16/98	10.00	Prim	16000
B250	09/16/98	16.00	Prim	5000000
B250	09/16/98	20.00	Prim	150000
B251	09/16/98	4.00	Prim	5500
51	09/16/98	8.00	Prim	2700000
251	09/16/98	16.00	Prim	5100
B252	09/16/98	12.00	Prim	2800
B252	09/16/98	20.00	Prim	4500
B253	09/17/98	2.00	Prim	4400
B253	09/17/98	8.00	Prim	3000000
B253	09/17/98	12.00	Prim	44000
B253	09/17/98	16.00	Prim	6300
B254	09/17/98	8.00	Prim	6100
B254	09/17/98	12.00	Prim	4100
B254	09/17/98	18.00	Prim	120000
B255	09/17/98	12.00	Prim	29000
B255	09/17/98	20.00	Prim	2100
B256	09/18/98	8.00	Prim	7800
B256	09/18/98	16.00	Prim	46000
B257	09/18/98	14.00	Prim	1800
B258	09/21/98	10.00	Prim	<200 U
B258	09/21/98	18.00	Prim	<200 U
B259	09/21/98	10.00	Prim	27000
B259	09/21/98	14.00	Prim	45000

lues represent total concentrations unless noted   < = Not detected at indicated reporting limit   -- = Not analyzed

For RCL TCEOFF

Date: 11/19/98

SUMMARY OF TCE RESULTS
Pre-Design Investigation
Taylor Instruments Facility
Rochester, New York

SITE	DATE	DEPTH (ft)	RESULT TYPE	Trichloroethene (ug/kg)
B259	09/21/98	18.00	Prim	86000
B260	09/22/98	8.00	Prim	4100000
B260	09/22/98	12.00	Prim	100000
B260	09/22/98	16.00	Prim	77000
B261	09/22/98	10.00	Prim	7100
B261	09/22/98	20.00	Prim	8500
B262	09/22/98	10.00	Prim	4600
B262	09/22/98	20.00	Prim	2200
B263	09/23/98	4.00	Prim	21000
B263	09/23/98	10.00	Prim	26000
B263	09/23/98	16.00	Prim	3400000
B263	09/23/98	20.00	Prim	120000
B264	09/23/98	10.00	Prim	15000
B264	09/23/98	20.00	Prim	11000
269	09/24/98	10.00	Prim	11000
B269	09/24/98	14.00	Prim	94000 J
B270	09/25/98	8.00	Prim	11000
B270	09/25/98	12.00	Prim	58000
B270	09/25/98	18.00	Prim	71000
B271	09/25/98	8.00	Prim	940
B271	09/25/98	12.00	Prim	1800
B271	09/25/98	20.00	Prim	740
B272	09/30/98	8.00	Prim	3200
B272	09/30/98	16.00	Prim	4300
B273	09/30/98	8.00	Prim	<200 U
B273	09/30/98	16.00	Prim	4600
B274	09/30/98	6.00	Prim	<200 U
B274	09/30/98	18.00	Prim	<200 U

'alues represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

For RCL TCEOFF

SUMMARY OF [illegible]URY RESULTS
Pre-Design Investigation
Taylor Instruments Facility
Rochester, New York

SAMPLE ID	TEST TRENCH ID	COMMENTS	PARAMETER	CONCENTRATION	UNITS
TT010103X	TT01	No Shards	MERCURY	2.42	MG/KG
TT010103X	TT01	No Shards	MERCURY	17.1	MG/KG
TT010202X	TT01	No Shards	MERCURY	0.368	MG/KG
TT010202X	TT01	No Shards	MERCURY	0.301	MG/KG
TT020102D	TT02	Above Shards	MERCURY	60.9	MG/KG
TT020102D	TT02	Above Shards	MERCURY	57.6	MG/KG
TT020102X	TT02	Above Shards	MERCURY	88.3	MG/KG
TT020102X	TT02	Above Shards	MERCURY	116	MG/KG
TT020102X	TT02	Above Shards	TCLP LEAD	ND	MG/L
TT020102X	TT02	Above Shards	TCLP MERCURY	ND	MG/L
TT020203D	TT02	Shards	MERCURY	1770	MG/KG
TT020203D	TT02	Shards	TCLP LEAD	1.39	MG/L
TT020203D	TT02	Shards	TCLP MERCURY	0.0686	MG/L
TT020203X	TT02	Shards	MERCURY	2170	MG/KG
TT020203X	TT02	Shards	TCLP LEAD	0.206	MG/L
TT020203X	TT02	Shards	TCLP MERCURY	0.107	MG/L
TT020305D	TT02	Below Shards	MERCURY	41.2	MG/KG
TT020305D	TT02	Below Shards	MERCURY	40.2	MG/KG
TT020305X	TT02	Below Shards	MERCURY	39.9	MG/KG
TT020305X	TT02	Below Shards	MERCURY	38.1	MG/KG
TT020402X	TT02	Above Shards	MERCURY	16.9	MG/KG
TT020402X	TT02	Above Shards	MERCURY	12.9	MG/KG
TT020503X	TT02	Shards	MERCURY	194	MG/KG
TT020503X	TT02	Shards	TCLP LEAD	3.85	MG/L
TT020503X	TT02	Shards	TCLP MERCURY	0.0450	MG/L
TT020605X	TT02	Below Shards	MERCURY	0.508	MG/KG
TT020605X	TT02	Below Shards	MERCURY	0.497	MG/KG
TT030103X	TT03	Free Hg - Shards	MERCURY	634	MG/KG
TT030103X	TT03	Free Hg - Shards	TCLP LEAD	3.12	MG/L
TT030103X	TT03	Free Hg - Shards	TCLP MERCURY	0.0726	MG/L
TT030204D	TT03	Shards	MERCURY	14800	MG/KG
TT030204D	TT03	Shards	TCLP ARSENIC	ND	MG/L
TT030204D	TT03	Shards	TCLP BARIUM	2.03	MG/L

SUMMARY OF [illegible]CURY RESULTS
Pre-Design Investigation
Taylor Instruments Facility
Rochester, New York

SAMPLE ID	TEST TRENCH ID	COMMENTS	PARAMETER	CONCENTRATION	UNITS
TT030204D	TT03	Shards	TCLP CADMIUM	ND	MG/L
TT030204D	TT03	Shards	TCLP CHROMIUM	ND	MG/L
TT030204D	TT03	Shards	TCLP LEAD	19.7	MG/L
TT030204D	TT03	Shards	TCLP MERCURY	0.00500	MG/L
TT030204D	TT03	Shards	TCLP SELENIUM	ND	MG/L
TT030204D	TT03	Shards	TCLP SILVER	ND	MG/L
TT030204X	TT03	Shards	MERCURY	4030	MG/KG
TT030204X	TT03	Shards	TCLP ARSENIC	ND	MG/L
TT030204X	TT03	Shards	TCLP BARIUM	1.45	MG/L
TT030204X	TT03	Shards	TCLP CADMIUM	ND	MG/L
TT030204X	TT03	Shards	TCLP CHROMIUM	ND	MG/L
TT030204X	TT03	Shards	TCLP LEAD	7.38	MG/L
TT030204X	TT03	Shards	TCLP MERCURY	0.00605	MG/L
TT030204X	TT03	Shards	TCLP SELENIUM	ND	MG/L
TT030204X	TT03	Shards	TCLP SILVER	ND	MG/L
TT030302D	TT03	Above Shards	MERCURY	475	MG/KG
TT030302D	TT03	Above Shards	TCLP LEAD	0.824	MG/L
TT030302D	TT03	Above Shards	TCLP MERCURY	0.00438	MG/L
TT030302X	TT03	Above Shards	MERCURY	90.1	MG/KG
TT030302X	TT03	Above Shards	MERCURY	111	MG/KG
TT030302X	TT03	Above Shards	TCLP LEAD	ND	MG/L
TT030302X	TT03	Above Shards	TCLP MERCURY	0.0261	MG/L
TT030403X	TT03	Shards	MERCURY	388	MG/KG
TT030403X	TT03	Shards	TCLP LEAD	4.02	MG/L
TT030403X	TT03	Shards	TCLP MERCURY	0.118	MG/L
TT030504D	TT03	Below Shards	MERCURY	22.4	MG/KG
TT030504D	TT03	Below Shards	MERCURY	12.2	MG/KG
TT030504X	TT03	Below Shards	MERCURY	25.7	MG/KG
TT030504X	TT03	Below Shards	MERCURY	11.6	MG/KG
TT040102X	TT04	Above Shards	MERCURY	78.5	MG/KG
TT040102X	TT04	Above Shards	MERCURY	143	MG/KG
TT040102X	TT04	Above Shards	TCLP LEAD	4.52	MG/L
TT040102X	TT04	Above Shards	TCLP MERCURY	ND	MG/L

SUMMARY OF [illegible]CURY RESULTS
Pre-Design Investigation
Taylor Instruments Facility
Rochester, New York

SAMPLE ID	TEST TRENCH ID	COMMENTS	PARAMETER	CONCENTRATION	UNITS
TT040201X	TT04	Above Shards	MERCURY	178	MG/KG
TT040201X	TT04	Above Shards	TCLP LEAD	0.160	MG/L
TT040201X	TT04	Above Shards	TCLP MERCURY	0.0109	MG/L
TT040302X	TT04	Shards	MERCURY	1800	MG/KG
TT040302X	TT04	Shards	TCLP LEAD	2.05	MG/L
TT040302X	TT04	Shards	TCLP MERCURY	0.0208	MG/L
TT040403X	TT04	Below Shards	MERCURY	227	MG/KG
TT040403X	TT04	Below Shards	TCLP LEAD	0.753	MG/L
TT040403X	TT04	Below Shards	TCLP MERCURY	0.00876	MG/L
TT040501X	TT04	Above Shards	MERCURY	75.6	MG/KG
TT040501X	TT04	Above Shards	MERCURY	127	MG/KG
TT040501X	TT04	Above Shards	TCLP LEAD	0.183	MG/L
TT040501X	TT04	Above Shards	TCLP MERCURY	ND	MG/L
TT040602X	TT04	Shards	MERCURY	361	MG/KG
TT040602X	TT04	Shards	TCLP LEAD	0.106	MG/L
TT040602X	TT04	Shards	TCLP MERCURY	0.00907	MG/L
TT040703X	TT04	Below Shards	MERCURY	43.5	MG/KG
TT040703X	TT04	Below Shards	MERCURY	22.6	MG/KG
TT040802X	TT04	Shards	MERCURY	8590	MG/KG
TT040802X	TT04	Shards	TCLP ARSENIC	ND	MG/L
TT040802X	TT04	Shards	TCLP BARIUM	2.36	MG/L
TT040802X	TT04	Shards	TCLP CADMIUM	0.141	MG/L
TT040802X	TT04	Shards	TCLP CHROMIUM	ND	MG/L
TT040802X	TT04	Shards	TCLP LEAD	11.0	MG/L
TT040802X	TT04	Shards	TCLP MERCURY	0.0970	MG/L
TT040802X	TT04	Shards	TCLP SELENIUM	ND	MG/L
TT040802X	TT04	Shards	TCLP SILVER	ND	MG/L
TT040902X	TT04	No Shards	MERCURY	5.47	MG/KG
TT040902X	TT04	No Shards	MERCURY	4.56	MG/KG
TT041003X	TT04	No Shards	MERCURY	1.36	MG/KG
TT041003X	TT04	No Shards	MERCURY	0.546	MG/KG
TT041105X	TT04	No Shards	MERCURY	0.115	MG/KG
TT041105X	TT04	No Shards	MERCURY	0.0978	MG/KG

SUMMARY OF CURY RESULTS
Pre-Design Investigation
Taylor Instruments Facility
Rochester, New York

SAMPLE ID	TEST TRENCH ID	COMMENTS	PARAMETER	CONCENTRATION	UNITS
TT050105X	TT05	Free Hg - Shards	MERCURY	3860	MG/KG
TT050105X	TT05	Free Hg - Shards	TCLP ARSENIC	ND	MG/L
TT050105X	TT05	Free Hg - Shards	TCLP BARIUM	2.28	MG/L
TT050105X	TT05	Free Hg - Shards	TCLP CADMIUM	0.131	MG/L
TT050105X	TT05	Free Hg - Shards	TCLP CHROMIUM	ND	MG/L
TT050105X	TT05	Free Hg - Shards	TCLP LEAD	16.9	MG/L
TT050105X	TT05	Free Hg - Shards	TCLP MERCURY	0.00336	MG/L
TT050105X	TT05	Free Hg - Shards	TCLP SELENIUM	ND	MG/L
TT050105X	TT05	Free Hg - Shards	TCLP SILVER	ND	MG/L
TT050206X	TT05	Below Shards	MERCURY	1.99	MG/KG
TT050206X	TT05	Below Shards	MERCURY	0.491	MG/KG
TT050303X	TT05	Shards	MERCURY	20.0	MG/KG
TT050303X	TT05	Shards	MERCURY	13.2	MG/KG
TT060102X	TT06	Shards	MERCURY	221	MG/KG
TT060102X	TT06	Shards	TCLP LEAD	2.72	MG/L
TT060102X	TT06	Shards	TCLP MERCURY	0.0116	MG/L
TT060202X	TT06	No Shards	MERCURY	8.28	MG/KG
TT060202X	TT06	No Shards	MERCURY	5.98	MG/KG
TT070102X	TT07	Shards	MERCURY	10300	MG/KG
TT070102X	TT07	Shards	TCLP ARSENIC	ND	MG/L
TT070102X	TT07	Shards	TCLP BARIUM	1.32	MG/L
TT070102X	TT07	Shards	TCLP CADMIUM	ND	MG/L
TT070102X	TT07	Shards	TCLP CHROMIUM	ND	MG/L
TT070102X	TT07	Shards	TCLP LEAD	2.67	MG/L
TT070102X	TT07	Shards	TCLP MERCURY	0.249	MG/L
TT070102X	TT07	Shards	TCLP SELENIUM	ND	MG/L
TT070102X	TT07	Shards	TCLP SILVER	ND	MG/L
TT070203X	TT07	Below Shards	MERCURY	16.0	MG/KG
TT070203X	TT07	Below Shards	MERCURY	11.0	MG/KG
TT070302X	TT07	No Shards	MERCURY	1.40	MG/KG
TT070302X	TT07	No Shards	MERCURY	0.721	MG/KG
TT070402D	TT07	Shards	MERCURY	8.99	MG/KG
TT070402D	TT07	Shards	MERCURY	10.7	MG/KG

SUMMARY OF [illegible]CURY RESULTS
Pre-Design Investigation
Taylor Instruments Facility
Rochester, New York

SAMPLE ID	TEST TRENCH ID	COMMENTS	PARAMETER	CONCENTRATION	UNITS
TT070402D	TT07	Shards	TCLP LEAD	ND	MG/L
TT070402D	TT07	Shards	TCLP MERCURY	ND	MG/L
TT070402X	TT07	Shards	MERCURY	26.3	MG/KG
TT070402X	TT07	Shards	MERCURY	146	MG/KG
TT070402X	TT07	Shards	TCLP LEAD	0.136	MG/L
TT070402X	TT07	Shards	TCLP MERCURY	ND	MG/L
TT070503X	TT07	Shards	MERCURY	15.9	MG/KG
TT070503X	TT07	Shards	MERCURY	15.3	MG/KG
TT070602X	TT07	No Shards	MERCURY	586	MG/KG
TT070602X	TT07	No Shards	TCLP LEAD	0.218	MG/L
TT070602X	TT07	No Shards	TCLP MERCURY	ND	MG/L
TT080102D	TT08	Shards	MERCURY	38100	MG/KG
TT080102D	TT08	Shards	TCLP ARSENIC	ND	MG/L
TT080102D	TT08	Shards	TCLP BARIUM	ND	MG/L
TT080102D	TT08	Shards	TCLP CADMIUM	ND	MG/L
TT080102D	TT08	Shards	TCLP CHROMIUM	ND	MG/L
TT080102D	TT08	Shards	TCLP LEAD	31.0	MG/L
TT080102D	TT08	Shards	TCLP MERCURY	0.0123	MG/L
TT080102D	TT08	Shards	TCLP SELENIUM	ND	MG/L
TT080102D	TT08	Shards	TCLP SILVER	ND	MG/L
TT080102X	TT08	Shards	MERCURY	20800	MG/KG
TT080102X	TT08	Shards	TCLP ARSENIC	ND	MG/L
TT080102X	TT08	Shards	TCLP BARIUM	1.24	MG/L
TT080102X	TT08	Shards	TCLP CADMIUM	ND	MG/L
TT080102X	TT08	Shards	TCLP CHROMIUM	ND	MG/L
TT080102X	TT08	Shards	TCLP LEAD	4.34	MG/L
TT080102X	TT08	Shards	TCLP MERCURY	0.0188	MG/L
TT080102X	TT08	Shards	TCLP SELENIUM	ND	MG/L
TT080102X	TT08	Shards	TCLP SILVER	ND	MG/L
TT080203X	TT08	Below Shards	MERCURY	109	MG/KG
TT080203X	TT08	Below Shards	TCLP LEAD	ND	MG/L
TT080203X	TT08	Below Shards	TCLP MERCURY	0.00314	MG/L
TT090102D	TT09	No Shards	MERCURY	65.8	MG/KG

SUMMARY OF [illegible]RY RESULTS
Pre-Design I[illegible]estigation
Taylor Instruments Facility
Rochester, New York

SAMPLE ID	TEST TRENCH ID	COMMENTS	PARAMETER	CONCENTRATION	UNITS
TT090102D	TT09	No Shards	MERCURY	106	MG/KG
TT090102X	TT09	No Shards	MERCURY	89.4	MG/KG
TT090102X	TT09	No Shards	MERCURY	128	MG/KG
TT090102X	TT09	No Shards	TCLP LEAD	ND	MG/L
TT090102X	TT09	No Shards	TCLP MERCURY	ND	MG/L
TT090202X	TT09	No Shards	MERCURY	1.90	MG/KG
TT090202X	TT09	No Shards	MERCURY	1.28	MG/KG
TT100103X	TT10	White Ash	MERCURY	17.7	MG/KG
TT100103X	TT10	White Ash	MERCURY	16.6	MG/KG
TT110102X	TT11	No Shards	MERCURY	49.9	MG/KG
TT110102X	TT11	No Shards	MERCURY	16.2	MG/KG
TT110205X	TT11	No Shards	MERCURY	ND	MG/KG
TT110205X	TT11	No Shards	MERCURY	ND	MG/KG
TT110302X	TT11	No Shards	MERCURY	42.3	MG/KG
TT110302X	TT11	No Shards	MERCURY	16.9	MG/KG
TT110405X	TT11	No Shards	TCLP LEAD	ND	MG/L
TT110405X	TT11	No Shards	MERCURY	110	MG/KG
TT110405X	TT11	No Shards	TCLP MERCURY	0.0258	MG/L

APPENDIX B

CORRESPONDENCE RELATED TO MERCURY CLEANUP GOALS

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 8
6274 East Avon-Lima Road, Avon, New York 14414-9519
Phone: (716) 226-2466 FAX: (716) 226-8696

John P. Cahill
Commissioner

Post-it® Fax Note 7671

To Jean McCreary	Date 7/10 # of pages ▶ 2
Co./Dept.	From Dave Prat
Phone #	Co. NYSDEC
Fax #	Phone #
	Fax #

July 10, 1998

Jean H. McCreary
Nixon, Hargrave, Devans & Doyle
Clinton Square
Post Office Box 1051
Rochester, NY 14603-1051

Re: Taylor Instruments Site #828028a
Rochester (C), Monroe (C)

Dear Ms. McCreary:

This is in response to your July 7, 1998 letter regarding the remediation of the Taylor Instruments site. For the most part, your July 7 letter represents an acceptable approach for remediation of the site; however, we do need you to agree to some clarifications:

1. There will be a requirement for post-excavation confirmatory sampling for mercury. However, comprehensive pre-excavation delineation during design will lead to acceptance of a less comprehensive post-excavation sampling program.

2. As stated in my June 25, 1998 letter, comment #2, the NYSDEC has not agreed to the definition of the TCE source areas as those areas with concentrations above 7 ppm TCE. All TCE soil concentrations above the TAGM level of 0.7 ppm are to be the focus of the remedial efforts. We understand your desire to put a cost cap on the remediation of these "expanded" areas; however, we are not in a position to do this. $50,000 may be a reasonable estimate but we cannot guarantee this would or should be the cap.

   Design phase investigation data around the source areas will be needed to further define the TCE contamination. We will review the design plans generated from these data and, if necessary, make a determination at that time whether the benefits of remediating outlying low level TCE contaminated areas are worthwhile. This determination will be made based on the same evaluation criteria that a normal Record of Decision is subject to (including cost-effectiveness and compliance with Standards, Criteria and Guidelines, among other things).

3. Please be aware that engineering controls on structures to ensure that soil VOC vapors do not pose a health risk may be necessary outside of "source areas" due to vapor migration under parking lots, etc.. This may be addressed in the soil management plan.

Please provide me with your acceptance or rejection of the above in writing by close of business July 14, 1998. I look forward to hearing from you and to successful resolution of this matter.

Sincerely,

David G. Pratt, P.E.
Environmental Engineer 2

cc: M.J. Peachey
J. Charles
M. Rivara
D. Napier
J. Harrington
R. Schick
J. Albert

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WASHINGTON D.C. 20005
(202) 457-5[illegible]

July 7, 1998

<u>VIA FAX AND U.S. MAIL</u>

David G. Pratt
Environmental Engineer 2
New York State Department of Environmental Conservation
Region 8
6274 East Avon-Lima Road
Avon, New York 14414-9519

RE: Taylor Instruments Site #828028

Dear David:

On behalf of Combustion Engineering, this responds to the New York State Department of Environmental Conservation ("NYSDEC" or "Department") offer set forth in your letter of June 17 as clarified in your letter of June 25 and subsequent conversations regarding cleanup goals for the site pursuant to the Voluntary Cleanup Agreement between the parties. CE accepts the Department's offer as follows:

1. **Mercury** – CE will meet 10 ppm from 0'-1' below finished grade, and meet 100 ppm below 1'. CE will replace on-site clay-tile sewers. No additional site characterization is required, although during the design phase a confirmatory sampling program to demonstrate that the clean up goal has been met will be proposed.

2. **TCE/VOCs** – CE will institute an in-situ treatment system in the "source areas" designed to achieve the 0.7 mg/kg level (TAGM) in soils, and to achieve groundwater standards at the perimeter over time. The boundaries of the "source areas" to be encompassed by the in-situ treatment system will be defined during the design phase based on a limited screening investigation to determine areas affected by the two identified source area activities (TCE bulk storage and vapor degreasing). During the design phase, we are willing to explore extending the proposed "source area" boundaries beyond the 7.0 mg/kg limit contained in CE's original proposal, if that extension can be done at a cost of the order of magnitude estimated by NYSDEC (approx. $50,000). If the expanded remediation proposed by NYSDEC cannot be performed at the cost that NYSDEC has estimated, additional remediation in these "expanded" source areas of

soils above 0.7 mg/kg but below 7.0 mg/kg would not be cost-effective, would not yield significant benefits in terms of protectiveness of human health or the environment, and, therefore, would not be required. This approach is cost-effective and consistent with other RODs issued in this region in which remediation was limited to defined source areas. Other than data required to define "source areas," no additional site characterization will be required. Post-remediation monitoring will be conducted in overburden and bedrock groundwater and to assess NAPLs, as stated in your June 17 letter.

3. **Off-Site** – CE will address off-site mercury sewer conditions to the satisfaction of the Monroe County Pure Water Authority, and will propose a monitoring program which considers on- and off-site concerns raised by the Department of Health. There will be no additional off-site investigations or remediation.

4. **Institutional Controls / Deed Restrictions** – CE will commit to deed restrictions against residential development and institute engineering controls on structures to ensure that soil vapors (TCE) do not pose an inhalation health risk to construction over source areas and precluding the use of groundwater for any purpose. A soil management plan for future development will be prepared.

As you can see from the above offer, CE has made substantial compromises in its positions to accommodate concerns expressed by the Department at recent meetings and in your letters and calls. CE has done so in the interests of settling this matter and directing its resources towards remediation rather than towards defending an adversarial listing process.

Assuming this is acceptable to the Department, CE proposes a conference call to discuss matters such as scheduling submission of the Investigative Report and Remedial Plan. Please feel free to call me if you have any questions or comments.

Sincerely,

Jean H. McCreary

Jean H. McCreary

cc: M.J. Peachey
J. Charles, Esq.

bcc: A. Karlbergs
P. Reckmeyer
A. Harrington
E. Feldman
K. Blakeley
G. Knight
M.E. Ford

New York State Department of Environmental Conservation
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Phone: (716) 226-2466 FAX: (716) 226-8696

John P. Cahill
Commissioner

June 25, 1998

Jean H. McCreary
Nixon, Hargrave, Devans & Doyle
Clinton Square
Post Office Box 1051
Rochester, NY 14603-1051

Re: Taylor Instruments Site #828028a
Rochester (C), Monroe (C)

Dear Ms. McCreary:

This is in response to your June 18, 1998 letter regarding the New York State Department of Environmental Conservation's (NYSDEC) proposal for remediation of the Taylor Instruments site. For the most part, your June 18 letter presents NYSDEC's approach accurately; however, we do have some clarifications to make:

1) The 10 ppm goal should address 0' - 1' below finished grade, whether it is "current" grade or some future finished grade.

2) The NYSDEC has not agreed to the definition of the TCE source areas as those areas with concentrations above 7 ppm TCE. All TCE soil concentrations above the TAGM level of 0.7 ppm are to be the focus of the remedial efforts.

   Also, cost will not be the only means of determining effectiveness of the system, although it will be taken into account.

   Furthermore, reduced soil contaminant levels may not be indicative of the effectiveness of the treatment system. Non-aqueous phase liquids (NAPLs) in both the overburden and bedrock may or may not be effectively treated by the proposed system. Contaminant monitoring in perimeter overburden and bedrock groundwater will need to be supplemented by overburden and bedrock monitoring closer to the source areas. If either the overburden or bedrock system is turned off, NAPL may contribute to groundwater contaminant levels rising again. Wells closer to the source areas will be beneficial in determining whether the system has been effective or needs to be turned back on (pulsing systems on and off is not uncommon).

   Finally, there was some discussion regarding construction over the TCE source areas. This construction will either need to be restricted or contain proper engineering controls.

3) We can not at this time commit to accepting “one or two on- or off-site monitoring wells or a soil gas monitoring program relating to ensuring that the overburden soil vapor levels of TCE/VOCs do not pose an inhalation health risk.” Our discussion regarding off-site issues concluded that Combustion Engineering will provide a proposal to address off-site monitoring concerns. What is specifically acceptable will depend on NYSDEC and NYSDOH's satisfaction with the remediation on-site.

4) Groundwater should be restricted from any use, not just drinking water. Also, a soil management plan for future development should be developed.

Please contact myself or Mary Jane Peachey at (716) 226 - 2466 if you have any questions.

Sincerely,

David G. Pratt, P.E.
Environmental Engineer 2

cc: M.J. Peachey
J. Charles
M. Rivara
D. Napier
J. Harrington
R. Schick
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June 18, 1998

<u>VIA FAX AND U.S. MAIL</u>

David G. Pratt, P.E.
Environmental Engineer 2
New York State Department of
  Environmental Conservation
Region 8
6274 East Avon-Lima Road
Avon, New York 14414-9519

RE: Taylor Instruments Site #828028

Dear David:

Thank you for the prompt transmittal of your letter restating the State's proposal for remediation at the Taylor Instruments Site. Since our discussions during the meeting on June 16 ranged over a number of areas not explicitly addressed in your letter, I wanted to set forth what CE understands, based on those discussions, to be NYSDEC's offer on on-site and off-site cleanup levels which CE will convey to its management for a decision by July 7:

1) **On-site Mercury**: In soils, NYSDEC will require CE to meet 10 ppm from 0'-1' below current grade; and to meet 100 ppm below 1'. (At the meeting you indicated that the surface goal has been met based on the IRM performed during the demolition, which resulted in 6"-18" subbase and an asphalt layer being installed.) On-site clay-tile sewers will be replaced. No additional site characterization is required, but confirmatory sampling will be required to demonstrate the 100 ppm goal for below 1' has been met.

2) **On-site TCE/VOCs**: At the meeting the Department accepted CE's proposal to meet 0.7 mg/kg for soils in the two defined source areas (defined as areas which have TCE levels in excess of 7 mg/kg), and to achieve state groundwater standards at the perimeter of the site over time, through operation of an in-situ remedial system in the source areas as long as technically feasible with periodic reviews of system cost-effectiveness at TCE/VOC removal. No additional site characterization will be required. Monitoring will be conducted at the perimeter for overburden and bedrock groundwater.

3) **Off-site**: NYSDEC will require CE to address off-site sewer mercury conditions to the satisfaction of the Monroe County Pure Water Authority, and to propose a monitoring program which considers on-site and off-site concerns (generally consisting of one or two on- or off-site monitoring wells or a soil gas monitoring program relating to ensuring that overburden soil vapor levels of TCE/VOCs do not pose an inhalation health risk). No additional off-site investigations or remediation will be required.

4) **Institutional Controls / Deed Restrictions**: The Department will require CE to commit to deed restrictions against residential development and engineering controls on structures to ensure that overburden soil vapors do not pose an inhalation health risk and that groundwater is not used for drinking water purposes.

CE is presenting this offer to its management in the context of DEC's and DOH's representations at the meeting that those agencies has been revisiting cleanup levels at other sites previously negotiated and currently being negotiated to require a 100 ppm mercury level in soil for final remedies.

Please let me know promptly if CE has not correctly understood the substance of the discussions on June 16 and if the offer it is presenting to its management as described above does not accurately reflect what the Department will require CE to implement pursuant to the Voluntary Cleanup Agreement if the offer is accepted.

Whatever the outcome, I would like to thank you and all of the agency representatives who were present at the June 16 meeting for their efforts toward resolving this matter.

Sincerely,

Jean H. McCreary

Jean H. McCreary

cc: MJ. Peachey
J. Charles

bcc:
- P. Reckmeyer
- A. Harrington
- E. Hynes
- E. Feldman
- D. Hamilton
- K. Blakeley
- A. Karlbergs
- G. Knight
- N. Walter
- L. Ford

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 8
6274 East Avon-Lima Road, Avon, New York 14414-9519
Phone: (716) 226-2466 FAX: (716) 226-8696

John P. Cahill
Commissioner

June 17, 1998

Jean H. McCreary
Nixon, Hargrave, Devans & Doyle
Clinton Square
Post Office Box 1051
Rochester, NY 14603-1051

Re: Taylor Instruments Site #828028a
Rochester (C), Monroe (C)

Dear Ms. McCreary:

As per your request in our June 16, 1998 meeting, I am again forwarding the State's proposal for remediation of the Taylor Instruments site. A similar proposal was outlined in my December 31, 1997 letter to Mr. Knight, Ms. Ford and yourself.

Discussions between Combustion Engineering (CE) and the New York State Department of Environmental Conservation (NYSDEC) regarding a Voluntary Cleanup Agreement began in September 1995. Negotiations over cleanup levels for the Taylor Instruments site have been occurring for at least a year.

The NYSDEC is again proposing the following cleanup approach for the Taylor Instruments site: 10 ppm for mercury from 0' to 1' below grade and 100 ppm below 1'; and TAGM 4046 objectives for VOCs (with periodic reviews of system effectiveness). These are to be combined with deed restrictions against residential development, engineering controls on structures, and a monitoring program which considers both on-site and off-site concerns. Also, off-site sewer conditions must be addressed to Monroe County's satisfaction. This offer considers the commercial/industrial future use planned for the site, as opposed to what would likely be required for cleanup to a residential scenario. Furthermore, our proposal is consistent with previous and current negotiations at other sites around New York State. NYSDEC has, in the past, informed CE that deviation from established standards and guidance values is based on more than just risk, even when taking into account future use. Technical impracticality, site-specific conditions, precedent, and cost are other items of concern which drive cleanups.

The Taylor VCA calls for on-site cleanup levels to be agreed to by November 30, 1997. If cleanup levels were not reached by that time, the VCA states the Department may proceed with listing the site. The Department has reminded CE that we are under an obligation to list sites appropriately and in a timely manner. NYSDEC believes that CE has had sufficient opportunity to perform remediation under the Voluntary Cleanup Program. This letter hereby serves to officially offer the above proposal to CE one final time. Please inform this office in writing by July 7, 1998 whether CE agrees to the above proposal.

Please contact myself or Mary Jane Peachey at (716) 226 - 2466 if you have any questions.

Sincerely,

David G. Pratt, P.E.
Environmental Engineer 2

cc: M.J. Peachey
J. Charles
M. Rivara
D. Napier
J. Harrington
R. Schick
J. Albert

APPENDIX C

ON-SITE STORM SEWERS WORK PLAN

FILE

REMEDIAL WORK PLAN
ON-SITE STORM SEWERS

Taylor Instrument Site
Rochester, New York

1.0 INTRODUCTION

Harding Lawson Associates, on behalf of Combustion Engineering Inc. (C-E), is submitting this work plan that outlines the proposed remedial actions for mercury contamination associated with the on-site storm sewers at the Taylor Instruments Facility located at 95 Ames Street, Rochester, New York

2.0 BACKGROUND INFORMATION

All former site structures except for a metal storage building at the northeast corner of the property (Building 60) were demolished in 1995. Demolition was conducted with New York State Department of Environmental Conservation's (NYSDEC) oversight and included removal of building footings and shallow subsurface utilities. Demolition debris was properly characterized and disposed at approved off-site facilities. Final grading was completed in April 1996, and the site is now largely paved with asphalt. A combination of new and existing storm sewers channel precipitation runoff to Monroe County's combined sewer system.

During facility demolition in 1995, a number of connections to the off-site sewers were terminated according to Monroe County Pure Waters (MCPW) requirements as they were no longer needed for facility operations. Many building-related sewer segments were also totally removed. In mid-1996, two sewer lines located in the northeast part of the site connecting to the Ames Street sewer were abandoned at the request of MCPW. These two connections were terminated, including installation of impermeable barriers across the bedding material. Area drainage was re-routed to the current Line D, which drains to Hague Street (Figure 1). In early 1997, one sewer line, which directed runoff from the southeast part of the site to the Ames Street sewer, was also abandoned; the connection terminated; and an impermeable barrier installed across the bedding material. Portions of this line were discovered to have significant groundwater infiltration and were replaced. Area drainage was re-rerouted to Hague Street via Line A (*Final Investigative Report* (FIR), 1999).

HLA performed an investigation of contamination in the storm sewers and reported the results as part of that investigation in *Technical Memorandum No. 2, Sewer Investigation* (October 1997). The information collected as part of the investigation for the on-site sewers, as well as other information, is contained in the FIR, March 1999. The FIR was submitted to NYSDEC on March 15, 1999. A copy of this report was forwarded to MCPW.

3.0 REMEDIAL ACTION OBJECTIVES

Remedial actions are proposed herein to address the mercury contamination in water and sediment that has been found in the on-site sewers. The specific objectives of the remedial actions are as follows:

- Remove existing accumulations of mercury-contaminated sediment from the on-site sewers.
- Minimize infiltration of groundwater into on-site sewers with mercury levels exceeding the groundwater standard.
- Minimize future entry of mercury-contaminated soil/sediment from entering the on-site sewers.

3.1 Existing Conditions

The precipitation runoff from the site enters a series of manholes and catch basins and is conveyed through six storm sewer laterals shown as Lines A, B, C, D, E, and F on Figure 1. These sewer laterals consist of approximately 1,300 feet of vitreous clay tile sewer pipe that was installed and used while the Taylor Instruments facility was in operation and approximately 1,400 feet of new PVC pipe installed after facility demolition. In general, the clay tile pipe is typically either 10 inches or 15 inches in diameter and the new PVC pipe is typically 8 inches in diameter. In general, the manholes are brick construction approximately 8 feet deep. These manholes were installed and used while the facility was in operation. The catch basins consist of two types of basins: (1) new cylindrical concrete basins with inverts that are typically 3 to 4 feet deep; and (2) older brick and concrete lined basins with that are 3 to 5 feet deep. The majority of the catch basins are new except for CB-1, CB-3, CB-4, CB-13, CB-16, CB-18, CB-19, CB-20, and MH-6 (Figure 1).

3.2 Remedial Action

The remedial actions proposed herein are planned to address the first two remedial objectives listed in Section 3.0. The last remedial objective applies to future excavation activities for mercury-contaminated soil remediation. The concept plan for the remedial actions is to clean the sections of the existing sewer piping, followed by the rehabilitation of the clay tile sections of pipe. The specific plan for the remedial actions is discussed in the following subsections.

3.2.1 Manhole Installation/Pressure Cleaning

Three manholes will be installed along Lines A, D, and E at the western property boundary, adjacent to Hague Street. These will allow capture of cleaning water and sediment before it can enter the Hague Street sewer main (Figure 1). The manholes will be approximately 8 to 9 feet deep. A manhole currently exists in Line C adjacent to Hague Street along the western property boundary where cleaning water can be captured during cleaning of Line C.

The pressure cleaning will be performed by an experienced pipe cleaning contractor with a high pressure (3,000 pounds per square inch [psi]) jetting tool that will spray water under pressure. The tool will run through a section of piping to move water, debris, and sediment to a manhole where the water will be collected and pumped to a large tank. The debris and sediment will be removed and stored temporarily onsite. The manhole will be isolated so the water and debris cannot move further downstream.

Lines A, C, D, and E will be pressure cleaned to remove significant accumulations of sediment and debris that may exist in the sewers. The cleaning water will be placed in a 10,000-gallon tank, which will be temporarily located on the site. After testing, if the water is below 50 micrograms per liter (µg/L) total mercury, MCPW has indicated that it can be discharged, by permit, to MCPW's sewer main on Hague Street.

3.2.2 Pressure Testing

The pressure testing will be performed by a plumbing contractor who will isolate and pressurize isolated sections of PVC line. Per City of Rochester Building Codes, the line is expected to hold 5 psi air for one hour to be considered tight. Pressure testing the existing PVC pipe to ensure it is tight will allow the identification of any leaking sections which would then be repaired or replaced; thereby, eliminating the possibility of groundwater and sediment from entering those sections of pipe.

3.2.3 Video

After cleaning, all existing storm sewer lines will be visually inspected using an in-pipe video camera to check for sediment or obstructions and to check PVC sections of line if they fail the tightness testing. A video inspection is a typical requirement prior to pipe rehabilitation.

3.2.4 In-situ Clay Tile Pipe Rehabilitation By Pipebursting

Pipebursting is an in-situ technique that allows for the rehabilitation of existing sections of pipe to occur with minimal excavation. A bursting tool, or missile, contains a pneumatic hammer that is advanced in an existing section of piping. As the missile advances within the pipe, the hammer breaks the pipe and compacts the surrounding soil and pipe sections while simultaneously pulling the replacement pipe into place. The replacement section of pipe is attached to the back of the missile. Pipebursting allows for the installation of the same size pipe or a larger diameter pipe.

With the exception of the clay tile sewers discussed in Section 3.2.7 below, all clay tile pipe (approximately 1,200 feet excluding Lines B and F) will be rehabilitated by pipebursting. The clay tile pipe will be replaced with polyethylene pipe. Pipebursting and replacement will eliminate the future potential sediment and groundwater infiltration into these storm sewers. Pipebursting will also cutoff smaller abandoned laterals that may be connected to Lines A, C, D, and E (Figure 1). A water tight seal will be made where the new pipe enters an existing manhole or catchbasin.

3.2.5 Catch Basin/Manhole Rehabilitation

Rehabilitation of existing brick catch basin and manholes will be performed by utilizing a spray-on epoxy resin after the manholes and catch basins are cleaned and the replacment pipes are in place. The spray creates a thin coating of epoxy that eliminates the infilitration of sediment and groundwater in older brick manholes. Rehabilitation of existing brick catchbasins and manholes will be performed on CB-3, CB-4, CB-13, CB-18, CB-19, CB-20, and MH-6 (Figure 1).

3.2.6 Reroute And Abandonment Of Lines B And F

Storm sewer lines B and F are currently connected to the Ames Street sewer. These laterals will be abandoned. The connections will be terminated at the property boundary and an impermeable barrier will be installed across the bedding material (Figure 1). Catch basin CB-1 will be rerouted to CB-5 in Line A, and CB-16 will be rerouted to CB-17 in Line E. Catch basin CB-17 will be deepened to accommodate these changes.

3.3 Storm Sewer Evaluation and Design

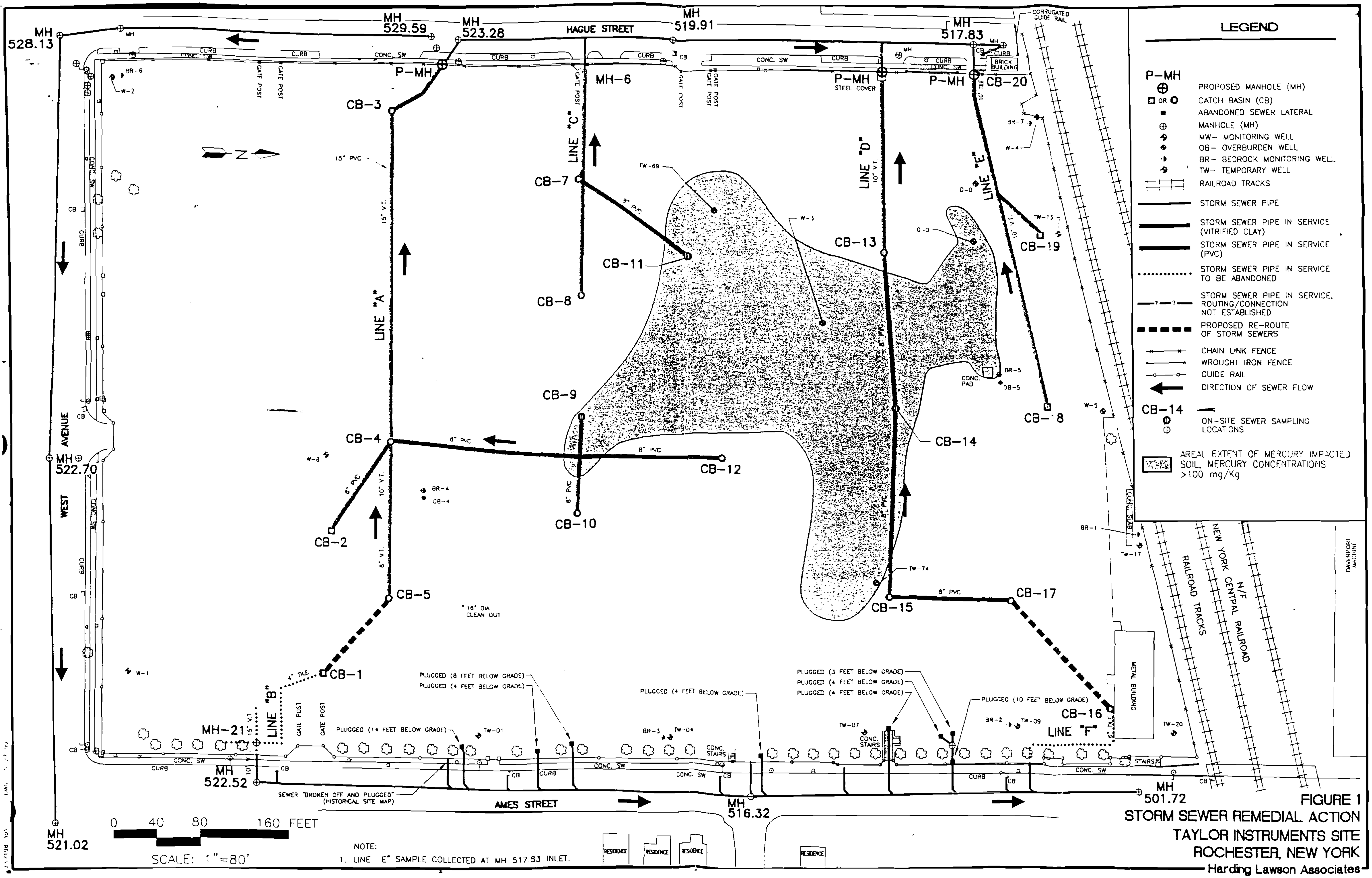
A hydraulic evaluation of the current on-site storm sewer system will be performed prior to pipe rehabilitation. Information to be utilized in this analysis will be surveying data, a topographic map with drainage areas for existing manholes and catch basins, piping sizes, and hydraulic design software. If it is found that any of the existing storm sewers are undersized, then recommendations may be made to increase capacity by increasing the pipe diameter through replacement by pipebursting.

3.4 Codes and Permits

All work performed above will meet the requirements of the Monroe County Department of Environmental Planning and the City of Rochester's Building Inspection Department. It is assumed that there will be a minimal period needed to obtain permits to perform work, where applicable.

3.5 Schedule

Currently the schedule to perform the remedial actions described above is to have the pipecleaning, with modifications, pressure testing, and video work (i.e., Sections 3.2.1 through 3.2.3) complete by the end of July. The pipe bursting (Section 3.2.4) is expected to start by early September. Enclosed is a proposed schedule for all work included in this work plan.

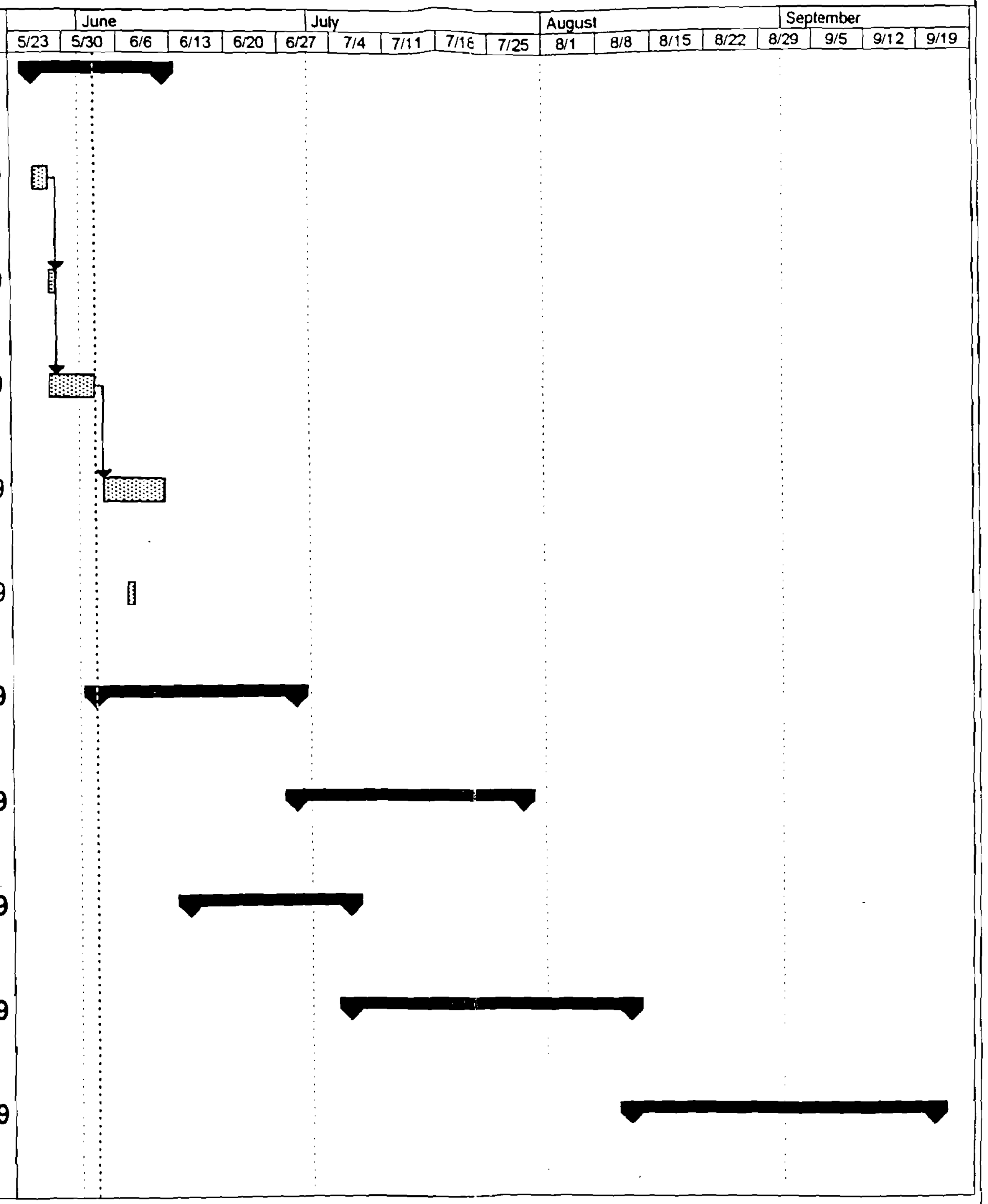


NOTE:
1. LINE E" SAMPLE COLLECTED AT MH 517.83 INLET.

FIGURE 1
STORM SEWER REMEDIAL ACTION
TAYLOR INSTRUMENTS SITE
ROCHESTER, NEW YORK
Harding Lawson Associates

Remedial Action
On-Site
Storm Sewers

ID	Task Name	Duration	Start	Finish
1	**On-Site Storm Sewers Remedial Work Plan**	**13 days**	**Wed 5/26/99**	**Fri 6/11/99**
2	Work Plan Preparation	2 days	Wed 5/26/99	Thu 5/27/99
3	Internal Review of Work Plan	1 day	Fri 5/28/99	Fri 5/28/99
4	Work Plan Review - Sybron	4 days	Fri 5/28/99	Wed 6/2/99
5	Work Plan Review - MCPW / NYSDEC	6 days	Fri 6/4/99	Fri 6/11/99
6	Meeting - MCPW / NYSDEC	1 day	Mon 6/7/99	Mon 6/7/99
7	**Contractor Procurement for Manholes**	**18 days**	**Thu 6/3/99**	**Mon 6/28/99**
12	**Construction - Manhole Installation, Pipecleaning, Pressure Testing, and Video Inspection**	**22 days**	**Tue 6/29/99**	**Wed 7/28/99**
20	**On-Site Storm Sewer Rehab Design**	**15 days**	**Tue 6/15/99**	**Mon 7/5/99**
22	**Contractor Procurement for On-Site Storm Sewer Rehab**	**27 days**	**Tue 7/6/99**	**Wed 8/11/99**
27	**Construction - Pipebursting, Rerouting and Abandonment of Lines B and F**	**28 days**	**Thu 8/12/99**	**Mon 9/20/99**



t: sewerstp
u 6/3/99

Task	▨	Progress	▬	Summary	▬	Rolled Up Split	....	Rolled Up Progress	▬	Project Summary	▬
Split	....	Milestone	◆	Rolled Up Task	▨	Rolled Up Milestone	◇	External Tasks	▨		

MONROE COUNTY

Department of Environmental Services
Division of Pure Waters

Jack Doyle
County Executive

John E. Graham, P.E.
Director

June 15, 1999

Mr. Ricky Ryan
HARDING LAWSON ASSOCIATES
1400 Centerpoint Blvd.
Knoxville, Tn. 37932-1968

RE: Taylor Instruments #828028a

Dear Mr. Ryan:

Monroe County has received and reviewed the On-Site Storm Sewers Work Plan for the referenced site. In addition, Michael Schifano and I met with Mr. Tim Pringle of your office to discuss the scope of work. The work plan is approved with the following modifications/clarifications.

1) Section 3.2.1 - Manholes will be constructed to allow for solids separation.

2) Section 3.2.6 - Harding Lawson will provide flow estimates of runoff to the Hague Street sewers. Flow rates should be for average and 25 year storm events.

3) Section 3.5 - Abandonment of lines B & F should be completed as soon as possible to allow Sybron an earlier starting date for cleaning grit from the Maple-Child Combined Relief Tunnel.

Mr. Thomas Posella (760-7610, Ext. 7078) of this Department will be responsible for reviewing hydraulic loadings and lateral abandonment. Feel free to contact him with any questions. Thank you for your continued cooperation.

Sincerely,

Harry M. Reiter
Pretreatment Coordinator

xc: Michael Schifano, MCDES
Thomas Posella, MCDES
David Pratt, NYSDEC - Region 8
Libby Ford, Nixon Hargrave
Ed Hynes, H & A
file

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New York State Department of Environmental Conservation
ivision of Environmental Remediation, Region 8
274 East Avon-Lima Road, Avon, New York 14414-9519
Phone: (716) 226-2466 FAX: (716) 226-8696

John P. Cahill
Commissioner

June 22, 1999

Ricky A. Ryan, P.E.
Harding Lawson Associates
1400 Centerpoint Blvd.
Suite 158
Knoxville, TN 37932-1968

Re: Taylor Instruments #828028a
Rochester (C), Monroe (C)

Dear Mr. Ryan:

The New York State Department of Environmental Conservation (NYSDEC), the New York State Department of Health (NYSDOH) and the Monroe County Health Department (MCHD) have reviewed the Remedial Work Plan for On-site Storm Sewers. The following are our comments:

1. No Health and Safety Plan (HSP) or procedures were referenced in the work plan. Please be sure to utilize the HSP which was used during intrusive activities of previous investigations.

2. As per the VCA, please notify me at least 5 working days before initiation of fieldwork.

3. A fact sheet announcing the completion of the Final Investigation Report (FIR) will be prepared by NYSDEC soon. The sewer cleaning project will be mentioned in the fact sheet. Please be sure that the final FIR report and the work plan for the sewer project are placed in the document repository as soon as possible.

4. Post-construction evaluation of the effectiveness of this cleaning/lining project will be required. Please also note that future remediation may impact the work to be performed as part of this work plan; therefore, this sewer cleaning/lining project may not be the final action regarding the on-site sewers.

If you have any questions, please do not hesitate to contact me.

Sincerely,

David G. Pratt, P.E.
Environmental Engineer 2

cc:		
	M.J. Peachey	D. Napier
	J. Charles	J. Albert
	R. Schick	J. McCreary / L. Ford

Harding Lawson Associates

HLA

June 28, 1999

FILE

Mr. Harry Reiter
Pretreatment Coordinator
Monroe County Pure Waters
444 East Henrietta Road
Building 15
Rochester, NY 14620-4630

RE: On-Site Storm Sewers Remedial Activities
Taylor Instruments Facility

Dear Mr. Reiter:

During our recent meeting with Monroe County Pure Waters concerning the On-Site Storm Sewers Work Plan, you requested additional investigation of the four laterals highlighted on the attached figure. Three of these laterals are not indicated as plugged and a fourth is indicated as plugged, but showed water flow in the Ames Street sewer inspection video.

To accommodate these requests, HLA will perform on-site excavation activities and video inspection where possible/ necessary to check for the presence and integrity of the pipe abandonment plugs. If it is determined that any of the laterals originate from the site and are not properly abandoned, then a plug and flow barrier will be placed across the pipe bedding material.

Additionally, I have received your letter dated June 15, 1999, that approves the On-Site Storm Sewers Work Plan contingent upon three modifications/clarifications. Please accept this letter as our agreement to incorporate MCPW's requested items into our planned activities.

If you have any questions, please do not hesitate to contact Tim Pringle or me at (423) 531-1922.

Sincerely,

HARDING LAWSON ASSOCIATES, INC.

Ricky A. Ryan

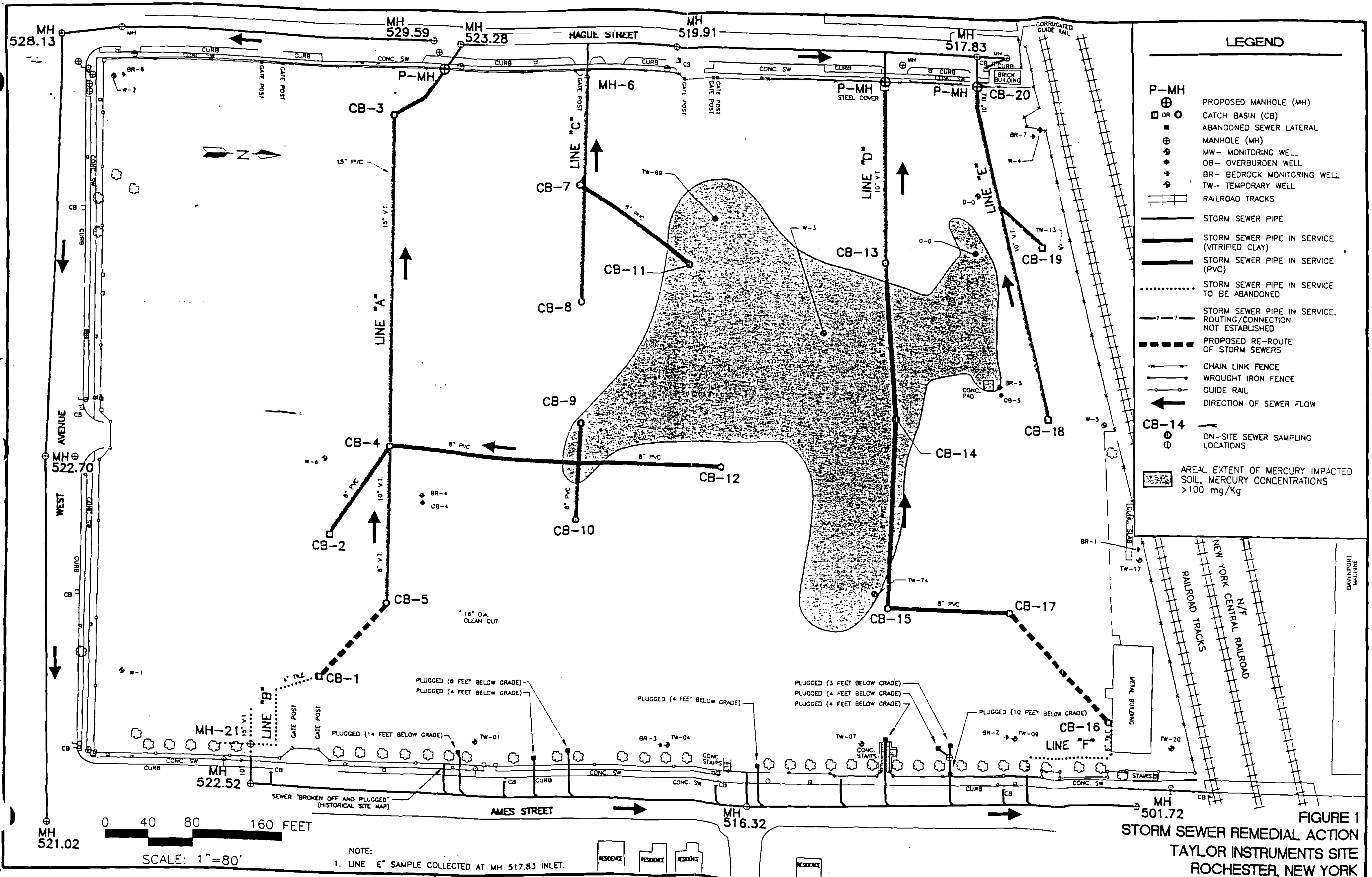
Ricky A. Ryan, P.E.
Principal Project Manager

Enclosure (1)

cc: David Pratt, NYSDEC
Ed Hynes, Haley & Aldrich
Libby Ford, NHDD
Jean McCreary, NHDD
File

Engineering and
Environmental Services

1400 Centerpoint Boulevard, Suite 158, Knoxville, TN 37932 423/531-1922 Fax 423/531-8226



NOTE:
1. LINE E" SAMPLE COLLECTED AT MH 517.83 INLET.

FIGURE 1
STORM SEWER REMEDIAL ACTION
TAYLOR INSTRUMENTS SITE
ROCHESTER, NEW YORK
Harding Lawson Associates

MONROE
COUNTY

Department of Environmental Services
Division of Pure Waters

Jack Doyle
County Executive

John E. Graham, P.E.
Director

July 23, 1999

Mr. Tim J. Pringle
Harding Lawson Associates
1400 Centerpoint Boulevard
Knoxville, TN 37932-1968

Re: Taylor Instruments – Hague Street
City of Rochester
Rochester Pure Waters District

Dear Mr. Pringle:

Monroe County Pure Waters has researched the history for the combined sewer system on Hague Street and Maple Street, which would receive the storm water flow from the above referenced property. There is no record, or personal knowledge from our staff, which indicates any problems with the District's combined sewer on Hague Street handling flow under current conditions. Presently, there is no need for Taylor Instruments to provide any on-site storm water detention. However, any future development of this property may require on-site detention of storm water. Plans for any future development must submitted to the Rochester Pure Waters District for review and approval prior to construction.

Please feel free to call me at (716) 760-7610 X7066 if you have any questions. Thank you.

Sincerely,

Kevin Quinn
Office of Development Review

444 East Henrietta Road • Rochester, New York 14620-4630 • Tel (716) 760-7600 • Fax (716) 428-4780
http://www.co.monroe.ny.us • *Recycled paper*

MONROE
COUNTY

Department of Environmental Services
Division of Pure Waters

Jack Doyle
County Executive

John E. Graham, P.E.
Director

March 14, 2000

FILE
2.7 A[illegible]
018

Mr. Ricky Ryan
HARDING LAWSON ASSOCIATES
1400 Centerpoint Blvd., Suite 158
Knoxville, TN. 37932

RE: Former Taylor Instruments Facility

Dear Mr. Ryan:

I have received and reviewed the Final Engineering Report On-Site storm sewers and the post construction sewer sampling results. Construction work is complete as defined in the work plan. Sampling results are within Monroe County Sewer Use Limits for mercury. I was surprised to find any detectable levels of mercury in the on-site sampling. Further monitoring will be required to demonstrate continued compliance. Quarterly monitoring will be required for a minimum of two years, after which time the data will be evaluated and permit status determined.

Site remediation Sewer Use Permit #PI 012 has expired. Enclosed is a Sewer Use Permit application which, when approved, will be in effect for one year and renewable annually.

Please send your Sewer Use Permit application, check and workmen's compensation insurance verification to my attention. Feel free to call me at 760-7523 with any questions you may have.

Sincerely,

Harry M. Reiter
Pretreatment Coordinator

Attachments
XC: David Pratt, NYSDEC
File

444 East Henrietta Road • Rochester, New York 14620-4630 • Tel (716) 760-7600 • Fax (716) 428-4780
http://www.co.monroe.ny.us • *Recycled paper*

APPENDIX D

DUAL-PHASE VACUUM EXTRACTION PILOT TEST REPORT

DPVE PILOT SCALE TEST EVALUATION REPORT
FORMER TAYLOR INSTRUMENTS / AMES STREET SITE
ROCHESTER, NY

Introduction

Harding Lawson Associates (HLA) on behalf of ABB Combustion Engineering completed a pilot scale test for Dual Phase Vacuum Extraction (DPVE) of groundwater and soil vapor at the former Taylor Instruments Site located on Ames Street in Rochester, NY. The pilot scale test provided site specific information that will serve as the basis for design of a full scale remedy. The intent of this report is to summarize pilot scale DPVE test operations activities and results for the test which was conducted from 5/19/99 to 5/24/99.

Description of Test Activities

The DPVE pilot scale test was set up to provide the necessary information about groundwater and soil vapor conditions necessary to design a full scale treatment system. The proposed full scale extraction and treatment equipment is anticipated to be similar to the equipment used during the test. The pilot test was designed to evaluate two subsurface horizons individually, as well as, simultaneously. The first horizon, consists of dense to very dense silty sand Ablation Till, extending from ground surface to approximately 13 feet below ground surface (bgs). The second horizon consists of very dense to extremely dense silty sand Basal Till, extending from approximately 13 feet bgs to 18 feet bgs. Two 4-inch diameter extraction wells were installed within a known source area located on the southern portion of the site, with one well screened in the deep horizon, while the other well was screened within the shallow horizon. Groundwater depth at the site was measured at approximately 7 feet bgs. These extraction wells are identified as EW-01S and EW-01D, shallow and deep wells, respectively. One-inch diameter PVC vapor and groundwater monitoring points were also installed at distances of approximately 10, 18, 34, and 54-feet from the two extraction wells aligned in the northeast (PZ-270S/D, -268S/D, -269S/D) and northwest (PZ-267S/D, -266S/D, -271S/D, -265S/D) directions (Figure 1, Attachment A). At each location, shallow and deep monitoring points were clustered.

To test the reactions of each subsurface zone to DPVE, the test was divided into three phases. The first phase extracted groundwater from the deep horizon only. The second phase extracted both groundwater and soil vapor from both deep and shallow horizons simultaneously, and the third phase from the shallow horizon only. Each phase will be discussed in greater detail in the Results section of this report. Within each phase of the test, two vacuum rates were also used to assess the optimal operational vacuum.

Prior to startup of the extraction system, groundwater samples were collected from the extraction wells to represent baseline contaminant quantities within the two hydrologic horizons. As the extraction activities continued through the three phases, groundwater level and vacuum pressure data were collected from the monitoring probes. Vapor contaminant levels were also measured from the effluent of the vacuum extraction pump and air stripper. Water level data and system operational data are presented as Attachment A. After completing the test, another groundwater sample was collected from the two extraction wells to represent post test contaminant conditions.

Description of Equipment

The DPVE pilot scale test extraction and treatment system used was a mobile, trailer-mounted unit consisting of a liquid ring vacuum extraction pump, an air/water separator, a low profile air stripper, various transfer pumps, and a groundwater storage tank. The unit controls were integrated into a main control panel that contained a programmable logic controller (PLC).

The liquid ring pump was an Atlantic Fluidics Model A75 capable of a maximum vacuum of 28-inches of mercury (Hg) at a sustainable air flow of 45 cubic feet per minute (cfm). The pump also had its own seal water tank, that allows operation of the pump with limited use of fresh water. The low profile air stripper was a Shallowtray, STAT 30 with 6 aeration trays capable of a maximum air/water ratio of 30:1 at a maximum groundwater flow rate of 35 gallons per minute (gpm).

The above extraction system was connected to both extraction wells with 1-inch diameter polyvinyl chloride PVC pipe. In-line ball valves were installed to isolate each well, as needed. The wellhead setup contained a 4-inch diameter Simmons well seal with openings for a 1-inch diameter PVC drop tube and 3/8-inch PVC pipe used for bleed air to provide additional lift. A vacuum gauge was also connected to the well seal to monitor vacuum applied to the well casing.

Extracted and treated groundwater was pumped to a temporary storage tank until confirmatory analytical sample results were obtained. The results were forwarded to Mr. Harry Reiter with Monroe County, Department of Environmental Services, Division of Pure Waters on 5/21/99. Mr. Reiter reviewed the analytical results and approved discharge of the stored water to the local public owned treatment work (POTW).

Pre-Test Groundwater Analytical Results

Prior to startup of the DPVE system, groundwater samples were collected from the two extraction wells and shipped to Columbia Laboratories for analysis. The samples were analyzed for volatile organic compounds (VOCs) using USEPA Method 8260. Analytical results from these wells represent baseline contaminant conditions and can be compared to post-test results. The following table summarizes pre-test groundwater analytical results for samples from EW-01S and EW-01D. Analytical results are provided in Attachment B:

Table 1
Pre-Test Groundwater Analytical Results
Former Taylor Instruments Site - Rochester, NY

Contaminants	EW-01S Results (mg/l)	EW-01D Results (mg/l)
2-Butanone (MEK)	14	ND
cis-1,2 Dichloroethene	ND	48
Trichloroethene	23	710

mg/l = milligrams per liter
ND = Not detected at/or above quantification limit.
Note: 2-butananone, also known as methylethylketone (MEK), is a known laboratory artifact. MEK is also an ingredient of common PVC glues, which were used to connect extraction piping.

Phase I Results

The first phase of the pilot test involved extraction of groundwater by using the deep extraction well only. The test began on May 19, 1999 at 1215 hrs. The liquid ring pump was set to produce a vacuum of 15-inches of Hg for the first stage of this phase. As expected, vacuum readings from the monitoring points were not measurable for this first stage of phase I, which operated for a total of 19 hours. Soil vapor flow was not expected during this phase due to extraction from the deeper zone only, which did not allow for dewatering of both the shallow and deep zones creating avenues for soil vapor flow. The vacuum was then increased to 20-inches of Hg and the system operated for an additional 9 hours. During this time vacuum readings from the monitoring points were still not measurable.

Groundwater extraction rates ranged from 0.15 to 0.23 gallons per minute (gpm) at 15 and 20-inches of Hg, respectively. Groundwater level data for this test phase indicated a radius of influence (R_o) of approximately 40 feet along the Northeast alignment, and approximately 60 feet along the Northwest alignment, see graph in Attachment C, (Figure 2, Attachment A).

Because no vacuum response was measured from monitoring points and sufficient groundwater drawdown data had been collected, it was decided to move into phase II after operating phase I for a total of 28 hours.

Phase II Results

The second phase of the pilot test involved extraction of groundwater and potential soil vapors by using both the shallow and deep extraction wells. The test began immediately after the phase I test was completed. The liquid ring pump was readjusted to 15-inch of Hg. Immediate soil vapor responses were observed along both the northeast and northwest monitoring point alignments. Responses along the northeast alignment were measured a distance of approximately 20-feet from the extraction wells, and approximately 30-feet along the northwest alignment (Figure 3, Attachment A).

The vacuum pump was adjusted to 20-inches of Hg after operating for 16.5 hours at 15-inches of Hg. Vapor influence measurements increased at each monitoring point. The magnitude of the increase was greater at the monitoring points located closest to the extraction wells. However, the soil vapor R_o did not change from the 20-feet and 30-feet along the northeast and northwest legs, respectively.

Groundwater extraction rates were doubled from the phase I sequence to 0.51 and 0.52 gpm at 15-inches and 20-inches of Hg, respectively. Groundwater level data for this test phase indicated a R_o of approximately 60-feet, see graph in Attachment C, for both the northeast and northwest alignments (Figure 2, Attachment A). This phase of the pilot study was operated for a total of 47.25 hours before beginning phase III.

Phase III Results

The third phase of the pilot test involved extracting groundwater and soil vapors from the shallow extraction well only. The test began immediately after completion of phase II. The liquid ring pump was readjusted to 15-inches of Hg to begin. Vacuum pressures were measured at distances consistent with phase II along both alignments (Figure 3, Attachment A). This stage was operated for 17 hours before increasing the vacuum pump to 20-inches of Hg. Similar vacuum pressures were measured during this stage of phase III which was operated for 11 hours.

Groundwater extraction rates ranged from 0.34 to 0.38 gpm at 15-inches and 20-inches of Hg, respectively. Groundwater level data for this phase indicated a R_o of 70-feet for the northeast alignment and 60-feet for the northwest alignment, see graph in Attachment C, (Figure 2, Attachment A). This phase was operated for a total of 28 hours.

The entire pilot test was operated for 103 hours. After completing phase III activities, the DPVE system was shutdown and final measurements of water levels and vacuum pressures were collected. This concluded the pilot test operations.

Post-Test Groundwater Analytical Results

Immediately following shut down of the pilot test equipment, groundwater samples were collected from the two extraction wells. This data was compared with results of samples collected before the pilot test commenced. The following table summarizes the analytical results for EW-01S and EW-01D. Analytical results are provided in Attachment B:

Table 2
Post-Test Groundwater Analytical Results
Former Taylor Instruments Site - Rochester, NY

Contaminants	EW-01S Results (mg/l)	EW-01D Results (mg/l)
2-Butanone (MEK)	ND	ND
cis-1,2 Dichloroethene	7.8	48
Trichloroethene	600	640

mg/l = milligrams per liter
ND = Not detectable at/or above quantification limit.
Note: 2-butananone, also known as methylethylketone (MEK), is a known laboratory artifact. MEK is also an ingredient of common PVC glues, which were used to connect extraction piping.

An additional groundwater sample will be collected from each extraction well in September 1999 to further evaluate the effects of the DPVE on contaminants within the groundwater. The results will be used to determine increasing of decreasing trends of groundwater contaminant levels which would give indications of contaminant movement and removal.

Summary of Results

The following table summarizes critical pilot study results by phase. These results include vapor R_o, groundwater R_o for each monitoring point alignment and stage of pumping and soil vapor vacuum and groundwater extraction rates. System operational data and groundwater level data are provided in Attachment D.

Table 3
Summary of DPVE Pilot Test Results
Fomer Taylor Instruments Site - Rochester, NY

Test Phase	Pump Vac. inches of Hg	Vapor R_o NE (feet)	Vapor R_o NW (feet)	GW Flow (gpm)	GW R_o NE (feet)	GW R_o NW (feet)
I	15	0	0	0.15	40	60
I	20	0	0	0.23	40	60
II	15	20	30	0.51	50	60
II	20	20	30	0.52	50	60
III	15	20	30	0.34	70	60
III	20	20	30	0.38	70	60

inches of Hg = inches of Mercury
NE = Northeast alignment
NW = Northwest alignment
GW = Groundwater
R_o = Radius of Influence
gpm = gallons per minute
Phase I = Extraction from deep horizon
Phase II = Extraction from deep and shallow horizons
Phase III = Extraction from shallow horizon

A summary of pre-test and post-test groundwater samples collected from the two extraction wells is provided in the following table:

Table 4
Summary of Groundwater Analytical Results
Former Taylor Instruments Site - Rochester, NY

Contaminant	EW-01S Pre-Test (mg/l)	EW-01S Post-Test (mg/l)	EW-01D Pre-Test (mg/)	EW-01D Post-Test (mg/l)
2-Butanone (MEK)	14	ND	ND	ND
cis-1,2 Dichloroethene	ND	7.8	48	48
Trichloroethene	23	600	710	640

mg/l = milligrams per liter
ND = Not detectable at/or above quantification limit.
EW-01S = Extraction Well (Shallow)
EW-01D = Extraction Well (Deep)
Note: 2-Butananone (MEK) is a known laboratory artifact. It is also an ingrediant of common PVC glues, which were used to connect extraction piping.

Contaminant extraction quantities were calculated using vapor contaminant field measurements collected from the liquid ring pump and air stripper effluents as well as groundwater contaminant levels collected from the extraction wells and the treatment system groundwater effluent. Although laboratory analytical samples were not obtained from vapor stream locations, periodic PID measurements of VOCs in the removed vapor throughout all phases of the test was done to allow an estimate to be made of the quantity of VOCs removed in the vapor phase. However, because VOCs were likely stripped from the removed groundwater within the well casing and transferred to the vapor stream, the total quantity of VOC removed is expected to have been less than the sum of the VOCs in the groundwater and the vapor. Contaminant extraction quantities were estimated at 15 to 20 lbs. of VOCs removed during the test.

Conclusions

The pilot test indicates that DPVE is a viable technology for removing contaminants from subsurface soils and groundwater at the site. The test provided site specific information that will serve as the basis of design of a full scale system. A full scale extraction and treatment system designed to remediate VOC contamination in groundwater and subsurface soils can now proceed. The following conclusions are based on previously discussed results.

Soil vapor influence

- Vacuum pressures ranged from a maximum of 12-inches to 0.10-inches of Hg at distances of 8-feet to 30-feet, respectively, from the extraction wells.
- There was a relatively homogeneous response along both the northwest and northeast alignments.
- Soil vapor R_o was observed to be approximately 20-feet along the northeast alignment and approximately 30-feet along the northwest alignment.
- Vapor response from the fully saturated deep horizon was not observed because the extraction system was unable to dewater both the shallow and deep zones sufficiently to create vapor flow avenues.
- Vapor flow rates, collected from the liquid ring pump effluent, were measured between 5 and 40 cubic feet per minute (CFM).

Groundwater Influence

- The ultimate hydraulic response observed was similar to a conventional groundwater extraction system.
- Observed drawdowns were 12-feet below static groundwater levels at a distance of 8-feet from the extraction wells, and 1-foot at distances of 50-feet.
- R_o is approximately 60 to 70-feet, based on the distance versus drawdown plotted for each phase of this DPVE pilot test.
- Groundwater extraction rates are expected to be between 0.30 and 0.55 gpm for each extraction well, but multiple wells may decrease this estimate slightly. Variations in permeability throughout the site may also alter these flow rates.

Contaminant Removal

- An estimated 15 to 20 lbs. of contaminants were removed from the subsurface during the pilot scale test activities. These estimates are based on vapor flow rates combined with the field vapor contaminant levels reported from the vacuum pump and air stripper effluents as well as groundwater flow rates and measured VOCs in the extraction wells at the beginning and end of the pilot test.
- An increase in TCE concentrations within the shallow horizon is attributed to the effectiveness of the extraction system at drawing the contaminants from residual source areas into the active extraction treatment zone.

- Observations of system operation show that contaminants were successfully stripped from groundwater within the vacuum extraction stage prior to entering the air stripper. This information will be considered during treatment system selection and sizing.

ATTACHMENT A

FIGURES

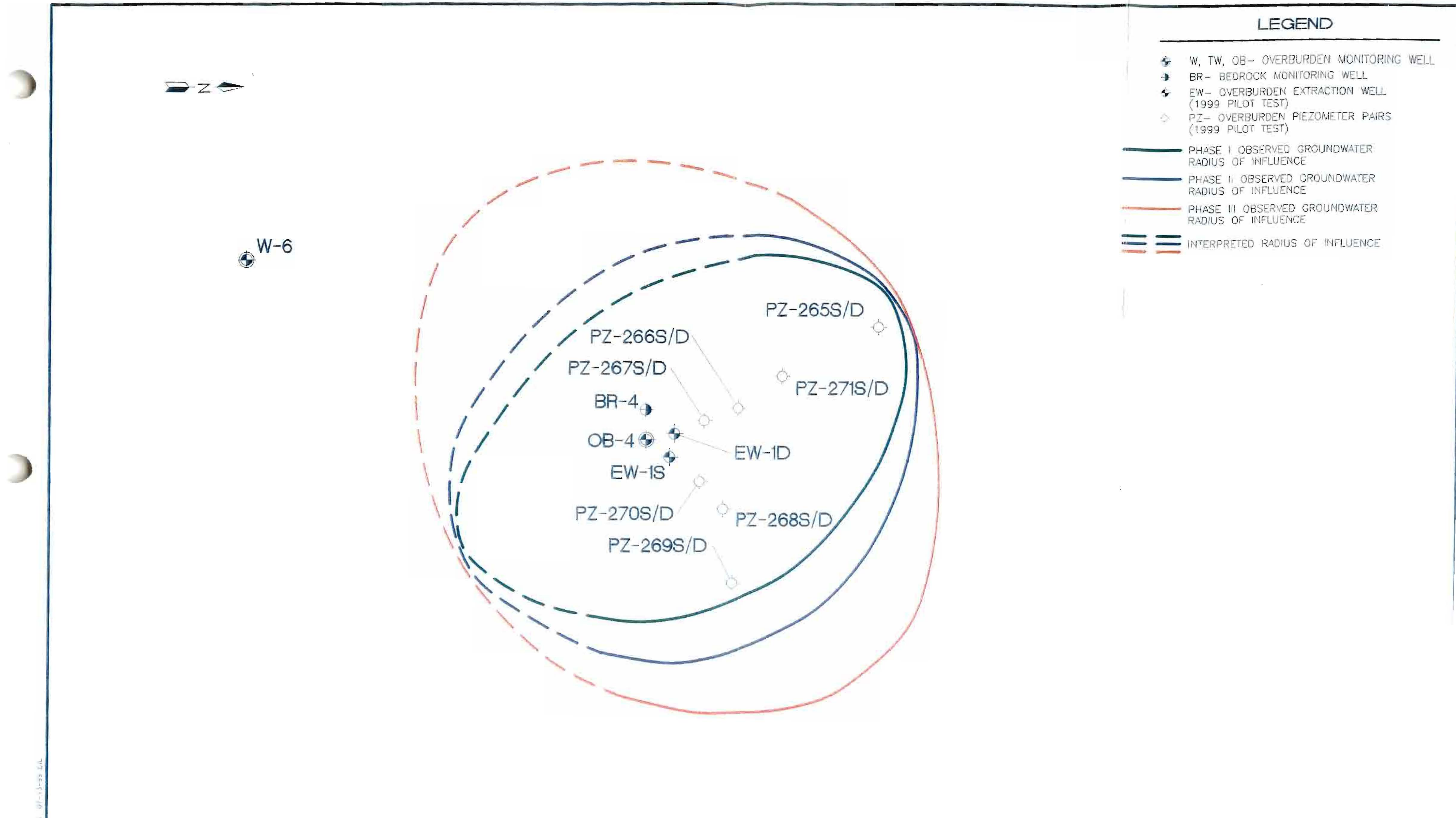
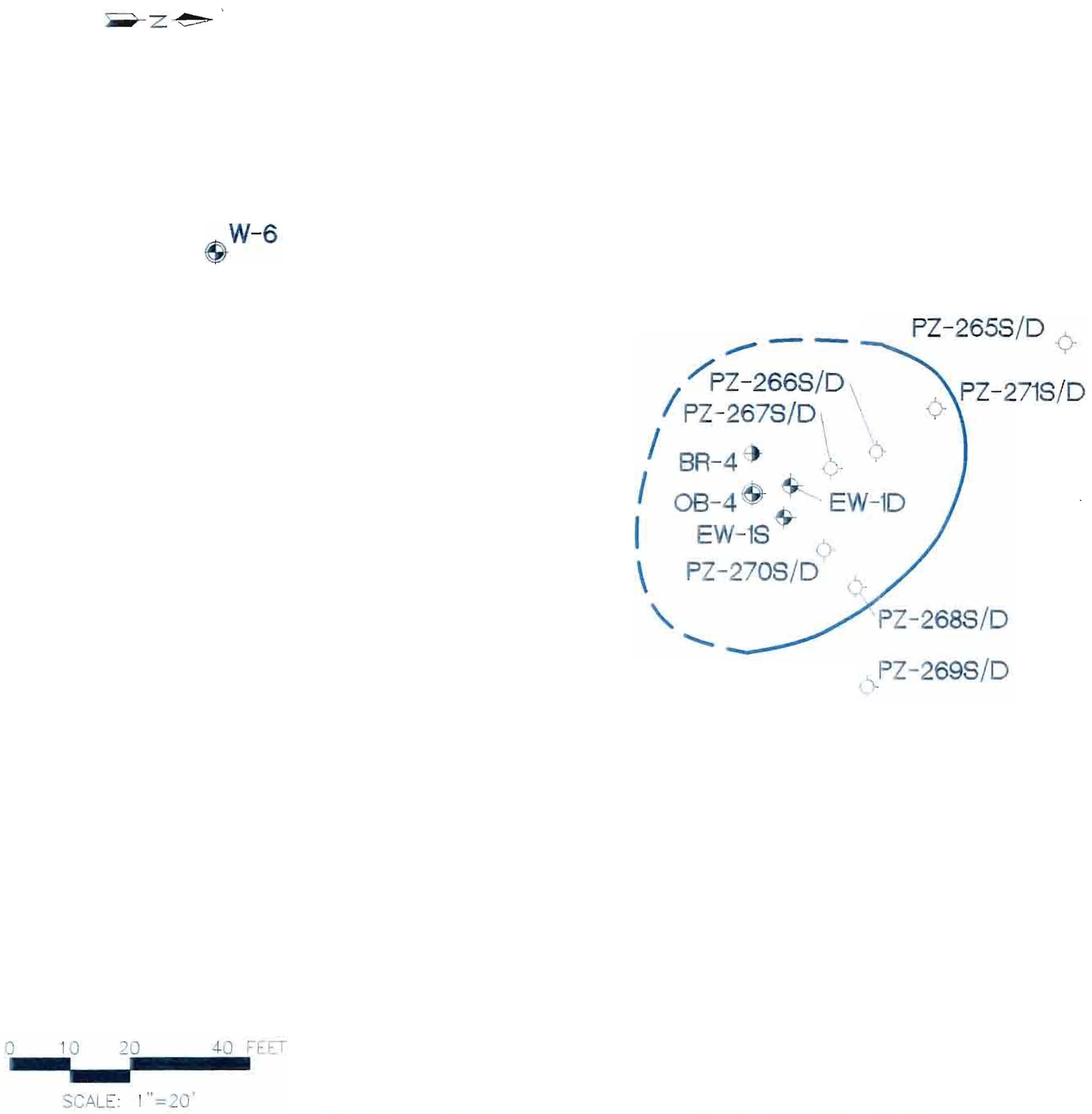


FIGURE 2
OBSERVED GROUNDWATER RADIUS OF INFLUENCE
DPVE PILOT SCALE TEST
TAYLOR INSTRUMENTS SITE, ROCHESTER, NEW YORK
Harding Lawson Associates



LEGEND

- W, TW, OB– OVERBURDEN MONITORING WELL
- BR– BEDROCK MONITORING WELL
- EW– OVERBURDEN EXTRACTION WELL (1999 PILOT TEST)
- PZ– OVERBURDEN PIEZOMETER PAIRS (1999 PILOT TEST)
- OBSERVED SOIL VAPOR RADIUS OF INFLUENCE TEST FOR EACH PHASE OF TEST
- INTERPRETED RADIUS OF INFLUENCE TEST

FIGURE 3
OBSERVED SOIL VAPOR RADIUS OF INFLUENCE
DPVE PILOT SCALE TEST
TAYLOR INSTRUMENTS SITE, ROCHESTER, NEW YORK
Harding Lawson Associates

J:\1198-39\1198F026.DWG 07-15-99 ESL

ATTACHMENT B

LABORATORY ANALYTICAL RESULT SHEETS

Services™

(716) 288-5380 • FAX (716) 288-8475

DATE 5/20/99 PAGE 1 OF 1

PROJECT NAME ABB AMES STREET
PROJECT MANAGER/CONTACT Rick Ryan
COMPANY/ADDRESS 1400 Centerpoint Blvd, Ste 158
Knoxville, TN 37777
TEL (423) 531-1922 FAX (423) 531-8026
SAMPLER'S SIGNATURE M. Lou Barrentine III

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	FOR OFFICE USE ONLY LAB I.D.	SAMPLE MATRIX	# OF CONTAINERS	GC/MS VOA's ☒ 8260 ☐ 624 ☐ 95-1	GC/MS SVOA's ☐ 8270 ☐ 625 ☐ 95-2	GC VOA's ☐ 8021 ☐ 601/602	PESTICIDES/PCB's ☐ 8081 ☐ 608 ☐ 95-3	STAR'S LIST 8021 VOA's ☐ TOTAL ☐ TCLP	STAR'S LIST 8270 SVOA's ☐ TOTAL ☐ TCLP	TCLP ☐ METALS ☐ VOA's ☐ SVOA's ☐ H/P	WASTE CHARACTERIZATION ☐ React ☐ Corros. ☐ Ignit.	METALS, TOTAL (LIST BELOW) Mercury	METALS, DISSOLVED (LIST BELOW)								PRESERVATION pH < 2.0	PRESERVATION pH > 12	PRESERVATION Other
EW-1S	5/19/99	11:15	293857	Water	3	X																			
EW-1D	5/19/99	11:30	293858	Water	3	X																			
Effluent	5/20/99	10:00	293859	Water	5	X								X											

RELINQUISHED BY:
M. Lou Barrentine III
Signature
M. Louis Barrentine III
Printed Name
HLA
Firm
5/20/99 10:30
Date/Time

RECEIVED BY:
Tom Hastings
Signature
Tom Hastings
Printed Name
CAS
Firm
5/20/99 10:30
Date/Time

RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

TURNAROUND REQUIREMENTS
__ 24 hr. __ 48 hr __ 5 day
__ Standard (10-15 working days)
__ Provide Verbal Preliminary Results
__ Provide FAX Preliminary Results
Requested Report Date ______

REPORT REQUIREMENTS
__ 1. Routine Report
__ 2. Routine Rep. w/CASE Narrative
__ 3. EPA Level III Validatable Package
__ 4. N.J. Reduced Deliverables Level IV
__ 5. NY ASP/CLP Deliverables
__ 6. Site specific QC.

INVOICE INFORMATION:
P.O. #:
Bill To

SAMPLE RECEIPT:
Shipping Via: CAS
Shipping #:
Temperature: 6.0
Submission No: 99-5-31

SPECIAL INSTRUCTIONS/COMMENTS:
METALS Mercury 7470A/245.1
ORGANICS: ☐ TCL ☐ PPL ☐ AE Only ☐ BN Only ☐ Special List
24 Hr. Turn on both Effluent Samples only. Normal turn on remaining samples

COLUMBIA ANALYTICAL SERVICES

VOLATILE ORGANICS
METHOD 8260B TCL
Reported: 06/09/99

Harding Lawson Associates
Project Reference: ABB/ TAYLOR INSTRUMENTS
Client Sample ID : EW-1S2

te Sampled : 05/24/99 Order #: 294930 Sample Matrix: WATER
te Received: 05/24/99 Submission #: 9905000360 Analytical Run 38957

NALYTE	PQL	RESULT	UNITS
ATE ANALYZED : 06/02/99			
NALYTICAL DILUTION: 200.00			
ETONE	20	4000 U	UG/L
NZENE	5.0	1000 U	UG/L
OMODICHLOROMETHANE	5.0	1000 U	UG/L
OMOFORM	5.0	1000 U	UG/L
OMOMETHANE	5.0	1000 U	UG/L
-BUTANONE (MEK)	10	2000 U	UG/L
ARBON DISULFIDE	10	2000 U	UG/L
ARBON TETRACHLORIDE	5.0	1000 U	UG/L
LOROBENZENE	5.0	1000 U	UG/L
LOROETHANE	5.0	1000 U	UG/L
LOROFORM	5.0	1000 U	UG/L
LOROMETHANE	5.0	1000 U	UG/L
BROMOCHLOROMETHANE	5.0	1000 U	UG/L
,1-DICHLOROETHANE	5.0	1000 U	UG/L
2-DICHLOROETHANE	5.0	1000 U	UG/L
,1-DICHLOROETHENE	5.0	1000 U	UG/L
S-1,2-DICHLOROETHENE	5.0	7800	UG/L
ANS-1,2-DICHLOROETHENE	5.0	1000 U	UG/L
,2-DICHLOROPROPANE	5.0	1000 U	UG/L
S-1,3-DICHLOROPROPENE	5.0	1000 U	UG/L
ANS-1,3-DICHLOROPROPENE	5.0	1000 U	UG/L
HYLBENZENE	5.0	1000 U	UG/L
-HEXANONE	10	2000 U	UG/L
THYLENE CHLORIDE	5.0	1000 U	UG/L
-METHYL-2-PENTANONE (MIBK)	10	2000 U	UG/L
YRENE	5.0	1000 U	UG/L
,1,2,2-TETRACHLOROETHANE	5.0	1000 U	UG/L
TRACHLOROETHENE	5.0	1000 U	UG/L
LUENE	5.0	1000 U	UG/L
,1,1-TRICHLOROETHANE	5.0	1000 U	UG/L
,1,2-TRICHLOROETHANE	5.0	1000 U	UG/L
ICHLOROETHENE	5.0	340000 E	UG/L
INYL CHLORIDE	5.0	1000 U	UG/L
-XYLENE	5.0	1000 U	UG/L
-P-XYLENE	5.0	1000 U	UG/L

URROGATE RECOVERIES	QC LIMITS		
-BROMOFLUOROBENZENE	(86 - 115 %)	96	%
LUENE-D8	(88 - 110 %)	99	%
BROMOFLUOROMETHANE	(86 - 118 %)	97	%

COLUMBIA ANALYTICAL SERVICES

VOLATILE ORGANICS
METHOD 8260B TCL
Reported: 06/09/99

Harding Lawson Associates
Project Reference: ABB/ TAYLOR INSTRUMENTS
Client Sample ID : EW-1S2

ite Sampled : 05/24/99 Order #: 294930 Sample Matrix: WATER
ite Received: 05/24/99 Submission #: 9905000360 Analytical Run 38957

ATE ANALYZED : 06/04/99
NALYTICAL DILUTION: 5000.00

NALYTE	PQL	RESULT	UNITS
ETONE	20	100000 U	UG/L
NZENE	5.0	25000 U	UG/L
OMODICHLOROMETHANE	5.0	25000 U	UG/L
OMOFORM	5.0	25000 U	UG/L
OMOMETHANE	5.0	25000 U	UG/L
-BUTANONE (MEK)	10	50000 U	UG/L
RBON DISULFIDE	10	50000 U	UG/L
RBON TETRACHLORIDE	5.0	25000 U	UG/L
LOROBENZENE	5.0	25000 U	UG/L
LOROETHANE	5.0	25000 U	UG/L
LOROFORM	5.0	25000 U	UG/L
LOROMETHANE	5.0	25000 U	UG/L
BROMOCHLOROMETHANE	5.0	25000 U	UG/L
,1-DICHLOROETHANE	5.0	25000 U	UG/L
,2-DICHLOROETHANE	5.0	25000 U	UG/L
,1-DICHLOROETHENE	5.0	25000 U	UG/L
S-1,2-DICHLOROETHENE	5.0	25000 U	UG/L
ANS-1,2-DICHLOROETHENE	5.0	25000 U	UG/L
,2-DICHLOROPROPANE	5.0	25000 U	UG/L
S-1,3-DICHLOROPROPENE	5.0	25000 U	UG/L
ANS-1,3-DICHLOROPROPENE	5.0	25000 U	UG/L
HYLBENZENE	5.0	25000 U	UG/L
-HEXANONE	10	50000 U	UG/L
ETHYLENE CHLORIDE	5.0	25000 U	UG/L
-METHYL-2-PENTANONE (MIBK)	10	50000 U	UG/L
YRENE	5.0	25000 U	UG/L
,1,2,2-TETRACHLOROETHANE	5.0	25000 U	UG/L
TRACHLOROETHENE	5.0	25000 U	UG/L
LUENE	5.0	25000 U	UG/L
,1,1-TRICHLOROETHANE	5.0	25000 U	UG/L
,1,2-TRICHLOROETHANE	5.0	25000 U	UG/L
ICHLOROETHENE	5.0	600000	UG/L
NYL CHLORIDE	5.0	25000 U	UG/L
-XYLENE	5.0	25000 U	UG/L
-P-XYLENE	5.0	25000 U	UG/L

URROGATE RECOVERIES	QC LIMITS		
-BROMOFLUOROBENZENE	(86 - 115 %)	102	%
LUENE-D8	(88 - 110 %)	103	%
BROMOFLUOROMETHANE	(86 - 118 %)	106	%

COLUMBIA ANALYTICAL SERVICES

VOLATILE ORGANICS
METHOD 8260B TCL
Reported: 06/09/99

Harding Lawson Associates
Project Reference: ABB/ TAYLOR INSTRUMENTS
Client Sample ID : EW-1D2

te Sampled : 05/24/99 Order #: 294931 Sample Matrix: WATER
te Received: 05/24/99 Submission #: 9905000360 Analytical Run 38957

NALYTE	PQL	RESULT	UNITS
ATE ANALYZED : 06/02/99			
NALYTICAL DILUTION: 500.00			
ETONE	20	10000 U	UG/L
NZENE	5.0	2500 U	UG/L
OMODICHLOROMETHANE	5.0	2500 U	UG/L
OMOFORM	5.0	2500 U	UG/L
OMOMETHANE	5.0	2500 U	UG/L
BUTANONE (MEK)	10	5000 U	UG/L
RBON DISULFIDE	10	5000 U	UG/L
RBON TETRACHLORIDE	5.0	2500 U	UG/L
LOROBENZENE	5.0	2500 U	UG/L
LOROETHANE	5.0	2500 U	UG/L
LOROFORM	5.0	2500 U	UG/L
LOROMETHANE	5.0	2500 U	UG/L
BROMOCHLOROMETHANE	5.0	2500 U	UG/L
1-DICHLOROETHANE	5.0	2500 U	UG/L
2-DICHLOROETHANE	5.0	2500 U	UG/L
1-DICHLOROETHENE	5.0	2500 U	UG/L
S-1,2-DICHLOROETHENE	5.0	48000	UG/L
ANS-1,2-DICHLOROETHENE	5.0	2500 U	UG/L
2-DICHLOROPROPANE	5.0	2500 U	UG/L
S-1,3-DICHLOROPROPENE	5.0	2500 U	UG/L
ANS-1,3-DICHLOROPROPENE	5.0	2500 U	UG/L
HYLBENZENE	5.0	2500 U	UG/L
HEXANONE	10	5000 U	UG/L
THYLENE CHLORIDE	5.0	2500 U	UG/L
METHYL-2-PENTANONE (MIBK)	10	5000 U	UG/L
YRENE	5.0	2500 U	UG/L
1,2,2-TETRACHLOROETHANE	5.0	2500 U	UG/L
TRACHLOROETHENE	5.0	2500 U	UG/L
LUENE	5.0	2500 U	UG/L
1,1-TRICHLOROETHANE	5.0	2500 U	UG/L
1,2-TRICHLOROETHANE	5.0	2500 U	UG/L
ICHLOROETHENE	5.0	450000 E	UG/L
NYL CHLORIDE	5.0	2500 U	UG/L
XYLENE	5.0	2500 U	UG/L
P-XYLENE	5.0	2500 U	UG/L

URROGATE RECOVERIES	QC LIMITS		
BROMOFLUOROBENZENE	(86 - 115 %)	96	%
LUENE-D8	(88 - 110 %)	99	%
BROMOFLUOROMETHANE	(86 - 118 %)	96	%

COLUMBIA ANALYTICAL SERVICES

VOLATILE ORGANICS
METHOD 8260B TCL
Reported: 06/09/99

Harding Lawson Associates
Project Reference: ABB/ TAYLOR INSTRUMENTS
Client Sample ID : EW-1D2

ite Sampled : 05/24/99 Order #: 294931 Sample Matrix: WATER
ite Received: 05/24/99 Submission #: 9905000360 Analytical Run 38957

NALYTE	PQL	RESULT	UNITS
ATE ANALYZED : 06/04/99			
NALYTICAL DILUTION: 5000.00			
CETONE	20	100000 U	UG/L
ENZENE	5.0	25000 U	UG/L
ROMODICHLOROMETHANE	5.0	25000 U	UG/L
ROMOFORM	5.0	25000 U	UG/L
ROMOMETHANE	5.0	25000 U	UG/L
-BUTANONE (MEK)	10	50000 U	UG/L
ARBON DISULFIDE	10	50000 U	UG/L
ARBON TETRACHLORIDE	5.0	25000 U	UG/L
HLOROBENZENE	5.0	25000 U	UG/L
HLOROETHANE	5.0	25000 U	UG/L
HLOROFORM	5.0	25000 U	UG/L
HLOROMETHANE	5.0	25000 U	UG/L
IBROMOCHLOROMETHANE	5.0	25000 U	UG/L
1-DICHLOROETHANE	5.0	25000 U	UG/L
2-DICHLOROETHANE	5.0	25000 U	UG/L
1-DICHLOROETHENE	5.0	25000 U	UG/L
IS-1,2-DICHLOROETHENE	5.0	51000	UG/L
RANS-1,2-DICHLOROETHENE	5.0	25000 U	UG/L
2-DICHLOROPROPANE	5.0	25000 U	UG/L
IS-1,3-DICHLOROPROPENE	5.0	25000 U	UG/L
RANS-1,3-DICHLOROPROPENE	5.0	25000 U	UG/L
THYLBENZENE	5.0	25000 U	UG/L
-HEXANONE	10	50000 U	UG/L
ETHYLENE CHLORIDE	5.0	25000 U	UG/L
-METHYL-2-PENTANONE (MIBK)	10	50000 U	UG/L
YRENE	5.0	25000 U	UG/L
1,2,2-TETRACHLOROETHANE	5.0	25000 U	UG/L
ETRACHLOROETHENE	5.0	25000 U	UG/L
LUENE	5.0	25000 U	UG/L
1,1-TRICHLOROETHANE	5.0	25000 U	UG/L
1,2-TRICHLOROETHANE	5.0	25000 U	UG/L
RICHLOROETHENE	5.0	640000	UG/L
INYL CHLORIDE	5.0	25000 U	UG/L
-XYLENE	5.0	25000 U	UG/L
-P-XYLENE	5.0	25000 U	UG/L

URROGATE RECOVERIES	QC LIMITS		
BROMOFLUOROBENZENE	(86 - 115 %)	108	%
LUENE-D8	(88 - 110 %)	103	%
BROMOFLUOROMETHANE	(86 - 118 %)	106	%

COLUMBIA ANALYTICAL SERVICES

VOLATILE ORGANICS
METHOD 8260B TCL
Reported: 06/09/99

Project Reference:
Client Sample ID : METHOD BLANK

te Sampled :	**Order #:** 297813	**Sample Matrix:** WATER
te Received:	**Submission #:**	**Analytical Run** 38957

ATE ANALYZED : 06/02/99
NALYTICAL DILUTION: 1.00

NALYTE	PQL	RESULT	UNITS
ETONE	20	20 U	UG/L
NZENE	5.0	5.0 U	UG/L
OMODICHLOROMETHANE	5.0	5.0 U	UG/L
OMOFORM	5.0	5.0 U	UG/L
OMOMETHANE	5.0	5.0 U	UG/L
BUTANONE (MEK)	10	10 U	UG/L
RBON DISULFIDE	10	10 U	UG/L
RBON TETRACHLORIDE	5.0	5.0 U	UG/L
LOROBENZENE	5.0	5.0 U	UG/L
LOROETHANE	5.0	5.0 U	UG/L
LOROFORM	5.0	5.0 U	UG/L
LOROMETHANE	5.0	5.0 U	UG/L
BROMOCHLOROMETHANE	5.0	5.0 U	UG/L
1-DICHLOROETHANE	5.0	5.0 U	UG/L
2-DICHLOROETHANE	5.0	5.0 U	UG/L
1-DICHLOROETHENE	5.0	5.0 U	UG/L
S-1,2-DICHLOROETHENE	5.0	5.0 U	UG/L
ANS-1,2-DICHLOROETHENE	5.0	5.0 U	UG/L
2-DICHLOROPROPANE	5.0	5.0 U	UG/L
S-1,3-DICHLOROPROPENE	5.0	5.0 U	UG/L
ANS-1,3-DICHLOROPROPENE	5.0	5.0 U	UG/L
HYLBENZENE	5.0	5.0 U	UG/L
HEXANONE	10	10 U	UG/L
THYLENE CHLORIDE	5.0	5.0 U	UG/L
METHYL-2-PENTANONE (MIBK)	10	10 U	UG/L
YRENE	5.0	5.0 U	UG/L
1,2,2-TETRACHLOROETHANE	5.0	5.0 U	UG/L
TRACHLOROETHENE	5.0	5.0 U	UG/L
LUENE	5.0	5.0 U	UG/L
1,1-TRICHLOROETHANE	5.0	5.0 U	UG/L
1,2-TRICHLOROETHANE	5.0	5.0 U	UG/L
ICHLOROETHENE	5.0	5.0 U	UG/L
NYL CHLORIDE	5.0	5.0 U	UG/L
XYLENE	5.0	5.0 U	UG/L
P-XYLENE	5.0	5.0 U	UG/L

URROGATE RECOVERIES	QC LIMITS		
BROMOFLUOROBENZENE	(86 - 115 %)	97	%
LUENE-D8	(88 - 110 %)	100	%
BROMOFLUOROMETHANE	(86 - 118 %)	102	%

OLUMBIA ANALYTICAL SERVICES

VOLATILE ORGANICS
METHOD 8260B TCL
Reported: 06/09/99

roject Reference:
lient Sample ID : METHOD BLANK

te Sampled : Order #: 297836 Sample Matrix: WATER
te Received: Submission #: Analytical Run 38957

ALYTE	PQL	RESULT	UNITS
TE ANALYZED : 06/04/99			
ALYTICAL DILUTION: 1.00			
ETONE	20	20 U	UG/L
ZENE	5.0	5.0 U	UG/L
MODICHLOROMETHANE	5.0	5.0 U	UG/L
MOFORM	5.0	5.0 U	UG/L
MOMETHANE	5.0	5.0 U	UG/L
BUTANONE (MEK)	10	10 U	UG/L
RBON DISULFIDE	10	10 U	UG/L
RBON TETRACHLORIDE	5.0	5.0 U	UG/L
LOROBENZENE	5.0	5.0 U	UG/L
LOROETHANE	5.0	5.0 U	UG/L
LOROFORM	5.0	5.0 U	UG/L
LOROMETHANE	5.0	5.0 U	UG/L
BROMOCHLOROMETHANE	5.0	5.0 U	UG/L
1-DICHLOROETHANE	5.0	5.0 U	UG/L
2-DICHLOROETHANE	5.0	5.0 U	UG/L
1-DICHLOROETHENE	5.0	5.0 U	UG/L
S-1,2-DICHLOROETHENE	5.0	5.0 U	UG/L
ANS-1,2-DICHLOROETHENE	5.0	5.0 U	UG/L
2-DICHLOROPROPANE	5.0	5.0 U	UG/L
S-1,3-DICHLOROPROPENE	5.0	5.0 U	UG/L
ANS-1,3-DICHLOROPROPENE	5.0	5.0 U	UG/L
YLBENZENE	5.0	5.0 U	UG/L
EXANONE	10	10 U	UG/L
HYLENE CHLORIDE	5.0	5.0 U	UG/L
ETHYL-2-PENTANONE (MIBK)	10	10 U	UG/L
RENE	5.0	5.0 U	UG/L
,2,2-TETRACHLOROETHANE	5.0	5.0 U	UG/L
RACHLOROETHENE	5.0	5.0 U	UG/L
UENE	5.0	5.0 U	UG/L
,1-TRICHLOROETHANE	5.0	5.0 U	UG/L
,2-TRICHLOROETHANE	5.0	5.0 U	UG/L
CHLOROETHENE	5.0	5.0 U	UG/L
YL CHLORIDE	5.0	5.0 U	UG/L
YLENE	5.0	5.0 U	UG/L
-XYLENE	5.0	5.0 U	UG/L

RROGATE RECOVERIES	QC LIMITS		
ROMOFLUOROBENZENE	(86 - 115 %)	93	%
UENE-D8	(88 - 110 %)	99	%
ROMOFLUOROMETHANE	(86 - 118 %)	95	%

An Eli Lilly Owned Company

DATE ______ PAGE ______ OF ______

PROJECT NAME ABB/Taylor Instruments
PROJECT MANAGER/CONTACT Rick Ryan
COMPANY/ADDRESS 1400 Centerpoint Blvd., #158
Knoxville, TN 37932
TEL (423) 531-1922 FAX (423) 531-8226
SAMPLER'S SIGNATURE ______

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	FOR OFFICE USE ONLY LAB I.D.	SAMPLE MATRIX	# OF CONTAINERS	GC/MS VOA's ☒ 8260 ☐ 624 ☐ 95-1	GC/MS SVOA's ☐ 8270 ☐ 625 ☐ 95-2	GC VOA's ☐ 8021 ☐ 601/602	PESTICIDES/PCB's ☐ 8081 ☐ 608 ☐ 95-3	STAR'S LIST 8021 VOA's ☐ TOTAL ☐ TCLP	STAR'S LIST 8270 SVOA's ☐ TOTAL ☐ TCLP	TCLP ☐ METALS ☐ VOA's ☐ SVOA's ☐ H/P	WASTE CHARACTERIZATION ☐ React ☐ Corros. ☐ Ignit.	METALS, TOTAL (LIST BELOW)	METALS, DISSOLVED (LIST BELOW)								PRESERVATION pH < 2.0	pH > 12	Other
EW-1S2	5/24/99	12:35		Water	3	X																			
EW-1D2	5/24/99	12:45		Water	3	X																			

RELINQUISHED BY:
Signature
Printed Name Len Smith
Firm HCA
Date/Time 5-24-49/1605

RECEIVED BY:
Signature Tom Hastings
Printed Name Tom Hastings
Firm ABB
Date/Time 5/24/99 16:05

RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

TURNAROUND REQUIREMENTS
__ 24 hr. __ 48 hr. __ 5 day
__ Standard (10-15 working days)
__ Provide Verbal Preliminary Results
__ Provide FAX Preliminary Results
Requested Report Date ______

REPORT REQUIREMENTS
__ 1. Routine Report
__ 2. Routine Rep. w/CASE Narrative
__ 3. EPA Level III Validatable Package
__ 4. N.J. Reduced Deliverables Level IV
__ 5. NY ASP/CLP Deliverables
__ 6. Site specific QC.

INVOICE INFORMATION:
P.O. #:
Bill To: ______

SAMPLE RECEIPT:
Shipping Via: Client
Shipping #:
Temperature: 5.5°
Submission No: 5-360

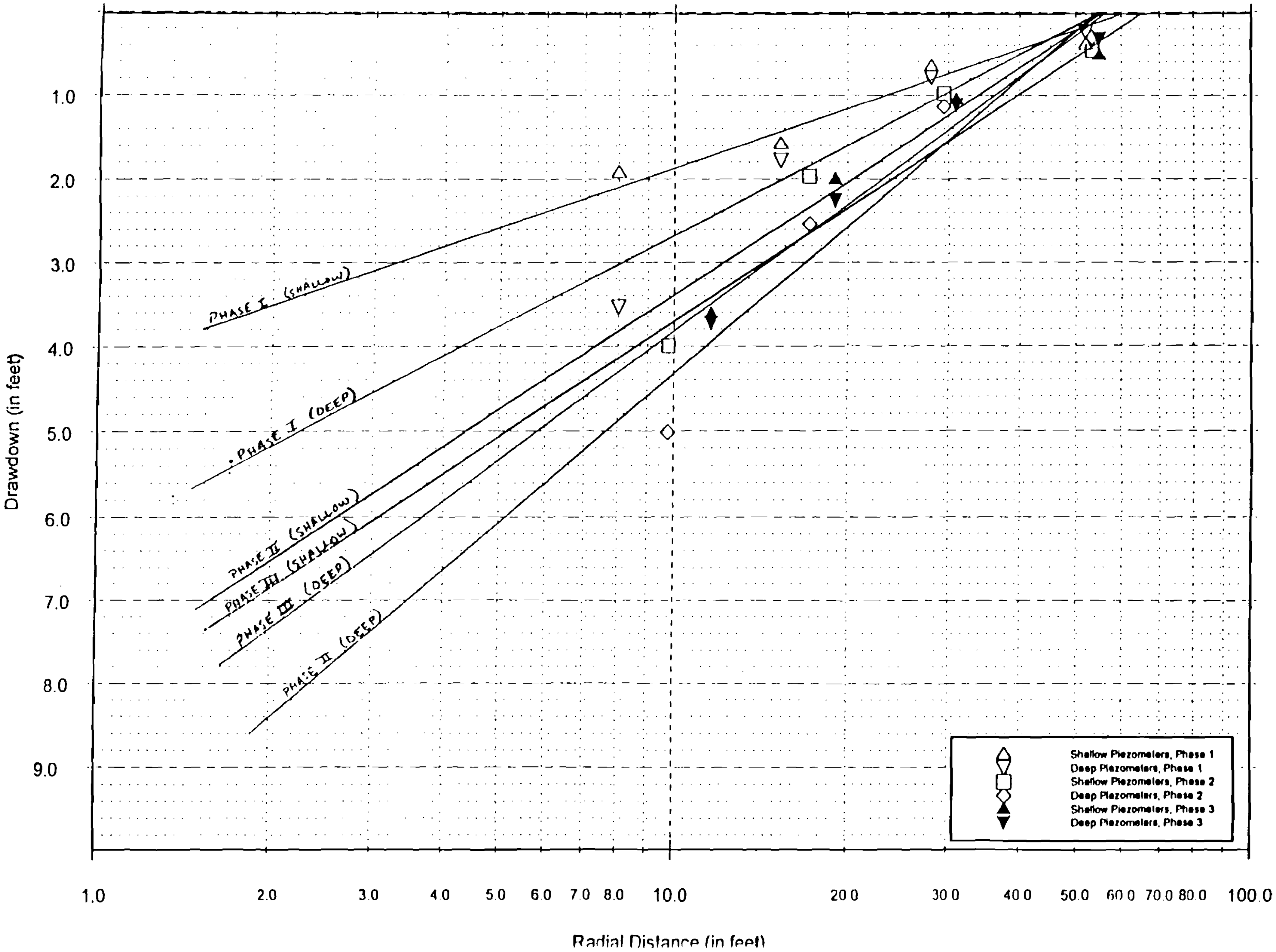
SPECIAL INSTRUCTIONS/COMMENTS:
METALS ______
ORGANICS: ☐ TCL ☐ PPL ☐ AE Only ☐ BN Only ☐ Special List
Normal turnaround.

ATTACHMENT C

GROUNDWATER DRAWDOWN GRAPHS

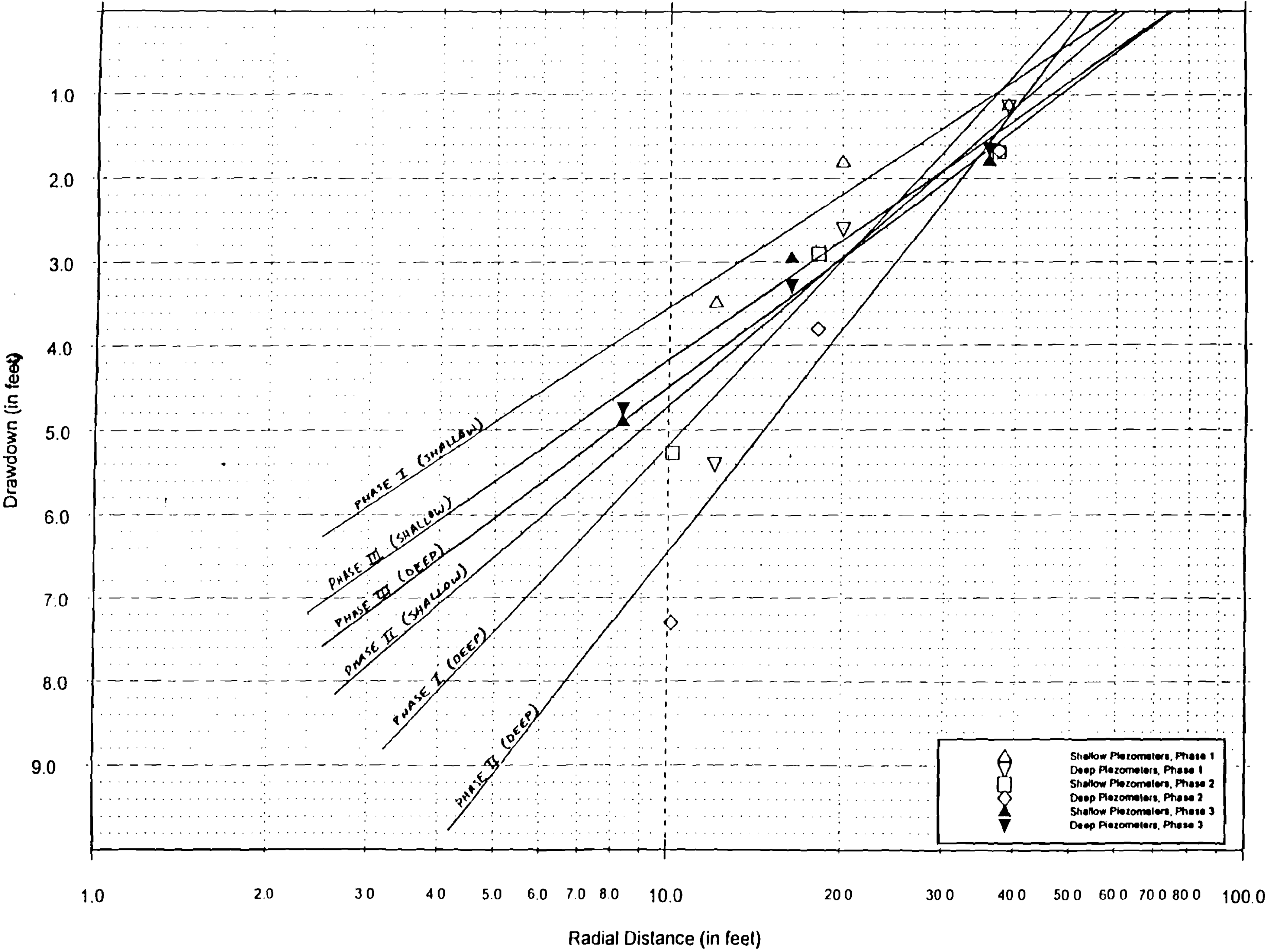
DPVE Pilot Test, Northwest Piezometers

Taylor Instruments Site, Rochester, NY



DPVE Pilot Test, Northeast Piezometers

Taylor Instruments Site, Rochester, NY



ATTACHMENT D

GROUNDWATER LEVEL DATA AND SYSTEM OPERATIONAL DATA

DPE SYSTEM DATA
FORMER ABB KENT TAYLOR FACILITY
ROCHESTER, NY

Date/Time	Vacuum Readings (in. Hg)		Well Flow	Effluent Discharge	Pump Effluent	PID Reading (ppm)		Vacuum Readings at Vapor Probes (in. H_2O)													
	Well Head	Pump	gpm	gallons	CFM	Pump	Stripper	PZ-267S	PZ-267D	PZ-266S	PZ-266D	PZ-271S	PZ-271D	PZ-265S	PZ-265D	PZ-270S	PZ-270D	PZ-268S	PZ-268D	PZ-269S	PZ-269D
	Begin Phase I																				
5/19/99 1215	10	15	0.15	0.00	NR	NR	NR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5/19/99 1247	10	15		<25.00	NR	NR	NR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5/19/99 1320	10	15		<25.00	NR	NR	NR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5/19/99 1350	10	15		25.00	NR	118.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5/19/99 1420	9.5	15		25.00	NR	158.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5/19/99 1450	10	15		25.00	NR	NR	NR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5/19/99 1520	9.5	15		25.00	NR	NR	NR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5/19/99 1550	9.5	15		25.00	NR	NR	NR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5/19/99 1620	10	15		50.00	NR	NR	NR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5/19/99 1720	11.5	15		50.00	NR	226.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5/19/99 2100	11	15.5		75.00	NR	NR	NR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5/20/99 715	9.5	15		175.00	26.00	NR	NR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Increased Pump Vac to 20" Hg																				
5/20/99 815	15	19	0.23	175.00	5.00	123.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5/20/99 915	15	19		200.00	1.00	NR	NR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5/20/99 1115	15	19		225.00	5.00	NR	NR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5/20/99 1515	14.5	19		250.00	5.00	NR	NR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5/20/99 1615	Phase II Start @ 15" Hg																				
5/20/99 1630	11	15	0.51	287.50	30.00	NR	NR	0.80	0.00	1.50	0.00	0.10	0.00	0.00	0.00	>6	0.00	0.60	0.00	0.00	0.00
5/20/99 1700	11	15		306.25	30.00	NR	NR	1.30	0.00	1.50	0.00	0.10	0.00	0.00	0.00	>6	0.00	0.60	0.00	0.00	0.00
5/20/99 1730	11	14.5		331.25	30.00	153.0	0.0	1.30	0.00	1.25	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.65	0.00	0.00	0.00
5/20/99 1800	11	14.5		345.00	30.00	NR	NR	1.45	0.00	1.20	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.60	0.00	0.00	0.00
5/20/99 1830	10.5	14.5		365.00	30.00	190.0	0.0	1.55	0.00	1.10	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.60	0.00	0.00	0.00
5/20/99 1900	10.5	14.5		377.50	30.00	NR	NR	1.65	0.00	1.10	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.65	0.00	0.00	0.00
5/20/99 1930	10.5	14.5		392.50	30.00	NR	NR	1.85	0.00	1.10	0.00	0.05	0.00	0.00	0.00	10.00	0.00	0.65	0.00	0.00	0.00
5/21/99 800	10	14		745.00	31.00	NR	NR	3.40	0.00	0.85	0.00	0.05	0.00	0.00	0.00	9.00	0.00	1.05	0.00	0.00	0.00
5/21/99 830	Increased Pump Vac to 20" Hg																				
5/21/99 930	15	19.5	0.52	800.00	5.00	NR	NR	5.60	0.00	1.20	0.00	0.15	0.00	0.00	0.00	12.00	0.00	0.70	0.00	0.00	0.00
5/21/99 1030	15	19		832.50	10.00	NR	NR	5.40	0.00	1.20	0.00	0.15	0.00	0.00	0.00	12.00	0.00	0.65	0.00	0.00	0.00
5/21/99 1130	15	19		868.75	10.00	NR	NR	5.60	0.00	1.15	0.00	0.10	0.00	0.00	0.00	12.00	0.00	0.60	0.00	0.00	0.00
5/21/99 1330	15	19		931.25	10.00	NR	NR	6.00	0.00	1.20	0.00	0.15	0.00	0+	0.00	12.00	0+	1.80	0.00	0.00	0.00
5/21/99 1530	15	19		993.75	10.00	NR	NR	8.00	0.00	1.50	0.00	0.25	0.00	0+	0.00	12.00	0.00	2.60	0.00	0.00	0.00
5/22/99 730	14	19		1481.25	10.00	NR	NR	8.00	0.00	1.40	0.00	0.35	0.00	0+	0.00	14.00	0.00	2.60	0.00	0.00	0.00
5/22/99 830	14	19		1512.50	10.00	NR	NR	8.00	0.00	1.70	0.00	0.35	0.00	0+	0.00	12.00	0+	2.40	0.00	0.00	0.00
5/22/99 1130	15.0	19.0		1606.25	15.00	NR	NR	8.00	0.00	1.70	0.00	0.35	0.00	0+	0.00	12.00	0.00	2.25	0.00	0.00	0.00
5/22/99 1530	Began Phase III @ 15" Hg																				
5/22/99 1600	12.5	15.5	0.34	1722.50	31.00	NR	NR	6.50	0.00	1.16	0.00	0.25	0.00	0+	0.00	10.00	0+	2.40	0.00	0.00	0.00
5/22/99 1630	13.5	15.5		1733.75	31.00	NR	NR	7.00	0.00	1.16	0.00	0.25	0.00	0+	0.00	10.00	0.00	1.93	0.00	0.00	0.00
5/22/99 1700	13	16.5		1745.00	31.00	NR	NR	6.50	0.00	1.30	0.00	0.25	0.00	0.00	0.00	10.00	0.00	2.20	0.00	0.00	0.00
5/22/99 1730	13	16.5		1755.00	31.00	NR	NR	6.50	0.00	1.30	0.00	0.25	0.00	0+	0.00	10.00	0.00	2.20	0.00	0.00	0.00
5/22/99 1809	12.5	16		1768.75	31.00	NR	NR	6.50	0.00	1.15	0.00	0.15	0.00	0+	0.00	10.00	0.00	2.20	0.00	0.00	0.00
5/23/99 0810	12	16		2056.25	31.00	NR	NR	6.00	0.00	1.15	0.00	0.15	0.00	0.00	0.00	10.00	0.00	2.00	0.00	0.00	0.00
5/23/99 0830	Increased vacuum to 19.5 " Hg (max																				
5/23/99 0900	15.4	19.5	0.38	2080.00	16.00	NR	NR	8.00	0.00	1.40	0.00	0.20	0.00	0.00	0.00	12.00	0.00	2.45	0.00	0.00	0.00
5/23/99 0930	15.5	19.5		2091.25	16.00	NR	NR	8.00	0.00	1.35	0.00	0.25	0.00	0.00	0.00	12.00	0.00	2.60	0.00	0.00	0.00
5/23/99 1000	15.5	19.2		2103.75	16.00	NR	NR	8.00	0.00	1.35	0.00	0.25	0.00	0.00	0.00	12.00	0.00	2.50	0.00	0.00	0.00
5/23/99 1030	15.4	19.1		2116.25	12.50	NR	NR	8.00	0.00	1.45	0.00	0.30	0.00	0.00	0.00	12.00	0.00	2.40	0.00	0.00	0.00
5/23/99 1330	15.1	19		2185.00	15.00	NR	NR	8.00	0.00	1.35	0.00	0.10	0.00	0.00	0.00	11.00	0.00	2.30	0.00	0.00	0.00
5/23/99 1630	15.5	19		2253.75	15.00	340	21.7	7.00	0.00	1.35	0.00	0.30	0.00	0.00	0.00	[illegible]	0.00	[illegible]	[illegible]		

WATER LEVEL DATA
ABB FACILITY
ROCHESTER, NY
Water Level (Feet BTOC)

Date/Time	Elapsed Time (Hrs)	PZ-267	PZ-267 dd	PZ-267D	PZ-267 dd	PZ-266	PZ-266 dd	PZ-266	PZ-266 dd	PZ-271	PZ-271 dd	PZ-271	PZ-271 dd	PZ-265	PZ-265 dd	PZ-265	PZ-265 dd	PZ-270	PZ-270 dd	PZ-270	PZ-270 dd
5/19/99 820	Initial	7.01		7.21		7.20		7.21		7.45		7.41		7.11		7.32		7.04		7.67	
5/19/99 12:15	0	Phase I Start																			
5/19/99 1247	0.5	7.17	-0.16	7.58	-0.37	7.30	-0.10	7.26	-0.05	7.46	-0.01	7.42	-0.01	7.20	-0.09	7.35	-0.03	7.11	-0.07	8.30	-0.63
5/19/99 1320	1.08	7.25	-0.24	7.86	-0.65	7.36	-0.16	7.37	-0.16	7.48	-0.03	7.44	-0.03	7.20	-0.09	7.32	0.00	7.20	-0.16	8.67	-1.00
5/19/99 1350	1.6	7.30	-0.29	8.02	-0.81	7.41	-0.21	7.46	-0.25	7.48	-0.03	7.46	-0.05	7.20	-0.09	7.33	-0.01	7.24	-0.20	8.90	-1.23
5/19/99 1420	2.08	7.33	-0.32	8.21	-1.00	7.46	-0.26	7.55	-0.34	7.51	-0.06	7.47	-0.06	7.20	-0.09	7.35	-0.03	7.28	-0.24	9.15	-1.48
5/19/99 1450	2.6	7.37	-0.36	8.36	-1.15	7.49	-0.29	7.60	-0.39	7.51	-0.06	7.51	-0.10	7.21	-0.10	7.35	-0.03	7.32	-0.28	9.40	-1.73
5/19/99 1520	3.08	7.41	-0.40	8.50	-1.29	7.51	-0.31	7.65	-0.44	7.52	-0.07	7.52	-0.11	7.21	-0.10	7.35	-0.03	7.35	-0.31	9.61	-1.94
5/19/99 1550	3.6	7.42	-0.41	8.55	-1.34	7.55	-0.35	7.68	-0.47	7.52	-0.07	7.52	-0.11	7.21	-0.10	7.35	-0.03	7.36	-0.32	9.73	-2.06
5/19/99 1620	4.08	7.42	-0.41	8.62	-1.41	7.55	-0.35	7.71	-0.50	7.55	-0.10	7.55	-0.14	7.21	-0.10	7.35	-0.03	7.38	-0.34	9.86	-2.19
5/19/99 1720	4.6	7.51	-0.50	8.86	-1.65	7.61	-0.41	7.80	-0.59	7.57	-0.12	7.57	-0.16	7.21	-0.10	7.35	-0.03	7.45	-0.41	10.25	-2.58
5/19/99 2100	8.75	7.62	-0.61	9.16	-1.95	7.73	-0.53	7.93	-0.72	7.65	-0.20	7.67	-0.26	7.25	-0.14	7.40	-0.08	7.55	-0.51	10.85	-3.18
5/20/99 715	19	7.71	-0.70	9.14	-1.93	7.83	-0.63	8.01	-0.80	7.76	-0.31	7.80	-0.39	7.39	-0.28	7.48	-0.16	7.67	-0.63	10.90	-3.23
5/20/99 815	20	7.75	-0.74	9.20	-1.99	7.85	-0.65	8.04	-0.83	7.77	-0.32	7.80	-0.39	7.4	-0.29	7.48	-0.16	7.7	-0.66	10.95	-3.28
5/20/99 915	21	7.78	-0.77	9.37	-2.16	7.88	-0.68	8.11	-0.90	7.79	-0.34	7.81	-0.40	7.41	-0.30	7.49	-0.17	7.72	-0.68	11.20	-3.53
5/20/99 1115	23	7.81	-0.80	9.48	-2.27	7.91	-0.71	8.15	-0.94	7.8	-0.35	7.82	-0.41	7.42	-0.31	7.50	-0.18	7.75	-0.71	11.37	-3.70
5/20/99 1515	27	7.83	-0.82	9.56	-2.35	7.93	-0.73	8.17	-0.96	7.81	-0.36	7.85	-0.44	7.40	-0.29	7.46	-0.14	7.79	-0.75	11.56	-3.89
5/20/99 1615	28	Phase II Start @ 15" Hg																			
5/20/99 1630	28.25	8.02	-1.01	9.60	-2.39	8.05	-0.85	8.19	-0.98	7.83	-0.38	7.85	-0.44	7.39	-0.28	7.46	-0.14	7.92	-0.88	11.61	-3.94
5/20/99 1700	28.75	8.23	-1.22	9.72	-2.51	8.2	-1.00	8.27	-1.06	7.85	-0.40	7.85	-0.44	7.4	-0.29	7.46	-0.14	8.11	-1.07	11.75	-4.08
5/20/99 1730	29.25	8.35	-1.34	9.88	-2.67	8.31	-1.11	8.39	-1.18	7.87	-0.42	7.87	-0.46	7.38	-0.27	7.46	-0.14	8.26	-1.22	11.95	-4.28
5/20/99 1800	29.75	8.4	-1.39	9.98	-2.77	8.37	-1.17	8.47	-1.26	7.88	-0.43	7.91	-0.50	7.38	-0.27	7.47	-0.15	8.31	-1.27	12.10	-4.43
5/20/99 1830	30.25	8.47	-1.46	10.10	-2.89	8.41	-1.21	8.55	-1.34	7.91	-0.46	7.92	-0.51	7.4	-0.29	7.45	-0.13	8.35	-1.31	12.22	-4.55
5/20/99 1900	30.75	8.50	-1.49	10.17	-2.96	8.45	-1.25	8.60	-1.39	7.91	-0.46	7.94	-0.53	7.40	-0.29	7.46	-0.14	8.41	-1.37	12.31	-4.64
5/20/99 1930	31.25	8.53	-1.52	10.23	-3.02	8.48	-1.28	8.65	-1.44	7.92	-0.47	7.96	-0.55	7.40	-0.29	7.47	-0.15	8.50	-1.46	12.40	-4.73
5/21/99 800	43.75	8.94	-1.93	10.75	-3.54	8.79	-1.59	8.99	-1.78	8.11	-0.66	8.20	-0.79	7.50	-0.39	7.56	-0.24	10.53	-3.49	13.08	-5.41
5/21/99 830	44.25	Increased pump vac to 20" Hg																			
5/21/99 930	45.25	9.10	-2.09	11.04	-3.83	8.85	-1.65	9.13	-1.92	8.14	-0.69	8.24	-0.83	7.51	-0.40	7.56	-0.24	11.02	-3.98	13.49	-5.82
5/21/99 1030	46.25	9.17	-2.16	11.23	-4.02	8.87	-1.67	9.20	-1.99	8.15	-0.70	8.25	-0.84	7.51	-0.40	8.56	-1.24	11.20	-4.16	13.76	-6.09
5/21/99 1130	47.25	9.21	-2.20	11.34	-4.13	8.90	-1.70	9.25	-2.04	8.16	-0.71	8.27	-0.86	7.51	-0.40	8.55	-1.23	11.26	-4.22	13.92	-6.25
5/21/99 1330	49.25	9.31	-2.30	11.42	-4.21	8.93	-1.73	9.27	-2.06	8.19	-0.74	8.29	-0.88	7.49	-0.38	8.53	-1.21	11.34	-4.30	14.07	-6.40
5/21/99 1530	51.25	9.61	-2.60	11.62	-4.41	9.01	-1.81	9.39	-2.18	8.24	-0.79	8.31	-0.90	7.47	-0.36	8.54	-1.22	11.53	-4.49	14.32	-6.65
5/22/99 730	67.25	10.87	-3.86	12.11	-4.90	9.15	-1.95	9.69	-2.48	8.40	-0.95	8.47	-1.06	7.55	-0.44	7.60	-0.28	12.20	-5.16	14.86	-7.19
5/22/99 830	68.25	10.91	-3.90	12.12	-4.91	9.16	-1.96	9.70	-2.49	8.41	-0.96	8.50	-1.09	7.56	-0.45	7.61	-0.29	12.22	-5.18	14.90	-7.23
5/22/99 1130	71.25	11.01	-4.00	12.23	-5.02	9.17	-1.97	9.75	-2.54	8.43	-0.98	8.55	-1.14	7.58	-0.47	7.62	-0.30	12.31	-5.27	14.97	-7.30
5/22/99 1530	75.25	Began Phase III @ 15" Hg																			
5/22/99 1600	75.75	10.85	-3.84	12.13	-4.92	9.20	-2.00	9.71	-2.50	8.45	-1.00	8.55	-1.14	7.55	-0.44	7.60	-0.28	12.23	-5.19	14.75	-7.08
5/22/99 1630	76.25	10.63	-3.62	11.94	-4.73	9.19	-1.99	9.64	-2.43	9.44	-1.99	8.55	-1.14	7.57	-0.46	7.62	-0.30	12.15	-5.11	14.42	-6.75
5/22/99 1700	76.75	10.57	-3.56	11.75	-4.54	9.16	-1.96	9.60	-2.39	8.44	-0.99	8.55	-1.14	7.60	-0.49	7.63	-0.31	12.09	-5.05	14.16	-6.49
5/22/99 1730	77.25	10.54	-3.53	11.63	-4.42	9.17	-1.97	9.56	-2.35	8.45	-1.00	8.54	-1.13	7.57	-0.46	7.63	-0.31	12.03	-4.99	13.96	-6.29
5/22/99 18:09	77.9	10.51	-3.50	11.47	-4.26	9.16	-1.96	9.52	-2.31	8.45	-1.00	8.53	-1.12	7.58	-0.47	7.62	-0.30	11.98	-4.94	13.7	-6.03
5/23/99 0810	92.05	10.35	-3.34	10.71	-3.50	9.16	-1.96	9.35	-2.14	8.49	-1.04	8.5	-1.09	7.65	-0.54	7.65	-0.33	11.61	-4.57	12.2	-4.53
5/23/99 8:30	92.38	Increase vacuum at wellhead to 15 in. Hg.																			
5/23/99 0900	92.9	10.47	-3.46	10.73	-3.52	9.17	-1.97	9.37	-2.16	8.49	-1.04	8.49	-1.08	7.63	-0.52	7.66	-0.34	11.67	-4.63	12.25	-4.58
5/23/99 0930	93.4	10.49	-3.48	10.77	-3.56	9.19	-1.99	9.37	-2.16	8.49	-1.04	8.49	-1.08	7.65	-0.54	7.65	-0.33	11.73	-4.69	12.3	-4.63
5/23/99 1000	93.9	10.55	-3.54	10.79	-3.58	9.17	-1.97	9.4	-2.19	8.49	-1.04	8.51	-1.10	7.65	-0.54	7.67	-0.35	11.77	-4.73	12.34	-4.67
5/23/99 1030	94.4	10.55	-3.54	10.81	-3.60	9.19	-1.99	9.42	-2.21	8.5	-1.05	8.51	-1.10	7.64	-0.53	7.65	-0.33	11.79	-4.75	12.36	-4.69
5/23/99 1330	97.4	10.6	-3.59	10.9	-3.69	9.19	-1.99	9.45	-2.24	8.51	-1.06	8.54	-1.13	7.66	-0.55	7.68	-0.36	11.9	-4.86	12.44	-4.77
5/23/99 1630	100.4	10.6	-3.59	10.91	-3.70	9.22	-2.02	9.48	-2.27	8.5	-1.05	8.51	-1.10	7.62	-0.51	7.63	-0.31	11.95	-4.91	12.43	-4.76
5/23/99 1930	103.4	10.63	-3.62	10.94	-3.73	9.21	-2.01	9.47	-2.26	8.51	-1.06	8.53	-1.12	7.63	-0.52	7.64	-0.32	11.94	-4.93	12.43	-4.76
5/24/99 1030	Final	8.7	-1.69	8.86	-1.65	8.65	-1.45	8.43	-1.22	8.32	-0.87	8.14	-0.73	7.52	-0.41	7.54	-0.22	8.76	-1.72	9.15	-1.48

APPENDIX E

GROUNDWATER MONITORING RESULTS

Ta 1

VOC Results
September 1997 - September 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT **(Units in ug/l)**	**SITE** **SAMPLE ID** **DATE** **RESULT TYPE**	**BR-01** **BR01XXXX** **09/07/97** **Primary**	**BR-01** **BR01XXXX** **10/01/97** **Primary**	**BR-01** **BR01059901** **05/06/99** **Primary**	**BR-01** **BR01099901** **09/16/99** **Primary**	**BR-02** **BR02XXXX** **09/07/97** **Primary**	**BR-02** **BR02XXXX** **10/01/97** **Primary**
Acetone		400 U	500 U	20 U	200 U	40 U	2000 U
Benzene		100 U	130 U	5 U	50 U	10 U	500 U
Bromodichloromethane		100 U	130 U	5 U	50 U	10 U	500 U
Bromoform		100 U	130 U	5 U	50 U	10 U	500 U
Bromomethane		100 U	130 U	5 U	50 U	10 U	500 U
2-Butanone (MEK)		200 U	250 U	10 U	100 U	20 U	1000 U
Carbon disulfide		200 U	250 U	10 U	100 U	20 U	1000 U
Carbon tetrachloride		100 U	130 U	5 U	50 U	10 U	500 U
Chlorobenzene		100 U	130 U	5 U	50 U	10 U	500 U
Chloroethane		100 U	130 U	5 U	50 U	10 U	500 U
Chloroform		100 U	130 U	5 U	50 U	10 U	500 U
Chloromethane		100 U	130 U	5 U	50 U	10 U	500 U
Dibromochloromethane		100 U	130 U	5 U	50 U	10 U	500 U
1,1-Dichloroethane		100 U	130 U	5 U	50 U	10 U	500 U
1,2-Dichloroethane		100 U	130 U	5 U	50 U	10 U	500 U
1,1-Dichloroethene		100 U	130 U	5 U	50 U	10 U	500 U
cis-1,2-Dichloroethene		100 U	130 U	320	1800	98	640
trans-1,2-Dichloroethene		100 U	130 U	5 U	50 U	85	500 U
1,2-Dichloropropane		100 U	130 U	5 U	50 U	10 U	500 U
cis-1,3-Dichloropropene		100 U	130 U	5 U	50 U	10 U	500 U
trans-1,3-Dichloropropene		100 U	130 U	5 U	50 U	10 U	500 U
Ethylbenzene		100 U	130 U	5 U	50 U	10 U	500 U
2-Hexanone		200 U	250 U	10 U	100 U	20 U	1000 U
Methylene chloride		100 U	130 U	5 U	50 U	10 U	500 U
4-Methyl-2-pentanone(MIBK)		200 U	250 U	10 U	100 U	20 U	1000 U
Styrene		100 U	130 U	5 U	50 U	10 U	500 U

Values represent total concentrations unless noted   < = Not detected at indicated reporting limit   --- = Not analyzed

U = Not Detected, quantitation limit noted, J = Estimated Value,   UJ = Quantitation Limit estimated   For RCL VOA

Table

VOC Results
September 1997 - September 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT (Units in ug/l)	SITE	BR-01	BR-01	BR-01	BR-01	BR-02	BR-02
	SAMPLE ID	BR01XXXX	BR01XXXX	BR01059901	BR01099901	BR02XXXX	BR02XXXX
	DATE	09/07/97	10/01/97	05/06/99	09/16/99	09/07/97	10/01/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
1,1,2,2-Tetrachloroethane		100 U	130 U	5 U	50 U	10 U	500 U
Tetrachloroethene		100 U	130 U	5 U	50 U	10 U	500 U
Toluene		100 U	130 U	5 U	50 U	10 U	500 U
1,1,1-Trichloroethane		100 U	130 U	5 U	50 U	10 U	500 U
1,1,2-Trichloroethane		100 U	130 U	5 U	50 U	10 U	500 U
Trichloroethene		3600	3800	1800	940	260	18000
Vinyl chloride		100 U	130 U	5 U	50 U	10 U	500 U
o-Xylene		100 U	130 U	5 U	50 U	10 U	500 U
m+p-Xylene		100 U	130 U	5 U	50 U	10 U	500 U

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VOC Results
September 1997 - September 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
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CONSTITUENT (Units in ug/l)	SITE SAMPLE ID DATE RESULT TYPE	BR-02 BR02059901 05/05/99 Primary	BR-02 BR02099901 09/16/99 Primary	BR-03 BR03XXXX 09/07/97 Primary	BR-03 BR03XXXX 10/02/97 Primary	BR-03 BR03059901 05/04/99 Primary	BR-03 BR03099901 09/16/99 Primary
Acetone		20 U	40 U	200 U	20 U	20 U	20 U
Benzene		5 U	10 U	50 U	5 U	5 U	5 U
Bromodichloromethane		5 U	10 U	50 U	5 U	5 U	5 U
Bromoform		5 U	10 U	50 U	5 U	5 U	5 U
Bromomethane		5 U	10 U	50 U	5 U	5 U	5 U
2-Butanone (MEK)		10 U	20 U	100 U	10 U	10 U	10 U
Carbon disulfide		10 U	20 U	100 U	10 U	10 U	10 U
Carbon tetrachloride		5 U	10 U	50 U	5 U	5 U	5 U
Chlorobenzene		5 U	10 U	50 U	5 U	5 U	5 U
Chloroethane		5 U	10 U	50 U	5 U	5 U	5 U
Chloroform		5 U	10 U	50 U	5 U	5 U	5 U
Chloromethane		5 U	10 U	50 U	5 U	5 U	5 U
Dibromochloromethane		5 U	10 U	50 U	5 U	5 U	5 U
1,1-Dichloroethane		5 U	10 U	50 U	5 U	5 U	5 U
1,2-Dichloroethane		5 U	10 U	50 U	5 U	5 U	5 U
1,1-Dichloroethene		6.0	10 U	50 U	5 U	5 U	5 U
cis-1,2-Dichloroethene		1200 J	56	50 U	6.1	5.5	5 U
trans-1,2-Dichloroethene		24	13	50 U	5 U	5 U	5 U
1,2-Dichloropropane		5 U	10 U	50 U	5 U	5 U	5 U
cis-1,3-Dichloropropene		5 U	10 U	50 U	5 U	5 U	5 U
trans-1,3-Dichloropropene		5 U	10 U	50 U	5 U	5 U	5 U
Ethylbenzene		5 U	10 U	50 U	5 U	5 U	5 U
2-Hexanone		10 U	20 U	100 U	10 U	10 U	10 U
Methylene chloride		5 U	10 U	50 U	5 U	5 U	5 U
4-Methyl-2-pentanone(MIBK)		10 U	20 U	100 U	10 U	10 U	10 U
Styrene		5 U	10 U	50 U	5 U	5 U	5 U

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VOC Results
September 1997 - September 1999
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CONSTITUENT (Units in ug/l)	SITE	BR-02	BR-02	BR-03	BR-03	BR-03	BR-03
	SAMPLE ID	BR02059901	BR02099901	BR03XXXX	BR03XXXX	BR03059901	BR03099901
	DATE	05/05/99	09/16/99	09/07/97	10/02/97	05/04/99	09/16/99
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
1,1,2,2-Tetrachloroethane		5 U	10 U	50 U	5 U	5 U	5 U
Tetrachloroethene		5 U	10 U	50 U	5 U	5 U	5 U
Toluene		5 U	10 U	50 U	5 U	5 U	5 U
1,1,1-Trichloroethane		5 U	10 U	50 U	5 U	5 U	5 U
1,1,2-Trichloroethane		5 U	10 U	50 U	5 U	5 U	5 U
Trichloroethene		3300 J	300	850	440	420 J	56
Vinyl chloride		5 U	10 U	50 U	5 U	5 U	5 U
o-Xylene		5 U	10 U	50 U	5 U	5 U	5 U
m+p-Xylene		5 U	10 U	50 U	5 U	5 U	5 U

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VOC Results
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CONSTITUENT (Units in ug/l)	SITE	BR-04	BR-04	BR-04	BR-04	BR-04	BR-04
	SAMPLE ID	**BR04XXXX**	**BR04XXXD**	**BR04XXXX**	**BR04059901**	**BR04059901D**	**BR04099901**
	DATE	**09/09/97**	**09/09/97**	**10/02/97**	**05/06/99**	**05/06/99**	**09/17/99**
	RESULT TYPE	**Primary**	**Duplicate 1**	**Primary**	**Primary**	**Duplicate 1**	**Primary**
Acetone		500 U	500 U	2000 U	200 U	200 U	400 U
Benzene		130 U	130 U	500 U	50 U	50 U	100 U
Bromodichloromethane		130 U	130 U	500 U	50 U	50 U	100 U
Bromoform		130 U	130 U	500 U	50 U	50 U	100 U
Bromomethane		130 U	130 U	500 U	50 U	50 U	100 U
2-Butanone (MEK)		250 U	250 U	1000 U	100 U	100 U	200 U
Carbon disulfide		250 U	250 U	1000 U	100 U	100 U	200 U
Carbon tetrachloride		130 U	130 U	500 U	50 U	50 U	100 U
Chlorobenzene		130 U	130 U	500 U	50 U	50 U	100 U
Chloroethane		130 U	130 U	500 U	50 U	50 U	100 U
Chloroform		130 U	130 U	500 U	50 U	50 U	100 U
Chloromethane		130 U	130 U	500 U	50 U	50 U	100 U
Dibromochloromethane		130 U	130 U	500 U	50 U	50 U	100 U
1,1-Dichloroethane		130 U	130 U	500 U	50 U	50 U	100 U
1,2-Dichloroethane		130 U	130 U	500 U	50 U	50 U	100 U
1,1-Dichloroethene		130 U	130 U	500 U	50 U	50 U	100 U
cis-1,2-Dichloroethene		240	260	500 U	160	210	690
trans-1,2-Dichloroethene		130 U	130 U	500 U	50 U	50 U	100 U
1,2-Dichloropropane		130 U	130 U	500 U	50 U	50 U	100 U
cis-1,3-Dichloropropene		130 U	130 U	500 U	50 U	50 U	100 U
trans-1,3-Dichloropropene		130 U	130 U	500 U	50 U	50 U	100 U
Ethylbenzene		130 U	130 U	500 U	50 U	50 U	100 U
2-Hexanone		250 U	250 U	1000 U	100 U	100 U	200 U
Methylene chloride		130 U	130 U	500 U	50 U	50 U	100 U
4-Methyl-2-pentanone(MIBK)		250 U	250 U	1000 U	100 U	100 U	200 U
Styrene		130 U	130 U	500 U	50 U	50 U	100 U

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VOC Results

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Taylor Instruments Facility

Rochester, NY

CONSTITUENT **(Units in ug/l)**	**SITE**	**BR-04**	**BR-04**	**BR-04**	**BR-04**	**BR-04**	**BR-04**
	SAMPLE ID	**BR04XXXX**	**BR04XXXD**	**BR04XXXX**	**BR04059901**	**BR04059901D**	**BR04099901**
	DATE	**09/09/97**	**09/09/97**	**10/02/97**	**05/06/99**	**05/06/99**	**09/17/99**
	RESULT TYPE	**Primary**	**Duplicate 1**	**Primary**	**Primary**	**Duplicate 1**	**Primary**
1,1,2,2-Tetrachloroethane		130 U	130 U	500 U	50 U	50 U	100 U
Tetrachloroethene		130 U	130 U	500 U	50 U	50 U	100 U
Toluene		130 U	130 U	500 U	50 U	50 U	100 U
1,1,1-Trichloroethane		130 U	130 U	500 U	50 U	50 U	100 U
1,1,2-Trichloroethane		130 U	130 U	500 U	50 U	50 U	100 U
Trichloroethene		3700	4700	27000	2100 J	2100 J	9900
Vinyl chloride		130 U	130 U	500 U	50 U	50 U	100 U
o-Xylene		130 U	130 U	500 U	50 U	50 U	100 U
m + p-Xylene		130 U	130 U	500 U	50 U	50 U	100 U

Values represent total concentrations unless noted   < = Not detected at indicated reporting limit   --- = Not analyzed

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Table

VOC Results
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Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT (Units in ug/l)	SITE SAMPLE ID DATE RESULT TYPE	BR-05 BR05XXXX 09/09/97 Primary	BR-05 BR05XXXX 10/01/97 Primary	BR-05 BR05059901 05/06/99 Primary	BR-05 BR05099901 09/17/99 Primary	BR-06 BR06XXXX 09/09/97 Primary	BR-06 BR06XXXX 10/01/97 Primary
Acetone		500 U	500 U	20 U	400 U	20 U	20 U
Benzene		130 U	130 U	5 U	100 U	5 U	5 U
Bromodichloromethane		130 U	130 U	5 U	100 U	5 U	5 U
Bromoform		130 U	130 U	5 U	100 U	5 U	5 U
Bromomethane		130 U	130 U	5 U	100 U	5 U	5 U
2-Butanone (MEK)		250 U	250 U	10 U	200 U	10 U	10 U
Carbon disulfide		250 U	250 U	10 U	200 U	10 U	10 U
Carbon tetrachloride		130 U	130 U	5 U	100 U	5 U	5 U
Chlorobenzene		130 U	130 U	5 U	100 U	5 U	5 U
Chloroethane		130 U	130 U	5 U	100 U	5 U	5 U
Chloroform		130 U	130 U	5 U	100 U	5 U	5 U
Chloromethane		130 U	130 U	5 U	100 U	5 U	5 U
Dibromochloromethane		130 U	130 U	5 U	100 U	5 U	5 U
1,1-Dichloroethane		130 U	130 U	5.2 J	100 U	5 U	5 U
1,2-Dichloroethane		130 U	130 U	5 U	100 U	5 U	5 U
1,1-Dichloroethene		130 U	130 U	23 J	100 U	5 U	5 U
cis-1,2-Dichloroethene		580	620	440	1400	5 U	5 U
trans-1,2-Dichloroethene		130 U	130 U	84 J	100 U	5 U	5 U
1,2-Dichloropropane		130 U	130 U	5 U	100 U	5 U	5 U
cis-1,3-Dichloropropene		130 U	130 U	5 U	100 U	5 U	5 U
trans-1,3-Dichloropropene		130 U	130 U	5 U	100 U	5 U	5 U
Ethylbenzene		130 U	130 U	5 U	100 U	5 U	5 U
2-Hexanone		250 U	250 U	10 U	200 U	10 U	10 U
Methylene chloride		130 U	130 U	5 U	100 U	5 U	5 U
4-Methyl-2-pentanone(MIBK)		250 U	250 U	10 U	200 U	10 U	10 U
Styrene		130 U	130 U	5 U	100 U	5 U	5 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = Not Detected, quantitation limit noted, J = Estimated Value, UJ = Quantitation Limit estimated For RCL VOA

Table 1-1

VOC Results
September 1997 - September 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT (Units in ug/l)	**SITE**	**BR-05**	**BR-05**	**BR-05**	**BR-05**	**BR-06**	**BR-06**
	SAMPLE ID	**BR05XXXX**	**BR05XXXX**	**BR05059901**	**BR05099901**	**BR06XXXX**	**BR06XXXX**
	DATE	**09/09/97**	**10/01/97**	**05/06/99**	**09/17/99**	**09/09/97**	**10/01/97**
	RESULT TYPE	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**
1,1,2,2-Tetrachloroethane		130 U	130 U	5 U	100 U	5 U	5 U
Tetrachloroethene		130 U	130 U	5 U	100 U	5 U	5 U
Toluene		130 U	130 U	5 U	100 U	5 U	5 U
1,1,1-Trichloroethane		130 U	130 U	5 U	100 U	5 U	5 U
1,1,2-Trichloroethane		130 U	130 U	5 U	100 U	5 U	5 U
Trichloroethene		10000	12000	6700	3500	5 U	5 U
Vinyl chloride		130 U	130 U	95 J	120	5 U	5 U
o-Xylene		130 U	130 U	5 U	100 U	5 U	5 U
m+p-Xylene		130 U	130 U	5 U	100 U	5 U	5 U

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Tab

VOC Results
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CONSTITUENT (Units in ug/l)	SITE	BR-06	BR-07	BR-07	BR-07	BR-07	BR-07
	SAMPLE ID	BR06059901	BR07XXXX	BR07XXXX	BR07XXXD	BR07059901	BR07099901
	DATE	05/04/99	09/07/97	10/01/97	10/01/97	05/05/99	09/15/99
	RESULT TYPE	Primary	Primary	Primary	Duplicate 1	Primary	Primary
Acetone		20 U	40 U	100 U	50 U	20 U	50 U
Benzene		5 U	10 U	25 U	13 U	5 U	13 U
Bromodichloromethane		5 U	10 U	25 U	13 U	5 U	13 U
Bromoform		5 U	10 U	25 U	13 U	5 U	13 U
Bromomethane		5 U	10 U	25 U	13 U	5 U	13 U
2-Butanone (MEK)		10 U	20 U	50 U	25 U	10 U	25 U
Carbon disulfide		10 U	20 U	50 U	25 U	10 U	25 U
Carbon tetrachloride		5 U	10 U	25 U	13 U	5 U	13 U
Chlorobenzene		5 U	10 U	25 U	13 U	5 U	13 U
Chloroethane		5 U	10 U	25 U	13 U	5 U	13 U
Chloroform		5 U	14	25 U	13 U	5 U	13 U
Chloromethane		5 U	10 U	25 U	13 U	5 U	13 U
Dibromochloromethane		5 U	10 U	25 U	13 U	5 U	13 U
1,1-Dichloroethane		5 U	10 U	25 U	13 U	5 U	13 U
1,2-Dichloroethane		5 U	10 U	25 U	13 U	5 U	13 U
1,1-Dichloroethene		5 U	10 U	25 U	13 U	5 U	13 U
cis-1,2-Dichloroethene		5 U	62	460	450	53	32
trans-1,2-Dichloroethene		5 U	10 U	25 U	13 U	5.9	13 U
1,2-Dichloropropane		5 U	10 U	25 U	13 U	5 U	13 U
cis-1,3-Dichloropropene		5 U	10 U	25 U	13 U	5 U	13 U
trans-1,3-Dichloropropene		5 U	10 U	25 U	13 U	5 U	13 U
Ethylbenzene		5 U	10 U	25 U	13 U	5 U	13 U
2-Hexanone		10 U	20 U	50 U	25 U	10 U	25 U
Methylene chloride		5 U	10 U	25 U	13 U	5 U	13 U
4-Methyl-2-pentanone(MIBK)		10 U	20 U	50 U	25 U	10 U	25 U
Styrene		5 U	10 U	25 U	13 U	5 U	13 U

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VOC Results
September 1997 - September 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT (Units in ug/l)	SITE SAMPLE ID DATE RESULT TYPE	BR-06 BR06059901 05/04/99 Primary	BR-07 BR07XXXX 09/07/97 Primary	BR-07 BR07XXXX 10/01/97 Primary	BR-07 BR07XXXD 10/01/97 Duplicate 1	BR-07 BR07059901 05/05/99 Primary	BR-07 BR07099901 09/15/99 Primary
1,1,2,2-Tetrachloroethane		5 U	10 U	25 U	13 U	5 U	13 U
Tetrachloroethene		5 U	10 U	25 U	13 U	5 U	13 U
Toluene		5 U	26	61	54	5 U	13 U
1,1,1-Trichloroethane		5 U	10 U	25 U	13 U	5 U	13 U
1,1,2-Trichloroethane		5 U	10 U	25 U	13 U	5 U	13 U
Trichloroethene		5 U	210	110	13 U	5.4	13 U
Vinyl chloride		5 U	200	700	530	360 J	340
o-Xylene		5 U	10 U	25 U	13 U	5 U	13 U
m+p-Xylene		5 U	10 U	25 U	13 U	5 U	13 U

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VOC Results
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Pre-Remedy Groundwater Monitoring Plan
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CONSTITUENT (Units in ug/l)	SITE	BR-07	MW00	MW00	OB-04	OB-04	OB-04
	SAMPLE ID	BR07099901D	MW00059901	MW00099901	OB04XXXX	OB04XXXX	OB04059901
	DATE	09/15/99	05/05/99	09/15/99	09/09/97	10/02/97	05/06/99
	RESULT TYPE	Duplicate 1	Primary	Primary	Primary	Primary	Primary
Acetone		50 U	20 U	20 U	50000 U	50000 U	20 U
Benzene		13 U	5 U	5 U	13000 U	13000 U	5.7
Bromodichloromethane		13 U	5 U	5 U	13000 U	13000 U	5 U
Bromoform		13 U	5 U	5 U	13000 U	13000 U	5 U
Bromomethane		13 U	5 U	5 U	13000 U	13000 U	5 U
2-Butanone (MEK)		25 U	10 U	10 U	25000 U	25000 U	10 U
Carbon disulfide		25 U	10 U	10 U	25000 U	25000 U	10 U
Carbon tetrachloride		13 U	5 U	5 U	13000 U	13000 U	5 U
Chlorobenzene		13 U	5 U	5 U	13000 U	13000 U	5 U
Chloroethane		13 U	5 U	5 U	13000 U	13000 U	5 U
Chloroform		13 U	5 U	5 U	13000 U	13000 U	5 U
Chloromethane		13 U	5 U	5 U	13000 U	13000 U	5 U
Dibromochloromethane		13 U	5 U	5 U	13000 U	13000 U	5 U
1,1-Dichloroethane		13 U	5 U	5 U	13000 U	13000 U	5 U
1,2-Dichloroethane		13 U	5 U	5 U	13000 U	13000 U	5 U
1,1-Dichloroethene		13 U	5 U	5 U	13000 U	13000 U	19
cis-1,2-Dichloroethene		33	5 U	5 U	27000	13000	1800 J
trans-1,2-Dichloroethene		13 U	5 U	5 U	13000 U	13000 U	25
1,2-Dichloropropane		13 U	5 U	5 U	13000 U	13000 U	5 U
cis-1,3-Dichloropropene		13 U	5 U	5 U	13000 U	13000 U	5 U
trans-1,3-Dichloropropene		13 U	5 U	5 U	13000 U	13000 U	5 U
Ethylbenzene		13 U	6.1	5 U	13000 U	13000 U	5 U
2-Hexanone		25 U	10 U	10 U	25000 U	25000 U	10 U
Methylene chloride		13 U	5 U	5 U	13000 U	13000 U	5 U
4-Methyl-2-pentanone(MIBK)		25 U	10 U	10 U	25000 U	25000 U	10 U
Styrene		13 U	5 U	5 U	13000 U	13000 U	5 U

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VOC Results

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Pre-Remedy Groundwater Monitoring Plan

Taylor Instruments Facility

Rochester, NY

CONSTITUENT (Units in ug/l)	SITE	BR-07	MW00	MW00	OB-04	OB-04	OB-04
	SAMPLE ID	BR07099901D	MW00059901	MW00099901	OB04XXXX	OB04XXXX	OB04059901
	DATE	09/15/99	05/05/99	09/15/99	09/09/97	10/02/97	05/06/99
	RESULT TYPE	Duplicate 1	Primary	Primary	Primary	Primary	Primary
1,1,2,2-Tetrachloroethane		13 U	5 U	5 U	13000 U	13000 U	5 U
Tetrachloroethene		13 U	5 U	5 U	13000 U	13000 U	23
Toluene		13 U	5 U	5 U	13000 U	13000 U	5.7
1,1,1-Trichloroethane		13 U	5 U	5 U	13000 U	13000 U	5 U
1,1,2-Trichloroethane		13 U	5 U	5 U	13000 U	13000 U	5 U
Trichloroethene		13 U	5 U	5 U	550000	280000	68000 J
Vinyl chloride		350	12	5 U	13000 U	13000 U	5 U
o-Xylene		13 U	5 U	5 U	13000 U	13000 U	5 U
m+p-Xylene		13 U	5 U	5 U	13000 U	13000 U	5 U

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VOC Results
September 1997 - September 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT (Units in ug/l)	SITE	OB-04	OB-05	OB-05	OB-05	OB-05	TW01
	SAMPLE ID	OB04099901	OB05XXXX	OB05XXXX	OB05059901	OB05099901	TW01XXXX
	DATE	09/17/99	09/09/97	10/01/97	05/06/99	09/17/99	09/08/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Acetone		2000 U	20000 U	5000 U	20 U	1000 U	20 U
Benzene		500 U	5000 U	1300 U	5 U	250 U	5 U
Bromodichloromethane		500 U	5000 U	1300 U	5 U	250 U	5 U
Bromoform		500 U	5000 U	1300 U	5 U	250 U	5 U
Bromomethane		500 U	5000 U	1300 U	5 U	250 U	5 U
2-Butanone (MEK)		1000 U	10000 U	2500 U	10 U	500 U	10 U
Carbon disulfide		1000 U	10000 U	2500 U	10 U	500 U	10 U
Carbon tetrachloride		500 U	5000 U	1300 U	5 U	250 U	5 U
Chlorobenzene		500 U	5000 U	1300 U	5 U	250 U	5 U
Chloroethane		500 U	5000 U	1300 U	5 U	250 U	5 U
Chloroform		500 U	5000 U	1300 U	5 U	250 U	5 U
Chloromethane		500 U	5000 U	1300 U	5 U	250 U	5 U
Dibromochloromethane		500 U	5000 U	1300 U	5 U	250 U	5 U
1,1-Dichloroethane		500 U	5000 U	1300 U	5 U	250 U	5 U
1,2-Dichloroethane		500 U	5000 U	1300 U	5 U	250 U	5 U
1,1-Dichloroethene		500 U	5000 U	1300 U	23	250 U	5 U
cis-1,2-Dichloroethene		5000	5000 U	1300 U	2700 J	2800	5 U
trans-1,2-Dichloroethene		500 U	5000 U	1300 U	29	250 U	5 U
1,2-Dichloropropane		500 U	5000 U	1300 U	5 U	250 U	5 U
cis-1,3-Dichloropropene		500 U	5000 U	1300 U	5 U	250 U	5 U
trans-1,3-Dichloropropene		500 U	5000 U	1300 U	5 U	250 U	5 U
Ethylbenzene		500 U	5000 U	1300 U	5 U	250 U	5 U
2-Hexanone		1000 U	10000 U	2500 U	10 U	500 U	10 U
Methylene chloride		500 U	5000 U	1300 U	5 U	250 U	5 U
4-Methyl-2-pentanone(MIBK)		1000 U	10000 U	2500 U	10 U	500 U	10 U
Styrene		500 U	5000 U	1300 U	5 U	250 U	5 U

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VOC Results
September 1997 - September 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT (Units in ug/l)	SITE SAMPLE ID DATE RESULT TYPE	OB-04 OB04099901 09/17/99 Primary	OB-05 OB05XXXX 09/09/97 Primary	OB-05 OB05XXXX 10/01/97 Primary	OB-05 OB05059901 05/06/99 Primary	OB-05 OB05099901 09/17/99 Primary	TW01 TW01XXXX 09/08/97 Primary
1,1,2,2-Tetrachloroethane		500 U	5000 U	1300 U	5 U	250 U	5 U
Tetrachloroethene		500 U	5000 U	1300 U	20	250 U	5 U
Toluene		500 U	5000 U	1300 U	5 U	250 U	5 U
1,1,1-Trichloroethane		500 U	5000 U	1300 U	5 U	250 U	5 U
1,1,2-Trichloroethane		500 U	5000 U	1300 U	5 U	250 U	5 U
Trichloroethene		43000	120000	47000	23000 J	86000	6.0
Vinyl chloride		500 U	5000 U	1300 U	140	250 U	5 U
o-Xylene		500 U	5000 U	1300 U	5 U	250 U	5 U
m+p-Xylene		500 U	5000 U	1300 U	5 U	250 U	5 U

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VOC Results
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Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

	SITE	TW01	TW01	TW04	TW04	TW04	TW04
CONSTITUENT (Units in ug/l)	**SAMPLE ID**	**TW01059901**	**TW01099901**	**TW04XXXX**	**TW04XXXD**	**TW04059901**	**TW04099901**
	DATE	**05/04/99**	**09/17/99**	**09/06/97**	**09/06/97**	**05/04/99**	**09/16/99**
	RESULT TYPE	**Primary**	**Primary**	**Primary**	**Duplicate 1**	**Primary**	**Primary**
Acetone		20 U	20 U	20 U	20 U	20 U	20 U
Benzene		5 U	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane		5 U	5 U	5 U	5 U	5 U	5 U
Bromoform		5 U	5 U	5 U	5 U	5 U	5 U
Bromomethane		5 U	5 U	5 U	5 U	5 U	5 U
2-Butanone (MEK)		10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide		10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride		5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene		5 U	5 U	5 U	5 U	5 U	5 U
Chloroethane		5 U	5 U	5 U	5 U	5 U	5 U
Chloroform		5 U	5 U	5 U	5 U	5 U	5 U
Chloromethane		5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane		5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane		5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane		5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene		5 U	5 U	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene		5 U	5 U	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene		5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane		5 U	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene		5 U	5 U	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene		5 U	5 U	5 U	5 U	5 U	5 U
Ethylbenzene		5 U	5 U	5 U	5 U	5 U	5 U
2-Hexanone		10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride		5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone(MIBK)		10 U	10 U	10 U	10 U	10 U	10 U
Styrene		5 U	5 U	5 U	5 U	5 U	5 U

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Table

VOC Results
September 1997 - September 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT (Units in ug/l)							
	SITE	**TW01**	**TW01**	**TW04**	**TW04**	**TW04**	**TW04**
	SAMPLE ID	**TW01059901**	**TW01099901**	**TW04XXXX**	**TW04XXXD**	**TW04059901**	**TW04099901**
	DATE	**05/04/99**	**09/17/99**	**09/06/97**	**09/06/97**	**05/04/99**	**09/16/99**
	RESULT TYPE	**Primary**	**Primary**	**Primary**	**Duplicate 1**	**Primary**	**Primary**
1,1,2,2-Tetrachloroethane		5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene		5 U	5 U	5 U	5 U	5 U	5 U
Toluene		5 U	5 U	5 U	5 U	5 U	5 U
1,1,1-Trichloroethane		5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane		5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene		5 U	5.1	77	72	91	92
Vinyl chloride		5 U	5 U	5 U	5 U	5 U	5 U
o-Xylene		5 U	5 U	5 U	5 U	5 U	5 U
m + p-Xylene		5 U	5 U	5 U	5 U	5 U	5 U

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VOC Results
September 1997 - September 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT (Units in ug/l)	SITE SAMPLE ID DATE RESULT TYPE	TW07 TW07XXXX 09/07/97 Primary	TW07 TW07XXXX 10/02/97 Primary	TW07 TW07059901 05/05/99 Primary	TW07 TW07099901 09/15/99 Primary	TW09 TW09XXXX 09/07/97 Primary	TW09 TW09059901 05/05/99 Primary
Acetone		20 U	20 U	20 U	20 U	50 U	40 U
Benzene		5.0 U	5 U	5 U	5.0 U	13 U	10 U
Bromodichloromethane		5.0 U	5 U	5 U	5.0 U	13 U	10 U
Bromoform		5.0 U	5 U	5 U	5.0 U	13 U	10 U
Bromomethane		5.0 U	5 U	5 U	5.0 U	13 U	10 U
2-Butanone (MEK)		10 U	10 U	10 U	10 U	25 U	20 U
Carbon disulfide		10 U	10 U	10 U	10 U	25 U	20 U
Carbon tetrachloride		5.0 U	5 U	5 U	5.0 U	13 U	10 U
Chlorobenzene		5.0 U	5 U	5 U	5.0 U	13 U	10 U
Chloroethane		5.0 U	5 U	5 U	5.0 U	13 U	10 U
Chloroform		5.0 U	5 U	5 U	5.0 U	13 U	10 U
Chloromethane		5.0 U	5 U	5 U	5.0 U	13 U	10 U
Dibromochloromethane		5.0 U	5 U	5 U	5.0 U	13 U	10 U
1,1-Dichloroethane		5.0 U	5 U	5 U	5.0 U	13 U	10 U
1,2-Dichloroethane		5.0 U	5 U	5 U	5.0 U	13 U	10 U
1,1-Dichloroethene		5.0 U	5 U	5 U	5.0 U	13 U	10 U
cis-1,2-Dichloroethene		5.3	5 U	5 U	12	23	34 J
trans-1,2-Dichloroethene		35	31	5 U	30	13 U	10 U
1,2-Dichloropropane		5.0 U	5 U	5 U	5.0 U	13 U	10 U
cis-1,3-Dichloropropene		5.0 U	5 U	5 U	5.0 U	13 U	10 U
trans-1,3-Dichloropropene		5.0 U	5 U	5 U	5.0 U	13 U	10 U
Ethylbenzene		5.0 U	5 U	5 U	5.0 U	13 U	10 U
2-Hexanone		10 U	10 U	10 U	10 U	25 U	20 U
Methylene chloride		5.0 U	5 U	5 U	5.0 U	13 U	10 U
4-Methyl-2-pentanone(MIBK)		10 U	10 U	10 U	10 U	25 U	20 U
Styrene		5.0 U	5 U	5 U	5.0 U	13 U	10 U

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Table

VOC Results
September 1997 - September 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT (Units in ug/l)						
SITE	TW07	TW07	TW07	TW07	TW09	TW09
SAMPLE ID	TW07XXXX	TW07XXXX	TW07059901	TW07099901	TW09XXXX	TW09059901
DATE	09/07/97	10/02/97	05/05/99	09/15/99	09/07/97	05/05/99
RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
1,1,2,2-Tetrachloroethane	5.0 U	5 U	5 U	5.0 U	13 U	10 U
Tetrachloroethene	5.0 U	5 U	5 U	5.0 U	13 U	10 U
Toluene	5.0 U	5 U	5 U	5.0 U	13 U	10 U
1,1,1-Trichloroethane	5.0 U	5 U	5 U	5.0 U	13 U	10 U
1,1,2-Trichloroethane	5.0 U	5 U	5 U	5.0 U	13 U	10 U
Trichloroethene	41	32	14	70	410	880 J
Vinyl chloride	5.0 U	5 U	5 U	5.0 U	13 U	10 U
o-Xylene	5.0 U	5 U	5 U	5.0 U	13 U	10 U
m+p-Xylene	5.0 U	5 U	5 U	5.0 U	13 U	10 U

Values represent total concentrations unless noted < =Not detected at indicated reporting limit --- =Not analyzed

U=Not Detected, quantitation limit noted, J=Estimated Value, UJ=Quantitation Limit estimated For RCL VOA

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CONSTITUENT (Units in ug/l)	SITE SAMPLE ID DATE RESULT TYPE	TW09 TW090599010 05/05/99 Duplicate 1	TW09 TW09099901 09/17/99 Primary	TW13 TW13XXXX 09/08/97 Primary	TW13 TW13059901 05/05/99 Primary	TW13 TW13099901 09/15/99 Primary	TW17 TW17XXXX 09/06/97 Primary
Acetone		20 U	100 U	20 U	20 U	20 U	200 U
Benzene		5 U	25 U	5.0 U	5 U	5.0 U	50 U
Bromodichloromethane		5 U	25 U	5.0 U	5 U	5.0 U	50 U
Bromoform		5 U	25 U	5.0 U	5 U	5.0 U	50 U
Bromomethane		5 U	25 U	5.0 U	5 U	5.0 U	50 U
2-Butanone (MEK)		10 U	50 U	10 U	10 U	10 U	100 U
Carbon disulfide		10 U	50 U	10 U	10 U	10 U	100 U
Carbon tetrachloride		5 U	25 U	5.0 U	5 U	5.0 U	50 U
Chlorobenzene		5 U	25 U	5.0 U	5 U	5.0 U	50 U
Chloroethane		5 U	25 U	5.0 U	5 U	5.0 U	50 U
Chloroform		5 U	25 U	5.0 U	5 U	5.0 U	50 U
Chloromethane		5 U	25 U	5.0 U	5 U	5.0 U	50 U
Dibromochloromethane		5 U	25 U	5.0 U	5 U	5.0 U	50 U
1,1-Dichloroethane		5 U	25 U	5.0 U	5 U	5.0 U	50 U
1,2-Dichloroethane		5 U	25 U	5.0 U	5 U	5.0 U	50 U
1,1-Dichloroethene		5 U	25 U	5.0 U	5 U	5.0 U	50 U
cis-1,2-Dichloroethene		28 J	39	5.0 U	5 U	5.0 U	50 U
trans-1,2-Dichloroethene		5 U	25 U	5.0 U	5 U	5.0 U	50 U
1,2-Dichloropropane		5 U	25 U	5.0 U	5 U	5.0 U	50 U
cis-1,3-Dichloropropene		5 U	25 U	5.0 U	5 U	5.0 U	50 U
trans-1,3-Dichloropropene		5 U	25 U	5.0 U	5 U	5.0 U	50 U
Ethylbenzene		5 U	25 U	5.0 U	5 U	5.0 U	50 U
2-Hexanone		10 U	50 U	10 U	10 U	10 U	100 U
Methylene chloride		5 U	25 U	5.0 U	5 U	5.0 U	50 U
4-Methyl-2-pentanone(MIBK)		10 U	50 U	10 U	10 U	10 U	100 U
Styrene		5 U	25 U	5.0 U	5 U	5.0 U	50 U

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CONSTITUENT (Units in ug/l)	SITE SAMPLE ID DATE RESULT TYPE	TW09 TW09059901D 05/05/99 Duplicate 1	TW09 TW09099901 09/17/99 Primary	TW13 TW13XXXX 09/08/97 Primary	TW13 TW13059901 05/05/99 Primary	TW13 TW13099901 09/15/99 Primary	TW17 TW17XXXX 09/06/97 Primary
1,1,2,2-Tetrachloroethane		5 U	25 U	5.0 U	5 U	5.0 U	50 U
Tetrachloroethene		5 U	25 U	5.0 U	5 U	5.0 U	50 U
Toluene		5 U	25 U	5.0 U	5 U	5.0 U	50 U
1,1,1-Trichloroethane		5 U	25 U	5.0 U	5 U	5.0 U	50 U
1,1,2-Trichloroethane		5 U	25 U	5.0 U	5 U	5.0 U	50 U
Trichloroethene		990 J	520	5.0 U	5 U	5.0 U	1900
Vinyl chloride		5 U	25 U	5.0 U	5 U	5.0 U	50 U
o-Xylene		5 U	25 U	5.0 U	5 U	5.0 U	50 U
m + p-Xylene		5 U	25 U	5.0 U	5 U	5.0 U	50 U

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CONSTITUENT (Units in ug/l)	SITE	TW17	TW17	TW20	TW20	TW20	TW20
	SAMPLE ID	TW17059901	TW17099901	TW20XXXX	TW20059901	TW20099901	TW20099901D
	DATE	05/06/99	09/17/99	09/08/97	05/05/99	09/16/99	09/16/99
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Duplicate 1
Acetone		20 U	200 U	20 U	20 U	20 U	20 U
Benzene		5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
Bromodichloromethane		5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
Bromoform		5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
Bromomethane		5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
2-Butanone (MEK)		10 U	100 U	10 U	10 U	10 U	10 U
Carbon disulfide		10 U	100 U	10 U	10 U	10 U	10 U
Carbon tetrachloride		5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
Chlorobenzene		5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
Chloroethane		5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
Chloroform		5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
Chloromethane		5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
Dibromochloromethane		5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
1,1-Dichloroethane		5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
1,2-Dichloroethane		5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
1,1-Dichloroethene		5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
cis-1,2-Dichloroethene		11 J	50 U	5.0 U	5 U	5.0 U	5.0 U
trans-1,2-Dichloroethene		5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
1,2-Dichloropropane		5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
cis-1,3-Dichloropropene		5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
trans-1,3-Dichloropropene		5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
Ethylbenzene		5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
2-Hexanone		10 U	100 U	10 U	10 U	10 U	10 U
Methylene chloride		5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
4-Methyl-2-pentanone(MIBK)		10 U	100 U	10 U	10 U	10 U	10 U
Styrene		5 U	50 U	5.0 U	5 U	5.0 U	5.0 U

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CONSTITUENT (Units in ug/l)						
SITE	TW17	TW17	TW20	TW20	TW20	TW20
SAMPLE ID	TW17059901	TW17099901	TW20XXXX	TW20059901	TW20099901	TW20099901D
DATE	05/06/99	09/17/99	09/08/97	05/05/99	09/16/99	09/16/99
RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Duplicate 1
1,1,2,2-Tetrachloroethane	5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
Tetrachloroethane	5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
Toluene	5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
1,1,1-Trichloroethane	5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
1,1,2-Trichloroethane	5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
Trichloroethene	1500	1400	11	11 J	5.0 U	5.0 U
Vinyl chloride	5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
o-Xylene	5 U	50 U	5.0 U	5 U	5.0 U	5.0 U
m+p-Xylene	5 U	50 U	5.0 U	5 U	5.0 U	5.0 U

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CONSTITUENT (Units in ug/l)	SITE SAMPLE ID DATE RESULT TYPE	TW69 TW69XXXX 09/08/97 Primary	TW69 TW69059901 05/05/99 Primary	TW74 TW74XXXX 09/07/97 Primary	TW74 TW74059901 05/05/99 Primary	W-1 MWW1XXXX 09/08/97 Primary	W-1 MWW1XXXD 09/08/97 Duplicate 1
Acetone		20 U	20 U	20 U	20 U	20 U	20 U
Benzene		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
Bromodichloromethane		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
Bromoform		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
Bromomethane		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
2-Butanone (MEK)		10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide		10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
Chlorobenzene		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
Chloroethane		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
Chloroform		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
Chloromethane		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
Dibromochloromethane		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
1,1-Dichloroethane		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
1,2-Dichloroethane		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
1,1-Dichloroethene		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
cis-1,2-Dichloroethene		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
trans-1,2-Dichloroethene		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
1,2-Dichloropropane		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
cis-1,3-Dichloropropene		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
trans-1,3-Dichloropropene		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
Ethylbenzene		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
2-Hexanone		10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
4-Methyl-2-pentanone(MIBK)		10 U	10 U	10 U	10 U	10 U	10 U
Styrene		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U

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	SITE	**TW69**	**TW69**	**TW74**	**TW74**	**W-1**	**W-1**
CONSTITUENT (Units in ug/l)	**SAMPLE ID**	**TW69XXXX**	**TW69059901**	**TW74XXXX**	**TW74059901**	**MWW1XXXX**	**MWW1XXXD**
	DATE	**09/08/97**	**05/05/99**	**09/07/97**	**05/05/99**	**09/08/97**	**09/08/97**
	RESULT TYPE	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Duplicate 1**
1,1,2,2-Tetrachloroethane		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
Tetrachloroethene		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
Toluene		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
1,1,1-Trichloroethane		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
1,1,2-Trichloroethane		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
Trichloroethene		5.0 U	5 U	19	18 J	5.0 U	5.0 U
Vinyl chloride		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
o-Xylene		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U
m+p-Xylene		5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U

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	SITE	W-1	W-2	W-2	W-2	W-3	W-3
CONSTITUENT **(Units in ug/l)**	**SAMPLE ID**	**W1059901**	**MWW2XXXX**	**MWW2XXXX**	**W2059901**	**MWW3XXXX**	**W3059901**
	DATE	**05/04/99**	**09/09/97**	**10/01/97**	**05/04/99**	**09/07/97**	**05/05/99**
	RESULT TYPE	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**
Acetone		20 U	20 U	20 U	20 U	20 U	20 U
Benzene		5 U	5.0 U	5 U	5 U	5.0 U	5 U
Bromodichloromethane		5 U	5.0 U	5 U	5 U	5.0 U	5 U
Bromoform		5 U	5.0 U	5 U	5 U	5.0 U	5 U
Bromomethane		5 U	5.0 U	5 U	5 U	5.0 U	5 U
2-Butanone (MEK)		10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide		10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride		5 U	5.0 U	5 U	5 U	5.0 U	5 U
Chlorobenzene		5 U	5.0 U	5 U	5 U	5.0 U	5 U
Chloroethane		5 U	5.0 U	5 U	5 U	5.0 U	5 U
Chloroform		5 U	5.0 U	5 U	5 U	5.0 U	5 U
Chloromethane		5 U	5.0 U	5 U	5 U	5.0 U	5 U
Dibromochloromethane		5 U	5.0 U	5 U	5 U	5.0 U	5 U
1,1-Dichloroethane		5 U	5.0 U	5 U	5 U	5.0 U	5 U
1,2-Dichloroethane		5 U	5.0 U	5 U	5 U	5.0 U	5 U
1,1-Dichloroethene		5 U	5.0 U	5 U	5 U	5.0 U	5 U
cis-1,2-Dichloroethene		5 U	5.0 U	5 U	5 U	5.0 U	5 U
trans-1,2-Dichloroethene		5 U	5.0 U	5 U	5 U	5.0 U	5 U
1,2-Dichloropropane		5 U	5.0 U	5 U	5 U	5.0 U	5 U
cis-1,3-Dichloropropene		5 U	5.0 U	5 U	5 U	5.0 U	5 U
trans-1,3-Dichloropropene		5 U	5.0 U	5 U	5 U	5.0 U	5 U
Ethylbenzene		5 U	5.0 U	5 U	5 U	5.0 U	5 U
2-Hexanone		10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride		5 U	5.0 U	5 U	5 U	5.0 U	5 U
4-Methyl-2-pentanone(MIBK)		10 U	10 U	10 U	10 U	10 U	10 U
Styrene		5 U	5.0 U	5 U	5 U	5.0 U	5 U

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CONSTITUENT (Units in ug/l)	SITE	W-1	W-2	W-2	W-2	W-3	W-3
	SAMPLE ID	W1059901	MWW2XXXX	MWW2XXXX	W2059901	MWW3XXXX	W3059901
	DATE	05/04/99	09/09/97	10/01/97	05/04/99	09/07/97	05/05/99
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
1,1,2,2-Tetrachloroethane		5 U	5.0 U	5 U	5 U	5.0 U	5 U
Tetrachloroethene		5 U	5.0 U	5 U	5 U	5.0 U	5 U
Toluene		5 U	5.0 U	5 U	5 U	5.0 U	5 U
1,1,1-Trichloroethane		5 U	5.0 U	5 U	5 U	5.0 U	5 U
1,1,2-Trichloroethane		5 U	5.0 U	5 U	5 U	5.0 U	5 U
Trichloroethene		5 U	23	5 U	5 U	10	5 U
Vinyl chloride		5 U	5.0 U	5 U	5 U	5.0 U	5 U
o-Xylene		5 U	5.0 U	5 U	5 U	5.0 U	5 U
m+p-Xylene		5 U	5.0 U	5 U	5 U	5.0 U	5 U

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U = Not Detected, quantitation limit noted, J = Estimated Value,   UJ = Quantitation Limit estimated   For RCL VOA

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	SITE	W-4	W-4	W-4	W-5	W-5	W-5
CONSTITUENT (Units in ug/l)	**SAMPLE ID**	**MWW4XXXX**	**W4059901**	**W4099901**	**MWW5XXXX**	**MWW5XXXX**	**W5059901**
	DATE	**09/07/97**	**05/05/99**	**09/16/99**	**09/08/97**	**10/01/97**	**05/05/99**
	RESULT TYPE	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**
Acetone		20 U	20 U	20 U	20 U	100 U	20 U
Benzene		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
Bromodichloromethane		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
Bromoform		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
Bromomethane		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
2-Butanone (MEK)		10 U	10 U	10 U	10 U	50 U	10 U
Carbon disulfide		10 U	10 U	10 U	10 U	50 U	10 U
Carbon tetrachloride		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
Chlorobenzene		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
Chloroethane		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
Chloroform		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
Chloromethane		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
Dibromochloromethane		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
1,1-Dichloroethane		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
1,2-Dichloroethane		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
1,1-Dichloroethene		5.0 U	5 U	5.0 U	5.0 U	25 U	6.2 J
cis-1,2-Dichloroethene		5.0 U	5 U	5.0 U	18	26	840 J
trans-1,2-Dichloroethene		5.0 U	5 U	5.0 U	7.8	25 U	41 J
1,2-Dichloropropane		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
cis-1,3-Dichloropropene		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
trans-1,3-Dichloropropene		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
Ethylbenzene		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
2-Hexanone		10 U	10 U	10 U	10 U	50 U	10 U
Methylene chloride		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
4-Methyl-2-pentanone(MIBK)		10 U	10 U	10 U	10 U	50 U	10 U
Styrene		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U

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	SITE	W-4	W-4	W-4	W-5	W-5	W-5
CONSTITUENT (Units in ug/l)	SAMPLE ID	MWW4XXXX	W4059901	W4099901	MWW5XXXX	MWW5XXXX	W5059901
	DATE	09/07/97	05/05/99	09/16/99	09/08/97	10/01/97	05/05/99
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
1,1,2,2-Tetrachloroethane		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
Tetrachloroethene		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
Toluene		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
1,1,1-Trichloroethane		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
1,1,2-Trichloroethane		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
Trichloroethene		5.3	5 U	5.0 U	2000	2200	3000 J
Vinyl chloride		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
o-Xylene		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U
m + p-Xylene		5.0 U	5 U	5.0 U	5.0 U	25 U	5 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = Not Detected, quantitation limit noted, J = Estimated Value, UJ = Quantitation Limit estimated For RCL VOA

VOC Results
September 1997 - September 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT (Units in ug/l)				
SITE	W-5	W-6	W-6	W-6
SAMPLE ID	W5099901	MWW6XXXX	W6059901	W6099901
DATE	09/17/99	09/08/97	05/05/99	09/16/99
RESULT TYPE	Primary	Primary	Primary	Primary
Acetone	40 U	20 U	20 U	20 U
Benzene	10 U	5.0 U	5 U	5.0 U
Bromodichloromethane	10 U	5.0 U	5 U	5.0 U
Bromoform	10 U	5.0 U	5 U	5.0 U
Bromomethane	10 U	5.0 U	5 U	5.0 U
2-Butanone (MEK)	20 U	10 U	10 U	10 U
Carbon disulfide	20 U	10 U	10 U	10 U
Carbon tetrachloride	10 U	5.0 U	5 U	5.0 U
Chlorobenzene	10 U	5.0 U	5 U	5.0 U
Chloroethane	10 U	5.0 U	5 U	5.0 U
Chloroform	10 U	5.0 U	5 U	5.0 U
Chloromethane	10 U	5.0 U	5 U	5.0 U
Dibromochloromethane	10 U	5.0 U	5 U	5.0 U
1,1-Dichloroethane	10 U	5.0 U	5 U	5.0 U
1,2-Dichloroethane	10 U	5.0 U	5 U	5.0 U
1,1-Dichloroethene	10 U	5.0 U	5 U	5.0 U
cis-1,2-Dichloroethene	76	5.0 U	5 U	14
trans-1,2-Dichloroethene	10 U	5.0 U	5 U	5.0 U
1,2-Dichloropropane	10 U	5.0 U	5 U	5.0 U
cis-1,3-Dichloropropene	10 U	5.0 U	5 U	5.0 U
trans-1,3-Dichloropropene	10 U	5.0 U	5 U	5.0 U
Ethylbenzene	10 U	5.0 U	5 U	5.0 U
2-Hexanone	20 U	10 U	10 U	10 U
Methylene chloride	10 U	5.0 U	5 U	5.0 U
4-Methyl-2-pentanone(MIBK)	20 U	10 U	10 U	10 U
Styrene	10 U	5.0 U	5 U	5.0 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = Not Detected, quantitation limit noted, J = Estimated Value, UJ = Quantitation Limit estimated For RCL VOA

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September 1997 - September 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT (Units in ug/l)	**SITE**	**W-5**	**W-6**	**W-6**	**W-6**
	SAMPLE ID	**W5099901**	**MWW6XXXX**	**W6059901**	**W6099901**
	DATE	**09/17/99**	**09/08/97**	**05/05/99**	**09/16/99**
	RESULT TYPE	**Primary**	**Primary**	**Primary**	**Primary**
1,1,2,2-Tetrachloroethane		10 U	5.0 U	5 U	5.0 U
Tetrachloroethene		10 U	5.0 U	5 U	5.0 U
Toluene		10 U	5.0 U	5 U	5.0 U
1,1,1-Trichloroethane		10 U	5.0 U	5 U	5.0 U
1,1,2-Trichloroethane		10 U	5.0 U	5 U	5.0 U
Trichloroethene		270	5.0 U	5 U	5.0 U
Vinyl chloride		10 U	5.0 U	5 U	5.0 U
o-Xylene		10 U	5.0 U	5 U	5.0 U
m + p-Xylene		10 U	5.0 U	5 U	5.0 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = Not Detected,quantitation limit noted, J = Estimated Value, UJ = Quantitation Limit estimated For RCL VOA

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VOC Results
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	SITE	**BR01010001**	**BR02010001**	**BR02010001D**	**BR03010001**	**BR04010001**	**BR05010001**
CONSTITUENT (ug/L)	SAMPLE ID	**BR01010001**	**BR02010001**	**BR02010001D**	**BR03010001**	**BR04010001**	**BR05010001**
	DATE	**1/7/00**	**1/12/00**	**12/14/99**	**1/12/00**	**1/17/00**	**1/12/00**
ACETONE		20 U	20 U	20 U	20 U	500 U	400 U
BENZENE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
BROMODICHLOROMETHANE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
BROMOFORM		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
BROMOMETHANE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
2-BUTANONE (MEK)		100 U	10 U	10 U	10 U	250 U	200 U
CARBON DISULFIDE		100 U	10 U	10 U	10 U	250 U	200 U
CARBON TETRACHLORIDE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
CHLOROBENZENE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
CHLOROETHANE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
CHLOROFORM		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
CHLOROMETHANE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
DIBROMOCHLOROMETHANE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
1,1-DICHLOROETHANE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
1,2-DICHLOROETHANE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
1,1-DICHLOROETHENE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
CIS-1,2-DICHLOROETHENE		1100	50	47	8.0	590	980
TRANS-1,2-DICHLOROETHENE		50 U	6.6	6.1	5.0 U	130 U	100 U
1,2-DICHLOROPROPANE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
CIS-1,3-DICHLOROPROPENE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
TRANS-1,3-DICHLOROPROPENE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
ETHYLBENZENE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
2-HEXANONE		100 U	10 U	10 U	10 U	250 U	200 U
METHYLENE CHLORIDE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
4-METHYL-2-PENTANONE (MIBK)		100 U	10 U	10 U	10 U	250 U	200 U
STYRENE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U

-- = not sampled or parameter not collected.

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VOC Results
January 2000
Pre-Remedy Groundwater Monitoring Plan
Former Taylor Instruments Facility
Rochester, NY

	SITE	**BR01010001**	**BR02010001**	**BR02010001D**	**BR03010001**	**BR04010001**	**BR05010001**
CONSTITUENT (ug/L)	SAMPLE ID	**BR01010001**	**BR02010001**	**BR02010001D**	**BR03010001**	**BR04010001**	**BR05010001**
	DATE	**1/7/00**	**1/12/00**	**12/14/99**	**1/12/00**	**1/17/00**	**1/12/00**
1,1,2,2-TETRACHLOROETHANE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
TETRACHLOROETHENE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
TOLUENE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
1,1,1-TRICHLOROETHANE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
1,1,2-TRICHLOROETHANE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
TRICHLOROETHENE		400	150	150	240	4500	1900
VINYL CHLORIDE		20 U	2.7	2.6	2.0 U	500 U	80
O-XYLENE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U
M+P-XYLENE		50 U	5.0 U	5.0 U	5.0 U	130 U	100 U

– = not sampled or parameter not collected.

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VOC Results
January 2000
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Former Taylor Instruments Facility
Rochester, NY

CONSTITUENT (ug/L)	SITE SAMPLE ID DATE	BR07010001 BR07010001 1/17/00	MW00010001 MW00010001 1/5/00	OB04010001 OB04010001 1/13/00	OB05010001 OB05010001 1/13/00	TW01010001 TW01010001 1/12/00	TW04010001 TW04010001 1/12/00
ACETONE		20 U	20 U	5000 U	2000 U	20 U	20 U
BENZENE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
BROMODICHLOROMETHANE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
BROMOFORM		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
BROMOMETHANE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
2-BUTANONE (MEK)		10 U	10 U	2500 U	1000 U	10 U	10 U
CARBON DISULFIDE		10 U	10 U	2500 U	1000 U	10 U	10 U
CARBON TETRACHLORIDE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
CHLOROBENZENE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
CHLOROETHANE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
CHLOROFORM		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
CHLOROMETHANE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
DIBROMOCHLOROMETHANE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
1,1-DICHLOROETHANE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
1,2-DICHLOROETHANE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
1,1-DICHLOROETHENE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
CIS-1,2-DICHLOROETHENE		21	5.0 U	1300 U	1700	5.0 U	5.0 U
TRANS-1,2-DICHLOROETHENE		7.6	5.0 U	1300 U	500 U	5.0 U	5.0 U
1,2-DICHLOROPROPANE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
CIS-1,3-DICHLOROPROPENE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
TRANS-1,3-DICHLOROPROPENE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
ETHYLBENZENE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
2-HEXANONE		10 U	10 U	2500 U	1000 U	10 U	10 U
METHYLENE CHLORIDE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
4-METHYL-2-PENTANONE (MIBK)		10 U	10 U	2500 U	1000 U	10 U	10 U
STYRENE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U

-- = not sampled or parameter not collected.

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VOC Results
January 2000
Pre-Remedy Groundwater Monitoring Plan
Former Taylor Instruments Facility
Rochester, NY

	SITE	**BR07010001**	**MW00010001**	**OB04010001**	**OB05010001**	**TW01010001**	**TW04010001**
CONSTITUENT (ug/L)	SAMPLE ID	**BR07010001**	**MW00010001**	**OB04010001**	**OB05010001**	**TW01010001**	**TW04010001**
	DATE	**1/17/00**	**1/5/00**	**1/13/00**	**1/13/00**	**1/12/00**	**1/12/00**
1,1,2,2-TETRACHLOROETHANE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
TETRACHLOROETHENE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
TOLUENE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
1,1,1-TRICHLOROETHANE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
1,1,2-TRICHLOROETHANE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
TRICHLOROETHENE		7.2	5.0 U	40000	22000	5.0 U	88
VINYL CHLORIDE		2.0 U	5.5	1000 U	200 U	2.0 U	2.0 U
O-XYLENE		5.0 U	5.0 U	1300 U	500 U	5.0 U	5.0 U
M+P-XYLENE		5.0 U	8.1	1300 U	500 U	5.0 U	5.0 U

-- = not sampled or parameter not collected.

Table 1a

VOC Results
January 2000
Pre-Remedy Groundwater Monitoring Plan
Former Taylor Instruments Facility
Rochester, NY

CONSTITUENT (ug/L)	SITE SAMPLE ID DATE	TW07010001 TW07010001 1/12/00	TW07010001D TW07010001D 1/12/00	TW09010001D TW09010001D 1/13/00	TW13010001 TW13010001 1/12/00	TW17010001 TW17010001 1/12/00	TW20010001 TW20010001 1/12/00
ACETONE		20 U	20 U	20 U	20 U	40 U	20 U
BENZENE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
BROMODICHLOROMETHANE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
BROMOFORM		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
BROMOMETHANE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
2-BUTANONE (MEK)		10 U	10 U	10 U	10 U	20 U	10 U
CARBON DISULFIDE		10 U	10 U	10 U	10 U	20 U	10 U
CARBON TETRACHLORIDE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
CHLOROBENZENE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
CHLOROETHANE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
CHLOROFORM		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
CHLOROMETHANE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
DIBROMOCHLOROMETHANE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
1,1-DICHLOROETHANE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
1,2-DICHLOROETHANE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
1,1-DICHLOROETHENE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
CIS-1,2-DICHLOROETHENE		5.0 U	5.0 U	31	5.0 U	10 U	5.0 U
TRANS-1,2-DICHLOROETHENE		20	19	5.0 U	5.0 U	10 U	5.0 U
1,2-DICHLOROPROPANE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
CIS-1,3-DICHLOROPROPENE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
TRANS-1,3-DICHLOROPROPENE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
ETHYLBENZENE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
2-HEXANONE		10 U	10 U	10 U	10 U	20 U	10 U
METHYLENE CHLORIDE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
4-METHYL-2-PENTANONE (MIBK)		10 U	10 U	10 U	10 U	20 U	10 U
STYRENE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U

-- = not sampled or parameter not collected.

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VOC Results
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Former Taylor Instruments Facility
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CONSTITUENT (ug/L)	SITE SAMPLE ID DATE	TW07010001 TW07010001 1/12/00	TW07010001D TW07010001D 1/12/00	TW09010001D TW09010001D 1/13/00	TW13010001 TW13010001 1/12/00	TW17010001 TW17010001 1/12/00	TW20010001 TW20010001 1/12/00
1,1,2,2-TETRACHLOROETHANE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
TETRACHLOROETHENE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
TOLUENE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
1,1,1-TRICHLOROETHANE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
1,1,2-TRICHLOROETHANE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
TRICHLOROETHENE		26	25	250	5.0 U	530	7.8
VINYL CHLORIDE		2.0 U	2.0 U	2.0 U	2.0 U	4.0 U	2.0 U
O-XYLENE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U
M+P-XYLENE		5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U

-- = not sampled or parameter not collected.

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VOC Results
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CONSTITUENT (ug/L)	SITE	**W4010001**	**W5010001**	**W6010001**
	SAMPLE ID	**W4010001**	**W5010001**	**W6010001**
	DATE	**1/12/00**	**1/12/00**	**1/12/00**
ACETONE		20 U	100 U	20 U
BENZENE		5.0 U	25 U	5.0 U
BROMODICHLOROMETHANE		5.0 U	25 U	5.0 U
BROMOFORM		5.0 U	25 U	5.0 U
BROMOMETHANE		5.0 U	25 U	5.0 U
2-BUTANONE (MEK)		10 U	6100	10 U
CARBON DISULFIDE		10 U	50 U	10 U
CARBON TETRACHLORIDE		5.0 U	25 U	5.0 U
CHLOROBENZENE		5.0 U	25 U	5.0 U
CHLOROETHANE		5.0 U	25 U	5.0 U
CHLOROFORM		5.0 U	25 U	5.0 U
CHLOROMETHANE		5.0 U	25 U	5.0 U
DIBROMOCHLOROMETHANE		5.0 U	25 U	5.0 U
1,1-DICHLOROETHANE		5.0 U	25 U	5.0 U
1,2-DICHLOROETHANE		5.0 U	25 U	5.0 U
1,1-DICHLOROETHENE		5.0 U	25 U	5.0 U
CIS-1,2-DICHLOROETHENE		5.0 U	210	5.0 U
TRANS-1,2-DICHLOROETHENE		5.0 U	25 U	5.0 U
1,2-DICHLOROPROPANE		5.0 U	25 U	5.0 U
CIS-1,3-DICHLOROPROPENE		5.0 U	25 U	5.0 U
TRANS-1,3-DICHLOROPROPENE		5.0 U	25 U	5.0 U
ETHYLBENZENE		5.0 U	25 U	5.0 U
2-HEXANONE		10 U	50 U	10 U
METHYLENE CHLORIDE		5.0 U	25 U	5.0 U
4-METHYL-2-PENTANONE (MIBK)		10 U	50 U	10 U
STYRENE		5.0 U	25 U	5.0 U

-- = not sampled or parameter not collected.

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VOC Results
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CONSTITUENT (ug/L)			
SITE	**W4010001**	**W5010001**	**W6010001**
SAMPLE ID	**W4010001**	**W5010001**	**W6010001**
DATE	**1/12/00**	**1/12/00**	**1/12/00**
1,1,2,2-TETRACHLOROETHANE	5.0 U	25 U	5.0 U
TETRACHLOROETHENE	5.0 U	25 U	5.0 U
TOLUENE	5.0 U	25 U	5.0 U
1,1,1-TRICHLOROETHANE	5.0 U	25 U	5.0 U
1,1,2-TRICHLOROETHANE	5.0 U	25 U	5.0 U
TRICHLOROETHENE	5.0 U	280	5.0 U
VINYL CHLORIDE	2.0 U	10 U	2.0 U
O-XYLENE	5.0 U	25 U	5.0 U
M+P-XYLENE	5.0 U	25 U	5.0 U

– = not sampled or parameter not collected.

Table 1-2

Mercury Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT (Units in ug/L)	SITE SAMPLE ID DATE RESULT TYPE	BR-01 BR01XXXX 09/07/97 Primary	BR-01 BR01XXXX 10/01/97 Primary	BR-01 BR01059901 05/06/99 Primary	BR-02 BR02XXXX 09/07/97 Primary	BR-02 BR02XXXX 10/01/97 Primary	BR-02 BR02059901 05/05/99 Primary
Mercury		0.48	0.20 U	0.30 U	0.30 U	0.20 U	0.30 U

Values represent total concentrations unless noted   < = Not detected at indicated reporting limit   --- = Not analyzed

U = Not Detected, quantitation limit noted, J = Estimated Value,   UJ = Quantitation Limit estimated   For RCL CVAA

Table 1-2

Mercury Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT (Units in ug/L)	SITE SAMPLE ID DATE RESULT TYPE	BR-03 BR03XXXX 09/07/97 Primary	BR-03 BR03XXXX 10/02/97 Primary	BR-03 BR03059901 05/04/99 Primary	BR-04 BR04XXXX 09/09/97 Primary	BR-04 BR04XXXD 09/09/97 Duplicate 1	BR-04 BR04XXXX 10/02/97 Primary
Mercury		0.30 U	0.20 U	0.30 U	0.30 U	0.38	0.20 U

Values represent total concentrations unless noted   < = Not detected at indicated reporting limit   --- = Not analyzed

U = Not Detected, quantitation limit noted, J = Estimated Value,   UJ = Quantitation Limit estimated   For RCL CVAA

Table 1-2

Mercury Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT (Units in ug/L)	SITE SAMPLE ID DATE RESULT TYPE	BR-04 BR04059901 05/06/99 Primary	BR-04 BR04059901D 05/06/99 Duplicate 1	BR-05 BR05XXXX 09/09/97 Primary	BR-05 BR05XXXX 10/01/97 Primary	BR-05 BR05059901 05/06/99 Primary	BR-06 BR06XXXX 09/09/97 Primary
Mercury		0.30 U	0.30 U	0.30 U	0.20 U	0.30 U	0.36

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = Not Detected, quantitation limit noted, J = Estimated Value, UJ = Quantitation Limit estimated For RCL CVAA

Table 1-2

Mercury Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT (Units in ug/L)	SITE SAMPLE ID DATE RESULT TYPE	BR-06 BR06XXXX 10/01/97 Primary	BR-06 BR06059901 05/04/99 Primary	BR-07 BR07XXXX 09/07/97 Primary	BR-07 BR07XXXX 10/01/97 Primary	BR-07 BR07XXXD 10/01/97 Duplicate 1	BR-07 BR07059901 05/05/99 Primary
Mercury		0.20 U	0.30 U	0.30 U	0.20 U	0.20 U	0.30 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = Not Detected, quantitation limit noted, J = Estimated Value, UJ = Quantitation Limit estimated For RCL CVAA

Table 1-2

Mercury Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT (Units in ug/L)		MW00	OB-04	OB-04	OB-04	OB-05	OB-05
	SITE	MW00	OB-04	OB-04	OB-04	OB-05	OB-05
	SAMPLE ID	MW00059901	OB04XXXX	OB04XXXX	OB04059901	OB05XXXX	OB05XXXX
	DATE	05/05/99	09/09/97	10/02/97	05/06/99	09/09/97	10/01/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Mercury		0.30 U	0.48	0.20 U	0.30 U	0.30 U	0.20 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = Not Detected, quantitation limit noted, J = Estimated Value, UJ = Quantitation Limit estimated For RCL CVAA

Table 1-2

Mercury Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT	(Units in ug/L)	SITE SAMPLE ID DATE RESULT TYPE	OB-05 OB05059901 05/06/99 Primary	TW01 TW01XXXX 09/08/97 Primary	TW01 TW01059901 05/04/99 Primary	TW04 TW04XXXX 09/06/97 Primary	TW04 TW04XXXD 09/06/97 Duplicate 1	TW04 TW04059901 05/04/99 Primary
Mercury			0.30 U	0.30 U	0.30 U	0.30 U	0.52	0.30 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = Not Detected, quantitation limit noted, J = Estimated Value, UJ = Quantitation Limit estimated For RCL CVAA

Table 1-2

Mercury Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT (Units in ug/L)		TW07	TW07	TW07	TW09	TW09	TW09
	SAMPLE ID	TW07XXXX	TW07XXXX	TW07059901	TW09XXXX	TW09059901	TW09059901D
	DATE	09/07/97	10/02/97	05/05/99	09/07/97	05/05/99	05/05/99
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Duplicate 1
Mercury		7.7	5.0	0.74	0.42	0.30 U	0.30 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = Not Detected,quantitation limit noted, J = Estimated Value, UJ = Quantitation Limit estimated For RCL CVAA

Table 1-2

Mercury Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

		SITE	**TW13**	**TW13**	**TW17**	**TW17**	**TW20**	**TW20**
CONSTITUENT	**(Units in ug/L)**	**SAMPLE ID**	**TW13XXXX**	**TW13059901**	**TW17XXXX**	**TW17059901**	**TW20XXXX**	**TW20059901**
		DATE	**09/08/97**	**05/05/99**	**09/06/97**	**05/06/99**	**09/08/97**	**05/06/99**
		RESULT TYPE	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**
Mercury			0.58	0.30 U	0.30 U	0.30 U	0.30 U	0.30 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = Not Detected, quantitation limit noted, J = Estimated Value, UJ = Quantitation Limit estimated For RCL CVAA

Table 1-2

Mercury Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

	SITE	TW69	TW69	TW74	TW74	W-1	W-1
CONSTITUENT (Units in ug/L)	**SAMPLE ID**	**TW69XXXX**	**TW69059901**	**TW74XXXX**	**TW74059901**	**MWW1XXXX**	**MWW1XXXD**
	DATE	**09/08/97**	**05/05/99**	**09/07/97**	**05/05/99**	**09/08/97**	**09/08/97**
	RESULT TYPE	**Primary**	**Primary**	**Primary**	**Primary**	**Primary**	**Duplicate 1**
Mercury		1.6	0.59	0.48	2.2	0.30 U	0.30 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = Not Detected, quantitation limit noted, J = Estimated Value, UJ = Quantitation Limit estimated For RCL CVAA

Table 1-2

Mercury Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT (Units in ug/L)	**SITE** **SAMPLE ID** **DATE** **RESULT TYPE**	**W-1** **W1059901** **05/04/99** **Primary**	**W-2** **MWW2XXXX** **09/09/97** **Primary**	**W-2** **MWW2XXXX** **10/01/97** **Primary**	**W-2** **W2059901** **05/04/99** **Primary**	**W-3** **MWW3XXXX** **09/07/97** **Primary**	**W-3** **W3059901** **05/05/99** **Primary**
Mercury		0.30 U	0.37	0.20 U	0.30 U	0.86	0.30 U

Values represent total concentrations unless noted   < = Not detected at indicated reporting limit   -- = Not analyzed

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Table 1-2

Mercury Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT	**(Units in ug/L)**	**SITE** **SAMPLE ID** **DATE** **RESULT TYPE**	**W-4** **MWW4XXXX** **09/07/97** **Primary**	**W-4** **W4059901** **05/05/99** **Primary**	**W-5** **MWW5XXXX** **09/08/97** **Primary**	**W-5** **MWW5XXXX** **10/01/97** **Primary**	**W-5** **W5059901** **05/05/99** **Primary**	**W-6** **MWW6XXXX** **09/08/97** **Primary**
Mercury			0.30 U	0.30 U	1.0	0.20 U	0.30 U	0.30 U

Values represent total concentrations unless noted   < = Not detected at indicated reporting limit   --- = Not analyzed

U = Not Detected,quantitation limit noted, J = Estimated Value,   UJ = Quantitation Limit estimated   For RCL CVAA

Table 1-2

Mercury Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT (Units in ug/L)		
	SITE	**W-6**
	SAMPLE ID	**W6059901**
	DATE	**05/05/99**
	RESULT TYPE	**Primary**
Mercury		0.30 U

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = Not Detected, quantitation limit noted, J = Estimated Value, UJ = Quantitation Limit estimated For RCL CVAA

Table 1-3

Engineering Parameter Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT	SITE	BR-01	BR-01	BR-02	BR-03	BR-03	BR-04
	SAMPLE ID	BR01XXXX	BR01059901	BR02XXXX	BR03XXXX	BR03059901	BR04XXXX
	DATE	09/07/97	05/06/99	09/07/97	09/07/97	05/04/99	09/09/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Aluminum	(mg/l)	0.177	1.18	0.100 U	0.272	0.1 U	0.100 U
Antimony	(mg/l)	0.0100 U	0.06 U	0.0100 U	0.0100 U	0.06 U	0.0100 U
Arsenic	(mg/l)	0.0296	0.01 U	0.0280	0.0333	0.01 U	0.0100 U
Barium	(mg/l)	0.0555	0.0540	0.0936	0.0203	0.02 U	0.198
Beryllium	(mg/l)	0.00500 U	0.005 U	0.00500 U	0.00500 U	0.005 U	0.00500 U
Cadmium	(mg/l)	0.00500 U	0.005 U	0.00500 U	0.00500 U	0.005 U	0.00500 U
Calcium	(mg/l)	152	174	116	103	104	116
Chromium	(mg/l)	0.0100 U	0.01 U	0.0100 U	0.0100 U	0.01 U	0.0100 U
Cobalt	(mg/l)	0.0500 U	0.05 U	0.0500 U	0.0500 U	0.05 U	0.0500 U
Copper	(mg/l)	0.0200 U	0.02 U	0.0200 U	0.0200 U	0.02 U	0.0200 U
Iron	(mg/l)	1.51	57.3	12.9	11.5	14.8	0.870
Lead	(mg/l)	0.00500 U	0.0116	0.00500 U	0.00500 U	0.005 U	0.00500 U
Magnesium	(mg/l)	41.9	56.9	43.5	57.3	58.9	44.2
Nickel	(mg/l)	0.0400 U	0.04 U	0.0400 U	0.0400 U	0.04 U	0.0400 U
Potassium	(mg/l)	3.00	2.94	5.62	16.8	33.7	7.20
Selenium	(mg/l)	0.00500 U	0.00634	0.00500 U	0.00500 U	0.005 U	0.00500 U
Silver	(mg/l)	0.0100 U	0.01 U	0.0100 U	0.0100 U	0.01 U	0.0100 U
Sodium	(mg/l)	67.5	49.7	66.9	91.2	90.2	113
Thallium	(mg/l)	0.0100 U	0.01 U	0.0100 U	0.0100 U	0.01 U	0.0100 U
Vanadium	(mg/l)	0.0500 U	0.05 U	0.0500 U	0.0500 U	0.05 U	0.0500 U
Zinc	(mg/l)	0.0100 U	0.0271	0.0100 U	0.0100 U	0.0182	0.0114
Total Dissolved Solids (TDS)	(mg/L)	---	663	---	---	1380	---
Total Suspended Solids (TSS)	(mg/l)	---	779	---	---	28.8	---
Biochemical Oxygen Demand (5-day)	(mg/L)	---	2 U	---	---	2 U	---
Chemical Oxygen Demand	(mg/L)	---	16.2	---	---	7.64	---
Total Organic Carbon	(mg/L)	---	1.86	---	---	1.9	---

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Table 1-3

Engineering Parameter Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT	SITE SAMPLE ID DATE RESULT TYPE	BR-01 BR01XXXX 09/07/97 Primary	BR-01 BR01059901 05/06/99 Primary	BR-02 BR02XXXX 09/07/97 Primary	BR-03 BR03XXXX 09/07/97 Primary	BR-03 BR03059901 05/04/99 Primary	BR-04 BR04XXXX 09/09/97 Primary
Hardness- calcium	(mg/l)	---	---	---	---	---	---
Hardness- magnesium	(mg/l)	---	---	---	---	---	---
Iron (Dissolved)	(mg/l)	---	0.281	---	---	1.48	---
Phosphorus, total	(mg/l)	---	---	---	---	---	---

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Table 1-3

Engineering Parameter Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

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Date: 08/19/99

CONSTITUENT	SITE SAMPLE ID DATE RESULT TYPE	BR-04 BR04XXXD 09/09/97 Duplicate 1	BR-04 BR04059901 05/06/99 Primary	BR-05 BR05XXXX 09/09/97 Primary	BR-05 BR05059901 05/06/99 Primary	BR-06 BR06XXXX 09/09/97 Primary	BR-06 BR06059901 05/04/99 Primary
Aluminum	(mg/l)	0.100 U	0.1 U	0.100 U	0.1 U	0.100 U	0.1 U
Antimony	(mg/l)	0.0100 U	0.06 U	0.0100 U	0.06 U	0.0100 U	0.06 U
Arsenic	(mg/l)	0.0100 U	0.01 U	0.0100 U	0.01 U	0.0100 U	0.01 U
Barium	(mg/l)	0.195	0.208	0.297	0.279	0.0450	0.106
Beryllium	(mg/l)	0.00500 U	0.005 U	0.00500 U	0.005 U	0.00500 U	0.005 U
Cadmium	(mg/l)	0.00500 U	0.005 U	0.00500 U	0.005 U	0.00500 U	0.005 U
Calcium	(mg/l)	116	162	133	163	76.7	99.1
Chromium	(mg/l)	0.0100 U	0.01 U	0.0100 U	0.01 U	0.0100 U	0.01 U
Cobalt	(mg/l)	0.0500 U	0.05 U	0.0500 U	0.05 U	0.0500 U	0.05 U
Copper	(mg/l)	0.0200 U	0.02 U	0.0200 U	0.02 U	0.0200 U	0.02 U
Iron	(mg/l)	0.851	3.06	2.69	8.08	7.64	9.77
Lead	(mg/l)	0.00500 U	0.005 U	0.00500 U	0.005 U	0.00500 U	0.005 U
Magnesium	(mg/l)	43.7	43.3	46.7	44.6	65.5	71.5
Nickel	(mg/l)	0.0400 U	0.04 U	0.0400 U	0.04 U	0.0400 U	0.04 U
Potassium	(mg/l)	7.05	6.32	6.74	4.10	5.42	5.16
Selenium	(mg/l)	0.00500 U	0.005 U	0.00500 U	0.005 U	0.00500 U	0.005 U
Silver	(mg/l)	0.0100 U	0.01 U	0.0100 U	0.01 U	0.0100 U	0.01 U
Sodium	(mg/l)	112	225	145	170	26.0	52.2
Thallium	(mg/l)	0.0100 U	0.01 U	0.0157	0.01 U	0.0100 U	0.01 U
Vanadium	(mg/l)	0.0500 U	0.05 U	0.0500 U	0.05 U	0.0500 U	0.05 U
Zinc	(mg/l)	0.0127	0.0112	0.0101	0.0122	0.0474	0.01 U
Total Dissolved Solids (TDS)	(mg/L)	---	1330	---	1150	---	690
Total Suspended Solids (TSS)	(mg/l)	---	2.60	---	12.6	---	21.5
Biochemical Oxygen Demand (5-day)	(mg/L)	---	2 U	---	2 U	---	2 U
Chemical Oxygen Demand	(mg/L)	---	22.6	---	18	---	8.27
Total Organic Carbon	(mg/L)	---	6.17	---	4.32	---	1.89

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Table 1-3

Engineering Parameter Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT	SITE	BR-04	BR-04	BR-05	BR-05	BR-06	BR-06
	SAMPLE ID	BR04XXXD	BR04059901	BR05XXXX	BR05059901	BR06XXXX	BR06059901
	DATE	09/09/97	05/06/99	09/09/97	05/06/99	09/09/97	05/04/99
	RESULT TYPE	Duplicate 1	Primary	Primary	Primary	Primary	Primary
Hardness- calcium	(mg/l)	---	---	---	---	---	---
Hardness- magnesium	(mg/l)	---	---	---	---	---	---
Iron (Dissolved)	(mg/l)	---	0.664	---	0.601	---	1.76
Phosphorus, total	(mg/l)	---	---	---	---	---	---

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Table 1-3

Engineering Parameter Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT	SITE	BR-07	OB-04	OB-04	OB-05	OB-05	TW01
	SAMPLE ID	BR07XXXX	OB04XXXX	OB04059901	OB05XXXX	OB05059901	TW01XXXX
	DATE	09/07/97	09/09/97	05/06/99	09/09/97	05/06/99	09/08/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Aluminum	(mg/l)	0.100 U	0.100 U	0.195	0.162	0.1 U	0.100 U
Antimony	(mg/l)	0.0100 U	0.0100 U	0.06 U	0.0100 U	0.06 U	0.0100 U
Arsenic	(mg/l)	0.0297	0.0100 U	0.01 U	0.0100 U	0.01 U	0.0100 U
Barium	(mg/l)	0.0718	0.434	0.149	0.105	0.0821	0.0308
Beryllium	(mg/l)	0.00500 U	0.00500 U	0.005 U	0.00500 U	0.005 U	0.00500 U
Cadmium	(mg/l)	0.00500 U	0.00500 U	0.005 U	0.00500 U	0.005 U	0.00500 U
Calcium	(mg/l)	81.1	113	162	148	136	111
Chromium	(mg/l)	0.0100 U	0.0100 U	0.01 U	0.0100 U	0.01 U	0.0100 U
Cobalt	(mg/l)	0.0500 U	0.0500 U	0.05 U	0.0500 U	0.05 U	0.0500 U
Copper	(mg/l)	0.0200 U	0.0200 U	0.02 U	0.0200 U	0.02 U	0.0200 U
Iron	(mg/l)	10.5	0.823	0.474	0.174	0.1 U	0.100 U
Lead	(mg/l)	0.00500 U	0.00500 U	0.005 U	0.00500 U	0.005 U	0.00500 U
Magnesium	(mg/l)	75.9	21.5	22.3	26.5	26.9	25.9
Nickel	(mg/l)	0.0400 U	0.0400 U	0.04 U	0.0400 U	0.04 U	0.0400 U
Potassium	(mg/l)	30.2	5.90	8.61	3.05	2.31	4.20
Selenium	(mg/l)	0.00500 U	0.00500 U	0.005 U	0.00500 U	0.005 U	0.00500 U
Silver	(mg/l)	0.0100 U	0.0100 U	0.01 U	0.0100 U	0.01 U	0.0100 U
Sodium	(mg/l)	132	42.4	110	20.0	21.3	116
Thallium	(mg/l)	0.0100 U	0.0100 U	0.01 U	0.0100 U	0.01 U	0.0205
Vanadium	(mg/l)	0.0500 U	0.0500 U	0.05 U	0.0500 U	0.05 U	0.0500 U
Zinc	(mg/l)	0.0100 U	0.0120	0.0485	0.0129	0.01 U	0.0177
Total Dissolved Solids (TDS)	(mg/L)	---	---	957	---	568	---
Total Suspended Solids (TSS)	(mg/l)	---	---	26.2	---	1 U	---
Biochemical Oxygen Demand (5-day)	(mg/L)	---	---	2 U	---	2 U	---
Chemical Oxygen Demand	(mg/L)	---	---	43.4	---	14.4	---
Total Organic Carbon	(mg/L)	---	---	13.8	---	3.13	---

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Table 1-3

Engineering Parameter Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT							
	SITE	BR-07	OB-04	OB-04	OB-05	OB-05	TW01
	SAMPLE ID	BR07XXXX	OB04XXXX	OB04059901	OB05XXXX	OB05059901	TW01XXXX
	DATE	09/07/97	09/09/97	05/06/99	09/09/97	05/06/99	09/08/97
	RESULT TYPE	Primary	Primary	Primary	Primary	Primary	Primary
Hardness- calcium	(mg/l)	---	---	404	---	340	---
Hardness- magnesium	(mg/l)	---	---	92.0	---	110	---
Iron (Dissolved)	(mg/l)	---	---	0.1 U	---	0.111	---
Phosphorus, total	(mg/l)	---	---	0.0675	---	0.05 U	---

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Table 1-3

Engineering Parameter Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT							
	SITE	**TW04**	**TW04**	**TW04**	**TW07**	**TW09**	**TW13**
	SAMPLE ID	**TW04XXXX**	**TW04XXXD**	**TW04059901**	**TW07XXXX**	**TW09XXXX**	**TW13XXXX**
	DATE	**09/06/97**	**09/06/97**	**05/04/99**	**09/07/97**	**09/07/97**	**09/08/97**
	RESULT TYPE	**Primary**	**Duplicate 1**	**Primary**	**Primary**	**Primary**	**Primary**
Aluminum	(mg/l)	0.100 U	0.100 U	0.1 U	0.100 U	0.100 U	0.100 U
Antimony	(mg/l)	0.0100 U	0.0100 U	0.06 U	0.0100 U	0.0100 U	0.0100 U
Arsenic	(mg/l)	0.0372	0.0368	0.01 U	0.0387	0.0344	0.0100 U
Barium	(mg/l)	0.0244	0.0261	0.0247	0.0398	0.0608	0.0675
Beryllium	(mg/l)	0.00500 U	0.00500 U	0.005 U	0.00500 U	0.00500 U	0.00500 U
Cadmium	(mg/l)	0.00500 U	0.00500 U	0.005 U	0.00500 U	0.00500 U	0.00500 U
Calcium	(mg/l)	186	196	101	276	182	166
Chromium	(mg/l)	0.0100 U	0.0100 U	0.01 U	0.0100 U	0.0100 U	0.0100 U
Cobalt	(mg/l)	0.0500 U	0.0500 U	0.05 U	0.0500 U	0.0500 U	0.0500 U
Copper	(mg/l)	0.0200 U	0.0200 U	0.02 U	0.0200 U	0.0200 U	0.0200 U
Iron	(mg/l)	0.100 U	0.123	0.438	0.100 U	0.100 U	0.100 U
Lead	(mg/l)	0.00500 U	0.00500 U	0.005 U	0.00500 U	0.00500 U	0.00500 U
Magnesium	(mg/l)	67.6	74.8	33.0	69.4	44.3	36.4
Nickel	(mg/l)	0.0400 U	0.0400 U	0.04 U	0.0400 U	0.0400 U	0.0400 U
Potassium	(mg/l)	10.1	8.34	6.22	4.34	20.0	3.79
Selenium	(mg/l)	0.00500 U	0.00500 U	0.005 U	0.0100 U	0.0100 U	0.00500 U
Silver	(mg/l)	0.0100 U	0.0100 U	0.01 U	0.0100 U	0.0100 U	0.0100 U
Sodium	(mg/l)	87.9	77.0	33.4	53.0	82.1	189
Thallium	(mg/l)	0.0100 U	0.0100 U	0.01 U	0.0100 U	0.0100 U	0.0206
Vanadium	(mg/l)	0.0500 U	0.0500 U	0.05 U	0.0500 U	0.0500 U	0.0500 U
Zinc	(mg/l)	0.0100 U	0.0213	0.0113	0.0100 U	0.0100 U	0.0127
Total Dissolved Solids (TDS)	(mg/L)	---	---	549	---	---	---
Total Suspended Solids (TSS)	(mg/l)	---	---	2.70	---	---	---
Biochemical Oxygen Demand (5-day)	(mg/L)	---	---	2 U	---	---	---
Chemical Oxygen Demand	(mg/L)	---	---	5 U	---	---	---
Total Organic Carbon	(mg/L)	---	---	1.77	---	---	---

Values represent total concentrations unless noted < =Not detected at indicated reporting limit --- =Not analyzed

U =Not Detected,quantitation limit noted, J =Estimated Value, UJ =Quantitation Limit estimated For RCL CVAA

Table 1-3

Engineering Parameter Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT	SITE	TW04	TW04	TW04	TW07	TW09	TW13
	SAMPLE ID	TW04XXXX	TW04XXXD	TW04059901	TW07XXXX	TW09XXXX	TW13XXXX
	DATE	09/06/97	09/06/97	05/04/99	09/07/97	09/07/97	09/08/97
	RESULT TYPE	Primary	Duplicate 1	Primary	Primary	Primary	Primary
Hardness- calcium	(mg/l)	---	---	252	---	---	---
Hardness- magnesium	(mg/l)	---	---	140	---	---	---
Iron (Dissolved)	(mg/l)	---	---	0.1 U	---	---	---
Phosphorus, total	(mg/l)	---	---	0.0659	---	---	---

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = Not Detected,quantitation limit noted, J = Estimated Value, UJ = Quantitation Limit estimated For RCL CVAA

Table 1-3

Engineering Parameter Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

Date: 08/19/99

	SITE	TW17	TW17	TW17	TW20	TW69	TW74
CONSTITUENT	**SAMPLE ID**	**TW17XXXX**	**TW17059901**	**TW17059901D**	**TW20XXXX**	**TW69XXXX**	**TW74XXXX**
	DATE	**09/06/97**	**05/06/99**	**05/06/99**	**09/08/97**	**09/08/97**	**09/07/97**
	RESULT TYPE	**Primary**	**Primary**	**Duplicate 1**	**Primary**	**Primary**	**Primary**
Aluminum	(mg/l)	0.100 U	0.1 U	0.1 U	0.100 U	0.100 U	0.100 U
Antimony	(mg/l)	0.0100 U	0.06 U	0.06 U	0.0100 U	0.0100 U	0.0100 U
Arsenic	(mg/l)	0.0265	0.01 U	0.01 U	0.0100 U	0.0100 U	0.0100 U
Barium	(mg/l)	0.0880	0.0569	0.0555	0.0724	0.0661	0.0200 U
Beryllium	(mg/l)	0.00500 U	0.005 U	0.005 U	0.00500 U	0.00500 U	0.00500 U
Cadmium	(mg/l)	0.00500 U	0.005 U	0.005 U	0.00500 U	0.00500 U	0.00500 U
Calcium	(mg/l)	182	134	131	104	94.9	0.755
Chromium	(mg/l)	0.0100 U	0.01 U	0.01 U	0.0100 U	0.0100 U	0.0100 U
Cobalt	(mg/l)	0.0500 U	0.05 U	0.05 U	0.0500 U	0.0500 U	0.0500 U
Copper	(mg/l)	0.0200 U	0.02 U	0.02 U	0.0200 U	0.0200 U	0.0200 U
Iron	(mg/l)	0.100 U	0.217	0.106	0.100 U	1.33	0.100 U
Lead	(mg/l)	0.00500 U	0.005 U	0.005 U	0.00500 U	0.00500 U	0.00500 U
Magnesium	(mg/l)	35.2	28.2	27.6	25.2	17.2	0.500 U
Nickel	(mg/l)	0.0400 U	0.04 U	0.04 U	0.0400 U	0.0400 U	0.0400 U
Potassium	(mg/l)	3.41	2.36	2.11	2.84	3.00	2.00 U
Selenium	(mg/l)	0.00500 U	0.005 U	0.005 U	0.00500 U	0.00500 U	0.0100 U
Silver	(mg/l)	0.0100 U	0.01 U	0.01 U	0.0100 U	0.0100 U	0.0100 U
Sodium	(mg/l)	81.3	51.6	51.6	42.0	522	0.500 U
Thallium	(mg/l)	0.0100 U	0.01 U	0.01 U	0.0154	0.0138	0.0100 U
Vanadium	(mg/l)	0.0500 U	0.05 U	0.05 U	0.0500 U	0.0500 U	0.0500 U
Zinc	(mg/l)	0.0100 U	0.01 U	0.01 U	0.0112	0.0134	0.0100 U
Total Dissolved Solids (TDS)	(mg/L)	---	617	644	---	---	---
Total Suspended Solids (TSS)	(mg/l)	---	4.73	---	---	---	---
Biochemical Oxygen Demand (5-day)	(mg/L)	---	2 U	2 U	---	---	---
Chemical Oxygen Demand	(mg/L)	---	7.01	7.01	---	---	---
Total Organic Carbon	(mg/L)	---	1.95	1.86	---	---	---

Values represent total concentrations unless noted   < = Not detected at indicated reporting limit   --- = Not analyzed

U = Not Detected, quantitation limit noted, J = Estimated Value,   UJ = Quantitation Limit estimated   For RCL CVAA

Table 1-3

Engineering Parameter Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT	SITE SAMPLE ID DATE RESULT TYPE	TW17 TW17XXXX 09/06/97 Primary	TW17 TW17059901 05/06/99 Primary	TW17 TW17059901D 05/06/99 Duplicate 1	TW20 TW20XXXX 09/08/97 Primary	TW69 TW69XXXX 09/08/97 Primary	TW74 TW74XXXX 09/07/97 Primary
Hardness- calcium	(mg/l)	---	334	327	---	---	---
Hardness- magnesium	(mg/l)	---	120	110	---	---	---
Iron (Dissolved)	(mg/l)	---	0.1 U	0.1 U	---	---	---
Phosphorus, total	(mg/l)	---	0.05 U	0.05 U	---	---	---

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = Not Detected, quantitation limit noted, J = Estimated Value, UJ = Quantitation Limit estimated For RCL CVAA

Table 1-3

Page: 1F

Date: 08/19/99

Engineering Parameter Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT	SITE SAMPLE ID DATE RESULT TYPE	W-1 MWW1XXXX 09/08/97 Primary	W-1 MWW1XXXD 09/08/97 Duplicate 1	W-2 MWW2XXXX 09/09/97 Primary	W-2 W2059901 05/04/99 Primary	W-3 MWW3XXXX 09/07/97 Primary	W-4 MWW4XXXX 09/07/97 Primary
Aluminum	(mg/l)	0.100 U	0.100 U	0.100 U	0.1 U	0.100 U	0.100 U
Antimony	(mg/l)	0.0100 U	0.0100 U	0.0100 U	0.06 U	0.0100 U	0.0100 U
Arsenic	(mg/l)	0.0100 U	0.0100 U	0.0100 U	0.01 U	0.0710	0.0206
Barium	(mg/l)	0.240	0.238	0.0473	0.0525	0.174	0.0519
Beryllium	(mg/l)	0.00500 U	0.00500 U	0.00500 U	0.005 U	0.00500 U	0.00500 U
Cadmium	(mg/l)	0.00500 U	0.00500 U	0.00500 U	0.005 U	0.00500 U	0.00500 U
Calcium	(mg/l)	253	242	33.3	33.6	498	97.8
Chromium	(mg/l)	0.0100 U	0.0100 U	0.0100 U	0.01 U	0.0100 U	0.0100 U
Cobalt	(mg/l)	0.0500 U	0.0500 U	0.0500 U	0.05 U	0.0500 U	0.0500 U
Copper	(mg/l)	0.0200 U	0.0200 U	0.0200 U	0.02 U	0.0200 U	0.0200 U
Iron	(mg/l)	0.457	0.471	0.100 U	0.1 U	6.01	1.94
Lead	(mg/l)	0.00500 U	0.00500 U	0.00500 U	0.005 U	0.00500 U	0.00500 U
Magnesium	(mg/l)	78.5	77.2	9.58	10.2	94.3	30.8
Nickel	(mg/l)	0.0400 U	0.0400 U	0.0400 U	0.04 U	0.0400 U	0.0400 U
Potassium	(mg/l)	3.60	3.66	2.00 U	2 U	5.79	2.38
Selenium	(mg/l)	0.00500 U	0.00500 U	0.00500 U	0.005 U	0.0100 U	0.00500 U
Silver	(mg/l)	0.0100 U	0.0100 U	0.0100 U	0.01 U	0.0100 U	0.0100 U
Sodium	(mg/l)	531	497	111	109	213	38.1
Thallium	(mg/l)	0.0143	0.0232	0.0100 U	0.01 U	0.0100 U	0.0100 U
Vanadium	(mg/l)	0.0500 U	0.0500 U	0.0500 U	0.05 U	0.0500 U	0.0500 U
Zinc	(mg/l)	0.0175	0.0223	0.0100 U	0.01 U	0.0100 U	0.0100 U
Total Dissolved Solids (TDS)	(mg/L)	---	---	---	399	---	---
Total Suspended Solids (TSS)	(mg/l)	---	---	---	1 U	---	---
Biochemical Oxygen Demand (5-day)	(mg/L)	---	---	---	2 U	---	---
Chemical Oxygen Demand	(mg/L)	---	---	---	6.37	---	---
Total Organic Carbon	(mg/L)	---	---	---	1.36	---	---

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = Not Detected, quantitation limit noted, J = Estimated Value, UJ = Quantitation Limit estimated For RCL CVAA

Table 1-3

Engineering Parameter Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT	SITE SAMPLE ID DATE RESULT TYPE	W-1 MWW1XXXX 09/08/97 Primary	W-1 MWW1XXXD 09/08/97 Duplicate 1	W-2 MWW2XXXX 09/09/97 Primary	W-2 W2059901 05/04/99 Primary	W-3 MWW3XXXX 09/07/97 Primary	W-4 MWW4XXXX 09/07/97 Primary
Hardness- calcium	(mg/l)	---	---	---	83.9	---	---
Hardness- magnesium	(mg/l)	---	---	---	42.0	---	---
Iron (Dissolved)	(mg/l)	---	---	---	0.1 U	---	---
Phosphorus, total	(mg/l)	---	---	---	0.05 U	---	---

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = Not Detected,quantitation limit noted, J = Estimated Value, UJ = Quantitation Limit estimated For RCL CVAA

Table 1-3

Engineering Parameter Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

Date: 08/19/99

CONSTITUENT	SITE	W-5	W-6
	SAMPLE ID	MWW5XXXX	MWW6XXXX
	DATE	09/08/97	09/08/97
	RESULT TYPE	Primary	Primary
Aluminum	(mg/l)	0.100 U	0.968
Antimony	(mg/l)	0.0100 U	0.0100 U
Arsenic	(mg/l)	0.0100 U	0.0100 U
Barium	(mg/l)	0.0495	0.0283
Beryllium	(mg/l)	0.00500 U	0.00500 U
Cadmium	(mg/l)	0.00500 U	0.00500 U
Calcium	(mg/l)	192	29.7
Chromium	(mg/l)	0.0100 U	0.0100 U
Cobalt	(mg/l)	0.0500 U	0.0500 U
Copper	(mg/l)	0.0200 U	0.0200 U
Iron	(mg/l)	0.670	1.85
Lead	(mg/l)	0.00500 U	0.00500 U
Magnesium	(mg/l)	64.3	0.799
Nickel	(mg/l)	0.0400 U	0.0400 U
Potassium	(mg/l)	2.36	13.8
Selenium	(mg/l)	0.00500 U	0.00500 U
Silver	(mg/l)	0.0100 U	0.0100 U
Sodium	(mg/l)	49.8	82.4
Thallium	(mg/l)	0.0225	0.0100 U
Vanadium	(mg/l)	0.0500 U	0.0500 U
Zinc	(mg/l)	0.0182	0.0177
Total Dissolved Solids (TDS)	(mg/L)	---	---
Total Suspended Solids (TSS)	(mg/l)	---	---
Biochemical Oxygen Demand (5-day)	(mg/L)	---	---
Chemical Oxygen Demand	(mg/L)	---	---
Total Organic Carbon	(mg/L)	---	---

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = Not Detected, quantitation limit noted, J = Estimated Value, UJ = Quantitation Limit estimated For RCL CVAA

Table 1-3

Engineering Parameter Results
September 1997 - May 1999
Pre-Remedy Groundwater Monitoring Plan
Taylor Instruments Facility
Rochester, NY

CONSTITUENT	SITE SAMPLE ID DATE RESULT TYPE	W-5 MWW5XXXX 09/08/97 Primary	W-6 MWW6XXXX 09/08/97 Primary
Hardness- calcium	(mg/l)	---	---
Hardness- magnesium	(mg/l)	---	---
Iron (Dissolved)	(mg/l)	---	---
Phosphorus, total	(mg/l)	---	---

Values represent total concentrations unless noted < = Not detected at indicated reporting limit --- = Not analyzed

U = Not Detected,quantitation limit noted, J = Estimated Value, UJ = Quantitation Limit estimated For RCL CVAA

APPENDIX F

CALCULATIONS RELATED TO MERCURY-CONTAMINATED SOIL EXCAVATION AND TEST TRENCHING DATA

Harding Lawson Associates
Engineering
and
Environmental Services

SHEET 1 OF 4
JOB NO 44836.79843
DATE 16 JUNE 99
COMPUTED BY S. STEPHANS
CHECKED BY PRINGLE

PROJECT TAYLOR INSTRUMENTS - AMES STREET
SUBJECT REVISED MERCURY SOIL VOLUME CALCS.

BASED ON TEST TRENCH PHYSICAL OBSERVATIONS OF GLASS SHARDS, THE SHARD AREA IN THE FINAL INVESTIGATION REPORT (FIR) CAN BE REVISED TO REFLECT THE OBSERVATION OF NO GLASS SHARDS AT THE FOLLOWING LOCATIONS:

- TT-2 STATION 2+10 TO 2+72 (END OF TRENCH)
- TT-7 STATION 0+00 TO 0+24

THESE PHYSICAL OBSERVATIONS COUPLED WITH ANALYTICAL RESULTS FROM THE FOLLOWING SOIL SAMPLE LOCATIONS:

- BS-23 TOTAL MERCURY < 100 mg/kg
- TT070302X TOTAL MERCURY < 100 mg/kg

SUGGEST THAT REDEFINITION OF THE AREAL EXTENT OF MERCURY IMPACTED SOIL TO BE ADDRESSED UNDER THE PROPOSED CLEAN UP GOAL IS WARRANTED. THE NEW PROPOSED AREAL EXTENT IS DEPICTED ON THE ATTACHED FIGURE (J:\7198-39\44834005.DWG)

THE FOLLOWING REVISED VOLUME CALCULATIONS ARE BASED ON THE REVISED AREAL EXTENT OF MERCURY IMPACTED SOIL TO BE ADDRESSED UNDER THE PROPOSED CLEAN-UP GOAL.

Harding Lawson Associates
Engineering
and
Environmental Services

SHEET 2 OF 4
JOB NO. 44836.0719843
DATE 16 JUNE 99
COMPUTED BY E. STEPHANO
CHECKED BY PRINGLE

PROJECT TAYLOR INSTRUMENTS - AMES STREET
SUBJECT REVISED MERCURY SOIL VOLUME CALCS

AREA 1 - SOUTHERN AREA INCLUDING TEST TRENCHES TT-2 AND TT-4 AREAS

0-1' BGS $\Longrightarrow$ ASPHALT AND GRAVEL SUBBASE

1'-4' BGS 37,950 sf $(3\text{ ft})\left(\frac{\text{yd}}{3\text{ ft}}\right)^3 =$ 4,217 cy

4'-8' BGS 1525 sf $(4\text{ ft})\left(\frac{\text{yd}}{3\text{ ft}}\right)^3 =$ 226 cy

AREA 2 - NORTHERN AREA INCLUDING TEST TRENCHES TT-6, TT-7, TT-8 AND T-11

0-1' BGS $\Longrightarrow$ ASPHALT AND GRAVEL SUBBASE

1'-4' BGS 9,250 sf $(3\text{ ft})\left(\frac{\text{yd}}{3\text{ ft}}\right)^3 =$ 1,028 cy

4'-8' BGS 0 = 0 cy

AREA 3 - EASTERN AREA INCLUDING TT-5 AREA

0-1' BGS $\Longrightarrow$ ASPHALT AND GRAVEL SUBBASE

1'-4' BGS 14,800 sf $(3\text{ ft})\left(\frac{\text{yd}}{3\text{ ft}}\right)^3 =$ 1,644 cy

4'-8' BGS 1,620 sf $(4\text{ ft})\left(\frac{\text{yd}}{3\text{ ft}}\right)^3 =$ 240 cy

* TOTAL VOLUME = 7,355 cy
(6,889 cy 1'-4' BGS)
(466 cy 4'-8' BGS)

Harding Lawson Associates
Engineering
and
Environmental Services

SHEET 3 OF 4
JOB NO. 44836.0719843
DATE 16 JUNE 99
PROJECT TAYLOR INSTRUMENTS – AMES ST
COMPUTED BY E. SHEPHERD
SUBJECT REVISED MERCURY SOIL VOLUMES CALCS.
CHECKED BY PRIDGEN

BASED ON RESULTS OF PRE-DESIGN SAMPLING FROM SEPT 98
28 SAMPLES COLLECTED FOR TCLP ANALYSIS, 1 EXCEEDED 0.2 mg/L TCLP FOR MERCURY, 5 EXCEEDED 5.0 mg/L TCLP FOR LEAD

SOIL FAILING FOR MERCURY:

$1/28 = 3.6\%$ SAY $\underline{5\%}$

SOIL FAILING FOR LEAD

$5/28 = 17.8\%$ SAY $\underline{20\%}$

DISPOSAL VOLUME ESTIMATES FOR SOIL W/ MERCURY > 100 mg/kg

1. TCE > 64 mg/kg – THIS SOIL WILL REQUIRES REDUCTION OF TCE TO < 60 mg/kg PRIOR TO DISPOSAL FOR MERCURY > 100 mg/kg

   ESTIMATED VOLUME: $700 \text{ sf} \, (3 \text{ ft}) \left(\frac{1 \text{ yd}}{3 \text{ ft}}\right)^3 = \underline{\underline{78 \text{ cy}}}$

2. SOIL PASSING TCLP FOR MERCURY AND LEAD

   75% OF TOTAL VOLUME $7{,}355 \text{ cy} \, (0.75) = 5{,}517 \text{ cy}$

3. SOIL PASSING TCLP FOR MERCURY, BUT FAILING TCLP FOR LEAD

   ASSUME 20% OF TOTAL VOLUME $\underline{\underline{1471 \text{ CY}}}$
   $7{,}355 \text{ cy} \, (0.2) = 1{,}471 \text{ cy}$

SHEET 4 OF 4
JOB NO. 44836, 0719843
DATE 16 JUNE 99
PROJECT TAYLOR INSTRUMENTS - AMES STREET
COMPUTED BY E. SHEPHARD
SUBJECT REVISED MERCURY SOIL VOLUME CALCS
CHECKED BY PRINGLE

4. SOIL PASSING TCLP FOR LEAD, BUT FAILING TCLP FOR MERCURY

ASSUME 5% OF TOTAL VOLUME

7,355 cy (0.05) = 368 cy

368 cy

ASSUME THAT THIS MATERIAL WILL CONTAIN TOTAL MERCURY > 260 mg/kg AND REQUIRE RETORTING

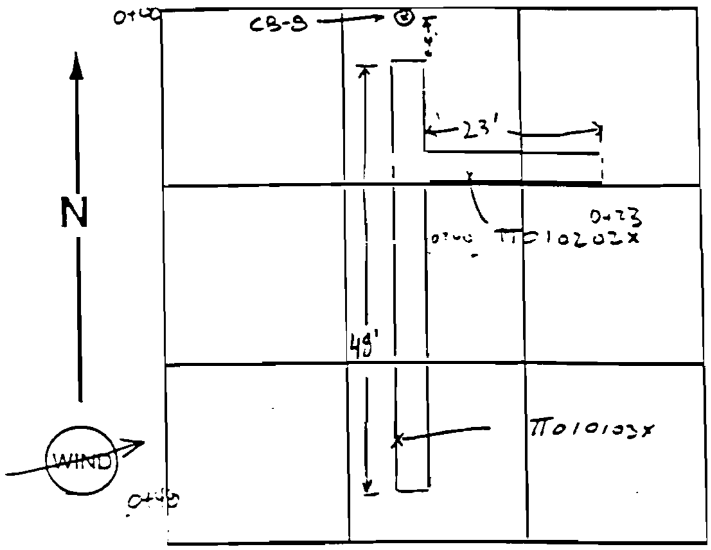
TEST PIT RECORD

Site: TAYLOR INSTRUMENTS 1 of ~~2~~ 3

Well/Boring TT-1 Date 21 SEPT 94 Time 1300 End 1600

Coordinates ______ Grid Element ______

SKETCH MAP OF TEST PIT SITE



SCALE 1" = ______ FT.

Crew Members:

1. E. SHEPHARD
2. B. [illegible]
3.
4.
5.
6.

Monitor Equipment:

PI Meter	Y	N
Explosive Gas	Y	N
Avail. Oxygen	Y	N
OVA	Y	N

Other: ______

Photographs, Roll: ______

Exposure: ______

NOTES:

TRENCH TT-1 IS 48'L x 1.5' WIDE x 4' DEEP

EAST EXTENSION 23'L x 1.5' W x 4'D

- TWO SAMPLES COLLECTED FOR Hg ANALYSIS

TT010103X - WHITE ASH-MATERIAL

TT010202X - UNDER 7" DIA PIPE

- TWO PHOTOS TAKEN

① PIPING/CONDUITS/FOUNDATION WALL

② EAST TT-1 EXTENSION

TEST PIT RECORD

9712011D(d) L 2

Harding Lawson Associates

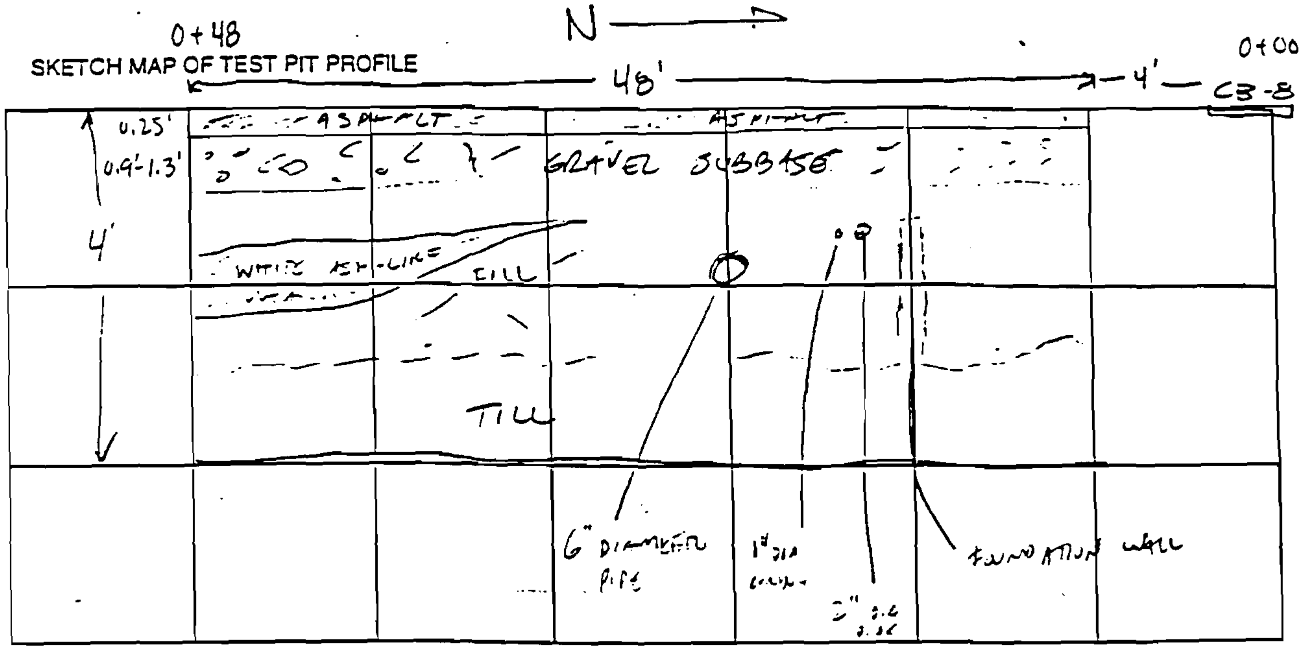
TEST PIT RECORD

2 of ~~2~~ 3

Profile Along Test Pit: TT-1

Site: TAYLOR INSTRUMENTS

SKETCH MAP OF TEST PIT PROFILE



SCALE 1" = ______ FT.
DEPTH (FT). ______

NOTES:

① 6" THICK FOUNDATION WALL 14.5' FROM CB-8, AT 1.5' BGS

② 2" DIAMETER PIPE CLAY/CAST IRON 16.2' FROM CB-8 AT 1.5' BGS

③ 1" DIAMETER STEEL CONDUIT 16.4' FROM CB-8 AT 1.5' BGS

④ 6" DIAMETER CAST IRON PIPE 19' FROM CB-8 AT 2' BGS

⑤ WHITE ASH LIKE MATERIAL FROM 33-52' FROM CB-8 RANGING FROM 1" TO 1' FEET THICK AT STARTING DEPTH OF 2' BGS

NO SHARDS OBSERVED

no.	Int. Ser. No.	Depth (Ft.)	HD. SP. VOA PPM
S-1	TT010103X	3	
S-2	TT010202X	2	
S-3			
S-4			
S-5			
S-6			
S-7			
S-8			

REFERENCE: FIELD BOOK, Pg. ______

ATTACHMENTS ______

SIGNATURE:

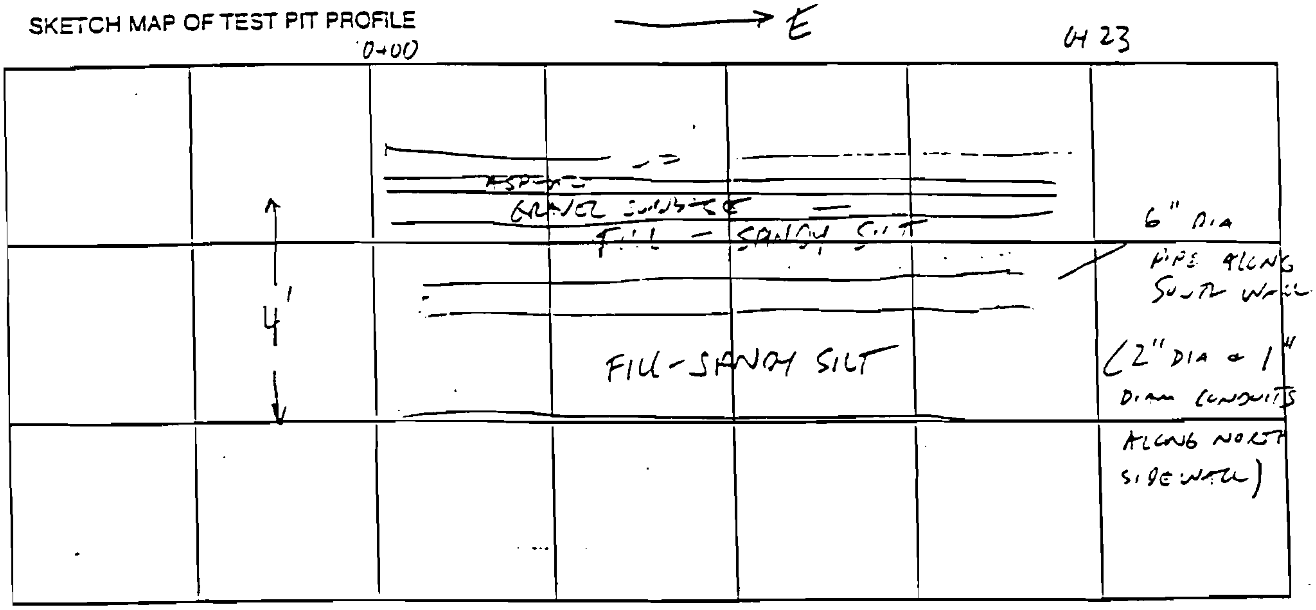
TEST PIT RECORD

TEST PIT RECORD

Profile Along Test Pit: TT-1 EASTERN EXTENSION 3 of 3

Site: TAYLOR INSTRUMENTS

SKETCH MAP OF TEST PIT PROFILE



SCALE 1" = ______ FT.

DEPTH (FT). ______

NOTES:

① NO SHARDS OBSERVED IN FILL MATERIAL BETWEEN PIPING IN N + S SIDEWALLS.

no.	Int. Ser. No.	Depth (Ft.)	HD. SP. VOA PPM
S-1			
S-2			
S-3			
S-4			
S-5			
S-6			
S-7			
S-8			

REFERENCE: FIELD BOOK, Pg. ______

ATTACHMENTS ______

SIGNATURE: ______

TEST PIT RECORD

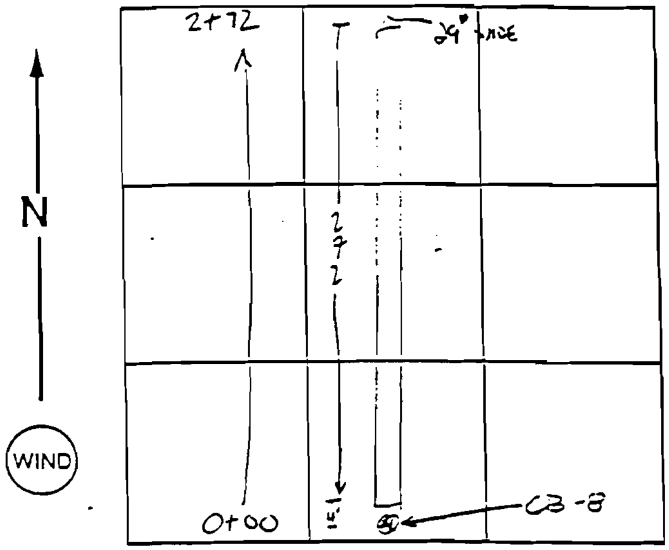
TEST PIT RECORD

Site: TAYLOR INSTRUMENTS 1 of ~~2~~ 5

Well/Boring TT-2 Date 22 SEPT 98 Time 0730 End 1145

Coordinates ______ Grid Element ______

SKETCH MAP OF TEST PIT SITE



SCALE 1" = ______ FT.

NOTES:

TRENCH TT-2 IS 272'L X 2.5'W X 5'D

- NINE SAMPLES COLLECTED FOR Hg ANALYSIS

TT020102X - 1' ABOVE SHARDS
TT020102D - DUPLICATE
TT020203X - SHARD LAYER
TT020203D - DUPLICATE
TT020305X - 1' BELOW SHARDS
TT020305D - DUPLICATE
COLLECTED AT 1+29
TT020402X - 1' ABOVE SHARDS
TT020503X - SHARD LAYER
TT020605X - 1' BELOW SHARDS
COLLECTED AT STATION 2+05
5 [illegible]

Crew Members:

1. E STEPHAND
2. J. LYONS
3.
4.
5.
6.

Monitor Equipment:

PI Meter	Y	N
Explosive Gas	Y	N
Avail. Oxygen	Y	N
OVA	Y	N

Other: JEROME Hg ANALYZER

Photographs, Roll: ______

Exposure: ______

TEST PIT RECORD

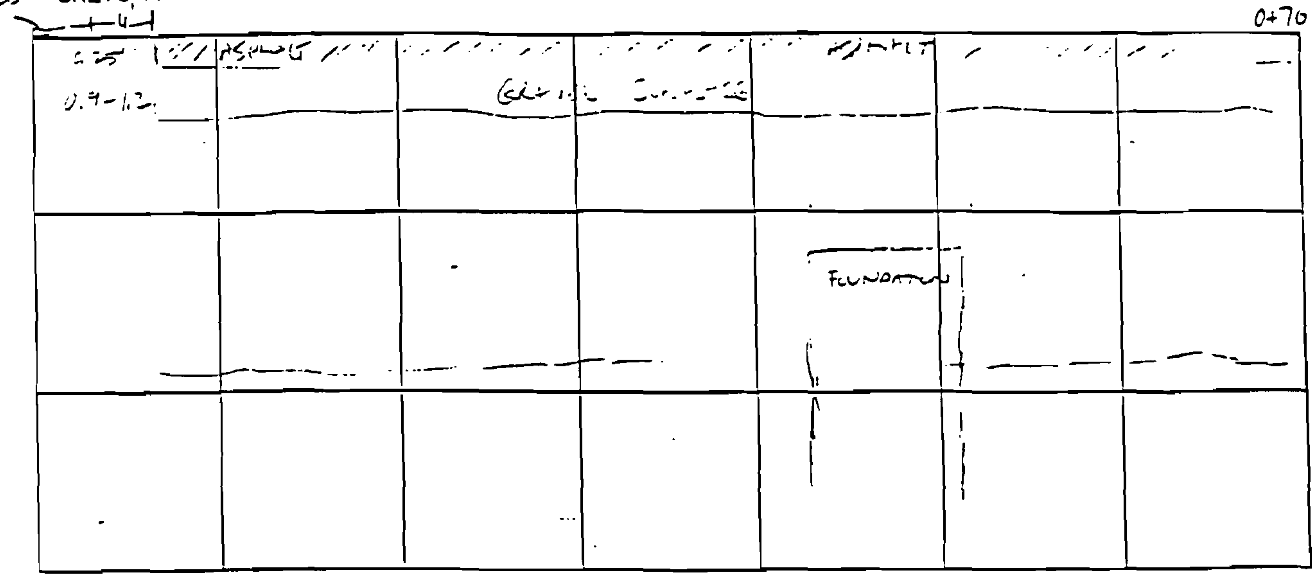
TEST PIT RECORD

2 of ~~7~~ 5

Profile Along Test Pit: TT-2

Site: TAYLOR INSTRUMENT

CB-8 SKETCH MAP OF TEST PIT PROFILE



SCALE 1" = ______ FT.
DEPTH (FT). ______

NOTES:

① FOUNDATION FROM 0+43' TO 0+52'

② NO SHARDS OBSERVED

no.	Int. Ser. No.	Depth (Ft.)	HD. SP. VOA PPM
S-1			
S-2			
S-3			
S-4			
S-5			
S-6			
S-7			
S-8			

REFERENCE: FIELD BOOK, Pg. ______

ATTACHMENTS ______

SIGNATURE:

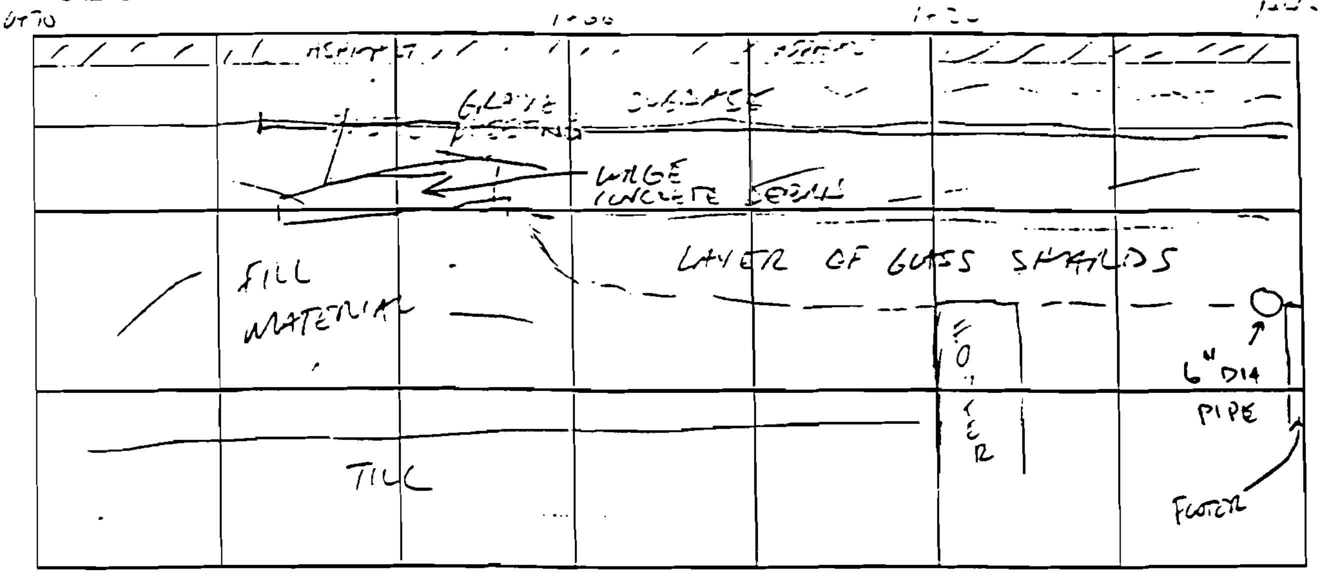
TEST PIT RECORD

TEST PIT RECORD

Profile Along Test Pit: TT-2 ~~2~~ of ~~2~~ 3 5

Site: TAYLOR INSTRUMENT

SKETCH MAP OF TEST PIT PROFILE



SCALE 1" = ______ FT.
DEPTH (FT). ______

NOTES:

① LARGE CONCRETE DEBRIS AT 0+83 TO 0+97. AT 1.5' BGS

② PLASTIC SHEETING UNDER ASPHALT. SUBBASE BEGINS AT 0+83'

③ GLASS SHARDS BEGIN AT 0+98' FROM 2.1' TO 3.0' BGS EXTENDING TO 2+10'

④ FOOTER AT 1+20 TO 1+25 AT 3.0' BGS

⑤ COLLECTED SAMPLE AT 1+29

⑥ 6" DIAMETER PIPE AT 1+37 AT 3' BGS

⑦ FOOTER AT 1+37 TO 1+40 AT 3' BGS

- JEROME READINGS RANGE FROM 0.035 TO 0.000 IMMEDIATELY ABOVE SHARDS
- [illegible] 0.000

no.	Int. Ser. No.	Depth (Ft.)	HD. SP. VOA PPM
S-1	TTU20102X	2	
S-2	TTU20102D	2	
S-3	TTU20203X	3	
S-4	TTU20203D	2	
S-5	TTU20305X	5	
S-6	TTU20305D	5	
S-7			
S-8			

REFERENCE: FIELD BOOK, Pg. ______

ATTACHMENTS ______

SIGNATURE:

TEST PIT RECORD

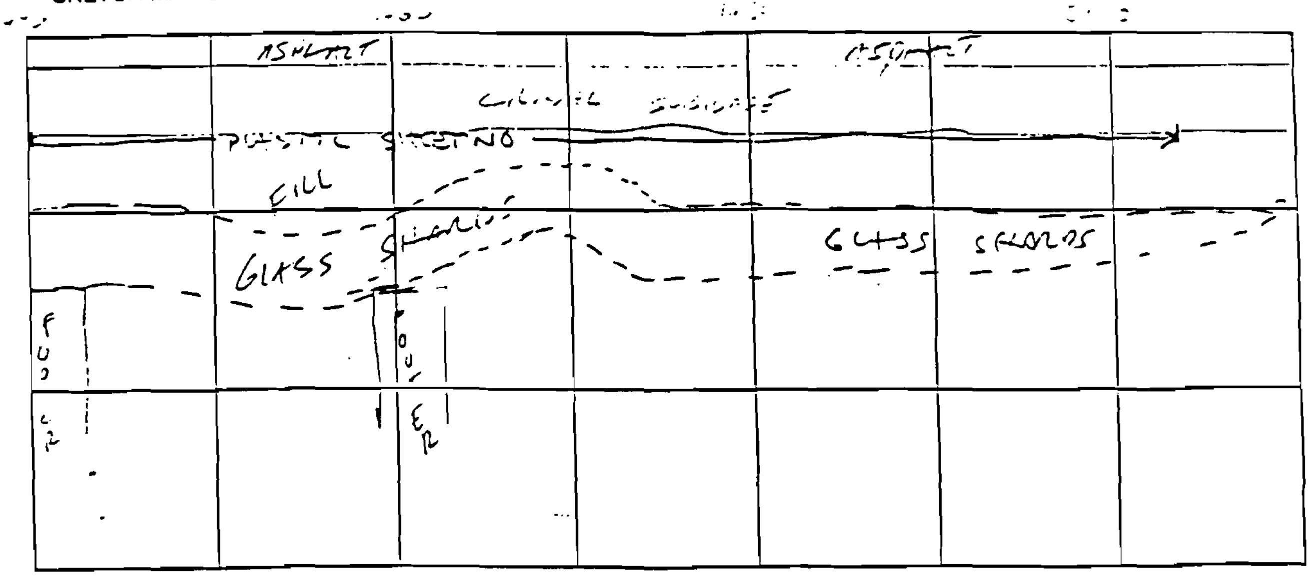
TEST PIT RECORD

2 of 2
4 5

Profile Along Test Pit: TT-2

Site: [illegible]

SKETCH MAP OF TEST PIT PROFILE



SCALE 1" = ______ FT.
DEPTH (FT). ______

NOTES:

① FOOTER 1+39 TO 1+44 AT 3' BGS

② AT 1+50 TO 1+55 SHARD LAYER DIPS TO 3-4' BGS THEN RISES TO 2-3' BGS

③ FOOTER 1+58 TO 1+63 AT 3' BGS.

④ AT 1+65 TO 1+76 SHARD LAYER RISES TO 2 TO 3 FT BGS THEN DIPS BACK TO 3-4' BGS

⑤ PLASTIC SHEETING ENDS AT 2+04

⑥ COLLECTED SAMPLE AT 2+05.

⑦ END OF SHARD LAYER AT 2+10.

no.	Int. Ser. No.	Depth (Ft.)	HD. SP. VOA PPM
S-1	TT020402X	2	
S-2	TT020503X	3	
S-3	TT020605X	5	
S-4			
S-5			
S-6			
S-7			
S-8			

REFERENCE: FIELD BOOK, Pg. ______

ATTACHMENTS ______

SIGNATURE:

TEST PIT RECORD

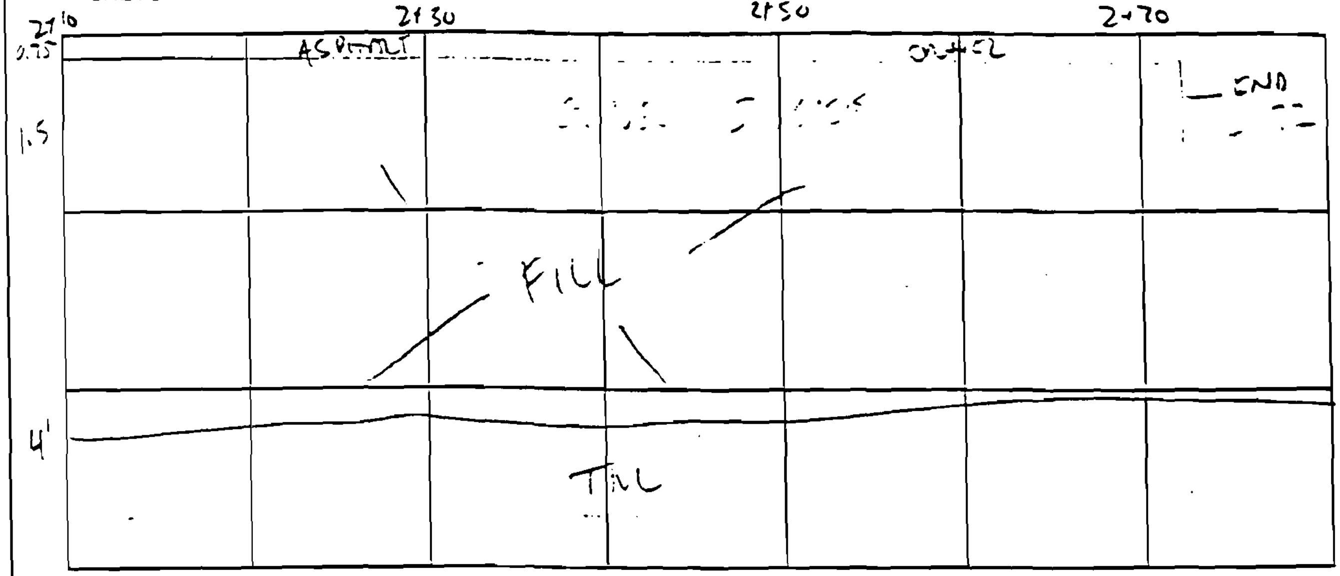
TEST PIT RECORD

2 of 2

Profile Along Test Pit: ______________________

Site: ______________________

SKETCH MAP OF TEST PIT PROFILE



SCALE 1" = ____________ FT.
DEPTH (FT). ____________

NOTES:

① PIPE AT 2+17 6" DIAMETER 3' BGS
② NO SHARDS OBSERVED 2+10 TO 2+72

no.	Int. Ser. No.	Depth (Ft.)	HD. SP. VOA PPM
S-1			
S-2			
S-3			
S-4			
S-5			
S-6			
S-7			
S-8			

REFERENCE: FIELD BOOK, Pg. ________

ATTACHMENTS ________

SIGNATURE: ________

TEST PIT RECORD

TEST PIT RECORD

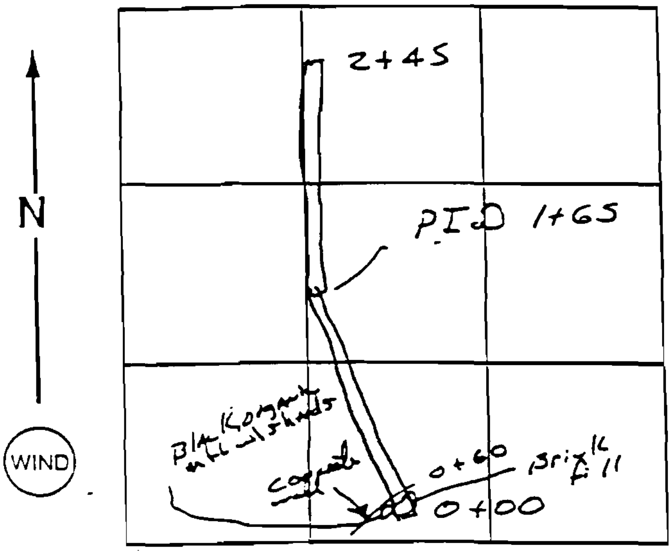
1 of 2

Site: Taylor Instruments

Well/Boring TT-03 Date 9-24-98 Time 0939 End 1420

Coordinates ______ Grid Element ______

SKETCH MAP OF TEST PIT SITE



SCALE 1" = ______ FT.

Crew Members:

1. L. Smith
2. B. Lyons
3.
4.
5.
6.

Monitor Equipment:

PI Meter Y N
Explosive Gas Y N
Avail. Oxygen Y N
OVA Y N
Other: Jerome MVA

Photographs, Roll: ______

Exposure: ______

NOTES:

MVA reading

1+65 → 0.020 in trench mg/m³
Breathing Zone (BZ) → 0.000
1+60 → 0.002 in trench
2+25 → 0.006 in trench
0.000 in BZ
1+40 → 0.061 in trench
0.011 in BZ (1131 hrs)
0.005 in BZ (1137 hrs)
1+17 MVA = 0.091 in trench
BZ - 0.006 [illegible]
~~1+75 = 0+75~~ ds
0+75 → 0.024 in trench
0+60 → BZ → 0.002
0+27 → 0.000 in trench; 0-OVA

TEST PIT RECORD

TEST PIT RECORD

2 of 2

Profile Along Test Pit: TT #03

Site: Taylor Instruments

SKETCH MAP OF TEST PIT PROFILE

see notes for X-sections.
- Elevation piston on east side of trench @ sta 0+27
- @ 0+73, intercepted 5, 6"ϕ conduits which had water in them which filled section of trench. See pg 17 F.B. for detail.
- 1+65 trench P.I.
- 1+65 to 1+80 → shards observed in material stockpile but no noticeable layer of shards.

SCALE 1" = ____ FT.
DEPTH (FT). ____

NOTES: 0-3" Asphalt on all X-Sections.
0+06 to 0+15 → 1' Grey Road fill & concrete below fill; 0+34 ⓢ
0+15 to ~~0+27~~ → 1' Grey Road Base; 1' Based finer matl; minor shard conc; 2' of brick fill w/ concrete at 4' Below asphalt.
0+37 to 0+40 → 1.5' Grey road base on concrete.
0+40 to 0+50 → 1.5' Grey R.B. layered w/ fine brown matl; 1.5' to 4' Br/Bl matl, organic but no shards observed.
0+50 to 0+78 → 0-1' Grey R.B. w/ plastic @ 1' B.A. (asphalt layer 3" thick from sta. 0+70 to 0+78); to 3' B.A. Brown/organic fill 3' to 4'/5', brown organic fill w/ shards mainly 1' thick but 2' thick in places. Some free Hg noticed
4/5' → 7' Brown fill

no.	Int. Ser. No.	Depth (Ft.)	HD. SP. VOA PPM
S-1	TT030103X	3'	@sta 0+52
S-2	TT030204X	4'	@sta 1+50
S-3	TT030204D	4'	Dupe
S-4	TT030302X	2'	@sta 1+15
S-5	TT030302D	2'	Dupe
S-6	TT030403X	3'	@sta 1+13
S-7	TT030504X	4'	@sta 1+15
S-8	TT030504D	4'	Dupe

REFERENCE: FIELD BOOK, Pg. ____

ATTACHMENTS ____

SIGNATURE: Len Smith

0+78 to 1+06 → 6" G. Fill, 3" old asphalt, then brown fill to concrete @ ~~14'~~ B.A.
1+06 to 1+24 → 8-12" G.R.B., 1-3' brown/tan fine grain fill; 3-4' Br/Bl shard layer w/ high conc. shard:
1+24 to 1+44 → 10" of grey R.B. then concrete @ 4.5' B.A.
1+44 to 1+53 → 3' R.B, 2' Brown organic matl, Black organic matl w/ high shard conc. w/ free Hg visible; 1' thick
1+53 to 1+65 → 20" thick R.B then concrete
1+65 to 1+80 → 16" Road. Base w/ plastic @ bottom, 4-6" organic, black matl lyr to 7' B.A. Grey R.B. w/ misc concrete debris.

TEST PIT RECORD

Harding Lawson Associates

9712011D(d) L3

Over →

1+80 to 1+85 – 10 [illegible] brown/black
fill to 5' B.G.

1+85 to 2+21 → 10" R.B., 3" asphalt, then concrete slab ~ 8" thick

2+21 to 2+45 → 1' R.B., 6" organic mtl w/ shards, to 5', Brown, fine
grained material.

TEST PIT RECORD

2 of 2

Profile Along Test Pit: TT-04
Site: Taylor Instruments

SKETCH MAP OF TEST PIT PROFILE
See Notes for profile.

- Concrete footing from sta 0+97 to 1+01 ⇒ 4' depth
- concrete footing from sta 1+12 to 1+16 ⇒ 3.5' depth (shards on top of footing)
- Concrete footing from sta 1+46 to 1+51 ⇒ 3' deep
- Concrete footing from sta 1+35 to 1+29 ⇒ 3' deep

- From sta 1+35 to 1+51 10" approx clay pipe running parallel to trench on south side of excavation. Shards noticed in fill on south side but not as noticeable on north side.
- Concrete footing from 1+96 to 1+90 and 1+69 to 1+63 at 3' depth

SCALE 1" = ______ FT.
DEPTH (FT). ______

NOTES: Depths from bottom of 3" asphalt layer

- 0+00 ⇒ 0+39; 0-8" Grey fill w/ small ø (1/2") aggregate (Road base); 8"-16" Brown fill with larger aggregate. 16" to 4' Black silt/clay; 4'-5' tan silt (fill)
- 0+39 to 0+50 ⇒ Same layers as 0+00 to 0+39 started seeing minor amount of shards in spoil stockpile
- 0+50 to 0+70 ⇒ 0-8" Grey road base 8" to 20" Black fill and rubble; 20" to 36" Brown organic material w/ shards, layer is pure shards ~~by~~ ds from sta 0+66 to 0+70 – 3-5' fill – Black silt mtl, 4-5' ⇒ tan silt fill
- 0+70 to 0+97 ⇒ 0 to 1' Grey road base; 2 to 3' Brown silt fill w/ 3 to 6" organic layer with minor shards; 3-4' Brown silt fill; 4-5' tan silt

no.	Int. Ser. No.	Depth (Ft.)	HD. SP. VOA PPM
S-1	TT040102X	2	1+98 "slag" mtl. above shards
S-2	TT040201X	1	1' above @ 1+45
S-3	TT040302X	2	sta 1+45
S-4	TT040403X	3	just below sewer
S-5	TT040501X	1	1+12, "slag", 1' above
S-6	TT040602X	2	1+12, ash
S-7	TT040703X	3	1+12
S-8	TT040902X	2	shards @ 0+70
	TT040902X	2	0+15 no shards
	TT041003X	3	0+15, clayey
	TT041105X	5	0+14, tan silt mtl

REFERENCE: FIELD BOOK, Pg. 22—31

ATTACHMENTS ______

SIGNATURE:

15 Ds

- 0+97 to 1+16 ⇒ 0-6" Grey road base w/ plastic on bottom. 0.5 to 2.5', Brown/Black fill; 2.5 ⇒ 3.5' Brown organic layer w/ minor shards, 3.5'-5' – tan silt
- 1+16 to 1+29 ⇒ 0-8" Grey road base w/ plastic on bottom; 8" to 3' silty brown/black fill, 3-4', Black silt w/ clay; 4-5' tan silt
- 1+29 to 1+51 ⇒ 0-8" Grey road base w/ plastic on bottom; 8"-2' Black/Brown fill; 2-4' Black brown fill w/ minor shards; 4-5' tan silt

TEST PIT RECORD

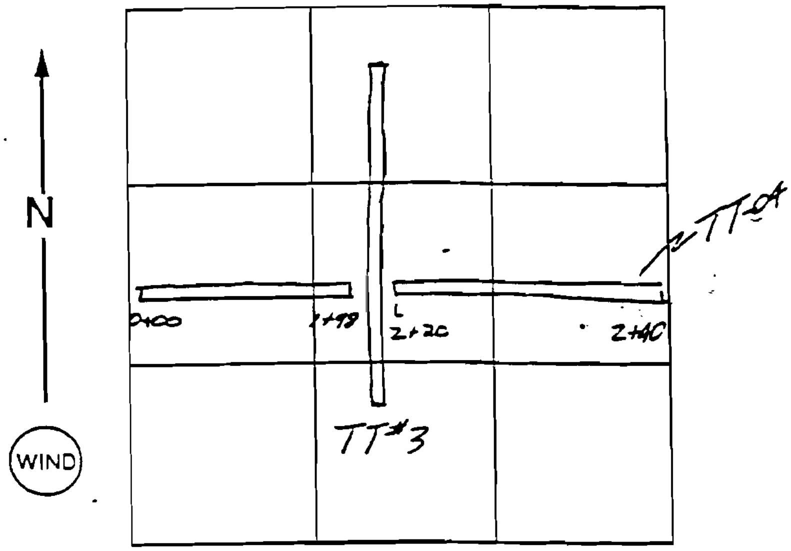
1 of 2

Site: Taylor Instruments

Well/Boring TT-04 Date 9-25-98 Time 0917 End 1412

Coordinates ______ Grid Element ______

SKETCH MAP OF TEST PIT SITE



SCALE 1" = ______ FT.

Crew Members:

1. L Smith
2. B. Lyons
3.
4.
5.
6.

Monitor Equipment:

PI Meter	Y	N
Explosive Gas	Y	N
Avail. Oxygen	Y	N
OVA	Y	N

Other: Jerome MVA

Photographs, Roll:

Exposure:

NOTES:

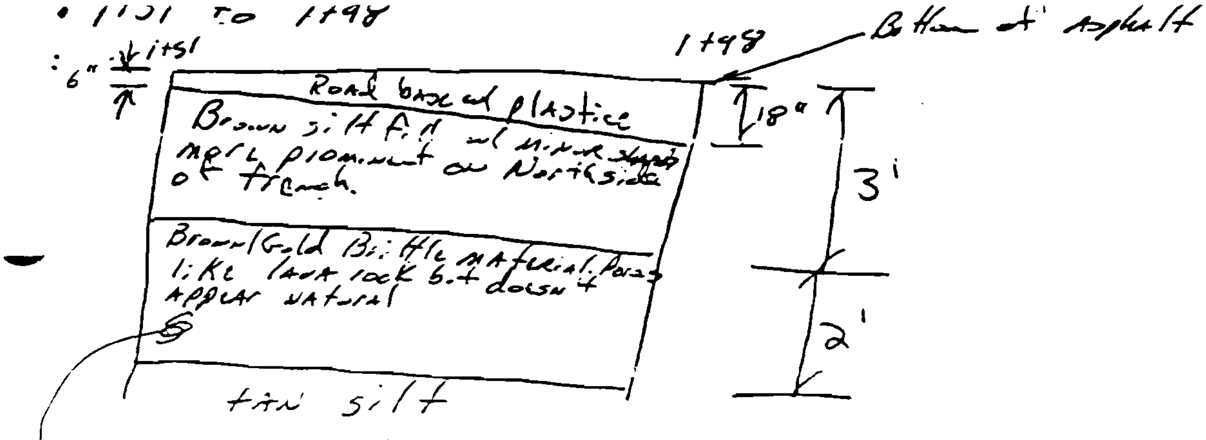
MVA Readings

Time	Trench Location	Reading in Trench	Reading in Breathing Zone
0918	1+50	6.009	0.000
0923	1+70	0 011	0. 000
0928	1+90	0.017	0.000
0938	2+60	0.009	0. 000
0953	1+20	0 000	NM*
0958	1+10	0.009	0. 000
1004	0+90	0.013	0.000
1009	0+70	0.193	0.007
1013	0+60	0.085	0. 000
1016	0+50	0. 040	0 000
1019	0+40	0.000	NM
1024	0+20	0.000	NM

*NM - Not Measured

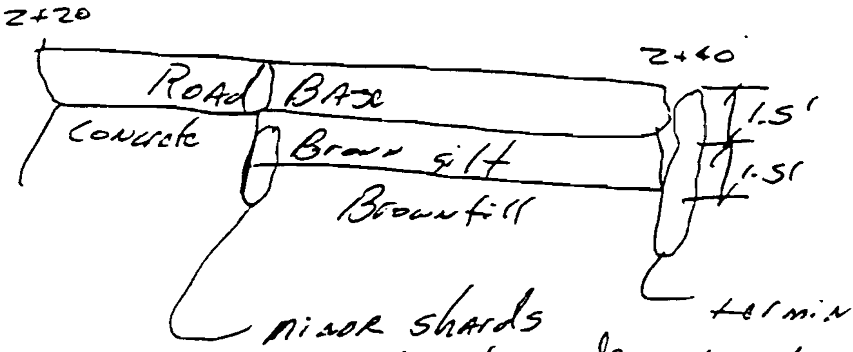
TEST PIT RECORD

• 1+51 TO 1+98



minor shards distributed throughout layer w/ dense shard layer begining @ sta 1+96 @ 4.5' depth

• 2+20 to 2+40



minor shards @ 2-3' Below grade

terminated trench due to building debris in AREA

TEST PIT RECORD

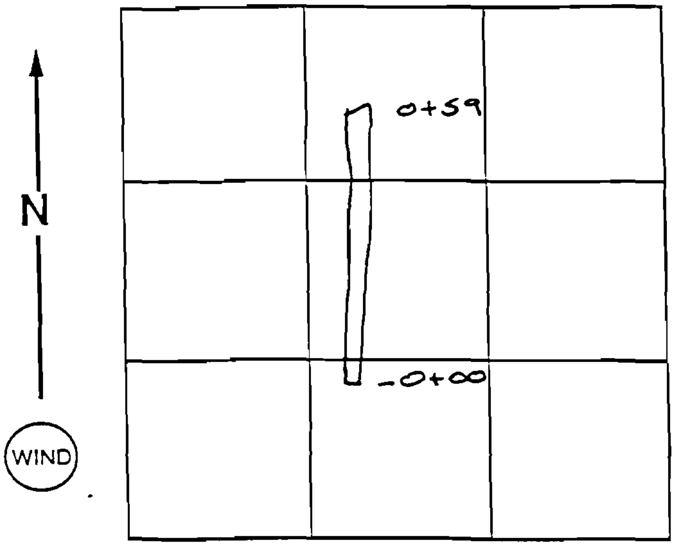
1 of 2

Site: Taylor Instruments

Well/Boring TT #5 Date 9/24/98 Time 0700 End 0922

Coordinates ______ Grid Element ______

SKETCH MAP OF TEST PIT SITE



SCALE 1" = ______ FT.

Crew Members:

1. L. Smith
2. B. Lyons
3.
4.
5.
6.

Monitor Equipment:

PI Meter	Y	N
Explosive Gas	Y	N
Avail. Oxygen	Y	N
OVA	Y	N

Other: MVA

Photographs, Roll: ______

Exposure: ______

NOTES:

Typical X-Section: 0-3" Asphalt; 3" to 21" Gray Road Base w/ plastic layer at bottom of road base layer. Rest varies as shown on sheet 2.

0+40 Jerome MVA Reading in trench = 0.000
Breathing zone reading = 0.000

TEST PIT RECORD

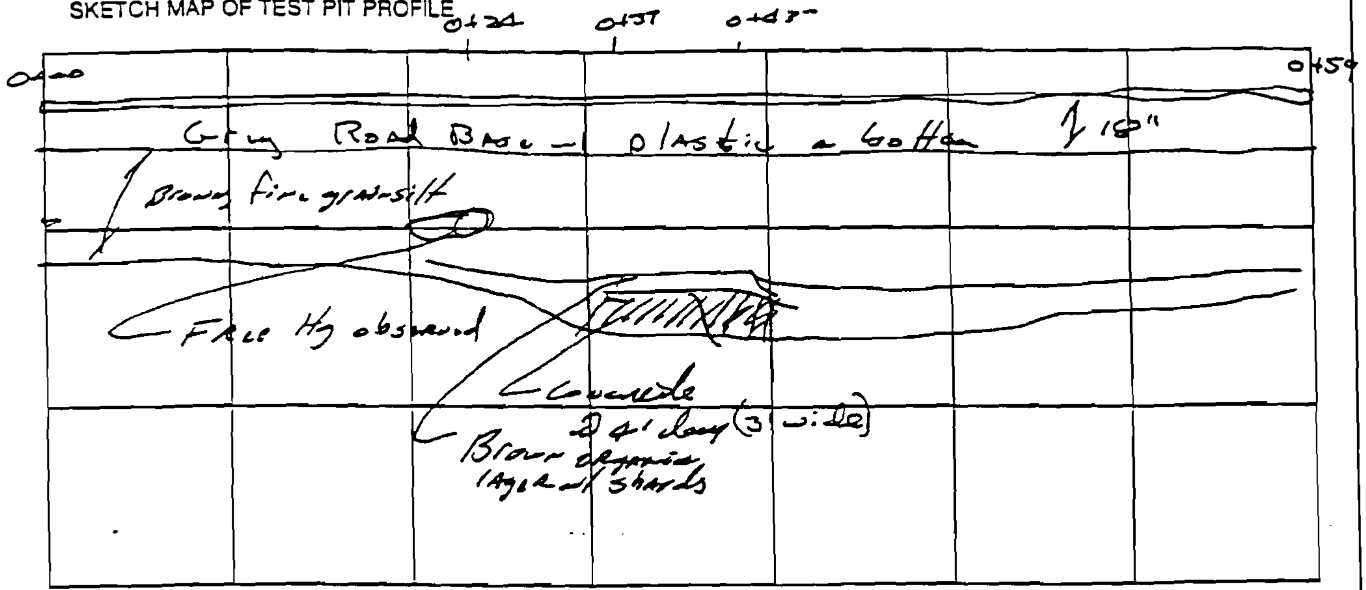
TEST PIT RECORD

2 of 2

Profile Along Test Pit: TT#5

Site: Taylor Instruments

SKETCH MAP OF TEST PIT PROFILE



SCALE 1" = ____________ FT.
DEPTH (FT). ____________

NOTES:

Collected @ 0+22

S-2 @ bottom, below shard layer

Collected @ 0+39 in shards, 4' depth

no.	Int. Ser. No.	Depth (Ft.)	HD. SP. VOA PPM
S-1	TT050105X	5'	
S-2	TT050206X	6'	
S-3	TT050204X	4'	TT050303X
S-4	0703X		
S-5			
S-6			
S-7			
S-8			

0+22

REFERENCE: FIELD BOOK, Pg. 11-12

ATTACHMENTS ____________

SIGNATURE: C. Lan...

TEST PIT RECORD

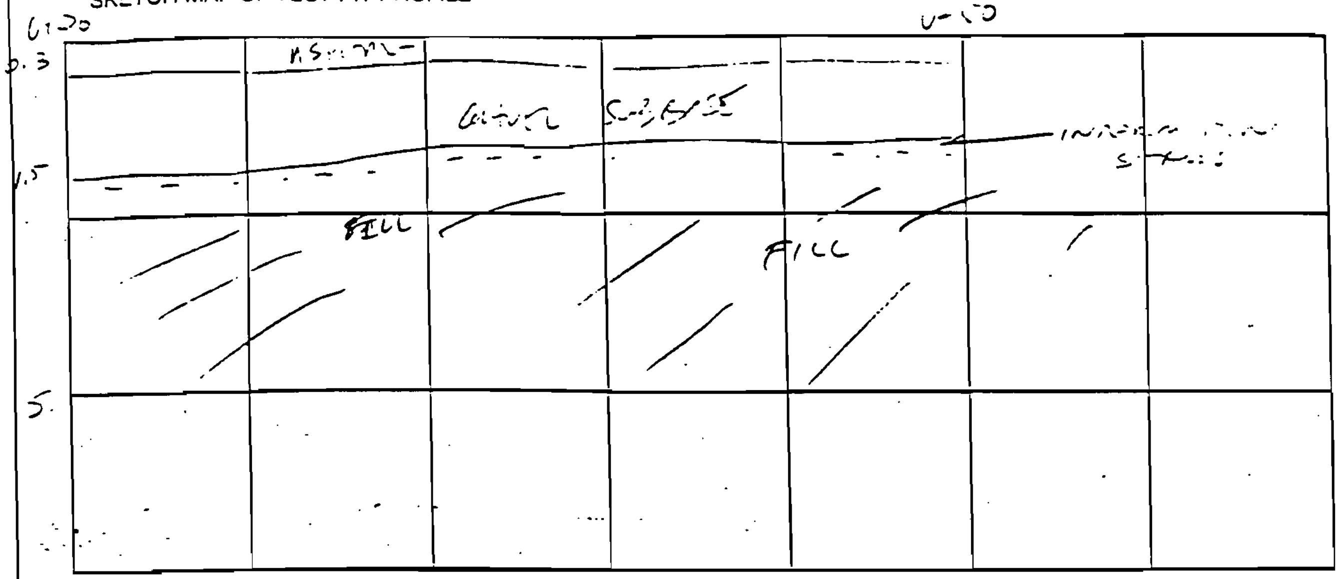
TEST PIT RECORD

2 of 2

Profile Along Test Pit: TT-6

Site: TAYLOR INSTRUMENT

SKETCH MAP OF TEST PIT PROFILE



SCALE 1" = ____________ FT.

DEPTH (FT). ____________

NOTES:

① PLASTIC SHEETING 0+00 TO 0+11 AT 1.5' BGS
② CONCRETE FORMATION AT 0+10 TO 0+11
AT 2.5' BGS
③ INTERMITTENT SHARDS FROM 0+11 TO 0+28
AT 1.6' BGS (1-2 SHARDS PER LINEAR FT)
④ NO SHARDS OBSERVED FROM 0+28 TO 0+50

no.	Int. Ser. No.	Depth (Ft.)	HD. SP. VOA PPM
S-1	TT060102X	2	
S-2	TT060202X	2	
S-3			
S-4			
S-5			
S-6			
S-7			
S-8			

REFERENCE: FIELD BOOK, Pg. ____________

ATTACHMENTS ____________

SIGNATURE:

TEST PIT RECORD

TEST PIT RECORD

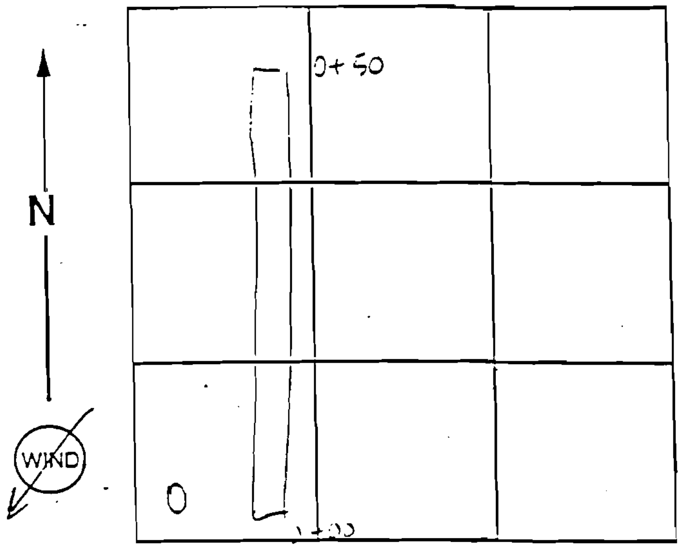
1 of 2

Site: TAYLOR INSTRUMENTS

Well/Boring TT-6 Date 27 [illegible] 98 Time 1220 End 1335

Coordinates Grid Element

SKETCH MAP OF TEST PIT SITE



SCALE 1" = ____________ FT.

Crew Members:

1. E. SHEPPARD
2. B. LYONS
3.
4.
5.
6.

Monitor Equipment:

PI Meter	Y	N
Explosive Gas	Y	N
Avail. Oxygen	Y	N
OVA	Y	N

Other:

Photographs, Roll:

Exposure:

NOTES:

TRENCH TT-6 IS 50'L x 2.75'W x 5'D

- TWO SAMPLES COLLECTED

TT060102X - STAINED AREA @ 0+15

TT060202X - NO STAINS @ 0+40'

TEST PIT RECORD

TEST PIT RECORD

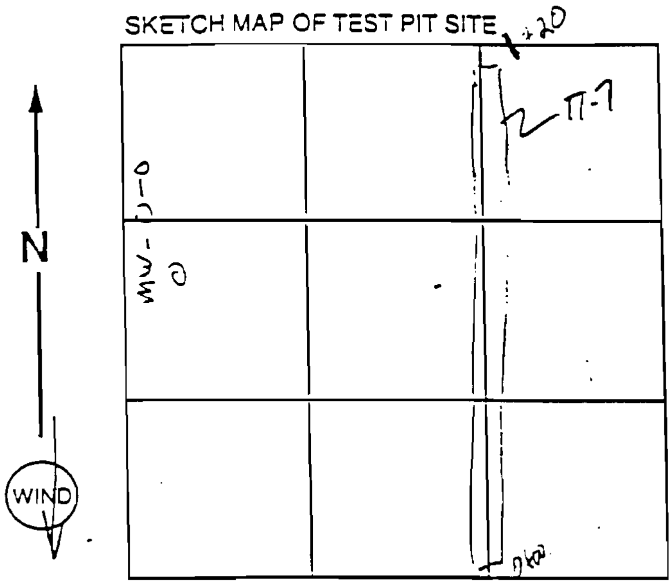
1 of 2

Site: TAYLOR INSTRUMENTS

Well/Boring TT-07 Date 23 SEPT 98 Time 0710 End 0840

Coordinates ______ Grid Element ______

SKETCH MAP OF TEST PIT SITE



SCALE 1" = ______ FT.

Crew Members:

1. E. SHAUGHANY
2. L. SMITH
3. B. LYONS
4.
5.
6.

Monitor Equipment:

PI Meter	Y N
Explosive Gas	Y N
Avail. Oxygen	Y N
OVA	Y N

Other: N/A

Photographs, Roll: ______

Exposure: ______

NOTES:

TRENCH TT-07 IS 120' L x 2.75 W x 3-5' DEEP

7 SAMPLES COLLECTED

		STATION LOCATION
TT070102X -	SHARDS	- 0+61
TT070203X -	1' BELOW SHARDS	- 0+61
TT070302X -	NO SHARDS	- 0+12
TT070402X -	HEAD OF SHARDS	- 0+24
TT070402D -	DUP	- 0+24
TT070503X -	MINIMAL SHARDS	- 0+32
TT070602X -	NO SHARDS	- 1+00

- 4 PHOTOS TAKEN

TEST PIT RECORD

Harding Lawson Associates

9712011D(d) L2

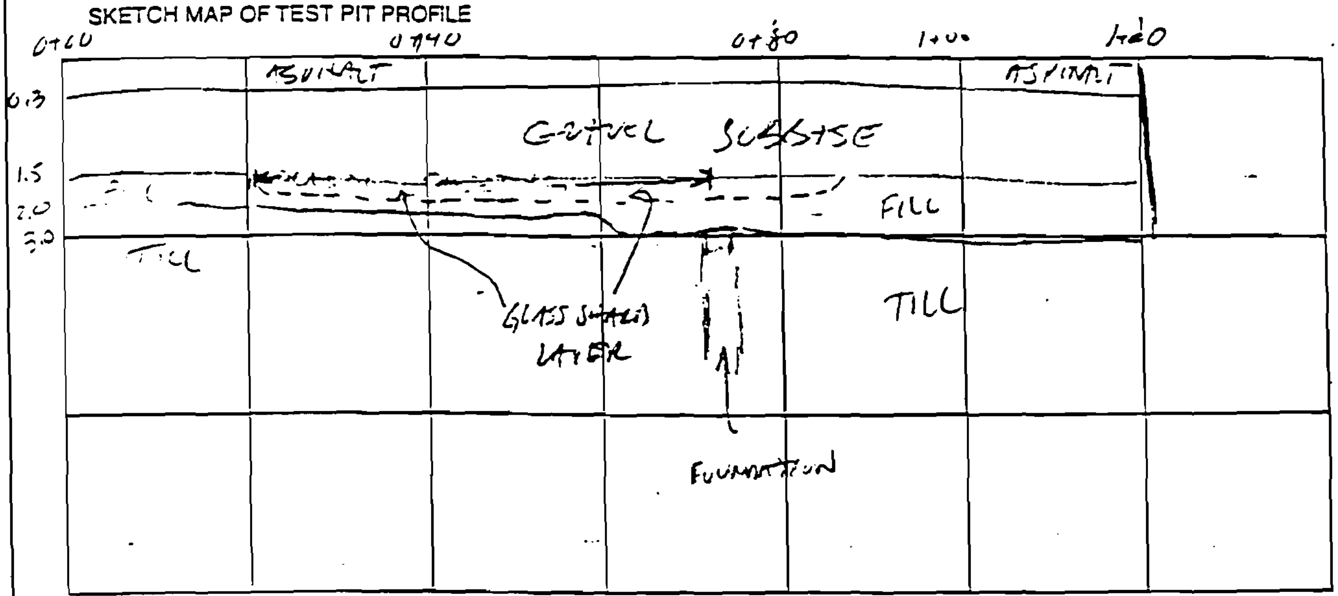
TEST PIT RECORD

2 of 2

Profile Along Test Pit: TT-7

Site: TAT LUL INSTRUMENTS

SKETCH MAP OF TEST PIT PROFILE



SCALE 1" = ______ FT.
DEPTH (FT). ______

NOTES:

① PLASTIC SHEETING 0+24 TO 0+72' @ 1.6' BGS

(2) BUILDING FOUNDATION 0+72 TO 0+77 @ 3' BGS

(3) GLASS SHARDS 0+24 TO 0+86 @ 1.5' BGS 0.3 TO 1.2' THICK LAYER, CONCENTRATED AT 0+61 TO 0+66

(4) TILL LAYER AT 2.0' BGS FROM 0+00 TO 0+61 DIPS TO 3' BGS AT 0+61 TO 1+20

5 LIQUID MERCURY BEADS OBSERVED @ 0+86 IN SIDEWALL OF TRENCH 1.9' BGS

NO SHARDS OBSERVED 0+00 TO 0+24

NO SHARDS OBSERVED 0+86 TO 1+20

no.	Int. Ser. No.	Depth (Ft.)	HD. SP. VOA PPM
S-1	TT070102X	7	SHARDS
S-2	TT070103X	3	1' BELOW SHARDS
S-3	TT070202X	2	NO SHARDS
S-4	TT070402X	1	BEGIN SHARDS
S-5	TT070402D	2	
S-6	TT070503X	3	
S-7	TT070602X	2	
S-8			

REFERENCE: FIELD BOOK, Pg. ______

ATTACHMENTS ______

SIGNATURE:

TEST PIT RECORD

TEST PIT RECORD

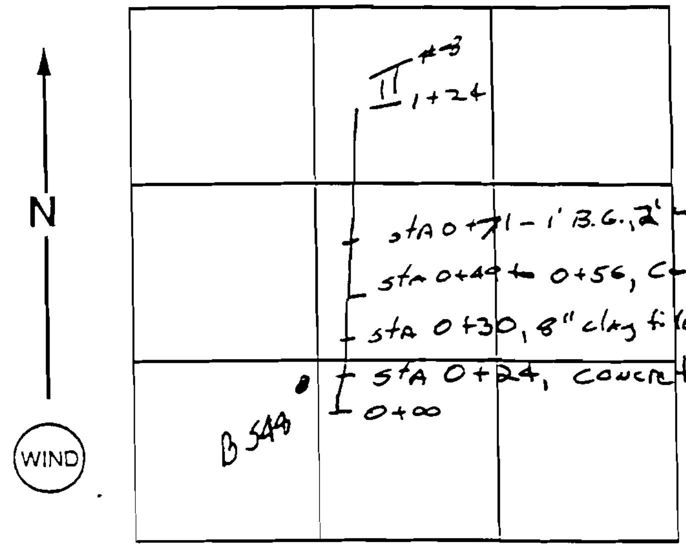
1 of 2

Site: Taylor Instruments

Well/Boring TT-08 Date 9/23/98 Time 1000 End 1235

Coordinates ____ Grid Element ____

SKETCH MAP OF TEST PIT SITE



sta 0+71 - 1' B.G., 2' wide footing

sta 0+49 to 0+56, Concrete 1' B.G.

sta 0+30, 8" clay tile. Didn't see in East side of trench

sta 0+24, concrete, 3' B.G., 1' wide.

SCALE 1" = ____ FT.

Crew Members:

1. L Smith
2. B. Lyons
3.
4.
5.
6.

Monitor Equipment:

PI Meter	Y	N
Explosive Gas	Y	N
Avail. Oxygen	Y	N
OVA	Y	N

Other: N/A

Photographs, Roll: ____

Exposure: ____

NOTES:

Samples collected: ①② TT080102X&D
(3) At sta 0+79 in
shard layer 2' B.G.
③ TT080203X at sta
0+79 at 1' Below shards

TEST PIT RECORD

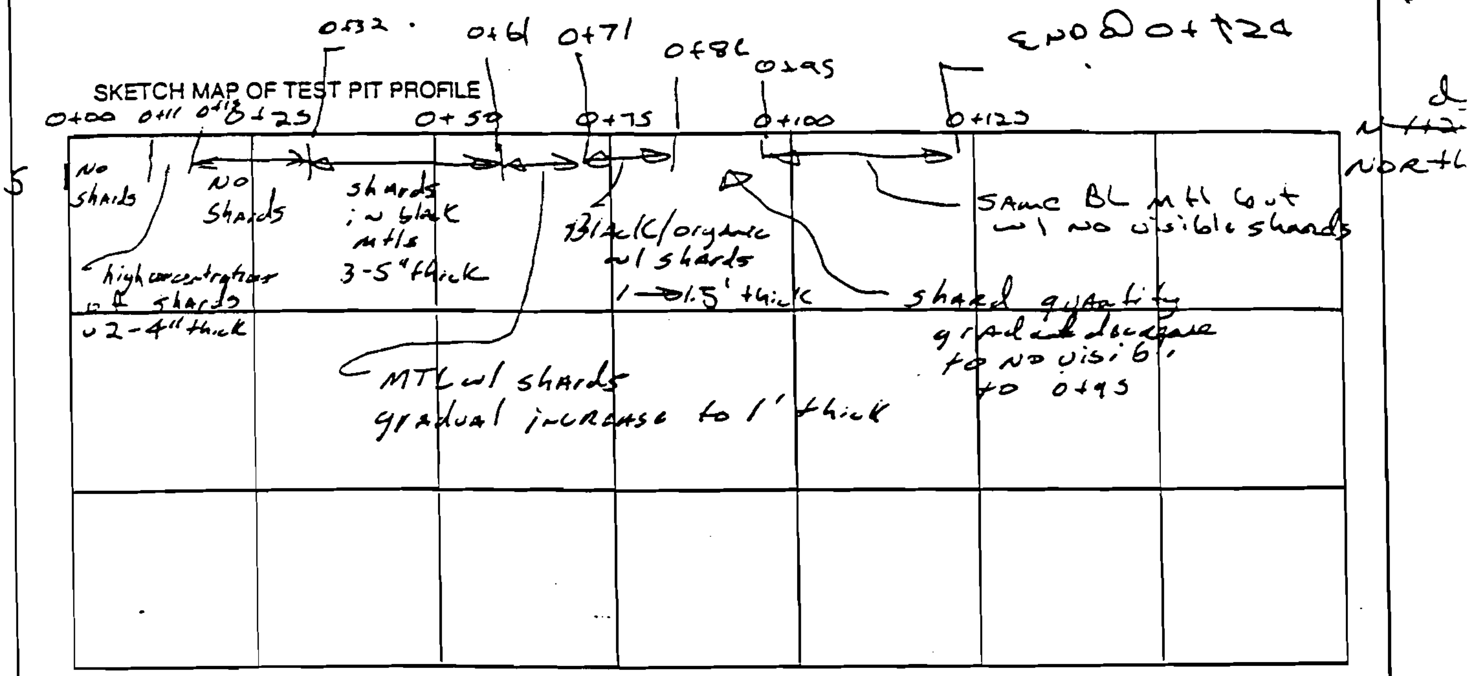
TEST PIT RECORD

2 of 2

Profile Along Test Pit: TT #8

Site: CEC Taylor Instruments

SKETCH MAP OF TEST PIT PROFILE



SCALE 1" = N/A FT.
DEPTH (FT).

NOTES:
Selected cross sections: Asphalt 0-3".
on all · downward w/ depth
0+11 & 0+15 - 1'-4" fill; 6" Black & red mtl;
2" Bl matl w/ shards in
high c.; Native fill
0+21 - 3" Grey fill w/ plastic; 9" clayey
fill; Native fill
0+32 - 1'-7" fill; 5" shards in BL matl;
1' Brown silt w/ shards; native fill
0+44 - 1'-3" fill; 1'-4" shards in BL matl;
native BR fill.
0+61 - 0-2' - Grey road base; native
fill
0+71 - 0-1' loam fill; 1'-2' Glass shards;
2-5' native fill
0+74 - 0-8"; Grey rd base; 0-8"-1'-10" BL
matl w/ shards; 1'10" to 2'-3" - shards in BL matl., sometimes pure
glass; > 2'-3" - native fill
0+84 - 0-1' Grey Rd. Base; 1'-2'-7" Black organic matl w/ shards;
2'-7" - 5' native fill
0+95 0-1' Grey Rd. Base, 1-2' BL matl; 2'-5' - native fill
1+24 → same as 0+95

no.	Int. Ser. No.	Depth (Ft.)	HD. SP. VOA PPM
S-1	TT080102X	2'	
S-2	TT0801020	2'	
S-3	TT080102X	2'	
S-4			
S-5			
S-6			
S-7			
S-8			

REFERENCE: FIELD BOOK, Pg. 10

ATTACHMENTS

SIGNATURE: Len Smith

TEST PIT RECORD

TEST PIT RECORD

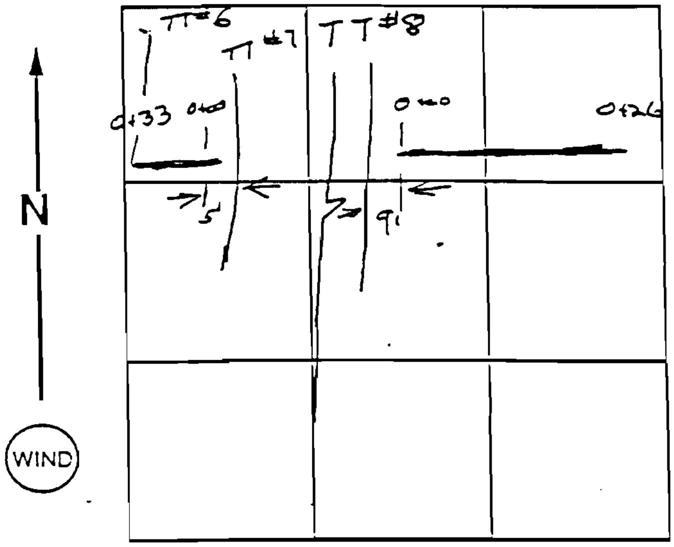
1 of 2

Site: Taylor Instruments

Well/Boring TT-09 Date 9/23/98 Time 1350 End 1520

Coordinates ______ Grid Element ______

SKETCH MAP OF TEST PIT SITE



SCALE 1" = — FT.

Crew Members:

1. L. Smith
2. B. Lyons
3.
4.
5.
6.

Monitor Equipment:

PI Meter	Y	N
Explosive Gas	Y	N
Avail. Oxygen	Y	N
OVA	Y	N

Other: AUA

Photographs, Roll: ______

Exposure: ______

NOTES:

East Section: hit 6" clay tile @ 2' Below Asphalt at sta 0+12' Typical X-Section 0-1' => Gray Road base w/ plastic @ bottom; 1'-2' => clean brown fill; 2'-5' native till. Hit concrete footing @ sta 0+20ft / Footing @ 2' BG No shards observed

West Section: No shards. Typical Cross Section = 0-1' - Gray Road Base; 1'-2.5' clean fill; 2.5'-5' Native brown fill

TEST PIT RECORD

TEST PIT RECORD

2 of 2

Profile Along Test Pit: TT#9

Site: Taylor Instrument

SKETCH MAP OF TEST PIT PROFILE see sheet #1 of 2

SCALE 1" = ____________ FT.
DEPTH (FT). ____________

NOTES:

. See sample chart

Sample No 1 @ Sta 0+10 on East side. Collected Dupe too.
Sample No 2 @ Sta 0+10 on West Side.

no.	Int. Ser. No.	Depth (Ft.)	HD. SP. VOA PPM
S-1	TT090102X	2'	
S-2	TT090102D	2'	
S-3	TT090202X	2'	
S-4			
S-5			
S-6			
S-7			
S-8			

REFERENCE: FIELD BOOK, Pg. 10

ATTACHMENTS N/A

SIGNATURE: Lee

TEST PIT RECORD

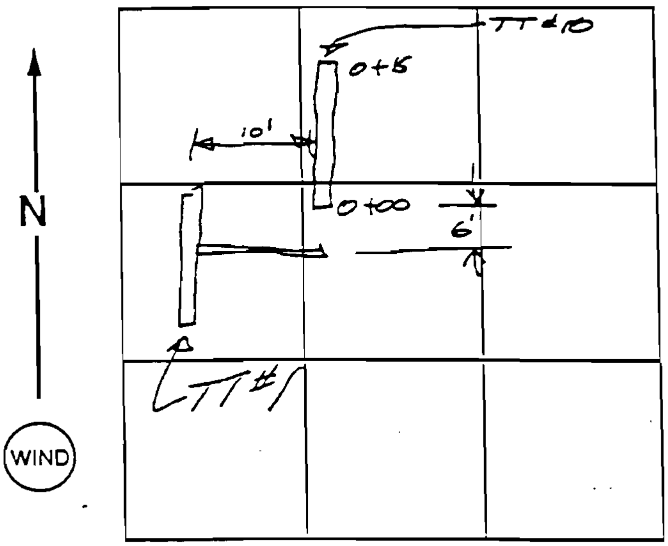
1 of 2

Site: Taylor Instruments

Well/Boring TT-10 Date 9-25 Time 1210 End 1317

Coordinates ______ Grid Element ______

SKETCH MAP OF TEST PIT SITE



SCALE 1" = ______ FT.

NOTES: Hit clay tile at 4' Below surface at sta 0+07.5 Minor amount of shards in backfill surrounding pipe.

Crew Members:

1. L. Smith
2. B. Lyons
3. G. Knight
4.
5.
6.

Monitor Equipment:

PI Meter	Y	N
Explosive Gas	Y	N
Avail. Oxygen	Y	N
OVA	Y	N

Other: Jerome, N/A

Photographs, Roll: ______

Exposure: ______

TEST PIT RECORD

Harding Lawson Associates

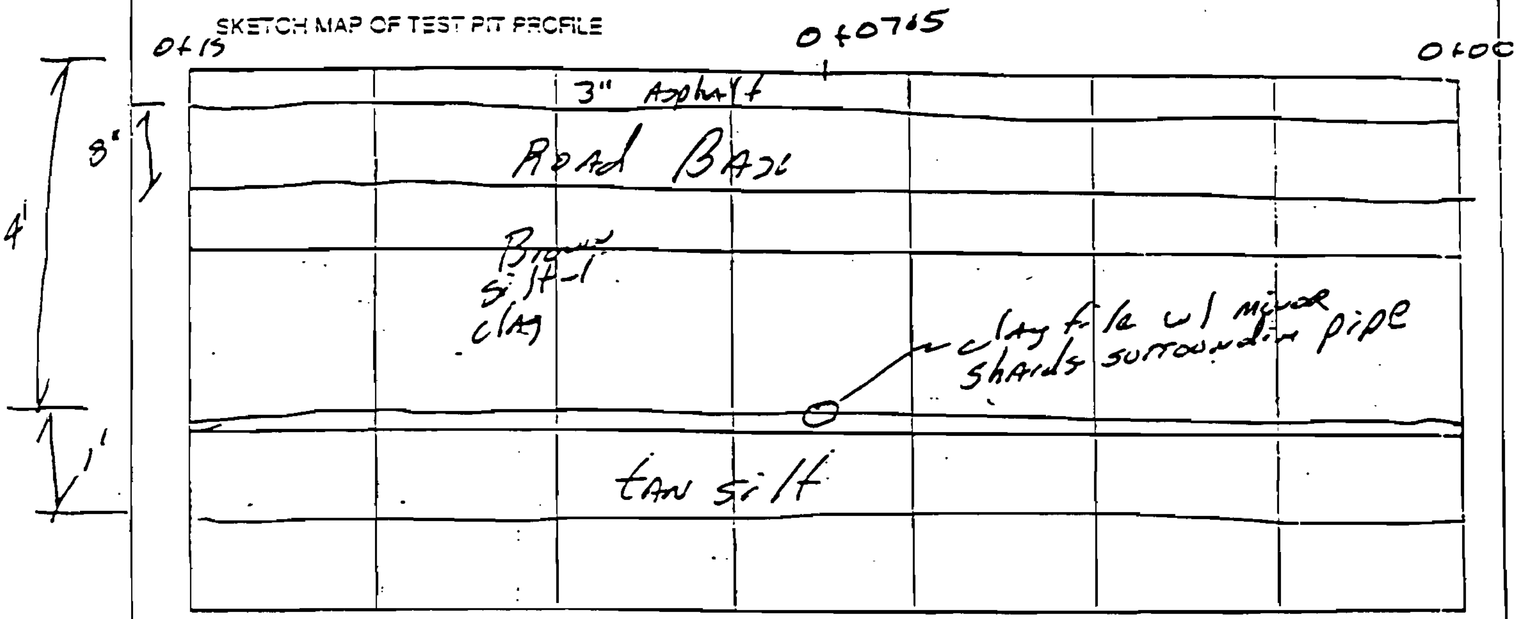
TEST PIT RECORD

2 of 2

Profile Along Test Pit: TT-10

Site: Taylor Instruments

SKETCH MAP OF TEST PIT PROFILE



SCALE 1" = ______ FT.

DEPTH (FT). ______

NOTES:

Collected sample 1-ft above clay

Line @ sta 0+07.5

no.	Int. Ser. No.	Depth (Ft.)	HC. SF. VOA PPM
S-1	TT100103X	3	
S-2			
S-3			
S-4			
S-5			
S-6			
S-7			
S-8			

REFERENCE FIELD BOOK, Pg. 27-28

ATTACHMENTS

SIGNATURE

TEST PIT RECORD

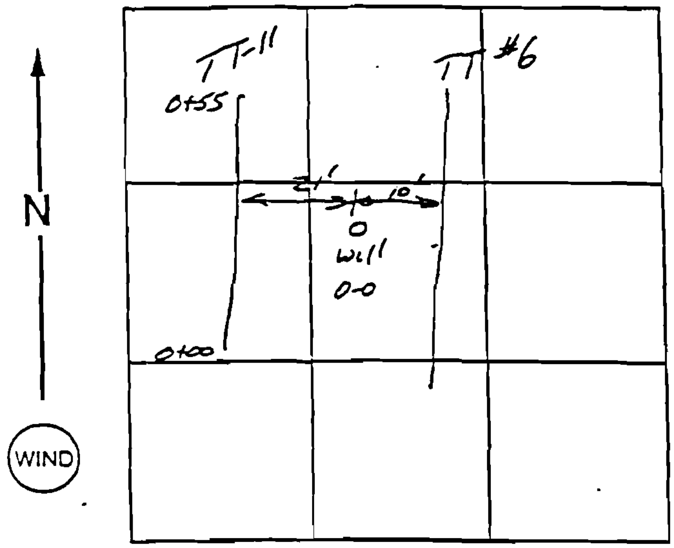
TEST PIT RECORD

Site: Taylor Instruments 1 of 2

Well/Boring TT-#11 Date 9-25-98 Time 1637 End 1730

Coordinates Grid Element

SKETCH MAP OF TEST PIT SITE



SCALE 1" = FT.

Crew Members:

1. L. Smith
2. B. Lyons
3.
4.
5.
6.

Monitor Equipment:

PI Meter	Y	N
Explosive Gas	Y	N
Avail. Oxygen	Y	N
OVA	[✓ Y]	N

Other: Jerome MVA

Photographs, Roll:

Exposure:

NOTES:

Jerome readings

0.000 @ sta 0+05

0.000 @ sta 0+10

0.000 @ sta 0+20

0.000 @ sta 0+30

Encountered soil w/ hydrocarbon odor 2-5' down from stas. 0+00 to sta 0+14. Collected OVA reading from soil stockpile = 15ppm.

TEST PIT RECORD

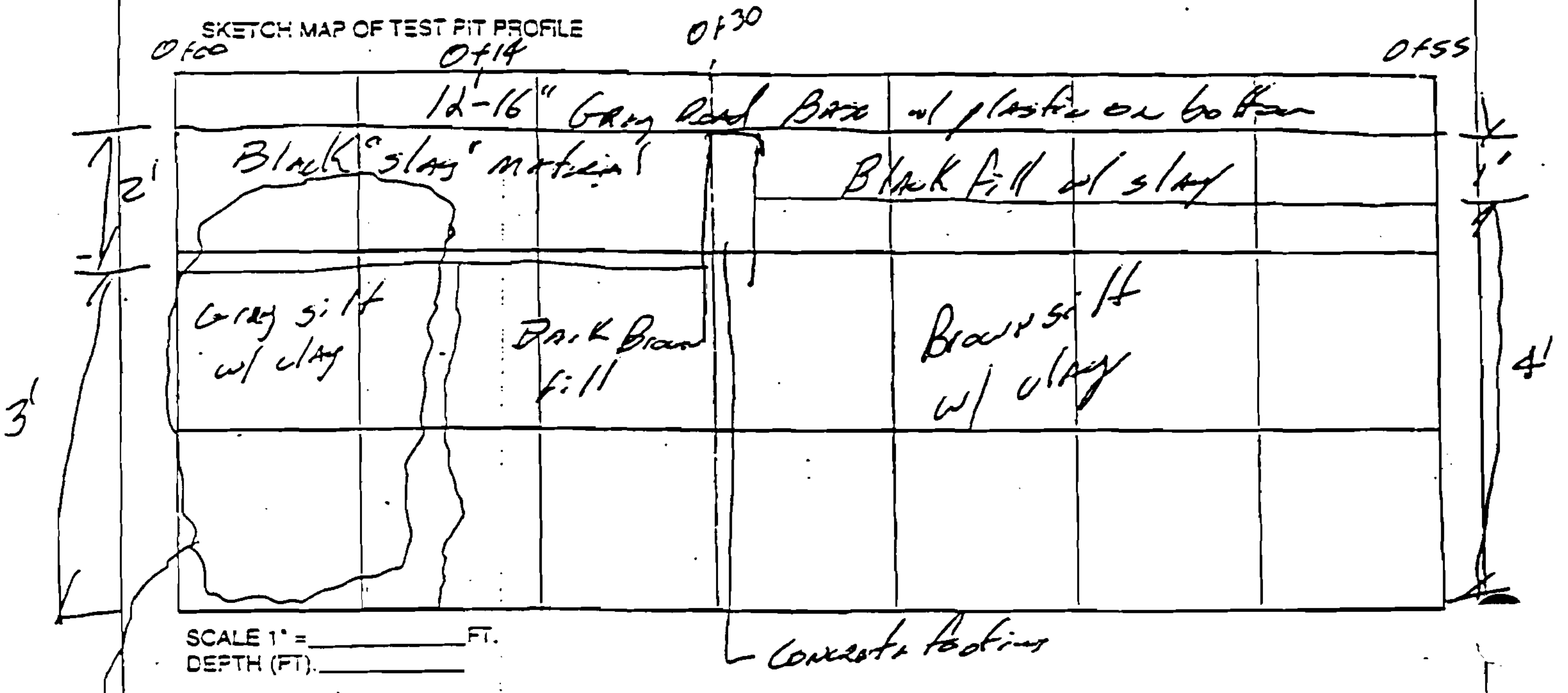
TEST PIT RECORD

2 of 2

Profile Along Test Pit: TT #11

Site: Taylor Instruments

SKETCH MAP OF TEST PIT PROFILE



SCALE 1" = ________ FT.
DEPTH (FT). ________

NOTES: material w/ hydrocarbon odor

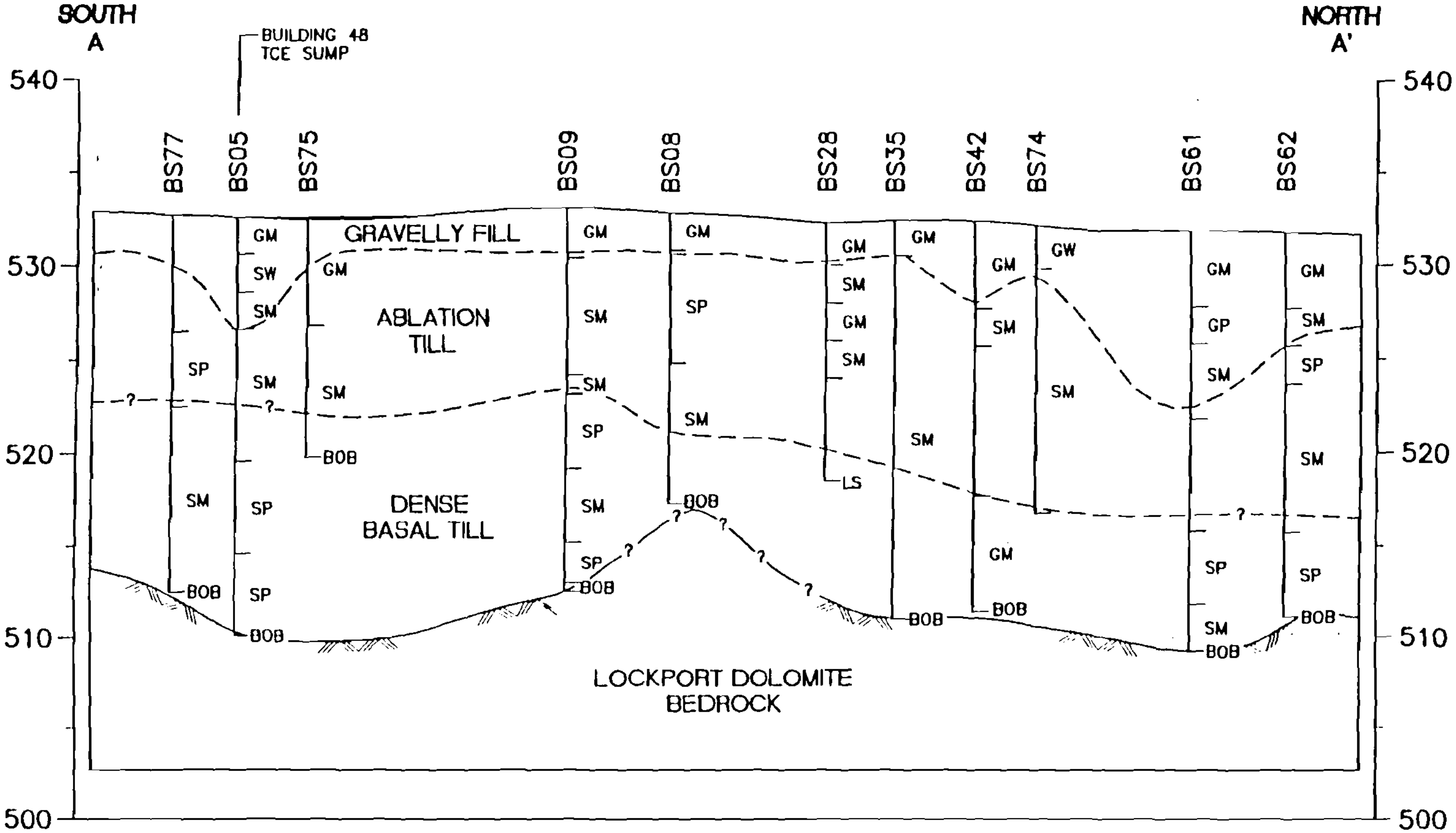
no.	Int. Ser. No.	Depth (Ft.)	HC. SP. VOA PPM
S-1	TT11002X	2	0+10 "slag"
S-2	TT110205X	5	0+10' Native Brown
S-3	TT110302X	2	0+17 "slag"
S-4	TT110405X	5	0+17 Native Brown
S-5			
S-6			
S-7			
S-8			

REFERENCE: FIELD BOOK, Pg. 30-31

ATTACHMENTS ________

SIGNATURE:

TEST PIT RECORD



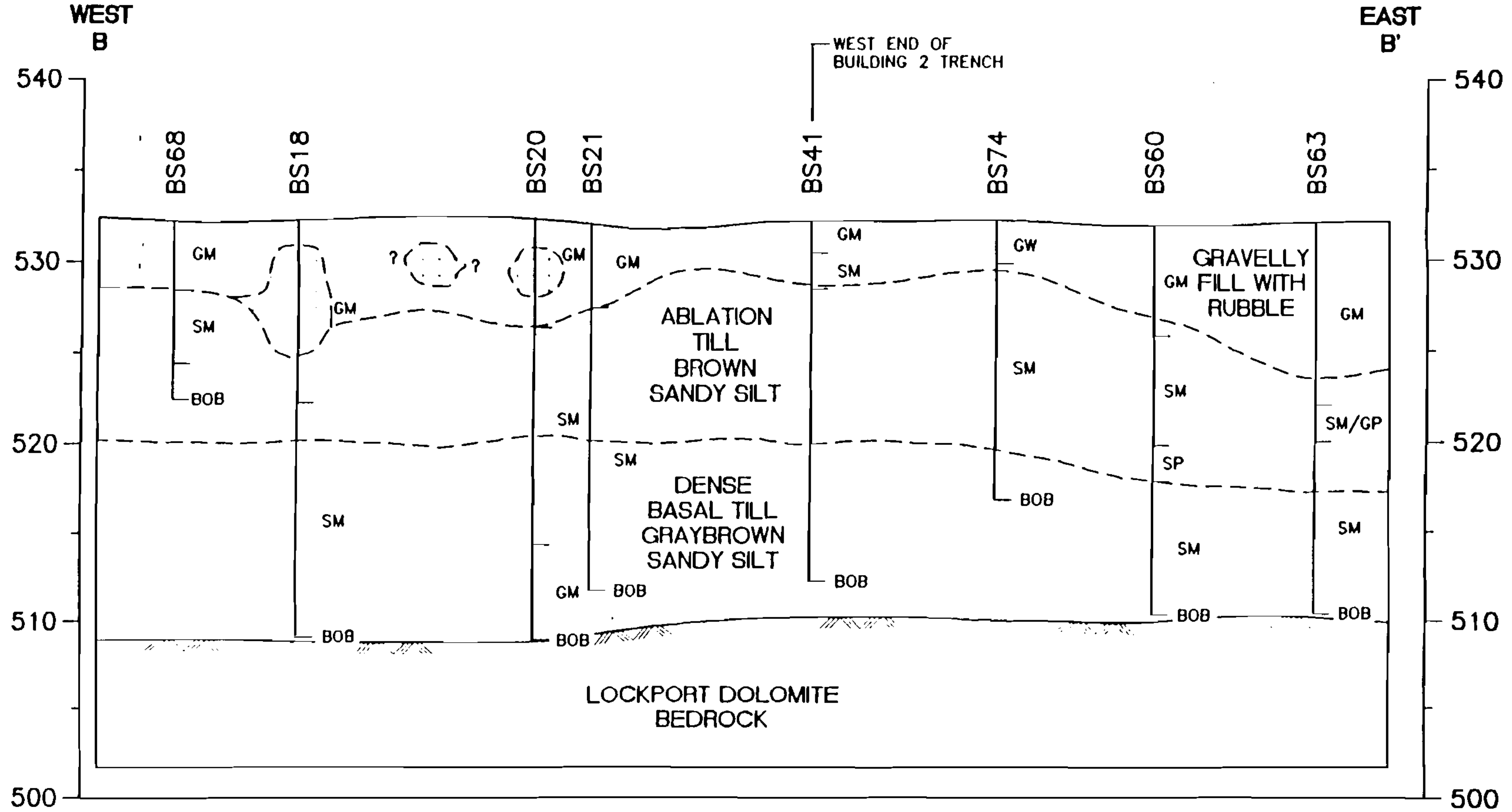
LEGEND

BS05	PHASE 1 BORING
– – – –	INTERPRETED GEOLOGIC BOUNDARY
GM, SM, SP, GW	USCS SOIL CLASSIFICATION
BOB	BOTTOM OF BORING

SCALE: 1" = 10' VERT.
1" = 100' HORIZ. (APPROX.)

FIGURE 4-2
INTERPRETED CROSS-SECTION A-A'
PHASE 1 VOLUNTARY SITE INVESTIGATION
95 AMES STREET, ROCHESTER, NEW YORK

ABB Environmental Services, Inc.



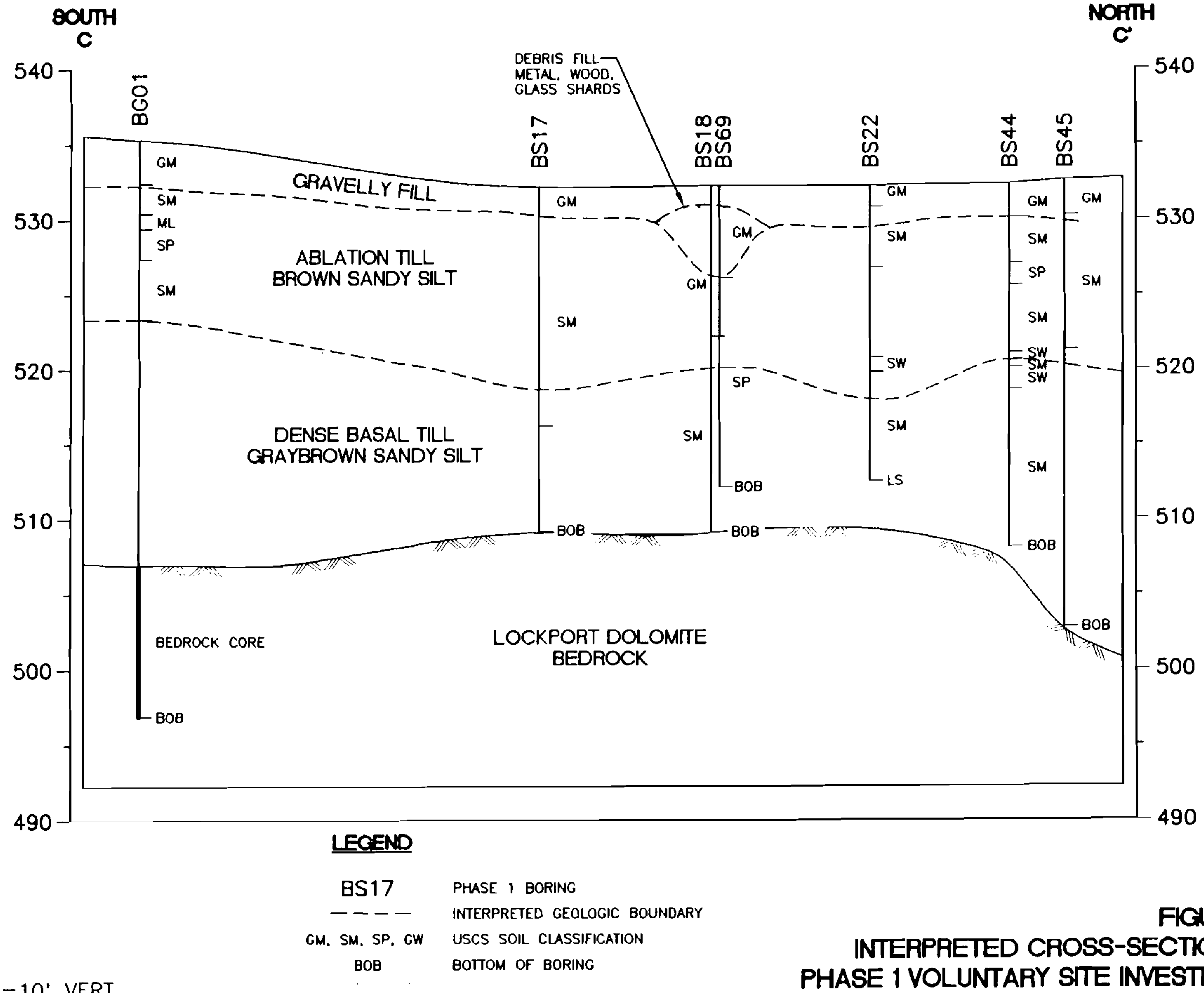
LEGEND

BS18	PHASE 1 BORING
— — — —	INTERPRETED GEOLOGIC BOUNDARY
GM, SM, SP, GW	USCS SOIL CLASSIFICATION
BOB	BOTTOM OF BORING
	FILL CONTAINING GLASS SHARDS

SCALE: 1" = 10' VERT.
1" = 100' HORIZ.(APPROX.)

FIGURE 4-3
INTERPRETED CROSS-SECTION B-B'
PHASE 1 VOLUNTARY SITE INVESTIGATION
95 AMES STREET, ROCHESTER, NEW YORK

ABB Environmental Services, Inc.



SCALE: 1" = 10' VERT.
1" = 100' HORIZ. (APPROX.)

FIGURE 4-4
INTERPRETED CROSS-SECTION C-C'
PHASE 1 VOLUNTARY SITE INVESTIGATION
95 AMES STREET, ROCHESTER, NEW YORK
ABB Environmental Services, Inc.

J:\7195-24\REPORT\7198S007.DWG (1=100

APPENDIX G

CORRESPONDENCE RELATED TO 1995 MERCURY WASTE CHARACTERIZATION

New York State Department of Environmental Conservation
Region 8 Office - Division of Hazardous Substances Regulation
6274 East Avon-Lima Road
Avon, New York 14414-9519

Telephone: (716) 226-2466

Michael D. Zagata
Commissioner

Renée Forgensi Davison
Regional Director

July 10, 1995

Ms. Libby Ford
Nixon, Hargrave, Devans & Doyle
Clinton Square
PO Box 1051
Rochester, NY 14603

Dear Ms. Ford:

RE: Former CE/Taylor Instrument Facility
Rochester (C), Monroe (C)

This is in response to your July 5, 1995 letter which summarizes the June 30, 1995 meeting minutes and outlines the general understanding of our discussion during the meeting. The following is offered by the Department in effort to address your concerns and to define the Department's position on the regulatory status of the mercury-bearing debris.

1. As indicated in my June 27, 1994 letter to you, the Department agrees that Combustion Engineering and its Taylor Instrument Site Team have made appropriate hazardous waste determinations on the waste that is being generated as part of the predemolition/demolition process at the site. These determinations were made in accordance with current regulations and are consistent with current State and federal guidance and regulatory interpretations. In absence of the Department's oversight, it remains the generator's responsibility to document that the waste was identified, segregated and disposed of in accordance with all applicable regulations.

   While evaluating the history of any industrial facility operated for approximately 85 years is difficult, the Taylor Instrument Site Team has evaluated, and assembled for the Department's review, a detailed history of the site's historical operations sufficient to make the necessary hazardous waste determinations.

The detailed floor by floor and building by building summary of the history of the site attached to the January 6, 1995 letter to the Department sets out this information. According to your correspondence, that summary was based upon numerous documents and interviews of current and former Taylor Instrument/Kent-Taylor employees and an extensive review of Taylor Instrument/Kent Taylor's environmental and facility department files.

2. Because the Department acknowledges that the Taylor Instrument Site Team have identified hazardous waste in accordance with applicable current regulations, guidance and policy, the Department agrees that the remaining waste generated is not hazardous waste, as long as the identified hazardous waste is kept strictly segregated from the non-hazardous waste. Thus, disposal of the non-hazardous waste at an appropriately permitted solid waste disposal facility will not be considered a violation of the Department's regulatory prohibition against disposing of hazardous waste other than at a Hazardous Waste Treatment, Storage and/or Disposal Facility. Such disposal also will not constitute grounds for listing the disposal facility as a hazardous waste disposal site under current Department regulations and policies.

3. Acceptance or rejection of the non-hazardous waste by an appropriately permitted solid waste disposal facility, is a decision between the disposal facility and the waste generator.

As to the last item in your letter, the Department cannot make a commitment as to what effect future changes in legislation, regulation or guidance will have on actions taken today. There are no current proposals that we are aware of to change hazardous waste definitions that would impact Inactive Hazardous Waste Disposal Site Registry listing or Corrective Action, however, that does not guarantee that future regulations will have have retroactive provisions with impacts in these areas.

I hope this response addresses all your concerns and please call me if you have any further questions.

Very truly yours,

M Khalil

Michael Khalil, P.E.
Environmental Engineer II
Division of Hazardous
Substances Regulation

rm

cc: Dan David
Frank Ricotta
Bill Yemen

file

Nixon. Hargrave, Devans & Doyle
Attorneys and Counselors at Law
A PARTNERSHIP INCLUDING PROFESSIONAL CORPORATIONS
CLINTON SQUARE
POST OFFICE BOX 1051
ROCHESTER, NEW YORK 14603
(716) 263-1000
TELEX 978450 (WUI)
FAX: (716) 263-1600

ONE KEYCORP PLAZA
ALBANY, NEW YORK 12207
(518) 427-2650

1600 MAIN PLACE TOWER
BUFFALO, NEW YORK 14202
(716) 853-8100

990 STEWART AVENUE
GARDEN CITY, NEW YORK 11530
(516) 832-7500

30 ROCKEFELLER PLAZA
NEW YORK, NEW YORK 10112
(212) 603-3000

SUITE 800
ONE THOMAS CIRCLE
WASHINGTON, D.C. 20005
(202) 457-5300

WRITER'S DIRECT DIAL NUMBER
(716) 263-1606

June 17, 1994

Michael Khalil
Division of Hazardous Substances Regulation
New York State Department of
Environmental Conservation
6274 East Avon-Lima Road
Avon, New York 14414-9519

RE: Classification of Mercury-Bearing Debris, Former Combustion Engineering ("CE")/Taylor Instrument Manufacturing Facility (Ames Street), Rochester, New York

Dear Mike:

Combustion Engineering ("CE") and Sybron Corporation[1] appreciates the Department's willingness to help CE, as the eventual generator of potentially hazardous demolition debris waste, ensure that it correctly applies the Department's interpretation of the mercury containing listed waste classification issue identified in our March 14, 1994 letter to NYSDEC.

Based on understandings reached between NYSDEC, CE and Sybron at our April 29, 1994 site meeting, this letter will discuss the interpretation Mr. Dixon Rollins of the Department set forth in his March 28, 1994 response letter. During our meeting, we reviewed with you a site diagram that was marked to show historical mercury storage and usage areas at the Facility. That diagram was compiled following investigations into historical operations, record reviews and interviews with former and current employees. We discussed the pre-manufacturing, manufacturing and post manufacturing-related operations for the mercury containing product lines with you. At the conclusion of that discussion, you

---

[1] As an owner and operator of the site until 1983, Sybron Corporation is working closely with CE on the various issues which are connected with investigating the site and, as necessary, restoring it.

indicated your satisfaction that CE had delineated the historical operations to the extent necessary to apply the Department's interpretation of the mercury-related listed waste issue. You also concurred that, over the 85 year manufacturing history at the site, the site produced consistent mercury containing product lines and used consistent manufacturing techniques for these product lines.

A. How Mercury-Related Listed Hazardous Demolition Waste Determinations Will Be Made

Based upon DEC's March 28, 1994 letter and the April 29 meeting, CE identified areas where the primary mercury-related activities involved the storage and/or handling of commercial grade mercury prior to its introduction into the manufacturing process. These areas were signified in yellow on the site diagram we reviewed with you. Floor debris from these areas which show any mercury will be identified and handled as a listed hazardous waste.

As the Department will realize, this is an extremely conservative approach. These areas do not present any greater health or environmental risks than other areas of the building. In fact, we do not believe that these areas present any significant health or environmental risks at all.[2] The above conservative approach is being adopted because of the limited areal extent of these areas.

B. Testing to Identify Mercury Characteristic Hazardous Demolition Waste Areas

CE intends to use the TCLP mercury level to classify all other areas of the building, based upon the results of the two-stage mercury testing program that CE has carried out in the buildings at the site thus far. A brief summary of this program follows.

During the first stage of the testing program, ABB-Environmental Services ("ABB-ES") collected many samples of wood and concrete flooring and plaster, brick and painted brick walls samples. These samples were analyzed for total mercury and TCLP mercury. The total mercury results were correlated to the TCLP results to establish a total

---

[2] A preliminary calculation was done which indicates that a more appropriate risk-based cleanup standard would be approximately 1200 mg/kg.

mercury concentration action level above which materials would be expected to fail TCLP for mercury. This evaluation resulted in the establishment of a conservative action level of 550 mg/kg total mercury. During the first stage, ABB ES also determined that wall and wood floor materials did not fail TCLP for mercury, even in the most intense mercury use areas.

The second stage of the investigation consisted of additional sampling of concrete floor materials in building areas with a history of mercury use. The samples were analyzed for total mercury and the results were compared to the 550 mg/kg action level. As a result of this two stage testing program, certain areas were identified that will require management as a characteristic hazardous waste during demolition.

Based upon DEC's March 28, 1994 letter and our subsequent April 29, 1994 meeting to discuss these issues, CE will complete the mercury-related hazardous waste determinations at the site by carrying out a third and final phase of testing. This third stage will consist of additional floor sampling analysis for total mercury. It is designed to delineate the areas requiring treatment and management as hazardous waste and to fill in data gaps. The results will be compared to the 550 mg/kg action level. The debris from any areas with mercury over this level will be segregated and handled as a hazardous waste.

C. Segregation of Mercury Hazardous Waste Debris

Once the final listed and characteristic hazardous waste area determination process is complete, the affected materials within the identified areas will be physically removed and managed as a hazardous waste. This segregation will be done prior to general building demolition.

D. Post-Building Demolition Action Plan

As we also discussed during our April 29, 1994 meeting, once the mercury and other hazardous waste demolition debris areas are removed, general building demolition will commence. We cannot set out an exact schedule for this because we cannot move forward until the hazardous demolition debris waste determination process outlined above is completed, the identified areas removed and the on-going asbestos abatement project is completed. It is anticipated that general building demolition will start sometime this fall. The upcoming demolition of the structures at the site will be managed so that the demolition activities will not be conducted on the small portion of the site which is currently on DEC's registry of inactive hazardous waste disposal sites. Once general building demolition is complete, the next phase in the overall project plan will be to commence a subsurface investigation. At that time we look forward to discussing the scope of this investigation with the appropriate representatives of the Department.

E. Conclusion

We believe that, with the Department's assistance, we have established a mercury-containing demolition hazardous waste determination protocol that meets both the letter and the spirit of the hazardous waste generator regulatory obligations. Accordingly, the waste characterization will proceed as outlined above, commencing in early July, unless the Department notifies us of any objections.

On behalf of CE and Sybron, I again express my appreciation for the Department's timely assistance in this area. As always, if you have any questions, please do not hesitate to give me a call. For your convenience, Attachment A clarifies some of the historical information you requested during the meeting.

Very truly yours,

Libby Ford

Libby Ford
Senior Environmental Health
Engineer

Attachment
cc: Rudy Gabel
Stephen J. Tomassi

ATTACHMENT A

The Ames Street property was purchased in 1904. Manufacturing operations began in either 1905 or 1906. At that time the company was named the Taylor Brothers Company. In 1907 the Taylor Brothers Company changed its name to the Taylor Instrument Companies. In 1968 Taylor Instrument Companies merged with the Ritter-Pfaudler Corporation to form Sybron Corporation. In 1983, Sybron sold its Taylor Instruments Division to Combustion Engineering, Inc. In approximately 1987 or 1988 the former Taylor Instrument operations became part of Combustion Engineering's process automation business. In 1990, Combustion Engineering was acquired by Asea Brown Boveri, Ltd. and the former Taylor Instrument entity became a part of a new division of ABB, Inc. called Kent-Taylor.

The buildings at the site currently encompass approximately 450,000 square feet. (At the meeting I originally gave you a higher figure, but after reviewing my notes, this is the approximate square footage.) Taylor Instruments (its predecessors and its successors) began building at the site in approximately 1904 and most of the buildings were completed by the 1950s.

Manufacturing operations were carried out at the site for approximately 85 years. The mercury-related product lines over this timeframe can be divided into two groups. The first type were "liquid in glass" measurement devices such as thermometers, barometers and sphygmomanometers. The common elements for these product lines are that glass tubes were filled with mercury under pressure. Once filled with mercury, these instruments underwent calibration, marking and additional assembly. The second product line was "solid filled" instruments. These measuring instruments utilized stainless steel tubes to hold the mercury which was injected under pressure.

New York State Department of Environmental Conservation
Region 8 Office - Division of Hazardous Substances Regulation
6274 East Avon-Lima Road
Avon, New York 14414-9519

Telephone: (716) 226-2466

Langdon Marsh
Acting
Commissioner

Peter J. Bush
Regional Director

June 27, 1994

Ms. Libby Ford
Nixon, Hargrave, Devans & Doyle
Clinton Square
Post Office Box 1051
Rochester, NY 14603

Dear Ms. Ford:

Re: Former CE/Taylor Instrument Facility
Rochester (C), Monroe (C)

This is in response to your June 17, 1994 letter which summarizes the April 29, 1994 meeting minutes and outlines the general understanding of our discussion during the site visit.

Based on the information presented during our meeting regarding the historical operations and as a result of the site tour, we feel that CE have satisfactorily delineated the mercury-contained equipment manufacturing activities.

Although we agree with your approach in identifying the mercury-related hazardous waste, we feel that the following documentation are needed for full evaluation of your activities:

- A copy of the site diagram that was reviewed during the site visit which delineated the historical operations at the site and which also signified in yellow the areas of concern.
- Available data that support your correlated action level of 550 mg/kg total mercury.
- Site diagram showing the certain areas that were identified during the two stage testing program that will require management as a characteristic hazardous waste.

This information can be submitted along with your findings from the third stage of your investigation.

Please call me if you have any questions regarding this letter.

Sincerely,

Michael Khalil, P. E.
Environmental Engineer II

db

cc: Bill Yemen

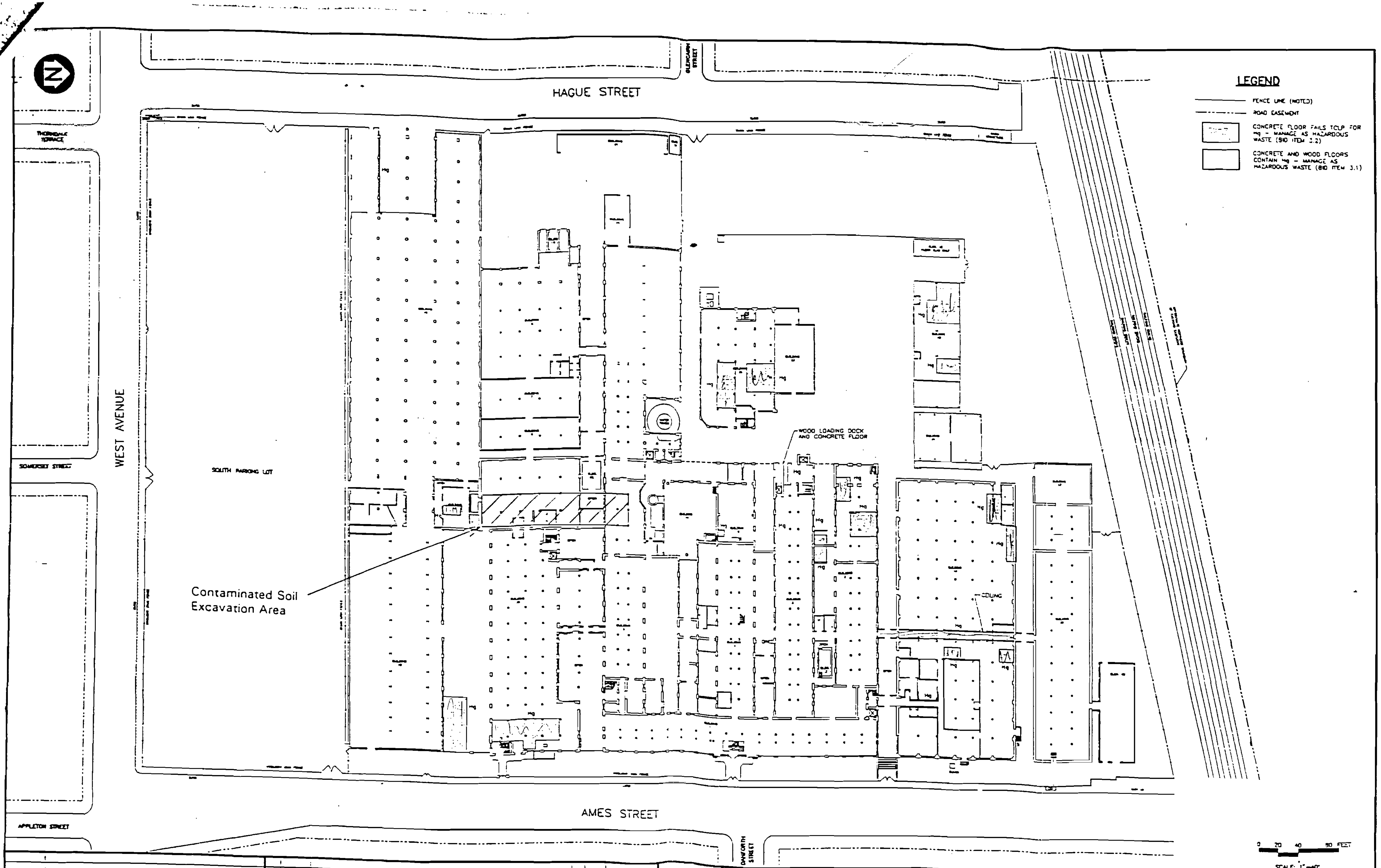


ABB Environmental Services

CLIENT
COMBUSTION ENGINEERING
STAMFORD, CONNECTICUT

DESIGN	
DRAWN	EJ LEDUC 11/28/94
CHKD.	
DEPT. NO.	
PROCESS	
PROJ. MGR.	
CLIENT	

TITLE
95 AMES STREET
FACILITY DEMOLITION PROJECT
ROCHESTER, NEW YORK

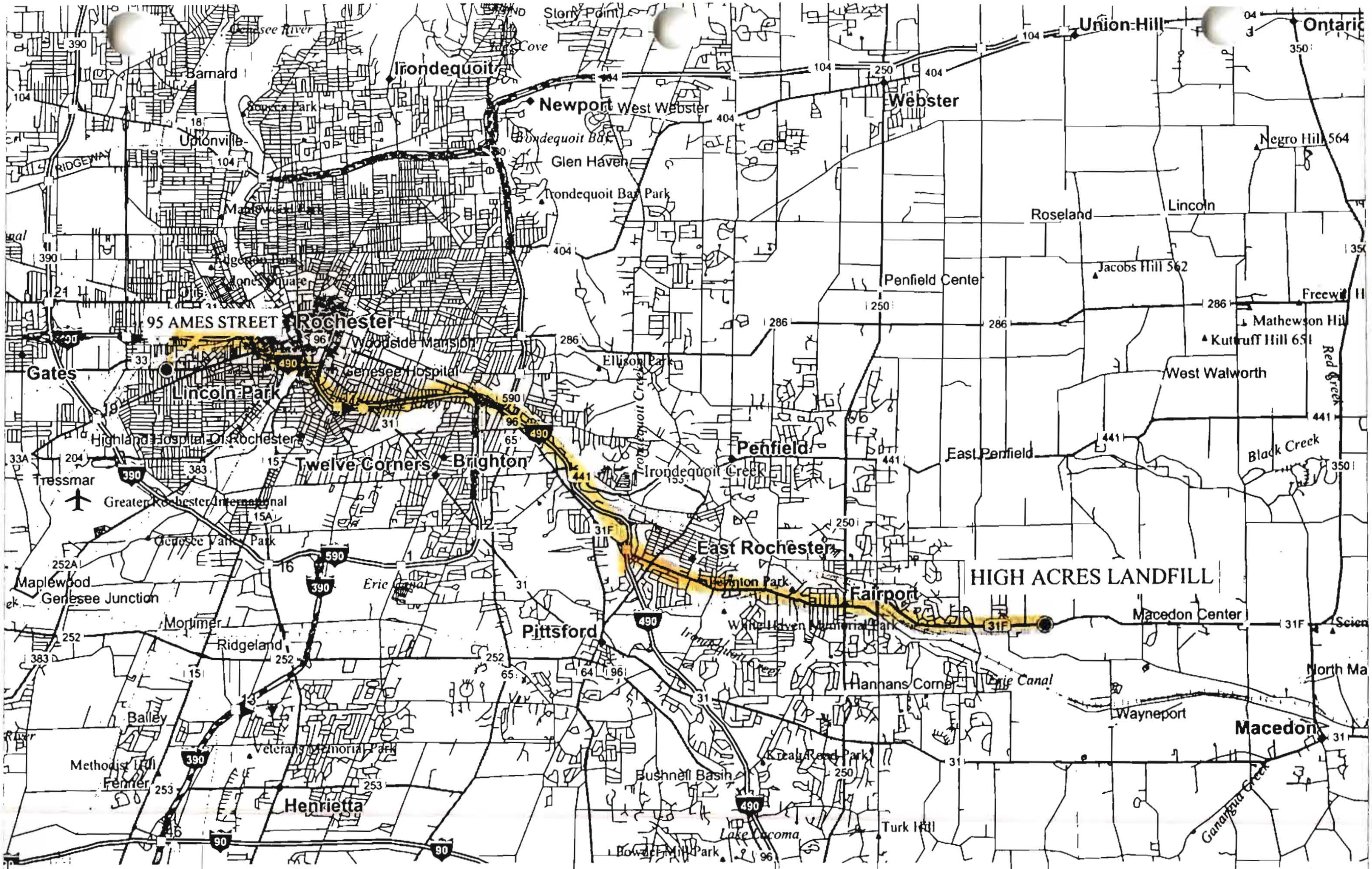
HAZARDOUS WASTE
DUE TO MERCURY

PROJ. NO. 7198–08

REV.

APPENDIX H

PROPOSED HAUL ROUTES



95 AMES STREET
HIGH ACRES LANDFILL
Rochester
Gates
Lincoln Park
Irondequoit
Barnard
Uptonville
Newport
West Webster
Webster
Union Hill
Ontario
Glen Haven
Irondequoit Bay
Irondequoit Bay Park
Seneca Park
Maplewood Park
Edgerton Park
Jones Square
Woodside Mansion
Genesee Hospital
Highland Hospital Of Rochester
Twelve Corners
Brighton
Tressmar
Greater Rochester International
Genesee Valley Park
Ellison Park
Irondequoit Creek
Penfield
East Penfield
Penfield Center
Roseland
Lincoln
Jacobs Hill 562
Negro Hill 564
Freewill Hill
Mathewson Hill
Kuttruff Hill 651
West Walworth
Black Creek
Red Creek
East Rochester
Fairport
Macedon Center
White Haven Memorial Park
Erie Canal
Hannans Corner
Wayneport
Macedon
North Ma
Pittsford
Maplewood
Genesee Junction
Mortimer
Ridgeland
Bailey
Methodist Hill
Fenner
Veterans Memorial Park
Henrietta
Bushnell Basin
Kreag Road Park
Lake Lacoma
Bowden Mill Park
Turk Hill
Ganargua Creek
Stony Point
Sandy Cove
Genesee River
RIDGEWAY
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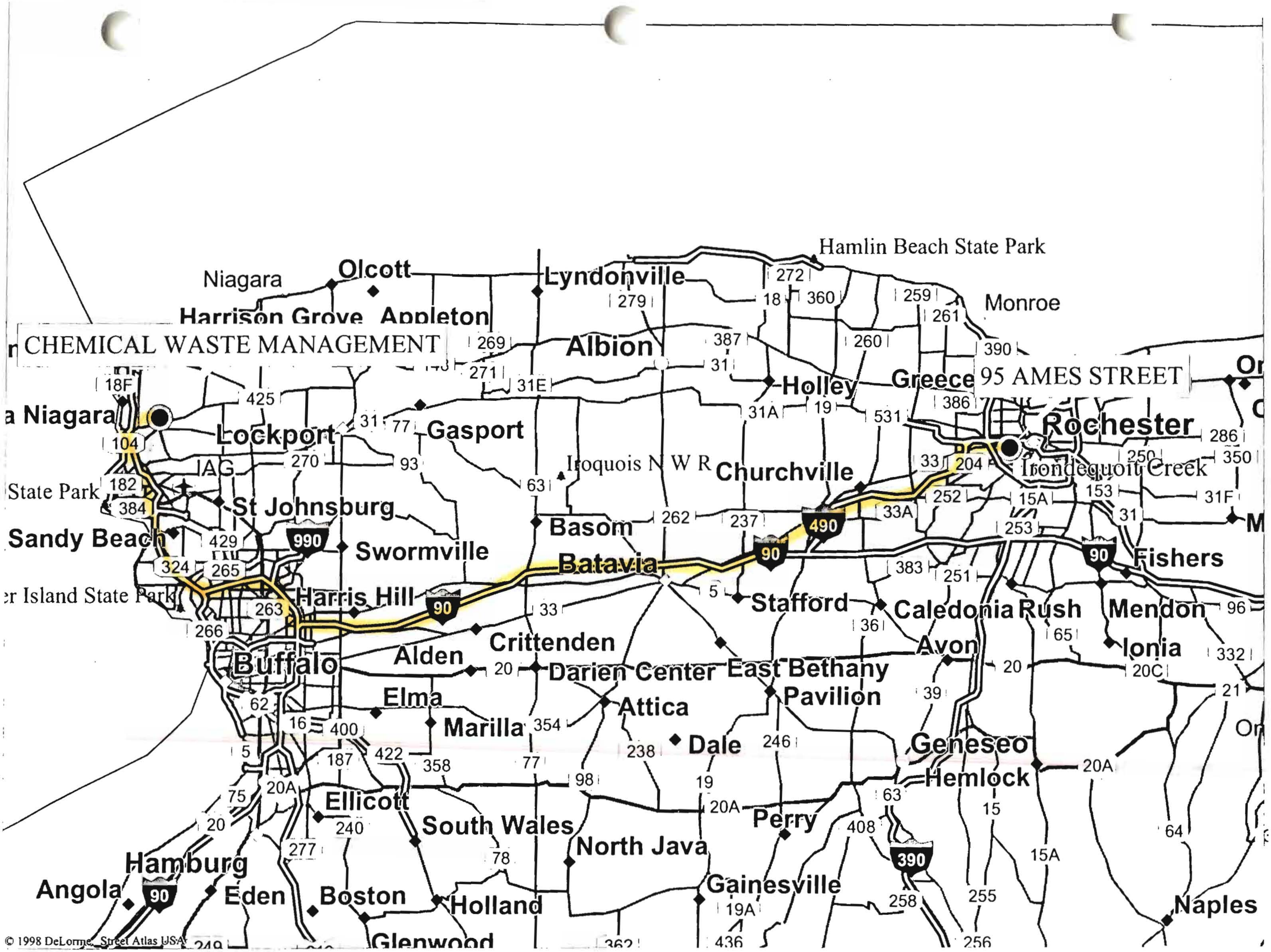

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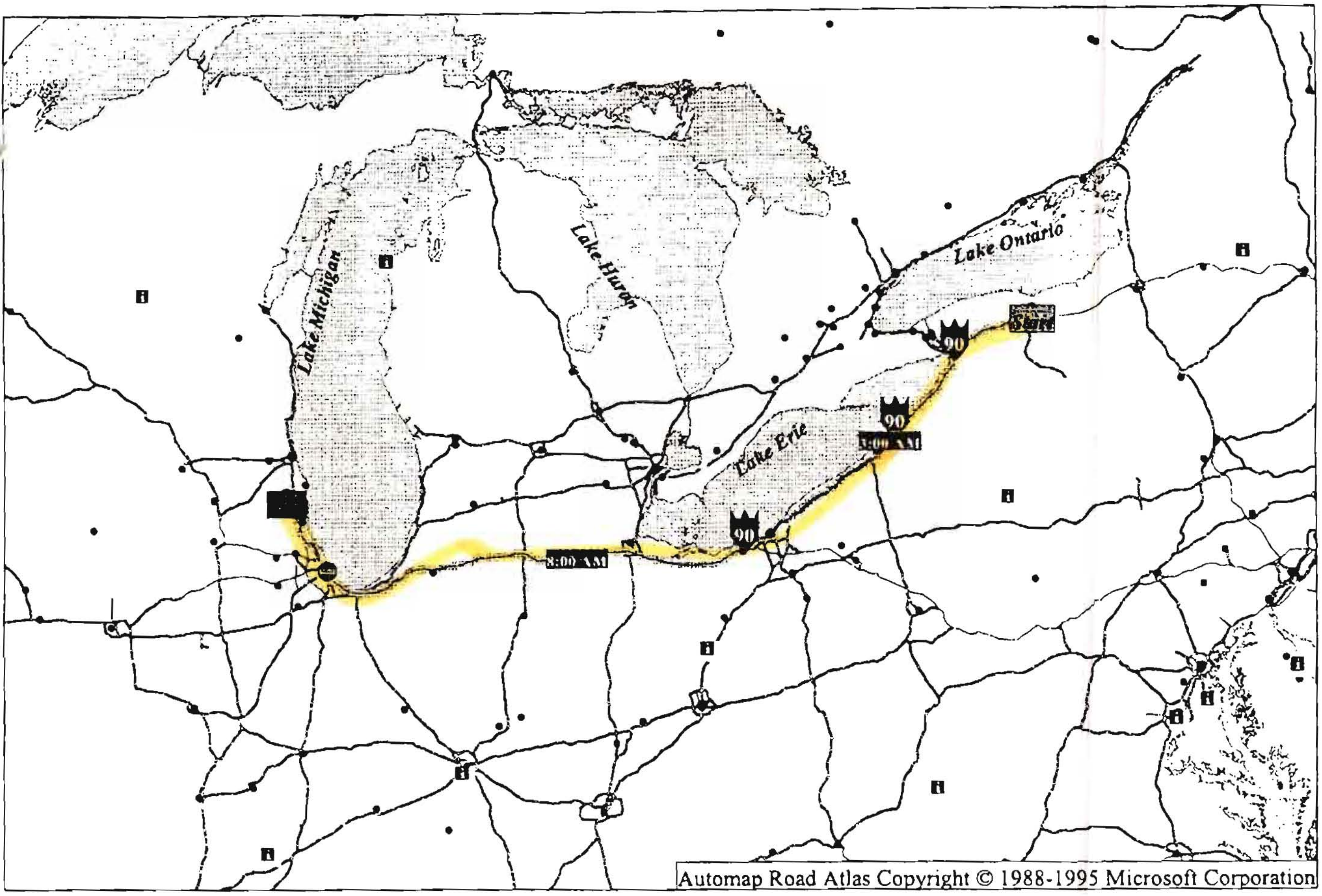

Automap Road Atlas Copyright © 1988-1995 Microsoft Corporation

Automap Road Atlas V4.00
Route: 'Rochester, NY' to 'Union Grove, WI'
Preferred: 718 miles, 1 day 1 hour 33 min, $160.36

Day	Time	Dist.	Instruction	Road	For	Dir.	Toward
1	12:00 AM	0.0	DEPART Rochester (NY) on the	I490	23 miles	W	
1	12:27 AM	23.1	Turn off onto	I90	612 miles	W	Batavia
1	11:51 AM	635	Turn off onto	I94	5 miles	W	Chicago
1	11:58 AM		*** End of day 1, Stop for 1 night ***				
2	12:00 AM	639	At Chicago, IL, stay on	I94	72 miles	W	Northbrook
2	1:26 AM	712	Turn off onto	SR11	6 miles	W	Union Grove
2	1:33 AM	717	ARRIVE Union Grove (WI)				

Automap Road Atlas for Windows © Microsoft Corporation

Map Version North America Feb 20 95

APPENDIX I

HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN
ON-SITE REMEDIAL PROGRAM

FORMER TAYLOR INSTRUMENTS FACILITY
95 AMES STREET
ROCHESTER, NEW YORK

Prepared for:

Combustion Engineering
501 Merritt 7
Norwalk, CT 06851

Prepared by:

Harding Lawson Associates
1400 Centerpoint Boulevard, Suite 158
Knoxville, TN 37932

FEBRUARY 2000

Harding Lawson Associates
1400 Centerpoint Blvd., Suite 158
Knoxville, TN 37932
(865) 531-1922

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Health and Safety Plan
On-Site Remedial Program
Former Taylor Instruments Facility
Rochester, New York

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Health and Safety Plan
On-Site Remedial Program
Former Taylor Instruments Facility
Rochester, New York

Section **Description** **Page No.**

LIST OF FIGURES

Health and Safety Plan
On-Site Remedial Program
Former Taylor Instruments Facility
Rochester, New York

LIST OF TABLES

Appendices

LIST OF ACRONYMS

CFR	Code of Federal Regulations
DOT	Department of Transportation
HASP	Health and Safety Plan
HLA	Harding Lawson Associates
HSD	Health and Safety Designee
HSO	Health and Safety Officer
HSSF	Health and Safety Short Form
IDLH	Immediately Dangerous to Life or Health
MCDOH	Monroe County Department of Health
mg/m^3	milligrams per cubic meter
MSDS	material safety data sheet
MVA	Mercury Vapor Analyzer
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OSHA	Occupational Safety and Health Administration
PID	Photoionization Detector
PM	project manager
PPE	personal protective equipment
ppm	parts per million
RSHO	Regional Safety and Health Officer
RWP	Remedial Work Plan
SCBA	self-contained breathing apparatus
SCS	Site Construction Supervisor
TAF	Task Analysis Form
TCE	trichloroethene

1.0 GENERAL

1.1 SCOPE AND PURPOSE

This Health and Safety Plan (HASP) has been prepared in conformance with the Harding Lawson Associates (HLA) Health and Safety Program and is intended to meet the requirements of 29 Code of Federal Regulations (CFR) 1910.120 and 29 CFR 1926. As such, the HASP addresses those activities associated with field and other operations for this project. Compliance with this HASP is required for all HLA personnel. Contractor personnel entering the site will be shown a copy of this HASP for informational purposes. A short form task-specific version of this HASP is also available and will be used by field personnel at the Site. The long-form HASP will be kept in the Construction Trailer for reference.

1.2 PROJECT PERSONNEL

1.2.1 Project Manager

The project manager (PM) is the individual with overall project management responsibilities. Those responsibilities as they relate to health and safety include provision for the development of this site-specific HASP; the necessary resources to meet requirements of this HASP; the coordination of staff assignments to ensure that personnel assigned to the project meet medical and training requirements; and the means and materials necessary to resolve any health and safety issues that are identified or that developed on the project.

The PM is Ricky Ryan, from HLA's Knoxville, Tennessee, office.

1.2.2 Site Construction Supervisor

The Site Construction Supervisor (SCS) is the PM's designee who is on site and vested with the authority by the PM to carry out day-to-day site operations, including interfacing with the Site Health and Safety Officer (HSO). Steve Rose, Ronny Fields, Tim Pringle, and Louis Barrentine from HLA's Knoxville office, have been designated SCSs.

1.2.3 Health and Safety Officer

The HSO for each field activity is designated by the PM. The HSO is responsible for implementing this site-specific HASP and any activity-specific procedures in accordance with the HLA Health and Safety Program. The HSO will investigate any accidents, illnesses, and incidents occurring on-site. The HSO will also conduct safety briefings and site-specific training for on-site personnel as well as perform the required monitoring. The HSO, in consultation with the PM, Regional Safety and Health Officer (RSHO), and SCS is responsible for updating and modifying this HASP as site or environmental conditions change. The HSO's authority and responsibility is outlined in Appendix A.

1.2.4 Other HLA Personnel

Depending on the specific activity being conducted (e.g., monitoring and recovery well installation, soil excavation, remedial system installation, sewer cleaning, or regulatory agency tour), different HLA personnel may visit or work at the Former Taylor Instruments Facility on a one-time, occasional or frequent basis. Regardless of the activity, all HLA personnel entering the site are subject to the provisions of this HASP.

When a particular site activity required or may potentially require greater than Level D protection, and for any activity involving sample collection, the "Medical Data Sheet" forms found in Appendix B of this HASP must be completed. Site visits, tours or other activities by HLA personnel for which only Level D protection is required does not require the completion of this form. Prior to each visit, however, the PM or HSO will brief these persons on the HASP components as they may apply to the specific activity as described in Section 3.

1.2.5 HLA Subcontractor Personnel

HLA subcontractors are generally required under their contract terms to devise a health and safety program for their employees who will enter or work at the site. This program, at a minimum, must comply with local, state, and federal requirements (particularly 29 CFR 1910.120) and utilize measures, which are at least as protective as those in HLA's HASP.

Unless specified in the subcontract agreement, HLA is not responsible for monitoring a subcontractor's compliance with the subcontractor's or HLA's HASP or local, state, or federal requirements. HLA does, however, have the contractual right to control subcontractors whom they believe may not be in compliance, through such measures as denying site access, issuing stop work orders, etc. Such measures will be applied at the discretion of the SCS, HSO, PM, and other responsible HLA personnel.

1.2.6 Other Site Visitors

Visitors to the Former Taylor Instruments Facility other than HLA personnel and subcontractors may include:

- Representatives of Combustion Engineering (HLA's client and the site owner).
- Combustion Engineering Legal Representatives (e.g., Nixon-Peabody LLP [environmental attorneys]).
- Potential vendors invited to job walks, etc.
- Regulatory agency, City and State government, and local utility personnel.
- Other unspecified project stakeholders.

Although HLA is not solely responsible for the health and safety of visitors, as agents of Combustion Engineering and professionals knowledgeable of site conditions HLA personnel have a responsibility to provide for the health and safety of visitors. As described in Section 3.0, a set of procedures has been devised in order to provide information and guidance to site visitors.

1.3 TRAINING

Training is defined under the HLA Health and Safety Program, and all HLA personnel entering potentially contaminated areas of this site must meet the requirements of 29 CFR 1910.120. Personnel without the required training will not be permitted in any area with potential for exposure to toxic substances or harmful physical agents (i.e., downrange).

1.4 MEDICAL SURVEILLANCE

All HLA personnel entering potentially contaminated areas of this site will be medically qualified for site assignment through a medical surveillance program outlined in the HLA Health and Safety Program. Personnel who have not received medical clearance will not be permitted in any area with potential for exposure to toxic substances or harmful physical agents (i.e., downrange).

2.0 SITE CHARACTERIZATION AND ANALYSIS

2.1 SITE NAME, LOCATION, AND SIZE

The Former Taylor Instruments Facility, the subject of the remedial action, is located at 95 Ames Street in Rochester, New York (Figure 2-1). The Site is currently undeveloped property covered with asphalt on approximately 14 acres of land (Figure 2-2).

2.2 SITE HISTORY AND LAYOUT

The Former Taylor Instruments Facility was part of the Rochester operations of ABB Kent-Taylor. Taylor Brothers Company (a predecessor purchased the property to ABB KENT-TAYLOR) in 1904; the company occupied the site in 1905 or 1906. Industrial operations at the site, conducted by ABB Kent-Taylor or its predecessor companies, have included the manufacture of thermometers, barometers, compasses, altimeters, process automation equipment, and other related products. The property is currently held under the Combustion Engineering name, with site closure activities being coordinated by the ABB, Inc., Real Estate Director in Stamford, Connecticut. As of April 1994, utilities throughout most of the site have been shut off.

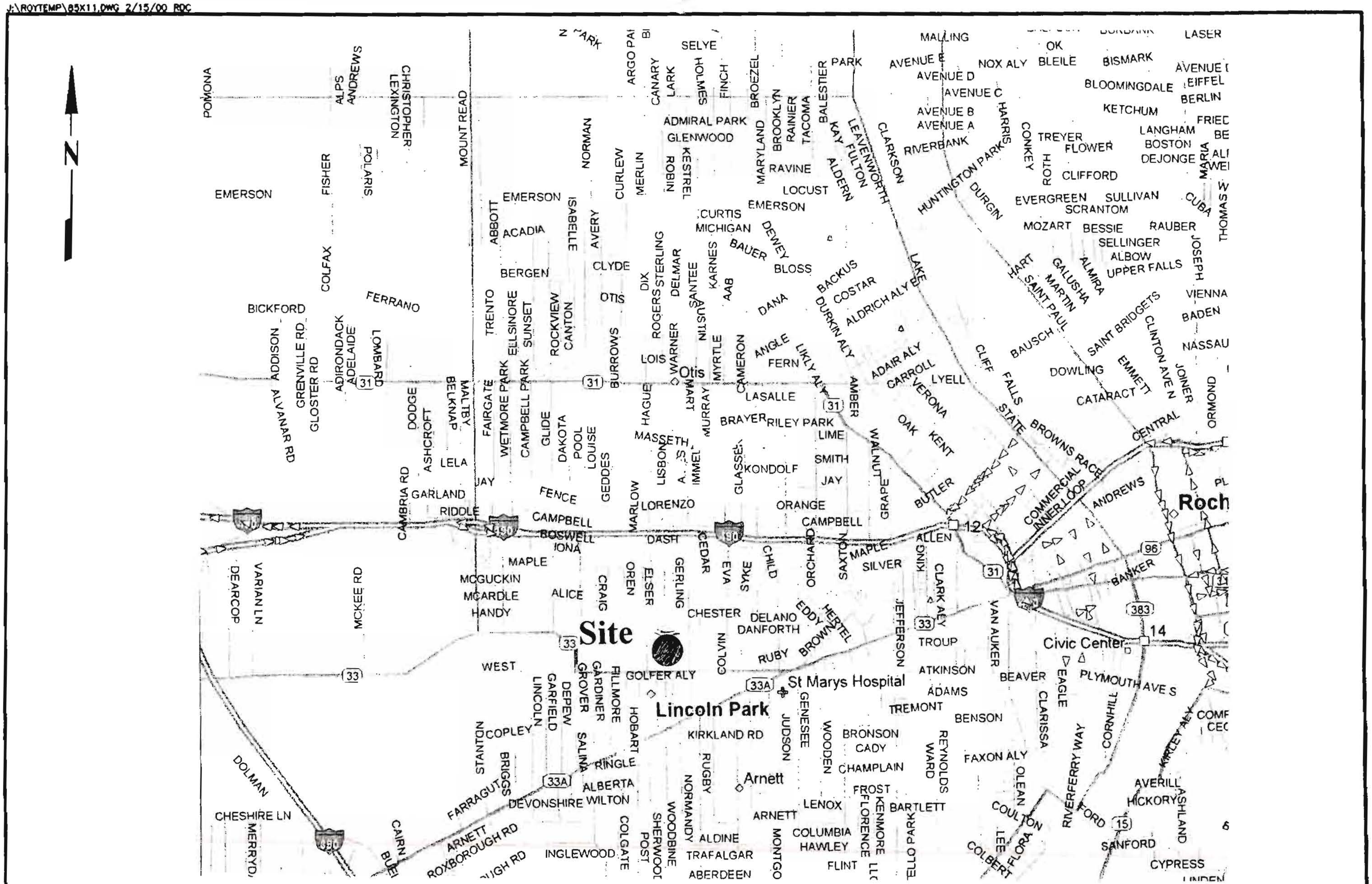
2.3 REMEDIAL WORK PLAN SCOPE OF WORK

HLA will be performing a number of tasks at the site in accordance with the Remedial Work Plan (RWP) (HLA, 2000). Some of these tasks are expected to last several years. For the most part, HLA's activates will fall into one of the following categories:

CATEGORY	ACTIVITIES
A	Excavation, staging, and loading of mercury and trichloroethene (TCE) contaminated soil, installation of recovery and monitoring wells, and remedial system installation, groundwater monitoring, and remedial system operation and maintenance. These activities may result in personnel being exposed to soil contaminated with mercury and/or lead and groundwater contaminated with TCE.
B	Attending and/or leading site tours and meetings involving the client, client subcontractors, regulatory agencies, government officials, community members, etc.

The Task Analysis section of this HASP (Section 3.0) analyzes each of the above Task Categories, which provides general information regarding potential health and safety hazards and protective measures. Because of the wide variety of activities likely to occur at this site, analysis of specific tasks within each class is not provided. Instead, the SCS/HSO for each field activity will undertake a specific task analysis, prior to fieldwork using the following process:

J:\ROYTEMP\85X11.DWG 2/15/00 RDC



Harding Lawson Associates
Engineering and Environmental Services

HLA

SITE LOCATION
TAYLOR INSTRUMENTS SITE
ROCHESTER, NEW YORK

FIGURE
2-1

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
RE	48454		2/15/00	00/00/00

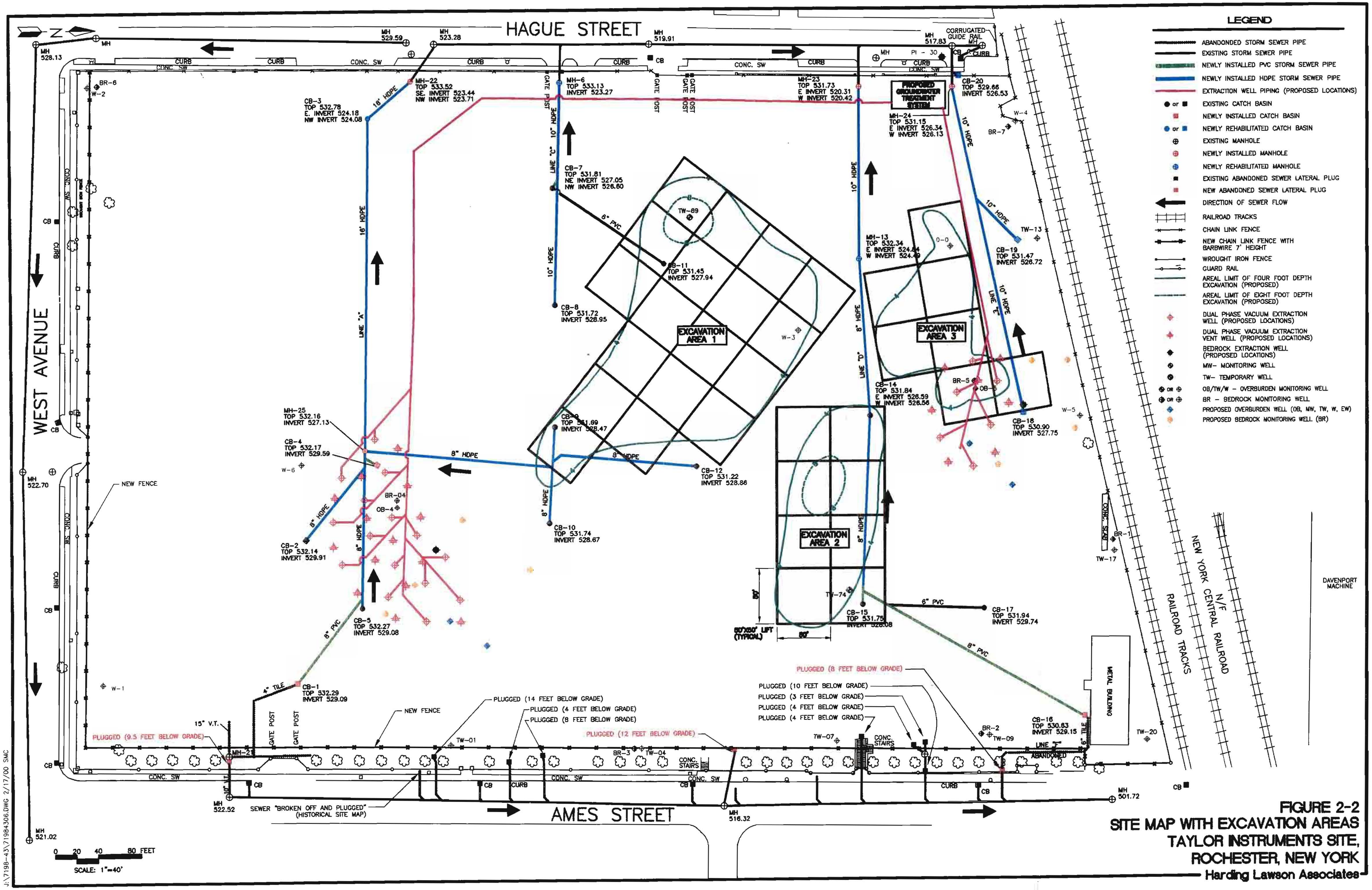


FIGURE 2-2
SITE MAP WITH EXCAVATION AREAS
TAYLOR INSTRUMENTS SITE,
ROCHESTER, NEW YORK
Harding Lawson Associates

J:\7198-43\71984306.DWG 2/17/00 SMC

1. Review this entire HASP.
2. Using the forms on the following pages, analyze all contemplated field activities likely for the particular task. The general information in Section 3.0 of this HASP will in many cases provide sufficient information to complete the analysis and select protective measures. The task analysis is to be approved by the PM and HSO.
3. Provide the HASP and completed task analysis forms to the field team for review and signature.
4. Submit a copy of the approved task analysis to the PM. It will be added to the site HASP "library", where it can be readily referred to for future task analyses.

The Task Analysis Form (TAF) is contained in Appendix C and the Health and Safety Short Form (HSSF) is contained in Appendix D. All workers involved in Category A activities will be given copies of the completed TAF and HSSF.

3.0 TASK ANALYSIS

The following sections provide a general analysis of each task category.

It is important to remember that every individual task analysis should also consider the impact of other tasks or operations being simultaneously conducted. Particularly with respect to Category A, which are generally conducted at Level D protection, the presence of other operations on the site may restrict both work in or even access to particular areas.

3.1 CATEGORY A

This category clearly has the highest risk potential of the two categories. All contemplated tasks within this category must be carefully analyzed and planned for.

3.1.1 Hazardous Substances

Field construction and monitoring activities all have a potential for site personnel to be exposed to low concentrations of organic and inorganic compounds.

Table 3-1 identifies the compounds that are known to be present on site, along with the established exposure limits for those substances.

Table 3-1 Chemicals of Concern

Former Taylor Instruments Facility
Rochester, New York

Compound	Exposure PEL/TWA or TLV/TWA	Limits STEL/CEIL
Mercury	0.05 mg/m^3 [skin]	---
Lead	0.05 ppm	
Trichloroethylene	50 ppm	200 ppm
Perchloroethylene	25 ppm	---
1,1,1 - Trichloroethane	350 ppm	450 ppm
Volatile Organic Compounds	5 ppm	---

Note: Material safety data sheets are contained in Appendix E.

PEL/TWA = Permissible Exposure Limit - Time Weighted Average
TLV/TWA = Threshold Limit Value - Time Weighted Average
STEL = Short-term Exposure Limit - The 15-minute time - weighted average which should not be exceeded at any time during the working day.
CEIL = The concentration that should not be exceeded during any part of the working exposure.
ppm = parts per million
[skin] = The potential significant contribution to the overall exposure by the cutaneous route, by direct skin contact with the substance.
mg/m^3 = milligrams per cubic meter

3.1.2 Site Risks

Health Hazards

Mercury vapors: Contractor operations, which involve removal of mercury, lead, or TCE contaminated soil, clearly pose potential risks to oversight personnel from vapors and dust. Risk will probably be dependant primarily on proximity to the work area, and whether significant dust is produced. Mercury vapor levels both in ambient air, and during environmental sampling, have been relatively low. Remediation or removal operations in mercury-contaminated areas must be considered to potentially produce vapor concentrations. Continuous air monitoring during these activities will ensure the appropriate level of personal protective equipment (PPE) required.

Solvents and hydrocarbons: Similar to mercury, disturbing these areas during remediation/removal may produce vapor levels requiring respiratory protection, and are also likely to produce dust. Continuous air monitoring during these activities will ensure the appropriate level of PPE required.

Safety Hazards

Category A activities pose potentially significant safety hazards due to the heavy equipment typically utilized, and the expected nature of the activity (e.g., excavation). Vehicle/equipment traffic, falling objects, "slip, trip and fall", loud/sustained noise, high-intensity light (e.g., metal cutting) and other hazards associated with heavy construction activity can be expected. Heat stress is likely to be a problem and will be monitored accordingly during the summer. Appendix F contains specific information related to heat stress. Soil excavation will be conducted that requires a worker to take samples from within the excavation. Currently, the plan is for the excavation to be no more than 4 feet deep. If soil excavation activities result in a depth of greater than 4 feet, sufficient ladders will be provided so that workers entering the excavation have a travel distance of nor more than 25 feet to each the nearest ladder. If the excavation is greater than 5 feet, the sides of the excavation will be sloped or shored (see Appendix G, Excavation, and 29 CFR 1926 Subpart P).

Conclusion/Risk Assessment

In general, the overall health and safety risks for Category A activities will be moderate. Although contaminant disturbance and construction-related safety hazards may be present, HLA personnel in an oversight/observation role will often be able to reduce the level of hazard without significant effect on their job performance (e.g., by simply moving away).

3.1.3 Protective Measures

Protective measures will be undertaken to minimize the potential health and safety risks for field personnel engaged in Category A activities.

Engineering Controls

Fans or blowers may be useful for vapor control in some instances. Use of water to control dust will be carefully evaluated, due to the potential need to containerize runoff. The simplest method of controlling hazard exposure to HLA personnel is to simply design and conduct activities in order to minimize it. For some operations, it may not be necessary for HLA to be in the active work area or exclusion zone in order to provide adequate general oversight.

Levels of Protection

The following paragraphs describe the anticipated levels of protection utilized for various Category A activities, for each type of known contaminant.

Mercury: To prevent dermal exposure inside the exclusion zone during excavation and where significant concentrations are known to exist, these areas should not be entered unless, at a minimum, boot covers, polycoated Tyvek, and nitrile gloves are worn. A minimum modified Level D, protection. Dust and vapor monitoring will be performed to ensure worker protection.

Solvents: For soil/groundwater sampling, modified Level D protection will likely be necessary.

The anticipated levels of personal protection for Category A activities are as follows:

Activity	**Typical Level Of Protection**
Excavation Wall Sampling	Level D
Drilling Activities	Level D/Modified Level D
Well Sampling	Modified Level D
Remedial System Installation	Level D/Modified Level D

Level D personal protective equipment will consist of Latex boot covers, hardhat, and polycoated Tyvek coveralls. Uncoated Tyveks may be used in contaminated areas where solvents and mercury contamination are not present (e.g., lead contamination only). Levels of protection may be changed at the discretion of the HSO, as warranted by a change in site conditions.

If Level C becomes necessary, cartridge respirators with organic vapor cartridges (e.g., MAS GMC with a N100 prefilter - or equivalent) will be used for high tetrachloroethene (PCE) and TCE levels. High mercury vapor concentrations will require the use of cartridges capable of filtering mercury vapors (e.g., MSA Mersorb). If high concentrations of both organic and mercury vapors are present, Level B PPE will be required (e.g., self-contained breathing apparatus [SCBA]). Refer to Appendix D for details of protection. Task activities may require upgrade per assigned action levels in Section 3.1.4.

3.1.4 Monitoring

Monitoring of the work environment will be undertaken to ensure that Immediately Dangerous to Life or Health (IDLH) or other dangerous conditions are identified. At a minimum, this monitoring will include evaluations for combustible atmospheres and hazardous concentrations of airborne contaminants.

Air Sampling

To the extent feasible, the presence of airborne contaminants will be evaluated through the use of direct reading instrumentation. Information gathered will be used to ensure the adequacy of the levels of protection being used and may be used as the basis for upgrading or downgrading the levels of protection in conformance with action levels provided in this HASP and at the direction of the task HSO.

In general, due to the prevalence of mercury at the Former Taylor Instruments Facility, the Jerome analyzer should be used to monitor for mercury vapors during the excavation activities at any location at the Former Taylor Instruments Facility. Subsequent use of the analyzer can depend on the initial readings, visual observations, and the specific area being investigated.

Depending on the task, the following sampling equipment will be used.

1. Jerome Mercury Vapor Analyzer
2. Photoionization Detector (PID)
3. Respirable Dust Meter

For solvents/hydrocarbons: Monitor continuously with the PID and upgrade accordingly.

For Dust: Monitor continuously with the Dust Meter and upgrade accordingly.

For mercury vapors: Monitor continuously with the Jerome Mercury Vapor Analyzer (MVA) and upgrade accordingly.

The manual describing the air monitoring instrument calibration and general maintenance is to be kept in the HLA site trailer and is the responsibility of the HSO. Information on air respiratory personal protective equipment is contained in Appendix H. A description of the air monitoring instruments is contained in Appendix I.

The action levels for upgrade are as follows:

Level D/Modified Level D acceptable if:

- PID reads <5 parts per million (ppm);
- MVA reads <0.0125 milligrams per cubic meter (mg/m^3); and
- Dust Meter reads <0.75 mg/m^3.

Level C required if:

- PID reads between 5 ppm and 12 ppm;
- MVA reads between 0.0125 mg/m^3 and 0.125 mg/m^3; and/or
- Dust Meter reads ≥ 0.75 mg/m^3.

Level B required if:

- PID reads >5 ppm and MVA >0.0125 ppm; and/or
- PID reads >125 ppm; or
- MVA >0.125 mg/m^3; and/or
- Dust Meter reads ≥ 7.5 mg/m^3.

Personal Monitoring

Urine monitoring for mercury should be considered for Category A activities, which involve sampling or working in suspect or known mercury-containing areas for extended periods. The need for this type of personal monitoring should be discussed with the RHSO on a task-by-task basis.

3.2 CATEGORY B - VISITOR TOURS AND MEETINGS

The health and safety risk potential for HLA personnel engaged in Category B activities is low and is largely based on the presence of concurrent site operations which visitors may want to observe. Nevertheless, Category B activities require a significant focus on health and safety for another reason: based on HLA's position as responsible for all site operations and most knowledgeable of site conditions, HLA personnel have a duty to inform visitors of site hazards and assist in avoiding them.

Procedures designed to ensure visitors are duly informed of potential hazards are presented following the Category B hazard analysis. HLA personnel must be careful, however, to evaluate the activity visitors are to engage in. For purposes of this HASP, Category B is intended to cover walking tours for general observation, potential subcontractor job walks, and other activities which do not involve observation, inspection or other direct involvement with site operations.

3.2.1 Site Risks

Health Hazards

Dust: Upwind areas outside the exclusion zone may be visited during site tours. These areas present a minimal dermal exposure hazard, primarily to hands and feet.

Safety Hazards

Category B activities will pose few safety hazards to HLA personnel not already covered in previous sections. Again, "slip, trip and fall" hazards are of greatest concern. Because visits will generally be planned to avoid active site operations, these operations should pose little hazard.

Conclusion/Risk Assessment

In general, the overall health and safety risks to HLA personnel for Category B activities will be low.

Protective Measures

Protective measures will be undertaken to minimize the potential health and safety risks for field personnel engaged in Category B activities.

Engineering Controls

Engineering controls will rarely be necessary.

Levels of Protection

The typical level of personal protection for Category B is modified Level D. Modified Level D will consist of work boots and a hard hat. Category B activities include walking tours, meetings, and other activities in which areas containing hazardous materials are not entered.

3.2.2 Monitoring

Monitoring of the work environment is not necessary, based on the site knowledge developed to date and the nature of Category B activities. Because Category B activities are frequently of very short duration, personal monitoring is not necessary.

3.3 COMMUNITY HEALTH AND SAFETY PLAN

Real-time continuous air monitoring, for volatile compounds and particulate levels at the perimeter of the work area is to be performed. The plan must include the following:

- Volatile organic compounds must be monitored at the downwind perimeter of the property on a continuous basis. If total organic vapor levels exceed 5 ppm and or mercury vapors exceed 0.0125 ppm above background, work activities must be halted and monitoring continuously under the provisions of a Vapor Emission Response Plan. All readings must be recorded and be available for New York State Department of Environmental Conservation (NYSDEC), New York State Department of Health (NYSDOH), and Monroe County Department of Health (MCDOH) personnel to review.
- Particulates should be continuously monitored upwind, downwind, and within the work area at temporary particulate monitoring stations. If the upwind particulate concentration is greater than the 1.5 mg/m^3 level, then dust suppression techniques must be employed. All readings must be recorded and be available for NYSDEC, NYSDOH, and MCDOH personnel to review.

3.3.1 Vapor Emission Response Plan

If the ambient air concentration of organic vapors exceeds 5 ppm or mercury exceeds 0.0125 ppm above background at the perimeter of the exclusion zone, activities will be halted and monitoring continued as outlined above. If the organic vapor level decreases below 5 ppm or mercury decreases below 0.0125 ppm above background, work activities can resume. If the organic vapor levels are greater than 5 ppm over background but less than 25 ppm over background at the perimeter of the work area, activities can resume with the appropriate PPE provided. The organic vapor level 200 feet downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background.

If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown. When work shutdown occurs, downwind air monitoring as directed by the HSO will be implemented to ensure that vapor emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Section 3.4.

3.4 MAJOR VAPOR EMISSION

If any organic levels greater than 5 ppm or mercury exceeds 0.0125 ppm over background are identified 200 feet downwind from the work area or half the distance to the nearest residential or commercial property, whichever is less, all work activities must be halted.

If, following the cessation of the work activities, or as the result of an emergency, organic levels persist above 5 ppm background or mercury exceeds 0.0125 ppm 200 feet downwind or half the distance to the nearest residential or commercial property from the work area, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 Foot Zone).

If efforts to abate the emission source are unsuccessful and if the following levels persist for more than 30 minutes in the 20 Foot Zone, then the Major Vapor Emission Response Plan shall automatically be placed into effect if organic vapor levels are approaching 5 ppm above background or mercury exceeds 0.0125 ppm.

However, the Major Vapor Emission Response Plan shall be immediately placed into effect if organic vapor levels are greater than 10 ppm above background at the site perimeter.

3.5 MAJOR VAPOR EMISSION RESPONSE PLAN

Upon activation, the following activities will be undertaken:

1. All Emergency Response Contacts in Appendix D will go into effect.
2. The local police authorities will immediately be contacted by the HSO and advised of the situation.
3. Frequent air monitoring will be conducted at 30 minutes intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the HSO.

3.6 SPECIAL PROCEDURES FOR SITE VISITORS

This section describes administrative procedures established for site visitors which Combustion Engineering, HLA and their subcontractors should implement.

3.6.1 Visitor Entry Forms

The following pages contain forms on which visitor-related procedures are based. HLA personnel should utilize these forms as follows.

"Safety Information and Procedures for Visitors to the Former Taylor Instruments Facility"

This form is intended to provide visitors with basic information about potential health and safety hazards at the site, and provide rules/procedures that visitors are to follow.

It is preferable that visitors review this form prior to arrival at the site. HLA personnel inviting or scheduling visitors (e.g., potential vendors or subcontractors) should ensure the two-page form is sent/Faxed to them in advance.

Because HLA personnel will often lead site tours or walkthroughs of specific areas, it is important that the Safety Procedures are known and understood. Of particular importance are rules regarding safety equipment (hard hat and sturdy shoes) and the need for escort at all times.

"Visitor Log and Signature Form"

This form serves as a permanent record that visitors were informed of potential hazards, and should be completed and signed by anyone entering the site who is not an HLA or Combustion Engineering employee or subcontractor. Visitors to the site must fill out a Visitor Log and Signature Form (Appendix J).

3.6.2 Visitor Entry Procedures

Specific procedures for bringing visitors to the site are described below. Compliance with procedures can be verified through use of the "Site Visitor Checklist".

1. Notify visitors in advance of the requirements for site entry, i.e., personal protective gear, attending the safety briefing, traveling with an escort. Send or Fax the "Safety Information..." form (2 pages) prior to their visit.

   As representative of the site owner, HLA may deny entry to persons who are unauthorized, uninvited, or who cannot or refuse to follow safety procedures. If there are any questions whether to allow entry, the PM, SCS, or HSO should be contacted.

2. Upon arrival, confirm visitors have reviewed the "Safety Information..." and have brought their own personal protective gear.

3. Deliver a safety briefing to the visitor(s):

   a) *Briefly review the "Safety Information..." sheet*, with particular emphasis on the Safety Procedures.

   b) *Describe health and safety hazards specific to the area(s) which will be visited.* Using the site plan, show the exclusion zone areas that will be avoided, noting any physical hazards (dim lighting, water, etc.) Describe hazardous materials which may be present.

   c) *Review the material safety data sheets (MSDSs) for chemicals of concern (the MSDS for mercury should ALWAYS be reviewed.)* Point out the health hazards and appropriate protective measures.

   d) *Describe current site operations, locations and potential hazards.* Emphasize that visitors must not interfere in any way with these operations.

   e) *Review any additional protective measures which will be used.* If measures or equipment (e.g., booties, gloves) beyond the standard hard hat/safety shoes/flashlight are needed to access certain areas, describe their use Include how to don, how to remove, where to dispose of.

5. Have all visitors complete and sign the "Visitor Log and Signature Form".

6. Escort visitors at all times. [NOTE: Under certain conditions, visitors can be allowed into the site without an escort. Unescorted visitors must be approved by the PM, SCS, or HSO.]

4.0 SITE CONTROL

4.1 ZONATION

Exclusion Zone: area within a 15-foot radius of each drilling/sampling/excavation location during digging, drilling or sampling (when a borehole or well is open).

Contaminant Reduction Zone: area beyond the 15-foot exclusion zone at each drilling/sampling/excavation location where equipment and personnel decontamination will occur, not to occur beyond 50-feet in any area from the drilling/sampling/excavation locations.

Support Zone: all areas beyond the contaminant reduction zone.

4.2 COMMUNICATIONS

When radio communication is not used, the following air horn signals will be employed:

Help	**Evacuation**	**All Clear**
Three Short Blasts (. . .)	Three Long Blasts (_ _ _)	Alternating Long and Short Blasts (_ . _ .)

4.3 WORK PRACTICES

All HLA personnel, subcontractors, or third party representatives should be aware of the previously detected presence of mercury. These personnel should also be aware of the potential for the contaminants to exist in airborne form.

5.0 DECONTAMINATION/DISPOSAL

All personnel and/or equipment leaving contaminated areas of the site will be subject to decontamination, which will take place in the contamination reduction zone. Based on HLA's extensive site experience, it is anticipated that levels of PPE will be either Level D or C. In the event Level B is required, HLA anticipates stopping work until concentrations decrease to restart work at Level C or D.

5.1 PERSONNEL DECONTAMINATION

Decontamination procedures are followed by all personnel leaving hazardous waste sites. Under no circumstances (except emergency evacuation) will personnel be allowed to leave the exclusion and contaminant reduction zones prior to decontamination. A typical personnel decontamination procedure is listed in Appendix K. Generalized procedures for removal of protective clothing are as follows:

1. Drop tools, monitors, samples, and trash at designated drop stations (i.e., plastic containers or drop sheets).
2. Step into the designated shuffle pit area and scuff feet to remove gross amounts of dirt from outer boots.
3. Scrub outer boots and outer gloves with decon solution or detergent and water. Rinse with water.
4. Remove tape from outer boots and remove boots; discard tape and boots in disposal container.
5. Remove tape from outer gloves and remove gloves; discard tape and gloves in disposal container.
6. If the worker has left the Exclusion Zone to change the air tank on the SCBA or the canister on the air-purifying respirator, this will be the last step in the decontamination procedure. The tank or cartridge should be exchanged, new outer gloves and boot covers donned, and the joints taped; the worker then returns to duty.
7. Remove outer garments and discard in disposal container.
8. Remove respirator and place or hang in the designated area.
9. Remove inner gloves and discard in disposal container.

NOTE: Disposable items (i.e., Tyvek coveralls, inner gloves, and latex overboots) will be changed daily unless there is reason to change sooner. Dual respirator canisters will be changed daily, unless more frequent changes are deemed appropriate by site surveillance data or personnel assessment.

Maximum and minimum decontamination procedures for PPE Levels B through D are listed in Appendix K.

Pressurized sprayers or other designated equipment will be available at the decontamination pad for washdown and cleaning of and equipment.

Respirators will be decontaminated daily and taken from the drop area. The masks will be disassembled, the cartridges set aside, and all other parts placed in a cleansing solution. Parts will be pre-coded (e.g., #1 on all parts of Mask #1). After an appropriate time in the solution, the parts will be removed and rinsed with tap water. Old cartridges will be discarded in the contaminated trash container for disposal. In the morning, the masks will be reassembled and new cartridges installed. Personnel will inspect their own masks and readjust the straps for proper fit.

5.2 SMALL EQUIPMENT DECONTAMINATION

Small equipment will be protected from contamination as much as possible by draping, masking, or otherwise covering the instruments with plastic (to the extent feasible), without hindering operation of the unit.

The contaminated equipment will be taken from the drop area and the protective coverings will be removed and disposed of in appropriate containers. Any dirt or obvious contamination will be brushed or wiped with a disposable paper wipe. The units can then be taken inside in a clean plastic tub, wiped off with damp disposable wipes, and dried. The units will be checked, standardized, and recharged as necessary for the next day's operation, and then prepared with new protective coverings.

5.3 HEAVY EQUIPMENT DECONTAMINATION

It is anticipated that drilling rigs and backhoes will become contaminated during borehole and excavation activities. They will be cleaned with water at the Decontamination Pad. Loose material will be removed. The person performing this activity will usually be at least at the level of protection used during the personnel and monitoring equipment decontamination.

5.4 DISPOSAL OF DECONTAMINATED MATERIALS

All protective gear, decontamination fluids (for both personnel and equipment), and other disposable materials will be disposed of at each site.

Decontamination fluids identified to be contaminated by site contaminants (i.e., Liqui-nox, used to decontaminate sampling equipment such as split spoons and groundwater sampling pumps) will be stored in Department of Transportation- (DOT)-approved 55-gallon drums or rolloff boxes. Contaminated disposable materials (e.g., gloves and Tyveks) will be double-bagged and stored as is, or placed in DOT-approved 55-gallon drums.

6.0 EMERGENCY/CONTINGENCY PLAN

This section identifies emergency contingency plan that has been developed for operations at this site. Other sections provide further information to be used under emergency conditions. Refer to Appendix D for emergency telephone numbers, routes to emergency medical facilities, and emergency signals.

6.1 PERSONNEL ROLES, LINES OF AUTHORITY, AND COMMUNICATION

The site HSO is the primary authority for directing operations under emergency conditions. All communications both on- and off-site will be directed through the HSO. Should the HSO be injured, the Health and Safety Designee (HSD) will assume HSO responsibilities. These responsibilities include:

- Investigate all accidents, illnesses, and incidents occurring on an assigned site and report the findings to the RHSO or the HSO.
- Assume the role of on-site coordinator during emergency response activities.
- Accompany all Occupational Safety and Health Administration (OSHA) and other government agency, and client personnel visiting an assigned site in response to health and safety issues.
- The HSO or HSD will immediately notify the RSHO after a stop work order is executed. Authorization to resume work, after such a stoppage, will only be issued by the HSO after consultation and approval from the RSHO

6.2 EVACUATION

6.2.1 Withdrawal Upwind

The work party will continually note general wind directions while on-site. If conditions warrant moving away from the work site, the crew will relocate upwind a distance of approximately 100 feet or farther, as indicated by site monitoring instruments. Donning an SCBA and a safety harness and line, the HSO and a member of the crew (the buddy system must be used) may return to the work site to determine if the condition noted was transient or persistent. If persistent, an alarm should be raised to notify on-site personnel of the situation and the need to leave the site. An attempt to decrease emissions should be made only if greater respiratory protection is donned. The HSO and client will be notified of conditions. When site access is restricted, thus hindering escape, the crew may be instructed to evacuate the site rather than move upwind, especially if withdrawal upwind moves the crew away from escape routes.

6.2.2 Site Evacuation

When conditions warrant site evacuation, the work party will proceed upwind of the work site and notify the HSO and field office of site conditions. If the decontamination area is upwind and greater than 500 feet from the work site, the crew will pass quickly through decontamination to remove contaminated outer suits. If the hazard is toxic gas, respirators will be retained. The crew will proceed to the field office to assess the situation. If instrumentation indicates an acceptable condition, respirators may be removed. As more information is received from the field crew, it will be relayed to the appropriate agencies. The advisability and type of further response action will be coordinated and carried out by the HSO.

6.2.3 Evacuation of Surrounding Area

If the HSO determines that conditions warrant evacuation of downwind residences and commercial operations, local agencies will be notified and assistance requested. Designated on-site personnel will initiate evacuation of the immediate off-site area without delay.

6.3 EMERGENCY MEDICAL TREATMENT/FIRST AID

Any personnel injured on-site will be rendered first aid as appropriate and transported to competent medical facilities for further examination and/or treatment. The preferred method of transport would be through professional emergency transportation means; however, when this is not readily available or would result in excessive delay, other transport will be authorized. Under no circumstances will injured persons transport themselves to a medical facility for emergency treatment.

7.0 ADMINISTRATION

7.1 PERSONNEL AUTHORIZED DOWNRANGE

Personnel authorized to participate in downrange activities at this site have been reviewed and certified for site operations by the PM/SCS and the HSO. Certification involves the completion of appropriate training, a medical examination, and a review of this site-specific HASP. All persons entering the site must use the buddy system, and check in with the Field Team Leader and/or HSO before going downrange.

For each field activity, the HSO will complete the "Authorized Personnel" section of the "Task Analysis" form.

7.2 MEDICAL DATA SHEET

The Medical Data Sheet will be completed by all on-site personnel and kept in the Support Zone during site operations. It is not a substitute for the Medical Surveillance Program requirements consistent with the HLA Corporate Health and Safety Program for Hazardous Waste Sites. This data sheet will accompany any personnel when medical assistance or transport to hospital facilities is required. If more space is required, use the back of this sheet. Medical Data Sheets are contained in Appendix B.

7.3 ROUTES TO EMERGENCY MEDICAL FACILITIES

The primary source of medical assistance for the site is:

The Genesee Hospital, 224 Alexander Street, Rochester, New York (general telephone number: 716-922-6000, emergency telephone number: 716-922-6400). See Figure 7-1.

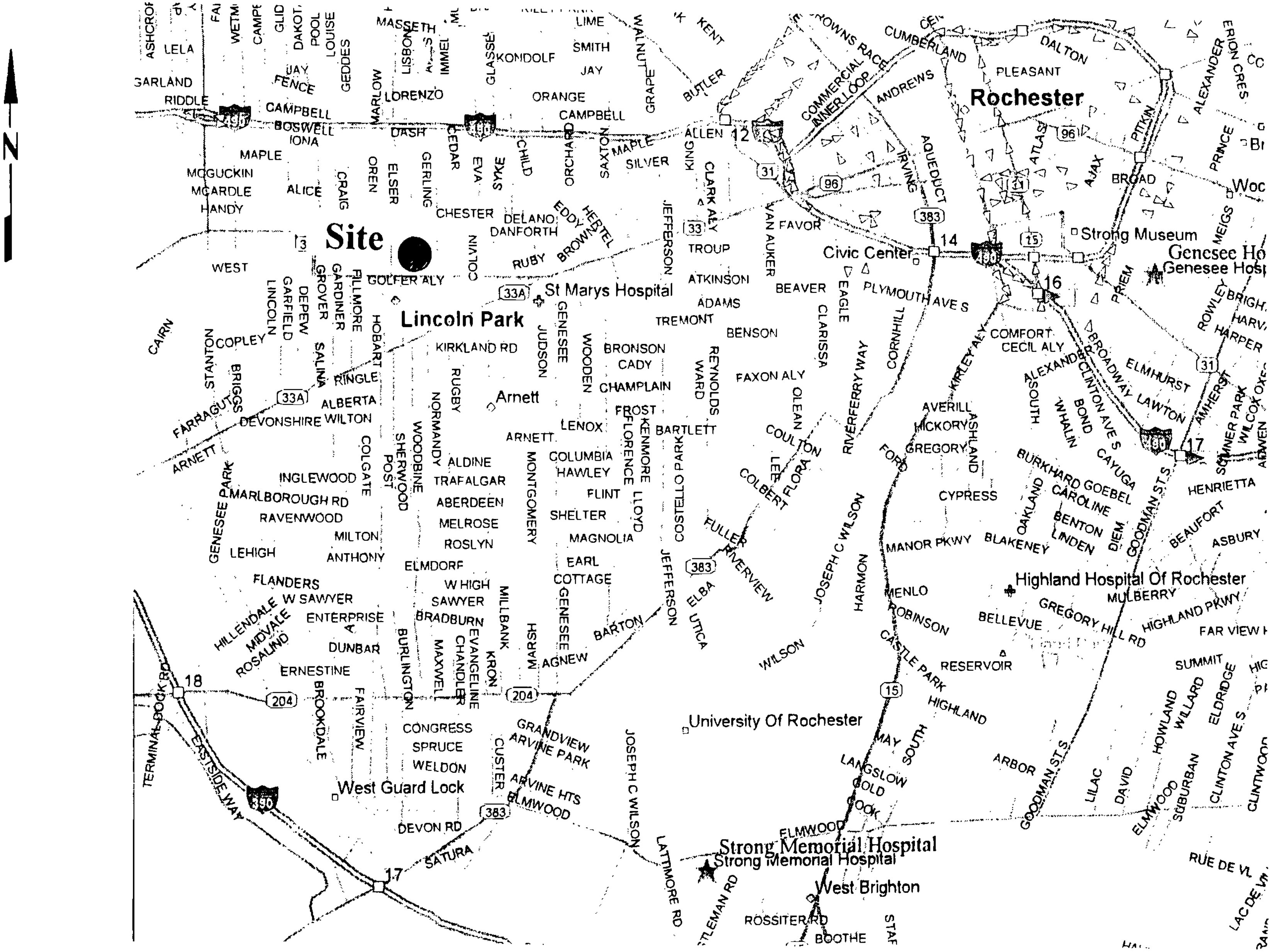
DIRECTIONS TO GENESEE:

- Start out going South on AMES ST towards DANFORTH ST by turning right.
- Turn LEFT onto STATE HIGHWAY 33 and continue East.
- Continue East on MAIN STREET WEST.
- Turn RIGHT onto STATE HIGHWAY 96 / EAST AVENUE and continue East.
- Turn RIGHT on ALEXANDER STREET and continue South.
- Continue to 224 ALEXANDER STREET.

The alternate source of medical assistance for the site is:

Strong Memorial Hospital, 601 Elmwood Avenue, Rochester, New York (general telephone number: 716-275-2100, emergency telephone number: 716-275-4551). See Figure 7-1.

J:\ROYTEMP\85X11A.DWG 2/15/00 RDC



Harding Lawson Associates
Engineering and
Environmental Services

HLA

HOSPITAL LOCATION
TAYLOR INSTRUMENTS SITE
ROCHESTER, NEW YORK

FIGURE
7-1

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
RE	48454		2/15/00	00/00/00

DIRECTIONS TO STRONG MEMORIAL:

- Start out going South on AMES ST towards DANFORTH STREET by turning RIGHT.
- Turn LEFT onto STATE HIGHWAY 33 and continue East.
- Turn RIGHT on GENESEE STREET and continue South.
- Turn LEFT onto STATE HIGHWAY 383 / BROOKS AVENUE and continue East.
- Turn RIGHT on PLYMOUTH AVE SOUTH and continue South.
- Turn LEFT on ELMWOOD AVENUE and continue East.
- Continue to 601 ELMWOOD AVENUE.

APPENDIX A

AUTHORITY AND RESPONSIBILITY OF HEALTH AND SAFETY PERSONNEL

APPENDIX A

AUTHORITY AND RESPONSIBILITY OF HEALTH AND SAFETY PERSONNEL

This section describes the health and safety designations and general responsibilities that will be employed for the project.

A.1 HEALTH AND SAFETY MANAGER

The Health and Safety Manager (HSM), Harding Lawson Associates (HLA) is Ms. Cynthia Sundquist. Ms. Sundquist can be reached by telephone at (207) 775-5401 in Portland, Maine. The HSM has final authority over health and safety issues that are not resolved at the site and has overall responsibility for ensuring that the policies and procedures of this Health and Safety Plan (HASP) are implemented by the Health and Safety Officer (HSO).

A.2 HEALTH AND SAFETY SUPERVISOR

The Health and Safety Officer (HSO) is the health and safety professional serving as the HLA's designee for this project. As such, the HSO will be responsible for (1) oversight of the daily efforts of site personnel; and (2) implementation of the HASP during site activities. The HSO will notify the PM and HSM of any Stop Work Orders issued by an HSO.

APPENDIX B

MEDICAL DATA SHEET

MEDICAL DATA SHEET

Task/Activity: ____________________

Name: ____________________

Address: ____________________

Home Telephone: Area Code ( ) ____________________

Age: __________ Height: __________ Weight: __________

In Case of Emergency contact: ____________________

Address: ____________________

Telephone: Area Code ( ) ____________________

Do you wear contact lenses: Yes ( ) No ( )

Allergies: ____________________

List medication(s) taken regularly: ____________________

Particular sensitivities: ____________________

Previous/current medical conditions or exposures to hazardous chemicals: ____________________

Name of Personal Physician: ____________________

Telephone: Area Code ( ) ____________________

APPENDIX C

TASK ANALYSIS FORM

APPENDIX C
TASK ANALYSIS
HARDING LAWSON ASSOCIATES
FORMER TAYLOR INSTRUMENTS FACILITY

NOTE: *Review Former Taylor Instruments Facility HASP before completing this form.*

GENERAL TASK INFORMATION

Task Title: ______________________________ PAN # ____________

SCS (name): ______________________ HSO (name): ______________________

Form prepared by: ______________________________ Date: ____________

HSO Approval: ______________________________ Date: ____________

SCS Approval: ______________________________ Date: ____________

Planned activity(s):

Activity/Description: ______________________________________

Activity/Description: ______________________________________

tivity/Description: ______________________________________

Activity/Description: ______________________________________

Overall Task Category (from HASP): ____________

Other concurrent site activities/tasks:

Activity/Task: ______________________ Task Category: ____________

Activity/Task: ______________________ Task Category: ____________

Activity/Task: ______________________ Task Category: ____________

Will these activities / tasks impact this task? (describe):

____

AUTHORIZED PERSONNEL:

______________________ ______________________

______________________ ______________________

______________________ ______________________

* Current First-aid Certification
Current CPR Certification

End of General Information. For each of this task's activities, complete a separate "Activity Analysis" form.

TASK ANALYSIS
HARDING LAWSON ASSOCIATES
FORMER TAYLOR INSTRUMENTS FACILITY

NOTE: *Review Former Taylor Instruments Facility HASP before completing this form.*

ACTIVITY ANALYSIS
(Page 1)

Activity: ______________________________

Known or suspected chemical/material hazards (list): ______________________________

____

Chemical/material location(s) (circle): Surface soil Subsurface soil Groundwater Building Materials

Other (list): ______________________________

Primary exposure route(s) (circle): Dermal Inhalation Ingestion Puncture

Safety hazard(s) (circle): Height Equipment Cold Stress Noise Eye Overhead

Confined Spaces Heat Stress Machinery Burns Lifting Slips/Falls

er (list): ______________________________

Overall Hazard Estimation: Serious Moderate Low Unknown None

ENGINEERING CONTROLS SELECTED (specify)

Initial Level of Personal Protection: ________

PPE:

- Cartridge Respirator
- Cartridge Type: __________
- Safety Boots/Shoes
- Chemical Resistant Boots
- Disposable Boot Covers
- Face Shield
- Safety Glasses
- Hard Hat
- Ear Protection
- Gloves
  - inner
  - outer
- Coveralls
- Tyveks
  - regulars
  - coated

Other (list): ______________________________

____

____

____

____

TASK ANALYSIS
HARDING LAWSON ASSOCIATES
FORMER TAYLOR INSTRUMENTS FACILITY

NOTE: *Review Former Taylor Instruments Facility HASP before completing this form.*

ACTIVITY ANALYSIS
(Page 2)

Monitoring Equipment (circle):

Jerome Mercury Vapor Analyzer   Draeger Tubes (specify type): ____________________

____

Other (list): ____________________

Emergency Equipment (circle):   First Aid Kit   Fire Extinguisher   Eye Wash

Other (list): ____________________

Contaminated levels for modifying protection equipment: Refer to HASP Section 3.0

Decontamination: All personnel and/or equipment leaving contaminated sites are subject to decontamination. Under no circumstances (except emergency evacuation) will personnel be allowed to leave the site prior to decontamination. The decontamination procedures to be used at the site are as follows: ____________________

____

____

____

Waste Disposal: Waste is to be placed into plastic bags and then into DOT drums located: ____________________

____

____

APPENDIX D

HEALTH AND SAFETY SHORT FORM

Harding Lawson Associates
Health and Safety Plan

Site: Former Taylor Instruments Facility Job Number: 48454/00001 Contact: Rick Ryan, P.E.
Street Address: 95 Ames Street, Rochester, New York
Proposed Date(s) of Investigation: May 2000 - October 2000
Prepared by: Sylvia Cresswell Date: 12/20/99
*Approved by:__________ Date:__________
Proposed Activity(s): Soil and groundwater remediation includes drilling, excavating, sampling, field monitoring and construction oversight.
Known or Suspected Chemicals (include PELs): Mercury (0.0125 mg/m^3), TCE (50 ppm), PCE (25 ppm), Lead (0.05 mg/m3), VOCs (5 ppm)
*Approval also serves as certification of a Hazard Assessment as required by 29 CFR 1910.132

HAZARD EVALUATION (Check all that apply):

Hazard Estimation:	☐ Serious	☐ Moderate	☒ Low	☐ Unknown	☐ None
Exposure Route(s):	☒ Dermal	☒ Inhalation	☐ Ingestion	☐ Puncture	
Contaminant Location(s):	☐ Surface	☒ Underground	☒ Soil	☐ Sediment	☒ Water
	☐ Tank	☐ Other (list):			
Health Hazard(s):	☒ Liquid	☒ Solid	☐ Sludge	☐ Corrosive	☐ Ignitable
	☒ Volatile	☐ Radioactive	☐ Reactive	☐ Unknown	
Safety Hazard(s):	☐ Height	☐ Equipment	☐ Cold Stress	☒ Noise	☒ Eye
	☐ Near Water	☐ Confined Space	☒ Heat Stress	☒ Machinery	☐ Burns
	☐ Lifting	☒ Slips/Falls	☐ Other (list):		

EQUIPMENT (check all that apply):

Initial Level of Personal Protection: Level D

X = Required for initial Level of PPE, # = Required for Upgrade only

PPE Selected:	# Cartridge Respirator	☐ Coveralls	☒ Inner Gloves
	type: OV w/N100 or Mersorb	☒ Safety Glasses	type: Nitrile or Vinyl
	☐ Escape Respirator	☐ Safety Goggles	☒ Outer Gloves
	☒ Safety Boots/Shoes	☐ Face Shield	type: Nitrile
	☐ Chemical Resistant Boots	☒ Hard Hat	☒ Tyveks
	# Disposible Boot Covers	☐ Ear Protection	type: Polycoated
	type: Vinyl	☐ Other (list):	type: Uncoated
Monitoring Equipment:	☒ PID	☒ Respirable Dust Meter	☐ Dosimeter Badge
	☐ FID	☐ Draeger Tubes	☐ Radiation Alert Meter
	☐ LEL/Oxygen Meter	list:	
	☐ Hydrogen Sulfide Meter	☒ Other (list): Jerome Mercury Vapor Analyzer	
Emergency Equipment:	☒ First Aid Kit	☒ Fire Extinguisher	☒ Eye Wash
	☐ Other (list):		

CONTAMINANT LEVELS FOR MODIFICATION OF PROTECTIVE EQUIPMEN Upgrade to level C protection if PID reads ≥ 5 ppm or MVA reads ≥ 0.0125 mg/m^3 and/or Dust Monitor $\geq$ 0.75 mg/m^3. Upgrade to Level B PPE (backoff and reassess) if both PID is greater than 5 ppm and MVA > 0.0125 mg/m^3, or if PID alone is ≥ 125 ppm, or MVA alone is $\geq$ 0.125 mg/m^3 and/or if Respirable dust meter is $\geq$ 7.5 mg/m^3. Polycoated Tyveks are required when Mercury, TCE or PCE is present, otherwise uncoated Tyveks may be used.

DECONTAMINATION/DISPOSAL: All personnel and/or equipment leaving contaminated sites are subject to decontamination. Under no circumstances (except emergency evacuation) will personnel be allowed to leave the site prior to decontamination. The decontamination procedures to be used at the site are as follows: See Feb, 2000 Health and Safety Plan

EMERGENCY MEDICAL TREATMENT/FIRST AID: First aid will be rendered to any person injured on-site, as appropriate. The injured person will then be transported to a medical facility for further examination and/or treatment. An ambulance will be used to transport the injured person to the hospital unless one is not readily available or could result in excessive delay. In this case, other transport is authorized. Under no circumstances will injured persons transport themselves to a medical facility for for emergency treatment.

EMERGENCY EVACUATION: In the event of an emergency requiring evacuation, the HSO assumes the role of on-site coordinator. Evacuation responses will occur at three levels: (1) withdraw from the immediate work area (100+ feet upwind); (2) site evacuation; and (3) evacuation of surrounding area. If the residences and commercial operations require evacuation, the local agencies will be notified and assistance requested. Designated on-site personnel will initiate evacuation of the immediate off-site area without delay.

EMERGENCY TELEPHONE NUMBERS:

Local Police Department	911
Local Fire Department	911
Local Rescue Service	911
Primary Hospital: Genesee Hospital	(716) 922-6400
Secondary Hospital: Strong Memorial Hospital	(716) 275-4551
Continuum Health Care (Dr. Winters)	(800) 350-4511
Pager (leave area code and telephone number)	(800)455-0964
National Poison Control Center	(800) 492-2414
Chemical Manufacturing Association-Chemical Referral Center	(800) 262-8200
Regional Safety and Health Officer: Cindy Sundquist	(207) 775-5401 (w) (207) 892-4402 (h)

AUTHORIZED PERSONNEL:

Tim Pringle *+	Ronny Fields *+
Sylvia Creswell *+	Rick Ryan *+
Louis Barrentine *+	Kurt Sichelstiel *+
Deven Carigan *+	Paul Edmondsl *+
Rob Ellis *+	Steve Rose *+

* Current First-aid Certification

FIELD TEAM REVIEW: I have read and reviewed the health and safety information in the HASP. I understand the information and will comply with the requirements of the HASP.

Name:__________ Date:__________
Name:__________ Date:__________
Name:__________ Date:__________
Name:__________ Date:__________
Name:__________ Date:__________

8.2 HASP APPROVALS By their signatures, the undersigned certify that this HASP will be used for the protection of the health and safety of all persons entering MCLB, Albany. Signatures also serve as certification of completion of the Hazard Assessments as required by 29 CFR 1910.132.

Sylvia M. Creswell
Health and Safety Officer

2/22/00
Date

Project Manager

2/22/00
Date

Cynthia Sundquist CIH, CSP
Regional Safety and Health Officer

9/7/00
Date

ROUTES TO EMERGENCY MEDICAL FACILITIES

PRIMARY HOSPITAL:

Facility Name: The Genesee Hospital
Address: 224 Alexander Street, Rochester, NY 14607
Telephone Number: (Gen) 716-922-6000 (Emergency) 716-922-6400

DIRECTIONS TO PRIMARY HOSPITAL (see attached map):

Start out going South on AMES ST towards DANFORTH ST by turning right.
Turn LEFT onto STATE HIGHWAY 33 and continue East.
Continue East on MAIN STREET WEST
Turn RIGHT onto STATE HIGHWAY 96 / EAST AVENUE and continue East.
Turn RIGHT on ALEXANDER STREET and continue South.
Continue to 224 ALEXANDER STREET.

ALTERNATE HOSPITAL:

Facility Name: Strong Memorial Hospital
Address: 601 Elmwood Avenue, Rochester, New York 14642
Telephone Number: (Gen) 716-275-2100 (Emergency) 716-275-4551

DIRECTIONS TO ALTERNATE HOSPITAL (see attached map):

Start out going South on AMES ST towards DANFORTH STREET by turning RIGHT.
Turn LEFT onto STATE HIGHWAY 33 and continue East.
Turn RIGHT on GENESEE STREET and continue South.
Turn LEFT onto STATE HIGHWAY 383 / BROOKS AVENUE and continue East.
Turn RIGHT on PLYMOUTH AVE SOUTH and continue South.
Turn LEFT on ELMWOOD AVENUE and continue East.
Continue to 601 ELMWOOD AVENUE.

APPENDIX E

MATERIAL SAFETY DATA SHEETS

```
TR METALS -- LEAD
MATERIAL SAFETY DATA SHEET
NSN: 681000N084293
Manufacturer's CAGE: 04MC9
Part No. Indicator: A
Part Number/Trade Name: LEAD
===========================================================================
                          General Information
===========================================================================
Company's Name: TR METALS
Company's Street: 1 PAVILION AVE
Company's City: RIVERSIDE
Company's State: NJ
Company's Country: US
Company's Zip Code: 08075
Company's Emerg Ph #: 800-424-9300(CHEMTREC)
Company's Info Ph #: 609-461-9000
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 01JAN93
Safety Data Review Date: 25MAR98
MSDS Serial Number: CGSQQ
===========================================================================
                    Ingredients/Identity Information
===========================================================================
Proprietary: NO
Ingredient: LEAD (SARA 313) (CERCLA)
Ingredient Sequence Number: 01
Percent: 99.99
NIOSH (RTECS) Number: OF7525000
CAS Number: 7439-92-1
OSHA PEL: N/K (FP N)
ACGIH TLV: 0.15 MG/M3 DUST
-------------------------------------
Proprietary: NO
Ingredient: SUPDAT: NERVOUS SYS DAMAGE RESULTING IN SEVERE HDCHS,
CONVULSIONS, COMA, DELIRIUM & DEATH. ALCOHOL & PHYSICAL (ING 3)
Ingredient Sequence Number: 02
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE
-------------------------------------
Proprietary: NO
Ingredient: ING 2: EXERTION CAN BRING ON SYMPTOMS. OTHER EFFECTS OF LONG
TERM EXPOSURE CAN RESULT IN DECREASED FERTILITY, (ING 4)
Ingredient Sequence Number: 03
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE
-------------------------------------
Proprietary: NO
Ingredient: ING 3: MISCARRIAGE & BIRTH DEFECTS.
Ingredient Sequence Number: 04
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE
-------------------------------------
Proprietary: NO
Ingredient: HYGIENE PRACTS: HYGIENE IE, WASH HANDS & FACE BEFORE EATING,
DRINKING, PUTTING ON MAKE-UP OR SMOKING. SHOWERING (ING 6)
Ingredient Sequence Number: 05
NIOSH (RTECS) Number: 9999999ZZ
```

OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: ING 5: IS REQUIRED BEFORE PUTTING ON STREET CLOTHES.
Ingredient Sequence Number: 06
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Physical/Chemical Characteristics

Appearance And Odor: HEAVY, DUCTILE, SOFT, BLUISH-GRAY METAL.
Boiling Point: 3164F,1740C
Melting Point: 621F,327C
Vapor Pressure (MM Hg/70 F): 1 @ 973C
Vapor Density (Air=1): N/A
Specific Gravity: 11.34 (H*2O=1)
Evaporation Rate And Ref: N/A
Solubility In Water: INSOLUBLE
Percent Volatiles By Volume: N/A

Fire and Explosion Hazard Data

Flash Point: N/A
Lower Explosive Limit: N/A
Upper Explosive Limit: N/A
Extinguishing Media: CLASS D EXTINGUISHERS: DRY POWDER TYPE.
Special Fire Fighting Proc: USE NIOSH APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: NONCOMBUSTIBLE IN SOLID METAL FORM. FLAMMABLE IN THE FORM OF DUST WHEN EXPOSED TO HEAT OR FLAME.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): EXCESSIVE HEAT (IE, ABOVE MELTING POINT). SEE MATERIALS TO AVOID.
Materials To Avoid: REACTS VIOLENTLY W/HYDROGEN PEROXIDE, CHLORINE TRIFLUORIDE, AMMONIUM NITRATE, POTASSIUM. INCOMPAT WITH NAN*3, (SUPDAT)
Hazardous Decomp Products: WHEN HEATED TO ABOVE MELTING POINT (IE, DECOMPOSITION) EMITS HIGHLY TOXIC FUMES OF LEAD.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

Health Hazard Data

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: LEAD APPEARS ON THE NAVY LIST OF OCCUP CHEM REPRO HAZS. SEEK CONSULTATION FROM APPROP HEALTH PROFESSIONALS CONCERNING LATEST HAZ LIST INFO & SAFE HANDLING & EXPOSURE INFO (FP N). SKIN: MAY CAUSE IRRIT. EYES: MAY CAUSE IRRIT. NORMAL HANDLING OR PROCESSING OF LEAD MAY RESULT IN GENERATION OF LEAD DUST (EFTS OF OVEREXP)
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: HLTH HAZ: &/OR FUME. LEAD IS CUMULATIVE TOXIN, EFTS OF PB EXPOS MAY NOT DEVELOP QUICKLY. SYMPS INCL DECREASED PHYSICAL FITNESS, LOSS OF APPETITE, ABDOMINAL PAINS, CONSTIPATION, FATIGUE, SLEEP DISTURBS, HEADACHE, ANEMIA, IRRITABILITY, TREMORS, HALLUCINATIONS &

DISTORTED PERCEPTION, MUSCLE & JOINT PAIN, MUSCLE (SUPDAT)

Med Cond Aggravated By Exp: DISEASES OF THE BLOOD AND BLOOD FORMING ORGANS, KIDNEYS, NERVOUS SYSTEM AND REPRODUCTIVE SYSTEM.

Emergency/First Aid Proc: INHALATION: REMOVE TO FRESH AIR. GET IMMEDIATE MEDICAL ATTENTION. EYES: FLUSH WELL WITH WATER FOR AT LEAST 15 MINUTES. IF IRRITATION PERSISTS SEEK MEDICAL ATTENTION. SKIN: WASH AREA THOROUGHLY WITH SOAP AND WATER. INGESTION: GIVE WATER. SEEK IMMEDIATE MEDICAL ATTENTION.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: LEAD IN DUST FORM; MINIMIZE EXPOSURE. WEAR FULL PROTECTIVE CLOTHING INCLUDING NIOSH APPROVED RESPIRATORS. CLEAN UP USING DUSTLESS METHODS (IE, VACUUM, DO NOT USE COMPRESSED AIR). PLACE IN CLOSED LABELED CONTAINERS FOR RECYCLING OR PROPER DISPOSAL.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Method: DISPOSE OF IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS. MAY HAVE VALUE ON A RECYCLED BASIS.

Precautions-Handling/Storing: STRICT CONTROL OF ATMOSPHERIC CONCENTRATION IN PROCESSING AND WORK AREAS. KEEP MATERIAL DRY. AVOID STORAGE NEAR INCOMPATIBLE MATERIALS.

Other Precautions: NOT APPLICABLE.

Control Measures

Respiratory Protection: NIOSH APPROVED HIGH EFFICIENCY RESPIRATOR FOR DUST AND LEAD FUME. USE AND PROCESS IN A WELL VENTILATED AREA.

Ventilation: LOCAL EXHAUST: AS REQUIRED FOR LEAD DUST & FUME. MECHANICAL (GEN): AS REQUIRED TO MAINTAIN APPROP OSHA PEL/TLV LEVELS.

Protective Gloves: IMPERVIOUS GLOVES (FP N).

Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).

Other Protective Equipment: ANSI APPRVD EYE WASH & DELUGE SHOWER (FP N). FULL PROT CLTHG & SHOES, INCLUDING HARD HATS, REQD FOR WORK W/MOLTEN METAL.

Work Hygienic Practices: NO EATING, DRINKING OR SMOKING WHILE PROCESSING OR HANDLING LEAD OR IN LEAD AREAS. PRACTICE GOOD PERSONAL (ING 5)

Suppl. Safety & Health Data: MATL TO AVOID: ZR, DISODIUM ACETYLIDE & OXIDANTS. CAN REACT STRONGLY W/OXIDIZING MATLS. EFTS OF OVEREXP: WEAK. INHAL OF LARGE AMTS OF LEAD MAY LEAD TO SEIZURES, COMA & PALE SKIN, BLUE LINE AT GUM MARGIN, DECREASED HAND-GRIP & PARALYSIS OF WRIST JOINTS. PRLNGD VERY HIGH EXPOS CAN ALSO RSLT IN KIDNEY DMG & (ING 2)

Transportation Data

Disposal Data

Label Data

Label Required: YES

Technical Review Date: 25MAR98

Label Date: 23MAR98

Label Status: G

Common Name: LEAD

Chronic Hazard: YES

Signal Word: WARNING!

Acute Health Hazard-Moderate: X

Contact Hazard-Slight: X

Fire Hazard-None: X

Reactivity Hazard-None: X

Special Hazard Precautions: ACUTE: EYES/SKIN: IRRITATION. CHRONIC: LEAD APPEARS ON THE NAVY OCCUPATIONAL CHEMICAL REPRODUCTIVE HAZARDS LIST (FP N). SYMPTOMS OF LEAD OVEREXPOSURE INCLUDE DECREASED PHYSICAL FITNESS, LOSS OF APPETITE, ABDOMINAL PAINS, CONSTIPATION, FATIGUE, SLEEP DISTURBANCES, HEADACHE, ANEMIA, IRRITABILITY, TREMORS, HALLUCINATIONS AND DISTORTED

PERCEPTION, MUSCLE AND JOINT PAIN, MUSCLE WEAKNESS, SEIZURES, COMA & DEATH. ANEMIA, PALE SKIN, BLUE LINE AT GUM MARGIN, DECREASED HAND-GRIP STRENGTH, ABDOMINAL PAIN, NAUSEA, VOMITING, AND PARALYSIS OF WRIST JOINTS. KIDNEY AND NERVOUS SYSTEM DAMAGE.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: TR METALS
Label Street: 1 PAVILION AVE
Label City: RIVERSIDE
Label State: NJ
Label Zip Code: 08075
Label Country: US
Label Emergency Number: 800-424-9300(CHEMTREC)

TRICHLOROETHYLENE

TCL

Common Synonyms

Trichloroethylene
Triclene; Algylen
Chlorylen
Gemalgene
Trethylene
Trichloran; Trilene

Watery liquid　Colorless　Sweet odor

Sinks in water. Irritating vapor is produced.

Stop discharge if possible. Keep people away.
Avoid contact with liquid and vapor.
Call fire department.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Combustible.
POISONOUS GASES ARE PRODUCED IN FIRE.
Wear goggles and self-contained breathing apparatus.
Extinguish with dry chemical, carbon dioxide, or foam.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose and throat.
If inhaled, will cause nausea, vomiting, difficult breathing, or loss of consciousness.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Irritating to skin and eyes.
If swallowed, will cause nausea, vomiting, difficult breathing, or loss of consciousness.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and have victim induce vomiting.
IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.

Water Pollution

Effect of low concentrations on aquatic life is unknown.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook)

Should be removed
Chemical and physical treatment

2. LABEL

2.1 **Category:** None
2.2 **Class:** Not pertinent

3. CHEMICAL DESIGNATIONS

3.1 **CG Compatibility Class:** Halogenated hydrocarbon
3.2 **Formula:** $CHCl=CCl_2$
3.3 **IMO/UN Designation:** 9.0/1710
3.4 **DOT ID No.:** 1710
3.5 **CAS Registry No.:** 79-01-6

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid
4.2 **Color:** Colorless
4.3 **Odor:** Chloroform-like; ethereal

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Organic vapor-acid gas canister; self-contained breathing apparatus for emergencies; neoprene or vinyl gloves; chemical safety goggles; face-shield; neoprene safety shoes; neoprene suit or apron for splash protection.
5.2 **Symptoms Following Exposure:** INHALATION: symptoms range from irritation of the nose and throat to nausea, an attitude of irresponsibility, blurred vision, and finally disturbance of central nervous system resulting in cardiac failure. Chronic exposure may cause organic injury. INGESTION: symptoms similar to inhalation. SKIN: defatting action can cause dermatitis. EYES: slightly irritating sensation and lachrymation.
5.3 **Treatment of Exposure:** Do NOT administer adrenalin or epinephrine; get medical attention for all cases of overexposure. INHALATION: remove victim to fresh air; if necessary, apply artificial respiration and/or administer oxygen. INGESTION: have victim drink water and induce vomiting; repeat three times; then give 1 tablespoon epsom salts in water. EYES: flush thoroughly with water. SKIN: wash thoroughly with soap and warm water.
5.4 **Threshold Limit Value:** 50 ppm
5.5 **Short Term Inhalation Limits:** 200 ppm for 30 min.
5.6 **Toxicity by Ingestion:** Grade 3; LD_{50} = 50 to 500 mg/kg
5.7 **Late Toxicity:** Data not available
5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary.
5.9 **Liquid or Solid Irritant Characteristics:** Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.
5.10 **Odor Threshold:** 50 ppm
5.11 **IDLH Value:** 1,000 ppm

6. FIRE HAZARDS

6.1 **Flash Point:** 90°F C.C.; practically nonflammable
6.2 **Flammable Limits in Air:** 8.0%-10.5%
6.3 **Fire Extinguishing Agents:** Water fog
6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent
6.5 **Special Hazards of Combustion Products:** Toxic and irritating gases are produced in fire situations.
6.6 **Behavior in Fire:** Not pertinent
6.7 **Ignition Temperature:** 770°F
6.8 **Electrical Hazard:** Not pertinent
6.9 **Burning Rate:** Not pertinent
6.10 **Adiabatic Flame Temperature:** Data not available
6.11 **Stoichiometric Air to Fuel Ratio:** Data not available
6.12 **Flame Temperature:** Data not available

7. CHEMICAL REACTIVITY

7.1 **Reactivity With Water:** No reaction
7.2 **Reactivity with Common Materials:** No reaction
7.3 **Stability During Transport:** Stable
7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
7.5 **Polymerization:** Not pertinent
7.6 **Inhibitor of Polymerization:** Not pertinent
7.7 **Molar Ratio (Reactant to Product):** Data not available
7.8 **Reactivity Group:** 36

8. WATER POLLUTION

8.1 **Aquatic Toxicity:**
660 mg/l/40 hr/daphnia/kill/fresh water
8.2 **Waterfowl Toxicity:** Data not available
8.3 **Biological Oxygen Demand (BOD):** Data not available
8.4 **Food Chain Concentration Potential:** None

9. SHIPPING INFORMATION

9.1 **Grades of Purity:** Technical; dry cleaning; degreasing; extraction
9.2 **Storage Temperature:** Ambient
9.3 **Inert Atmosphere:** No requirement
9.4 **Venting:** Pressure-vacuum

10. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook)

A-X-Y

11. HAZARD CLASSIFICATIONS

11.1 **Code of Federal Regulations:** ORM-A
11.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	1
Health	
Vapor Irritant	1
Liquid or Solid Irritant	1
Poisons	2
Water Pollution	
Human Toxicity	1
Aquatic Toxicity	2
Aesthetic Effect	2
Reactivity	
Other Chemicals	1
Water	0
Self Reaction	1

11.3 **NFPA Hazard Classification:**

Category	Classification
Health Hazard (Blue)	2
Flammability (Red)	1
Reactivity (Yellow)	0

12. PHYSICAL AND CHEMICAL PROPERTIES

12.1 **Physical State at 15°C and 1 atm:** Liquid
12.2 **Molecular Weight:** 131.39
12.3 **Boiling Point at 1 atm:** 189°F = 87°C = 360°K
12.4 **Freezing Point:** —123.5°F = —86.4°C = 186.8°K
12.5 **Critical Temperature:** Not pertinent
12.6 **Critical Pressure:** Not pertinent
12.7 **Specific Gravity:** 1.46 at 20°C (liquid)
12.8 **Liquid Surface Tension:** 29.3 dynes/cm = 0.0293 N/m at 20°C
12.9 **Liquid Water Interfacial Tension:** 34.5 dynes/cm = 0.0345 N/m at 24°C
12.10 **Vapor (Gas) Specific Gravity:** 4.5
12.11 **Ratio of Specific Heats of Vapor (Gas):** 1.116
12.12 **Latent Heat of Vaporization:** 103 Btu/lb = 57.2 cal/g = 2.4×10^5 J/kg
12.13 **Heat of Combustion:** Not pertinent
12.14 **Heat of Decomposition:** Not pertinent
12.15 **Heat of Solution:** Not pertinent
12.16 **Heat of Polymerization:** Not pertinent
12.25 **Heat of Fusion:** Data not available
12.26 **Limiting Value:** Data not available
12.27 **Reid Vapor Pressure:** 2.5 psia

NOTES

MERCURY

MCR

Common Synonyms	Liquid	Silver	Odorless
Quicksilver	Sinks in water.		

AVOID CONTACT WITH LIQUID. Keep people away.
Stop discharge if possible.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire	Not flammable.
Exposure	CALL FOR MEDICAL AID. LIQUID Effects of exposure may be delayed.
Water Pollution	HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook)

Should be removed
Chemical and physical treatment

2. LABEL

2.1 Category: None

3. CHEMICAL DESIGNATIONS

3.1 CG Compatibility Class: Not listed
3.2 Formula: Hg
3.3 IMO/UN Designation: Not listed
3.4 DOT ID No.: 2809
3.5 CAS Registry No.: 7439-97-6

4. OBSERVABLE CHARACTERISTICS

4.1 Physical State (as shipped): Liquid
4.2 Color: Silvery
4.3 Odor: None

5. HEALTH HAZARDS

5.1 Personal Protective Equipment: Avoid contact of liquid with skin. For vapor use chemical cartridge (Hopcalite) respirator.
5.2 Symptoms Following Exposure: No immediate symptoms. As poisoning becomes established, slight muscular tremor, loss of appetite, nausea, and diarrhea are observed. Psychic, kidney, and cardiovascular disturbances may occur.
5.3 Treatment of Exposure: Consult a doctor.
5.4 Threshold Limit Value: 0.05 mg/m³
5.5 Short Term Inhalation Limits: Data not available
5.6 Toxicity by Ingestion: No immediate toxicity
5.7 Late Toxicity: Development of mercury poisoning
5.8 Vapor (Gas) Irritant Characteristics: None
5.9 Liquid or Solid Irritant Characteristics: None
5.10 Odor Threshold: Not pertinent
5.11 IDLH Value: 28 mg/m³

6. FIRE HAZARDS

6.1 Flash Point: Not flammable
6.2 Flammable Limits in Air: Not flammable
6.3 Fire Extinguishing Agents: Not pertinent
6.4 Fire Extinguishing Agents Not to be Used: Not pertinent
6.5 Special Hazards of Combustion Products: Not pertinent
6.6 Behavior in Fire: Not flammable
6.7 Ignition Temperature: Not flammable
6.8 Electrical Hazard: Not pertinent
6.9 Burning Rate: Not flammable
6.10 Adiabatic Flame Temperature: Data not available
6.11 Stoichiometric Air to Fuel Ratio: Data not available
6.12 Flame Temperature: Data not available

7. CHEMICAL REACTIVITY

7.1 Reactivity With Water: No reaction
7.2 Reactivity with Common Materials: No reaction
7.3 Stability During Transport: Stable
7.4 Neutralizing Agents for Acids and Caustics: Not pertinent
7.5 Polymerization: Not pertinent
7.6 Inhibitor of Polymerization: Not pertinent
7.7 Molar Ratio (Reactant to Product): Data not available
7.8 Reactivity Group: Data not available

8. WATER POLLUTION

8.1 Aquatic Toxicity:
0.5-1 ppm/48 hr/caragius ardium/TL_m/fresh water
0.29 ppm/48 hr/marine fish/TL_m/salt water
8.2 Waterfowl Toxicity: Data not available
8.3 Biological Oxygen Demand (BOD): None
8.4 Food Chain Concentration Potential: Mercury concentrates in liver and kidneys of ducks and geese to levels above FDA limit of 0.5 ppm. Muscle tissue usually well below the limit.

9. SHIPPING INFORMATION

9.1 Grades of Purity: Pure
9.2 Storage Temperature: Ambient
9.3 Inert Atmosphere: No requirement
9.4 Venting: Open

10. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook)

A-X

11. HAZARD CLASSIFICATIONS

11.1 Code of Federal Regulations: ORM-B
11.2 NAS Hazard Rating for Bulk Water Transportation: Not listed
11.3 NFPA Hazard Classification: Not listed

12. PHYSICAL AND CHEMICAL PROPERTIES

12.1 Physical State at 15°C and 1 atm: Liquid
12.2 Molecular Weight: 200.59
12.3 Boiling Point at 1 atm: 675°F = 357°C = 630°K
12.4 Freezing Point: —38.0°F = —38.9°C = 234.3°K
12.5 Critical Temperature: 2664°F = 1462°C = 1735°K
12.6 Critical Pressure: 23,300 psia = 1587 atm = 160.6 MN/m²
12.7 Specific Gravity: 13.55 at 20°C (liquid)
12.8 Liquid Surface Tension: 470 dynes/cm = 0.470 N/m at 20°C
12.9 Liquid Water Interfacial Tension: 375 dynes/cm = 0.375 N/m at 20°C
12.10 Vapor (Gas) Specific Gravity: Not pertinent
12.11 Ratio of Specific Heats of Vapor (Gas): Not pertinent
12.12 Latent Heat of Vaporization: Not pertinent
12.13 Heat of Combustion: Not pertinent
12.14 Heat of Decomposition: Not pertinent
12.15 Heat of Solution: Not pertinent
12.16 Heat of Polymerization: Not pertinent
12.25 Heat of Fusion: 2.7 cal/g
12.26 Limiting Value: Data not available
12.27 Reid Vapor Pressure: Data not available

NOTES

TRICHLOROETHANE

TCE

Common Synonyms

1,1,1-Trichloroethane
Methylchloroform
Aerothene
Chlorothene

Watery liquid — Colorless — Sweet odor

Sinks in water. Irritating vapor is produced.

Stop discharge if possible. Keep people away.
Avoid contact with liquid and vapor.
Call fire department.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Combustible.
POISONOUS GASES ARE PRODUCED IN FIRE.
Wear goggles and self-contained breathing apparatus.
Extinguish with dry chemical, carbon dioxide, or foam.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose and throat.
If inhaled, will cause dizziness or difficult breathing.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Irritating to skin and eyes.
If swallowed, may produce nausea.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and have victim induce vomiting.
IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.

Water Pollution

Effect of low concentrations on aquatic life is unknown.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook)

Should be removed
Chemical and physical treatment

2. LABEL

2.1 Category: None
2.2 Class: Not pertinent

3. CHEMICAL DESIGNATIONS

3.1 **CG Compatibility Class:** Halogenated hydrocarbon
3.2 **Formula:** CH_3CCl_3
3.3 **IMO/UN Designation:** Not listed
3.4 **DOT ID No.:** 2831
3.5 **CAS Registry No.:** 71-55-6

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid
4.2 **Color:** Colorless
4.3 **Odor:** Chloroform-like; sweetish

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Organic vapor-acid gas canister; self-contained breathing apparatus for emergencies; neoprene or polyvinyl-alcohol-type gloves; chemical safety goggles and face shield; neoprene safety shoes (or leather safety shoes plus neoprene footwear); neoprene or polyvinyl alcohol suit or apron for splash protection.

5.2 **Symptoms Following Exposure:** INHALATION: symptoms range from loss of equilibrium and incoordination to loss of consciousness; high concentration can be fatal due to simple asphyxiation combined with loss of consciousness. INGESTION: produces effects similar to inhalation and may cause some feeling of nausea. EYES: slightly irritating and lachrymatory. SKIN: defatting action may cause dermatitis.

5.3 **Treatment of Exposure:** Get medical attention for all eye exposures and any other serious overexposures. Do NOT administer adrenalin or epinephrine; otherwise, treatment is symptomatic. INHALATION: remove victim to fresh air; if necessary, apply artificial respiration and/or administer oxygen. INGESTION: have victim drink water and induce vomiting. EYES: flush thoroughly with water. SKIN: remove contaminated clothing and wash exposed area thoroughly with soap and warm water.

5.4 **Threshold Limit Value:** 350 ppm
5.5 **Short Term Inhalation Limits:** 1,000 ppm for 60 min. in man
5.6 **Toxicity by Ingestion:** Grade 1; LD_{50} = 5 to 15 g/kg (rat, mouse, rabbit, guinea pig)
5.7 **Late Toxicity:** Data not available
5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary.
5.9 **Liquid or Solid Irritant Characteristics:** Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.
5.10 **Odor Threshold:** 100 ppm
5.11 **IDLH Value:** 1,000 ppm

6. FIRE HAZARDS

6.1 **Flash Point:** Data not available
6.2 **Flammable Limits in Air:** 7%-16%
6.3 **Fire Extinguishing Agents:** Dry chemical, foam, or carbon dioxide
6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent
6.5 **Special Hazards of Combustion Products:** Toxic and irritating gases are generated in fires.
6.6 **Behavior in Fire:** Not pertinent
6.7 **Ignition Temperature:** 932°F
6.8 **Electrical Hazard:** Not pertinent
6.9 **Burning Rate:** (est.) 2.9 mm/min.
6.10 **Adiabatic Flame Temperature:** Data not available
6.11 **Stoichiometric Air to Fuel Ratio:** Data not available
6.12 **Flame Temperature:** Data not available

7. CHEMICAL REACTIVITY

7.1 **Reactivity With Water:** Reacts slowly, releasing corrosive hydrochloric acid.
7.2 **Reactivity with Common Materials:** Corrodes aluminum, but reaction is not hazardous.
7.3 **Stability During Transport:** Stable
7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
7.5 **Polymerization:** Not pertinent
7.6 **Inhibitor of Polymerization:** Not pertinent
7.7 **Molar Ratio (Reactant to Product):** Data not available
7.8 **Reactivity Group:** 36

8. WATER POLLUTION

8.1 **Aquatic Toxicity:**
75-150 ppm/*/pinfish/TL_m/salt water
*Time period not specified.
8.2 **Waterfowl Toxicity:** Data not available
8.3 **Biological Oxygen Demand (BOD):** Data not available
8.4 **Food Chain Concentration Potential:** None

9. SHIPPING INFORMATION

9.1 **Grades of Purity:** Uninhibited, inhibited; industrial inhibited; white room; cold cleaning
9.2 **Storage Temperature:** Ambient
9.3 **Inert Atmosphere:** No requirement
9.4 **Venting:** Pressure-vacuum

10. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook)

A-X-Y

11. HAZARD CLASSIFICATIONS

11.1 **Code of Federal Regulations:** ORM-A

11.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	1
Health	
Vapor Irritant	1
Liquid or Solid Irritant	1
Poisons	2
Water Pollution	
Human Toxicity	1
Aquatic Toxicity	3
Aesthetic Effect	2
Reactivity	
Other Chemicals	1
Water	0
Self Reaction	0

11.3 **NFPA Hazard Classification:**

Category	Classification
Health Hazard (Blue)	2
Flammability (Red)	1
Reactivity (Yellow)	0

12. PHYSICAL AND CHEMICAL PROPERTIES

12.1 **Physical State at 15°C and 1 atm:** Liquid
12.2 **Molecular Weight:** 133.41
12.3 **Boiling Point at 1 atm:** 165°F = 74°C = 347°K
12.4 **Freezing Point:** <−38°F = <−39°C = <234°K
12.5 **Critical Temperature:** Not pertinent
12.6 **Critical Pressure:** Not pertinent
12.7 **Specific Gravity:** 1.31 at 20°C (liquid)
12.8 **Liquid Surface Tension:** 25.4 dynes/cm = 0.0254 N/m at 20°C
12.9 **Liquid Water Interfacial Tension:** (est.) 45 dynes/cm = 0.045 N/m at 20°C
12.10 **Vapor (Gas) Specific Gravity:** 4.6
12.11 **Ratio of Specific Heats of Vapor (Gas):** 1.104
12.12 **Latent Heat of Vaporization:** 100 Btu/lb = 58 cal/g = 2.4×10^5 J/kg
12.13 **Heat of Combustion:** (est.) 4700 Btu/lb = 2600 cal/g = 110×10^5 J/kg
12.14 **Heat of Decomposition:** Not pertinent
12.15 **Heat of Solution:** Not pertinent
12.16 **Heat of Polymerization:** Not pertinent
12.25 **Heat of Fusion:** Data not available
12.26 **Limiting Value:** Data not available
12.27 **Reid Vapor Pressure:** 4.0 psia

NOTES

TETRACHLOROETHYLENE

TTE

Common Synonyms
Tetracap
Perclene
Perchloroethylene
Perk

Watery liquid   Colorless   Sweet odor

Sinks in water. Irritating vapor is produced.

Stop discharge if possible.
Avoid contact with liquid and vapor.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Not flammable.
Poisonous gases are produced when heated.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose and throat.
If inhaled, will cause difficult breathing, or loss of consciousness.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Irritating to skin and eyes.
Harmful if swallowed.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.

Water Pollution

Effect of low concentrations on aquatic life is unknown.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook)

Should be removed
Chemical and physical treatment

2. LABEL

2.1 Category: None
2.2 Class: Not pertinent

3. CHEMICAL DESIGNATIONS

3.1 CG Compatibility Class: Not listed
3.2 Formula: $Cl_2C{=}CCl_2$
3.3 IMO/UN Designation: 9.0/1897
3.4 DOT ID No.: 1897
3.5 CAS Registry No.: 127-18-4

4. OBSERVABLE CHARACTERISTICS

4.1 Physical State (as shipped): Liquid
4.2 Color: Colorless
4.3 Odor: Ethereal; like chloroform; mildly sweet

5. HEALTH HAZARDS

5.1 Personal Protective Equipment: For high vapor concentrations use approved canister or air-supplied mask; chemical goggles or face shield; plastic gloves.
5.2 Symptoms Following Exposure: Vapor can affect central nervous system and cause anesthesia. Liquid may irritate skin after prolonged contact. May irritate eyes but causes no injury.
5.3 Treatment of Exposure: INHALATION: if illness occurs, remove patient to fresh air, keep him warm and quiet, and get medical attention. INGESTION: induce vomiting only on physician's recommendation. EYES AND SKIN: flush with plenty of water and get medical attention if irritation or injury occurs.
5.4 Threshold Limit Value: 50 ppm
5.5 Short Term Inhalation Limits: 100 ppm for 60 min.
5.6 Toxicity by Ingestion: Grade 2; LD_{50} = 0.5 to 5 g/kg
5.7 Late Toxicity: None
5.8 Vapor (Gas) Irritant Characteristics: Vapors cause a slight smarting of the eyes or throat if present in high concentrations. The effect is temporary.
5.9 Liquid or Solid Irritant Characteristics: Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.
5.10 Odor Threshold: 5 ppm
5.11 IDLH Value: 500 ppm

6. FIRE HAZARDS

6.1 Flash Point: Not flammable
6.2 Flammable Limits in Air: Not flammable
6.3 Fire Extinguishing Agents: Not pertinent
6.4 Fire Extinguishing Agents Not to be Used: Not pertinent
6.5 Special Hazards of Combustion Products: Toxic, irritating gases may be generated in fires.
6.6 Behavior in Fire: Not pertinent
6.7 Ignition Temperature: Not flammable
6.8 Electrical Hazard: Not pertinent
6.9 Burning Rate: Not flammable
6.10 Adiabatic Flame Temperature: Data not available
6.11 Stoichiometric Air to Fuel Ratio: Data not available
6.12 Flame Temperature: Data not available

7. CHEMICAL REACTIVITY

7.1 Reactivity With Water: No reaction
7.2 Reactivity with Common Materials: No reaction
7.3 Stability During Transport: Stable
7.4 Neutralizing Agents for Acids and Caustics: Not pertinent
7.5 Polymerization: Not pertinent
7.6 Inhibitor of Polymerization: Not pertinent
7.7 Molar Ratio (Reactant to Product): Data not available
7.8 Reactivity Group: Data not available

8. WATER POLLUTION

8.1 Aquatic Toxicity: Data not available
8.2 Waterfowl Toxicity: Data not available
8.3 Biological Oxygen Demand (BOD): None
8.4 Food Chain Concentration Potential: None

9. SHIPPING INFORMATION

9.1 Grades of Purity: Dry cleaning and industrial grades: 95+%
9.2 Storage Temperature: Ambient
9.3 Inert Atmosphere: No requirement
9.4 Venting: Pressure-vacuum

10. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook)

A-X

11. HAZARD CLASSIFICATIONS

11.1 Code of Federal Regulations: ORM-A
11.2 NAS Hazard Rating for Bulk Water Transportation:

Category	Rating
Fire	0
Health	
Vapor Irritant	1
Liquid or Solid Irritant	1
Poisons	2
Water Pollution	
Human Toxicity	1
Aquatic Toxicity	3
Aesthetic Effect	2
Reactivity	
Other Chemicals	1
Water	0
Self Reaction	1

11.3 NFPA Hazard Classification: Not listed

12. PHYSICAL AND CHEMICAL PROPERTIE

12.1 Physical State at 15°C and 1 atm: Liquid
12.2 Molecular Weight: 165.83
12.3 Boiling Point at 1 atm: 250°F = 121°C = 394°K
12.4 Freezing Point: —8.3°F = —22.4°C = 250.8°K
12.5 Critical Temperature: 657°F = 347°C = 620°K
12.6 Critical Pressure: Not pertinent
12.7 Specific Gravity: 1.63 at 20°C (liquid)
12.8 Liquid Surface Tension: 31.3 dynes/cm = 0.0313 N/m at 20°
12.9 Liquid Water Interfacial Tension: 44.4 dynes/cm = 0.0444 N/m at 25°
12.10 Vapor (Gas) Specific Gravity: Not pertinent
12.11 Ratio of Specific Heats of Vapor (Gas 1.116
12.12 Latent Heat of Vaporization: 90.2 Btu/lb = 50.1 cal/g = 2.10 X 10^5 J/kg
12.13 Heat of Combustion: Not pertinent
12.14 Heat of Decomposition: Not pertinent
12.15 Heat of Solution: Not pertinent
12.16 Heat of Polymerization: Not pertinent
12.25 Heat of Fusion: Data not available
12.26 Limiting Value: Data not available
12.27 Reid Vapor Pressure: Data not availabl

NOTES

APPENDIX F

TEMPERATURE EXTREMES

F. TEMPERATURE EXTREMES

F.1 HEAT STRESS

Due to the increase in ambient air temperatures and the effects of protective outer wear decreasing body ventilation, there is increased potential for injury, specifically heat casualties. Site personnel will be instructed in the identification of a heat stress victim, the first-aid treatment procedures for the victim, and the prevention of heat stress casualties.

F.1.1 Identification and Treatment

F.1.1.1 Heat Exhaustion

Symptoms. Heat exhaustion usually begins with muscular weakness, dizziness, nausea, and a staggering gait. Vomiting is frequent. The bowels may move involuntarily. The victim is very pale, the skin is clammy, and he or she may perspire profusely. The pulse is weak and fast; breathing is shallow. The victim may faint unless he or she lies down. This may pass; however, sometimes it persists and, while heat exhaustion is generally not considered life threatening, death could occur.

First Aid. Immediately remove the victim to the CRZ in a shady or cool area with good air circulation. Remove all protective outer wear. Call a physician. Treat the victim for shock (i.e., have the victim lie down, raise the feet 6 to 12 inches, and maintain body temperature but loosen all clothing). If the victim is conscious, it may be helpful to give sips of water. Transport the victim to a medical facility.

F.1.1.2 Heat Stroke

Symptoms. This is the most serious of heat casualties because the body excessively overheats. Body temperatures often are between 107 and 110°F. The victim will have a red face and will not be sweating. First there is often pain in the head, dizziness, nausea, oppression, and dryness of the skin and mouth. Unconsciousness follows quickly and death is imminent if exposure continues. The attack will usually occur suddenly. Heat stroke is always serious.

First Aid. Immediately evacuate the victim to a cool and shady area in the CRZ. Remove all protective outer wear and all personal clothing. Lay the victim on his or her back with the head and shoulders slightly elevated. It is imperative that the body temperature be lowered immediately. This can be accomplished by applying cold wet towels or ice bags to the head and groin. Sponge off the bare skin with cool water or rubbing alcohol, if available, or even place the victim in a tub of cool water. The main objective is to cool without chilling. Do not give stimulants. Transport the victim to a medical facility as soon as possible.

F.1.2 Prevention of Heat Stress

One of the major causes of heat casualties is the depletion of body fluids and salts through sweating. Fluids should be maintained in the Support Zone. Salts can be replaced by either a 0.1 percent salt solution, more heavily salted foods, or commercial mixes such as Gatorade. The commercial mixes are advised for personnel on low-sodium diets.

During warm weather, a work schedule will be established that allows most work to be conducted during the morning hours, before ambient air temperature levels reach highs.

A work/rest schedule will be implemented for personnel required to wear Level B or C protection (i.e., an impervious outer garment) with sufficient time allowed for personnel to "cool down" (this may require working in shifts). Two hours is the maximum time between breaks at Level B or C, regardless of temperature. At elevated temperatures, breaks should be scheduled as follows:

Ambient Temperatures	Maximum Time Between Cool Down Breaks
Above 90°F	¼ hour
85° to 90°F	½ hour
80° to 85°F	1 hour
70° to 80°F	1½ hours

F.1.3 Heat Stress Monitoring

Monitoring of personnel wearing impervious clothing should commence when the ambient temperature reaches 70°F, with increased frequency if ambient temperature increases or as slow recovery rates are indicated. When temperatures exceed 85°F, workers should be monitored for heat stress after every work period. As a screening mechanism of the body's recuperative ability to excess heat, one or more of the following techniques should be used.

1. Measure the heart rate (HR) for 30 seconds, by radial pulse, as early in the resting period as possible. At the beginning of the rest period, the HR should not exceed 110 beats per minute. If the HR is higher, the next work period should be shortened by 10 minutes (or 33 percent), with the length of the rest period staying the same. If the pulse rate is still above 110 beats per minute at the beginning of the next rest period, the following work cycle should again be shortened by 33 percent.

2. Measure oral body temperature with a clinical thermometer, as early as possible in the resting period. At the beginning of the rest period, oral temperature (OT) should not exceed 99°F. If OT exceeds 99°F, the next work period should be shortened by 10 minutes (or 33 percent), with the length of the rest period staying the same. If the OT again exceeds 99°F at the beginning of the next period, the following work cycle should be further shortened by 33 percent. OT should also be measured at the end of the rest period to ensure that it has dropped below 99°F.

3. Maintain good hygienic standards by changing clothes frequently, showering daily, and allowing clothing to dry during rest periods. Persons who notice skin problems should immediately consult medical personnel.

APPENDIX G

EXCAVATION

G EXCAVATION AND TRENCHING

G.1 EXCAVATION PROCEDURES

Because excavations and trenches pose a hazard to employees, structures, and equipment, all excavations created during site operations will be done in accordance with 29 CFR 1926 Subpart P. The following steps summarize the excavation procedures that will be followed by all HLA personnel:

- Prior to excavating or trenching, all surface encumbrances located so as to create a hazard to the employees will be removed or supported, and all underground utilities will be determined and located.
- Under no circumstances will site personnel enter excavations that are not adequately protected from cave-ins by shoring or sloping.
- Stairways, ladders, or ramps will be located in trenches deeper than 4 feet.
- All equipment will be kept at least 2 feet from the edge of the excavation.

G.2 SLOPING

Acceptable options for sloping or benching include the following:

Option 1. A slope of 1½ horizontal to 1 vertical (34 degrees measured from the horizontal).

Option 2. Determination of the maximum allowable slope based on soil conditions and in accordance with the conditions and requirements set forth in 1926 Subpart P, Appendix A and B (located in HLA Construction Trailer).

G.3 SHORING

Acceptable options for shoring include the following:

Option 1. Designs using Subpart P of 1910.126 (located in HLA Construction Trailer).

APPENDIX H

RESPIRATORY PROTECTION PROGRAM

H. RESPIRATORY PREOTECTION PROGRAM

H.1INTRODUCTION

This program was developed to govern the selection and use of respiratory protective devices by Harding Lawson Associates (HLA) personnel. The program is intended to comply with OSHA requirements as set forth in 29 CFR 1910.134(b). The scope of this program is limited to activities related to field investigations of potentially hazardous waste disposal sites.

H.2PERSONNEL REQUIREMENTS

All personnel assigned to field activities at hazardous or potentially hazardous locations are currently required by HLA's health and safety policies to be enrolled in the corporate health monitoring program. Part of this program involves spirometry, a measure of the respiratory system status. No personnel may be assigned to the use of or may withdraw from stock any respiratory protective device without a physician's certification that use of the device will not be injurious to health. Psychological limitations (e.g., claustrophobia) are also considered in personnel assignments. Training in the use of the selected device and fit testing, as described herein, are also required.

Personnel will not be assigned duties that require a respirator when facial hair, skullcaps, or eyeglasses will interfere with a proper fit. Contact lenses may not be worn with any respiratory protective device. Eyeglass frames that fit inside the respirator facepiece are provided as necessary.

H.3APPLICABLE EQUIPMENT

HLA maintains the following respiratory protective equipment:

- full-face chemical/mechanical air-purifying respirators,
- SCBA,
- full-face airline-supplied breathing apparatus, and
- 5-minute escape air supply.

This equipment is intended for use on an as-needed basis, to be determined by an evaluation of on-site conditions. Respiratory protective equipment should not be used arbitrarily by any HLA personnel. Selection criteria are presented separately; training is required in the use of each type of equipment before drawing from stock.

H.4PERSONNEL TRAINING

Training of personnel in the proper use and care of respiratory protective equipment is considered essential to the success of the program. Training encompasses the following topics:

- respiratory protection principles,
- selection of appropriate equipment,
- use of equipment,
- maintenance of equipment, and
- fit testing.

Information regarding each topic is presented as standard respiratory protection procedures in the corporate health and safety program manual.

H.5 PROGRAM ADMINISTRATION AND DOCUMENTATION

Administration of the HLA Respiratory Protection Program is the responsibility of the HSM, and includes the following:

- respirator selection,
- personnel training,
- fit testing,
- respirator maintenance,
- documentation,
- program evaluation and improvements, and
- personnel pulmonary testing and certification.

Fit testing and respirator maintenance is performed by the equipment manager of HLA's Sample Control and Staging Center in Portland, Maine, and designated, trained employees at the other offices. All fit-testing and respirator maintenance is conducted under the administration of the HSM. Major maintenance is performed by manufacturer-certified technicians only. Personnel training in respiratory protection is one aspect of the HSM's ongoing personnel training programs. Program evaluation is a dynamic process, occurring each time a project HASP is prepared.

Medical supervision of personnel occurs as part of the HLA health monitoring program, also administered by the HSM's ongoing personnel training programs. Program evaluation is a dynamic process, occurring each time a project HASP is prepared.

Documentation of the various elements of the HLA respiratory protection program is achieved through several media, as follows:

- Documentation of respirator selection is included in the hazard assessment of each site's HASP.

- Documentation of personnel training is maintained in both hardcopy and computerized files.

- Documentation of medical surveillance is achieved indirectly by maintaining a list of enrolled employees in the health monitoring program, and directly through physician certification of personnel allowed to be assigned respiratory protective devices.

- Using the appropriate form, documentation of fit-testing is maintained on file with the equipment manager of the Sample Control and Staging Center and with the HSM or designee.

- Documentation of site surveillance is required both by this program and by the HASP for each site. Records of site surveillance are created by the HSO and maintained in project files.

- Respirator inspection and maintenance records are created and maintained by the equipment manager for each respirator, SCBA, and escape respirator.

Inspection and documentation occur either before each unit is removed from stock and when it is returned, or monthly.

H.6 INSPECTION, MAINTENANCE, AND STORAGE

H.6.1 Introduction

Respirator maintenance is an integral part of the overall respirator program. Wearing a poorly maintained or malfunctioning respirator, in one sense, is more dangerous than not wearing a respirator at all. Personnel wearing defective devices think they are protected when, in reality, they are not. Emergency escape and rescue devices are particularly vulnerable to poor maintenance because they generally are used infrequently, and then in the most hazardous and demanding circumstances. Serious injury or death can result from wearing a defective device during an emergency escape or rescue. The respirator program includes the following components:

- inspection for defects (including a leak check),
- cleaning and disinfecting,
- repair as required, and
- proper and sanitary storage of equipment.

H.6.2 Inspection for Defects

The most important part of a respirator maintenance program is continual inspection of the devices. If properly performed, inspections will identify damaged or malfunctioning respirators before they can be used. Two types of inspections will be performed: (1) while the respirator is in use, and (2) while it is being cleaned. Because the use and cleaning will be performed primarily by the same personnel, these inspections may become concurrent.

H.6.3 Frequency of Inspection

OSHA requires that "All respirators be inspected before and after each use," and that those not used routinely (i.e., emergency escape and rescue devices) "shall be inspected after each use and at least monthly...." Obviously, emergency escape and rescue devices do not require inspection before each use.

H.6.4 Inspection Procedures

Respirator inspection will include checking of the following:

- tightness of the connections;
- facepiece;
- valves;
- connecting tubes; and
- canisters, filters, or cartridges.

In addition, the regulator and warning devices on a SCBA will be check for proper functions.

H.6.5 Field Inspection of Air-purifying Respirators

Routinely used air-purifying respirators will be checked as follows before and after each use:

1. Examine the facepiece for:

   - excessive dirt;
   - cracks, tears, holes, or physical distortion of shape from improper storage;
   - inflexibility of rubber facepiece (stretch and knead to restore flexibility);
   - cracked or badly scratched lenses in full facepieces;
   - incorrectly mounted full facepiece lenses, or broken or missing mounting clips; and
   - cracked or broken air-purifying element holder(s), badly worn threads, or missing gasket(s).

2. Examine the head straps or head harness for:

   - breaks;
   - loss of elasticity;
   - broken or malfunctioning buckles and attachments; and
   - excessively worn serration on head harness, which might permit slippage (full facepieces only).

3. Examine the exhalation valve for the following after removing the cover:

   - foreign material (e.g., detergent residue, dust particles, or human hair under valve seat);
   - cracks, tears, or distortion in the valve material
   - improper insertion of the valve body in the facepiece;
   - cracks, breaks, or chips in the valve body, particularly the sealing surface;
   - missing or defective valve cover; and
   - improper installation of the valve in the valve body.

4. Examine the air-purifying element(s) for:

   - incorrect cartridge, canister, or filter for the hazard;

   - incorrect installation, loose connections, missing or worn gasket, or cross-threading in the holder;

   - expired shelf-life date on the cartridge or canister;

   - cracks or dents in the outside case of the filter, cartridge, or canister indicated by the absence of sealing material, tape, or foil over the inlet; and

   - identical cartridges if more than one are used.

H.6.6 Care and Cleaning of Self-contained Breathing Apparatus

The proper care of SCBAs involve the following:

- inspection for defects,
- cleaning and disinfecting,
- repair, and
- storage.

The following checklist is to be used by personnel whenever they check out a SCBA. (Note: Any discrepancy found should be cause to set the unit aside until it can be repaired by a certified repairperson.)

1. Preliminary Inspection. Check to ensure that:

   - high-pressure hose connector is tight on cylinder fitting,
   - bypass valve is closed,
   - mainline valve is closed,
   - there is no cover or obstruction on regulator outlet, and
   - pressure in the tank is at least 1,800 psi.

2. Backpack and Harness Assembly.

   - Straps

     - visually inspect for complete set
     - visually inspect for frayed or damaged straps that may break during use

   - Buckles

     - visually inspect for mating ends
     - check locking function

   - Backplate and Cylinder Lock

     - visually inspect backplate for cracks and for missing rivets or screws
     - visually inspect cylinder hold-down strap and physically check strap tightener and lock to ensure that it is fully engaged

3. Cylinder and Cylinder Valve Assembly.

   - Cylinder

     - physically check cylinder to ensure that it is tightly fastened to backplate
     - check hydrostatic test date to ensure that it is current
     - visually inspect cylinder for large dents or gouges in metal

   - Head and Valve Assembly

     - visually inspect cylinder for presence of valve lock
     - visually inspect cylinder gauge for conditions of face, needle, and lens
     - open cylinder valve and listen or feel for leakage around packing (if leakage is noted, do not use until repaired); note function of valve lock

4. Regulator and High-pressure Hose.

- High-pressure Hose and Connector. Listen or feel for leakage in hose or at hose-to-cylinder connector. (Bubble in outer hose covering may be caused by seepage of air through hose when stored under pressure. This does not necessarily mean a faulty hose.)
- Regulator and Low-pressure Alarm
  - Cover outlet of regulator with palm of hand. Open mainline valve and read regulator gauge (must read at least 1,800 psi and not more than rated cylinder pressure).
  - Close cylinder valve and slowly move hand from regulator outlet to allow slow flow of air. Gauge should begin to show immediate loss of pressure as air flows. Low-pressure alarm should sound between 650 and 550 psi. Remove hand completely from outlet and close mainline valve.
  - Place mouth onto or over regulator outlet and blow. A positive pressure should be created and maintained for 5 to 10 seconds without any loss of air. Next, establish a slight negative pressure in regulator and hold for 5 to 10 seconds. Vacuum should remain constant. This tests the integrity of the diaphragm. Any loss of pressure or vacuum during this test indicates a leak in the apparatus.
  - Open cylinder valve.
  - Place hand over regulator outlet and open mainline valve. Remove hand from outlet and replace in rapid movement. Repeat twice. Air should escape when hand is removed each time, indicating a positive pressure in chamber. Close mainline valve and remove hand from outlet.
  - Ascertain that no obstruction is in or over the regulator outlet. Open and close the bypass valve momentarily to ensure flow of air through bypass system.

5. Facepiece and Corrugated Breathing Tube.

- Facepiece
  - Visually inspect head harness for damaged serration and deteriorated rubber. Visually inspect rubber facepiece body for signs of deterioration or extreme distortion.
  - Retaining clamp properly in place, visually inspect lens for proper seal in rubber facepiece, and for cracks or large scratches.
  - Visually inspect exhalation valve for visible deterioration or foreign materials buildup.
- Breathing Tube and Connector
  - Stretch breathing tube and visually inspect for deterioration and holes.

- Visually inspect connector to ensure good condition of threads and for presence and proper condition of "O" ring or rubber gasket seal.
- Perform a negative pressure test on facepiece.
  - a. Don backpack and facepiece.
  - b. With facepiece held tightly to face or facepiece properly donned, stretch breathing tube to open corrugations and place thumb or hand over end of connector.
  - c. Inhale. Negative pressure should be created inside mask, causing it to pull tightly to face. This negative pressure should be maintained for 5 to 10 seconds. If negative pressure leaks down, the facepiece assembly is not adequate and should not be worn.

6. Storage of Unit. Check that:
   - cylinder is refilled as necessary and unit is cleaned and inspected;
   - cylinder valve is closed;
   - high-pressure hose connector is tight on cylinder;
   - pressure is bled off high-pressure hose and regulator;
   - bypass valve is closed;
   - mainline valve is closed;
   - all straps are completely loosened and laid straight; and
   - facepiece is properly stored to protect against dust, sunlight, heat, extreme cold, excess moisture, and damaging chemicals.

H.6.7 Cleaning and Sanitizing

Any good detergent may be used, followed by a disinfecting rinse or a combination disinfectant-detergent for a one-step operation. Reliable, effective disinfectants can be made from readily available household solutions, including the following:

- Hypochlorite solution (50 ppm of chlorine) can be made by adding approximately 2 milliliters of bleach (e.g., Clorox™) to 1 liter of water, or 2 tablespoons of bleach per gallon of water. A 2-minute immersion disinfects the respirators.
- Aqueous solution of iodine (50 ppm of iodine) can be made by adding approximately 0.8 milliliter of tincture of iodine per liter of water, or 1 teaspoon of tincture of iodine per gallon of water. A 2-minute immersion is sufficient to disinfect the respirators.

To prevent damaging the rubber and plastic in the respirator facepieces, the cleaning water should not exceed 140 °F; however, to ensure adequate cleaning, it should not be less than 120 °F.

H.6.8 Rinsing

The cleaned and disinfected respirators should be rinsed thoroughly in water (140 °F maximum) to remove all traces of detergent and disinfectant. This is important for preventing dermatitis.

H.6.9 Drying

The respirators may be allowed to dry in room air on a clean surface. They may also be hung from a horizontal wire, like drying clothes; however, care must be taken not to damage or distort the facepieces.

H.6.10 Reassembly and Inspection

To avoid contamination, the clean, dry respirator facepieces should be reassembled and inspected in an area separate from the disassembly area. The inspection procedures were discussed previously; special emphasis should be given to inspecting the respirators for detergent or soap residue left by inadequate rinsing. This appears most often under the seat of the exhalation valve and can cause valve leakage or sticking. The respirator should be thoroughly inspected and all defects corrected. New or retested cartridges and canisters should be installed, and the completely reassembled respirator should be tested for leaks. For SCBA devices, the facepiece should be combined with the tested regulator and the fully charged cylinder, and an operation check should be performed.

H.6.11 Maintenance and Repair

Replacement or repair should be done by trained, experienced persons using parts designed for the respirator. Besides being contrary to OSHA requirements, substitution of parts from a different brand or type of respirator invalidates approval of the device. This restriction applies particularly to maintenance of the more complicated devices, especially SCBA, and more specifically, regulator valves and low-pressure warning devices. These devices should be returned to the manufacturer or to a trained technician for adjustment or repair. No problems are anticipate in repairing and maintaining most simple respirators, particularly the commonly used air-purifying type.

H.6.12 Respirator Storage

Respirators must be stored properly to protect against the following:

- dust,
- sunlight,
- heat,
- extreme cold,
- excessive moisture,
- damaging chemicals, and
- mechanical damage.

Damage and contamination of respirators may occur if they are stored on a workbench; in a tool cabinet or toolbox among heavy tools, greases, and dirt; or in a vehicle.

APPENDIX I

MONITORING EQUIPMENT

I MONITORING EQUIPMENT

The work environment will be monitored to ensure that IDLH or other dangerous conditions are identified. At a minimum, monitoring will include evaluations for mercury and organic vapor and dust.

I.1 AIR SAMPLING: EQUIPMENT, CALIBRATION, AND MAINTENANCE

To the extent feasible, the presence of airborne contaminants will be evaluated through the use of direct-reading instrumentation. Information gathered will be used to ensure the adequacy of the levels of protection being used at the site, and may be used as the basis for upgrading or downgrading levels of protection, at the discretion of the site HSO.

I.1.1 Jerome Vapor Analyzer

The instrument utilizes a patented, stable gold film sensor, which is highly selective to the measured compound: Thereby, eliminating interferences common to other instruments. The gold film sensor reacts with mercury vapors and creates an electrical response that correlates to a mercury vapor concentration given in mg/m^3. The calibration and routine maintenance instructions are included in the manufacturer's instructions.

I.1.2 RAE Systems Mini Rae 2000 PID

Like the OVA, the photoionization detector (PID) operates on the basis of ionization of the contaminant, which results in a meter deflection proportional to the concentration of the contaminant. In the PID, ionization is caused by a UV light source. The strength of the UV, measured in electron volts (eV), determines which contaminants can be ionized.

I.1.3 Data RAM - Model PDR-1000

This instrument measures concentrations of dust, smoke, mist, and fumes in applications such as remediation-site worker and personal exposure monitoring. The unit's range is 0.001 to 400 mg/m^3, and in addition calculates average, maximum, and STEL values. Calibration and maintenance will be performed in accordance with the manufacturer's instructions.

I.1.4 Calibration Information

<u>MiniRAE 2000</u>

- The detection limits for the calibrated instrument are going to be 0.0 ppm to 100.0 ppm.
- The calibration gas to be used is 100 ppm Isobutylene.
- The lamp for this unit is a 10.6 eV Lamp.
- The calibration method will be a two-point process using "fresh air" and the Isobutylene 100 ppm gas (span gas). First a "fresh air" calibration, which contains no detectable VOC (0.0 ppm), is used to set the zero point for the sensor. Then a standard reference gas (Isobutylene) that contains a known concentration of a given gas is used to set the second point of reference.
- Calibrate daily with a calibration check twice daily and recalibration if out of calibration.

Jerome 411 MVA

- Detection limits are 0.000 ppm to 0.999 ppm.
- Stable gold film sensor, which is highly selective to the compound measured.
- Perform self calibration per manufacturers instructions.
- Calibrate daily with a calibration check twice daily and recalibration if out of calibration.

DataRAM Model PDR-1000

- Detection limits are 0.001 to 400 mg/m^3.
- Perform self calibration per manufacturer's instructions.
- Calibrate daily with a calibration check twice daily and recalibration if out of calibration.

APPENDIX J

VISITORS LOG AND SIGNATURE FORM

VISITOR LOG AND SIGNATURE FORM
FORMER TAYLOR INSTRUMENTS FACILITY

NOTICE: The purpose of this form is to ensure that visitors to the Former Taylor Instruments Facility property are aware that construction and other activities are taking place and as a result, health and safety hazards potentially exist at the site. The primary methods used to inform visitors of potential hazards are: 1) each visitor must review the *Safety Information and Procedures for Visitors to the Former Taylor Instruments Facility* and, 2) an HLA representative or contractor familiar with the site and potential hazards will deliver a short safety briefing prior to your entering the site. To ensure this is done for your visit, please complete this form and return it to your escort.

General Information

Name. ______________________________

Affiliation: ______________________________

Date(s) of visit: ______________________________

Purpose of visit: ______________________________

Site area(s) to be visited: ______________________________

Planned activities: ______________________________

Escort's name: ______________________________

Additional Hazard Information

Nature/locations of active operations:

Summary of other potential hazards not discussed in *Safety Information and Procedures*:

Signature

"I have read and understand the Safety Information and Procedures for Visitors to the Former Taylor Instruments Facility, and have been briefed by Harding Lawson Associates representative on potential health and safety hazards. During my visit I agree to abide by the Safety Procedures and will follow direction provided by my escort".

Signature: ______________________________ Date: ______________

SAFETY INFORMATION AND PROCEDURES FOR VISITORS TO FORMER TAYLOR INSTRUMENTS FACILITY

Welcome to the Former Taylor Instruments Facility. You must be aware that this site may contain potential health and safety hazards related to general site conditions, construction activities, or chemicals. The information and procedures provided herein are designed to ensure your visit to the site is a safe one.

Potential Health and Safety Hazards:

1. Ongoing activities such as contaminated soil excavation or environmental sampling may present hazards. Active work areas may or may not be marked with caution tape or other devices.

Safety Procedures:

The following must be observed by all visitors to the Former Taylor Instruments Facility.

1. Personal protective equipment is required when entering or touring the site for any reason:

   - Hard hat
   - Suitable footwear (no open-toed shoes, no sneakers or tennis shoes; steel-toed shoes are preferred)

   Based on your specific activity while at the site, other safety equipment may be required.

2. Before entering the site, you must be briefed by an HLA representative or contractor on the hazards specific to the areas you will visit or your planned activities. The briefing will include a description of hazards in the areas you will visit; review of Material Safety Data Sheets (MSDSs) for chemicals of concern; a discussion of current activities occurring on the site; and instructions on how to avoid potential health and safety hazards. **It is critical that you pay close attention to the information and instructions provided during this briefing.** The individual providing the briefing will be happy to respond to any questions or concerns you may have.

3. Each visitor or group will be provided with an escort who is familiar with the site and potential hazards. **Visitors must remain with the escort's sight and follow his/her instructions at all times, unless specifically authorized otherwise.** Do not enter any room or area of the site or otherwise move about on your own unless authorized to do so.

4. Do not approach or interfere with site operations or the persons engaged in them (including talking) **for any reason**, unless specifically authorized to do so by your escort. Doing so may pose a hazard to you, or them.

5. In the event you encounter whap appears to an abnormal or dangerous situation, report it immediately to your escort or other HLA representative or contractor. Do not attempt to take corrective action on your own.

6. Do not operate or attempt to operate any equipment or machinery of any type.

7. Do not handle or attempt to handle chemicals or potentially hazardous materials of any type, or handle building materials or other substances from areas which your escort indicates may contain hazardous materials.

8. Smoking, eating and drinking are permitted only in the vicinity of the field trailers.

9. Small children or pets are not allowed on the site.

APPENDIX K

DECONTAMINATION

K DECONTAMINATION

K.1 PERSONNEL DECONTAMINATION

Decontamination procedures are followed by all personnel leaving hazardous waste sites. Under no circumstances (except emergency evacuation) will personnel be allowed to leave the exclusion and contaminant reduction zones prior to decontamination. Generalized procedures for removal of Levels B, C, and D PPE are as follows:

Level B Decontamination		
Station 1	Equipment drop	Deposit equipment used on site (tools, sampling devices and containers, monitoring instruments, radios, clipboard, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross-contamination. During hot weather operations, cool-down station may be set up within this area.
Station 2	Outer garment, boots, and gloves wash and rinse	Scrub outer boots, outer gloves and chemical-resistant splash suit with decontamination solution or detergent water. Rinse off using copious amounts of water.
Station 3	Outer boot and glove removal	Remove outer boots and gloves. Deposit in container with plastic liner.
Station 4	Tank change	If worker leaves EZ to change air tank, this is the last step in the decontamination procedure. Worker's air tank is exchanged, new outer gloves and boot covers donned, joints taped, and worker returns to duty.
Station 5	Boots, gloves, and outer garment removal	Boots, chemical-resistant splash suit, inner gloves removed and deposited in separate containers lined with plastic.
Station 6	SCBA removal	SCBA backpack and facepiece are removed. Avoid touching face with fingers. SCBA deposited on plastic sheets.
Station 7	Field wash	Hands and face are thoroughly washed. Shower as soon as possible.

Level C Decontamination		
Station 1	Equipment drop	Deposit equipment used on site (tools, sampling devices and containers, monitoring instruments, radios, clipboard, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross-contamination. During hot weather operations, cool-down station may be set up within this area.
Station 2	Outer garment, boots, and gloves wash and rinse	Scrub outer boots, outer gloves, and chemical-resistant splash suit with decontamination solution or detergent water. Rinse off using copious amounts of water.
Station 3	Outer boot and glove removal	Remove outer boots and gloves. Deposit in container with plastic liner.
Station 4	Tank change	If worker leaves EZ to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot covers donned, joints taped, and worker returns to duty.
Station 5	Boots, gloves, and outer garment removal	Boots, chemical-resistant splash suit, inner gloves removed and deposited in separate containers lined with plastic
Station 6	SCBA removal	Facepiece are removed. Avoid touching face with fingers. Facepiece deposited on plastic sheets.
Station 7	Field wash	Hands and face are thoroughly washed. Shower as soon as possible.

Level D Decontamination		
Station 1	Equipment drop	Deposit equipment used on site (tools, sampling devices and containers, monitoring instruments, radios, clipboard, etc.) on plastic drop cloths. Segregation at the drop reduces the probability of cross-contamination. During hot weather operations, cool-down station may be set up within this area.
Station 2	Outer garment, boots, and gloves wash and rinse	Scrub outer boots, outer gloves, and chemical-resistant splash suit with decontamination solution or detergent water. Rinse off using copious amounts of water.
Station 3	Outer boot and glove removal	Remove outer boots and gloves. Deposit in container with plastic liner.
Station 4	Boots, gloves, and outer garment removal	Boots, chemical-resistant splash suit, inner gloves removed and deposited in separate containers lined with plastic.
Station 5	Field wash	Hands and face are thoroughly washed. Shower as soon as possible.

K.2 RESPIRATOR DECONTAMINATION

Respirators will be decontaminated daily and taken from the drop area. The masks will be disassembled, the cartridges set aside, and all other parts placed in a cleansing solution. Parts will be pre-coded (e.g., #1 on all parts of Mask #1). After an appropriate time in the solution, the parts will be removed and rinsed with tap water. Old cartridges will be marked to indicate length of use (i.e., if it is possible to evaluate the remaining utility of the cartridge), or discarded in the contaminated trash container for disposal. In the morning, the masks will be reassembled and new cartridges installed, if appropriate. Personnel will inspect their own masks and readjust the straps for proper fit.

K.3 SMALL EQUIPMENT DECONTAMINATION

Small equipment will be protected from contamination as much as possible by draping, masking, or otherwise covering the instruments with plastic (to the extent feasible), without hindering operation of the unit. For example, the PI meter can be placed in a clear plastic bag to allow for reading the scale and operating the knobs. The PI meter can be partially wrapped, keeping the sensor tip and discharge port clear.

The contaminated equipment will be taken from the drop area and the protective coverings will be removed and disposed of in appropriate containers. Any dirt or obvious contamination will be brushed or wiped with a disposable paper wipe. The units can then be taken inside in a clean plastic tub, wiped off with damp disposable wipes, and dried. The units will be checked, standardized, and recharged as necessary for the next day's operation, and then prepared with new protective coverings.

K.4 HEAVY EQUIPMENT DECONTAMINATION

It is anticipated that drilling rigs and backhoes will become contaminated during borehole and test-pitting activities. They will be cleaned with high-pressure water or steam, followed by a soap and water wash and rinse. Loose material will be removed with a brush. The person performing this activity will usually be at least at the level of protection used during the personnel and monitoring equipment decontamination.

K.5 DISPOSAL OF DECONTAMINATED MATERIALS

All protective gear, decontamination fluids (for both personnel and equipment), and other disposable materials will be disposed of at each site.

Decontamination fluids identified to be contaminated by site contaminants (i.e., Liqui-nox, used to decontaminate sampling equipment such as split spoons and groundwater sampling pumps) will be stored in DOT-approved 55-gallon drums. Contaminated disposable materials (e.g., gloves and Tyveks) will be double-bagged and stored as is, or placed in DOT-approved 55-gallon drums.

APPENDIX J

OFF-SITE GROUNDWATER MONITORING PLAN
(PREPARED BY SYBRON)

WORK PLAN FOR ASSESSMENT OF OFF-SITE GROUNDWATER CONDITIONS
TAYLOR INSTRUMENTS SITE
VCA INDEX #B8-0508-97-02
95 AMES STREET
ROCHESTER, NEW YORK

By:

Haley & Aldrich of New York
Rochester, New York

For:

New York State Department of Environmental Conservation
Avon, New York

File No. 70600-001
Revised December 1999

HALEY & ALDRICH

UNDERGROUND
ENGINEERING &
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22 December 1999
File No. 70600-001

Mr. David G. Pratt, P.E.
NYS Department of Environmental Conservation
Division of Environmental Remediation, Region 8
6274 East Avon-Lima Road
Avon, New York 14414-9519

Subject: Revised Work Plan
Assessment of Off-Site Groundwater Conditions
Taylor Instruments - VCA Index #B8-0508-97-02
Rochester, New York

Dear Mr. Pratt:

Haley & Aldrich of New York is pleased to submit this letter on behalf of Sybron International Corporation (Sybron) responding to the Department's comments on the Off-Site Groundwater Assessment Work Plan for the Taylor Instruments property dated September 21, 1999. The Department's comments were provided in a December 1, 1999 letter to Ricky A. Ryan, P.E. of Harding Lawson Associates, consultant for Combustion Engineering (C-E).

Sybron's response to these comments pertain solely to off-site matters in accordance with the settlement agreement between C-E and Sybron wherein C-E has retained responsibility for on-site work and Sybron has assumed responsibility for off-site work associated with the Taylor Instruments property. The work plan has been revised reflecting the Department's comments on off-site groundwater as numbered 22 through 31 in your letter. Our responses and work plan revisions are summarized below and the revised Work Plan for Assessment of Off-Site Groundwater Conditions enclosed herewith.

Comment #22: Page 3 – The work plan states that DEC will be informed if significant adjustments to any of the proposed well locations are required. Any change in proposed well locations must involve the Department's concurrence prior to implementation.

Response: The second paragraph on page 3 is revised to clarify that any changes in proposed well locations will not occur without the Department's concurrence prior to implementation.

Comment #23: Page 5 – Bentonite pellets should be used instead of bentonite slurry for the seal above the sand pack. No specification is given for the amount of water to be included in the grout mix. No more than 7 gallons of water should be used per 94 pound bag of Portland cement.

Response: Item #2 in Section 3.2 is revised to indicate that bentonite clay pellets will be placed above the sand pack and hydrated. and that the Portland cement-bentonite grout will be mixed using 6.5 gallons of water per 94 pound bag of Portland cement and 4 percent by weight granular bentonite.

Comment #24: The amount of water lost during drilling (bedrock wells) should be recorded and at least that amount should be removed during development.

Response: Item #5 in Section 3.1 is added to indicate that the approximate amount of water lost during rock coring will be recorded on the drilling logs and at least an equal amount of water will be recovered during well development.

Comment #25: Table 1 - Please use ASP methods w/category B deliverables not SWP-846 methods. This is critical for the off-site investigation where there are sensitive receptors and contaminant concentrations are presumably lower.

Response: Section 3.4 is revised to indicate that groundwater analyses will be performed using ASP methods with Category B deliverables at least for the initial sampling event. Table 1 is also revised reflecting ASP methods. The need for ASP methods in subsequent sampling events will be evaluated with the Department based on the initial sampling results.

Comment #26: Well locations - A well cluster should be installed as near as possible to soil gas sampling point SGV-7. It seems reasonable to substitute this location for the proposed location at the end of Gerling Place. A well cluster should also be installed at soil gas sampling locations SGV-6. This location should be in addition to the location proposed by Zena and Chester Streets. These suggestions are based solely on the soil gas data since the on-site groundwater (bedrock) flow direction has not yet been determined. Additional wells may be needed to address this issue.

Response: The text of the work plan (pages 1 and 3) and Figure 1 are revised consistent with this comment. The proposed well cluster location at the end of Gerling Place is eliminated and substituted by a new well cluster near the former SGV-7 sample location. An additional well cluster is added in proximity to the former SGV-6 sample location. The revised work plan includes the installation of a total of four well clusters.

Comment #27: Each of the well clusters should include deeper bedrock well in addition to the wells proposed. This is important because: 1) the TCE is a dense phase contaminant; 2) very high TCE concentrations are present on-site in the deepest bedrock layer (27000 ppb at BR-4) yet encountered; and, 3) the TCE concentrations present in on-site groundwater clearly indicate the presence of DNAPL (Pankow and Cherry, 1996, pages 454-459).

Response: Bedrock under the Taylor property is the Lockport dolomite formation. Groundwater yield in the Lockport is mostly a function of fracture density, which tends to be most prevalent in the upper layers of the bedrock due to glacial loading and Pleistocene freeze-thaw events. Groundwater yields within the Lockport typically decrease with depth due to physical compaction of joints and bedding planes under the rock mass. Haley & Aldrich anticipates that if a dissolved-VOC plume is present in the offsite groundwater, it is more likely to be found in the transmissive upper bedrock zone and that the proposed shallow-bedrock wells are appropriate for identifying the presence or absence of an offsite plume. Haley & Aldrich proposes to evaluate the need for deeper bedrock based on the findings of the initial investigation results. If a plume were found in one or more of the shallow bedrock wells, Sybron would consider installing one or two deep bedrock wells and packer testing. However, from a risk standpoint, deep-bedrock groundwater is not likely to pose a threat to the public at this site.

Comment #28: It is imperative that collection of water level data be coordinated for off-site and on-site wells so that the data are more meaningful. All water level information should be collected contemporaneously prior to purging for water quality sampling. A water level contour map should be produced from this data for each hydro-stratigraphic interval. Quarterly water levels should be obtained for at least the first two years in order to ensure samples are obtained during both high and low water level conditions.

Response: Sybron agrees with the points raised in the Department's comment. Accordingly, Section 3.4 of the work plan is revised as follows:

- Water level measurements - Haley & Aldrich will coordinate water level monitoring events with C-E to facilitate the collection of on-site and off-site water levels at the same time.
- Water level contour map - Offsite well locations and water level data will be forwarded to C-E for integration into the site-wide groundwater contour maps. We currently anticipate providing data for the overburden and upper-bedrock hydrostratigraphic zones.
- Quarterly water levels - As requested by the Department, water level measurements will be obtained quarterly for the first two-years.

Comment #29: The flow zones within bedrock should be identified using packer testing. Well completions should be within the identified flow zones.

Response: Packer testing is not planned for the shallow bedrock well installations because all of the shallow bedrock wells are likely to yield groundwater without the need for identifying and screening discrete flow zones. If deeper wells are deemed necessary, packer testing may be appropriate and will be performed during drilling of any deep wells to identify flow zones. Procedures for deeper bedrock installations will be provided to the Department prior to the implementation.

Comment #30: a. Air Monitoring - The reference to monitoring at the perimeter is confusing. Where is the site perimeter defined. b. A community air monitoring plan must be provided.

Response: The Health & Safety Plan contained in Appendix A of the work plan is revised to clarify the air monitoring procedures that will be conducted during the well drilling and water-quality sampling, including community air monitoring. In Sybron's opinion, it is highly unlikely that hazardous levels of airborne contaminants will be encountered during drilling or water-quality sampling in the offsite areas. Nevertheless, the Health & Safety Plan includes periodic air monitoring of the work area and the work-area perimeter during any off-site subsurface investigations. Sybron acknowledges the importance of protecting the public from airborne contaminants and physical hazards. The work-zone perimeter at each exploration location will be clearly marked with cones and caution tape. Ambient air readings will be obtained with hand-held meters such as a MiniRae photoionization detector, or equivalent real time measuring devices. A sequential log of all readings and non-detects with the dates, times, and locations will be kept by the field inspectors.

Comment #31: We wish to make clear that the data generated by this study may necessitate additional investigative work.

Response: The need for additional investigative work for assessment of off-site groundwater conditions will be evaluated with the Department in light of the results of initial investigations and the stated objectives identified in the work plan.

In closing, we note that in the Department's Comment #2, that the Department has requested C-E to change the cleanup goal for VOCs in groundwater (under the VCA, C-E agreed to achieve Class GA groundwater standards at the Site property boundary) to apply both On-Site and Off-Site. Sybron reserves the right to comment on Department Comment #2 until after Sybron reviews C-E's response to Comment #2 and any other subsequent communications between the Department and C-E on this matter. Sybron has submitted the Off-Site groundwater assessment work plan with the understanding that the groundwater cleanup goal for the Site is to achieve Class GA groundwater standards at the Taylor Site property boundary. As stated in our work plan, the objectives of the Off-Site assessment are to: quantify the levels of Site-related VOCs in overburden and bedrock groundwater downgradient from the Site; and to evaluate the information obtained in the context of human health risk.

Thank you for the Department's quick response to the work plans submitted. We appreciate your continued interest in this important project and acknowledge the Department's cooperation in evaluating the two work plans. To streamline our communication, please include my name and Mr. Peter Reckmeyer, Counsel for Sybron on the copy list for future Department correspondence. Mr. Reckmeyer's mailing address is: Sybron Laboratory Products Corporation, 10 Pleasant Street, Portsmouth, New Hampshire 03801. Should there be any questions, please feel free to call me at (716) 327-5536.

Sincerely yours,
HALEY & ALDRICH OF NEW YORK

Edward L. Hynes
Vice President

Enclosures: Revised Work Plan (4 copies, NYSDEC Avon)

C: NYSDEC, James D. Charles, Esq. (w/enc.)
NYSDOH, G. Anders Carlson (w/enc.)
NYSDOH, David Napier (w/enc.)
MCHD, Joseph Albert (w/enc.)
Nixon Peabody, Libby Ford (w/enc.)
Harding Lawson Associates, Ricky Ryan (w/enc.)
Sybron International Corporation
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I. INTRODUCTION

This Work Plan presents the details to conduct an assessment of off-site groundwater conditions at the Taylor Instruments Site located at 95 Ames Street in Rochester, New York. This Work Plan has been developed in response to requests made by the New York State Department of Environmental Conservation (NYSDEC), and the New York State Health Department (NYSDOH), for additional assessment of off-site groundwater conditions at the Taylor Instruments Site, ultimately to confirm there continues to be no threat to human health. This assessment will build upon the results of prior investigations conducted that have indicated the lack of any human health risk from the Taylor Instruments Site.

The Assessment as herein described includes the installation of clusters of monitoring wells to assess conditions in the overburden and bedrock groundwater regimes downgradient of the Taylor Instruments Site. The wells will be sampled and analyzed for the volatile organic compounds (VOCs) that have been identified as the compounds of concern in groundwater on the Taylor Instruments Site. The specific objectives identified for this groundwater assessment are to:

1. Quantify the levels of any site-related VOCs that are present in overburden and bedrock groundwater downgradient from the Taylor Instruments Site.

2. Evaluate the potential for complete residential exposure pathways based upon VOC analytical results, depth to groundwater and proximity of residential areas to areas of off-site VOC groundwater contamination from the Taylor Instruments Site.

Based on the investigations performed on the Taylor Instruments Site and our understanding of the local geology, four hydrogeologically downgradient well clusters will be installed at positions north and east of the Taylor Instruments Site.

This investigation program will be undertaken as part of the remedial action program for the Taylor Instruments Site. Pursuant to a Voluntary Cleanup Agreement (VCA) between Combustion Engineering (CE) and the NYSDEC, CE agreed to perform work within the property boundaries of the Taylor Instruments Site ("on-site work") and outside of the property boundaries of the Taylor Instruments Site ("off-site work") to remediate contamination at or from the Taylor Instruments Site. In a settlement agreement between CE and Sybron International Corporation ("Sybron"), CE has retained responsibility for and control of any on-site work, and Sybron has assumed responsibility for and control of any off-site work. Sybron has retained Haley & Aldrich of New York to perform the off-site work on behalf of Sybron. Accordingly, this Work Plan will be implemented under the direction of Haley & Aldrich of New York on behalf of Sybron.

The following sections of this Work Plan provide a summary of hydrogeologic conditions at the Taylor Instruments Site, technical scope of work and data assessment procedures, and the proposed schedule and reporting of findings. This Work Plan is appended by supporting information including a project Health & Safety Plan developed pursuant to OSHA 1910.120 regulations and detailed specifications and procedures for groundwater well installation and sampling.

II. SITE HYDROGEOLOGY

Hydrogeologic conditions at the Taylor Instruments Site have been described based upon the results of the subsurface investigation programs as documented in the Final Investigation Report (FIR) for the Taylor Instruments Site (Harding Lawson Associates, March 1999). It is anticipated that similar hydrogeologic conditions will exist within the areas near the Taylor Instruments Site included within the scope of this off-site investigation program.

The geologic conditions at the Taylor Instruments Site include unconsolidated overburden glacial till deposits overlying bedrock ranging from 14 to 30 feet in thickness. The bedrock underlying the site has been mapped as the Lockport dolomite. Regionally, this formation consists of flat to gently-dipping medium to thick bedded fine-grained dolomite with interbedded shales. Bedrock at the site is characterized as light gray dolomite with fine-grained texture and horizontal and low angle joints or fractures.

Groundwater is present within the overburden and in the underlying fractured bedrock beneath the site. Based on measurements collected during Taylor Instruments Site investigations groundwater flow is generally towards the north and northeast consistent with regional groundwater flow in the vicinity of the site.

III. SCOPE OF WORK

The proposed scope of work includes installation of a total of four clusters of monitoring wells each consisting of two wells, one of which will be installed in overburden, and one installed in bedrock. These well clusters will be installed at the approximate locations north and east of the Taylor Instruments Site as shown on Figure 1. These proposed locations are situated in a hydraulically downgradient direction of the Taylor Instruments Site based on the investigations as documented in the FIR. Well locations are generally situated between the Taylor Instruments Site and the nearest off-site residential areas and at certain other locations requested by NYSDEC.

The wells will be placed within roadways and public rights-of-way to the extent possible in accordance with access permits that will be obtained from the City of Rochester, and other agencies as required. The actual locations of the wells will be determined in the field and may vary from the locations shown on Figure 1 based on accessibility, utility clearance, landowner permission, and other factors. It is anticipated that well cluster #OS-4 as identified on Figure 1 will require access onto private property, therefore the installation of this well cluster may or may not be possible. If this or any of the other well locations need to be moved, the new locations will be reviewed and agreed upon with NYSDEC in advance. NYSDEC will be informed at least one week before the start of the drilling program.

The well clusters will be used to identify groundwater flow conditions and to collect samples to assess groundwater quality in overburden and bedrock at the sampling locations. Each cluster will consist of an overburden well screened across the water table, and a bedrock well with an open monitoring interval of 2.0 to 12.0 ft. below the top of bedrock or at a greater interval based on bedrock groundwater conditions observed during the drilling program.

The subsurface exploratory borings will be completed using standard rotary drilling equipment and techniques. A truck mounted rotary drill rig capable of performing both the soil boring and bedrock well installation will be utilized during the investigative program. Auger cuttings and other subsurface materials generated during the drilling program will be containerized for characterization and appropriate disposition following the drilling program.

Field work will be conducted in accordance with the Health and Safety Plan contained in Appendix A. The drilling and well installation program is summarized below based upon the detailed procedures presented in Appendix B. Groundwater sampling will be conducted following the procedures summarized below and as described in detail in Appendix C. Test boring logs, well construction reports and sampling records will be prepared by the site geologist and will be presented in the report summarizing the offsite investigative program.

3.1 Bedrock Groundwater Well Installation

The bedrock well in each cluster will be installed first in the series of wells to be installed in order to characterize the stratigraphy and to screen soils for the potential presence of VOCs. The initial boring will be conducted by advancing 6-1/4-in. I.D. hollow stem augers to the top of bedrock using continuous split-spoon soil sampling methods in accordance with ASTM procedure D1586-84. The continuous split-spoon samples will enable the characterization and identification of overburden soil conditions at the site, and the approximate depths to water in the soil overburden. Potential confining layers in the overburden will be evaluated. The soil samples will be contained in sealed containers and will be headspace screened for total VOCs using a photoionization organic vapor detector. Results of the VOC screening will be documented on the boring logs.

Bedrock monitoring wells will be completed to enable the discrete sampling of groundwater in bedrock. These wells will be installed in a manner that will prevent hydraulic communication with the overburden using the following procedure:

1. Upon auger refusal the augers will be removed, and a temporary 6-in. I.D. steel casing will be installed to the top-of-bedrock.

2. An NX core barrel will be advanced 2 ft. into the top of bedrock, and the core hole reamed using a 5-7/8-in. nominal roller bit.

3. A 4-in. I.D. steel casing will be installed to the full depth of the borehole, the temporary casing removed, and the casing grouted in place with Portland cement-bentonite grout mixture containing 4% granular bentonite and 2% calcium chloride by weight and no more than 7 gallons of water per 94-lb sack of cement. Based on the Halliburton Cementing Tables (1981) such a mixture will approach a compressive strength of 500 psi over a 12-hour timespan. The grout will be placed using the Halliburton method by injecting the grout mixture through the inside of the well casing and displacing the grout out into the casing/borehole annulus using water pressure. Sufficient grout volumes will be calculated for the full annular space of the cased boreholes. Grout return at the ground surface will be verified such that the entire cased borehole annulus will be grout filled. Water pressure inside the well casing will be maintained by means of a swedge-valve at the top of the casing until such time as the grout has set. The grout seal will be allowed to cure for a minimum of 12 hours prior to coring the bedrock wells.

4. Following the 12-hour grout curing time, the swedge-valve will be removed, a 3-7/8 in. nominal rollerbit will be used to clean the casing to its full depth, and a 10 ft. long open NX corehole will be drilled into bedrock below the bottom of the well casing. Following completion of the coring interval, drilling water and groundwater from the well casing and corehole will be evacuated (if possible) and recovery will be monitored. If there is no groundwater yield from the core interval, successive 10 foot core intervals will be advanced. The open NX core hole will serve as the monitoring interval. Rock Quality Designation (RQD) evaluation will be made for the full depth bedrock core samples, and any bedrock fractures intercepted by the core borings will be noted on the drilling logs.

5. At each bedrock well, the volume of water lost during bedrock drilling (if any) will be estimated and recorded on the drilling logs, and at least an equal volume of water will be recovered from the well during well development.

6. A lockable steel protective surface casing or sealed steel roadway box will be installed at the ground surface, with a concrete apron to direct surface water away from the well.

3.2 Overburden Groundwater Well Installation

The overburden wells in each well cluster will be drilled within approximately 5 ft. laterally form the bedrock wells using 4-1/4 in. I.D. hollow stem auger flights. The overburden wells will be installed following the installation of the bedrock well at each well cluster location. The auger flights will be advanced to a depth of approximately 6 ft. below the depth to water determined during drilling of the adjacent bedrock well. Water level measurements will be taken in the augers during drilling of both the bedrock and overburden wells in order to determine the water table depth.

Overburden wells will be installed using the following procedures:

1. A 10 ft. long by 2 in. I.D. Schedule 40 factory slotted PVC well screen will be placed in the borehole to intercept the water table surface and a sand pack installed consisting of Morie #00N silica sand. The borehole annulus across the entire well screen will be sandpacked to 1 ft. above the top of the well screen. The auger flights will be slowly withdrawn as the sandpack is installed to prevent native soils falling into contact with the well screen.

2. A 2-ft. thick layer of bentonite clay pellets will be placed above the sandpack and hydrated with potable water. The remainder of the borehole annulus will then be grouted with Portland cement-bentonite grout mixture containing 4% granular bentonite by weight and 6.5 gallons of water per 94-lb bag of cement.

3. A lockable steel protective surface or sealed steel roadway box casing will be installed at the ground surface, with a concrete apron to direct surface water away from the well.

3.3 Well Elevation Control

Elevations at ground surface, top of the inner casing and top of outer casing will be established at each well location by a NYS licensed surveyor based on the National Geodetic Vertical Datum. Well locations will be determined based upon tape measurements from fixed features identified in the field. Well elevation and locations will be placed on a base plan of the area.

3.4 Groundwater Sampling and Analysis

Each monitoring well will be developed prior to sampling by bailing or pumping until the development water is relatively free of sediment. As described in Section 3.1, the volume of water removed during development will be greater than the amount of water lost during bedrock drilling (if any). All wells will be developed concurrently and development water will be pumped to a single tank truck or several 55-gallon drums for characterization and appropriate disposition. Well development records of the dates and total gallons removed from each well will be kept by the site geologist.

Groundwater level measurements from the newly installed offsite monitoring wells will be collected following installation and development, and prior to sampling to allow interpretation of groundwater flow directions. The sampling event will be conducted at least two weeks after the completion of the well installation and development activities to allow sufficient time for the wells to equilibrate. Haley & Aldrich will coordinate the dates for collecting the water-level measurements to coincide with measurements from the onsite wells being monitored by C-E. The offsite well locations, survey control data, and water-level measurement data will be forwarded to C-E for integration into the site-wide groundwater contour maps. Haley & Aldrich currently anticipates providing data for the overburden and upper-bedrock hydrostratigraphic zones. Measurements of the static groundwater levels in each offsite well will be obtained quarterly for two years. Following the two years, the frequency of water level monitoring will be revised with NYSDEC concurrence.

Following the installation of wells, an initial sampling event will be conducted to assess groundwater quality conditions. After water level measurements are obtained each well will be sampled by purging a minimum of three well volumes prior to sample collection. A dedicated polyethylene bailer or decontaminated pumping system will be used to purge each well and a dedicated polyethylene bailer will be used to collect the groundwater samples following the procedures described in Appendix C. The groundwater samples will be labeled and placed in an iced cooler upon collection, managed under standard chain-of-custody procedures, and submitted to Columbia Analytical Services (CAS) laboratory in Rochester, New York within 24 hours of collection.

CAS will analyze the groundwater samples for volatile organic compounds by NYSDEC CLP-ASP Method 95-1 (certified laboratory program Analytical Services Protocol) with category B deliverables. Each sample batch will include a trip blank and one matrix spike/matrix spike duplicate. The sampling and analytical protocols are summarized on Table 1. The scope and analytical procedures for subsequent sampling events will be determined based upon the initial sampling results with the concurrence of NYSDEC.

IV. DATA ASSESSMENT PROCEDURES

Data Assessment of data will be conducted as verification that the data obtained are valid and appropriate for use in evaluation of groundwater conditions at the Taylor Instruments Site. Sample data and Quality assurance (QA) and quality control (QC) will be implemented by analysis of field and laboratory quality control samples and evaluation of a laboratory analytical deliverables that will contain the following information:

☐ Blanks - Trip blanks and Method blanks
☐ Instrument tunings
☐ Calibration Standards
☐ Calibration Verifications
☐ Surrogate Recoveries
☐ Laboratory Controls
☐ Holding Times
☐ Correct Data Qualifiers
☐ Raw Sample Data

The QA/QC data and raw laboratory sample data will be reviewed and reported, following guidelines listed in NYSDEC, Division of Environmental Remediation, Guidance for the Development of Quality Assurance Plans and Data Usability Summary Reports (DUSR). Haley & Aldrich will evaluate the laboratory groundwater analytical data using appropriately qualified personnel as specified in the DUSR Guidelines.

V. WORK SCHEDULE AND REPORTING

This project is anticipated to be completed during a single mobilization lasting approximately two to three weeks. Laboratory analytical results will be obtained within approximately six to eight weeks and the investigation report prepared in about four weeks from receipt of receipt of the analytical report. The total project duration is anticipated to be approximately 12 to 15 weeks. Haley & Aldrich will provide the NYSDEC with at least five working days notice prior to commencement of field activities.

The results of the investigation will be documented in a report to be submitted to NYSDEC and DOH. The report will provide a description of the drilling program results including geology and hydrologic conditions, interpretations on groundwater depth and flow direction, field screening observations and an evaluation of the groundwater quality data obtained. To the extent that VOCs are detected in groundwater, an assessment will be made of detected substances and concentrations relative to on-site groundwater conditions as documented in the FIR and in subsequent monitoring programs conducted at the Taylor Instruments Site. The report will also provide an evaluation of likelihood that exposure pathways could exist off-site based on sampling results, depths of groundwater, proximity to residential areas and other factors as appropriate.

The report will contain tables as appropriate to summarize data results and a figure showing well locations and other pertinent information. The report will include appendices with the test boring and core boring reports, well installation and groundwater measurement forms, groundwater sampling records and chain-of-custody forms, the laboratory analytical report and data assessment summary.

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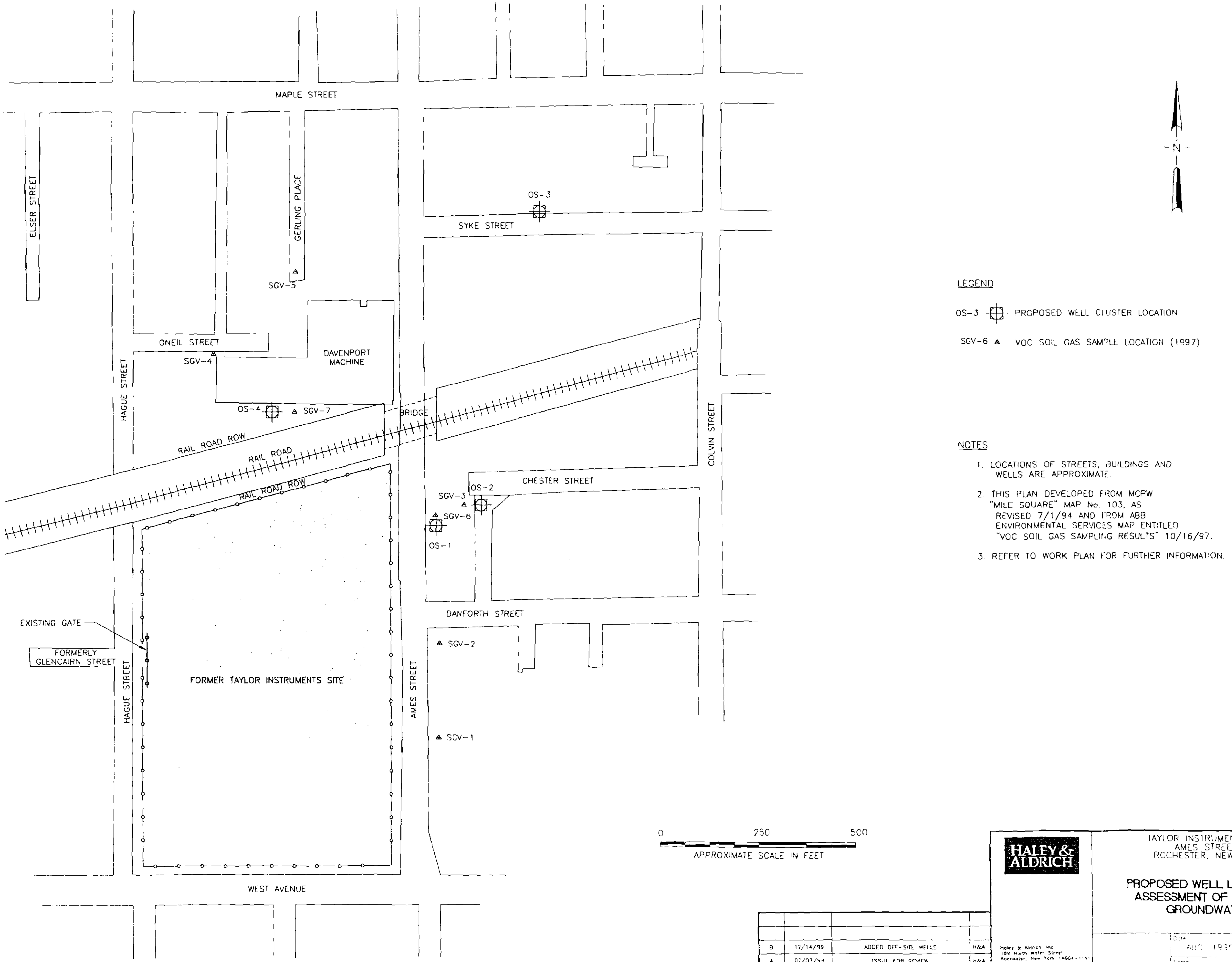

LEGEND

OS-3 ⌖ PROPOSED WELL CLUSTER LOCATION

SGV-6 ▵ VOC SOIL GAS SAMPLE LOCATION (1997)

NOTES

1. LOCATIONS OF STREETS, BUILDINGS AND WELLS ARE APPROXIMATE.
2. THIS PLAN DEVELOPED FROM MCPW "MILE SQUARE" MAP No. 103, AS REVISED 7/1/94 AND FROM ABB ENVIRONMENTAL SERVICES MAP ENTITLED "VOC SOIL GAS SAMPLING RESULTS" 10/16/97.
3. REFER TO WORK PLAN FOR FURTHER INFORMATION.

ISSUE	DATE	REVISIONS	BY
B	12/14/99	ADDED OFF-SITE WELLS	H&A
A	07/07/99	ISSUE FOR REVIEW	H&A

HALEY & ALDRICH

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TAYLOR INSTRUMENTS SITE
AMES STREET
ROCHESTER, NEW YORK

PROPOSED WELL LOCATIONS ASSESSMENT OF OFF-SITE GROUNDWATER

Date: AUG 1999
File No: 70600-001
Scale: AS SHOWN
Filename: WELLOCB.DWG
Project Engineer: WCH/ELH
Designed By: H&A
Drawn By: RLWI
Checked By: WCH/ELH
Sheet No: 1 of 2
Drawing No: 1
Issue: B

70600-001 WELLOCB.DWG

- ☐ If you are on the ground, stay away from rig and do not let others get near the vehicle. Seek assistance immediately by calling the local emergency services contact. Emergency phone numbers are listed on page 3 of this HSP.

EXCAVATION AND TRENCHING SAFETY

General Excavation and Trenching Safety

The following is a list of minimum requirements for trenching and excavating. Each excavation/trench/shoring project is different, therefore the Contractor/Consultant Project Manager is responsible for evaluating site specific conditions and making appropriate provisions in the task-specific health and safety requirements in conformance with 29 CFR 1926 Subpart P - Excavations.

- ☐ Contact the proper utilities to obtain clearance. Prior to work, review the utilities in the area and be sure they have been staked properly. Before work begins, a Safe Work Permit must be obtained from the Client/Site manager of Operations Safety Representative.
- ☐ Be aware that trenches and excavations deeper than four feet are considered confined spaces and require additional safety precautions, such as shoring. If an excavation exceeds four feet in depth, contact the Client or H&A Safety Representative to review the original Safe Work Permit and ensure that it is adequate.
- ☐ The walls and faces of all excavations and trenches more than four feet deep, in which an employee is exposed to danger from moving ground, will be guarded by a shoring system, sloping of the ground, or some other equivalent means. The design of shoring systems must be done by a registered Professional Engineer as per 29 CFR 1926 Subpart P.
- ☐ For excavations or trenches in which an employee may be required to enter, excavated or other material will be effectively stored and retained at least two feet or more from the edge of the excavation or trench.
- ☐ Daily inspections of excavations will be made by the Contractor/Consultant Site Coordinator. If evidence of possible cave-ins or slides is apparent, all work in the excavation will cease until the necessary precautions have been taken to safeguard employees.
- ☐ Trenches more than four feet deep will have ladders or steps located so as to require no more than 25 feet of lateral travel.
- ☐ Hard hats and other personal protective equipment will be worn at all times during any type of excavating or trenching operation.
- ☐ Determine soil composition (e.g., through soil sampling, soil maps, etc.) and other relevant site conditions, with special emphasis on conditions conducive to cave-ins.
- ☐ Monitor the atmosphere in and around trenches on a regular basis to check for explosive, toxic or otherwise dangerous gases and vapors.

- ☐ The Contractor/Consultant Project Manager will insure that all employees involved in the excavation activity have appropriate training in safe trenching practices, with emphasis on factors such as:
  - utility line identification
  - cave-in prevention measures
  - recognition of conditions which may cause cave-ins
  - means of egress from trench
- ☐ Water will not be allowed to accumulate in any excavation. Utilize ditches, dikes, pumps, or other means to keep surface water out of trenches.
- ☐ All open excavations must be well marked and barricaded.

Cave-In Hazards

The following conditions increase the likelihood of cave-in:

- ☐ Soil materials composed of unconsolidated, uncompacted, and/or rounded particles (See 29 CFR 1926 Subpart P - Excavation Standard). Special care must be used when trenching in areas which have previously been excavated and backfilled.
- ☐ Soils which have a high water content, or have been subjected to freeze-thaw or frost-heaving.
- ☐ Loading of trench walls by adjacent equipment, supplies, structures, "back-dirt" piles, etc.
- ☐ Vibration due to equipment operating near excavations.
- ☐ Trench walls that are steeper than the angle of repose of the material composing the walls.
- ☐ Deep trenches (i.e., high trench walls).

The following precautions should be used to prevent cave-ins in all trenches in excess of 4 ft. deep. These precautions should also be used in trenches less than 4 ft. deep whenever those site conditions just listed indicate the likelihood of a cave-in:

- ☐ Sloping: Trench walls should be sloped to the correct angle of repose.
- ☐ Shoring: Vertical trench walls (unless composed of solid rock) must be shored and braced, or restrained with movable trench boxes, to prevent cave-in. A registered professional engineer must design shoring systems and meet accepted engineering requirements.

PERSONAL PROTECTIVE EQUIPMENT

Protective clothing and respiratory protection help protect workers from chemical hazards. Although personal protective equipment is the least preferred method, it may be necessary if engineering controls and work practices are inadequate in preventing workers from coming in contact with potential hazards. Personal protective equipment (PPE) will be selected for the potential hazards anticipated and detailed in the task-specific health & safety requirements.

Personnel at the work site will have their own appropriate and properly fitted safety equipment and protective clothing. Safety equipment and protective clothing will be used as directed by the Contractor/Consultant Safety Officer. All such non-disposable equipment and clothing will be kept clean and maintained in proper condition. The contractors and their subcontractors will supply all PPE. Client will only provide PPE to their employees. Personnel will be trained in the use of the required protective equipment and equipment will be properly fitted.

The levels of protection to be used on-site will be based on applicable OSHA and Environmental Protection Agency (EPA) regulations, Client/site requirements, environmental sampling data, site conditions, and other factors. It will be the responsibility of the Contractor/Consultant Safety Officer to select the most effective PPE based on the anticipated hazards of the task.

Levels of Protection

The following is a description of the specific requirements of various levels of PPE in conformance with EPA nomenclature.

1. Level A Protection

   Level A provides the highest level of respiratory and skin protection. Based on site contaminants, historical sampling, and operational data, utilization of this level of protection is not anticipated. This level of protection is anticipated only in extreme situations beyond the scope of this document, (i.e., HazMat Response).

2. Level B Protection

   Level B should be worn when the highest level of respiratory protection, but a lesser level of skin protection is required. It is the minimum level of protection required to conduct initial field work with unknown or suspected hazardous materials. Once sampling data (soil, water, or air) has been collected and analyzed, the necessity of this level of protection may be re-evaluated.

   Level B Personal Protective Equipment (not limited to the following):

   ☐ Supplied-air respirator (MSHA/NIOSH approved):

      a) Pressure-demand, self-contained breathing apparatus

      or

      b) Pressure-demand, airline respirator with escape bottle.

- ☐ Chemical protective clothing: Chemically resistant to anticipated contaminants, (e.g. Saranex or polyethylene coated Tyvek, Chemrel, or Chem-Tuff).
- ☐ Gloves (outer): Chemically resistant to anticipated contaminants.
- ☐ Gloves (inner)
- ☐ Boots (outer): Chemically resistant to anticipated contaminants.
- ☐ Hard hat*
- ☐ 2-Way radio communications* (intrinsically safe).
- ☐ Joints between gloves, boots, and suit must be taped to ensure an adequate seal.

* The need for these items is dependent upon the work to be performed and will be chosen by the Contractor/Consultant Safety Officer.

3. Level C Protection

Level C protection with an air-purifying respirator should be worn routinely in an atmosphere only after the air contaminant(s) is (are) identified, concentrations measured and the criteria for wearing air-purifying respirator met. Generally, Level C provides the same level of skin protection as Level B, but a lesser degree of respiratory protection.

Level C Personal Protective Equipment:

- ☐ Air-purifying respirators, full-face, (half-face with appropriate safety glasses or goggles when potential for liquid splashes is low), canister or cartridge equipped (MSHA/NIOSH approved).
- ☐ Chemical protective clothing: Chemically resistant to anticipated contaminants, e.g. Saranex or polyethylene coated Tyvek, Chemrel, or Chem-Tuff.
- ☐ Gloves (outer): Chemically resistant to anticipated contaminants.
- ☐ Gloves (inner).
- ☐ Boots (outer): Chemically resistant to anticipated contaminants.
- ☐ Hard hat*
- ☐ 2-Way radio communications* (intrinsically safe).
- ☐ Joints between gloves, boots, and suit must be taped to ensure an adequate seal.

* The need for these items is dependent upon the work to be performed and will be chosen by the Contractor/Consultant Safety Officer.

Criteria for Selection of Level C:

Meeting all of the following criteria permits use of Level C protection:

- ☐ Oxygen concentrations not less than 19.5% or no greater than 22% by volume.
- ☐ Personnel inhalation exposure will be reduced by the respirator below the substance's Threshold Limit Value (TLV)/Permissible Exposure Limit (PEL) whichever is lowest and the concentration is within the service limit of the canister/cartridge.
- ☐ Atmospheric contaminant concentrations do not exceed IDLH levels. (See Table 1).
- ☐ Atmospheric contaminants, splashes, or other direct contact will not adversely affect any body area left unprotected by chemically resistant clothing.
- ☐ Job functions do not require self-contained breathing apparatus.
- ☐ Atmospheric contaminant concentrations are not in excess of Level C action criteria. (See Table 2).

4. Level D Protection

Level D is the minimum level of protection to be used during any site activities and does not provide respiratory or skin protection.

Level D Personnel Protective Equipment:

- ☐ Coveralls or work uniform.
- ☐ Gloves*
- ☐ Substantial leather chemical-resistant boots or shoes (steel toe and shank is highly recommended).
- ☐ ANSI Z87 safety glasses.

Chemical splash goggles*.

- ☐ Hard hat*.
- ☐ Disposable/reusable footwear covers*

* The need for these items is dependent upon the work to be performed and will be chosen by the Contractor/Consultant Safety Officer.

Criteria For Selection of Level D:

Meeting any of these criteria allows use of Level D protection:

- ☐ No contaminants are present.
- ☐ Work functions preclude splashes, immersion, or potential for unexpected inhalation of any hazardous chemicals.

Level D protection is a minimum work uniform. It can be worn only in areas where the possibility of contact with contamination is minimal.

Personal Protective Equipment (PPE) Selection

PPE selection will be based on the task and the nature of hazards (type of contaminants, duration of exposure), engineering controls, and the work practices that are anticipated. The selected equipment will provide protection from the chemicals suspected to be present and which demonstrate the potential for skin exposure. The PPE chosen for each task will be specified in the task-specific health & safety requirements.

Changes in PPE

The Contractor/Consultant Safety Officer will make the decision to upgrade or downgrade the levels of protection. The decision will be primarily based on the results of the real-time air monitoring performed during site activity.

AIR MONITORING

Air Monitoring Scope

The Contractor/Consultant Site Coordinator will ensure that periodic real-time air monitoring is conducted during site operations, and that appropriate precautions are taken to protect site workers and the public from inhalation exposures. Should any monitoring indicate concentrations in excess of established action levels, the Contractor/Consultant Site Coordinator will notify Contractor/Consultant Safety Officer and will implement appropriate action to protect project personnel, client employees, and the public.

For the Former Taylor Instruments Offsite Groundwater Investigations, any offsite work areas will be demarcated with cones and yellow caution tape, and "hard-hat area" signs. The public will be excluded from the work area. The demarcated area within the yellow caution tape is herein referred to as the "work area" or "exclusion zone" and the area immediately surrounding the yellow tape is referred to as the "perimeter". An exclusion zone extending approximately 10- to 15-ft from the drilling equipment shall be established around the perimeter of each drilling location before breaking ground.

Sample locations for air monitoring will primarily include the work area and its perimeter. Readings will also be recorded from the worker breathing zone (defined as 9-inch radius hemisphere centered at the nose and forward of the shoulders) and the borehole annulus.

Organic vapor readings will be collected inside the work area on an **hourly** basis, or more frequently at the discretion of the field inspector. If organic vapor readings in the work area exceed 5 ppm, real-time air monitoring at the downwind work area perimeter is required under the specifications of the Community Air Monitoring Plan, below. Readings will be collected **more frequently** if the provisions of the Major or Minor Vapor Emissions Response Plans are activated.

Real-time air monitoring will be conducted using a photoionization detector such as a MiniRae or Photovac MicroTIP organic vapor meter, or equivalent. The organic vapor meter shall be equipped with an appropriate ultraviolet-lamp detector (or a flame-ionization detector) as specified in the task-specific Health & Safety section. These hand-held instruments are capable of detecting the volatile organic chemical compounds identified in Table 1 to an approximate lower detection limit of 1 ppm. The OSHA TLV's for the compounds listed in Table 1 are at or above the detection limit of the proposed equipment. The rapid response of these instruments provides quick determination of airborne concentrations and allows for appropriate changes in the safety procedures, if needed. Specific equipment to be used is described in the Air Monitoring Equipment Section below.

Periodic air monitoring for volatile compounds will be performed during the activities for which inhalation has been identified as a potential exposure route. These activities include, but are not limited to:

- ☐ Drilling and soil sampling.
- ☐ Excavation of contaminated soil for remediation.
- ☐ Construction activities involving excavation in areas of known or potential soil or groundwater contamination.
- ☐ Pump tests where organic vapors were detected during well installation or water samples.
- ☐ Well sampling and hand bailing.

Community Air Monitoring Plan

In the event that total organic vapor readings in the work area breathing zone exceed 5 ppm above background, real-time air monitoring for volatile compounds at the exclusion zone perimeter will be required. The community air monitoring plan includes the following criteria:

- If total organic vapor levels exceed 5 ppm above background at the exclusion zone perimeter, work will be halted and monitoring will be continued under the provisions of a Minor Vapor Emission Response Plan, as described below. All readings must be recorded and be available for NYSDEC and NYSDOH personnel to review.

Minor Vapor Emissions Response Plan

If the ambient concentration of organic vapors exceeds 5 ppm at the work area perimeter, work will be halted and monitoring will continue. If the vapor levels decrease below 5ppm above background, work activities can resume. If the organic vapor levels are greater than 5 ppm but less than 25 ppm over background at the work area perimeter, work activities can resume provided:

1. The organic vapor level 200 ft downwind of the work area or one-half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background; AND
2. The vinyl chloride level (as measured with a drager tube) at the work area perimeter is less than 0.5 ppm; AND
3. More frequent intervals of monitoring, as directed by the safety officer are conducted.

If the total organic vapor level is above 25 ppm, or the vinyl chloride level is over 0.5 ppm at the work area perimeter, work must be stopped. Downwind monitoring will be continued to minimize the potential impact to the nearest residential or commercial structure at the levels specified in the Major Vapor Emissions Response Plan described below.

Major Vapor Emissions Response Plan

If the total organic vapor levels measured 200 ft downwind of the work area, or one half the distance to the nearest downwind residential or commercial structure (whichever is less) is more than 5 ppm over background, air monitoring must be performed within 20 ft of these structures ("20-ft Zone").

All active operations at the site shall stop and remain down if any of the following vapor levels are observed within the 20-ft Zone:

1. Total organic vapors at 5 ppm or greater over background; OR
2. Vinyl chloride levels greater than 0.5 ppm.

If, following cessation of work activities, efforts to abate the emission source are unsuccessful and any of the above levels persist for more than 30 minutes in the 20-ft Zone, the Major Vapor Emissions Response Plan (MVERP) shall be placed into effect. In addition, any of the following **within the 20-ft Zone** will necessitate activation of the MVERP:

- Organic vapor levels greater than 50 ppm over background
- Vinyl chloride levels over 1 ppm.

Major Vapor Emissions Response Plan Activation

Upon MVERP activation, the following activities will be undertaken:

1. The safety officer will be notified, all Emergency Response Contacts listed in the Health & Safety Plan will be contacted, including local police authorities; AND
2. Frequent air monitoring will be conducted at 30-minute intervals within the 20-ft Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the safety officer.

All site employees will be briefed with regard to the details of the Minor and Major Vapor Emissions Response Plans, including anticipated hazards, safety practices, emergency procedures, and communication pathways prior to initiating work.

Air Monitoring Equipment

1. Direct Reading Instruments

The instruments used for air monitoring activities may include, but are not limited to, those listed below. The Contractor/Consultant Safety Officer will make the decision as to which instruments must be on a project specific basis.

☐ A flame ionization detector (FID) equal or superior to Foxboro organic vapor analyzer (OVA) Model 128.

☐ A photoionization detector (PID) equal or superior to HNU 101 or Photovac MicroTIP. Due to the general contaminant mix at the site the 10.6 eV probe will be used during site investigations.

☐ A combustible gas indicator/oxygen meter and/or multi-sensor type monitor.

Note: During environmental activities, the potential for creating a flammable atmosphere will be monitored, (e.g., prior to confined space entry, initial operations with atmospheres having the potential to exceed IDLH.) Please refer to Table 2 of this HSP for Action Levels.

Each instrument must be intrinsically safe where warranted. Each will be calibrated and maintained in accordance with the manufacturer's recommendations. Calibration records will be maintained in a daily field logbook.

2. Integrated Sampling Equipment/Techniques

Variable flow, belt mounted personal sampling pumps may be used in conjunction with the appropriate sample media to provide exposure estimates where real time analysis is inadequate. At the discretion of the Contractor/Consultant Site Coordinator and Safety Officer, integrated samples may also be collected at stations around the work area perimeter. The following equipment/techniques may be used:

☐ Diffusion or Permeation Type Dosimeters

☐ Analysis of Sorbents

3. Specialized Monitoring Equipment and Analyses

Specialized sampling instruments and analyses (e.g., H_2S monitors, solid sorbents, sampling bags) will be used on project sites on an "as needed" basis as determined by the site conditions, sampling history at the site, and the type of work to be performed. The Contractor/Consultant Safety Officer will determine the need for specialized equipment or analyses on a project specific basis and include thorough descriptions of sampling plans/procedures and equipment operation and maintenance in the task-specific health & safety requirements.

4. Spare Monitoring Equipment

Appropriate spare monitoring equipment will be made available either on the Project Site or at a location in the project area, as determined by the Contractor/Consultant Safety Officer. The location of spare equipment will be included in the task-specific health & safety requirements. Field activities will be suspended if the properly calibrated field monitoring instrumentation is not available.

Record Keeping

A Record of field meter readings and PPE upgrades will be maintained by the Contractor/Consultant Site Coordinator on the Record of Field Monitoring or Field Logbook. The entries will include:

- ☐ Task description and date
- ☐ Location of work site
- ☐ Personnel involved:
  - ➤ Name
  - ➤ Function
  - ➤ Level of personal protection (any change in level of protection will be recorded at the time of implementation)
- ☐ Health and Safety instrumentation calibration:
  - ➤ Instrument name (OVA, LEL, etc.)
  - ➤ Serial number
  - ➤ Calibration information (i.e. calibration gas)
- ☐ Meteorological information
  - ➤ Type of day (sunny, cloudy, rain, etc.)
  - ➤ Wind speed and direction (estimate)
  - ➤ Temperature
- ☐ Events of the day in chronological order and/or task summary.
- ☐ Health and safety instrumentation readings
  - ➤ Breathing zone concentrations
  - ➤ Time
  - ➤ Sample concentrations
- ☐ Any unusual occurrences, problems or observations
- ☐ Signature of writer

Specific personal decontamination procedures must be detailed in the task-specific health & safety requirements. The following are guidelines for developing personnel decontamination procedures contained in the task-specific health & safety requirements:

1. Tools, etc. will be dropped off onto a plastic sheet in the exclusion zone for subsequent re-use or decontamination.

2. The boot wash station will consist of two plastic or metal tubs, two garden sprayers, and a boot brush. One sprayer will contain a detergent water mixture; the other will contain clean water.

3. The outer layer of disposable protective clothing will be removed by removing outer boots, outer gloves, hood, tape, etc., and placed in a receptacle for disposal. Clothing will be removed by "peeling" off while turning it inside-out. This will minimize contact with possible contamination on the outer surface.

4. Respirators will be removed and cartridges placed in a receptacle for disposal.

5. Inner gloves will be removed by rolling off the hand while turning them inside-out and placed in a receptacle for disposal.

6. If highly toxic, skin-corrosive or skin-absorbable materials are known or suspected to be present, personnel must shower before exiting the site.

NOTE: The Contractor/Consultant Site Coordinator will ensure established personnel decontamination procedures are properly implemented and enforced.

Equipment Decontamination

Equipment, including drill rigs, will arrive at the site free of debris and contamination. Equipment will be cleaned and decontaminated before departure from the site. Decontamination of chemically contaminated equipment will be performed at a minimum of modified Level D protection for steam cleaning and hydro-washing.

Specific equipment decontamination procedures will be based upon the type of work being performed and anticipated levels of contamination. The following items are guidelines for the establishment of equipment decontamination procedures to be included in the task-specific health & safety requirements:

1. All equipment that has been in the exclusion zone or the contamination reduction zone will be visually inspected and/or wipe sampled to assess the extent of contamination.

2. Sensitive instrumentation should be handled in a manner which will minimize the potential of exposure to hazardous soils and liquids. This care in handling will greatly reduce the amount of decontamination required. Should the conditions in the exclusion zone present an extreme potential for contamination, instrumentation may be wrapped in plastic.

3. All hand tools, safety equipment, and heavy equipment will be decontaminated before leaving the site. (e.g. high pressure, low volume hot water washed, steam cleaned, brushed with low phosphate detergent, and water rinsed.)

4. Heavy equipment must have visible residues removed in the exclusion zone. Wheels, wheel wells and cabs of vehicles must be cleaned before equipment is removed from the exclusion zone. The equipment may then be moved to a more centrally located decontamination pad for more extensive decontamination. This move must be accomplished in a manner that will prevent the spread of contamination along the travel path. A detailed plan for necessary equipment relocation must be included in the task-specific health & safety requirements (Section 2).

5. If warranted and required by the Project Work Plan, samples such as equipment blanks will be taken and submitted for project related analysis to confirm the decontamination procedures.

Location of Decontamination Areas

Decontamination areas for project equipment and personnel will be designated by the Client or site Project Manager by the following guidelines:

- ☐ Each decontamination area will be sited to have access to water and electrical (GFCI protected) supplies as necessary for the decontamination process.
- ☐ Access to the decontamination area(s) will be limited and controlled.
- ☐ The specific decontamination area(s) for each project will be clearly defined in the task-specific health & safety requirements.

APPENDIX B

Drilling & Well Construction Procedures

Drilling and Well Construction Details

The subsurface test borings will be performed using standard rotary drilling equipment and techniques. A truck mounted rotary drill rig capable of performing both the soil and rock boring and well installation will be utilized during all phases of the drilling program. The performance criteria of the well installation program and subsurface test boring program will be as follows:

- Provide sufficient subsurface stratigraphic information to determine depths and lateral extent of permeable and nonpermeable hydrogeologic units in the bedrock formations.
- Allow monitoring of groundwater levels and piezometric heads sufficient to define rates and direction of groundwater flow (vertical and horizontal).
- Allow sampling of groundwater through the monitoring wells sufficient to evaluate concentrations of contaminants offsite in the subsurface.
- Maintain subsurface exploration and well installation procedures that do not exacerbate the spread of contaminants in the subsurface.
- Install monitoring wells of such construction as to allow long term integrity of the wells and collection of representable samples of offsite groundwater.

The well construction procedures to be used for an individual well will be determined by the specific depth interval over which the well is to be completed. Based upon available geologic data for the former Taylor site, it is anticipated that the "target" intervals for the well completion will be the overburden soils at the water table, and the bedrock from a depth of 2.0 to 12.0 ft. below the top of bedrock. Following completion of the initial coring interval, drilling and groundwater from the well casing and corehole will be evacuated (if possible) and recovery will be monitored. If there is no groundwater yield from the core interval, additional 10 foot core intervals will be advanced. The open NX core hole will serve as the monitoring interval. Well construction procedures for these intervals are described below. Three drilling locations will be selected for bedrock exploration. Two-well clusters will be installed at each of the three locations. Continuous split-spoon soil sampling to the top of bedrock will be performed at each of the three bedrock locations.

All subsurface explorations and well installations will be documented, as appropriate, using the following field log forms:

- test boring report
- core boring report
- overburden groundwater monitoring well report
- bedrock monitoring well installation report

Procedures For Overburden Drilling And Overburden Monitoring Well Installation

The procedures addressed in this section include those related to the drilling, installation, and completion of overburden monitoring wells. The collection of soil samples for visual description of their physical properties is also discussed.

Overburden monitoring wells will consist of a 2.0 in. diameter, schedule 40 PVC well screen and casing. Each overburden monitoring well will be constructed as follows:

- The depth to the top of bedrock may be determined from an adjacent deeper test boring or from an existing monitoring well in the cluster. A borehole will then be drilled to an elevation approximately 6 ft. below the water table using 4-1/4 in. I.D. hollow-stem augers.
- In areas where the water table is known to be at or near the top of bedrock, the overburden well will be installed to the top of bedrock. Continuous split-spoon samples will be collected at the adjacent bedrock well and logged in accordance with the soil classification procedures described in the main text of this report.
- A Schedule 40 PVC well screen (maximum length of 10 feet) and PVC casing will be placed to the bottom of the borehole with the screened interval extending upward to approximately 4 feet above the water table. As the augers are slowly removed, clean washed quartz sand will be placed in the annular space around the well screen and casing from the base of the screen to approximately two feet above the screen. The sand will consist of clean, washed quartz sand which is designed for use with a No.10 screen slot size (0.010-in). A minimum of two feet of bentonite pellets or hydrated granular bentonite will be installed above the sand pack. Accurate measurements of the material depths will be made by frequently sounding the annulus during installation. The volume of materials needed will be calculated and compared to the actual volume used.
- In the event that the top of the sand pack is above the water table, pellets will not be installed since complete hydration would not be achieved. In this instance, granular bentonite will be mixed with water to form thick pre-hydrated slurry to install with a tremie line to form the seal. Cement/bentonite grout will be placed from the top of the bentonite seal to a point five feet below existing ground surface. The grout will consist of one bag (94 lbs) of Portland Cement and two to three pounds of bentonite mixed with approximately 7.5 gallons of clean water.
- The actual lengths of the above mentioned parameters (length of screen, length of sand pack, thickness of bentonite seal) may vary due to the thickness of overburden or the elevation of the water table in relation to ground surface and bedrock elevation.
- The well casing will be secured with a vented lockable cap and sealed steel roadway box and concrete surface seal. Each well cap will be fitted with a lock.

Bedrock Monitoring Well Installation

Wells constructed within the bedrock will require a single four-inch diameter casing and completed open rock interval. During drilling at each bedrock monitoring well location, split-spoon soil samples will be collected continuously at two-foot intervals from the ground surface to refusal on bedrock. The soil samples from each split-spoon will be visually and texturally described in the field as they are collected by the field geologist.

Upon auger refusal at the top of bedrock, a temporary 6 inch steel casing will be installed to the top of bedrock. A 2.0 ft. NX corehole will be cut into the top of bedrock and the corehole reamed using a 6.0 in. nominal rollerbit.

A 4.0 in. diameter steel casing will be installed to the full depth of the borehole, following removal of the 6.0-in. temporary steel casing. The 4.0-in steel casing grouted in place using the Halliburton single-plug method. Approximately 1.5 times the total estimated annular space volume of grout will be mixed for the technique. The grout mixture will be prepared by mixing five pounds of bentonite, two pounds of calcium chloride, and one bag of Portland Cement with 7.5 gallons of potable water. The grout will be placed inside the casing with a drillable plug placed on top of the grout. Water pressure will be used to force the plug and grout toward the bottom of the casing and subsequently the grout into the annular space. The plug will be forced to within approximately two feet of the bottom of the casing. A valve on the clean water line will be closed to maintain pressure on the plug and the grout will be allowed to stand for at least 12 hours before drilling is resumed.

The casing will be cleaned, after the grout has set, with a 3-7/8 in. nominal rollerbit. A 10 ft. NX corehole interval will then be cut into the bedrock below the bottom of the 4.0 in. steel casing. The open core interval will be monitored for groundwater yield following the evacuation of drilling water. If there is no groundwater yield additional ten-foot core intervals will be advanced and the procedure repeated. A maximum of thirty feet of core will be drilled. The 3.0 in. diameter NX corehole will serve as the open monitoring interval. All rock core samples obtained from the core boring explorations will be logged and described by the geologist in the field, and placed in new storage boxes to be held in storage for future reference.

Each bedrock monitoring well will be completed with a sealed steel roadway box. The well cap will be fitted with a lock.

Borehole Decommissioning

In the event that a borehole is drilled into the subsurface soils and/or bedrock and is not to be completed as a well it will be decommissioned by sealing with grout. Cement/bentonite grout will be placed from the bottom of the borehole to a point 5 feet below existing grade by the tremie method. The grout will consist of one bag (94 lbs.) of Portland Cement and five pounds of bentonite mixed with approximately 7.5 gallons of clean water. The remainder of the annular space will be backfilled with native soils and hand compacted and mounded to promote surface runoff away from the boring. Paved or concrete surfaces will be restored as necessary. A Borehole Sealing Report will be completed for any borehole decommissioned documenting borehole depths and sealing procedures.

Equipment Decontamination

All drilling equipment which comes in contact with the subsurface materials including drilling bits, water pressure testing equipment, augers, casings and tools will be decontaminated prior to site entry, between each well location and between successive depth intervals in the event of significant contamination when telescoping casing is used. Decontamination of this equipment will be accomplished using a brush to remove any large solid particles, followed by steam cleaning with clean water at a decontamination pad. All decontamination liquids will be containerized for appropriate disposal. Split-spoon samplers used for the collection of soil samples will be decontaminated at the drilling location with an alconox wash followed by a clean water rinse

APPENDIX C

Groundwater Sampling Procedures

Groundwater Sampling Procedures

The purpose of this document is to explain the procedures that will be followed during the groundwater sampling operations at the site.

Well Maintenance Check

Prior to sampling, a routine inspection of the condition of the protective casing and surface seal will be performed. The protective casing will be inspected for the integrity of the locking cap and the surface seal. In addition each well will be checked for any other signs of damage or unauthorized entry. Observations of any irregularities will be noted on the groundwater sampling record as well as the well number, date and time.

Air Monitoring

In order to provide workers with the proper respiratory protection for sampling, air monitoring in the breathing zone and immediately over the well head will be performed immediately after the initial uncapping. Health and safety procedures that are appropriate to the ambient air conditions will be implemented. Readings for both the breathing zone and well head will be recorded on the groundwater sampling record. The Health and Safety Plan for this work defines respiratory protection action levels, and a description of the proper air monitoring equipment.

Water Level Measurements

The depth to groundwater will be measured with an electronic depth-indicating sounder. The probe will be lowered into the well until the meter indicates water is reached. The probe will be raised above water level and slowly lowered again until water is indicated. The cable will be held against the side of the inner protective casing at the point designated for water level measurements and a depth reading taken. This procedure will be followed three times or until a consistent value is obtained. The value will be recorded to the nearest 0.01 feet. The probe will be raised to the surface and together with the amount of cable that was wetted in the well, will be decontaminated with a distilled water rinse.

Well Evacuation and Sampling

- The well will be purged with a dedicated Teflon bailer, dedicated disposable poly-bailer or a decontaminated pumping system. The bailer will be attached to a polypropylene or nylon line and the well bailed until 3 well volumes are removed from the well or until the well is dry. If a pump system is used the pump will be turned on and the flow rate measured. The pump will be turned off and the discharge redirected to a 5-gallon carboy, 55-gallon drum or other appropriate container and then pumping will be resumed. The well will be evacuated of a minimum three well volumes or until purged dry. Observations on the flow rate, rate of recovery and other pertinent observations will be recorded on the groundwater sampling record. When well evacuation is complete, the pump will be withdrawn from the well and decontaminated.

- Groundwater quality samples will be obtained after evacuation of the well. A polypropylene or nylon line will be attached to a decontaminated translucent disposable dedicated bailer equipped with a bottom check ball. The bailer will be lowered to the middle of the open interval of the well or, if little water is in the well, to within one foot of the bottom of the well. Care will be taken in slowly lowering the bailer into the water so as not to agitate the water unnecessarily. The bailer will then be raised to the surface. The appropriate sample vials will be filled slowly to avoid sample aeration and field parameter measurements conducted as described in a subsequent section.

Field Measurements

A portion of the groundwater collected during the sampling procedures will be subjected to the field tests of temperature, pH and specific electrical conductance. Tests for field parameters will be conducted after all sample containers have been filled. Groundwater for these tests will be collected in a glass container with a minimum volume of 125 milliliters.

Temperature will be taken first and measured with a thermometer to the nearest tenth of a degree and the value recorded on the groundwater sampling record. The thermometer will be rinsed with deionized water and stored in a plastic carrying case for transport to other sampling locations.

The specific electrical conductance will be measured using a conductivity probe. The probe will be placed in the sample, readings taken and then recorded on the groundwater sampling record. The probe will be decontaminated between samples with a deionized water rinse and placed in a field carrying case.

The pH will be measured with a pH meter that is calibrated daily with appropriate standards. The clean probe will be inserted into the sample container and the readings recorded on the groundwater sampling record to the nearest 0.1 pH unit. The probe will be rinsed with dionized water and inserted into its own carrying case.

Equipment Decontamination

All of the sampling equipment (excluding the pH/temperature, turbidity and conductivity meters) will be decontaminated between sampling events using the following procedure:

1. An initial Alconox or equivalent detergent wash.
2. Clean water rinse.
3. Distilled/deionized water rinse.
4. Airdry

Decontamination waste water will be containerized in 55-gallon drums.

Quality Control Samples

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Samples: MS/MSD samples will be collected at the same time and location as field samples and will be collected at a frequency of one per matrix/method per day or 10 percent of the total analyses. MS/MSD samples will be collected in immediate succession using identical sampling techniques, sample storage, transportation and analysis. MS/MSD will be evenly split from the same bailer load and equally proportioned into each receptacle for the split duplicate.

Trip Blanks: Trip blanks are intended to assess the potential introduction of contamination during round trip sample handling and transport from the laboratory to the field. A trip blank sample will be obtained from the contract laboratory for each sampling event and will be stored in the sample collection cooler during the daily sampling activities. The trip blank will return to the laboratory with the groundwater samples. The trip blanks consist of distilled/deionized water placed in two 40 ml borosilicate glass vials. One trip blank will be analyzed for sample shipment for volatiles analysis.

Sample Containers, Preservation Methods and Holding Time

The types of containers, preservation methods and holding times are media and analytical specific in accordance with EPA and NYSDEC recommended protocol. These procedures will be identified and coordinated with the analytical laboratory prior to the conduct of the field work. Holding times will be measured from the time of sample collection.

Sample Labels

Sample labels will be placed on all samples and will contain the following information:

- Date and time of collection
- Sample location
- Sample number
- Analysis to be performed
- Samplers initials/Company name

Groundwater Sampling Record

The groundwater sampling record used during sampling procedures will include the following information:

- Well number
- Static water level (depth to water)
- Depth to bottom of the well
- Calculated well volume
- Actual evacuation volume
- Date and time
- Analyses to be performed
- Preservation method
- Field meter calibration information
- General remarks (weather conditions, etc.)
- Sample temperature, pH and specific conductivity

All entries will be made in black indelible ink with a ballpoint pen and will be written legibly. Entry errors will be crossed out with a single line, dated and initialed by the person making the correction.

Sample Custody

A chain-of-custody form will be completed after sample collection. The chain-of-custody forms will accompany the samples to the laboratory at the end of each day. A sample transfer will be completed when the sampling team relinquishes the samples to laboratory personnel by signing the chain-of-custody form.

Table 1

Summary of Sampling and Analytical Protocols
Taylor Instrument Site
Work Plan for Assessment of Off-Site Groundwater Conditions
File No. 70600-001

Sample Media	Sampling Locations	Number of Samples	Sample Container Set	Analytical Protocol	Quantitation Limit (ug/L)
Groundwater	Monitoring Wells	8	2 X 40-mL vials each sample	ASP 95-1	10
	matrix spike	1			
	matrix spike duplicate	1			
Trip Blank	---	1			

Sample Preservative	Sample Delivery time frame	Analytical time frame
pH adjusted to <2 w/ HCl	48 hours	10 days VTSR
Cooled to 4 deg. C w/ ice		

Notes.

1. VTSR = verified time of sample receipt
2 All sample containers and Trip Blank to be supplied by CAS Laboratory in Rochester, NY.
3 The sample delivery group will include all offsite monitoring wells, one matrix spike & matrix spike duplicate, and the Trip Blank.
4. Matrix spike & matrix spike duplicate samples will be collected from one of the monitoring wells in addition to the regular sample (TOTAL 6 VIALS).
5 ASP target compound list attached.

g:projects/70600/001/osp2-table 1.xls

APPENDIX A

Health & Safety Plan

Project/File No. 70600

HALEY & ALDRICH, INC.
HEALTH & SAFETY PROGRAM

SITE SPECIFIC HEALTH & SAFETY PLAN FOR

Project Name: Site Assessment of Off-site Groundwater Conditions

Location: Ames Street, Rochester, New York

Site Contact: Peter Reckmeyer

This Health and Safety Plan provides site specific descriptions and work procedures. General work practices, training, medical monitoring, compliance programs and record keeping procedures are included in the Haley & Aldrich Corporate Health and Safety Program Manual issued to all employees.

INDIVIDUAL COMPLETING THIS QUESTIONNAIRE:

James Marschner

DATE FIELD WORK IS SCHEDULED TO BEGIN:

Winter 2000

Date Submitted: 8 September 1999
Date of Health and Safety Briefing:
Revision Dates: 12/22/99

APPROVALS:

The following signatures constitute approval of this Health & Safety Plan. This plan should not be deviated from without prior written or verbal approval.

REVISIONS:

APPROVED: INITIAL DATE

Signature: ______________
Name: Mark Golembiewski
CORPORATE H&S MANAGER
(Required for Sustained Level C and all Level B work)
DATE ______________

Signature: ______________
Name: James Marschner
H&A BRANCH H&S MANAGER
22 Dec 99
DATE ______________

Signature: Edward L Hynes
Name: Edward L. Hynes
SITE/PROJECT MANAGER
22 Dec 99
DATE ______________

PRE-SITE HEALTH & SAFETY BRIEFING:

I HAVE READ, UNDERSTOOD, AND AGREE TO FOLLOW THIS HEALTH & SAFETY PLAN. EMERGENCY RESPONSE NUMBERS AND HOSPITAL MAP ARE ON THE NEXT PAGE.

REVISIONS:

			INITIAL/DATE
NAME	SIGNATURE	DATE	
NAME	SIGNATURE	DATE	
NAME	SIGNATURE	DATE	
NAME	SIGNATURE	DATE	

Copy and attach with the plan if more team members are working on the project.

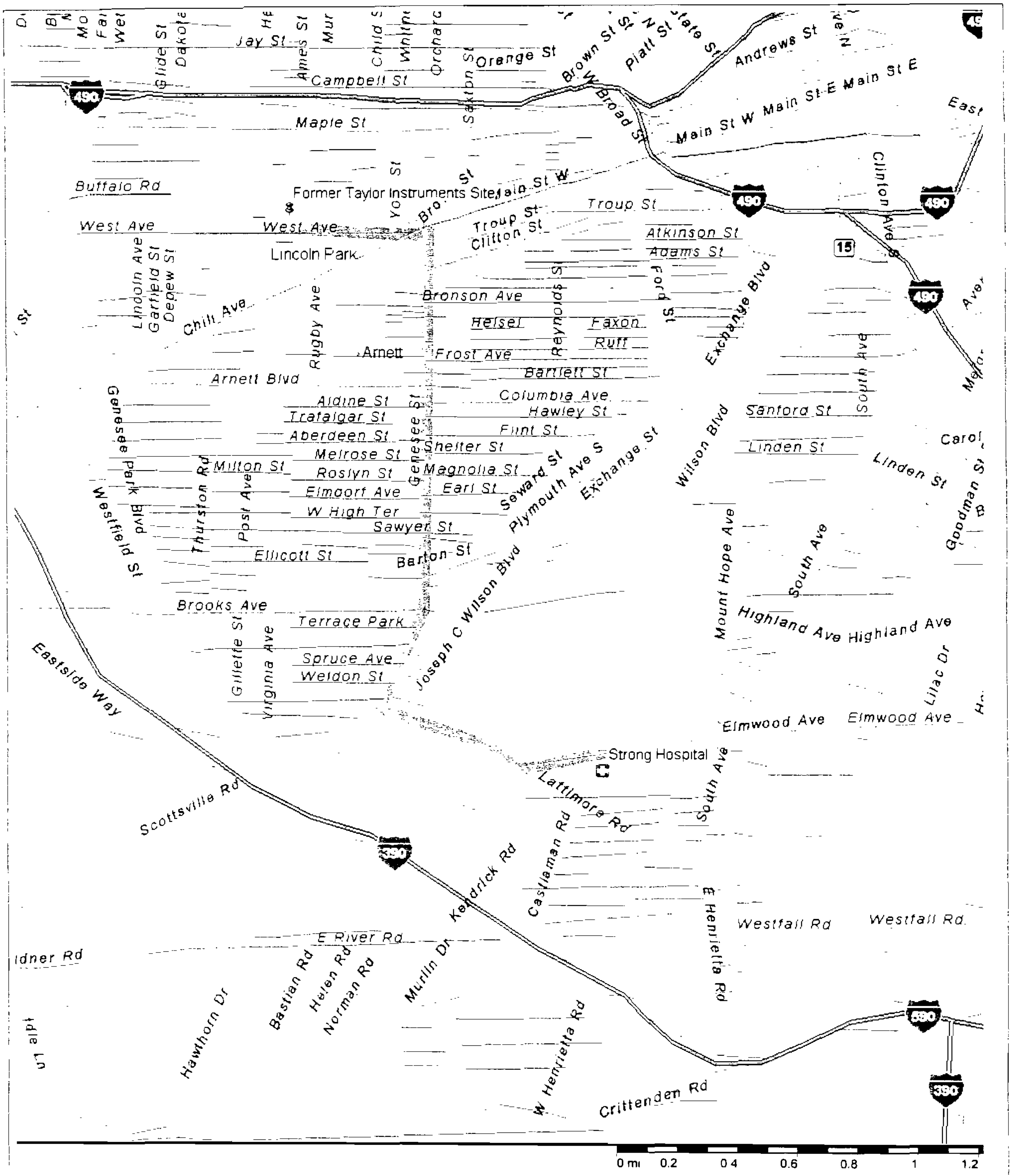
EMERGENCY RESPONSE RESOURCES

(Copy MUST be immediately available to field personnel)

*Nearest Hospital:	Strong Memorial Hospital
Address:	601 Elmwood Avenue, Rochester, NY
Phone Number:	(716) 275-4551
Emergency Response Number: Ambulance, Fire, Police, Environmental Emergency	**911**
Enter Local Emergency Response Number if not on 911 system:	**911**
Occupational Health Physician:	Dr. Bruce Barron
Address:	Strong Memorial Hospital, 601 Elmwood Avenue Occupational & Environmental Medicine Group
Phone Number:	(716) 275-9192
Emergency Phone Number:	(716) 275-4551 - Strong Memorial Hospital Emergency Dept.
Haley & Aldrich Project Manager:	Edward L. Hynes
Phone Number:	(716) 327-5536
Emergency Phone Number:	(716) 232-7386 ext. 0 (Haley & Aldrich Operator)
Client Project Manager:	Peter Reckmeyer
Phone Number:	1-800-258-0834 ext. 703
Emergency Phone Number:	
Other:	CHEMTREC (Chemical Transportation Emergency Center)
Address:	2501 M Street, NW Washington, DC 20037
Phone Number:	1-800-424-9300

How will Evacuation Alarms and/or Emergency Information be communicated on site:
Voice If other, describe:

How will Emergency Services be notified: Cellular/Portable phone If other, describe:



Nearest Hospital:	Strong Memorial Hospital
Address:	601 Elmwood Avenue, Rochester, NY
Phone Number:	275-4771 (Emergency Department)

SITE DESCRIPTION AND WORK AREAS:

(Please provide site plan or sketch. Include site history/usage, type of facility and investigation.)

Prior sampling data available: ☐ Yes. ☒ No.

- If yes, attach copy of results or reference location, summarize below.
- If no, list any known or suspected hazardous materials or contamination at the site.
- Include a description of any known or potential hazards on the site. i.e. – excavation, confined space entry, utilities, traffic, railroad, client procedures, specific concerns, etc.

List of hazardous materials: chlorinated solvents, mercury

Site Description: Former location of the Taylor Instruments Company, manufactured thermometers, thermostats, and related instruments. All but one of the buildings have been demolished and the site is now paved and fenced.

POTENTIALLY IMPACTED ENVIRONS

☒ Soil ☒ Air ☒ Groundwater ☐ Surface water

SOURCES OF INFORMATION

☐ Geologic References
☐ Water Reports
☒ Previous Reports
☐ Other
☒ City Directories
☒ Agency Files (DEC, DEP, etc.)
☐ Sanborn Maps

HAZARD ASSESSMENT

(Check those that may apply)

☐ Confined Space
☐ Excavation
☒ Mist
☒ Gases
☒ Carcinogen
☐ Active Construction Site
☐ Cold
☐ Heavy Metals
☒ Noise (dB)

☒ Fire/Explosion
☒ Drilling/Heavy Equipment
☒ Fume
☐ Acid
☒ Fuels
☐ Asbestos
☐ Heat
☐ Pesticides
☐ Other

☐ Dust
☐ Remote location
☒ Vapor
☐ Base
☒ Uncertain Utility Location
☐ Biohazard
☒ Inorganics
☒ Solvents

Comments/Special Concerns

Arrangements are to be made for utility clearance prior to drilling.

List Required Tasks and potential hazards by number:

1- Observe the Installation of offsite overburden and bedrock groundwater wells. Air monitoring while the installation is in process. See section describing community air monitoring plan to be activated if vapors are encountered.

2-.

3-

4-

Required Personal Protective Equipment(PPE)/Clothing/Etc. for Task Number 1.

(Selected PPE can be applicable to one or more tasks)

Protection Level: ☒ D ☐ C ☐ B ☐ A Modified? ☒ Yes. ☐ No.

Check all that is required:

☒ Eyes/Face/Glasses/Shield
☒ Inner Gloves (PVC)
☐ Duct Tape
☒ Earmuffs/Plugs
☐ Boot Covers, Disposable
☐ Flashlight

☒ Boots, Rubber
☒ First Aid Kit
☐ Fire Extinguisher
☒ Tyvek Coverall
☐ Air Horn/Signaling Device
☒ Other, specify: Boots, Steel toe.

☐ Saranex Coverall
☒ Hardhat
☒ Outer Gloves
☒ Respirator*
Cartridge Type P-100

- *** The need for donning respirators will be determined by field measurements for VOC's.**

Refer to Tables 1&2 for exposure guidelines and PPE/monitoring upgrade requirements.

EQUIPMENT/INSTRUMENTATION

Monitoring/Field Screening Equipment

☐ HNu ☐ 10.2eV ☐ 11.7eV	☐ Hydrogen Cyanide Meter (Monitor)
☐ OVA	☒ Photovac Micro Tip , 10.6eV
☐ Confined Space Meter - LEL/O_2/H_2S/CO	☐ Dust/Aerosol/Fiber Count
☐ Explosimeter (LEL)	☐ Photovac GC
☐ Radiation Meter	☒ Draeger Tubes
☐ Other (Specify)	Specify - vinyl chloride

Description of Monitoring Requirements: include frequency and location by Task number

Exposure Guidelines for common contaminants are listed in Table 1. Requirements for PPE upgrades based on monitoring are covered in Table 2. Record monitoring data and PPE upgrades on attached Record of Field Monitoring, maintain with project files.

Decontamination Equipment

☐ Distilled Water	☒ Tap Water
☐ Hexane	☐ Methanol
☒ Alconox Soap	☐ Acetone
☒ Brushes	☐ Wash Tubs (specify #
☒ Plastic Sheeting	☒ Disposal Bags
☒ Steam Cleaner	☐ Other (Specify)

Decontamination and Waste Disposal Procedures: (specify type and location of decontamination and plans for disposal of generated waste products)

COMMENTS/PROCEDURES/SPECIAL CONCERNS/SAFE WORK PRACTICES

Utility stake-out / clearances prior to drilling.

TABLE 1
HAZARD MONITORING

(CIRCLE CONTAMINANTS OF CONCERN, WRITE ADDITIONAL CONTAMINANTS AND EXPOSURE GUIDELINES ON LAST PAGE)

CONTAMINANTS OF CONCERN	ROUTES OF EXPOSURE	IDLH	PEL	TLV	PID	FID	ODOR THRESHOLD	IRRITATION THRESHOLD	ODOR DESCRIPTION
Acetone	R, I, C	2500	1000	500 Cv 750	9.69	60	13	---	Chem, sweet, pungent
Ammonia	R, A, I, C	300	50	25 Cv 35	---	---	0.5-2	10	Pungent suffocating oder
Benzene	R,A,I,C	Ca	1	SK 0.5	9.25	150	4.68	---	Solvent
2-Butoxyethanol	R,A,I,C	700	50	----	10.0	----	----	---	Mild ether like
Carbon tetrachloride (Tetrachlormethane)	R,A,I,C	Ca	2 Cv 25 200; 5 min peak	SK 5 Cv 10	11.47	10	50	---	Sweet, pungent
Chlorobenzene	R,I,C	1000	75	10	9.07	200	0.68	---	Almond like
Chloroform	R,I,C	Ca	2	10	11.42	65	50	--	Sweet
Cyanides (CN salts)	R,A,I,C	50 mg/m	5 mg/m^3	SK Cv 5 mg/m^3	---	---	---	---	Faint almond odor
o-Dichlorobenzene	R,A,I,C	200	Cv 50	25 Cv 50	9.06	50	0.3	E 20-30	Pleasant, aromatic
p-Dichlorobenzene	R,I,C	150	Cv 75	10	8.94	---	0.18	E 80-160	Distinct, aromatic mothball-like
Dichlorodifluoromethane (Freon 12)	R,C	15000	1000	1000	11.97	15	---	---	---
1,1-Dichloroethane	R,I,C	3000	100	100	---	80	200	---	Distinct
1,2-Dichloroethane	R,I,A,C	Ca	50 Cv 100	10	11.12	80	88	---	Chloroform
1,1-Dichloroethylene (Vinylidene chloride, 1,1-DCE	R,I	Ca	-	5 Cv 20	-	40	190	---	---
1,2-Dichloroethylene	R,I,C	1000	200	200	9.65	50	0.085	---	Ether-like, acrid
Ethanol	R,A,I,C	---	1000	1000	10.48	25	10	---	Sweet
Ferric Chloride	R,I,C	----	----	----	---	----	---	---	----
Ethylbenzene	R,I,C	800	100	Cv 125 100	8.76	100	2.3	E 200	Aromatic
Ethylene Glycol vapor	R,A,I,C	---	Cv 50	Cv 50	---	---	---	---	---
Formaldehyde	I,C	Ca	0.75	Cv 0.3	10.88	---	0.83	E 0.5	Hay
Gasoline	R,I,C	Ca	-	300	--	---	---	---	Petroleum
Hexane, n-isomer	R,I,C	--	50	50	10.18	70	130	E T 1400-1500	Mild, gasoline like
Hydrogen Cyanide (as CW)	R,A,I,C	50	10	SK Cv-4.7	13.69	--	0.58	---	Bitter almonds

CONTAMINANTS OF CONCERN	ROUTES OF EXPOSURE	IDLH	PEL	TLV	PID	FID	ODOR THRESHOLD	IRRITATION THRESHOLD	ODOR DESCRIPTION
Hydrogen peroxide	R,I,C	75	1	1	11	---	---	---	Sharp
Methanol	R,I,C	25000	Sk 200	SK 200	10.84	12	1000	---	Sweet
MEK peroxide	R,I,C	---	Cv 0.7	Cv 0.2	---	---	---	---	---
Methyl Chloroform (1,1,1-TCA)	R,I,C	700	350	350	**	105	20-100	---	Chloroform-like
Methylene Chloride (Dichloromethane, Methylene dichloride)	R,I,C	Ca	25	50	11.35	100	25-50	E 5000	Ether-like
Methyl Mercaptan	R,C	150	Cv 0.5	0.5	9.44	---	---	---	Garlic, Rotten Cabbage
MIBK (Hexone)	R,I,C	500	100	50 Cv 75	---	---	---	---	Pleasant
Naptha (coal tar)	R,I,C	1000	100	400	---	---	---	---	Aromatic
Naphthalene	R,A,I,C	250	10	10	8.14	---	0.3	E 15	Mothball-like
Octane	R,I,C	750	500	300 Cv 375	9.9	80	48	---	Gasoline-like
Pentachlorophenol	R,A,I,C	Ca 2.5 mg/m³	0.5mg/m³sk	SK 0.5mg/m³	---	---	---	---	Pungent when hot
Phenol	R,A,I,C	250	Sk5	Sk5	8.5	---	0.04	E,N,T 68	Medicinal
Potassium Hydroxide	R,I,C	----	----	----	----	----	----	---	-------
Propane	R,C	2100	1000	2500	10.95	80	16000	---	Natural gas odor
Sodium Hydroxide	R,I,C	10mg/m3	2mg/m3	----	----	----	----	---	------
Stoddard Solvent (Mineral Sprits)	R,Cl,I	20,000 mg/m³	500	100	*	---	1	E 400	Kerosene-like
1,1,2,2-Tetrachloroethane	R,A,I,C	Ca (100)	Sk 5	1	11.1	100	1.5	---	---
Tetrachloroethylene (Perchloroethylene)	R,I,C	Ca	25	25	9.32	70	4.68	N,T513-690	Ether, Chloroform-like
Toluene	R,A,I,C	500	200	50	8.82	110	2.14	E 300-400	Mothballs
Trichloroethylene	R,I,C	Ca (1000)	50	50	9.47	70	21.4	---	Solventy, chloroform-like
Turpentine	R,A,I,C	800	100	100	---	---	200	E,N 200	Pine like
Vinyl Chloride	R	Ca	2	2	9.995	---	3000	---	Ethereal
Xylenes	R,A,I,C	1000	100	100	8.56/8.44	111/116	1.1	E,N,T 200	Aromatic
DUSTS, MISTS AND MISCELLANEOUS COMPOUNDS									
Asbestos	R	Ca	0.1 fibr/cc	Species dependent	---	---	---	---	---
PCBs-42% Chlorine	R,A,I,C	Ca	1mg/m³Sk	1mg/m³Sk	---	---	---	---	Mild,

CONTAMINANTS OF CONCERN	ROUTES OF EXPOSURE	IDLH	PEL	TLV	PID	FID	ODOR THRESHOLD	IRRITATION THRESHOLD	ODOR DESCRIP TION
									hydrocarbon
PCBs-54% Chlorine	R,A,I,C	Ca	0.5mg/m^{3}Sk	0.5mg/m^{3}Sk	---	---	---	---	Mild, hydrocarbon
Styrene	R,I,C	700	100	20	8.47	85	0.047	E 200-400	Rubber, solvent
Aluminum- metal dust	R,I,C	---	15mg/m^3	10mg/m^3	---	---	---	---	---
- soluble salts	R,I,C	---	2mg/m^3	2mg/m^3	---	---	---	---	---
Arsenic	R,A,I,C	Ca	0.01mg/m^3	0.2mg/m^3	---	---	---	---	---
Barium:soluble compounds	R,I,C	250mg/m^3	0.5mg/m^3	0.5mg/m^3	---	---	---	---	---
Cadmium dusts	R,I	Ca	0.005mg/m^3	0.01mg/m^3	---	---	---	---	---
Chromium: Species Dependent	R,I,A,C	25mg/m^3	Spec Dep	Spec Dep	--	---	---	---	
Copper - dust & mist	R,I,C	---	1mg/m^3	1mg/m^3	---	---	---	---	---
Lead - arsenate	R,I,C	Ca	0.05mg/m^3	0.15mg/m^3	---	---	---	---	---
- inorg dust & fume	R,I,C	---	0.05mg/m^3	0.15mg/m^3	---	---	---	---	---
- chromate	R,I,C	---	---	0.05mg/m^3	---	---	---	---	---
Manganese & compounds	R,I	500 mg/m^3	Cv-5mg/m^3	0.2mg/m^3	---	---	---	---	---
Mercury & inorg. comp.	R,A,C	10 mg/m^3	Cv0.1mg/m^3	0.1mg/m^3		---	---	---	---
- (organo) alkyl comp	R,A,I,C	2 mg/m^3	0.01mg/m^3	0.01mg/m^3	---	---	---	---	---
Nickel - metal, insoluble	R,I,C	Ca	1mg/m^3	1mg/m^3	---	---	---	---	---
- soluble comp.	R,I,C	Ca	0.1mg/m^3	0.1mg/m^3	---	---	---	---	---
Portland cement	R,I,C	---	10mg/m^3	10mg/m^3	---	---	---	---	---
Selenium compounds	R,A,I,C	100mg/m^3	0.2mg/m^3	0.2mg/m^3	---	---	---	---	---
Silver - metal	R,I,C	---	0.01mg/m^3	0.1mg/m^3	---	---	---	---	---
- soluble comp	R,I,C	---	---	0.01mg/m	---	---	---	---	---
Thallium, soluble	R,A,I,C	20mg/m^3	0.1mg/m Sk	0.1mg/m Sk	---	---	---	---	---
Tin, metal & inorganic Comp. except oxides	R,C	400mg/m^3	2mg/m^3	2mg/m^3	---	---	---	---	---
Tin, organic compounds	R,A,I,C	200mg/m	0.1mg/m^3	0.1mg/m^{3}Sk	---	---	---	---	---
Zinc chromates, as	R,I,C	---	Cv0.1mg/m^3	Cv0.1mg/m^3	--	---	---	---	--

CONTAMINANTS OF CONCERN	ROUTES OF EXPOSURE	IDLH	PEL	TLV	PID	FID	ODOR THRESHOLD	IRRITATION THRESHOLD	ODOR DESCRIPTION
Cr									
Zinc oxide dust	R,I,C	---	10mg/m^3	10mg/m^3	---	---	---	---	---

Table 1 - Hazard Monitoring

Notes: All units in ppm unless otherwise noted.

R = Respiratory (Inhalation)
I = Ingestion
SK = Skin
Cv = Ceiling value
Ca = Carcinogen

A = Skin Absorption
C= Skin and/or Eye Contact

* = Use 10.2 eV lamp
**= Use 11.7 eV lamp

Additional Contaminants:	Exposure Guidelines:

TABLE 2

MONITORING METHOD, ACTION LEVELS AND PROTECTIVE MEASURES

INSTRUMENT	HAZARD	ACTION LEVEL(1)	ACTION RESPONSE
Respirable Dust Monitor	Contaminant Particles	> 0.05 mg/m^3	Level C Protection
OVA, HNU(2), Photovac Microtip	Organic Vapors	Background	Level D
		3 ppm > background or lowest OSHA permissible exposure limit, whichever is lower, or as modified for this task. Sustained for >3 sec in the breathing zone	Level C, site evacuation may be necessary for specific compounds
		50 ppm over background unless lower values required due to respirator protection factors	Level B(3)
Explosimeter(4) (LEL)	Explosive Atmosphere	<10% Scale Reading	Proceed with work
		10-15% Scale Reading	Monitor with extreme caution
		> 15% Scale Reading	Evacuate site
O_2 Meter(5)	Oxygen Deficient Atmosphere	19.5% O_2	Monitor with caution
		19.5% - 23.5% O_2	Continue with caution
		< 19.5% O_2	Evacuate site; oxygen Deficient
		> 23.5% O_2	Evacuate site; fire hazard
Four Gas Meter	O2/CO/LEL/H2S	required	For confined space entry
Draeger Tube	Vapors/Gases	> 0.1 mg/m3 Hg	Consult Table 1 or other resources for concentration toxicity/detection data. Upgrade to Level C and evacuate. Upgrade to Level B if concentrations of compounds exceed thresholds shown at left.

Notes:
1. MONITOR BREATHING ZONE
2. CAN ALSO BE USED TO MONITOR SOME INORGANIC SPECIES.
3. POSITIVE PRESSURE DEMAND SELF CONTAINED BREATHING APPARATUS
4. LOWER EXPLOSIVE LIMIT (LEL) SCALE IS 0-100%. LEL FOR MOST GASSES IS 15%.
5. NORMAL ATMOSPHERIC OXYGEN CONCENTRATION AT SEA LEVEL IS ~ 20%.
6. BACKGROUND GAMMA RADIATION IS ~ 0.01 - 0.02 MILLIREMS/HOUR.
7. CONTACT H&A HEALTH AND SAFETY STAFF IMMEDIATELY.

RECORD OF FIELD MONITORING

Project Number:_ ______________________ Date:____________________

Project Description: ____

Task Description: ____

Personnel on-site: ____

Instrument Type: ______________________________ Serial Number: ____________
(OVA, LEL, PID, etc)

Calibration and/or operational check completed as per manufacturers instructions: yes ____ no ____

Time completed: ________________ Weather conditions: __________________________

Reading Type: Breathing Zone-BZ Perimeter-P Surface-S	**Level:** (ppm or indicate units)	**Time:**	**PPE Level*:**

* EPA Levels B, C or D

Comments: __ ____
____

The following information should be maintained for all projects requiring air monitoring.

GENERAL HEALTH & SAFETY PROCEDURES

MEDICAL SURVEILLANCE PROGRAM

Purpose

The Medical Surveillance Program is conducted to provide an initial baseline of the worker's health. Subsequent medical exams are used to monitor the worker's continued well being. The implementation of a medical surveillance program is the responsibility of the contractor/subcontractor employer.

Requirements

Medical surveillance is required by the Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120 (f): Hazardous Waste Site Operations and Emergency Response. The Contractor/Consultant's medical surveillance program must meet or exceed these regulatory requirements.

These regulatory requirements include the determination by a physician that the individual being examined is physically able to use respiratory protection and is able to perform the work defined within the specific job description. The capability of an individual to perform the specified work will be determined from examinations that may include:

☐ Medical and occupational history, and past gastrointestinal, hematologic, renal, cardiovascular, reproductive, immunological, and neurological problems as well as a history of respiratory disease and personal smoking habits;

☐ Physical examination, including blood pressure measurements;

☐ Pulmonary function test (FVC and FEV1);

☐ Chest x-ray;

☐ ECG (Electrocardiogram);

☐ Eye examination and visual acuity;

☐ Audiometry;

☐ Urinalysis; and

☐ Blood chemistry: Hematology, serum analyses, heavy metals toxicology

Periodic Monitoring

All personnel are required to have a physical examination prior to the beginning of their work on-site. This period may be shortened if the Contractor/Consultant Medical Consultant deems this appropriate. The physician performing the physical will insure the requirements of 29 CFR 1910.120(f) are fulfilled. Documentation attesting to current medical monitoring compliance must be maintained by the Contractor/Consultant Safety Officer.

SITE CONTROLS

Work Site Access Control

Access to client property is dependent upon site-specific conditions under owner permission and will be controlled by the Client Project Manager. It will be the Contractor/Consultant Project Manager's responsibility to control access to a site by means of temporary barriers such as flagging tape or fencing. The barrier will be inspected daily for integrity and adequacy by the Contractor/Consultant Site Coordinator.

For sites requiring Level C to Level A PPE (personal protective equipment) the area of field operations will be subdivided into three distinct areas. The extent of these areas is task and location specific. Access to each zone will be controlled with fencing and/or plastic flagging tape. The three areas are defined as:

☐ Exclusion Zone

The exclusion zone is the area where the highest potential for exposure by dermal or inhalation routes exists. Personal protective equipment is required and a daily log will be kept of all personnel entering this zone. The exclusion zone will be marked off with barricades or barrier tape which will be placed a minimum of 50 feet from the active work area. This 50 foot minimum may be altered in the Task-Specific Health & Safety Requirements depending upon actual site layout. During field operations this boundary may be expanded by the Contractor/Consultant Site Coordinator based upon observations and/or monitoring measurements. Whenever possible, all field work should be performed upwind from potential contaminant sources.

☐ Contamination Reduction Zone

The contamination reduction zone is the area immediately adjacent to the exclusion zone. The probability of dermal and inhalation exposure is lower than in the exclusion zone. Typically, contamination reduction zones include facilities for personnel or equipment decontamination. Personal protective equipment worn in the exclusion zone may not be worn outside the contamination reduction zone except during emergencies.

☐ Support Zone

Support zones cover all areas outside the contamination reduction zone. Typically, the support area includes facilities for a lunch area, office spaces, and clean equipment and material storage. Protective clothing worn in the exclusion zone may not be worn in a support zone except in emergencies. Emergency contacts are listed immediately following the Table of Contents.

Visitors:

☐ Visitors and subcontractors entering the site are subject to the same requirements as contractor and consultant personnel and will only be permitted in the immediate area of active operations (i.e., exclusion zone) after receiving written approval from the Contractor/Consultant Project Manager, and supplying a written agreement to comply with this HSP.

☐ A visitors log will be kept by the Contractor/Consultant Site Coordinator or other designated person, or information will be recorded in Field logbook.

☐ Visitor vehicles are restricted to support zones.

Unauthorized Personnel

All established procedures and actions are designed to prohibit unauthorized entry to the work sites. However, if security is violated, the following actions will be taken:

☐ Unauthorized personnel found within any active site will be reported to the Contractor/Consultant Project Manager, Safety Officer, and Site Coordinator.

☐ Unauthorized personnel found in the exclusion zone will be escorted through the contamination reduction zone and will be subject to all decontamination procedures established in the project-specific HSP.

☐ Any unauthorized personnel entering an active site will be escorted from the facility. No re-entry will be permitted.

ENGINEERING CONTROLS

Engineering controls will be the method of preference to control health and safety hazards. Examples of engineering controls are:

☐ The use of excavation equipment to take samples from trenches;

☐ The use of cover material (soil) to suppress vapor emissions;

☐ The use of air conditioning in heavy equipment cabs to mitigate operator heat stress; and

☐ The use of ventilation equipment to eliminate hazardous atmospheres from confined spaces.

Administrative controls and personal protective equipment will be used where engineering controls are not feasible or are inadequate. Administrative controls include the exclusion of unnecessary personnel from hazardous areas. It should be noted that scheduled job rotation is not an acceptable administrative control to reduce employee exposure to airborne chemicals.

The hazard control methods to be employed must be described in the task-specific health & safety requirements where they deviate from those described here. As a project progresses, changes to these methods may be necessary. All such changes will be documented as addenda to the task-specific health & safety procedures.

Standard Safe Work Practices

Standard safe work practices applicable to most site activities are listed below. Additional safe work practices unique to specific site tasks must be included in the task-specific health & safety requirements

1. All field personnel must inform the Contractor/Consultant Site Coordinator or designated representative before entering work areas so that their presence can be recorded.

2. Workers must utilize the "buddy system": at least two members of the field crew (including subcontractor personnel) must be in visual contact with each other on-site whenever hazardous work is to be performed. If this is not possible, two-way radios will be used.

3. Eating, drinking, chewing gum or tobacco, smoking, or any other activity that increases the probability of hand-to-mouth transfer of contaminated material will not be permitted in contaminated or potentially contaminated areas of the work site.

4. All personal safety equipment and protective clothing will be worn in conformance with the task specific requirement of this HSP.

5. Disposable outer coveralls, boots and gloves will be secured at the wrists and legs, and there will be closure of the suit around the neck if specified in the PPE section.

6. Individuals getting wet to the skin with chemically contaminated liquids must be dealt with immediately and as completely as possible. Response actions will be based on the extent of the contamination and the properties of the material. Medical attention should be sought as necessary.

7. Hands must be washed before eating, drinking, smoking and before using toilets at the facilities provided.

8. Avoid contact with surfaces either suspected or known to be contaminated, such as puddles, mud, or other discolored surfaces. Store equipment on elevated or protected surfaces to reduce the potential of incidental contamination.

9. Only remove personal protective equipment in the contamination reduction zone per decontamination section.

10. Place all disposable coveralls, gloves, and cartridges in appropriate receptacles at the end of every shift or sooner, as directed by the Contractor/Consultant Site Coordinator.

11. Inspect all non-disposable clothing (i.e. hard hat liner, work gloves, cotton overalls) for contamination in the contamination reduction zone. Any clothing found to be

contaminated will be decontaminated or disposed of in a manner approved by the Contractor/Consultant Site Coordinator.

12. Report all injuries to the Contractor/Consultant Site Coordinator, Client/site Project Manager, and appropriate Medical agency. An accident report, or equivalent must be completed by the Contractor/Consultant Site Coordinator and submitted to the Client Operations Safety Representative or Project Manager for appropriate follow-up.

13. The presence or consumption of alcoholic beverages or illicit drugs on client property or during the work day is strictly forbidden.

14. Spillage or splashing of contaminated materials must be prevented. Spills must be contained and follow up calls made as appropriate for the release.

15. Be alert to unsafe conditions or acts and notify the Contractor/Consultant Site Coordinator.

16. Workers need to be familiar with the work area and surroundings, including:
    ☐ Wind direction in relation to the work area;
    ☐ Accessibility of associates, equipment, vehicles;
    ☐ Available communications;
    ☐ Hot zone (areas of known or suspected contamination);
    ☐ Site access;
    ☐ Nearest water sources.

17. The number of personnel and equipment in the exclusion zone must be kept to a minimum.

18. Wastes generated during work activities must be disposed of in accordance with state, federal, and local, regulations.

Safe Work Permits/Hot Work Permits

Safe Work Permits are to be obtained from the Client Operations Safety Representative before any work is done that involves:

☐ Entering vessels, tanks, pits, trenches, manholes, or other confined spaces.

☐ Exposure to toxic or infectious material or to abnormal temperatures or pressures when such exposures are outside the employee's daily routine.

☐ Using explosives for blasting or demolition.

☐ Using flammable or combustible coatings inside buildings. Application of combustible paints by brush or roller is excluded.

☐ Excavating and trenching.

☐ Working in elevated areas such as roofs.

- ☐ Using temporary heating devices.
- ☐ Working in designated safe work permit areas.

Hot Work Permits are to be obtained from the Client before any work is done that involves:

- ☐ Operating gasoline powered vehicles or equipment inside buildings.
- ☐ Cutting, welding, lead burning, tar kettles, or similar work involving open flames or very high temperatures. In explosion prone areas, this includes any potential source of ignition, such as electric hand tools.

Working in Confined Spaces

A confined space, as defined by OSHA, is any space having a limited means of egress, that is not intended for normal occupancy and which is subject to the accumulation of toxic or flammable contaminants or has an oxygen deficient atmosphere.

Confined spaces are also areas where occupants are rendered isolated from help in case of need. Confined spaces include, but are not limited to: Ovens, tanks, vessels, bins, boilers, ducts, sewers, pipe chases, manholes, underground utility vaults, tunnels, pipelines, excavations, and trenches.

If activities require entrance into a confined space, strict Health and Safety protocol must be followed. Prior to any confined space work activities, written authorization must be obtained and a confined space entry permit completed. Only trained employees will be allowed to enter.

1. Confined Space Entry

    - ☐ A Safe Work Permit will be issued by the Client or site manager prior to entry into the confined space. This permit must be completed including the signatures of the Contractor/Consultant Safety Officer and Client or site manager Operations Safety Representative.
    - ☐ Only authorized, trained personnel may enter a confined space.
    - ☐ Open flame devices will not be used to open frozen or otherwise shut manhole covers, hatches or doors. Hot water or steam will be used to remove ice and snow holding such openings closed.

2. Confined Space Ventilation

    The confined space will be ventilated to prevent the accumulation of:

    - ☐ Flammable vapors above 10% of the Lower Explosive Limit.
    - ☐ Oxygen deficient or oxygen rich atmospheres, particulate matter.
    - ☐ Toxic and other contaminants in the atmosphere above one half of the TLV.

3. Safety Concerns

A standby employee will be stationed outside the entrance to the confined space to observe or communicate with the employee at all times. Communications (visual, voice, radio or signal line) will be maintained between all individuals present. The standby employee will be trained and equipped to initiate rescue operation.

Utility Clearance

Utility clearance will be obtained by the Contractor/Consultant Project Manager from Client Facilities personnel and any local utilities such as *(Telephone)*, (*Gas and Electric*), and the appropriate Town or Village authority before the start of any drilling or excavation conducted at the site.

- ☐ Other local utility clearance can be obtained by calling the toll-free hotline Dig Up Alert at (800)962-7962 and record the "reference number" for possible future use.
- ☐ All utilities in the work area should be staked at least two weeks prior to the start of work.
- ☐ All activities must be explained in detail to the respective utility by the Contractor/Consultant Site Coordinator. For some activities, such as blasting, the utility may request to have a representative at the site to expedite emergency response.

DRILLING SAFETY

Drilling and sampling activities present several potential hazards. Minimizing these hazards requires strict adherence to safe operating procedures.

Drill Crews

Drillers will be responsible for the safe operation of the drill rig as well as their crew's adherence to the requirements of the project-specific HSP. The driller must ensure that all safety equipment is in proper condition and is properly used. The members of the drill crew will follow all instructions of the driller, wear all appropriate personal protective equipment, and be aware of the hazards and applicable control procedures.

Rig Inspection

Each day, prior to the start of work, the drill rig and associated equipment will be inspected by the driller. The following checks will be made:

- ☐ Vehicle condition: Check proper operation of brakes, lights, steering mechanism, and horn.
- ☐ Equipment storage: All equipment such as auger flights, split spoon samplers, hammers, hand tools, etc. will be properly stored in an appropriate location and will be secured before moving the rig.
- ☐ Wire rope, Cat Line: All wire rope, cable and Cat Line will be inspected for signs of wear such as broken wires, a reduction in rope diameter, abrasion, or signs of rust. Worn, frayed, or otherwise damaged wire, rope or cable will be replaced.

- ☐ Safety equipment: Each rig will have at least one fire extinguisher (Type B/C) and one First Aid Kit.

Rig Set-Up

Each drill rig will be properly blocked and leveled prior to raising the derrick. The rig will be moved only after the derrick has been lowered. The leveling jacks will not be raised until the derrick has been lowered.

Blocking provides a more stable drilling structure by evenly distributing the weight of the rig. Proper blocking ensures that a differential settling of the rig does not occur. Wooden blocks, at least 12 by 12 inches and four to eight inches thick, are recommended and should be placed between the jack swivels and the ground. The emergency brake will be engaged and the wheels that are on the ground chocked.

Site drilling will comply with the following rules:

- ☐ Before drilling, the Contractor/Consultant Site Coordinator will ensure an adequate safety zone around the drill rig and associated operations.
- ☐ Before drilling, the existence of underground utilities in the work area will be determined and conspicuously marked (See Section D of Section 3.4).
- ☐ If drilling is conducted in the vicinity of overhead power lines, proper distance will be maintained between the drill rig and the lines as per OSHA 29 CFR 1926, Subpart N. The proper distance or shielding technique will be stated in the project-specific HSP.

General Operating Procedures

The operator of the drill rig will only operate from the position of the controls. If the operator must leave this position, the transmission must be in neutral.

When working on the derrick platform, the drill crew should not guide drill rods or pipe into racks by taking hold of a moving line. Materials should not be stored or transported within the derrick. Pipe, drill rods, auger flights, hammers, and other drilling tools should be stored in racks and chained in place. During drilling, penetration hammers will be placed at a safe location on the ground.

Emergency Procedure for Electrical Contact

If a drill rig contacts an electrical line, it may or may not be insulated from the ground by its tires. Death or serious injury will result if a person touches the rig and the ground simultaneously.

- ☐ Under most circumstances, the operator and other personnel on the seat of the vehicle should remain seated and not leave the vehicle. Do not move or touch any part, particularly a metallic part, of the vehicle or drill rig.
- ☐ If it is determined that the rig should be vacated, all personnel should jump clear and as far as possible from the rig. Do not step off--jump off, and do not hang on the vehicle or any part of the rig when jumping clear.

- ☐ If you are on the ground, stay away from rig and do not let others get near the vehicle. Seek assistance immediately by calling the local emergency services contact. Emergency phone numbers are listed on page 3 of this HSP.

EXCAVATION AND TRENCHING SAFETY

General Excavation and Trenching Safety

The following is a list of minimum requirements for trenching and excavating. Each excavation/trench/shoring project is different, therefore the Contractor/Consultant Project Manager is responsible for evaluating site specific conditions and making appropriate provisions in the task-specific health and safety requirements in conformance with 29 CFR 1926 Subpart P - Excavations.

- ☐ Contact the proper utilities to obtain clearance. Prior to work, review the utilities in the area and be sure they have been staked properly. Before work begins, a Safe Work Permit must be obtained from the Client/Site manager of Operations Safety Representative.

- ☐ Be aware that trenches and excavations deeper than four feet are considered confined spaces and require additional safety precautions, such as shoring. If an excavation exceeds four feet in depth, contact the Client or H&A Safety Representative to review the original Safe Work Permit and ensure that it is adequate.

- ☐ The walls and faces of all excavations and trenches more than four feet deep, in which an employee is exposed to danger from moving ground, will be guarded by a shoring system, sloping of the ground, or some other equivalent means. The design of shoring systems must be done by a registered Professional Engineer as per 29 CFR 1926 Subpart P.

- ☐ For excavations or trenches in which an employee may be required to enter, excavated or other material will be effectively stored and retained at least two feet or more from the edge of the excavation or trench.

- ☐ Daily inspections of excavations will be made by the Contractor/Consultant Site Coordinator. If evidence of possible cave-ins or slides is apparent, all work in the excavation will cease until the necessary precautions have been taken to safeguard employees.

- ☐ Trenches more than four feet deep will have ladders or steps located so as to require no more than 25 feet of lateral travel.

- ☐ Hard hats and other personal protective equipment will be worn at all times during any type of excavating or trenching operation.

- ☐ Determine soil composition (e.g., through soil sampling, soil maps, etc.) and other relevant site conditions, with special emphasis on conditions conducive to cave-ins.

- ☐ Monitor the atmosphere in and around trenches on a regular basis to check for explosive, toxic or otherwise dangerous gases and vapors.

☐ The Contractor/Consultant Project Manager will insure that all employees involved in the excavation activity have appropriate training in safe trenching practices, with emphasis on factors such as:

- utility line identification
- cave-in prevention measures
- recognition of conditions which may cause cave-ins
- means of egress from trench

☐ Water will not be allowed to accumulate in any excavation. Utilize ditches, dikes, pumps, or other means to keep surface water out of trenches.

☐ All open excavations must be well marked and barricaded.

Cave-In Hazards

The following conditions increase the likelihood of cave-in:

☐ Soil materials composed of unconsolidated, uncompacted, and/or rounded particles (See 29 CFR 1926 Subpart P - Excavation Standard). Special care must be used when trenching in areas which have previously been excavated and backfilled.

☐ Soils which have a high water content, or have been subjected to freeze-thaw or frost-heaving.

☐ Loading of trench walls by adjacent equipment, supplies, structures, "back-dirt" piles, etc.

☐ Vibration due to equipment operating near excavations.

☐ Trench walls that are steeper than the angle of repose of the material composing the walls.

☐ Deep trenches (i.e., high trench walls).

The following precautions should be used to prevent cave-ins in all trenches in excess of 4 ft. deep. These precautions should also be used in trenches less than 4 ft. deep whenever those site conditions just listed indicate the likelihood of a cave-in:

☐ Sloping: Trench walls should be sloped to the correct angle of repose.

☐ Shoring: Vertical trench walls (unless composed of solid rock) must be shored and braced, or restrained with movable trench boxes, to prevent cave-in. A registered professional engineer must design shoring systems and meet accepted engineering requirements.

PERSONAL PROTECTIVE EQUIPMENT

Protective clothing and respiratory protection help protect workers from chemical hazards. Although personal protective equipment is the least preferred method, it may be necessary if engineering controls and work practices are inadequate in preventing workers from coming in contact with potential hazards. Personal protective equipment (PPE) will be selected for the potential hazards anticipated and detailed in the task-specific health & safety requirements.

Personnel at the work site will have their own appropriate and properly fitted safety equipment and protective clothing. Safety equipment and protective clothing will be used as directed by the Contractor/Consultant Safety Officer. All such non-disposable equipment and clothing will be kept clean and maintained in proper condition. The contractors and their subcontractors will supply all PPE. Client will only provide PPE to their employees. Personnel will be trained in the use of the required protective equipment and equipment will be properly fitted.

The levels of protection to be used on-site will be based on applicable OSHA and Environmental Protection Agency (EPA) regulations, Client/site requirements, environmental sampling data, site conditions, and other factors. It will be the responsibility of the Contractor/Consultant Safety Officer to select the most effective PPE based on the anticipated hazards of the task.

Levels of Protection

The following is a description of the specific requirements of various levels of PPE in conformance with EPA nomenclature.

1. Level A Protection

   Level A provides the highest level of respiratory and skin protection. Based on site contaminants, historical sampling, and operational data, utilization of this level of protection is not anticipated. This level of protection is anticipated only in extreme situations beyond the scope of this document, (i.e., HazMat Response).

2. Level B Protection

   Level B should be worn when the highest level of respiratory protection, but a lesser level of skin protection is required. It is the minimum level of protection required to conduct initial field work with unknown or suspected hazardous materials. Once sampling data (soil, water, or air) has been collected and analyzed, the necessity of this level of protection may be re-evaluated.

   Level B Personal Protective Equipment (not limited to the following):

   ☐ Supplied-air respirator (MSHA/NIOSH approved):

   a) Pressure-demand, self-contained breathing apparatus

   or

   b) Pressure-demand, airline respirator with escape bottle.

☐ Chemical protective clothing: Chemically resistant to anticipated contaminants, (e.g. Saranex or polyethylene coated Tyvek, Chemrel, or Chem-Tuff).

☐ Gloves (outer): Chemically resistant to anticipated contaminants.

☐ Gloves (inner)

☐ Boots (outer): Chemically resistant to anticipated contaminants.

☐ Hard hat*

☐ 2-Way radio communications* (intrinsically safe).

☐ Joints between gloves, boots, and suit must be taped to ensure an adequate seal.

* The need for these items is dependent upon the work to be performed and will be chosen by the Contractor/Consultant Safety Officer.

3. Level C Protection

Level C protection with an air-purifying respirator should be worn routinely in an atmosphere only after the air contaminant(s) is (are) identified, concentrations measured and the criteria for wearing air-purifying respirator met. Generally, Level C provides the same level of skin protection as Level B, but a lesser degree of respiratory protection.

<u>Level C Personal Protective Equipment</u>:

☐ Air-purifying respirators, full-face, (half-face with appropriate safety glasses or goggles when potential for liquid splashes is low), canister or cartridge equipped (MSHA/NIOSH approved).

☐ Chemical protective clothing: Chemically resistant to anticipated contaminants, e.g. Saranex or polyethylene coated Tyvek, Chemrel, or Chem-Tuff.

☐ Gloves (outer): Chemically resistant to anticipated contaminants.

☐ Gloves (inner).

☐ Boots (outer): Chemically resistant to anticipated contaminants.

☐ Hard hat*

☐ 2-Way radio communications* (intrinsically safe).

☐ Joints between gloves, boots, and suit must be taped to ensure an adequate seal.

* The need for these items is dependent upon the work to be performed and will be chosen by the Contractor/Consultant Safety Officer.

Criteria for Selection of Level C:

Meeting all of the following criteria permits use of Level C protection:

- ☐ Oxygen concentrations not less than 19.5% or no greater than 22% by volume.
- ☐ Personnel inhalation exposure will be reduced by the respirator below the substance's Threshold Limit Value (TLV)/Permissible Exposure Limit (PEL) whichever is lowest and the concentration is within the service limit of the canister/cartridge.
- ☐ Atmospheric contaminant concentrations do not exceed IDLH levels. (See Table 1).
- ☐ Atmospheric contaminants, splashes, or other direct contact will not adversely affect any body area left unprotected by chemically resistant clothing.
- ☐ Job functions do not require self-contained breathing apparatus.
- ☐ Atmospheric contaminant concentrations are not in excess of Level C action criteria. (See Table 2).

4. Level D Protection

Level D is the minimum level of protection to be used during any site activities and does not provide respiratory or skin protection.

Level D Personnel Protective Equipment:

- ☐ Coveralls or work uniform.
- ☐ Gloves*
- ☐ Substantial leather chemical-resistant boots or shoes (steel toe and shank is highly recommended).
- ☐ ANSI Z87 safety glasses.

Chemical splash goggles*.

- ☐ Hard hat*.
- ☐ Disposable/reusable footwear covers*

* The need for these items is dependent upon the work to be performed and will be chosen by the Contractor/Consultant Safety Officer.

Criteria For Selection of Level D:

Meeting any of these criteria allows use of Level D protection:

- ☐ No contaminants are present.
- ☐ Work functions preclude splashes, immersion, or potential for unexpected inhalation of any hazardous chemicals.

Level D protection is a minimum work uniform. It can be worn only in areas where the possibility of contact with contamination is minimal.

Personal Protective Equipment (PPE) Selection

PPE selection will be based on the task and the nature of hazards (type of contaminants, duration of exposure), engineering controls, and the work practices that are anticipated. The selected equipment will provide protection from the chemicals suspected to be present and which demonstrate the potential for skin exposure. The PPE chosen for each task will be specified in the task-specific health & safety requirements.

Changes in PPE

The Contractor/Consultant Safety Officer will make the decision to upgrade or downgrade the levels of protection. The decision will be primarily based on the results of the real-time air monitoring performed during site activity.

AIR MONITORING

Air Monitoring Scope

The Contractor/Consultant Site Coordinator will ensure that periodic real-time air monitoring is conducted during site operations, and that appropriate precautions are taken to protect site workers and the public from inhalation exposures. Should any monitoring indicate concentrations in excess of established action levels, the Contractor/Consultant Site Coordinator will notify Contractor/Consultant Safety Officer and will implement appropriate action to protect project personnel, client employees, and the public.

For the Former Taylor Instruments Offsite Groundwater Investigations, any offsite work areas will be demarcated with cones and yellow caution tape, and "hard-hat area" signs. The public will be excluded from the work area. The demarcated area within the yellow caution tape is herein referred to as the "work area" or "exclusion zone" and the area immediately surrounding the yellow tape is referred to as the "perimeter". An exclusion zone extending approximately 10- to 15-ft from the drilling equipment shall be established around the perimeter of each drilling location before breaking ground.

Sample locations for air monitoring will primarily include the work area and its perimeter. Readings will also be recorded from the worker breathing zone (defined as 9-inch radius hemisphere centered at the nose and forward of the shoulders) and the borehole annulus.

Organic vapor readings will be collected inside the work area on an **hourly** basis, or more frequently at the discretion of the field inspector. If organic vapor readings in the work area exceed 5 ppm, real-time air monitoring at the downwind work area perimeter is required under the specifications of the Community Air Monitoring Plan, below. Readings will be collected **more frequently** if the provisions of the Major or Minor Vapor Emissions Response Plans are activated.

Real-time air monitoring will be conducted using a photoionization detector such as a MiniRae or Photovac MicroTIP organic vapor meter, or equivalent. The organic vapor meter shall be equipped with an appropriate ultraviolet-lamp detector (or a flame-ionization detector) as specified in the task-specific Health & Safety section. These hand-held instruments are capable of detecting the volatile organic chemical compounds identified in Table 1 to an approximate lower detection limit of 1 ppm. The OSHA TLV's for the compounds listed in Table 1 are at or above the detection limit of the proposed equipment. The rapid response of these instruments provides quick determination of airborne concentrations and allows for appropriate changes in the safety procedures, if needed. Specific equipment to be used is described in the Air Monitoring Equipment Section below.

Periodic air monitoring for volatile compounds will be performed during the activities for which inhalation has been identified as a potential exposure route. These activities include, but are not limited to:

- ☐ Drilling and soil sampling.
- ☐ Excavation of contaminated soil for remediation.
- ☐ Construction activities involving excavation in areas of known or potential soil or groundwater contamination.
- ☐ Pump tests where organic vapors were detected during well installation or water samples.
- ☐ Well sampling and hand bailing.

Community Air Monitoring Plan

In the event that total organic vapor readings in the work area breathing zone exceed 5 ppm above background, real-time air monitoring for volatile compounds at the exclusion zone perimeter will be required. The community air monitoring plan includes the following criteria:

- If total organic vapor levels exceed 5 ppm above background at the exclusion zone perimeter, work will be halted and monitoring will be continued under the provisions of a Minor Vapor Emission Response Plan, as described below. All readings must be recorded and be available for NYSDEC and NYSDOH personnel to review.

Minor Vapor Emissions Response Plan

If the ambient concentration of organic vapors exceeds 5 ppm at the work area perimeter, work will be halted and monitoring will continue. If the vapor levels decrease below 5ppm above background, work activities can resume. If the organic vapor levels are greater than 5 ppm but less than 25 ppm over background at the work area perimeter, work activities can resume provided:

1. The organic vapor level 200 ft downwind of the work area or one-half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background; AND
2. The vinyl chloride level (as measured with a drager tube) at the work area perimeter is less than 0.5 ppm; AND
3. More frequent intervals of monitoring, as directed by the safety officer are conducted.

If the total organic vapor level is above 25 ppm, or the vinyl chloride level is over 0.5 ppm at the work area perimeter, work must be stopped. Downwind monitoring will be continued to minimize the potential impact to the nearest residential or commercial structure at the levels specified in the Major Vapor Emissions Response Plan described below.

Major Vapor Emissions Response Plan

If the total organic vapor levels measured 200 ft downwind of the work area, or one half the distance to the nearest downwind residential or commercial structure (whichever is less) is more than 5 ppm over background, air monitoring must be performed within 20 ft of these structures ("20-ft Zone").

All active operations at the site shall stop and remain down if any of the following vapor levels are observed within the 20-ft Zone:

1. Total organic vapors at 5 ppm or greater over background; OR
2. Vinyl chloride levels greater than 0.5 ppm.

If, following cessation of work activities, efforts to abate the emission source are unsuccessful and any of the above levels persist for more than 30 minutes in the 20-ft Zone, the Major Vapor Emissions Response Plan (MVERP) shall be placed into effect. In addition, any of the following **within the 20-ft Zone** will necessitate activation of the MVERP:

- Organic vapor levels greater than 50 ppm over background
- Vinyl chloride levels over 1 ppm.

Major Vapor Emissions Response Plan Activation

Upon MVERP activation, the following activities will be undertaken:

1. The safety officer will be notified, all Emergency Response Contacts listed in the Health & Safety Plan will be contacted, including local police authorities; AND
2. Frequent air monitoring will be conducted at 30-minute intervals within the 20-ft Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the safety officer.

All site employees will be briefed with regard to the details of the Minor and Major Vapor Emissions Response Plans, including anticipated hazards, safety practices, emergency procedures, and communication pathways prior to initiating work.

Air Monitoring Equipment

1. Direct Reading Instruments

The instruments used for air monitoring activities may include, but are not limited to, those listed below. The Contractor/Consultant Safety Officer will make the decision as to which instruments must be on a project specific basis.

☐ A flame ionization detector (FID) equal or superior to Foxboro organic vapor analyzer (OVA) Model 128.

☐ A photoionization detector (PID) equal or superior to HNU 101 or Photovac MicroTIP. Due to the general contaminant mix at the site the 10.6 eV probe will be used during site investigations.

☐ A combustible gas indicator/oxygen meter and/or multi-sensor type monitor.

Note: During environmental activities, the potential for creating a flammable atmosphere will be monitored, (e.g., prior to confined space entry, initial operations with atmospheres having the potential to exceed IDLH.) Please refer to Table 2 of this HSP for Action Levels.

Each instrument must be intrinsically safe where warranted. Each will be calibrated and maintained in accordance with the manufacturer's recommendations. Calibration records will be maintained in a daily field logbook.

2. Integrated Sampling Equipment/Techniques

Variable flow, belt mounted personal sampling pumps may be used in conjunction with the appropriate sample media to provide exposure estimates where real time analysis is inadequate. At the discretion of the Contractor/Consultant Site Coordinator and Safety Officer, integrated samples may also be collected at stations around the work area perimeter. The following equipment/techniques may be used:

☐ Diffusion or Permeation Type Dosimeters

☐ Analysis of Sorbents

3. Specialized Monitoring Equipment and Analyses

Specialized sampling instruments and analyses (e.g.,H_2S monitors, solid sorbents, sampling bags) will be used on project sites on an "as needed" basis as determined by the site conditions, sampling history at the site, and the type of work to be performed. The Contractor/Consultant Safety Officer will determine the need for specialized equipment or analyses on a project specific basis and include thorough descriptions of sampling plans/procedures and equipment operation and maintenance in the task-specific health & safety requirements.

4. Spare Monitoring Equipment

Appropriate spare monitoring equipment will be made available either on the Project Site or at a location in the project area, as determined by the Contractor/Consultant Safety Officer. The location of spare equipment will be included in the task-specific health & safety requirements. Field activities will be suspended if the properly calibrated field monitoring instrumentation is not available.

Record Keeping

A Record of field meter readings and PPE upgrades will be maintained by the Contractor/Consultant Site Coordinator on the Record of Field Monitoring or Field Logbook. The entries will include:

- ☐ Task description and date
- ☐ Location of work site
- ☐ Personnel involved:
    - ➤ Name
    - ➤ Function
    - ➤ Level of personal protection (any change in level of protection will be recorded at the time of implementation)
- ☐ Health and Safety instrumentation calibration:
    - ➤ Instrument name (OVA, LEL, etc.)
    - ➤ Serial number
    - ➤ Calibration information (i.e. calibration gas)
- ☐ Meteorological information
    - ➤ Type of day (sunny, cloudy, rain, etc.)
    - ➤ Wind speed and direction (estimate)
    - ➤ Temperature
- ☐ Events of the day in chronological order and/or task summary.
- ☐ Health and safety instrumentation readings
    - ➤ Breathing zone concentrations
    - ➤ Time
    - ➤ Sample concentrations
- ☐ Any unusual occurrences, problems or observations
- ☐ Signature of writer

Specific personal decontamination procedures must be detailed in the task-specific health & safety requirements. The following are guidelines for developing personnel decontamination procedures contained in the task-specific health & safety requirements:

1. Tools, etc. will be dropped off onto a plastic sheet in the exclusion zone for subsequent re-use or decontamination.

2. The boot wash station will consist of two plastic or metal tubs, two garden sprayers, and a boot brush. One sprayer will contain a detergent water mixture; the other will contain clean water.

3. The outer layer of disposable protective clothing will be removed by removing outer boots, outer gloves, hood, tape, etc., and placed in a receptacle for disposal. Clothing will be removed by "peeling" off while turning it inside-out. This will minimize contact with possible contamination on the outer surface.

4. Respirators will be removed and cartridges placed in a receptacle for disposal.

5. Inner gloves will be removed by rolling off the hand while turning them inside-out and placed in a receptacle for disposal.

6. If highly toxic, skin-corrosive or skin-absorbable materials are known or suspected to be present, personnel must shower before exiting the site.

NOTE: The Contractor/Consultant Site Coordinator will ensure established personnel decontamination procedures are properly implemented and enforced.

Equipment Decontamination

Equipment, including drill rigs, will arrive at the site free of debris and contamination. Equipment will be cleaned and decontaminated before departure from the site. Decontamination of chemically contaminated equipment will be performed at a minimum of modified Level D protection for steam cleaning and hydro-washing.

Specific equipment decontamination procedures will be based upon the type of work being performed and anticipated levels of contamination. The following items are guidelines for the establishment of equipment decontamination procedures to be included in the task-specific health & safety requirements:

1. All equipment that has been in the exclusion zone or the contamination reduction zone will be visually inspected and/or wipe sampled to assess the extent of contamination.

2. Sensitive instrumentation should be handled in a manner which will minimize the potential of exposure to hazardous soils and liquids. This care in handling will greatly reduce the amount of decontamination required. Should the conditions in the exclusion zone present an extreme potential for contamination, instrumentation may be wrapped in plastic.

3. All hand tools, safety equipment, and heavy equipment will be decontaminated before leaving the site. (e.g. high pressure, low volume hot water washed, steam cleaned, brushed with low phosphate detergent, and water rinsed.)

4. Heavy equipment must have visible residues removed in the exclusion zone. Wheels, wheel wells and cabs of vehicles must be cleaned before equipment is removed from the exclusion zone. The equipment may then be moved to a more centrally located decontamination pad for more extensive decontamination. This move must be accomplished in a manner that will prevent the spread of contamination along the travel path. A detailed plan for necessary equipment relocation must be included in the task-specific health & safety requirements (Section 2).

5. If warranted and required by the Project Work Plan, samples such as equipment blanks will be taken and submitted for project related analysis to confirm the decontamination procedures.

Location of Decontamination Areas

Decontamination areas for project equipment and personnel will be designated by the Client or site Project Manager by the following guidelines:

- ☐ Each decontamination area will be sited to have access to water and electrical (GFCI protected) supplies as necessary for the decontamination process.
- ☐ Access to the decontamination area(s) will be limited and controlled.
- ☐ The specific decontamination area(s) for each project will be clearly defined in the task-specific health & safety requirements.

APPENDIX B

Drilling & Well Construction Procedures

Drilling and Well Construction Details

The subsurface test borings will be performed using standard rotary drilling equipment and techniques. A truck mounted rotary drill rig capable of performing both the soil and rock boring and well installation will be utilized during all phases of the drilling program. The performance criteria of the well installation program and subsurface test boring program will be as follows:

- Provide sufficient subsurface stratigraphic information to determine depths and lateral extent of permeable and nonpermeable hydrogeologic units in the bedrock formations.

- Allow monitoring of groundwater levels and piezometric heads sufficient to define rates and direction of groundwater flow (vertical and horizontal).

- Allow sampling of groundwater through the monitoring wells sufficient to evaluate concentrations of contaminants offsite in the subsurface.

- Maintain subsurface exploration and well installation procedures that do not exacerbate the spread of contaminants in the subsurface.

- Install monitoring wells of such construction as to allow long term integrity of the wells and collection of representable samples of offsite groundwater.

The well construction procedures to be used for an individual well will be determined by the specific depth interval over which the well is to be completed. Based upon available geologic data for the former Taylor site, it is anticipated that the "target" intervals for the well completion will be the overburden soils at the water table, and the bedrock from a depth of 2.0 to 12.0 ft. below the top of bedrock. Following completion of the initial coring interval, drilling and groundwater from the well casing and corehole will be evacuated (if possible) and recovery will be monitored. If there is no groundwater yield from the core interval, additional 10 foot core intervals will be advanced. The open NX core hole will serve as the monitoring interval. Well construction procedures for these intervals are described below. Three drilling locations will be selected for bedrock exploration. Two-well clusters will be installed at each of the three locations. Continuous split-spoon soil sampling to the top of bedrock will be performed at each of the three bedrock locations.

All subsurface explorations and well installations will be documented, as appropriate, using the following field log forms:

- test boring report
- core boring report
- overburden groundwater monitoring well report
- bedrock monitoring well installation report

Procedures For Overburden Drilling And Overburden Monitoring Well Installation

The procedures addressed in this section include those related to the drilling, installation, and completion of overburden monitoring wells. The collection of soil samples for visual description of their physical properties is also discussed.

Overburden monitoring wells will consist of a 2.0 in. diameter, schedule 40 PVC well screen and casing. Each overburden monitoring well will be constructed as follows:

- The depth to the top of bedrock may be determined from an adjacent deeper test boring or from an existing monitoring well in the cluster. A borehole will then be drilled to an elevation approximately 6 ft. below the water table using 4-1/4 in. I.D. hollow-stem augers.

- In areas where the water table is known to be at or near the top of bedrock, the overburden well will be installed to the top of bedrock. Continuous split-spoon samples will be collected at the adjacent bedrock well and logged in accordance with the soil classification procedures described in the main text of this report.

- A Schedule 40 PVC well screen (maximum length of 10 feet) and PVC casing will be placed to the bottom of the borehole with the screened interval extending upward to approximately 4 feet above the water table. As the augers are slowly removed, clean washed quartz sand will be placed in the annular space around the well screen and casing from the base of the screen to approximately two feet above the screen. The sand will consist of clean, washed quartz sand which is designed for use with a No.10 screen slot size (0.010-in). A minimum of two feet of bentonite pellets or hydrated granular bentonite will be installed above the sand pack. Accurate measurements of the material depths will be made by frequently sounding the annulus during installation. The volume of materials needed will be calculated and compared to the actual volume used.

- In the event that the top of the sand pack is above the water table, pellets will not be installed since complete hydration would not be achieved. In this instance, granular bentonite will be mixed with water to form thick pre-hydrated slurry to install with a tremie line to form the seal. Cement/bentonite grout will be placed from the top of the bentonite seal to a point five feet below existing ground surface. The grout will consist of one bag (94 lbs) of Portland Cement and two to three pounds of bentonite mixed with approximately 7.5 gallons of clean water.

- The actual lengths of the above mentioned parameters (length of screen, length of sand pack, thickness of bentonite seal) may vary due to the thickness of overburden or the elevation of the water table in relation to ground surface and bedrock elevation.

- The well casing will be secured with a vented lockable cap and sealed steel roadway box and concrete surface seal. Each well cap will be fitted with a lock.

Bedrock Monitoring Well Installation

Wells constructed within the bedrock will require a single four-inch diameter casing and completed open rock interval. During drilling at each bedrock monitoring well location, split-spoon soil samples will be collected continuously at two-foot intervals from the ground surface to refusal on bedrock. The soil samples from each split-spoon will be visually and texturally described in the field as they are collected by the field geologist.

Upon auger refusal at the top of bedrock, a temporary 6 inch steel casing will be installed to the top of bedrock. A 2.0 ft. NX corehole will be cut into the top of bedrock and the corehole reamed using a 6.0 in. nominal rollerbit.

A 4.0 in. diameter steel casing will be installed to the full depth of the borehole, following removal of the 6.0-in. temporary steel casing. The 4.0-in steel casing grouted in place using the Halliburton single-plug method. Approximately 1.5 times the total estimated annular space volume of grout will be mixed for the technique. The grout mixture will be prepared by mixing five pounds of bentonite, two pounds of calcium chloride, and one bag of Portland Cement with 7.5 gallons of potable water. The grout will be placed inside the casing with a drillable plug placed on top of the grout. Water pressure will be used to force the plug and grout toward the bottom of the casing and subsequently the grout into the annular space. The plug will be forced to within approximately two feet of the bottom of the casing. A valve on the clean water line will be closed to maintain pressure on the plug and the grout will be allowed to stand for at least 12 hours before drilling is resumed.

The casing will be cleaned, after the grout has set, with a 3-7/8 in. nominal rollerbit. A 10 ft. NX corehole interval will then be cut into the bedrock below the bottom of the 4.0 in. steel casing. The open core interval will be monitored for groundwater yield following the evacuation of drilling water. If there is no groundwater yield additional ten-foot core intervals will be advanced and the procedure repeated. A maximum of thirty feet of core will be drilled. The 3.0 in. diameter NX corehole will serve as the open monitoring interval. All rock core samples obtained from the core boring explorations will be logged and described by the geologist in the field, and placed in new storage boxes to be held in storage for future reference.

Each bedrock monitoring well will be completed with a sealed steel roadway box. The well cap will be fitted with a lock.

Borehole Decommissioning

In the event that a borehole is drilled into the subsurface soils and/or bedrock and is not to be completed as a well it will be decommissioned by sealing with grout. Cement/bentonite grout will be placed from the bottom of the borehole to a point 5 feet below existing grade by the tremie method. The grout will consist of one bag (94 lbs.) of Portland Cement and five pounds of bentonite mixed with approximately 7.5 gallons of clean water. The remainder of the annular space will be backfilled with native soils and hand compacted and mounded to promote surface runoff away from the boring. Paved or concrete surfaces will be restored as necessary. A Borehole Sealing Report will be completed for any borehole decommissioned documenting borehole depths and sealing procedures.

Equipment Decontamination

All drilling equipment which comes in contact with the subsurface materials including drilling bits, water pressure testing equipment, augers, casings and tools will be decontaminated prior to site entry, between each well location and between successive depth intervals in the event of significant contamination when telescoping casing is used. Decontamination of this equipment will be accomplished using a brush to remove any large solid particles, followed by steam cleaning with clean water at a decontamination pad. All decontamination liquids will be containerized for appropriate disposal. Split-spoon samplers used for the collection of soil samples will be decontaminated at the drilling location with an alconox wash followed by a clean water rinse

APPENDIX C

Groundwater Sampling Procedures

Groundwater Sampling Procedures

The purpose of this document is to explain the procedures that will be followed during the groundwater sampling operations at the site.

Well Maintenance Check

Prior to sampling, a routine inspection of the condition of the protective casing and surface seal will be performed. The protective casing will be inspected for the integrity of the locking cap and the surface seal. In addition each well will be checked for any other signs of damage or unauthorized entry. Observations of any irregularities will be noted on the groundwater sampling record as well as the well number, date and time.

Air Monitoring

In order to provide workers with the proper respiratory protection for sampling, air monitoring in the breathing zone and immediately over the well head will be performed immediately after the initial uncapping. Health and safety procedures that are appropriate to the ambient air conditions will be implemented. Readings for both the breathing zone and well head will be recorded on the groundwater sampling record. The Health and Safety Plan for this work defines respiratory protection action levels, and a description of the proper air monitoring equipment.

Water Level Measurements

The depth to groundwater will be measured with an electronic depth-indicating sounder. The probe will be lowered into the well until the meter indicates water is reached. The probe will be raised above water level and slowly lowered again until water is indicated. The cable will be held against the side of the inner protective casing at the point designated for water level measurements and a depth reading taken. This procedure will be followed three times or until a consistent value is obtained. The value will be recorded to the nearest 0.01 feet. The probe will be raised to the surface and together with the amount of cable that was wetted in the well, will be decontaminated with a distilled water rinse.

Well Evacuation and Sampling

- The well will be purged with a dedicated Teflon bailer, dedicated disposable poly-bailer or a decontaminated pumping system. The bailer will be attached to a polypropylene or nylon line and the well bailed until 3 well volumes are removed from the well or until the well is dry. If a pump system is used the pump will be turned on and the flow rate measured. The pump will be turned off and the discharge redirected to a 5-gallon carboy, 55-gallon drum or other appropriate container and then pumping will be resumed. The well will be evacuated of a minimum three well volumes or until purged dry. Observations on the flow rate, rate of recovery and other pertinent observations will be recorded on the groundwater sampling record. When well evacuation is complete, the pump will be withdrawn from the well and decontaminated.

- Groundwater quality samples will be obtained after evacuation of the well. A polypropylene or nylon line will be attached to a decontaminated translucent disposable dedicated bailer equipped with a bottom check ball. The bailer will be lowered to the middle of the open interval of the well or, if little water is in the well, to within one foot of the bottom of the well. Care will be taken in slowly lowering the bailer into the water so as not to agitate the water unnecessarily. The bailer will then be raised to the surface. The appropriate sample vials will be filled slowly to avoid sample aeration and field parameter measurements conducted as described in a subsequent section.

Field Measurements

A portion of the groundwater collected during the sampling procedures will be subjected to the field tests of temperature, pH and specific electrical conductance. Tests for field parameters will be conducted after all sample containers have been filled. Groundwater for these tests will be collected in a glass container with a minimum volume of 125 milliliters.

Temperature will be taken first and measured with a thermometer to the nearest tenth of a degree and the value recorded on the groundwater sampling record. The thermometer will be rinsed with deionized water and stored in a plastic carrying case for transport to other sampling locations.

The specific electrical conductance will be measured using a conductivity probe. The probe will be placed in the sample, readings taken and then recorded on the groundwater sampling record. The probe will be decontaminated between samples with a deionized water rinse and placed in a field carrying case.

The pH will be measured with a pH meter that is calibrated daily with appropriate standards. The clean probe will be inserted into the sample container and the readings recorded on the groundwater sampling record to the nearest 0.1 pH unit. The probe will be rinsed with dionized water and inserted into its own carrying case.

Equipment Decontamination

All of the sampling equipment (excluding the pH/temperature, turbidity and conductivity meters) will be decontaminated between sampling events using the following procedure:

1. An initial Alconox or equivalent detergent wash.
2. Clean water rinse.
3. Distilled/deionized water rinse.
4. Airdry

Decontamination waste water will be containerized in 55-gallon drums.

Quality Control Samples

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Samples: MS/MSD samples will be collected at the same time and location as field samples and will be collected at a frequency of one per matrix/method per day or 10 percent of the total analyses. MS/MSD samples will be collected in immediate succession using identical sampling techniques, sample storage, transportation and analysis. MS/MSD will be evenly split from the same bailer load and equally proportioned into each receptacle for the split duplicate.

Trip Blanks: Trip blanks are intended to assess the potential introduction of contamination during round trip sample handling and transport from the laboratory to the field. A trip blank sample will be obtained from the contract laboratory for each sampling event and will be stored in the sample collection cooler during the daily sampling activities. The trip blank will return to the laboratory with the groundwater samples. The trip blanks consist of distilled/deionized water placed in two 40 ml borosilicate glass vials. One trip blank will be analyzed for sample shipment for volatiles analysis.

Sample Containers, Preservation Methods and Holding Time

The types of containers, preservation methods and holding times are media and analytical specific in accordance with EPA and NYSDEC recommended protocol. These procedures will be identified and coordinated with the analytical laboratory prior to the conduct of the field work. Holding times will be measured from the time of sample collection.

Sample Labels

Sample labels will be placed on all samples and will contain the following information:

- Date and time of collection
- Sample location
- Sample number
- Analysis to be performed
- Samplers initials/Company name

Groundwater Sampling Record

The groundwater sampling record used during sampling procedures will include the following information:

- Well number
- Static water level (depth to water)
- Depth to bottom of the well
- Calculated well volume
- Actual evacuation volume
- Date and time
- Analyses to be performed
- Preservation method
- Field meter calibration information
- General remarks (weather conditions, etc.)
- Sample temperature, pH and specific conductivity

All entries will be made in black indelible ink with a ballpoint pen and will be written legibly. Entry errors will be crossed out with a single line, dated and initialed by the person making the correction.

Sample Custody

A chain-of-custody form will be completed after sample collection. The chain-of-custody forms will accompany the samples to the laboratory at the end of each day. A sample transfer will be completed when the sampling team relinquishes the samples to laboratory personnel by signing the chain-of-custody form.