INTERIM REMEDIAL MEASURE WORK PLAN

FORMER DINABURG DISTRIBUTING, INC.
INDEX # B8-0478-95-08
1012 SOUTH CLINTON AVENUE
ROCHESTER, NEW YORK

SEPTEMBER 1998

Prepared For:

New York State Department of Environmental Conservation
6274 East Avon – Lima Road
Avon, New York 14414

Prepared on Behalf of:

Estate of Saul Dinaburg
c/o Mr. Jack Dinaburg
430 Lake Avenue
Rochester, New York 14608

GALSON

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1.0 Introduction

This Work Plan describes Interim Remedial Measures (IRM) to be conducted at the site of the former Dinaburg Distributing facility in Rochester, New York. The New York State Department of Environmental Conservation (NYSDEC) by a correspondence of Mr. Todd Caffoe, P.E., of May 22, 1998, requested that such an IRM Work Plan be prepared pursuant to the terms of the Voluntary Clean-Up Agreement (File No. B8-0478-95-08) previously executed between NYSDEC and the Estate of Saul Dinaburg.

1.1 Site Background

The site is approximately 0.25± acres in area, consisting of two parcels at 1012 South Clinton Avenue, in Rochester, New York. The site is accessible from South Clinton Avenue to the southwest and Benton Street to the southeast and it is zoned as commercial property.

The original portion of the existing building at the rear of the site was reportedly built prior to 1931. Several additions have been made to the building since that time. The site was reported to have been used for automobile repair services from approximately 1950 until 1969. A hydraulic lift, with an adjacent floor drain, used by the former auto repair businesses is extant within the building.

From approximately 1971 until 1993, the site was occupied by Dinaburg Distributing, Inc., operators of a dry cleaning supply business. In January 1994 a Phase I Environmental Site Assessment (ESA) was performed by Empire Soils Investigations, and the site was documented to have been operated by Solvents and Petroleum Service, Inc., also a dry cleaning supply business, which used it for storage purposes.

The site currently contains a single story commercial building which is vacant, surrounded by asphalt covered surfaces and a small grass-covered lawn area.

1.2 Previous Investigations

The previously identified January 1994 ESA performed by Empire Soils Investigations discussed potential environmental concerns involving historic site use by both automotive repair businesses and dry cleaning chemical distribution and storage operations. Consequently, recommendations for further investigation were made for evaluation of the hydraulic lift, potential spills of dry cleaning solvents and petroleum products, the floor drain, and asbestos.

A Phase I ESA Addendum (March 1994) identified several spills at the site which were reported to the Monroe County Health Department (MCHD), NYSDEC and/or the United States Environmental Protection Agency (USEPA) between 1975 and 1989. These spills reportedly involved perchloroethylene (PCE), Varsol (mineral spirits), perchlorethane [*sic*], and fuel oil/diesel fuel.

In July and August 1994, as a consequence of a potential transfer of ownership, MARCOR Environmental Remediation Incorporated (MARCOR), was retained to collect a water sample

from a floor sump and a soil sample from beneath the concrete floor in the vicinity of the hydraulic lift. These samples were analyzed and the floor sump water sample was determined to have contained solvent- and petroleum-derived VOCs. Based on these results, the floor sump was cleaned and affected media were reportedly removed for disposal.

A Soil Vapor Survey of the site was completed by MARCOR in November 1994. The survey screened approximately 35 soil gas sampling locations for total VOCs, and in some locations for discrete PCE and trichloroethene (TCE) concentrations. The soil vapor survey identified elevated concentrations of total volatile organic vapors.

Based on the results of previous investigations, Chase Bank as trustee for the Estate requested that Sear-Brown perform an Environmental Site Characterization which involved:

- dye testing of the floor drain to identify its destination
- sampling and chemical analysis of hydraulic lift oil
- soil boring/monitoring well installations
- chemical analysis and geotechnical analysis of soil samples
- chemical analysis of groundwater samples
- a monitoring well elevation survey
- water level measurements and DNAPL checks on the monitoring wells.

A Basement Survey and Air Monitoring investigation was conducted by Sear-Brown during October 1995, in conjunction with the Conceptual Work Plan for Additional Site Investigation Activities. The survey and air monitoring programs were performed in the presence of representatives from the NYSDEC, the New York State Department of Health (NYSDOH) and/or the Monroe County Department of Health (MCDOH). Prior to implementation of the program, the agency representatives concurred in the selection of which properties would have their basements sampled. As presented in the Basement Survey and Air Monitoring Report (December 1995), perchloroethylene ("PCE") and trichloroethylene ("TCE") were not detected in any of the basement air samples. Sear-Brown concluded that there was no adverse impact to air quality in the surveyed basements.

Pursuant to Voluntary Cleanup Agreement File No. B8-0478-95-08, a Voluntary Investigation Report was developed by Sear-Brown in April 1998 which described the soil and groundwater sampling programs conducted at the site. The field investigation activities were conducted by Sear-Brown during the period October through December 1997 following the approved Revised Work Plan for Additional Site Investigation Activities (May 1996) and Department-approved modifications to the Work Plan. The presence of trichloroethene, tetrachloroethene and cis-1,2-dichloroethene at concentrations in excess of NYSDEC soil guidance values and/or drinking water standards was confirmed by soil and groundwater sampling programs. Media impacted includes unsaturated fill and the glacial till above and below the water table. The Sear-Brown report identified a probable source area within the eastern portion of the building and stated that the contamination had migrated laterally through the saturated portion of the till horizon.

In the conclusions and recommendations section of the Voluntary Investigation Report (May 1998), Sear-Brown reported that no evidence of soil contamination in excess of soil guidance values was detected and that this indicated that the migration of contaminants from the source

area "appears to be controlled largely by groundwater advection". Sample analytical results from groundwater recovered from onsite wells and offsite well MW- 6 indicated that volatile organic compounds (VOCs) were detected. Groundwater analytical results for samples from offsite wells MW-4 and MW-5 did not indicate any detectable concentrations of VOCs.

2.0 Objective of Interim Remedial Measure Work Plan

The objective of this Interim Remedial Measure Work Plan (Work Plan) is present the concept for the IRM, and to initiate the cleanup of the source area. A summary of proposed tasks and an associated schedule is presented in Table 2, Section 6.3.

The IRM entails installation of pumps in two of the existing wells, pumping and treatment of groundwater by use of a low-profile air stripper with a carbon vapor phase scrubber. Treated water will be discharged to the City of Rochester sewer.

Maintenance of the air stripper and carbon scrubber will be required every two months.

Quarterly sampling will be performed for the air stripper influent and effluent. During the startup of the IRM, all eight wells will also be sampled to provide a baseline from which to measure the effectiveness of the remediation. The wells will be sampled annually to monitor the remediation.

Proposed methods and procedures for the additional investigation activities planned at the site are summarized in section 9.0 of this document and detailed in the May 1996 Quality Assurance Project Plan prepared by Sear-Brown, and appended to this Work Plan (Appendix A).

Similarly, Sear-Brown's (May 1996) Health and Safety Plan (HASP), presented in Appendix B, which describes personal safety protection standards and procedures to be followed during the planned additional site investigation activities, will be adopted for the IRM activities.

In summary, the IRM will consist of the following:

- initial (baseline) groundwater sampling from eight (8) wells
- groundwater recovery pump installation in two (2) wells
- assembly, start-up and operation of air stripping (groundwater) and vapor-phase carbon treatment equipment.
- weekly sampling and analysis of treatment system influent and effluent (first month of operation)
- monthly sampling and analysis of treatment system influent and effluent (first six months of operation)
- quarterly sampling and analysis of treatment system influent and effluent
- annual sampling and analysis of groundwater from eight (8) wells

Galson proposes to adopt Sear-Brown's (May 1996) Community Air Monitoring Plan (Appendix C), prepared to address VOC air quality issues that may arise as a result of the operation of the treatment equipment at the site.

3.0 Groundwater Pumping and Treatment Plan

Pumps will be installed in two (2) existing wells, wells MW-2 and MW-3, in order to recover contaminated groundwater for treatment on-site. Pumping of groundwater from these two locations, identified as source areas, will mitigate off-site migration of contaminants and begin the remediation of source areas of groundwater contamination.

3.1 Groundwater Pump Installation

An all pneumatic bladder pump will pump water from wells MW-2 and MW-3. The pump will be driven by a portable cycle controller, with air supplied by a portable air compressor. The groundwater pumping apparatus will consist of the following major components:

- Solo® II sampling pumps
- pump tubing (air and liquid) bundles
- well cap
- air compressor

Each of the above-listed components is described below.

Sampling Pumps – Solo® II sampling pumps, supplied by QED Environmental Systems, will consist of a pneumatic displacement pump which fills and discharges in alternating cycles. The pump runs itself, with an internal float system and a magnetic air control valve. The float follows changing liquid levels in the pump, signaling the valve to turn the air supply on as soon as the pump is full and off when empty. The air control mechanism uses a magnetic relay to isolate it from pumped fluids. When air pressure is shut off, an inlet check valve allows liquid to enter the pump under the hydrostatic pressure in the well. After the pump fills, air pressure is turned on, seating the inlet check valve and forcing the liquid out through the discharge check valve and tubing.

The pump has no controller, in-line control devices, or factory-set control cycle timers. All at-well equipment operates on compressed air. No electricity is required at the well head.

Pump Tubing Bundles – The sample pump tubing bundles will consist of air and liquid tubing or hoses constructed of Nylon 12, which will not swell in water and provides excellent resistance to hydrocarbons, fuels and alkalis.

Well Cap Assembly – Each well will have a well cap which secures the pump tubing or hose and supports the pump in the well

Air Compressor – The air compressor will supply air to the pump. The air compressor will be of oilless design, with no lubricating oil in any chamber or component, to prevent potential contamination to the sample in the event of malfunction. The air compressor will be powered by a clean-running four stroke Honda gasoline engine (4 HP) with no oil and gasoline mixing. The compressor will be at a maximum distance of 40 feet from the wellhead

3.2 Pumping Schedule

Groundwater pumping in wells MW-2 and MW-3 will be initiated following the installation of the treatment train and a system test, and the acquisition of a round of groundwater samples from each of the eight (8) groundwater monitoring wells for the purpose of developing baseline water quality data. Total system yield is expected to be 4 gallons per minute (gpm).

3.3 Groundwater Treatment – Air Stripper and Vapor Phase Carbon Treatment System

The air stripper utilized at the Dinaburg site will be a low profile, multiple sieve tray design using pressure rather than vacuum to generate airflow. The air stripper process will pipe influent water to the air stripper inlet distribution port. The water will then be allowed to flow over a weir and through a series of sieve/aeration trays as it descends to a sump at the bottom of the unit. Air forced up through the sieve holes in each tray forms a froth of bubbles, generating a large surface area. Depth of froth and unit air-to-water ratio will be controlled to optimize the contaminant removal process. This will allow mass transfer of contaminants from the water into the rising air, which will be routed to a vapor phase carbon canister at the top of the unit. A demister pad is used to prevent the release of water droplets in the exhaust.

The stripper shell will be of one piece welded construction and it will either be coated with epoxy or be made of uncoated stainless steel. Shell design will include mounting brackets suitable for hold-down on a skid or floor, plus forklift cutouts and/or lifting lugs to allow the unit to be moved easily without damage.

The stripper will be equipped with an integral sump, tray support tracks, and a high efficiency demister, plus an external sump gauge to allow visual observation of water level. The demister will effectively remove water droplets at air flow velocity greater than stripper blower maximum capacity.

The stripper will accommodate slide-out removable interchangeable sieve trays for easy cleaning. Access to the trays will be via a removable transparent front hatch, without requiring removal of influent, effluent, or air discharge piping. The sieve trays will be constructed of stainless steel and a slide-out design. The sieve trays will include a mechanical flow control device which will regulate water volume in each tray, preventing air short circuiting. Trays will be supplied with engineered perforations, sized and located to maintain not less than the specified active area of optimum mass transfer (not including seal pot or downcomer area). A spare set of trays may be utilized which would reduce system downtime by allowing operation to resume without a delay for tray cleaning. This option would also allow for easier tray cleaning since extra trays can be set aside to allow calcium and/or iron fouling to dry on them so it can simply be cracked off. The stripper is fully accessible for cleaning from the front.

During stripper operation the air to water ratio will be kept in accordance with generally accepted chemical engineering practice as defined in Perry's Handbook.

The vapor phase carbon vessel to be used is a low pressure drop series vessel. The low pressure drop type of vessel is preferred since it will minimize the backpressure on the air stripper blower and will therefore minimize the size of the blower required. The project will use two vessels sized at 500 pounds each of reactivated 4x10 coal-based carbon media. This is estimated to be effective at removing volatile constituents at the identified concentrations from the stripper exhaust for approximately 1.5 to 2 months duration.

Operation of the carbon filter requires periodic monitoring of the following:

- Pressure reading at primary and secondary influent (pressure drop consistency check)
- Inspection of filters for leaking and stress (corrosion check)

3.4 Treated Groundwater Disposal to POTW

The treated groundwater will be routed to the combined storm and sanitary sewer and ultimately the publicly-owned treatment works (POTW) operated by the Monroe County Department of Environmental Services, Division of Pure Waters ("Pure Waters"). Galson has initiated discussions with Pure Waters regarding this project, and they are both aware of the site and prepared to cooperate with the proposed remedial efforts.

A proposal detailing the objectives of the IRM and the contaminants of concern will be submitted to Pure Waters two weeks prior to the initiation of field work. Once Pure Waters issues a Monroe County Sewer Use Permit application to Galson it will be completed and returned within one week.

When the system is assembled and operational a sample of the influent and effluent water will be acquired during the pilot test phase for submittal to the laboratory. Analytical results will be submitted to NYSDEC and Pure Waters. Pure Waters will review the letter report and either request modifications to the system or issue an operating permit for the system.

Assuming that an operating permit is issued, additional influent and effluent sampling will be conducted at the following rates:

Period	Sampling Frequency	Notes
First Month of Operation	Weekly	--
First 6 months of Operation	Monthly	--
Greater than 6 months	Quarterly	(with Pure Waters approval)

Laboratory analytical data from samples of the treated groundwater (effluent), along with discharged water volume data collected from the meter on the stripper discharge, will be supplied to Pure Waters to verify compliance with the conditions of the discharge permit.

3.5 Air Stripper Vapor Phase Air Discharge Registration

It is expected that the IRM will operate for a period of several years. The NYSDEC Division of Air Resources requires that a two step process be followed in order to receive permission to route emissions from the vapor phase carbon canister on the air stripper to the atmosphere. The first step involves the completion and submission of a Spill Cleanup/Remediation Air Emission Work Sheet ("Air Guide 1 Work Sheet"), detailing the contaminants of concern, system start date, various site-specific and system-specific details with emission loading data calculated from the design specifications for the system. Once the Work Sheet has been submitted to and accepted by the NYSDEC, a Minor Facility Registration form must be completed and submitted. This registration serves as a compliance notification to the NYSDEC and the Department responds by issuing a registration certificate for the facility.

Both of the above-referenced steps will be followed for this project and the associated documentation will be filed as attachments to the initial project report.

4.0 Groundwater Sampling and Analysis Plan

Groundwater sampling for the IRM will consist of an initial baseline sampling event for all eight monitoring wells, with subsequent annual sampling of the wells. Samples will be acquired following procedures presented in Sear-Brown's May 1996, Quality Assurance Project Plan (QAPP), applicable NYSDEC field methods, and the procedures described in this section.

A minimum of three (3) well volumes of groundwater will be removed or the well completely evacuated before sampling occurs. All samples will be preserved according to the prescribed methods and chain of custody forms will be completed by field personnel. The samples will be shipped at the end of each day to the laboratory for analysis. Analytical parameters for groundwater samples are presented in Table 1.

Galson will be responsible for determining that the analytical laboratory has and maintains NYSDOH ELAP certification in all categories of CLP and Solid and Hazardous Waste analytical testing for the duration of the project.

Table 1 – Analytical Parameters
Former Dinaburg Distributing Inc. Site, Rochester, NY

SAMPLING METHOD	MATRIX	NUMBER OF SAMPLES	FREQUENCY	PARAMETERS	ANALYTICAL METHODS
Well Sampling – 8 wells	Groundwater – Baseline Sampling	12 (one time) [8 samples & 4 QA/QC]	Single Event	Volatile Organics	EPA Method 524.2
Well Sampling – 8 wells	Groundwater – Annual Sampling	12 per year [8 samples & 4 QA/QC]	Once each year	Volatile Organics	EPA Method 524.2
Influent/Effluent Sampling	Groundwater (untreated & treated)	3/week [2 samples & 1 QA/QC]	First Month	Volatile Organics	EPA Method 524.2
Influent/Effluent Sampling	Groundwater (untreated & treated)	3/month [2 samples & 1 QA/QC]	First 6 months	Volatile Organics	EPA Method 524.2
Influent/Effluent Sampling	Groundwater (untreated & treated)	3/quarter [2 samples & 1 QA/QC]	Every Quarter (after first 6 months)	Volatile Organics	EPA Method 524.2

4.1 Sampling and Analysis of Air Stripper Influent and Effluent

The influent and effluent of the groundwater treatment system will be sampled to determine the treatment efficiency of the system and to provide documentation to the County that the effluent is at or below the permitted concentrations for discharge to the sewer/POTW. The samples will be delivered to the laboratory at the end of each day of sampling.

Based on the requirements of Pure Waters, the frequency of the sampling will vary. During the first month of operation, sampling is required every week. After the first month and through the sixth month, sampling is performed on a monthly basis. Sampling of the air stripper influent and effluent will be performed on a quarterly basis after the first six months of operation..

4.2 Groundwater Well Sampling

Prior to purging and sampling, the wellhead cap will be removed and the air immediately above the well will be evaluated for total VOC concentrations through use of an HNu PID meter. Each well will also be monitored for the presence/absence of discrete Dense Non-Aqueous Phase Liquid (DNAPL) with a Solinst Model 121 Interface probe or its equivalent.

Water level measurements will be obtained from each well using a Solinst electric water level meter and readings will be logged on a monitoring well sampling log form for each well.

Sampling will be completed following the methods presented in the QAPP (Appendix A).

As mentioned previously, each of the eight well samples will be analyzed initially in order to generate a baseline for groundwater quality which will be used for comparison with future sample data from treatment system influent samples, and also comparison with sample data collected annually from each well. Additionally, samples of the influent and effluent water from the treatment system will be analyzed at least once each quarter to provide data on treatment system operation and efficiency. Finally, samples of groundwater from each well will be obtained once each year to complement the baseline data and allow for monitoring of the overall effectiveness of the system.

4.3 Baseline Groundwater Sampling

For development of the baseline data, initially each of the wells will be sampled and analyzed for volatile organic compounds using EPA Method 524.2. One blind field duplicate and one laboratory-prepared trip blank will be analyzed for volatile organic compounds for QA/QC purposes. One matrix spike (MS) and one matrix spike duplicate (MSD) analysis will also be performed for QA/QC purposes.

To the extent that the contaminant levels allow, the laboratory will be requested to provide a detection limit of 2 ug/l for vinyl chloride. However, if matrix interference occurs, which requires sample dilution, the requested detection limit for vinyl chloride may not be attainable.

At the time of sampling, a separate flask will be filled with a portion of the groundwater samples for field measurements. The field tests will include turbidity, temperature, pH, and specific conductivity.

4.4 Weekly Groundwater Sampling

For the first month of treatment system operation the influent and effluent from the system will be sampled and analyzed for volatile organic compounds using EPA Method 524.2. This data

will be summarized in a letter report which will be submitted to NYSDEC and to Pure Waters for review.

4.5 Monthly Groundwater Sampling

For the first six (6) months of system operation samples of the influent and effluent water from the treatment system will be analyzed once each month to provide data on treatment system operation and efficiency. The samples will be analyzed for volatile organic compounds using EPA Method 524.2. One laboratory prepared trip blank will also be analyzed for QA/QC purposes. This data will be summarized in a letter report which will be submitted to NYSDEC and to Pure Waters for review. If approved by Pure Waters this frequency of sampling and analytical will be reduced to once per quarter after the initial six month period.

4.6 Quarterly Groundwater Sampling

After the first six (6) months of system operation samples of the influent and effluent water from the treatment system will be analyzed once every quarter to provide data on treatment system operation and efficiency, given approval by Pure Waters. As previously detailed, the samples will be analyzed for volatile organic compounds using EPA Method 524.2. One laboratory-prepared trip blank will also be analyzed for QA/QC purposes. This data will be summarized in a letter report which will be submitted to NYSDEC and to Pure Waters for review.

4.7 Annual Groundwater Well Sampling

Once each year each well will be sampled and analyzed for volatile organic compounds using EPA Method 524.2. One blind field duplicate and one laboratory-prepared trip blank will be analyzed for QA/QC purposes. One matrix spike (MS) and one matrix spike duplicate (MSD) analysis will also be performed for QA/QC purposes.

At the time of sampling, a separate flask will be filled with a portion of the groundwater samples for field measurements. The field tests will include turbidity, temperature, pH, and specific conductivity.

The annual sampling will follow the above-stated protocol, with elimination of any sampling point when no target compounds have been detected at concentrations above groundwater standards for two (2) consecutive rounds, i.e., two years, of sampling.

5.0 Documentation and Reporting

Detailed documentation of site activities will be maintained during the field work. Daily Site Logs and Sampling Log forms will be generated and included in the written report to the Department.

5.1 Field Documentation

Documentation of the field activities and environmental sampling will include the following:

- Field Notebook – Field personnel will maintain a bound field notebook which will document dates, times and duration of pertinent field occurrences. Notebook entries will be made on consecutive pages.
- Treatment System Operational Log Forms – parameters of system operation (pressure, flow, etc..) logged on these forms.
- Project Photographs – Photographs will be taken of field activities.
- Calibration Records – Calibration records for field instrumentation will be maintained in the field notebook.
- Safety Forms – Sign-in forms, air monitoring results, and other safety related documentation will be maintained.
- Chain-of-Custody Forms – Sample handling will be recorded on chain-of-custody forms with associated labels and custody seals.

5.2 Reporting – Project Deliverables

Reporting will consist of the following:

- Initial Report - to be filed after receipt of baseline analytical data and to include the tabulation and summarization of same. This report will present discussion of the results of the sampling and will also describe the treatment system installation and its initial operating condition.

- Weekly Effluent Sample Laboratory Data, Letter Reports - to be filed with NYSDEC and Pure Waters once each week for the first month of operation, after receipt of the analytical data each week. Upon receipt and review of the data, a report will be prepared which summarizes the methods, field findings (system operational data), and lab results.

- Monthly Effluent Sample Laboratory Data, Letter Reports - to be filed with NYSDEC and Pure Waters once each month for the first six (6) months of operation, after receipt of the analytical data each week. Upon receipt and review of the data, a report will be prepared which summarizes the methods, field findings (system operational data), and lab results.

- Quarterly Treatment System Reports – after six (6) months of system operation, and at the discretion of Pure Waters, monthly reports will be replaced by quarterly reports, which will be filed after receipt of the analytical data. Upon receipt and review of the data, a report will be prepared which summarizes the methods, field findings (system operational data), lab results, interpretations, conclusions and recommendations.

- Annual Report - to be filed once each year after receipt of the analytical data for groundwater sampling. Upon receipt and review of the data, a report will be prepared which summarizes the methods, field findings, lab results, interpretations, conclusions and recommendations.

6.0 Project Organization and Schedule

A multi-disciplined team is required to perform the activities described in this document. The project team will include experienced staff and qualified subcontractors that are appropriately trained for their assigned duties.

6.1 Key Project Personnel

The primary personnel selected to perform the activities included in this document are presented below along with a brief description of their duties. Resumes for these individuals are provided in Appendix D.

Theresa A. Beddoe, CPG - Project Manager
- Provides overall project management;
- Provides managerial guidance to technical group;
- Serves as liaison between technical group and client;
- Serves as liaison with NYSDEC; and
- Prepares and reviews reports.

Paul J. Micciche, PG – Senior Hydrogeologist
- Remediation task leader;
- Reviews and interprets hydrogeological data and contaminant plume geometry;
- Provides technical representation at meetings; and
- Prepares reports.

Kevin McGovern – Field Geologist
- Provides immediate supervision of on-site activities, including treatment system installation and operation, groundwater sample collection, and health and safety;
- Ensures that samples are properly collected, stored and subjected to the appropriate chain-of-custody protocols;
- Maintains field equipment and logs operational data for same; and
- Assists in preparation of reports.

Derek C. Anderson, P.E. – Environmental Engineer
- Evaluation of treatment system design; and
- Assisting project manager with cost estimates.

6.2 Subcontractors

Qualified, experienced and licensed or certified subcontractors will be retained to perform the aqueous sample analyses.

The treatment system, manufactured by QED Environmental Systems, Inc., will be designed by, purchased from, and installed by BISCO Environmental of Dedham, Massachusetts. BISCO personnel experienced in the assembly and start-up of the treatment system will deliver and install the system and then test its operation.

6.3 Project Schedule

The remediation activities proposed in this IRM work plan will be conducted upon approval by NYSDEC. Table 2 contains a summary of the activities to be conducted and the approximate timetable to complete those tasks.

Table 2 – Project Schedule
Former Dinaburg Distributing Inc. Site, Rochester, NY

Task No.	Task Description	Start Date	Duration	Deliverable
1	NYSDEC Approval of Work Plan		NA	Authorization
2	Subcontractor Mobilization		1 week	*Not Applicable*
3	Submittal of Effluent Discharge Proposal to Pure Waters			Proposal
4	Groundwater Treatment System Design		2 weeks	*Not Applicable*
5	Baseline Well Sampling		2 days	Report – 2 weeks after lab data received
6	Submittal of Sewer Use Permit Application to Pure Waters			Permit Application
7	Treatment System Installation		1.5 weeks	*Not Applicable*
8	System Ramp-up and Pilot Testing		2 days	*Not Applicable*
9	Weekly Influent/Effluent Testing		1 month	Letter Report
10	Monthly Influent/Effluent Testing		6 months	Letter Report
11	Quarterly Influent/Effluent Sampling		1 day every 3 months	Report – 2 weeks after lab data received
12	Annual Well Sampling	1 year > task 6	2 days / year	Report – 2 weeks after lab data received

7.0 Additional Project Documents

By reference, the following existing documents from Sear-Brown's 1996 *Additional Site Investigation Activities Work Plan (ASIA work plan)*, are herein appended for use in this project (with amendments as noted in subsequent subsections). The appendices from the ASIA work plan are:

Appendix 1 - Quality Assurance Project Plan (QAPP)	(Appendix A of this document)
Appendix 2 - Health and Safety Plan (HASP)	(Appendix B of this document)
Appendix 3 - Community Air Monitoring Plan (CAMP)	(Appendix C of this document)

7.1 QAPP Amendments

The QAPP (Sear-Brown, 1996) presented the policies, organization, objectives, functional activities, and specific quality assurance and quality control activities to ensure the validity of data generated in the completion of the additional site investigation activities.

The project description portion of the QAPP is revised such that the proposed activities for the IRM are as follows:

- initial (baseline) groundwater sampling from eight (8) wells
- groundwater recovery pump installation in two (2) wells
- assembly, start-up and operation of air stripping (groundwater) and vapor-phase carbon treatment equipment.
- weekly sampling and analysis of treatment system influent and effluent (first month of operation)
- monthly sampling and analysis of treatment system influent and effluent (first six months of operation)
- quarterly sampling and analysis of treatment system influent and effluent; and
- annual sampling and analysis of groundwater from eight (8) wells.

Sampling procedures for this IRM are the same as those for the ASIA WP.

Analytical procedures for the IRM are amended to incorporate the use of EPA Method 524.2 as the analytical method for groundwater, and air stripper influent and effluent analyses. The practical quantitation limit will be 0.5 ppb for Method 524.2.

7.2 HASP Amendments

The HASP (Sear-Brown, 1996) details the personal safety protection standards and procedures followed during the ASIA work at the site.

Based on the results of the ASIA, the list of site-specific chemicals is amended to consist of PCE and TCE.
The ASIA HASP included roadway hazards as one of the physical hazards which were a concern at the site. Since this IRM work plan does not include any activity which will require personnel

to work in close proximity to public roadways, the roadway hazard precautions listed in the HASP are not adopted for this project. If conditions or circumstances dictate that personnel are in fact required to participate in activities on active roadways the precautions will be followed.

7.3 CAMP Amendments

The CAMP (Sear-Brown, 1996) was prepared to address potential VOC and particulate air quality issues during drilling and sampling activities at and adjacent to the Dinaburg site. The air monitoring protocols to be followed during IRM activities will adhere to the same protocols as those found in the CAMP with the following exceptions:

- Work area monitoring will consist of periodic monitoring of total VOCs using an HNu meter to monitor the breathing zone during treatment system startup and during the acquisition of the well samples.

- No fugitive dust control measures will be administered. as no disturbance of site soils is involved.

Minor and major vapor release response plan activities will be performed as detailed in the CAMP.

APPENDIX A

Quality Assurance Project Plan

APPENDIX 1

QUALITY ASSURANCE PROJECT PLAN
FOR
ADDITIONAL SITE INVESTIGATION ACTIVITIES
FORMER DINABURG DISTRIBUTING, INC.
1012 SOUTH CLINTON AVENUE
ROCHESTER, NEW YORK

MAY 1996

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QUALITY ASSURANCE PROJECT PLAN
FOR
ADDITIONAL SITE INVESTIGATION ACTIVITIES
FORMER DINABURG DISTRIBUTING, INC.
1012 SOUTH CLINTON AVENUE
ROCHESTER, NEW YORK

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Appendix

A Laboratory QA/QC Plan

QUALITY ASSURANCE PROJECT PLAN
FOR
ADDITIONAL SITE INVESTIGATION ACTIVITIES
FORMER DINABURG DISTRIBUTING, INC.
1012 SOUTH CLINTON AVENUE
ROCHESTER, NEW YORK

1.0 Introduction

This Quality Assurance Project Plan (QAPP) is to be utilized in conjunction with the Revised Work Plan for the Additional Site Investigation Activities to be conducted at the former Dinaburg Distributing, Inc., located at 1012 South Clinton Avenue, Rochester, New York (Figure 1). This QAPP presents the policies, organization, objectives, functional activities, and specific quality assurance and quality control activities to ensure the validity of data generated in the completion of the investigation. The purpose of the program is to ensure that all technical data generated are accurate and representative.

Quality assurance (QA) is a management system for ensuring that all information, data, and decisions resulting from investigation and environmental monitoring programs are technically sound, and properly documented. Quality control (QC) is the functional mechanism through which quality assurance achieves its goals. Quality control programs, for example, define the frequency and methods of checks, audits, and reviews necessary to identify problems and dictate corrective actions to resolve these problems, thus ensuring high quality data. As such, a quality assurance and quality control program pertains to all data collection, evaluation, and review activities which are part of the investigation.

All QA/QC procedures will be in accordance with applicable professional technical standards, government regulations and guidelines, and specific project goals and requirements. This QAPP has been prepared in accordance with New York State Department of Environmental Conservation (NYSDEC) and United States Environmental Protection Agency (USEPA) -Region II guidance documents.

The QAPP incorporates the following activities:

- Sample collection, control, chain-of-custody, and analysis;
- Document control;
- Laboratory instrumentation, analysis, and control; and
- Review of project reports.

Analytical samples will be collected in the field utilizing standard operating procedures and sent to a NYSDOH - certified[1] laboratory for analysis. Duplicates, replicates, and spiked samples will be used to identify the quality of the analytical data. Field audits may be conducted to verify that proper sampling techniques and chain-of-custody procedures are followed. Field data compilation, tabulation, and analysis will be checked for accuracy. Calculations and other post-field tasks will be reviewed by senior project personnel. Equipment used to take field measurements will be maintained and calibrated in accordance with established procedures. Records of calibration and maintenance will be kept by assigned personnel. Field testing and data acquisition will be performed following strict guidelines as described herein.

Document control procedures will be used to coordinate the distribution, coding, storage, retrieval, and review of all data collected during all sampling tasks.

[1]Certified by NYSDOH Environmental Laboratory Approval Program (ELAP) for the analysis of wastewater and solid and hazardous waste.

2.0 Project Description

This QAPP pertains to the completion of field activities and subsequent laboratory and data analysis associated with the additional site investigations of the former Dinaburg Distributing, Inc. (Dinaburg), located at 1012 South Clinton Avenue, Rochester, New York. All investigation elements are described in detail in the Revised Work Plan, Former Dinaburg Distributing, Inc., Rochester, New York.

The Additional Site Investigation is being initiated by The Estate of Saul Dinaburg (Estate) to respond to the NYSDEC requests to conduct additional investigations at the facility due to suspected chlorinated solvent and petroleum contamination of site soils and groundwater.

Activities associated with the Additional Investigation include drilling and sampling of subsurface soils; installation of groundwater monitoring wells; sampling and analysis of groundwater samples; conducting aquifer tests; and, measuring groundwater elevations.

2.1 Site Description

The site covers approximately $0.25^{\pm}$ acres and consists of two rectangular parcels oriented perpendicular to one another at 1012 South Clinton Avenue, City of Rochester, Monroe County (Figure 2). The site is zoned commercial.

The site currently contains a vacant, one-story commercial building, asphalt covered surfaces and a small grass covered lawn area. It is reported that the original portion of the existing building at the rear of the site was built prior to 1931. Several additions have been made to the building since that time.

Historical use of the site was reported to have included auto repair services from circa 1950 to circa 1969. From circa 1971 to circa 1993, the site was occupied by Dinaburg Distributing, Inc., which operated a dry cleaning supply business from this site. During a January 1994 Phase I Environmental Site Assessment, the site was reported as being used by Solvents and Petroleum Service, Inc. as a storage facility for their dry cleaning supply business. The site is presently vacant.

Further discussions regarding site history, topography, hydogeology, and previous investigations are provided in the Revised Work Plan and in the April 1955 Environmental Site Characterization Report prepared by Sear-Brown.

3.0 Project Organization and Responsibility

This QAPP provides for designated qualified personnel to review products and provide guidance on QA matters. This QAPP also outlines the approach to be followed to ensure that products of sufficient quality are obtained. Figure 3 illustrates the program organization. This structure will provide for direct and constant operational responsibility, clear lines of authority, and the integration of QA activities. The various QA functions are of project positions explained in the following subsections.

Project Manager

The project manager will have overall responsibility for ensuring that the project meets the objectives and quality standards as presented in the Additional Site Investigation Work Plan and this QAPP. He will be responsible for implementing the project and will have the authority to commit the resources necessary to meet project objectives and requirements. The project manager's primary function is to ensure that technical, financial, and scheduling objectives are achieved successfully. The project manager will provide the major point of contact and control for matters concerning the project. In addition, he will be responsible for technical quality control and project oversight, and will be the primary point-of-contact.

Team Leaders

The project manager will be supported by a team leader or leaders who will be responsible for leading and coordinating the day-to-day activities of the various resource specialists under their supervision. The team leader is a highly experienced environmental professional who will report directly to the project manager.

Technical Staff

The technical staff (team members) for this project will be drawn from corporate resources and appropriately qualified subcontractors. The technical team staff will be utilized to gather and analyze data, and to prepare various task reports and support materials. All of the designated technical team members will be experienced professionals who possess the degree of specialization and technical competence required to effectively and efficiently perform the required work.

Project QA Director
The Project QA Director will be responsible for maintaining QA for the project.

Laboratory Director
The laboratory director will be responsible for all analytical work and works in conjunction with the QA unit. He maintains liaison with the QA officer regarding QA and custody requirements.

Laboratory Manager
The laboratory manager will maintain liaison with the laboratory director regarding QA elements of specific sample analyses tasks. He will report to the laboratory director and work in conjunction with the QA unit.

Laboratory QA Coordinator
The Laboratory QA officer will be responsible for overseeing the QA program within the laboratory and for maintaining all QC documentation. He reports directly to the laboratory director.

Laboratory Staff
Each member of the laboratory staff will perform an assigned QA or analytical function that is pertinent to and within the scope of his or her knowledge, experience, training, and aptitude. An individual will be assigned the responsibility for checking, reviewing, or otherwise verifying that a sample analysis activity has been correctly performed.

Laboratory Facilities
All laboratory work will be performed in accordance with guidelines established by NYSDEC, USEPA, the Water Pollution Control Federation, and/or the American Society for Testing and Materials (ASTM). In case of conflict these guidelines and protocols will be considered in the order shown (i.e., NYSDEC criteria is of primary precedence). In addition, QA and QC programs will be maintained for the instruments and the analytical procedures used. The laboratory's QA/QC Plan is provided in Appendix A.

The laboratory will be certified by the New York State Department of Health (ELAP) for the analysis of wastewater.

4.0 QA Objectives for Data Measurement

All measurements will be made to ensure that analytical results are representative of the media and conditions measured. Unless otherwise specified, all data will be calculated and reported in units consistent with other organizations who report similar data to allow comparability of data bases among organizations.

The key considerations for the QA assessment of generated data are accuracy, precision, completeness, representativeness, and comparability. These characteristics are defined below:

Accuracy: Accuracy is the degree of agreement of a measurement or average of measurements with an accepted reference or "true" value and is a measure of bias in the system.

Precision: Precision is the degree of mutual agreement among individual measurements of a given parameter.

Completeness: Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected to be obtained under correct normal conditions.

Representativeness: Representativeness expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition.

Comparability: Comparability expresses the confidence with which one data set can be compared to another.

4.1 Goals

The QA/QC goal will focus on controlling measurement error within the limits established and will ultimately provide a database for estimating the actual uncertainty in the measurement data.

Target values for detection limit, percent spike recovery and percent "true" value of know check standards, and RPD of duplicates/replicates are provided in the referenced analytical procedures. It should be noted that target values are not always attainable. Instances may arise where high sample concentrations, nonhomogenity of samples, or matrix interferences preclude achievement of target detection limits or other quality control criteria. In such instances, the laboratory will report reasons for deviations from these detection limits or noncompliance with quality control criteria.

5.0 Sampling Procedures

The sampling of various environmental media will be completed as part of remedial investigation activities. Table 1 presents the location, type, analytical requirements, and quantities of samples to be collected as part of the Additional Site Investigation Activities.

5.1 Sampling Protocol

The following sections outline the sampling procedures for the collection of environmental media samples of sediment and soils. Groundwater monitoring well installation procedures are described in the Work Plan.

5.1.1 Soil Samples

5.1.1.1 Soil Borings

The borings will be continuously sampled using a split-spoon sampler and methods specified in ASTM Methods D1586-84. This method requires driving the split spoon into the formation with a 140 pound hammer dropped from a height of 30 inches. Soil samples to be submitted for chemical analysis will be extracted from the core to provide a representative sample of that depth interval. These sub-cores will be extracted using a stainless steel trowel or knife. Care will be taken to insure that the outer portion of the soil core which contacted the split spoon is removed by scraping with the trowel or knife. Soil samples will be containerized for the type of analysis planned for the boring and the container requirements shown on Table 2. The sample containers will be labeled in accordance with Section 6.3.1.

5.1.2 Groundwater Samples

5.1.2.1 Detection of Immiscible Layers

Checks for immiscible layers will be conducted prior to purging the well for sampling. A Soilinst Model 121 or equivalent audible interface probe will be used to detect light phases (LNAPL) and dense phases (DNAPL). If present, the depth and thickness of the immiscble phase will be measured and recorded on the sampling records.

5.1.2.2 Groundwater Monitoring Well Development and Sampling

Groundwater monitoring wells will be developed and purged prior to sampling. Acceptable methods include bailers, peristaltic pumps, and inertia pumps. Bailers or inertia pumps may be initially used for development if the turbidity of the water is high. Development and purge water will be collected and stored on site in 55-gallon drums. The wells will be sufficiently developed to reduce turbidity and to allow representative formation water to enter the well prior to sample collection. Water quality field parameters (turbidity, pH, specific conductance and temperature) will be monitored for each successive well volume removed during development. Stabilized field parameter measurements will be used as indications of inflow of representative groundwater to the wells.

Following well development and prior to collecting groundwater samples, the monitoring well will be purged to remove stagnant water and allow fresh formation water to enter the well. Wells will be purged using utilizing bailers and/or peristaltic pumps. Water quality field parameters (turbidity, pH, specific conductance and temperature) will be monitored for each successive well volume removed during development. Stabilized field parameter measurements (i.e., varying less than 10 % over two successive well volumes) will be used as indications of inflow of representative groundwater to the wells.

Following the completion of purging, groundwater samples will be collected using dedicated or disposable Teflon bottom-filling bailers. Bailer cords will be made of Teflon coated wire, stainless steel wire or polypropylene monofilament. A ten-foot leader constructed of the approved materials may be used with a nylon cord above.

5.2 Field Quality Control Samples

Field quality control samples will consist of one field duplicate soil sample collected from the soil borings and one field duplicate groundwater sample collected from the newly installed groundwater monitoring wells.

5.3 *Sample Containers*

The volumes and containers required for the sampling activities are included in Table 2. Prewashed sample containers will be provided by the laboratory. All bottles are to be prepared in accordance with USEPA bottle washing procedures.

5.4 *Decontamination*

Sampling methods and equipment have been chosen to minimize decontamination requirements and the possibility of cross contamination. Sampling equipment used on more than one location will be decontaminated between locations by one of the following decontamination procedures:

Sampling Tools

- Initial cleaning of all foreign matter;
- Low phosphate detergent wash;
- Tap water rinse;
- Methanol rinse (pesticide grade);
- Hexane rinse;
- Methanol rinse (pesticide grade);
- Deionized water rinse; and
- Air dry.

Drill Augers, Rods, and Split-Spoon Samplers

The drill rig, augers, rods, split spoon samplers, and other related downhole equipment will be decontaminated using high pressure steam prior to initiating the soil boring program. This decontamination procedure will also used on the downhole equipment between each boring. Steam cleaning will be performed inside the building in a designated on-site decontamination area. Throughout and after the cleaning processes, direct contact between the equipment and the ground surface will not be permitted. Decontamination waste water will be collected in 55-gallon drums. The drill rig and associated equipment will also be cleaned upon completion of the investigation prior to departure from the site using the following methods:

- Initial cleaning of all foreign matter;
- Wash down with high pressure, high temperature detergent spray to remove and/or volatilize organic contamination.

5.5 *Levels Of Protection/Site Safety*

All sampling will be conducted under a documented Health and Safety Plan. On the basis of air monitoring, the level of protection may be downgraded or upgraded at the discretion of the site safety officer. Crew members will conduct all on-site activities in pairs utilizing the "buddy system." Team members will stand upwind during the collection of samples, when possible.

All work will initially be conducted in Level D (refer to Site Specific Health and Safety Plan). Air purifying respirators (APRs) will be available if monitoring indicates an upgrade to Level C.

6.0 Sample Custody

This section describes standard operating procedures for sample identification and chain-of-custody to be utilized for all field activities. The purpose of these procedures is to ensure that the quality of the samples is maintained during collection, transportation, storage, and analysis. All chain-of-custody requirements comply with standard operating procedures indicated in USEPA and NYSDEC sample-handling protocol.

Sample identification documents must be carefully prepared so that sample identification and chain-of-custody can be maintained and sample disposition controlled. Sample identification documents include:

- Field records,
- Sample label,
- Custody seals, and
- Chain-of-custody records.

6.1 Chain-Of-Custody

The primary objective of the chain-of-custody procedures is to provide an accurate written or computerized record that can be used to trace the possession and handling of a sample from collection to completion of all required analyses.

6.1.1 Sample Tags

Sample tags attached to or affixed around the sample container must be used to properly identify all samples collected in the field. The sample tags are to be placed on the bottles so as not to obscure any QA/QC lot numbers on the bottles; sample information must be printed in a legible manner using waterproof ink. Field identification must be sufficient to enable cross-reference with the field sampling records or sample logbook. For chain-of-custody purposes, all QC samples are subject to exactly the same custodial procedures and documentation as "real" samples.

6.1.2 Custody Seals

Custody seals are preprinted adhesive-backed seals with security slots designed to break if the seals are disturbed. Sample shipping containers (coolers, cardboard boxes, etc., as appropriate) are sealed in as many places as necessary to ensure security. Seals must be signed and dated before use. On receipt at the laboratory, the custodian must check (and

certify, by completing logbook entries) that seals on boxes are intact. Strapping tape should be placed over the seals to ensure that seals are not accidentally broken during shipment.

6.1.3 Chain-Of-Custody Record

The chain-of-custody record must be fully completed at least in duplicate by the field technician who has been designated by the project manager as responsible for sample shipment to the appropriate laboratory for analysis. (See Appendix 1, Custody Forms.) In addition, if samples are known to require rapid turnaround in the laboratory because of project time constraints or analytical concerns (e.g., extraction time or sample retention period limitations, etc.), the person completing the chain-of-custody record should note these constraints in the "Remarks" section of the custody record.

6.1.4 Field Custody Procedures

- As few persons as possible should handle samples.
- Sample bottles will be obtained precleaned by the laboratory and shipped to the sampling personnel in charge of the field activities. Coolers or boxes containing cleaned bottles should be sealed with a custody tape seal during transport to the field or while in storage prior to use.
- The sample collector is personally responsible for the care and custody of samples collected until they are transferred to another person or dispatched properly under chain-of-custody rules.
- The sample collector will record sample data in a controlled field notebook and/or on appropriate field sampling records.
- The site team leader will determine whether proper custody procedures were followed during the fieldwork and decide if additional samples are required.

6.2 *Documentation*

6.2.1 *Sample Identification*

All containers of samples collected from the project will be identified using the following format on a label or tag fixed to the sample container:

DIN-XX-YY-ZZ

- DIN - This set of initials indicates the Dinaburg site investigation project.

- XX - These initials identify the sample. Actual sample locations will be recorded on the sampling record (Appendix A). Field duplicates, field blanks and rinsate blanks will be assigned unique sample numbers.
- YY - These initials identify the sample matrix in accordance with the following abbreviations:
  GW - Groundwater Sample
  SS - Soil Sample
  ZZ - Sub-Sample Number

Each sample will be labeled, chemically preserved, if required and sealed immediately after collection. To minimize handling of sample containers, labels will be filled out prior to sample collection. The sample label will be filled out using waterproof ink and will be firmly affixed to the sample containers. The sample label will give the following information:

- Name of sampler,
- Date and time of collection,
- Sample number,
- Intended analysis and
- Preservation required.

6.2.2 *Daily Logs*

Daily logs and data forms are necessary to provide sufficient data and observations to enable participants to reconstruct events that occurred during the project. All daily logs will be kept in a notebook and consecutively numbered. All entries will be made in waterproof ink, dated, and signed. Sampling data will be recorded in the sampling

records. All information will be completed in waterproof ink. Corrections will be made according to the procedures given at the end of this section.

6.3 Sample Handling, Packaging, And Shipping

The transportation and handling of samples must be accomplished in a manner that not only protects the integrity of the sample, but also prevents any detrimental effects due to the possible hazardous nature of samples. Regulations for packaging, marking, labeling, and shipping hazardous materials are promulgated by the United States Department of Transportation (DOT) in the Code of Federal Regulations, 49 CFR 171 through 177.

All chain-of-custody requirements must comply with standard operating procedures in the NYSDEC and USEPA sample handling protocol. Field personnel will make arrangements for transportation of samples to the laboratory. When custody is relinquished to a shipper, field personnel will telephone the laboratory custodian to inform him of the expected time of arrival of the sample shipment and to advise him of any time constraints on sample analysis. All samples will be delivered to the laboratory no later than 48 hours from the day of collection.

7.0 Calibration Procedures And Frequency

All instruments and equipment used during sampling and analysis will be operated, calibrated, and maintained according to the manufacturer's guidelines and recommendations as well as criteria set forth in the applicable analytical methodology references.

7.1 Field Instruments

A calibration program will be implemented to ensure that routine calibration is performed on all field instruments. Field team members familiar with the field calibration and operations of the equipment will maintain proficiency and perform the prescribed calibration procedures outlined in the Operation and Field Manuals accompanying the respective instruments. Calibration records for each field instrument used on the project will be maintained on-site and a copy will be kept in the project files.

7.1.1 Portable Total Organic Vapor Monitor

Any vapor monitor used will undergo routine maintenance and calibration prior to shipment to the project site. Daily calibration and instrument checks will be performed by a trained team member at the start of each day. Daily calibrations will be performed according to the manufacturer's specifications and are to include the following:

Battery check: If the equipment fails the battery check, recharge the battery.

- Gas standard: The gauge should display an accurate reading when a standard gas is used.

- Cleaning: If proper calibration cannot be achieved, then the instrument ports must be cleaned.

7.1.2 pH and Specific Conductance

The following steps should be observed by personnel engaged in groundwater sampling for pH and specific conductance:

- The pH meter should be calibrated with a fresh standard buffer solution (pH 7) prior to each field test.

- The operation of the instrument should be checked with fresh standard buffer solution (pH 4 and pH 10) prior to each day's sampling.

- The specific conductance meter should be calibrated prior to each sampling event using a standard solution of known specific conductance.

More frequent calibrations may be performed as necessary to maintain analytical integrity. Calibration records for each field instrument used on the project should be maintained and a copy kept in the project files.

7.2 Laboratory Instruments

Laboratory calibration procedures are addressed in detail in the laboratory QAPP. A copy of the laboratory QAPP is provided as Appendix A to this plan. All calibration procedures will be consistent with the method used for analysis.

8.0 Analytical Procedures

8.1 Field

On-site procedures for analysis of total organic vapor and other field parameters are addressed in the Additional Investigation Work Plan.

8.2 Laboratory

Analytical methods to be utilized for the sampling tasks are referenced in: NYSDEC, Analytical Services Protocol, September 1993; Test Methods for Evaluating Solid Waste (Physical/Chemical Methods), SW-846, September 1994; and Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised March 1983.

Specific analytical methods for constituents of interest in soil and groundwater are listed in Table 3. The laboratory will maintain and have available for the appropriate operators standard operating procedures relating to sample preparation and analysis according to the methods stipulated in Table 3. Where the noted method does not contain a detection limit for the listed compound, the laboratory will complete method detection limit studies according to SW-846 protocols. The studies will be completed prior to the analysis of any samples, and the documentation submitted for to the designated representative for approval.

9.0 Data Reduction, Validation, And Reporting

QA/QC requirements will be strictly adhered to during sampling and analytical work. All data generated will be reviewed by comparing and interpreting results from chromatograms (responses, stability of retention times), accuracy (mean percent recovery of spiked samples), and precision (reproducibility of results). Refer to Section 10 for detailed discussion of QA/QC protocol.

Data storage and documentation will be maintained using logbooks and data sheets that will be kept on file. Analytical and field QC will be documented and included in the analytical testing report. A central file will be maintained for the sampling and analytical effort after the final laboratory report is issued.

All calculations and data manipulations are included in the appropriate methodology references. Control charts and calibration curves will be used to review the data and identify outlying results. Prior to the submission of the report to the client, all data will be evaluated for precision, accuracy, and completeness. Sections 4.0, 8.0, and 13.0 of this document include some of the QC criteria to be utilized in the data evaluation process.

Although formal data validation is not required for this field program, laboratory data packages will be provided with the necessary QA/QC investigation to validate the data utilizing the appropriate guidance documents, if necessary. Principal criteria used to validate data during collection and reporting will be in general accordance with the following guidance documents; Functional Guidelines for Evaluating Organic Analysis, EPA, February 1, 1988, (EPA 68-01-6699) and Functional Guidelines for Evaluating Inorganic Analysis, EPA, July 1, 1988, or their updated versions.

Laboratory reports will be reviewed by the laboratory supervisor, the QA officer, laboratory manager and/or director, and the project manager. Analytical reports will contain a data tabulation including results and supporting QC information will be provided. Raw data will be available for later inspection, if required, and maintained in the control job file.

10.0 Internal Quality Control Checks

QC data are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of glass-ware and reagents. The procedures to be followed for internal quality control checks are to be consistent with NYSDOH Environmental Laboratory Approval Program (ELAP). Details of the laboratory's QA/QC procedures are provided in Appendix 1.

11.0 Performance And System Audits

11.1 Field Audits

The Project QA Director may conduct episodic audits of the operations at the site to ensure that work is being performed in accordance with the work plan and associated standard operating practice. The audit will cover, but not necessarily be limited to, such areas as:

- Conformance to standard operating procedures
- Completeness and accuracy of documentation
- Chain of custody procedures
- Compliance with the Health and Safety Plan
- Construction specifications

At least one such audit will be performed.

11.2 Laboratory Audits

In addition to any audits required by NYSDEC, the Project QA Director may chose to audit the laboratory. These additional audits may take the form of Performance evaluation samples or on-site inspections of the laboratory. Performance evaluation samples may be either blind samples or known to the laboratory. Reasonable notice will be provided if the audit is to include an on-site inspection of the laboratory.

12.0 Preventive Maintenance

12.1 Field

Field personnel assigned to complete the work will be responsible for preventative maintenance of all field instruments. The field sampling personnel will protect the portable total organic vapor monitors, temperature, conductivity, and pH instruments by placing them in portable boxes and/or protective cases.

All field equipment will be subject to a routine maintenance program, prior to and after each use. The routine maintenance program for each piece of equipment will be in accordance with the manufacturer's operations and maintenance manual. All equipment will be cleaned and checked for integrity after each use. Necessary repairs will be performed immediately after any defects are observed, and before the item of equipment is used again. Equipment parts with a limited life (such as batteries, membranes and some electronic components) will be periodically checked and replaced or recharged as necessary according to the manufacturer's specifications.

12.2 Laboratory

The laboratory's preventative maintenance procedures are provided in the laboratory's QAPP.

13.0 Data Assessment Procedures

Performance of the following calculations will be completed to evaluate the accuracy, precision and completeness of collected measurement data.

13.1 Precision

Precision of a particular analysis is measured by assessing its performance with duplicate or replicate samples. Duplicate samples are pairs of samples taken in the field and transported to the laboratory as distinct samples. Their identity as duplicates is sometimes not known to the laboratory and usually not known to bench analysts, so their usefulness for monitoring analytical precision at bench level is limited. For most purposes precision is determined by the analysis of replicate pairs (i.e., two samples prepared at the laboratory from one original sample). Often in replicate analysis the sample chosen for replication does not contain target analytes so that quantification of precision is impossible. Replicate pairs of spiked samples, known as matrix spike/matrix spike duplicate samples, are used for precision studies. This has the advantage that two real positive values for a target analyte can be compared.

Precision is calculated in terms of Relative Percent Difference (RPD), which is expressed as follows:

$$RPD = \frac{(X_1 - X_2)}{(X1 + X2)/2} \times 100$$

where X_1 and X_2 represent the individual values found for the target analyte in the two replicate analyses or in the matrix spike/matrix spike duplicate analyses.

RPDs must be compared to the method RPD for the analysis. The analyst or his supervisor must investigate the cause of RPDs outside stated acceptance limits. This may include a visual inspection of the sample for nonhomogeneity, analysis of check samples, etc. Follow-up action may include sample reanalysis or flagging of the data as suspect if problems cannot be resolved.

13.2 Accuracy

Accuracy of a particular analysis is measured by assessing its performance with "known" samples. These "knowns" can take the form of EPA or NBS traceable standards (usually spiked into a pure water matrix), or laboratory prepared solutions of target analytes into a pure water or sample matrix; or (in the case of GC or GC/MS analyses) solutions of surrogate compounds which can be spiked into every sample and are designed to mimic the behavior of target analytes

without interfering with their determination. In each case the recovery of the analyte is measured as a percentage, corrected for analytes known to be present in the original sample if necessary, as in the case of a matrix spike analysis. For EPA or NBS supplied known solutions, this recovery is compared to the published data that accompany the solution. For prepared solutions, the recovery is compared to EPA-developed data or historical data as available. For surrogate compounds, recoveries are compared to USEPA CLP acceptable recovery tables. If recoveries do not meet required criteria, then the analytical data for the batch (or, in the case of surrogate compounds, for the individual sample) are considered potentially inaccurate.

For highly contaminated samples, recovery of matrix spike may depend on sample homogeneity. As a rule, analyses are not corrected for recovery of matrix spike or surrogate compounds.

13.3 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the total amount expected to be obtained under normal conditions. Completeness for each parameter is calculated as:

$$\text{Completeness} = \frac{\text{Number of successful analyses}}{\text{Number of requested analyses}} \times 100$$

Target value for completeness for all parameters is 100%. A completeness value of 95% will be considered acceptable. Incomplete results will be reported to the client project officer.

13.4 Representativeness

The characteristic of representativeness is not quantifiable. Subjective factors to be taken into account are as follows:

- The degree of homogeneity of a site;
- The degree of homogeneity of a sample taken from one point in a site; and
- The available information on which a sampling plan is based.

To maximize representativeness of results, sampling techniques and sample locations will be carefully chosen so that they provide laboratory samples representative of the site and the specific area.

14.0 Corrective Action

Corrective actions can be initiated as a result of performance and system audits, laboratory and interfield comparison studies, data validation, and/or a QA program audit. They may also be required as a result of a request from project representatives. All corrective action necessary to resolve a analytical problems will be taken. Success or failure of corrective actions will be reported with an estimate of effect on data quality, if any.

Corrective actions may include altering procedures in the field, conducting subsequent audits, or modifying project protocol. Time and type of corrective action, if needed, will depend on the severity of the problem and relative overall project importance. The project manager is responsible for initiating corrective action and the team leader is responsible for its implementation in the correction of field non-conformance corrective actions.

15.0 Quality Assurance Reports

Upon completion of a project sampling effort, analytical and QC data will be included in a comprehensive report that summarizes the work and provides a data evaluation. A discussion of the validity of the results in the context of QA/QC procedures will be made, as well as a summation of all QA/QC activity.

Serious analytical problems will be reported. Time and type of corrective action, if needed, will depend on the severity of the problem and relative overall project importance. Corrective actions may include altering procedures in the field, conducting an audit, or modifying laboratory protocol. All corrective action will be implemented after notification of project representatives.

TABLES

- Type and number of containers used
- Sample identifications
- Type of sampling devices where applicable and sample type (grab, composite)
- Preservatives
- Time and date of sample collection
- Record of field blanks and sample duplicates
- Sample matrix
- Notes and/or hazard identifications

Transportation Data

- Who sent the containers
- Form of transportation

Custody Transfers

- Who sampled, relinquished, or received the samples
- The date and time of the transfer

Acceptance by Laboratory

- All chain of custody sheets will be signed by the person receiving the samples, accompanied by the date and time of receipt.
- Laboratory assigned identification number
- Check and notation of pH where acid or basic preservatives were used
- Notation of presence of head-space for samples to be analyzed for volatiles
- Notation of any leakage or obvious degradation of samples

Analysis

- Date of each analysis and initials of analyst

Disposal

- Date and method of disposal and signature of responsible person.

2.4. LABORATORY EQUIPMENT AND PREVENTATIVE MAINTENANCE

Laboratory Equipment. To provide quality analytical data, not only must the appropriate laboratory equipment and general supplies be chosen, but their proper functioning must also be checked at predetermined intervals. This section, while not inclusive of all laboratory equipment that may be called upon for the completion of a project, delineates the procedures to be used to insure proper functioning of the laboratory equipment in general that are most commonly used. SOP's on file for specific procedures will discuss special QA/QC considerations for the procedure.

It is essential for traceability and for a smooth-running laboratory that all operations pertaining to calibration and maintenance be properly documented. Records for each instrument or group of similar instruments are to be kept in bound notebooks with all entries signed and dated in a similar manner to the record kept for all other laboratory services.

Table 1 lists the major maintenance and calibration procedures that are required and their frequency.

Some specifications not included in the table are discussed below.

Glassware. All volumetric glassware is Class A or equivalent. Although methods used to clean glassware will vary with use, SOP's are provided for each type of cleaning required (e.g., for metals analysis, organics, aquatic toxicology, etc.). Standard cleaning procedures recommended in EPA or ASTM methods are used to ensure that glassware is truly clean. Each analytical section retains its own glassware.

Table 1
Maintenance and Calibration Procedures
for Laboratory Instrumentation

Task or Instrument	Frequency	Comments
Analytical Balance	Calibration weekly in two ranges with NBS traceable weights. Professional cleaning and adjustment yearly.	Record date, target weight, actual weight.
Autoclaves	Each use (bacteriology)	Record date, time in, time out, description of material.
Incubators and Water Baths	Twice daily (4 hours apart). Tolerances depend on use.	Record date, time, and reading.
Ovens	Daily or beginning and end of cycle.	Record date, temperature, and time.
Refrigerators	Twice daily (4 hours apart)	Record date, time, reading.
Thermometers	Yearly.	Calibrate against NBS traceable thermometer. Record date, number, calibration temperature, actual temperature, and any correction factor.
NBS Thermometers	Yearly	Check ice point. Record date.
pH Meter	Daily, when in use	Set at 7, read at 4 and 10, or set at buffer closest to desired range. Record date buffer values, and actual reading.

Task or Instrument	Frequency	Comments
Conductivity Meter	Cell constant yearly with 0.01 M KCl. Daily calibration with 0.001 M KCl, or with each use.	Record date, value, actual reading, temperature, and initial.
Spectrometers	Check for wavelength alignment yearly. For visible, check with $KMnO_4$ at 526 and 546 nm.	Record wavelength and measured value.
Atomic Absorption Graphite furnace	Yearly	Professional cleaning and adjustment. Renew stock standards. Replace furnace tubes and rings whenever blanks show a high background.
Gas Chromatograph	As recommended by the manufacturer	
Gas Chromatograph/Mass Spectrometer	As recommended by the manufacturer	
High Performance Liquid Chromatograph	As recommended by the manufacturer	

Sample Containers. For those analyses were glass/Teflon capped bottles are not required, disposable plastic containers are used. Where glass bottles are required, they are cleaned using EPA or ASTM protocol according to analyte and sealed until use.

Reagents, Solvents, and Gases. Reagents and solvents are of Analytical Reagent Grade (AR) where obtainable. In specialized cases, such as acids for metal digestion or solvents for organic analysis, specialized reagents designed for the particular purpose will be used.

A file will be kept of all chemicals as they enter the laboratory and all containers will be dated at that time and an expiration date noted. The date at which the bottle is opened is also recorded.

In preparing standard solutions, the following are recorded:

- Lot number of reagent
- Date of receipt
- Any pretreatment such as drying (temp. and length of time)
- Standardization if required
- Date and initials of preparer
- Expiration date

Bottles containing standard solutions must indicate on the label:

- Name and concentration
- Date prepared and maximum holding time
- Whether refrigeration is required
- The date prepared and initials

- Date of last standardization if required
- Number of the notebook used for recording of preparation information

2.5 CALIBRATION PROCEDURES

2.5.1. Standard Curves. In some cases, standard curves used for instrument calibration can be stored in the data station and recalled as needed. For all other instruments, a curve must be generated at specified intervals, kept on file, and referred to by date in the laboratory notebook. The curve must be checked each time an analysis is performed by running continuing calibration standards at intervals designated within each department, and within specifications set by each department. In general, new standardization curves need to be generated whenever chemical batches are changed, after instrument repair, on change of operators, and in some cases with each analytical batch. Information about the durability of any particular calibration curve is included in the method (if such information is available).

2.5.2. GC, GC/MS. GC/Mass Spectrophotometers are tuned daily or for each 12-hour period using DFTPP or BFB. Criteria to be used for ion abundance are part of the analytical SOP. Calibration of GC's and GC/MS's are described in references such as EPA-600/4-82-057, July 1982, "Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater"; EPA SW846, September 1994, "Test Methods for Evaluating Solid Waste,"; NYS DEC Analytical Services Protocol Manual, 9/93.

2.5.3. Other Calibration Procedures. Calibration techniques for instruments are frequently given in the instrument manual or the appropriate methods. In all cases, written instructions for use of the instrument includes method and frequency of calibration.

2.6. ANALYTICAL PROCEDURES.

Before starting any analysis, a decision must be made on the degree of accuracy and precision required and the limits of detection that need to be met.

Analytical procedures will generally fall into one of four categories.

1. An approved procedure exists for the analyte in the matrix of concern. Some sources for such information are given in Table 2.
2. An approved procedure exists for the analyte, but not in the matrix of concern.
3. An analytical procedure exists that needs further development and evaluation.
4. No analytical method exists and one will have to be developed.

In the first case where an approved procedure is available, it will only be necessary to ensure that limits of accuracy, precision, and detection limit can be consistently met. In the other three cases, some degree of method development and validation is required. In such a case, a written protocol for method validation will be generated using recognized criteria (e.g., "Use of Statistics to Develop and Evaluate Analytical Methods," Grant T.W. Wernimont, AOAC). The plan will be approved and reviewed as necessary by the Laboratory QA/QC section.

Table 2

References for Methods

1. "Methods for Chemical Analysis of Water and Wastes," U.S. Environmental Protection Agency, EPA-600/4-79-020, March, 1979.

2. "Standard Methods for the Examination of Water and Wastewater, 14th - 17th Editions.

3. "Part VIII Environmental Protection Agency 40 CFR Part 136 Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; Final Rule and Interim Final Rule and Proposed Rule," October 26, 1984.

4. "Methods for Analysis of Inorganic Substances in Water and Fluvial Sediments," U.S. Geological Survey, Open-File Report 85-495, or "Methods for Determination of Inorganic Substances in Water and Fluvial Sediments," U.S.G.S., Techniques of Water-Resources Investigation, Book 5, Chapter A1, 1979, or Book 5, Chapter A3, p. 4 (1972).

5. "Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater," EPA-600/4-82-057, July 1982.

6. "Test Methods for Evaluating Solid Waste," EPA SW846, September, 1994.

7. "Annual Book of Standards," American Society for Testing and Materials.

8. "Official Methods of Analysis." Association of Official Analytical Chemists (AOAC).

9. "Analytical Services Protocol," New York State Department of Environmental Conservation, 1993.

10. "Pesticide Analytical Manual," Volumes I and II, U.S. Department of Health and Human Services, Food and Drug Administration.

11. "Biological Analytical Manual," U.S. Department of Health and Human Services, Food and Drug Administration.

In all cases, the document describing an analytical procedure must include at least the following:

- Details of sample collection and preservation.
- A statement of quality control objectives and how to achieve them.
- Analytical details such as equipment, reagents, and method.
- Specifications for data recording, reduction, validation, and reporting.

2.7. DATA REDUCTION, VALIDATION, AND REPORTING

In general, the plan to govern the reduction, validation, and reporting of data addresses the following:

1. Complete and accurate recording of the output of all measuring devices. In general, laboratory data is recorded in such a way that an observer can follow the chain of events to the final answer without having to question the operator. This means inclusion in the laboratory notebooks or forms of such details as:
   - methods used.
   - results of calibration procedures.
   - quality control data (e.g., blanks, spikes, duplicates, and reference standards).
   - complete calculations (except for computerized output).
   - a description of any problems encountered, unusual events, or occurrences that could affect the accuracy and precision of the data.

With the computerization of many laboratory instruments, much of the recording and calculation of final data are automatic, but a record is still kept of sample preparation, instrument parameters, quality control, and any final data reduction that is needed.

An example of the type of record that is kept with an instrument printout is given in Figure 2 for the analysis of metals.

2. Transfer of the completed data to data storage. This can be done by hand or by direct electronic transfer of instrument output to data storage.

3. Data retrieval for use in decision-making.

For each step of this process, provisions are made to check the following:

- Any errors in recording, calculation, or transcription.
- Whether the data meet predetermined levels of accuracy and precision.
- Whether or not the data are complete.

Daily surveillance of data quality is the responsibility of the laboratory quality control officer.

Figure 2

LSL RUN LOG FAA METALS

Analyte	RUN #
DATE	

Calibration			
		Conc.	Abs
	STD 1		
	STD 2		
	STD 3		
	STD 4		
	STD 5		
	STD 6		
	STD 7		
	STD 8		
	ICV		
	ICB		
	LCS / QC		
	L-STD		

Instrument ID PE 3030B s#128602
Lamp _____
Current _____
energy _____
Oxident air/N2O _____
Fuel - C2H2

Corr.Coeff	IDL
slope	RDL
intercept	CC

QC Solutions		ID	Conc
	ICV / CCV		
	LCS / QC		

		result	% R	Q
	CCV1			
	CCB1			
	CCV2			
	CCB2			
	CCV3			
	CCB3			
	CCV4			
	CCB4			
	CCV5			
	CCB5			
	CCV6			
	CCB6			
	CCV7			
	CCB7			
	CCV8			
	CCB8			
	CCV9			
	CCB9			
	CCV10			
	CCB10			

		result	% R	Q
	CCV11			
	CCB11			
	CCV12			
	CCB12			
	CCV13			
	CCB13			
	CCV14			
	CCB14			
	CCV15			
	CCB15			
	CCV16			
	CCB16			
	CCV17			
	CCB17			
	CCV18			
	CCB18			
	CCV19			
	CCB19			
	CCV20			
	CCB20			

2.8. INTERNAL QUALITY CONTROL CHECKS

During the course of analysis, checks are made with predetermined frequency to ensure that all systems are functioning properly. Such checks take all or some of the following forms:

- Measurement of reagent blanks to check baseline noise.
- Measurement of standards or third party reference samples.
- Analysis of blind QC samples

Before the start of any new analytical program, written statements are provided in consultation with the laboratory quality control officer. These specify as to the frequency of internal quality control checks and the criteria to be used to judge whether or not the system is in control.

2.9. PREVENTATIVE MAINTENANCE

Maintenance procedures have already been discussed in Section 2.4. with calibration procedures. Besides the routine maintenance procedures discussed in that section, a policy for renewing laboratory supplies and for having available spare instrument parts or backup instrumentation is followed.

2.10. DATA PRECISION AND ACCURACY

2.10.1. Precision. The precision of analytical data is measured by the analysis of duplicate samples at specified intervals. Relative percent difference (RPD) is calculated as:

$$RPD = \frac{D_1 - D_2}{(D_1 + D_2)/2} \times 100$$

where D_1 and D_2 represent the values of the two duplicates.

Standard deviation for the RPD is calculated. Warning and control limits set up for the degree of precision decided upon. All results are checked against these limits as they are generated. Results at or above the warning limits signal the analyst to search for potential problems. Results at or above the control limits signify the need to identify and resolve problems, then repeat all analyses since the last in-control point.

Precision of field monitoring is determined by taking duplicate samples at the same sampling point, while precision of analysis is checked by splitting a single field sample.

2.10.2. Accuracy. The accuracy of results is checked by the analysis of spiked samples at predetermined intervals. The percent recovery of spikes (% R) is calculated as:

$$\% R = \frac{Observed - Background}{Spike} \times 100$$

Percent recovery for reference standards (background = 0) is handled in the same way as for sample spikes. The standard deviation for percent recovery is calculated and control charts generated with upper and lower warning and control limits. As in the case

of duplicates, the warning limit signals the need to search for problems, while the control limit indicates the need to identify and resolve problems and to repeat all analyses since the last in-control point.

Control charts for spiked samples and for reference standards are kept separately. Spikes to determine accuracy are carried through all phases of the analysis including sample preparation. Spiking of samples is also used to determine matrix problems in the prepared sample.

2.10.3. Overall Plan for the Assessment of Data Quality. Table 3 outlines the protocol to be followed to assess data quality for a number of types of analysis. LSL also utilizes a three tier quality performance check system to verify that not only was the appropriate quality program followed, but that the data has been evaluated properly.

Table 3

Category	QC Requirement	Frequency
1. Volumetric, colorimetric analyses	Reagent blank	Each batch. For colorimetric, at start and end of run and every 20 samples
	Reference sample	Every 10th sample
	Spiked sample	Every 20th sample.
	Duplicates	10% of positive samples
2. Metals		
ICP, AA	Reagent blank	Each batch. To be run at start and end of run and every 10 samples.
	Reference sample	Start and end of run. Every 10th sample.
	Spiked sample	Every 20th sample or per batch.
	Duplicates	10% of positive samples.

Category	QC Requirement	Frequency
Furnace AA	Reagent blank	Start and end of run and every 10 samples.
	Reference sample	Start and end of run and every 10th sample.
	Analytical spike	Every sample. If recovery <85% or >115%, use method of standard additions.
	Matrix spike	5%
3. GC, GC/MS, HPLC	Reagent blank	Daily or each batch run.
	Reference standard	Start and end of run and every 10th sample.
	Spiked sample	Every 10th sample.
	Surrogate standard(s)	All samples by GC/MS. For GC, as required by NYS DOH protocol.

TABLE 1
SUMMARY OF SAMPLING LOCATIONS AND ANALYSIS

Sample No.	Location	Sampling Depth	Media	Sampling Method	Analysis
DIN-MW1-GW	Well MW-1	Mid-depth	Groundwater	Bailer	8240, 8015
DIN-MW2-GW	Well MW-2	Mid-depth	Groundwater	Bailer	8240, 8015
DIN-MW3-GW	Well MW-3	Mid-depth	Groundwater	Bailer	8240, 8015
DIN-MW3R-GW	Well MW-3R	Mid-depth	Groundwater	Bailer	8240, 8015
DIN-MW4-GW	Well MW-4	Mid-depth	Groundwater	Bailer	8240, 8015
DIN-MW5-GW	Well MW-5	Mid-depth	Groundwater	Bailer	8240, 8015
DIN-MW6-GW	Well MW-6	Mid-depth	Groundwater	Bailer	8240, 8015
DIN-MW3R-SS-01	Well MW-3R	TBD	Soil	Split-spoon	8240, 8015
DIN-MW3R-SS-02	Well MW-3R	TBD	Soil	Split-spoon	8240, 8015
DIN-MW4-SS-01	Well MW-4	TBD	Soil	Split-spoon	8240, 8015
DIN-MW4-SS-02	Well MW-4	TBD	Soil	Split-spoon	8240, 8015
DIN-MW5-SS-01	Well MW-5	TBD	Soil	Split-spoon	8240, 8015
DIN-MW5-SS-02	Well MW-5	TBD	Soil	Split-spoon	8240, 8015
DIN-MW6-SS-01	Well MW-6	TBD	Soil	Split-spoon	8240, 8015
DIN-MW6-SS-02	Well MW-6	TBD	Soil	Split-spoon	8240, 8015

TBD: To be determined based on the results of field screening.

TABLE 2
REQUIRED SAMPLE CONTAINERS, VOLUMES, PRESERVATION, AND HOLDING TIMES

Media	Type of Analysis	Required Container	Minimum Sample Volume	Preservation	Maximum Holding Time
Soil	EPA 8240	4 oz. cwm	5 grams	Cool 4C	14 days
Groundwater	EPA 8240	40ml vial	5 ml	pH<2, HCl or H2S04	14 days
	EPA 8015	40ml vial	5 ml	Cool 4C	7 days

TABLE 3
SUMMARY OF ANALYTICAL METHODS

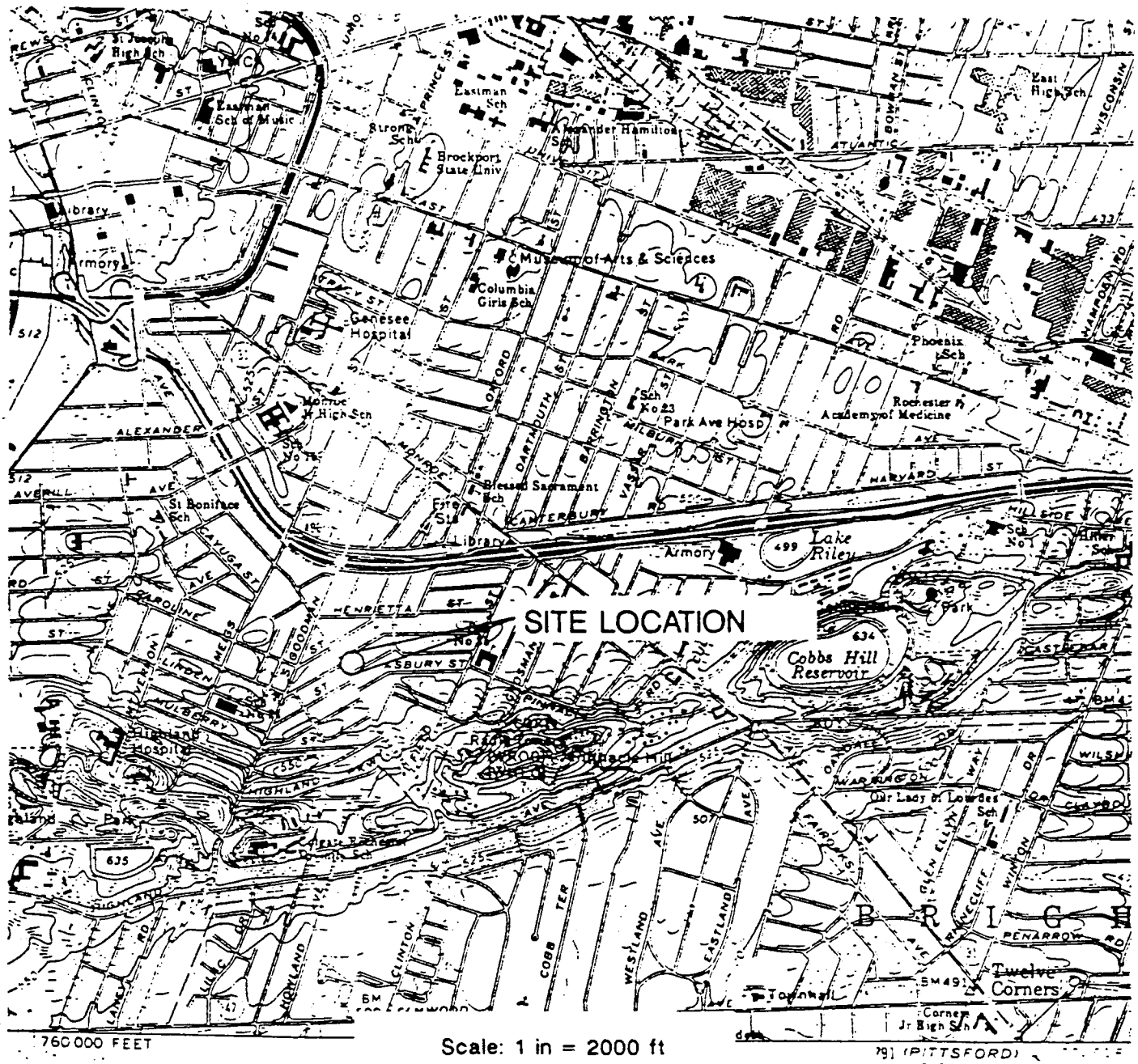
Type of Analysis	Analytical Method	Practical Quantitation Limits (ppb)
Volatile Organic Compounds*	SW-846 Method 8240	Matrix and compound specific, refer to SW-846**
Mineral Spirits	SW-846 Method 8015	Matrix and compound specific, refer to SW-846

Notes:
*plus trimethylbezene isomers as TICs
** 2 ug/l detection limit for vinyl chloride

TABLE 4
SUMMARY OF QUALITY CONTROL CHECKS

Type of QC Check	Frequency	Min. Number Required	Remarks
Laboratory Blanks			
Method Blanks	1 per sample batch	1 or 5% of batch size	Batch may include samples from other projects
Reagent/Solvent Blanks	1 per lot	1	
Standard Reference Blanks	1 per sample batch	1 or 5% of batch size	Batch may include samples from other projects
Matrix Spike Blanks	1 per sample batch	1 or 5% of batch size	Batch may include samples from other projects
Duplicates/ Replicates			
Field Duplicates	1 per event per media	1	Sample to be selected based on field screening
Laboratory Replicates	1 per batch	1	None planned but may be required to perform additional analyses on a sample

FIGURES



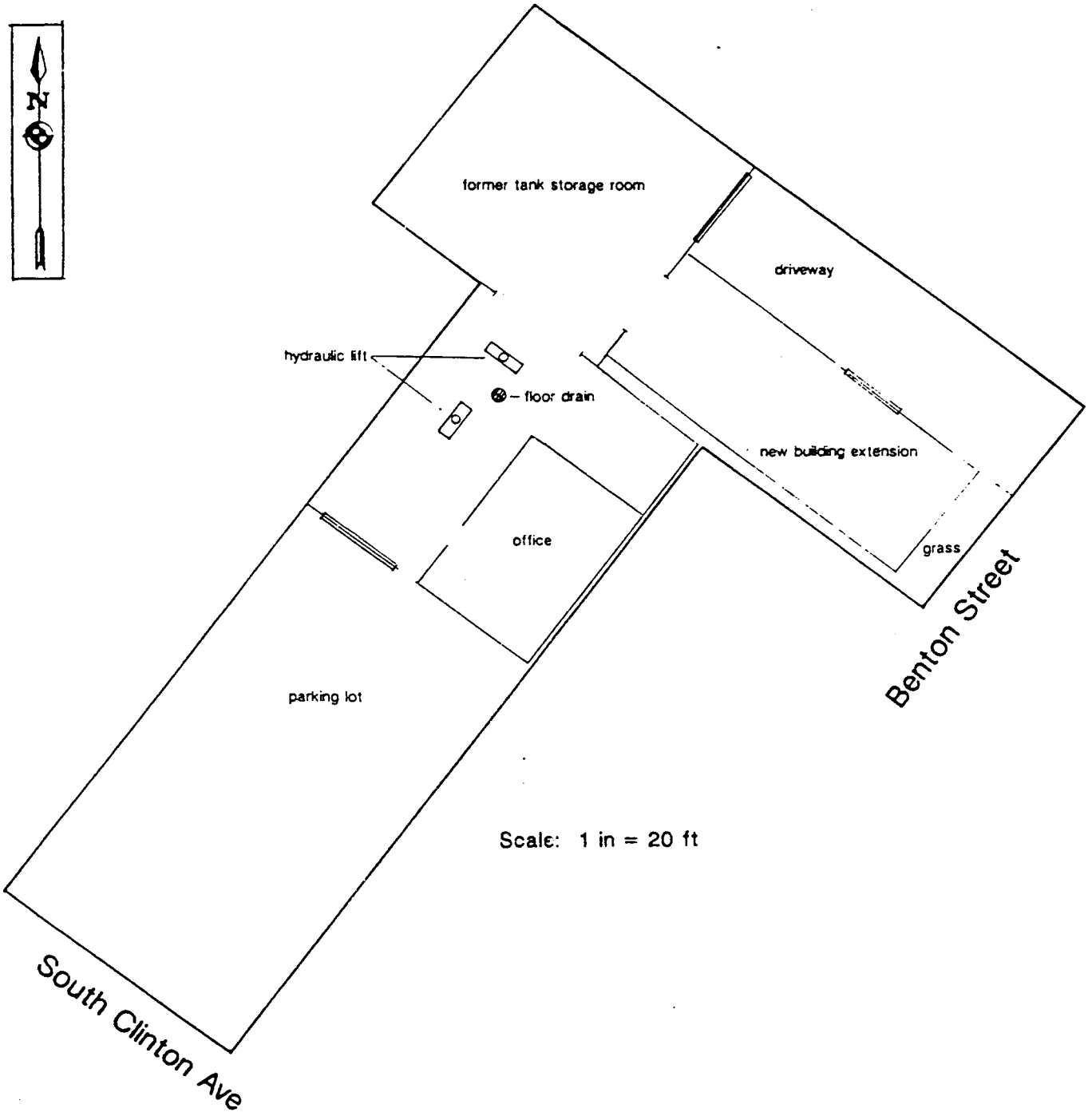
THE **SEAR-BROWN** GROUP
FULL-SERVICE DESIGN PROFESSIONALS
85 METRO PARK
ROCHESTER NEW YORK 14623
716-475-1440 FAX 716-272-1814

FIGURE 1

SITE LOCATION MAP

DINABURG DISTRIBUTING
1012 SOUTH CLINTON AVE
ROCHESTER, NY

Source: USGS Roch East Quad



THE **SEAR-BROWN** GROUP
FULL-SERVICE DESIGN PROFESSIONALS
85 METRO PARK
ROCHESTER NEW YORK 14623
716-475-1440 FAX: 716-272-1814

FIGURE 2

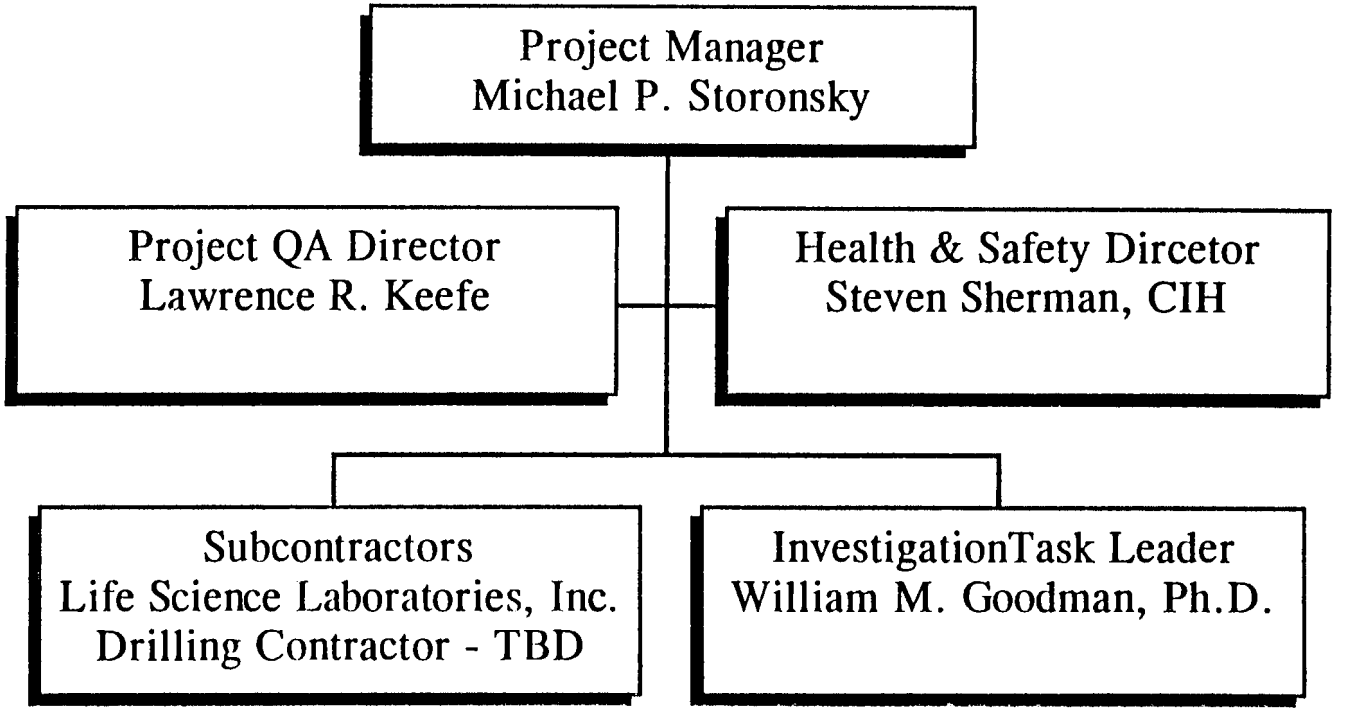
SITE PLAN

DINABURG DISTRIBUTING
1012 SOUTH CLINTON AVE
ROCHESTER, NY

Base Map: Tape Location Map, 4/10/90

H.H SULLIVAN, INC 574517

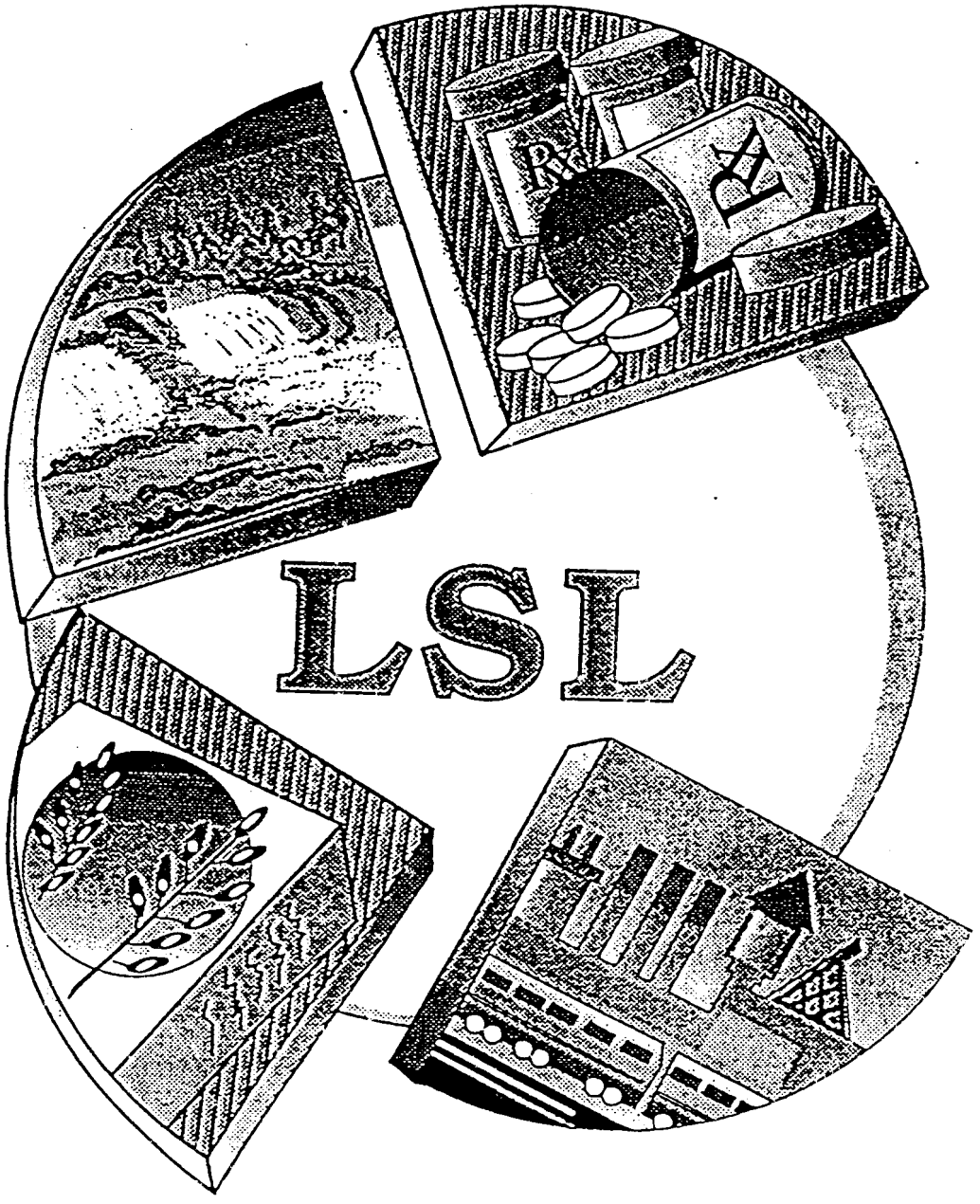
FIGURE 3
PROJECT ORGANIZATIONAL CHART



APPENDIX A

LABORATORY QA/QC PLAN

Life Science Laboratories, Inc.



Quality Assurance / Quality Control Manual

Revised 1995

LIFE SCIENCE LABORATORIES, INC.
5854 Butternut Drive, East Syracuse, New York 13057 Telephone: (315) 445-1105 Fax: (315) 445-1301

1. PURPOSE

The Quality Assurance Program provides a measure of the credibility of the data produced in the laboratory on a day-to-day basis. The program is designed to ensure that the laboratory continues to generate valid results through quality control assessment procedures as well as through preventative and corrective measures. The following sections describe in general the Quality Assurance/Quality Control (QA/QC) measures in current use at Life Science Laboratories, Inc. (LSL). More detailed QA/QC requirements are included in the Standard Operating Procedure (SOP) for each analytical procedure.

2. QUALITY ASSURANCE FOR SAMPLING AND ANALYSIS

2.1. OBJECTIVES AND SCOPE OF THE QUALITY ASSURANCE/QUALITY CONTROL PROGRAM.

The objective of the QA/QC program will be to provide data of such quality that they may be of use in decision making. To meet this requirement, data must meet the following requirements:

1. Be of known accuracy and precision.
2. Be comparable between different monitoring/analysis personnel.
3. Be representative of the system sampled.
4. Be produced in a complete, timely, cost-effective manner.

The following plan is designed to provide specifications for the day-to-day operation of the Laboratory in such a way that these requirements will be met. For projects that involve special requirements, additional details may be needed.

2.2. FIELD MONITORING

One of the most critical elements in a program designed to generate data to be used in environmental decision-making is the plan to sample the system of concern. Obviously no matter how carefully chemical, physical, or biological measurements are made, the results will only be of use if the samples on which they are performed are taken in an appropriate manner and properly maintained to prevent degradation. Samples that are procured during field monitoring should be such that data produced from them have the following characteristics:

- Provide the accuracy and precision required for the particular project.
- Be representative of the system monitored (i.e., represent the properties of the system as a whole and also any variability in the system).
- Provide as complete a picture of the system as required.

Before undertaking any field sampling project, a detailed sampling plan will be developed and reviewed by the appropriate division(s). Recommendations for planning the sampling program will be taken from the "Handbook for Sampling and Sample

Preservation of Water and Wastewater," EPA 600/4-82-029 and "Test Methods for Evaluating Solid Waste," EPA, September 1994, SW846.

2.3. SAMPLE CUSTODY

The ability to chart the progress of samples through collection, transport, analysis, and disposal is a vital aspect of any monitoring program. Complete documentation of all the above phases is necessary to prove that the monitoring was performed in an appropriate manner. This also aids in evaluating and solving problems that may arise due to improper sample handling.

Chain of custody is maintained at LSL, using either forms supplied by the client or LSL forms (Figure 1). Completed forms are returned to the client and a copy kept on file. During analysis, chain of custody is maintained from laboratory notebooks through data entry by recording dates and initials at all stages. In cases where special precautions are needed, such as for NYS DEC Analytical Services Protocol, in-house chain of custody forms are available. Data to be recorded on the chain of custody form, in field notes, or laboratory log-in sheets are as follows:

Field Data

- The client's address and telephone numbers
- The contact person
- Work authorization
- The identification of the client's site
- The client's project identifier

Figure 1

Chain of Custody Record

Life Science Laboratories, Inc.
LSL 354 Butternut Drive
East Syracuse, NY 13057
Phone # (315) 445-1105 Telefax # (315) 445-1301

Client: _____ Phone # _____

Address: _____ Telefax # _____

_____

Authorization:

Contact Person:

LSL Project #:

Client's Site I.D.:

Client's Project I.D.:

LSL Sample Number	Client's Sample Identifications	Sample Date	Sample Time	Type grab	Type comp.	Matrix	Preserv. Added	Containers #	Containers size/type	Analyses	Preserv. Check

Notes and Hazard identifications:

Custody Transfers

	Date	Time
Containers Sent By: Date:		
Containers Received by:		
Sampled By: Received By:		
Relinquished By: Received By:		
Relinquished By: Received for Lab By:		

Shipment Method: Samples Received Intact: Y N

APPENDIX B

Health and Safety Plan

APPENDIX 2

HEALTH AND SAFETY PLAN
FOR
ADDITIONAL SITE INVESTIGATION ACTIVITIES
FORMER DINABURG DISTRIBUTING, INC.
1012 SOUTH CLINTON AVENUE
ROCHESTER, NEW YORK

MAY 1996

Prepared for:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
6274 EAST AVON-LIMA ROAD
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Prepared on Behalf of:

ESTATE OF SAUL DINABURG
c/o THE CHASE MANHATTAN BANK, N.A.
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THE SEAR-BROWN GROUP, INC.
85 METRO PARK
ROCHESTER, NEW YORK 14623

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1.0 INTRODUCTION

The following Health and Safety Plan (HASP) describes personal safety protection standards and procedures to be followed during planned additional site investigation work at the former Dinaburg Distributing facility, 1012 South Clinton Avenue, Rochester, New York (Figure 1). This work will include drilling activities and associated soil and groundwater sampling.

This HASP establishes mandatory safety procedures and personal protection standards pursuant to the Occupational Safety and Health Administration (OSHA) regulations 29 Code of Federal Regulations (CFR) 1910.120. The HASP applies to all Sear-Brown personnel conducting any site work, as defined in 29 CFR 1910.120(a). All personnel involved in the mentioned activities must familiarize themselves with this HASP, comply with its requirements and have completed the required health and safety training and medical surveillance program participation pursuant to 29 CFR 1910.120 prior to beginning any work on site.

THIS HASP IS FOR THE EXPRESSED USE OF SEAR-BROWN GROUP EMPLOYEES. ALL OTHER CONTRACTORS TO BE WORKING IN THE EXCLUSION AREAS ARE REQUIRED BY LAW TO DEVELOP THEIR OWN HASP, AS WELL TO MEET ALL PERTINENT ASPECTS OF OSHA REGULATIONS. SEAR-BROWN GROUP RESERVES THE RIGHT TO STOP ANY SITE WORK WHICH IS DEEMED TO POSE A HEALTH AND SAFETY THREAT TO ITS STAFF.

1.1 Background

The site covers approximately $0.25^{\pm}$ acres and consists of two rectangular parcels oriented perpendicular to one another at 1012 South Clinton Avenue, City of Rochester, Monroe County (Figure 2). The site is zoned commercial and is accessible from South Clinton Avenue to the southwest and Benton Street to the southeast.

The site currently contains a vacant, one-story commercial building, asphalt covered surfaces and a small grass-covered lawn area. The original portion of the existing building at the rear of the site was reportedly built prior to 1931. Several additions have been made to the building since that time.

Historical use of the site was reported to have included auto repair services from circa 1950 to circa 1969. A hydraulic lift, with two cylinders, used by the former auto repair businesses is still present in the building. A floor drain is located adjacent to the hydraulic lift.

From circa 1971 to circa 1993, the site was occupied by Dinaburg Distributing, Inc., which operated a dry cleaning supply business. At the time of a January 1994 Phase I Environmental Site Assessment (ESA) performed by Empire Soils Investigations, the site was documented to have been operated by Solvents and Petroleum Service, Inc. as a storage facility for their dry cleaning supply business. The site is presently vacant.

1.2 Site-Specific Chemicals of Concern

Perchloroethylene (PCE), trichloroethylene (TCE), mineral spirits, and diesel fuel are the primary volatile compounds that are present, or are potentially present, in the soil and groundwater at the former Dinaburg Distributing facility. Material Safety Data Sheets (MSDSs) for PCE, TCE and Exxon Varsol 1, which is the brand of mineral spirits reported to have been used at the site, are presented in Appendix A. The air monitoring action levels will be based on one-half of the current Threshold Limit Valve (TLV) or Permissible Exposure Limit (PEL) for PCE with a margin of safety built into the action levels to account for the non-specificity of the field monitoring instruments. Exposure limits for less hazardous compounds will be satisfied by meeting the more stringent exposure limits for PCE. Table 1 summarizes health and safety data for PCE and TCE, which are the two compounds of primary concern.

Table 1
Health and Safety Data for Major Contaminants of Concern

Compound	PEL/TWA	Physical Description	Odor Threshold	Route of Exposure	Target Organs
Tetrachloroethene (PCE)	25 ppm	Colorless liquid with a mild chloroform-like odor.	4.68-50 ppm	inhalation ingestion dermal contact	Liver, Kidneys, eyes, upper respiratory, central nervous system.
Trichloroethylene (TCE)	50 ppm	Colorless liquid with a chloroform-like odor.	21.4-400 ppm	inhalation ingestion dermal contact	Respiratory system, heart, liver, kidneys, central nervous system, skin.

Notes:
PEL - permissible exposure limits
TWA - time weighted average, 8-hour workday
ppm - parts per million, in air

2.0 SEAR-BROWN PERSONNEL ORGANIZATION

The following Sear-Brown personnel will be involved in operations regarding the former Dinaburg Distributing facility.

2.1 Principal-in-Charge

The Principal-in-Charge, John Hayden, P.E., Ph.D. will work directly with the Project Manager to ensure that all activities are conducted in a safe and correct manner. He will have responsibility for all documents prepared for submittal and will maintain continuity and oversight throughout the duration of the project.

2.2 Project Manager

Mr. Michael Storonsky, Associate, is the Project Manager. Mr. Storonsky is responsible for ensuring that all Sear-Brown procedures and methods are carried out, and that all Sear-Brown personnel abide by the provisions of this Health and Safety Plan.

2.3 Site Safety Officer/Field Team Leader

Peter Smith will serve as the field team leader and Site Safety Officer during this project. Mr. Smith will report directly to the Project Manager and will be responsible for the implementation of this HASP as well as daily calibration of Sear-Brown Group's safety monitoring instruments. Mr. Smith will keep a log book of all calibration data and instrument readings for the site.

2.4 Health and Safety Coordinator

Mr. Steve Sherman, CIH, Sear-Brown's Health and Safety Coordinator, will provide support on the project as required.

2.5 *Daily Meetings*

All Sear-Brown personnel and contractors working within the exclusion zone will be required to read this document and sign off on the daily safety meeting form presented in Appendix B.

3.0 MEDICAL SURVEILLANCE REQUIREMENTS

3.1 Introduction

A. Hazardous waste site workers can often experience high levels of physical and chemical stress. Their daily tasks may expose them to toxic chemicals, physical hazards, biologic hazards, or radiation. They may develop heat stress while wearing protective equipment or working under temperature extremes, or face life-threatening emergencies such as explosions and fires. Therefore, a medical program is essential to: assess and monitor worker's health and fitness both prior to employment and during the course of the work; provide emergency and other treatment as needed; and keep accurate records for future reference. In addition, OSHA requires a medical evaluation for employees that may be required to work on hazardous waste sites and/or wear a respirator (29 CFR Part 1910.120 and 1910.134), and certain OSHA standards include specific medical surveillance requirements (e.g., 29 CFR Part 1926.62, Part 1910.95 and Parts 1910.1001 through 1910.1045).

3.2 Medical Examinations

A. All Sear-Brown personnel working in contaminated areas of the site shall have been examined by a licensed physician as prescribed in 29 CFR Part 1910.120, and determined to be medically fit to perform their duties for work conditions which require respirators. Employees will be provided with medical examinations as outlined below:

- Pre-job physical examination
- Annually thereafter if contract duration exceeds 1 year;
- Termination of employment;
- Upon reassignment in accordance with CFR 29 Part 1910.120(e)(3)(i)(C);
- If the employee develops signs or symptoms of illness related to workplace exposures;
- If the physician determines examinations need to be conducted more often than once a year; and
- When an employee develops a lost time injury or illness during the Contract period.

B. Examinations will be performed by, or under the supervision of a licensed physician, preferably one knowledgeable in occupational medicine, and will be provided without cost to the employee, without loss of pay and at a reasonable time and place. Medical surveillance protocols and examination and test results shall be reviewed by the Occupational Physician.

4.0 ON-SITE HAZARDS

4.1 Chemical Hazards

The primary potential chemical hazards on-site are expected to be exposure to the chlorinated compounds detailed in Table 2. Material safety data sheets for the anticipated chemicals are presented in Appendix A.

The soil and groundwater contaminants are volatile, therefore, any activity at the site which causes physical disturbance of the soil can potentially allow the release of contaminants into the air. Such an occurrence may be recognized by noticeable chemical odors. Field personnel should be aware of the odor threshold for these chemicals and their relation to the action levels and Permissible Exposure Limits.

Common symptoms of overexposure to chlorinated VOCs are dizziness, headache, drowsiness, irritated eyes, nose and throat, nausea. vomiting, vertigo, loss of coordination, fatigue, tremors, visual disturbances, and abdominal pains. To prevent exposure to these chemicals, dermal contact will be minimized by using disposable surgical gloves with work gloves (as appropriate) when handling soil, groundwater equipment or samples. Real time, breathing zone levels of total VOCs will be monitored using a portable photoionization detector (PID). If ambient levels exceed action levels, all site activities will be performed using level C personal protection until ambient concentrations dissipate. Where levels exceed 50 ppm, work will cease and the project manager will be notified immediately. Intrusive work may also be halted where required by action levels detailed in the Community Air Monitoring Plan (CAMP), Appendix C.

In addition, depending on seasonal conditions disturbance of the site soils may cause the particulate contaminants to become airborne as dust. Therefore, particulates will be monitored as discussed in Section 6.1 and dust-suppression methods used where appropriate as discussed in Section 6.2, or in the CAMP.

Finally, aeration of the groundwater may cause volatilization of chemicals into the air, particularly PCE and TCE. Table 2 summarizes first aid instructions for exposure pathways for the compounds of concern.

Table 2
Exposure Pathways and First Aid Response for Contaminants of Concern

Substance	Exposure Pathways	First-Aid Instructions
TCE, PCE, mineral spirits, and fuel oil	eye dermal inhalation ingestion	irrigate immediately, hospital soap wash promptly respiratory support, first aid medical attention immediately

4.2 Physical Hazards

Hazards typically encountered at drilling sites will be a concern at this site. These hazards include slippery ground surfaces, holes, and operation of heavy machinery and equipment. The basic safety apparel such as steel-toed shoes, hard hat and safety glasses will be worn during all activities by field team members.

Under no circumstances will Sear-Brown personnel approach the borehole during active drilling operation. All field personnel working around the rig will be shown the location and operation of kill switches, which are to be tested daily.

Multi-purpose fire extinguishers, functional and within annual inspection period, will be staged and readily accessible for use.

The use of electrical equipment in any established exclusion zones will be limited to areas verified as containing non-explosive atmospheres (< 10% LEL) prior to operation, unless the equipment has been previously demonstrated or designed to be FM or UL rated as intrinsically safe. Care will be taken to avoid an ignition source while working in the presence of vapors.

The driller shall make all necessary contacts with utilities and/or underground utility locator hotlines prior to drilling, and shall meet OSHA requirements for distances between the drilling rig and overhead utilities. No drilling work will be carried out where the drill rig chassis has not been stabilized and the rig is not to be moved between locations with its boom in a vertical position.

4.2.1 Noise

The use of heavy machinery/equipment and operation may result in noise exposures which require hearing protection. Exposure to noise can result in temporary hearing losses, interference with speech communication, interference with complicated tasks or permanent hearing loss due to repeated exposure to noise.

During the investigative activities, all Sear-Brown field team members will utilize hearing protection when sound levels are in excess of 90 dB TWA. All aspects of the Sear-Brown Hearing Conservation Program (HCP) will apply when noise levels are in excess of 85 dB TWA. Drill rig operation does not typically result in noise exposures requiring an HCP.

4.2.2 Heat Stress Exposure

This project is anticipated to be started during the summer season when heat is a potential threat to the health and safety of site personnel. The Site Safety Officer under the direction of the Project Manager will determine the schedule of work and rest. These schedules will be employed as necessary so that personnel do not suffer adverse effects from heat. Table 3 summarizes exposure symptoms and first aid instructions for heat stress. Non-caffeinated, thirst replenishment liquids will be available on-site. Cold stress protocols will be implemented as an Addendum to this document where seasonal conditions warrant.

4.2.3 Roadway Hazards

Drilling activities are planned to take place within active roadways adjacent to the site. Where such workzones are established, personnel shall assure that protective measures including signage, cones, shielding through use of vehicles parked at workzone perimeter, are in place. The drilling contractor shall be responsible for meeting signage requirements of DOT. Fluorescent safety vests shall be worn by all personnel.

Table 3
Exposure Symptoms and First Aid for Heat Exposure

Hazard	Exposure Symptoms	First-Aid Instructions
Heat Stress	Fatigue, sweating, irritability	rest; take fluids
	Dizziness, disorientation perspiration ceases, loss of consciousness	remove from hot area, activate 911, administer first aid, no fluids to be administered to unconscious victim.

5.0 SITE WORK ZONES

The following work zones will be physically delineated by Sear-Brown during the remedial activities.

5.1 Control Zones

Control boundaries will be established within the areas of site activities. Examples of boundary zones include: the exclusion and decontamination zone. All boundaries will be dynamic, and will be determined by the planned activities for the day. The Field Team Leader will record the names of any visitors to the site.

5.2 Exclusion Zone

The controlled portion of the site will be delineated to identify the exclusion zone, wherein a higher level of personal protective equipment may be required for entry during intrusive activities. The limits of the exclusion zone will be designated at each work location appropriately. A decontamination zone will be located immediately outside the entrance to the exclusion zone. All personnel leaving the exclusion zone will be required to adhere to proper decontamination procedures.

A "super exclusion" zone will be established around the borehole which will not be entered by Sear-Brown personnel at any time during any active drilling, slambar, cathead, silica sand dumping, or other related activities. The drilling contractor will be directed to stop such activity when Sear-Brown site team members have need to enter this zone.

5.3 Decontamination Zone

The decontamination zone will be located immediately outside the entrance to the exclusion zone on its apparent upwind side, if feasible, and will be delineated with caution tape and traffic cones. This zone will contain the necessary decontamination materials for personnel decontamination. Decontamination procedures are outlined in section 8.0 of this plan.

6.0 SITE MONITORING/ACTION LEVELS

6.1 Site Monitoring

Field activities associated with the drilling and sampling may create potentially hazardous conditions due to the migration of contaminants into the breathing zone. These substances may be in the form of mists, vapors, dusts, or fumes that can enter the body through ingestion, inhalation, absorption, and direct dermal contact. Monitoring for VOCs will be performed to ensure appropriate personal protective measures are employed during site activities.

A separate Community Air Monitoring Plan (CAMP) has also been developed (Appendix 3) to protect the surrounding neighborhood.

Although the concentrations of anticipated contaminants in soil/groundwater should not present an explosive hazard, explosive environments or conditions may be encountered unexpectedly during the course of this project. Monitoring for explosivity in the atmosphere will be routinely conducted during site activities as a precautionary measure to ensure site personnel are not subjected to any dangerous conditions.

The following describes the conditions that will be monitored for during the remediation activities. All calibrations, etc., done on instruments, as well as background and site readings will be logged.

Organic Vapor Concentrations - Organic vapors will be monitored continuously in the breathing zone in the work area with an HNu portable photoionization detector (PID) with a 10.2 eV lamp. The instrument will be calibrated daily. HNu readings will be used as the criteria for upgrading or downgrading protective equipment and for implementing additional precautions or procedures.

Split spoons or other soil sampling devices will be monitored using the HNu at the time they are opened, with appropriate PPE to be used where soils exhibit measurable volatile organic compound levels.

Explosivity - Explosivity will be monitored continuously during active drilling operations. Measurements obtained from this monitoring instrument will also be used as criteria for implementation of work stoppage or site evacuation. A combination combustible gas/oxygen (CGO_2) instrument, calibrated per manufacturer's recommendations, will be used.

Particulates - Should subsurface conditions be observed to be dry, Sear-Brown will perform particulate monitoring with a MIE PDM-3 Miniram aerosol monitor, within the work area to monitor personal exposures to particulates and to compare work area readings with downwind and upwind readings. The first readings of the day will be obtained prior to the commencement of work to obtain a daily background reading, and the instrument will be zeroed daily and calibrated to manufacturer's specifications. Readings will be recorded every 30 minutes thereafter. If the work area particulate levels exceed the background levels by more than 0.15 mg/m^3, the Contractor will be instructed to implement dust suppression measures. Moist soil conditions are expected during this drilling work which should reduce the need for particulate monitoring.

6.2 Action Levels

During the course of any activity, as long as HNu readings in the breathing zone are less than 5 ppm above background, Level D protection will be considered adequate. Level C protection will be required when VOC concentrations in ambient air exceed 5 ppm total VOCs above background but remain below 50 ppm total VOCs.

If concentrations in the work zone exceed 50 ppm for a period of 5 minutes or longer, work will immediately be terminated by the Site Safety Officer. Options to allow continued drilling will then be discussed amongst all parties. Supplied-air respiratory protection is generally required for drilling to resume under these conditions. If Level B protection is not used, work may resume in Level C once monitoring concentrations have decreased below 50 ppm and the conditions outlined in the CAMP are met.

If the monitoring of fugitive particulate levels exceeds 0.15 mg/m^3 above background, then the drilling Contractor will be directed to implement fugitive dust control measures which may include use of engineering controls such as water spray at the borehole.

7.0 PERSONAL PROTECTIVE EQUIPMENT

Based on an evaluation of the hazards at the site, personal protective equipment (PPE) will be required for all personnel and visitors entering the drilling exclusion zone. It is anticipated that all Sear-Brown oversight work will be performed in level D. The drilling contractor will be responsible for selection and implementation of PPE for their personnel.

7.1 Protective Clothing/Respiratory Protection:

Protective equipment for each level of protection is as follows:

If HNu readings are above 50 ppm, requiring an upgrade to Level B, site work will be halted pending review of conditions and options by Sear-Brown and other parties.

When HNu readings range between 5 and 50 ppm, upgrade to Level C:

Level C

- Full face, air purifying respirator with organic/HEPA cartridge.
- Disposable chemical resistant one-piece suit (Tyvek or Saranex, as appropriate).
- Inner and outer chemical resistant gloves.
- Hard hat.
- Steel-toed boots.
- Disposable booties.

When HNu readings range between background and 5 ppm use Level D:

Level D

- Safety glasses.
- Steel-toed boots.
- Protective cotton, latex or leather gloves depending on site duties.
- Hard hat.
- Tyvek coverall (optional).

8.0 DECONTAMINATION

8.1 Personnel Decontamination

For complete decontamination, all personnel will observe the following procedures upon leaving the exclusion zone:

1. Remove outer boots and outer gloves and place in disposal drum.

2. If using a respirator, remove respirator, dispose of cartridges if necessary, and set aside for later cleaning.

3. Remove disposable chemical resistant suit and dispose of in drum.

4. Remove and dispose of inner gloves.

Decontamination solutions shall be supplied at the decontamination zone. The wash solution will consist of water and detergent such as Alconox or trisodium phosphate (TSP), and the rinse solution will consist of clean water.

Contaminated wash solutions shall be collected in drums for disposal. All other disposable health and safety equipment will be decontaminated and disposed of as nonhazardous waste.

8.2 Equipment Decontamination

If equipment is utilized during field activities, it will be properly washed or steam-cleaned prior to exiting the decontamination zone. Pre- or post-use rinsing using solvents will be done wearing appropriate PPE.

Monitoring instruments will be either wrapped in polysheeting or carried by personnel not involved in handling contaminated materials, to reduce the need for decontamination. All instruments will be wet-wiped prior to removal from the work zone.

9.0 EMERGENCY PROCEDURES

The Site Safety Officer will coordinate emergency procedures and will be responsible for initiating emergency response activities. Emergency communications at the site will be conducted verbally and by means of an air horn. All personnel will be informed of the location of the cellular telephone and horn. Three blasts on the air horn will be used to signal distress.

9.1 List of Emergency Contacts

Ambulance: 911
Hospital: Highland, 473-2200
Fire Department: 911
Police: 911
Poison Control Center: 275-5151
Utility Emergency: 546-1100

9.2 Directions to Hospital

A map presenting directions to the hospital is included in the back of the document (Figure 2). The route shall be reviewed at the initial site safety meeting on site.

9.3 Accident Investigation and Reporting

A. All accidents requiring first aid which occur incidental to activities onsite will be investigated. The investigation format will be as follows:

- interviews with witnesses,
- pictures, if applicable, and
- necessary actions to alleviate the problem.

B. In the event that an accident or some other incident such as an explosion or exposure to toxic chemicals occurs during the course of the project, the Project Health and Safety Officer will be telephoned as soon as possible and receive a written notification within 24 hours. The report will include the following items:

- Name of injured.
- Name and title of person(s) reporting.
- Date and time of accident/incident.
- Location of accident/incident, ie., building number, facility name.
- Brief summary of accident/incident giving pertinent details including type of operation ongoing at the time of the accident/incident.
- Cause of accident/incident.
- Casualties (fatalities, disabling injuries), hospitalizations.
- Details of any existing chemical hazard or contamination.
- Estimated property damage, if applicable.
- Nature of damage; effect on contract schedule.
- Action taken to insure safety and security.
- Other damage or injuries sustained (public or private).

Where reportable injuries, hospitalizations or fatalities occur amongst Sear-Brown personnel, the necessary document required by OSHA will be submitted within timeframes allowed by law.

The accident report form is illustrated in Table 4.

TABLE 4
ACCIDENT REPORT

Project_____ Date of Occurrence_____

Location _____

_____

Type of Occurrence: (check all that Apply)

☐Disabling Injury ☐Other Injury
☐Property Damage ☐Equip. Failure
☐Chemical Exposure ☐Fire
☐Explosion ☐Vehicle Accident
☐Other (explain)_____

_____

Witnesses to Accident/Injury:

_____ _____
_____ _____
_____ _____

Injuries:
Name of Injured _____

What was being done at the time of the accident/injury?

_____
_____

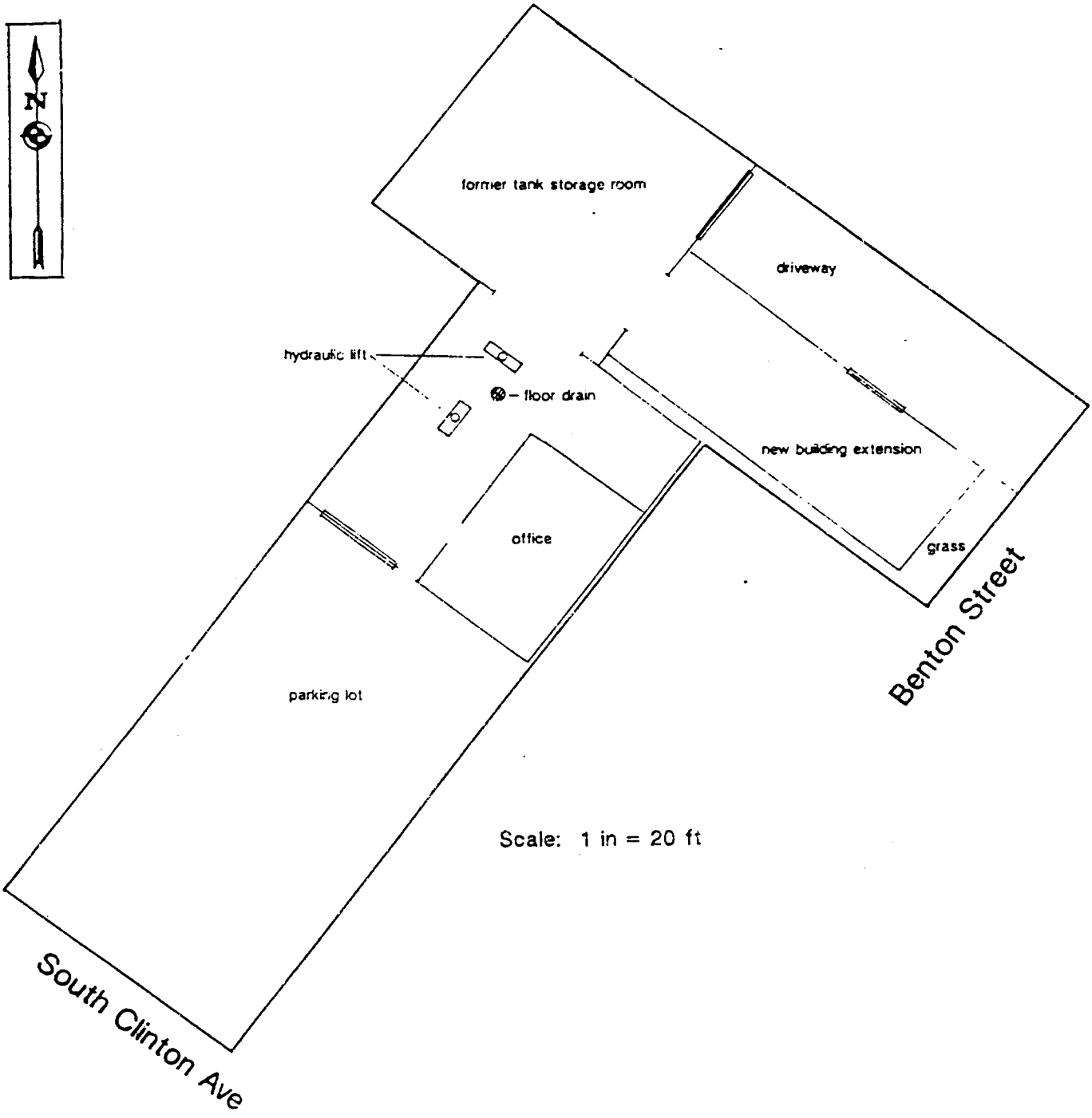
What corrective actions will be taken to prevent recurrence? _____
_____
_____

SIGNATURES

Health and Safety Officer _____ Date _____
Project Manager _____ Date _____
Reviewer _____ Date _____

Comments by reviewer _____
_____
_____

FIGURES



Scale: 1 in = 20 ft

THE **SEAR-BROWN** GROUP
FULL-SERVICE DESIGN PROFESSIONALS

85 METRO PARK
ROCHESTER NEW YORK 14623

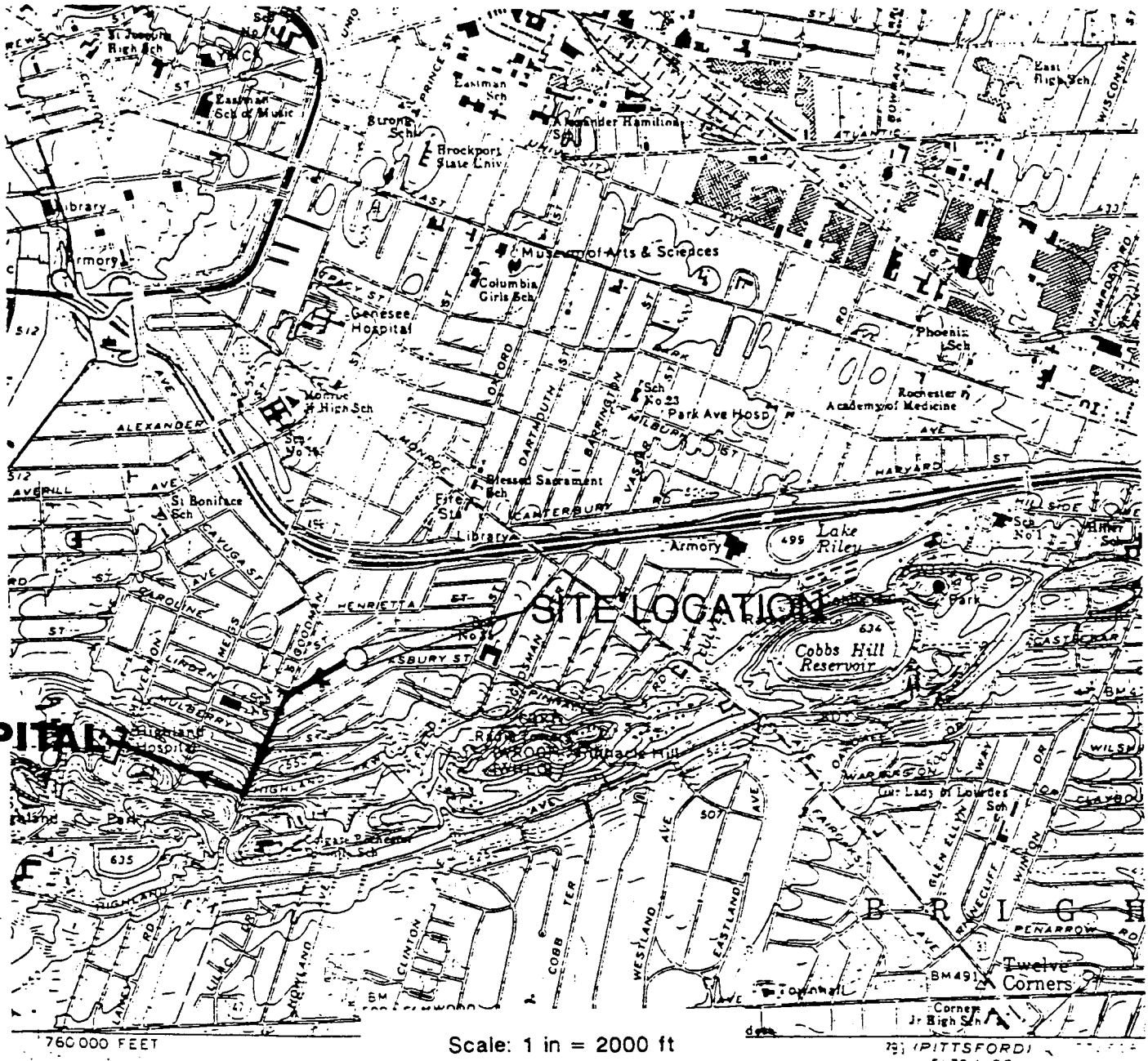
716-475-1440 FAX: 716-272-1814

FIGURE 1

SITE PLAN

DINABURG DISTRIBUTING
1012 SOUTH CLINTON AVE
ROCHESTER, NY

Base Map: Tape Location Map, 4/10/90



THE **SEAR-BROWN** GROUP
FULL-SERVICE DESIGN PROFESSIONALS
85 METRO PARK
ROCHESTER, NEW YORK
716-475-1440 FAX 716-272-1814

FIGURE 2

HOSPITAL ROUTE

DINABURG DISTRIBUTING
1012 SOUTH CLINTON AVE
ROCHESTER, NY

Source: USGS Roch.East Quad

APPENDIX A
MATERIAL SAFETY DATA SHEETS

P.O. Box 355, Milwaukee, Wisconsin 53201 USA

FAX (414) 273-4979

DATE: 06/23/92
CUST#: 451045
PO#: 6971

MATERIAL SAFETY DATA SHEET

IDENTIFICATION

PRODUCT #: 27039-3 NAME: TETRACHLOROETHYLENE, 99.9+%, HPLC GRADE
CAS #:127-18-4
MF: C2CL4

SYNONYMS
ANKILOSTIN * ANTISOL 1 * CARBON BICHLORIDE * CARBON DICHLORIDE *
CZTEROCHLOROETYLEN (POLISH) * DIDAKENE * DOW-PER * ENT 1,860 * ETHENE,
TETRACHLORO- * ETHYLENE TETRACHLORIDE * FEDAL-UN * NCI-C04580 * NEMA
* PER * PERAWIN * PERC * PERCHLORETHYLEEN, PER (DUTCH) * PERCHLOR *
PERCHLORAETHYLEN, PER (GERMAN) * PERCHLORETHYLENE * PERCHLORETHYLENE,
PER (FRENCH) * PERCHLOROETHYLENE * PERCHLOROETHYLENE (ACGIH,DOT,OSHA)
* PERCLENE * PERCLENE D * PERCLOROETILENE (ITALIAN) * PERCOSOLVE *
PERK * PERKLONE * PERSEC * RCRA WASTE NUMBER U210 * TETLEN * TETRACAP
* TETRACHLORETHEEN (DUTCH) * TETRACHLORAETHEN (GERMAN) *
TETRACHLORETHYLENE * TETRACHLOROETHENE * TETRACHLOROETHYLENE * 1,1,2,
2,-TETRACHLOROETHYLENE * TETRACHLOROETHYLENE (DOT,OSHA) *
TETRACLOROETENE (ITALIAN) * TETRALENO * TETRALEX * TETRAVEC *
TETROGUER * TETROPIL * UN 1597 (DOT) *

TOXICITY HAZARDS

RTECS NO: KX3850000
ETHYLENE, TETRACHLORO-
IRRITATION DATA
SKN-RBT 810 MG/24H SEV — EJTXAZ 9,171,76
SKN-RBT 500 MG/24H MLD — 85JCAE -,108,86
EYE-RBT 162 MG MLD — EJTXAZ 9,171,76
EYE-RBT 500 MG/24H MLD — 85JCAE -,108,86
TOXICITY DATA
ORL-RAT LD50:2629 MG/KG
IHL-RAT LC50:34200 MG/M3/8H — AIHAAP 20,364,59
IPR-RAT LD50:4678 MG/KG — AIHAAP 20,364,59
ORL-MUS LD50:8100 MG/KG — ENVRAL 40,411,86
IHL-MUS LC50:5200 PPM/4H — NTIS** PB257-185
IVN-MUS LD50:565 GM/KG — APTOA6 9,303,53
SCU-MUS LD50:2100 MG/KG — JPETAB 123,224,58
CARCINOGEN STATUS, AND REGULATIONS — TXAPA9 10,119,67
OSHA: TLV-TWA 50 PPM; STEL 200 PPM 85INAB 5,464,86
NCI: CARCINOGEN REVIEW:ANIMAL SUFFICIENT EVIDENCE IMSUDL 7,355,87
NCI: CARCINOGEN REVIEW:HUMAN INADEQUATE EVIDENCE IMSUDL 7,355,87
EPA: GROUP 2B IMSUDL 7,355,87
EPA: 1988 PESTICIDE SUBJECT TO REGISTRATION OR RE-REGISTRATION
NIOSH: 54,30548,89
MEXICO: AIR:TWA 100 PPM (670 MG/M3) OTLVS* 3,201,71
DFG: MAK:8H TWA 100 PPM;CL 200;PK 300/5M/3H FEREAC 54,2923,89
DFG: FINAL:8H TWA 25 PPM (170 MG/M3) FEREAC 54,2923,89

CONTINUED ON NEXT PAGE

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Fax 74.99.68.03

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CUST#: 451045
PO#: 6971

PRODUCT #: 27039-3 NAME: TETRACHLOROETHYLENE, 99.9+%, HPLC GRADE
CAS #:127-18-4
MF: C2CL4

---------- TOXICITY HAZARDS ----------

NIOSH REL TO TETRACHLOROETHYLENE-AIR:TWA MINIMIZE WORKPLACE EXPOSURE
MMWR** 37(S-7),25,88
NCIS 1974: HZD 54790; NIS 288; TNF 52013; NOS 155; TNE 549154
NOES 1983: HZD 54790; NIS 268; TNF 49025; NOS 151; TNE 688110; TFE 177342
EPA GENETOX PROGRAM 1988, POSITIVE: CELL TRANSFORM.-RLV F344 RAT EMBRYO
EPA GENETOX PROGRAM 1988, POSITIVE: S CEREVISIAE GENE CONVERSION; S CEREVISIAE-HOMOZYGOSIS
EPA GENETOX PROGRAM 1988, POSITIVE: S CEREVISIAE-REVERSION
EPA GENETOX PROGRAM 1988, POSITIVE/LIMITED: CARCINOGENICITY-MOUSE/RAT
EPA GENETOX PROGRAM 1988, NEGATIVE: CELL TRANSFORM.-SA7/SHE
EPA TSCA CHEMICAL INVENTORY, JUNE 1990
EPA TSCA SECTION 8(E) STATUS REPORT 8EHQ-0979-0310;8EHQ-0680-0345; 8EHQ-0578-0146
ON EPA IRIS DATABASE
EPA TSCA TEST SUBMISSION (TSCATS) DATA BASE, MARCH 1992
NIOSH CURRENT INTELLIGENCE BULLETIN 20, 1978
NIOSH ANALYTICAL METHODS: SEE HYDROCARBONS, HALOGENATED, 1003
NCI CARCINOGENESIS BIOASSAY (GAVAGE);CLEAR EVIDENCE:MOUSE NCITR* NCI-TR-13,77
NTP CARCINOGENESIS STUDIES (INHALATION);CLEAR EVIDENCE:MOUSE,RAT NTPTR* NTP-TR-311,86
NCI CARCINOGENESIS BIOASSAY (GAVAGE);INADEQUATE STUDIES:RAT NCITR* NCI-TR-13,77
NTP SIXTH ANNUAL REPORT ON CARCINOGENS, 1991 : ANTICIPATED TO BE CARCINOGEN
ARGET ORGAN DATA
PERIPHERAL NERVE AND SENSATION (LOCAL ANESTHETIC)
SENSE ORGANS AND SPECIAL SENSES (CONJUNCTIVA IRRITATION)
BEHAVIORAL (GENERAL ANESTHETIC)
BEHAVIORAL (HALLUCINATIONS, DISTORTED PERCEPTIONS)
BEHAVIORAL (COMA)
LIVER (TUMORS)
KIDNEY, URETER, BLADDER (KIDNEY TUMORS)
BLOOD (LEUKEMIA)
PATERNAL EFFECTS (SPERMATOGENESIS)
EFFECTS ON FERTILITY (POST-IMPLANTATION MORTALITY)
EFFECTS ON EMBRYO OR FETUS (FETOTOXICITY)
SPECIFIC DEVELOPMENTAL ABNORMALITIES (MUSCULOSKELETAL SYSTEM)
SPECIFIC DEVELOPMENTAL ABNORMALITIES (HOMEOSTASIS)

CONTINUED ON NEXT PAGE

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MATERIAL SAFETY DATA SHEET

CUST#: 451045
PO#: 6971

PRODUCT #: 27039-3 NAME: TETRACHLOROETHYLENE, 99.9+%, HPLC GRADE
CAS #:127-18-4
MF: C2CL4

TOXICITY HAZARDS

TUMORIGENIC EFFECTS (TESTICULAR TUMORS)
EFFECTS ON NEWBORN (LIVE BIRTH INDEX)
EFFECTS ON NEWBORN (BIOCHEMICAL AND METABOLIC)
EFFECTS ON NEWBORN (BEHAVIORAL)
TUMORIGENIC (CARCINOGENIC BY RTECS CRITERIA)
TUMORIGENIC (NEOPLASTIC BY RTECS CRITERIA)

ONLY SELECTED REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES (RTECS)
DATA IS PRESENTED HERE. SEE ACTUAL ENTRY IN RTECS FOR COMPLETE INFORMATION.

HEALTH HAZARD DATA

ACUTE EFFECTS
HARMFUL IF SWALLOWED, INHALED, OR ABSORBED THROUGH SKIN.
VAPOR OR MIST IS IRRITATING TO THE EYES, MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT.
CAUSES SKIN IRRITATION.
EXPOSURE CAN CAUSE:
NAUSEA, DIZZINESS AND HEADACHE
NARCOTIC EFFECT
CHRONIC EFFECTS
DAMAGE TO THE LIVER
DAMAGE TO THE KIDNEYS
CARCINOGEN.
MAY ALTER GENETIC MATERIAL.
TARGET ORGAN(S):
NERVES, HEART
LIVER, KIDNEYS
FIRST AID
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES OR SKIN WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES.
ASSURE ADEQUATE FLUSHING OF THE EYES BY SEPARATING THE EYELIDS WITH FINGERS.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS.
CALL A PHYSICIAN.
REMOVE AND WASH CONTAMINATED CLOTHING PROMPTLY.

PHYSICAL DATA

BOILING PT: 121 C

CONTINUED ON NEXT PAGE

MATERIAL SAFETY DATA SHEET

CUST#: 451045
PO#: 6971

PRODUCT #: 27039-3 NAME: TETRACHLOROETHYLENE, 99.9+%, HPLC GRADE
CAS #:127-18-4
MF: C2CL4

PHYSICAL DATA

MELTING PT: -22 C
SPECIFIC GRAVITY: 1.623
VAPOR DENSITY: 5.83
VAPOR PRESSURE: 18 MM @ 20 C
19 MM @ 25 C
APPEARANCE AND ODOR
COLORLESS LIQUID

FIRE AND EXPLOSION HAZARD DATA

FLASHPOINT: NONE
EXTINGUISHING MEDIA
NONCOMBUSTIBLE.
USE EXTINGUISHING MEDIA APPROPRIATE TO SURROUNDING FIRE CONDITIONS.
SPECIAL FIREFIGHTING PROCEDURES
WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.
UNUSUAL FIRE AND EXPLOSIONS HAZARDS
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

REACTIVITY DATA

INCOMPATIBILITIES
STRONG BASES
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
TOXIC FUMES OF:
PHOSGENE GAS
HYDROGEN CHLORIDE GAS
CARBON MONOXIDE, CARBON DIOXIDE

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED
EVACUATE AREA.
WEAR SELF-CONTAINED BREATHING APPARATUS, RUBBER BOOTS AND HEAVY RUBBER GLOVES.
ABSORB ON SAND OR VERMICULITE AND PLACE IN CLOSED CONTAINERS FOR DISPOSAL.
VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.
WASTE DISPOSAL METHOD
DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A

CONTINUED ON NEXT PAGE

CUST#: 451045
PO#: 6971

PRODUCT #: 27039-3 NAME: TETRACHLOROETHYLENE, 99.9+%, HPLC GRADE
CAS #: 127-18-4
MF: C2CL4

---------- SPILL OR LEAK PROCEDURES ----------

CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER.

--- PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE ---

WEAR APPROPRIATE NIOSH/MSHA-APPROVED RESPIRATOR, CHEMICAL-RESISTANT GLOVES, SAFETY GOGGLES, OTHER PROTECTIVE CLOTHING.
SAFETY SHOWER AND EYE BATH.
USE ONLY IN A CHEMICAL FUME HOOD.
DO NOT BREATHE VAPOR.
DO NOT GET IN EYES, ON SKIN, ON CLOTHING.
WASH THOROUGHLY AFTER HANDLING.
CARCINOGEN.
IRRITANT.
HARMFUL LIQUID AND FUMES.
MUTAGEN.
KEEP TIGHTLY CLOSED.
STORE IN A COOL DRY PLACE.
EL PRECAUTIONARY STATEMENTS
TOXIC
MAY CAUSE CANCER.
MAY CAUSE HERITABLE GENETIC DAMAGE.
HARMFUL BY INHALATION, IN CONTACT WITH SKIN AND IF SWALLOWED.
IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN.
HARMFUL VAPOR.
TARGET ORGAN(S):
NERVES, HEART
LIVER, KIDNEYS
IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE (SHOW THE LABEL WHERE POSSIBLE).
IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ADVICE.
WEAR SUITABLE PROTECTIVE CLOTHING, GLOVES AND EYE/FACE PROTECTION.
EGULATORY INFORMATION
THIS PRODUCT IS SUBJECT TO SARA SECTION 313 REPORTING REQUIREMENTS.

ABOVE INFORMATION IS BELIEVED TO BE CORRECT BUT DOES NOT PURPORT TO BE LL INCLUSIVE AND SHALL BE USED ONLY AS A GUIDE. ALDRICH SHALL NOT BE HELD ABLE FOR ANY DAMAGE RESULTING FROM HANDLING OR FROM CONTACT WITH THE VE PRODUCT. SEE REVERSE SIDE OF INVOICE OR PACKING SLIP FOR ADDITIONAL MS AND CONDITIONS OF SALE.

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DATE: 12/29/92
CUST#: 451045
PO#:

M A T E R I A L S A F E T Y D A T A S H E E T

- - - - IDENTIFICATION - - - -

PRODUCT #: 37214-5
CAS #:79-01-6 NAME: TRICHLOROETHYLENE, ANHYDROUS, 99+%
MF: C2HCL3

SYNMS
ACETYLENE TRICHLORIDE * ALGYLEN * ANAMENTH * BENZINOL * BLACOSOLV * BLANCOSOLV * CECOLENE * CHLORILEN * 1-CHLORO-2,2-DICHLOROETHYLENE * CHLORYLEA * CHLORYLEN * CHCRYLEN * CIRCOSOLV * CRAWHASPOL * DENSINFLUAT * 1,1-DICHLORO-2-CHLOROETHYLENE * DOW-TRI * DUKERON * ETHINYL TRICHLORIDE * ETHYLENE TRICHLORIDE * FLECK-FLIP * FLOCK FLIP * FLUATE * GEMALGENE * GERMALGENE * LANADIN * LETHURIN * NARCOGEN * NARKOGEN * NARKOSOID * NCI-C04546 * NIALK * PERM-A-CHLOR * PERM-A-CLOR * PETZINOL * PHILEX * RCRA WASTE NUMBER U228 * TCE * THRETHYLEN * THRETHYLENE * TRETHYLENE * TRI * TRIAD * TRIAL * TRIASOL * TRICHLOORETHEEN (DUTCH) * TRICHLOORETHYLEEN, TRI (DUTCH) * TRICHLORAETHEN (GERMAN) * TRICHLORAETHYLEN, TRI (GERMAN) * TRICHLORAN * TRICHLOREN * TRICHLORETHENE (FRENCH) * TRICHLORETHYLENE * TRICHLORETHYLENE, TRI (FRENCH) * TRICHLOROETHENE * TRICHLOROETHYLENE * 1,1,2-TRICHLOROETHYLENE * 1,2,2-TRICHLOROETHYLENE * TRICHLOROETHYLENE (ACGIH,DOT,OSHA) * TRI-CLENE * TRICLORETENE (ITALIAN) * TRICLORETILENE (ITALIAN) * TRIELENE * TRIELIN * TRIELINA * TRIOL * TRI-PLUS * TRI-PLUS M * UN 1710 (DOT) * VESTROL * VITRAN * ZTROSOL *

- - - - TOXICITY HAZARDS - - - -

RTECS #: KX4550000
ETHYLENE, TRICHLORO-

IRRITATION DATA
SKN-RBT 2 MG/24H SEV — 85JCAE -,106,86
EYE-RBT 20 MG/24H MOD — 85JCAE -,106,86

TOXICITY DATA
ORL-HMN LDLO:7 GM/KG — ARTODN 35,295,76
INH-MAN LCLO:2000 PPM — NZMJAX 50,119,51
ORL-RAT LD50:1232 MG/KG — ENVRAL 40,411,86
ORL-MUS LD50:2402 MG/KG — NTIS** AD-A030-636
INH-MUS LC50:8450 PPM/4H — APTOA6 9,303,53
IPR-MUS LD50:16 GM/KG — JPETAB 123,224,58
IVN-MUS LD50:33900 UG/KG — CRCCT* 6,141,54
IPR-DOG LD50:1900 MG/KG — TXAPA9 10,119,67
SKN-RBT LD50:>20 GM/KG — NTIS** AD-A062-138

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MATERIAL SAFETY DATA SHEET

PRODUCT #:

CUST#: 451045

MF: C2HCL3

NAME: TRICHLOROETHYLENE, ANHYDROUS, 99+%

- - - - TOXICITY HAZARDS - - - -

EWS, STANDARDS, AND REGULATIONS
ACGIH TLV-TWA 50 PPM; STEL 200 PPM 85INA8 5,595,86
IARC CANCER REVIEW:ANIMAL LIMITED EVIDENCE IMEMDT 20,545,79
IARC CANCER REVIEW:HUMAN INADEQUATE EVIDENCE IMEMDT 20,545,79
MSHA STANDARD-AIR:TWA 100 PPM (535 MG/M3) OTLVS* 3,263,71
OSHA PEL:8H TWA 100 PPM;CL 200;PK 300/5M/2H FEREAC 54,2923,89
OSHA PEL FINAL:8H TWA 50 PPM (270 MG/M3);STEL 200 PPM (1080 MG/M3)
FEREAC 54,2923,89
NIOSH REL TO TRICHLOROETHYLENE-AIR:10H CA TWA 25 PPM;CL 2 PPM/1H
NIOSH* DHHS #92-100,92
NIOSH REL TO WASTE ANESTHETIC GASES AND VAPORS-AIR:CL 2 PPM/1H MMWR**
37(S-7),28,88
NOHS 1974: HZD 73790; NIS 251; TNF 37699; NOS 141; TNE 446588
NOES 1983: HZD 73790; NIS 192; TNF 23225; NOS 143; TNE 401373; TFE
175316
ATSDR TOXICOLOGY PROFILE (NTIS** PB/90/127523/AS)
EPA GENETOX PROGRAM 1988, POSITIVE: CELL TRANSFORM.-RLV F344 RAT
EMBRYO; HOST-MEDIATED ASSAY
EPA GENETOX PROGRAM 1988, POSITIVE: MOUSE SPOT TEST; SPERM MORPHOLOGY-
MOUSE
EPA GENETOX PROGRAM 1988, POSITIVE: S CEREVISIAE GENE CONVERSION; S
CEREVISIAE-HOMOZYGOSIS
EPA GENETOX PROGRAM 1988, POSITIVE: S CEREVISIAE-REVERSION
EPA GENETOX PROGRAM 1988, POSITIVE/LIMITED: CARCINOGENICITY-MOUSE/RAT
EPA GENETOX PROGRAM 1988, NEGATIVE: D MELANOGASTER SEX-LINKED LETHAL
EPA GENETOX PROGRAM 1988, INCONCLUSIVE: HISTIDINE REVERSION-AMES TEST
EPA TSCA CHEMICAL INVENTORY, JUNE 1990
EPA TSCA SECTION 8(E) STATUS REPORT 8EHQ-0680-0345;8EHQ-0982-0457;
8EHQ-0979-0310
EPA TSCA SECTION 8(E) STATUS REPORT 8EHQ-0578-0146
EPA IRIS DATABASE
EPA TSCA TEST SUBMISSION (TSCATS) DATA BASE, JULY 1992
NIOSH CURRENT INTELLIGENCE BULLETIN 2, 1975
NIOSH ANALYTICAL METHODS: SEE TRICHLOROETHYLENE, 1022;
TRICHLOROETHYLENE BY PORTABLE GC, 3701
NCI CARCINOGENESIS BIOASSAY (GAVAGE);CLEAR EVIDENCE:MOUSE NCITR* NCI-
TR-2,76
NTP CARCINOGENESIS STUDIES (GAVAGE);CLEAR EVIDENCE:MOUSE NTPTR* NTP-
TR-243,83

CONTINUED ON NEXT PAGE

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MATERIAL SAFETY DATA SHEET

PRODUCT #: CUST#: 451045

MF: C2HCL3 NAME: TRICHLOROETHYLENE, ANHYDROUS, 99+%

- - - - TOXICITY HAZARDS - - - -

NCI CARCINOGENESIS BIOASSAY (GAVAGE);NO EVIDENCE:RAT NCITR* NCI-TR-2, 76
NTP CARCINOGENESIS STUDIES (GAVAGE);INADEQUATE STUDY:RAT NTPTR* NTP-TR-273,88
NTP CARCINOGENESIS STUDIES (FEED);INADEQUATE STUDIES:RAT NTPTR* NTP-TR-243,83

GET ORGAN DATA
SENSE ORGANS AND SPECIAL SENSES (OTHER EYE EFFECTS)
BEHAVIORAL (SOMNOLENCE)
BEHAVIORAL (HALLUCINATIONS, DISTORTED PERCEPTIONS)
VASCULAR (TUMORS)
LUNGS, THORAX OR RESPIRATION (TUMORS)
GASTROINTESTINAL (OTHER CHANGES)
LIVER (JAUNDICE, OTHER OR UNCLASSIFIED)
LIVER (LIVER FUNCTION TESTS IMPAIRED)
LIVER (TUMORS)
BLOOD (LYMPHOMA INCLUDING HODGKIN'S DISEASE)
SKIN AND APPENDAGES (TUMORS)
PATERNAL EFFECTS (SPERMATOGENESIS)
EFFECTS ON FERTILITY (POST-IMPLANTATION MORTALITY)
EFFECTS ON EMBRYO OR FETUS (FETOTOXICITY)
SPECIFIC DEVELOPMENTAL ABNORMALITIES (CENTRAL NERVOUS SYSTEM)
SPECIFIC DEVELOPMENTAL ABNORMALITIES (MUSCULOSKELETAL SYSTEM)
SPECIFIC DEVELOPMENTAL ABNORMALITIES (UROGENITAL SYSTEM)
SPECIFIC DEVELOPMENTAL ABNORMALITIES (OTHER DEVELOPMENTAL ABNORMALITIES)
TUMORIGENIC (CARCINOGENIC BY RTECS CRITERIA)
TUMORIGENIC (EQUIVOCAL TUMORIGENIC AGENT BY RTECS CRITERIA)
ONLY SELECTED REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES (RTECS) DATA IS PRESENTED HERE. SEE ACTUAL ENTRY IN RTECS FOR COMPLETE INFORMATION.

- - - - HEALTH HAZARD DATA - - - -

ACUTE EFFECTS
HARMFUL IF SWALLOWED, INHALED, OR ABSORBED THROUGH SKIN.
CAUSES SEVERE IRRITATION.
HIGH CONCENTRATIONS ARE EXTREMELY DESTRUCTIVE TO TISSUES OF THE MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT, EYES AND SKIN.
SYMPTOMS OF EXPOSURE MAY INCLUDE BURNING SENSATION, COUGHING,

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MATERIAL SAFETY DATA SHEET

PRODUCT #:

CUST#: 451045

MF: C2HCL3

NAME: TRICHLOROETHYLENE, ANHYDROUS, 99+%

- - - - HEALTH HAZARD DATA - - - -

WHEEZING, LARYNGITIS, SHORTNESS OF BREATH, HEADACHE, NAUSEA AND VOMITING.
EXPOSURE TO AND/OR CONSUMPTION OF ALCOHOL MAY INCREASE TOXIC EFFECTS.
EXPOSURE CAN CAUSE:
GASTROINTESTINAL DISTURBANCES
DAMAGE TO THE KIDNEYS
NAUSEA, DIZZINESS AND HEADACHE
NARCOTIC EFFECT
PROLONGED CONTACT CAN CAUSE:
DERMATITIS

RONIC EFFECTS
CARCINOGEN.
MAY ALTER GENETIC MATERIAL.
TARGET ORGAN(S):
CENTRAL NERVOUS SYSTEM
LIVER, KIDNEYS
HEART
LUNGS

ST AID
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES OR SKIN WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS. CALL A PHYSICIAN IMMEDIATELY.
DISCARD CONTAMINATED CLOTHING AND SHOES.

- - - - PHYSICAL DATA - - - -

BOILING POINT: 87 C
MELTING POINT: -87 C TO C
SPECIFIC GRAVITY: 1.462

EARANCE AND ODOR
OLORLESS LIQUID

CONTINUED ON NEXT PAGE

P.O. Box 355, Milwaukee, Wisconsin 53201 USA

MATERIAL SAFETY DATA SHEET

PRODUCT #: CUST#: 451045

NAME: TRICHLOROETHYLENE, ANHYDROUS, 99+%

MF: C2HCL3

- - - - FIRE AND EXPLOSION HAZARD DATA - - - -

FLASHPOINT NONE

XTINGUISHING MEDIA
NONCOMBUSTIBLE.
USE EXTINGUISHING MEDIA APPROPRIATE TO SURROUNDING FIRE CONDITIONS.

PECIAL FIREFIGHTING PROCEDURES
WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.

NUSUAL FIRE AND EXPLOSIONS HAZARDS
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

- - - - REACTIVITY DATA - - - -

NCOMPATIBILITIES
OXIDIZING AGENTS
REDUCING AGENTS
STRONG BASES
ALUMINUM
MAGNESIUM
SENSITIVE TO LIGHT

'DOUS COMBUSTION OR DECOMPOSITION PRODUCTS
OXIC FUMES OF:
CARBON MONOXIDE, CARBON DIOXIDE
HYDROGEN CHLORIDE GAS
PHOSGENE GAS

- - - - SPILL OR LEAK PROCEDURES - - - -

PS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED
EVACUATE AREA.
WEAR SELF-CONTAINED BREATHING APPARATUS, RUBBER BOOTS AND HEAVY RUBBER GLOVES.
ABSORB ON SAND OR VERMICULITE AND PLACE IN CLOSED CONTAINERS FOR DISPOSAL.
VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

CONTINUED ON NEXT PAGE

PO Box 355, Milwaukee, Wisconsin 53201 USA

CUST#: 451045

PRODUCT #:

NAME: TRICHLOROETHYLENE, ANHYDROUS, 99+%

MF: C2HCL3

- - - - SPILL OR LEAK PROCEDURES - - - -

WASTE DISPOSAL METHOD
DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER. OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

- - - - PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE - - - -
WEAR APPROPRIATE NIOSH/MSHA-APPROVED RESPIRATOR, CHEMICAL-RESISTANT GLOVES, SAFETY GOGGLES, OTHER PROTECTIVE CLOTHING.
SAFETY SHOWER AND EYE BATH.
USE ONLY IN A CHEMICAL FUME HOOD.
DO NOT BREATHE VAPOR.
DO NOT GET IN EYES, ON SKIN, ON CLOTHING.
AVOID PROLONGED OR REPEATED EXPOSURE.
WASH THOROUGHLY AFTER HANDLING.
SEVERE IRRITANT.
HARMFUL VAPOR.
CARCINOGEN.
MUTAGEN.
KEEP TIGHTLY CLOSED.
PROTECT FROM LIGHT.
STORE IN A COOL DRY PLACE.

LABEL PRECAUTIONARY STATEMENTS
TOXIC
MAY CAUSE CANCER.
MAY CAUSE HERITABLE GENETIC DAMAGE.
HARMFUL BY INHALATION, IN CONTACT WITH SKIN AND IF SWALLOWED.
CAUSES SEVERE IRRITATION.
TARGET ORGAN(S):
CENTRAL NERVOUS SYSTEM
LIVER, KIDNEYS
HEART
LUNGS
PROTECT FROM LIGHT.
IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE (SHOW THE LABEL WHERE POSSIBLE).
IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ADVICE.
WEAR SUITABLE PROTECTIVE CLOTHING, GLOVES AND EYE/FACE PROTECTION.

REGULATORY INFORMATION

CONTINUED ON NEXT PAGE

PRODUCT #: CUST#: 451045

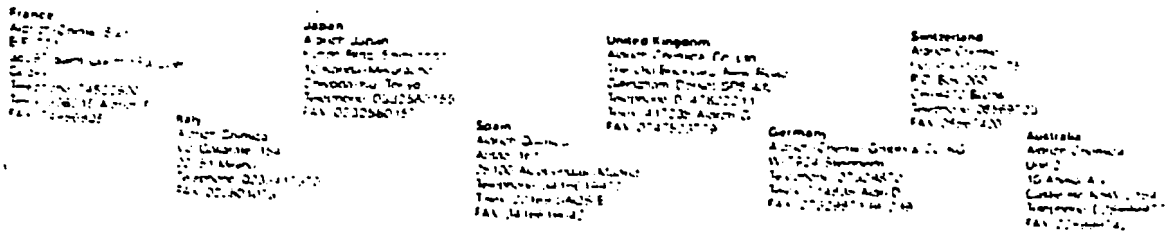
MF: C2HCL3 NAME: TRICHLOROETHYLENE, ANHYDROUS, 99+%

- - - - PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE - - - -

THIS PRODUCT IS SUBJECT TO SARA SECTION 313 REPORTING REQUIREMENTS.

THE ABOVE INFORMATION IS BELIEVED TO BE CORRECT BUT DOES NOT PURPORT TO BE ALL INCLUSIVE AND SHALL BE USED ONLY AS A GUIDE. ALDRICH SHALL NOT BE HELD LIABLE FOR ANY DAMAGE RESULTING FORM HANDLING OR FROM CONTACT WITH THE ABOVE PRODUCT. SEE REVERSE SIDE OF INVOICE OR PACKING SLIP FOR ADDITIONAL TERMS AND CONDITIONS OF SALE.

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MATERIAL SAFETY DATA SHEET

Ashland Chemical Co.

Date Prepared: 01/05/96
Date Printed: 03/01/96
MSDS No: 0000589-006.001

EXXON VARSOL 1

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1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material Identity
Product Name: EXXON VARSOL 1
General or Generic ID: ALIPHATIC HYDROCARBON

Company
Ashland Chemical Co.
P.O. Box 2219
Columbus, OH 43216
614-790-3333

Emergency Telephone Number:
1-800-ASHLAND (1-800-274-5263)
24 hours everyday

Regulatory Information Number:
1-800-325-3751

---

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient(s)	CAS Number	
ALIPHATIC HYDROCARBONS (STODDARD TYPE)	8052-41-3	100.0
1,2,4-TRIMETHYLBENZENE	95-63-6	3.5

---

3. HAZARDS IDENTIFICATION

Potential Health Effects

Eye

Exposure may cause mild eye irritation. Symptoms may include stinging, tearing, and redness.

Skin

Exposure may cause mild skin irritation. Prolonged or repeated exposure may dry the skin. Symptoms may include redness, burning, drying and cracking, and skin burns. Skin absorption is possible, but harmful effects are not expected from this route of exposure under normal conditions of handling and use.

Continued on next page

Autoignition Temperature
No data

Hazardous Products of Combustion
May form:, carbon dioxide and carbon monoxide, various hydrocarbons.

Fire and Explosion Hazards
Vapors are heavier than air and may travel along the ground or be moved by ventilation and ignited by heat, pilot lights, other flames and ignition sources at locations distant from material handling point. Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively.

Extinguishing Media
regular foam, carbon dioxide, dry chemical.

Fire Fighting Instructions
Wear a self-contained breathing apparatus with a full facepiece operated in the positive pressure demand mode with appropriate turn-out gear and chemical resistant personal protective equipment. Refer to the personal protective equipment section of this MSDS.

NFPA Rating
Health - 0, Flammability - 2, Reactivity - 0

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6. ACCIDENTAL RELEASE MEASURES

Small Spill
Absorb liquid on vermiculite, floor absorbent or other absorbent material.

Large Spill
Eliminate all ignition sources (flares, flames including pilot lights, electrical sparks). Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source. Prevent from entering drains, sewers, streams or other bodies of water. Prevent from spreading. If runoff occurs, notify authorities as required. Pump or vacuum transfer spilled product to clean containers for recovery. Absorb unrecoverable product. Transfer contaminated absorbent, soil and other materials to containers for disposal.

Continued on next page

Swallowing

Single dose oral toxicity is low. Swallowing small amounts during normal handling is not likely to cause harmful effects; swallowing large amounts may be harmful. This material can enter the lungs during swallowing or vomiting and cause lung inflammation and/or damage.

Inhalation

Exposure to vapor or mist is possible. Short-term inhalation toxicity is low. Breathing small amounts during normal handling is not likely to cause harmful effects; breathing large amounts may be harmful. Symptoms are more typically seen at air concentrations exceeding the recommended exposure limits.

Symptoms of Exposure

gastrointestinal irritation (nausea, vomiting, diarrhea), irritation (nose, throat, respiratory tract), central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness), central nervous system depression (dizziness, drowsiness, weakness, fatugue, nausea, headache, unconsciousness).

Target Organ Effects

No data

Developmental Information

No data

Cancer Information

Based on the available information, this material cannot be classified with regard to carcinogenicity. This material is not listed as a carcinogen by IARC, NTP or OSHA.

Other Health Effects

No data

Primary Route(s) of Entry

Inhalation, Skin contact, Eye contact.

Continued on next page

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4. FIRST AID MEASURES

Eyes

If symptoms develop, move individual away from exposure and into fresh air. Flush eyes gently with water while holding eyelids apart. If symptoms persist or there is any visual difficulty, seek medical attention.

Skin

Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

Swallowing

Do not induce vomiting. This material is an aspiration hazard. If individual is drowsy or unconscious, place on left side with the head down. Seek medical attention. If possible, do not leave individual unattended.

Inhalation

If symptoms develop, immediately move individual away from exposure and into fresh air. Seek immediate medical attention; keep person warm and quiet. If person is not breathing, begin artificial respiration. If breathing is difficult, administer oxygen.

Note to Physicians

No data

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5. FIRE FIGHTING MEASURES

Flash Point

105.0 F (40.5 C)

Explosive Limit

(for product) Lower 1.0 % Upper 6.0 %

Continued on next page

Prevent run-off to sewers, streams or other bodies of water. If run-off occurs, notify proper authorities as required, that a spill has occured.

7. HANDLING AND STORAGE

Handling

Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed. All five gallon pails and larger metal containers including tank cars and tank trucks should be grounded and/or bonded when material is transferred. Hydrocarbon solvents are basically non-conductors of electricity and can become electrostatically charged during mixing, filtering or pumping at high flow rates. If this charge reaches a sufficiently high level, sparks can form that may ignite the vapors of flammable liquids. Warning. Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into vacuum equipment, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product in elevated temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye Protection

Chemical splash goggles in compliance with OSHA regulations are advised; however, OSHA regulations also permit other type safety glasses. Consult your safety representative.

Continued on next page

Skin Protection
Wear resistant gloves (consult your safety equipment supplier)., To prevent repeated or prolonged skin contact, wear impervious clothing and boots..

Respiratory Protections
If workplace exposure limit(s) of product or any component is exceeded (see exposure guidelines), a NIOSH/MSHA approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators (negative pressure type) under specified conditions (see your industrial hygienist). Engineering or administrative controls should be implemented to reduce exposure.

Engineering Controls
Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below TLV(s).

Exposure Guidelines
Component

ALIPHATIC HYDROCARBONS (STODDARD TYPE) (8052-41-3)
OSHA VPEL 100.000 ppm - TWA
ACGIH TLV 100.000 ppm - TWA

1,2,4-TRIMETHYLBENZENE (95-63-6)
No exposure limits established

---

9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point
(for product) 315.0 - 398.0 F (157.2 - 203.3 C) @ 760 mmHg

Vapor Pressure
(for product) 2.000 mmHg @ 68.00 F

Continued on next page

Specific Vapor Density
4.900 @ AIR=1

Specific Gravity
.787 @ 60.00 F

Liquid Density
6.560 lbs/gal @ 60.00 F
.787 kg/l @ 15.00 C

Percent Volatiles
100.0 %

Evaporation Rate
.12 (BUTYL ACETATE)

Appearance
No data

State
LIQUID

Physical Form
HOMOGENEOUS SOLUTION

Color
CLEAR & COLORLESS

Odor
No data

pH
Not applicable

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10. STABILITY AND REACTIVITY

Hazardous Polymerization
Product will not undergo hazardous polymerization.

Continued on next page

Hazardous Decomposition
May form:, carbon dioxide and carbon monoxide, various hydrocarbons.

Chemical Stability
Stable.

Incompatibility
Avoid contact with:, strong oxidizing agents.

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11. TOXICOLOGICAL INFORMATION

No data

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12. ECOLOGICAL INFORMATION

No data

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13. DISPOSAL CONSIDERATION

Waste Management Information
Dispose of in accordance with all applicable local, state and federal regulations.

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14. TRANSPORT INFORMATION

DOT Information - 49 CFR 172.101
DOT Description:
NAPHTHA, SOLVENT,COMBUSTIBLE LIQUID,UN1255,III

Container/Mode:
55 GAL DRUM/TRUCK PACKAGE

Continued on next page

NOS Component:
None

RQ (Reportable Quantity) - 49 CFR 172.101
Not applicable

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15. REGULATORY INFORMATION

US Federal Regulations

TSCA (Toxic Substances Control Act) Status
TSCA (UNITED STATES) The intentional ingredients of this product are listed.

CERCLA RQ - 40 CFR 302.4
None

SARA 302 Components - 40 CFR 355 Appendix A
None

Section 311/312 Hazard Class - 40 CFR 370.2
Immediate(X) Delayed( ) Fire(X) Reactive( ) Sudden Release of Pressure( )

SARA 313 Components - 40 CFR 372.65

Section 313 Component(s)	CAS Number	Max %
1,2,4-TRIMETHYLBENZENE	95-63-6	3.30

International Regulations

Inventory Status
DSL (CANADA) The intentional ingredients of this product are listed.

State and Local Regulations

California Proposition 65
None

Continued on next page

New Jersey RTK Label Information

STODDARD SOLVENT	8052-41-3
PSEUDOCUMENE	95-63-6

Pennsylvania RTK Label Information

STODDARD SOLVENT	8052-41-3
PSEUDOCUMENE	95-63-6

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16. OTHER INFORMATION

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.

APPENDIX B
ON-SITE SAFETY MEETING FORMS

ON-SITE SAFETY MEETING

Project:_____
Date:_____ Time:_____ Job No.:_____
Address:_____

Scope of Work:_____

Weather Temp:_____ Wind direction/speed:_____
Sky Conditions:_____ Humidity:_____
Weather Conditions affecting work:_____

Safety Topics Discussed

Protective Clothing/Equipment:_____

Chemical Hazards:_____

Physical Hazardous:_____

Personnel/Equipment Decontamination:_____

Personnel/Job Functions:_____

Emergency Procedures:_____

Special Equipment:_____

Other:_____

Emergency Phone Numbers/Addresses

Ambulance 911
Hospital 911 or 263-6000
Police 911
Fire Department 911

On-Site Safety Meeting
ATTENDEES

Name Printed	Signature	Job Function

Meeting Conducted By: _____ _____
Name Printed Signature

Site Safety Officer _____ _____
Team Leader _____ _____

HEALTH & SAFETY PLAN

Project Name: (former) Dinaburg Site Project & Task #: 12709-R150

Site Location: S. Clinton Avenue, Rochester, NY

HASP Author: SJ Sherman, CIH Date: May 1, 1996

Approval: M. Storonsky Date: _____

Description of Site and Pertinent History: former automotive repair business and solvent distribution company. Previous investigations have shown low level subsurface soil and groundwater contamination

☐ Active Site ☒ Inactive Site ☐ Abandoned Site

ANTICIPATED HAZARDS:

Chemical

- ☒ explosive/flam/ign
- ☒ carcinogen
- ☐ radioactive
- ☐ corrosive
- ☒ volatile
- ☐ reactive
- ☐ medical waste/pathogen
- ☐ acute toxicity
- ☒ other unforeseen buried utilities

Physical

- ☒ noise
- ☐ confined space
- ☒ trenching/excavation/drilling
- ☐ heights
- ☐ water hazards
- ☒ heat/cold stress
- ☒ vehicular/heavy equipment
- ☐ electrical
- ☐ unknown drums/containers

Planned Site Activities: drilling with associated soil and groundwater sampling on and off site.

FIELD TEAM:

(all personnel entering the exclusion zone meet the training and medical surveillance requirements of OSHA 29CFR1910.120)

Name	Responsibilities
TBD	(Team Leader)
TBD	(Site Safety)

THIS HASP HAS BEEN DEVELOPED BY ***THE SEAR-BROWN GROUP©*** FOR THE EXPRESSED USE OF ITS STAFF. IT IS NOT INTENDED, NOR LEGALLY ALLOWED, TO BE USED BY OTHER WORKERS ON SITE, WHOSE EMPLOYERS MUST CREATE THEIR OWN HASP.

HEALTH & SAFETY PLAN

KNOWN CHEMICAL HAZARD SUMMARY:

Compound	PEL or TLV	Routes of Exposure	Acute Exposure Symptoms	Odor Description	Good Warning Properties?	Monitoring Methods
PCE	25 ppm	inh, ing, derm	CNS, dermal	sweet, solvent	yes	HNu
TCE	50 ppm	inh, ing, derm	CNS, dermal	sweet, solvent	yes	HNu
min-spirits	100 ppm	inh, ing, derm	CNS, dermal	paint thinner	yes	HNu
fuel oil	100 mg/m^3 (NIOSH)	inh, ing, derm	CNS, dermal	Kerosene	yes	HNu

A current Material Safety Data Sheet (MSDS) must be attached for materials used by field team, e.g., preservatives, other supplies.

SITE LAYOUT: Attach Site Map or sketch layout on reverse of this page.

Site Access Control and Egress Considerations: drilling may be done in active roadways requiring traffic control. Locations will be very close to residences. Hot zone delineation critical.

SPECIAL CONSIDERATIONS:

- ☞ HASP read by all team members?
- ☞ hospital/emergency info reviewed?
- ☞ PPE/respiratory protection available per HASP?
- ☞ site work during daylight hours only?
- ☞ heat/cold stress considered?
- ☞ no work during electrical storms?
- ☞ NO EAT/DRINK/SMOKE/CHEW UNTIL DECONNED
- ☞ all personnel know location/operation of drill rig kill switches?
- ☞ animal/insect/poison ivy considerations?

PERSONAL PROTECTIVE EQUIPMENT:

Task	Protective Clothing	Gloves	Respirator	Other	Other
drill observation	Tyvek	surgical	available HEPA/organic	hardhat	eye, foot protection
soil sampling	Tyvek	neoprene work glove over surgical	available	hardhat	eye, foot protection
groundwater sampling	Tyvek	As per soil	available	hardhat	eye, foot protection
Other PPE details:	coated tyvek preferable during wet operations (poly or saranex) traffic vests for all personnel working in street.				

HEALTH & SAFETY PLAN

SITE MONITORING:

Task	Contaminant(s)	Instrumentation	Limitations, Etc.	Action Level for PPE Upgrade and/or Work Stoppage
drilling observation	VOC	Hnu, CGO2	wet weather, methane	5 ppm-C 50 ppm-Stop
split spoon samples	VOC	Hnu	wet weather, methane	5 ppm-C 50 ppm-Stop
groundwater	VOC	Hnu	wet weather, methane	5 ppm-C 50 ppm-Stop

SAMPLING:

Describe Planned Sampling Activities: split spoon soil samples, groundwater samples after wells are developed

PPE During Sampling (list by task): Soil/groundwater: tyvek, neoprene work glove over surgicial, safety glasses, steel toed boots, hardhat. Splash apron or coated tyvek as appropriate during water sampling.

PPE During Sample Handling/Packaging: Surgicial gloves, respirator use during handling of vermiculite (if used during packing).

DECONTAMINATION:

Equipment Decon Solutions & Procedures: detergent wash/rinse. Pressure and/or steam clean as appropriate

PPE Required During Equipment Decon? level D with splash protection

Personnel Decon: hand/face wash prior to eat/drink/smoke. PPE will be disposable

Disposal of Used PPE: drum and store in secure location pending removal of other investigation derived materials.

Disposal of Decon Liquids: See above. Allowable holding periods and proper manifesting, etc. must be respected. Drilling contractor will be responsible for proper disposal of drummed waste generated as part of the well installations.

HEALTH & SAFETY PLAN

EMERGENCY CONTACTS: Attach sketch of hospital route or use reverse side.

REPORT ALL INJURIES TO SEAR-BROWN ROCHESTER,
HUMAN RESOURCES DEPT, ON ACCIDENT REPORT FORM
ASAP

Fire/Police/Rescue Phone #: 911

Local Hospital Name/Phone #: Highland - (716)-473-2200

Client Contact: Jim Lieb (716)-258-5156

Agency Contact(s): Todd Caffoe (DEC) (716) 226-2466
Rick Elliott or Joe Albert (MCDOH) (716) 274-6904
Dave Napier (NYSDOH) (716) 423-8074

Sear-Brown Contacts:

Project Manager Name/Home Phone: M. Storonsky (716) 223-8023

Steven Jay Sherman/Home Phone: (716) 688-0084

Branch Office Contact: (716) 475-1440

Sear-Brown Cellular Phone (if applicable): (716) 738-8523

SITE EVACUATION PROCEDURES:

Leave defined exclusion area (through decon area, where feasible) Personnel to be staged at safe distance upwind, dependent on reasons for evacuation.

APPENDIX C

Community Air Monitoring Plan

APPENDIX 3

COMMUNITY AIR MONITORING PLAN
FOR
ADDITIONAL SITE INVESTIGATION ACTIVITIES
FORMER DINABURG DISTRIBUTING, INC.
1012 SOUTH CLINTON AVENUE
ROCHESTER, NEW YORK

MAY 1996

Prepared for:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
6274 EAST AVON-LIMA ROAD
AVON, NEW YORK 14414

Prepared on Behalf of:

ESTATE OF SAUL DINABURG
c/o THE CHASE MANHATTAN BANK, N.A.
UPSTATE REAL ESTATE ADMINISTRATION
ONE CHASE SQUARE
ROCHESTER, NEW YORK 14643

Prepared by:

THE SEAR-BROWN GROUP, INC.
85 METRO PARK
ROCHESTER, NEW YORK 14623

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- 2.1 Perimeter Monitoring 2
- 2.2 Work Area Monitoring 3
- 2.3 Fugitive Dust Control 3
- 2.4 Minor Vapor Emission Response Plan 3
- 2.5 Major Vapor Emission Response Plan 4

3.0 Record Keeping and Quality Control 5

Figures

Figure 1 Site Location Map

1.0 Introduction

This Community Air Monitoring Plan (Plan) has been prepared by The Sear-Brown Group (Sear-Brown) on behalf of the Estate of Saul Dinaburg (Estate), to address potential volatile organic compound (VOC) and particulate air quality issues during drilling and sampling activities planned at, and adjacent to, the former Dinaburg Distributing, Inc. facility at 1012 South Clinton Street in Rochester, N.Y. (see Figure 1).

The investigation activities planned during the portion of the project covered by this Plan includes subsurface drilling at locations on-site and in the surrounding neighborhood as well as associated soil and groundwater sampling. Perchloroethylene (PCE), trichloroethylene (TCE), mineral spirits, and diesel fuel are the primary volatile compounds that are present, or are potentially present, in the soil and groundwater at the former Dinaburg Distributing facility. Material Safety Data Sheets (MSDSs) for PCE, TCE and Exxon Varsol 1, which is the brand of mineral spirits reported to have been used at the site, are presented in Appendix A. Volatilization of these compounds through disturbance of soils and/or groundwater could result in releases to the ambient air creating possible nuisance or health threats to the neighborhood. This plan details real-time monitoring activities to be carried out during soil boring and monitoring well installations, to minimize the potential for neighborhood exposure to airborne hazards resulting from fugitive emissions during the drilling work.

Pursuant to DEC Division of Hazardous Waste Remediation Technical and Administrative Guidance Memorandum - Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites, (HWR-89-4031), this Plan addresses the methods that will be implemented to monitor particulate (dust) levels at the perimeter of, and within the work area. In the event elevated particulate levels are encountered, this Plan identifies the steps that will be taken to rectify the elevated particulate levels.

Air monitoring and response actions for VOCs are also included in this plan. VOC monitoring of the work sites will also be conducted as part of the Health and Safety Plan (HASP) that will be implemented during drilling by Sear-Brown.

2.0 Methodology

The additional investigation activities at the site will consist primarily of drilling, well installation and development, and soil/water sampling. The following programs will be implemented to monitor and, if necessary, control the potential migration of fugitive dust and/or VOCs on the property.

2.1 Perimeter Monitoring

For each day of field work, a wind sock or flag will be used to monitor wind direction in the area of the work zone. Based upon the daily wind direction, two temporary particulate monitoring points will be identified, one upwind and one downwind of the work area, at the perimeter of the site or drilling location.

Real-time particulate monitoring will be carried out using an MIE PDM-3 MiniRam aerosol monitor, or its equivalent, capable of providing the measurement of airborne particulate matter. VOC monitoring will be done with an HNu Photoionization Detector (PID) fitted with an 10.2 eV lamp. Rainy, damp conditions may eliminate the need for particulate monitoring, as well as reduce the usefulness of the PID.

Prior to the commencement of drilling each day, background measurements of particulate and VOC concentrations will be logged at the up- and downwind locations with the drill rig engine and any other gas/diesel engines operating on site.

Thereafter, readings will be recorded at approximate 30 minute intervals. These readings will be used to observed the difference between upwind and downwind particulate and VOC levels. If at any time, the difference between the upwind and downwind particulate levels exceed 0.15 mg/m^3 or VOC levels downwind exceed upwind levels (adjusted for engine exhaust) by 5 ppm, then work will be temporarily halted and the Contractor will implement dust suppression techniques or any other means necessary to control VOCs, similar to those discussed in Section 2.3.

2.2 *Work Area Monitoring*

In addition to perimeter monitoring, monitoring for VOCs, particulates, and explosivity will be carried out continuously within the work area to monitor personal exposures and to compare work area readings with downwind and upwind readings. The first readings of the day will be obtained prior to the commencement of work to obtain daily background readings. Readings will logged along with the perimeter measurements. Specific monitoring and procedures to be used in the exclusion (work) zone can be found in the Health and Safety Plan (HASP) prepared for the activities at this site.

2.3 *Fugitive Dust Control*

If the monitoring described in Sections 2.1 or 2.2 result in fugitive particulate levels exceeding 0.15mg/m^3 above background, then the drilling Contractor will implement fugitive dust control measures which may include one or more of the following:

- using a water spray at the borehole;
- establishing wind shielding around the borehole;
- slowing down the drilling speed; and/or
- stopping the drilling activities.

2.4 *Minor Vapor Emission Response Plan*

If the ambient air concentration of organic vapors exceeds 5 ppm above background at the perimeter of the work area, activities will be halted and monitoring continued. If the organic vapor level decreases below 5 ppm above background, work activities can resume, with emphasis given to observing spikes in levels. 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 provided:

- the organic vapor level 200 ft. 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. (The location of structures in the subject neighborhood may not allow the 200 ft. buffer zone to be used).

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 Safety Officer will be implemented to evaluate if the vapor emission levels exceed those specified in the Major Vapor Emission section.

2.5 Major Vapor Emission Response Plan

If organic vapor levels greater than 5 ppm over background are identified 200 feet downwind from the work area or half the distance to the nearest residential or commercial structure, which ever is less, all work activities must be halted.

If, following the cessation of the work activities, or as the result of an emergency, organic vapor levels greater than 5 ppm above background persist 200 feet downwind or half the distance to the nearest residential or commercial structure, 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 area are unsuccessful and if the organic vapors levels continue to persist at or near 5 ppm above background for more than 30 minutes in the 20 foot zone, then the Major Vapor Emission Response Plan shall automatically be placed into effect.

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 20 foot zone.

Upon activation, the following activities will be undertaken:

1. All Emergency Response Contacts as listed in the Health and Safety Plan will go into effect.

2. The local police authorities will immediately be contacted by the Safety Officer and advised of the situation. Evacuation or neighborhood notification plans can be discussed at that time.

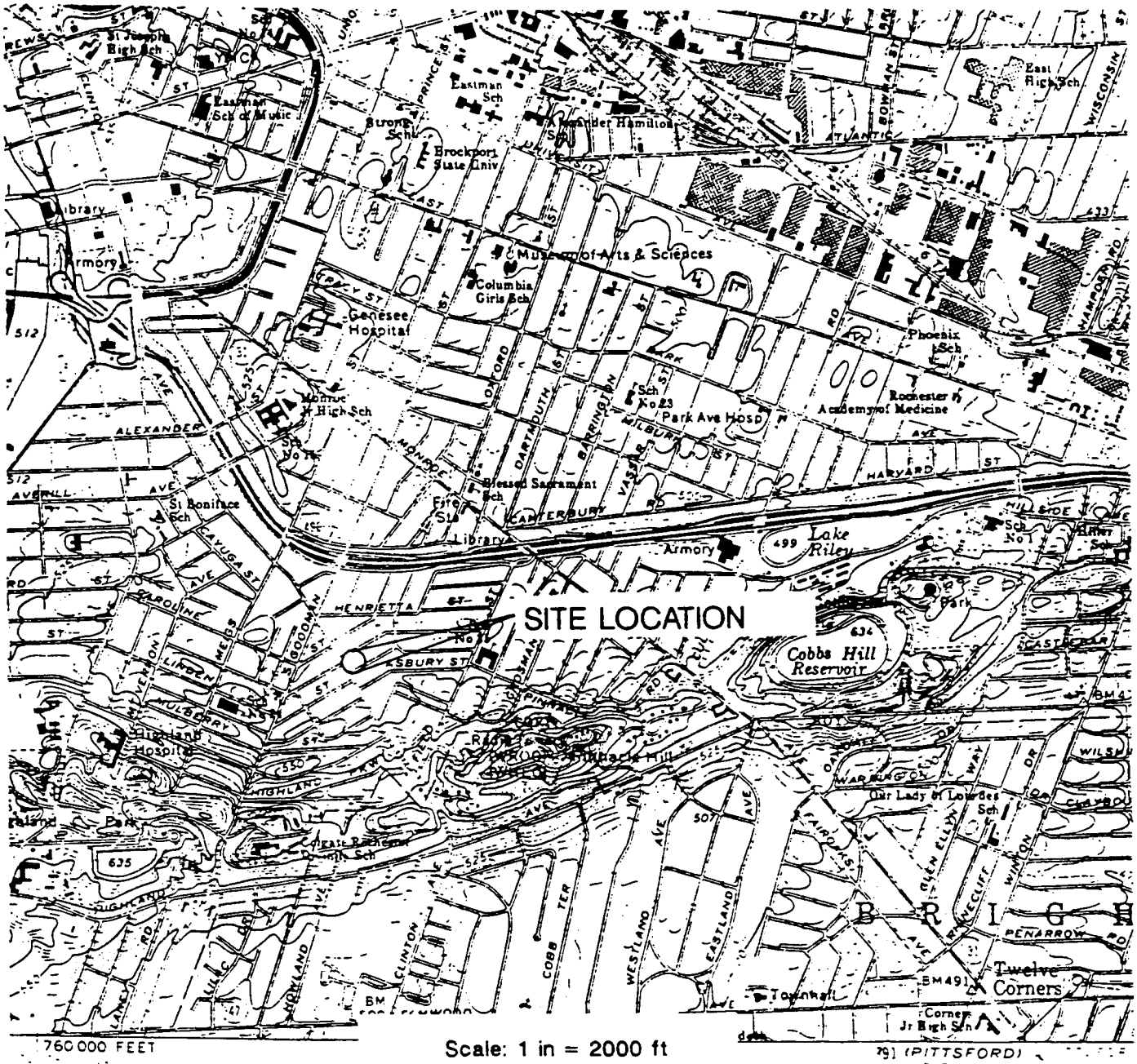
3. Frequent air monitoring will be conducted at 30 minutes intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Safety Officer.

3.0 Record Keeping and Quality Control

For the duration of the field activities, a monitoring log book will be kept to record calibration, operational notes and monitoring readings. The results of the Community Air Monitoring Program will be incorporated by Sear-Brown into the required reports pursuant to the terms and conditions of the Voluntary Agreement.

Instrumentation will be calibrated and/or operationally checked, either daily or at intervals recommended by the manufacturer. Only approved calibration gases will be used. All operators will have been trained in the proper use, maintenance, limitation, and interpretation of results of the monitoring equipment.

FIGURES



by the Geological Survey

York Geodetic Survey

hods from aerial
cked 1971

from U. S. Lake Charts 23 and 238 (1971)
avigational purposes

: New York coordinate
or)

CONTOUR INTERVAL 5
NATIONAL GEODETIC VERTICAL DA
DEPTH CURVES AND SOUNDINGS IN FEET—DATU

THE **SEAR-BROWN** GROUP
FULL-SERVICE DESIGN PROFESSIONALS

85 METRO PARK
ROCHESTER, NEW YORK 14623

716-475-1440 FAX. 716-272-1814

FIGURE 1

SITE LOCATION MAP

DINABURG DISTRIBUTING
1012 SOUTH CLINTON AVE
ROCHESTER, NY

Source: USGS Roch.East Quad.

APPENDIX D

Resumes of Key Personnel

THERESA A. BEDDOE, CPG
Regional Client Services Manager

Education

Post Graduate (Ph.D.) work in Hydrogeology, 1984-1985, University of Arizona
M.S., Geological Sciences, Virginia Polytechnic Institute and State University
B.S., Geology, Rensselaer Polytechnic Institute

Certifications

Certified Professional Geologist, American Institute of Professional Geologists, No. 7598, April 17, 1989.

Areas of Special Competence

Site Investigations
Environmental Site Assessments
Environmental Impact Studies
Well Hydraulics
Hydrogeochemistry
Hydrogeologic Modeling
Studies in Karst Terrains
Geophysical Techniques
Solid/Hazardous Waste Facility Permitting

Professional Organizations

Technical Association of the Pulp and Paper Industry
American Water Resources Association
American Geophysical Union

Experience

Ms. Beddoe has served as project manager and assistant project manager for projects involving contamination of sites with hazardous materials. Additionally, she has served as project manager for numerous solid waste site investigations and permitting efforts. Ms. Beddoe has also managed projects involving the development of new sources of water or expanding existing well field capacity for various municipal and commercial clients. She has provided services to developers of both consolidated and unconsolidated mineral resources. Ms. Beddoe has provided numerous investigations of underground storage tank installations, and her services have been sought for many project feasibility studies.

HAZARDOUS WASTE SITE INVESTIGATIONS

As project manager/assistant project manager, Ms. Beddoe has developed project-specific field investigations programs, overseeing sampling of target media, enforcing safety and personal protective measures, and ensuring that appropriate quality assurance protocols are met.

Apple Valley Shopping Center Superfund Site: Project and site manager for a federal Superfund Emergency Removal Action at a Dutchess County site contaminated with chlorinated hydrocarbons. Provided expert testimony in a suit of the potentially responsible parties by the property owner. The project concerned contamination emanating from a shopping center from the vicinity of a dry cleaner which had contaminated wells in an adjacent subdivision and threatened a public water supply

well field. The Emergency Removal Action required placing granular activated carbon treatment systems on the residential wells, and installing two low-profile air strippers, the first such application to provide drinking water, to treat the water supply for the shopping center and pretreat the supply for the two most contaminated houses. The project is under USEPA oversight.

Torrey Landfill Remediation Project: Project manager for the construction of the final remediation of a state inactive hazardous waste site located in Yates County. The remediation included the construction of a geomembrane/geocomposite cap system, leachate collection and storage, and a groundwater interception well system. The site had reportedly received industrial waste from various sources, and threatened to contaminate various area wells. The project involved NYSDEC oversight and funding.

Dynaburg Distributing: Project manager for the remediation of a City of Rochester property used as a distributorship for trichloroethene and tetrachloroethene. Contamination had spread widely to involve several city blocks. The technical challenge involved the fact that the site was underlain by relatively tight tills. The site was being addressed under the Voluntary Cleanup Program with NYSDEC oversight.

Grasslands Road: Project manager for the characterization of contamination at a site in Westchester County which had been used for chemical and radionuclide research and development, including dry cleaning research, and presently used in medical research. The site was contaminated with a variety of volatile organic compounds and metals. The site was being entered into the Voluntary Cleanup Program of the NYSDEC when the client sold his interest in the property.

Waverly Plaza: Project and site manager for the characterization of contamination related to a dry cleaning operation at a shopping mall in Suffolk County. Extensive soil gas survey and soil and groundwater sampling were conducted. The site was sensitive because it overlay a sand aquifer.

SOLID WASTE SITE INVESTIGATIONS

In her capacity as project manager, Ms. Beddoe has completed site characterization and assessment of the impact of existing facilities, developed closure plans, managed permitting of transfer stations and landfills, and assisted communities in obtaining public funding. In addition, she has supported the development and permitting of new industrial waste landfills with site characterization, environmental impact statements, representation at SEQRA public meetings, negotiations with regulatory agencies, and preparation of permit documents.

PAUL J. MICCICHE, PG
Project Manager

Education	Graduate (M.S.) work in Hydrogeology, 1986-1988 Western Michigan University B.S. Geology, State University of New York College at Brockport
Registrations	Registered Professional Geologist - Pennsylvania, No. PG-002835-G, October 13, 1995; also registered in Wisconsin.
Areas of Special Competence	Project Management Site Investigations Groundwater Monitoring Environmental Site Assessments, Phases I and II Underground Storage Tank Closures/Upgrades Spill Prevention, Control, and Countermeasure Plans Soil Vapor Investigations Regulatory Compliance
Experience	Mr. Micciche has served as project manager of numerous projects related to Phase I and II ESAs, underground storage tank (UST) management, I investigations and upgrade projects, and characterization and remediation of hazardous waste sites. Mr. Micciche has also been responsible for design, implementation and management of large scale soil vapor investigations. Supervised project teams, utilized project scheduling and financial management software to provide clients with deliverables on schedule and within budget. Mr. Micciche is experienced in RCRA and CERCLA investigation techniques applied at industrial sites and military installations. Provided field supervision for numerous multi-phase ESAs for industrial clients throughout the United States.
Notable Projects	Managed a multi-phase soil vapor investigation for International Paper Company in compliance with NYSDEC Order on Consent Terms. Participated in Work Plan negotiations with NYSDEC and NYSDOH as consultant to International Paper. Performed Phase I and II ESAs for eight (8) Xerox Corporation facilities, and Wilmorite commercial development sites located throughout the United States. Manager for database sorting and reporting project in support of a Phase I RCRA Facility Investigation for Eastman Kodak Company. Provided field quality control/management for an OXY Chemical project in Niagara Falls, New York, involving the installation of a leachate/DNAPL barrier wall at the S-Area Landfill site. Wrote RCRA Corrective Action

Sampling Work Plans for SWMUs and consolidated SWMU descriptions/histories developed during investigations within Kodak Park. Managed work group and generated Work Plan for a USACE Rapid Response remediation project at the Seneca Army Depot in Romulus, NY. Participated in environmental compliance audits addressing UST regulations, air emission permit compliance, OSHA and other safety issues, RCRA and CERCLA issues at several facilities for a major transportation authority in western New York State.

Professional Organizations

New York State Council of Professional Geologists, Buffalo Association of Professional Geologists, and Air & Waste Management Association

KEVIN J. MCGOVERN
Field Geologist

Education

B.S., Geology, State University of New York College at Fredonia, 1992

Certifications

OSHA 40 Hour Health and Safety Training Course for Hazardous Waste Operations with Annual Refreshers

Professional Experience

Prior to joining Galson, Mr. McGovern coordinated and supervised underground bulk petroleum storage tank removal projects, assisted with the preparation of site specific health and safety plans and work plans, performed scheduled monitoring and maintenance of groundwater treatment systems and free product recovery systems, delineated contaminated soil via field screening and proper soil sampling on listed sites, conducted air monitoring at several remediation projects as part of approved site health and safety plans, prepared reports (with CADD drawings) on behalf of clients and supervised upgrades in office computer hardware.

Notable Projects

SOIL DELINEATION AND REMEDIATION

Kolb Soil Remediation: Mr. McGovern has supervised and documented the delineation and staging of petroleum contaminated soil at the Kolb Residence in Rochester, New York.

Syracuse Supply Co.: Mr. McGovern has supervised, documented and submitted a report of the removal of approximately 4,000 tons of petroleum contaminated soil from the Syracuse Supply Co. Ainsley Drive facility in Syracuse, New York to a permitted landfill.

GROUNDWATER REMEDIATION AND MONITORING

Yates County, Torrey Landfill Final Remediation Project: Mr. McGovern has supervised and documented the installation and abandonment of several monitoring wells at the Yates County, Torrey Landfill in Dresden, New York.

Town of Wheatland Highway Garage: Mr. McGovern has performed groundwater sampling, including chain-of-custody, sample preservation and transportation of samples for the Town of Wheatland Highway Garage in Wheatland, New York.

New York State Office of General Services: Mr. McGovern has performed groundwater sampling, including chain-of-custody, sample preservation and transportation of samples for the Groveland Correctional Facility in Sonyea, New York.

Northeast Environmental Services: At the hazardous waste treatment, storage and disposal facility operated by Northeast Environmental Services, Inc., in Wampsville, New York, Mr. McGovern performed groundwater sampling, including chain-of-custody, sample preservation and transportation of samples, supervised monitoring well installations, assisted in the installation of the site's vapor extraction system, conducted pumping tests and temperature verification to assist in evaluating the site's aquifers. In addition he performed scheduled monitoring and maintenance on the site's groundwater treatment system and conducted air monitoring and inspection of the site's tank room and tank room manifold system as part of the site's operating permit. Mr. McGovern prepared monthly, quarterly and annual reports (with CADD drawings) and submitted them to the New York State Department of Environmental Conservation on behalf of the site. Also, Mr. McGovern designed (with CADD assistance), supervised and implemented modifications to the site's groundwater treatment system.

DEREK C. ANDERSON, PE
Project Engineer

Education

B.S., Civil Engineering, Rose-Hulman Institute of Technology, 1987

Certifications

OSHA 40-Hour Hazardous Waste Site Operation
NYSDOL Certified Asbestos Inspector
NYSDOL Certified Asbestos Designer

Professional Organizations

American Society of Civil Engineers
ASCE Newsletter Editor
Town of Webster Parks & Recreation Advisory Board Member

Experience

Mr. Anderson is responsible for project design and coordination, preparation of plans and specifications, writing reports, developing cost estimates, maintaining client contact, construction administration, and tracking project budgets.

CORNING WASTEWATER TREATMENT
Canton , NY
Project Engineer for planning, design and construction of industrial wastewater treatment plant. Investigation phase included extensive dye testing and research of existing discharges to isolate storm, process and cooling water systems. A flow separation project was also included in the design. The process included use of two inclined plate settling tanks along with associated chemical feed, sludge dewatering (vacuum filter) and outfall design. Permitting was also his responsibility.

TORREY LANDFILL REMEDIATION PROJECT
Yates County, New York
Project Engineer for design and construction of final remediation measures at a NYSDEC Inactive Hazardous Waste Site. The project included planning, design and construction of a geomembrane/geocomposite cap system, leachate collection and storage, landfill gas control, and groundwater interception well system. The site had reportedly received industrial waste from various sources and was potentially contaminating area wells. Design elements included leachate/groundwater pumping/storage tank system and load-out area. The project involved NYSDEC oversight and funding. Project costs were approximately $ 6 million.

WATER TREATMENT PLANT
Village of Wellsville, NY
Mr. Anderson designed and prepared plans and specifications for a 2.0 MGD water treatment plant to replace an aging facility. During design, he coordinated the work of other departments. During construction, he reviewed shop drawings

and attended progress meetings. The design used packaged water treatment units and a pre-engineered building as cost savings measures.

UNIVERSITY OF ROCHESTER
Medical Research Building , Rochester New York
Project Engineer for complete Civil Engineering services for this new 250,000square foot building on the medical school campus. Services included SEQR review with DEIS preparation. A new traffic study was completed. The site had numerous existing utilities to research and design around including the main steam/utility tunnel feeding the campus. All new utility services were designed. City permitting was also his responsibility.