File on eDOCs Yes X No

Site Name Emarc-O

Site No. 826011

County Livingston

Town Lima

Foilable Yes No

File Name Report_bw_826011_1999-12.

Scanned & eDOC

FER_omm.pdf

HALEY & ALDRICH

UNDERGROUND ENGINEERING & ENVIRONMENTAL SOLUTIONS

826011 Enarco O&M plan 12/99

HALEY & ALDRICH

FINAL ENGINEERING REPORT / O&M PLAN
ENARC-O MACHINE PRODUCTS, INC.
LIMA, NEW YORK
NYSDEC REGISTRY NO. 8-26-011

by

Haley & Aldrich of New York
Rochester, New York

for

Kaddis Manufacturing Corporation
Rochester, New York

File No. 70372-050
December 1999

UNDERGROUND
ENGINEERING &
ENVIRONMENTAL
SOLUTIONS

Haley & Aldrich of New York
189 North Water Street
Rochester, NY 14604-1151
Tel: 716.232.7386
Fax: 716.232.6768
Email: ROC@HaleyAldrich.com

HALEY & ALDRICH

21 December 1999
File No. 70372-050

New York State Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Construction Services, Room 267
50 Wolf Road
Albany, New York 12233-7010

Attention: David J. Chiusano, P.E.

Subject: Final Engineering Report / O&M Plan
Enarc-O Machine Products, Inc.
Lima, New York
NYSDEC Registry No. 8-26-011

Ladies and Gentlemen:

Attached are five copies of the **Final Engineering Report and Post-Remedial Operation and Maintenance Plan**, prepared by Haley and Aldrich of New York on behalf of Kaddis Manufacturing Corporation. This report provides the documentation that implementation and construction were conducted in accordance with the Remedial Design/Remedial Action Plan (RD/RAP), dated January 1999, as required by the Order on Consent, dated June 1999.

The construction activities performed in September 1999 were based on the proposed remedy as outlined in the revised RD/RAP. The main elements of this report include: 1) a detailed summary of the construction activities, including modifications to the intended design made during construction; 2) record drawing(s); and 3) the Operation and Maintenance plan. Supporting documentation is provided in the attached appendices. If you need any additional information please do not hesitate to contact us.

Sincerely yours,
HALEY & ALDRICH OF NEW YORK

Robert J. Mahoney, P.G.
Senior Environmental Geologist

Wayne C. Hardison, P.E.
Vice President

Vincent B. Dick
Vice President

c: Kaddis Manufacturing Corporation, Ronald F. Iannucci
Harter, Secrest & Emery, Attn: William H. Helferich, III

\\ROC\common\Projects\70372\050\Engin_rpt.doc

OFFICES

Boston
Massachusetts

Cleveland
Ohio

Denver
Colorado

Hartford
Connecticut

Los Angeles
California

Manchester
New Hampshire

Newark
New Jersey

Portland
Maine

San Diego
California

San Francisco
California

Washington
District of Columbia

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

I. INTRODUCTION

1.01 Purpose

This report presents the **Final Engineering Report** and the **Post-Remedial Operation and Maintenance Plan** for the Enarc-O Machine Products facility site in Lima, New York. The construction was performed in accordance with the Revised Remedial Design and Remedial Action Plan (RDRAP) dated January 1999 (as modified by letters, dated 17 and 20 August 1999). Any other substantive modifications to the intended design are changes as described in this report.

In accordance with the Order on Consent (Appendix A) dated June 1999, the purpose of this report is to:

- document that the construction activities were done in accordance with the Remedial Design/Remedial Action Plan (RD/RAP);
- provide record drawing(s);
- describe the construction activities;
- describe any changes or modifications to the approved design;
- provide operating and maintenance instructions; and
- provide system performance monitoring procedures.

1.02 Project Background

The site is a 6-acre property located at 1175 Bragg Street in Lima, New York, in the northeastern portion of Livingston County as shown on Figure 1. The Enarc-O facility is a one-story slab-on-grade building, located in the northern half of the site. Enarc-O manufactures precision screw products.

The facility is on the New York State Department of Environmental Conservation (NYSDEC) Inactive Hazardous Waste Site Registry (Site No. 8-26-011). In accordance with 6NYCRR Part 375, Haley & Aldrich of New York performed a remedial investigation (RI). The results and findings were summarized in a report entitled "Report on Remedial Investigation, Enarc-O Machine Products, Lima, New York, NYSDEC Registry No. 8-26-011", dated January 1996.

The investigation identified the presence of chlorinated volatile organic compounds in soil and groundwater at the site, primarily in the site's apparent source area located beneath the facility's courtyard and a portion of the building. Specifically, trichloroethene, tetrachloroethane, 1,1,1-trichloroethane, and cis 1,2-dichloroethene were present at greatest concentrations in the source area.

The RI was followed by a feasibility study (FS), which evaluated numerous potential remedial techniques in light of the known contaminant presence, site conditions and constraints and designated cleanup goals. The FS was summarized in a report entitled "Report on Feasibility Study, Enarc-O Machine Products, Lima, New York, NYSDEC Registry No. 8-26-011", dated May 1997, prepared by Haley & Aldrich of New York. The FS report selected a combination of response actions to address the presence of contaminants in source-area soils.

Refer to the RI and FS reports for detailed discussions on site conditions and remedial response evaluation.

Based on these investigations and reports, NYSDEC prepared a Proposed Remedial Action Plan (PRAP, dated June 1997), which presented a description of the proposed remedial actions to be taken at the site. After a public comment period, the PRAP was followed up by a Record of Decision ("ROD", dated February 1998-Appendix B), which finalized NYSDEC acceptance of the proposed remedy. The remediation focused on contaminants in the site's source-area soils.

The Remedial Design/Remedial Action Plan (RD/RAP, dated January 1999) presented a detailed description of the proposed remedy, including design elements, implementation strategy, and a post-construction monitoring program. A consent order between Kaddis Manufacturing and NYSDEC was executed in June 1999, for implementation of the RD/RAP. The RD/RAP construction was performed in September 1999 in accordance with the Consent Order for remediation.

1.03 Source Area Description

Figure 2 shows the Enarc-O building and courtyard configuration. Based on the results of the remedial investigation, an apparent source area was delineated that included an area beneath the floor slab in the vicinity of the former degreaser and in the courtyard immediately south of the degreaser area.

Contaminants in source area soils were generally concentrated in a limited area in the vicinity of the former indoor degreaser and former outdoor aboveground storage tank. VOCs in soil vapor were detected at shallow depths within the building near the degreaser and just outside the south building wall in the courtyard. In the courtyard area, TCE and other VOC's were present in an irregular pattern with respect to depth and distance from the degreaser location.

1.04 Health and Safety Plan

All activities associated with installation and operation of the remedial system were performed in accordance with the Health and Safety Plan, which is included in Appendix C.

II. REMEDIAL OBJECTIVES

The remedial objectives for the site were limited to the source area as described above, in accordance with the findings from the RI/FS. The remedial objectives included the following:

2.01 Excavation/Disposal

The shallow (< 4 ft.) courtyard soils will be excavated and disposed offsite as solid waste. The analytical data for the shallow soil indicated that the contaminant concentrations were low enough to allow disposal of the soil at an approved solid waste landfill. This reduces the potential for the accessible soil to contribute to the groundwater contamination.

2.02 Separation/treatment

The separation/treatment objective is to use low vacuum vapor extraction for soils left in place, from below the excavation and soils under the building former degreaser.

2.03 Control/isolation

The control/isolation objective is to cover the courtyard with a low-permeability cap to reduce the potential for stormwater to flush any residual contaminants into the groundwater and prevent soil vapor from venting.

2.04 System Operation and Maintenance

This objective is to operate and maintain the installed system.

2.05 System Monitoring and Reporting

This objective is to monitor the installed system for conformance to remedial objectives and provide reporting to the concerned parties.

III. REMEDIAL ACTION

The following sections provide a summary of the construction activities and the design modifications, which occurred during implementation. A record drawing, P-1, is included in Appendix D.

3.01 Soil Excavation and Disposal

A. Excavation Activities

Soil excavation activities were performed on 16 and 17 September 1999 by SAW Environmental Services, Inc. under Haley & Aldrich of New York observation. The soil was loaded directly into dump trucks for transport, which was performed by Silvarole Trucking, a licensed waste hauler. The soil was disposed at Waste Management of New York's (WMNY) High Acres Landfill in Fairport, New York. A copy of the approved waste profile is included in Appendix E.

Approximately 250 tons of material was disposed, including soil excavated from the courtyard, and several drums of drill cuttings from previous test borings and well installation. Manifests for each truckload are included in Appendix E. In addition, eight drums of new drill cuttings were generated during the angled extraction well installation (see discussion below). These drums were disposed at High acres Landfill on 11 October 1999. The manifest for this disposal is also included in Appendix E.

The excavation was monitored with a photoionization detector (PID) to evaluate soil as it was excavated. In addition, for health and safety purposes, the perimeter of the excavation area was monitored approximately every 30 minutes with a PID to ensure suitable air quality. No PID readings on the perimeter exceeded 5 PPM, which was approximately the background value. PID measurements in the excavation ranged from 0 to 40 PPM.

An area located in the southeast portion of the courtyard (see Drawing P-1) was excavated to a greater depth than the remainder of the courtyard. This area contained loose fine sand backfill. It was also observed that the buried SPDES discharge piping adjacent to this area was cracked and leaking, and therefore the loose sands contained significant free moisture. To prevent further infiltration of water and potential contaminant migration, the area of loose sand was excavated down to undisturbed natural soil, at a depth of approximately 8 ft. The cracked section of SPDES piping was replaced with a new section of PVC pipe, connected to the existing pipe with Fernco type couplings. Drawing P-1 indicates the limits of the pipe section that was replaced.

The concrete SPDES discharge vault and piping were maintained during excavation and backfill activities to allow continuous flow of discharge water, which consists of non-contact cooling water from Enarc-O manufacturing operations.

Monitoring Well 201D was maintained during the excavation to be used for future groundwater monitoring. The well casing was temporarily cut off and capped at the base of the excavation to allow access for a drilling rig to install the angled extraction wells (see discussion below). Upon backfill, the casing was extended back up to original grade and a new surface completion installed.

Since monitoring Well 201S had been dry since installation, it was abandoned during the remediation activities. The abandonment was accomplished by removing the well casing and tremie-grouting the borehole with a cement-bentonite grout to ground surface.

B. Rainfall Accumulation, Collection and Disposal

After initial excavation, and prior to the installation of the angled wells, rain water accumulated within the excavation as a result of a significant storm. This accumulated water was pumped into a temporary storage tank for disposal. A total of approximately 1500 gallons were collected.

Environmental Products and Services, Inc. removed the water from the tank using a vacuum truck, and disposed of the collected water at their facility in Syracuse, NY on 1 October 1999. A copy of the manifest for the disposal is included in Appendix F.

Prior to removal of the temporary storage tank, the driver released a limited amount of water remaining in the tank to the ground surface. The water was of sufficient volume to flow onto adjoining property. Resulting soil sampling was performed under the direction of NYSDEC and NYSDOH, and did not reveal adverse environmental impact to the soil. A letter report prepared by Haley & Aldrich summarizing the circumstances of the spill and resulting soils analytical results was provided to NYSDEC and NYSDOH. A copy of the letter report dated 10 November 1999, including analytical results, is also provided in Appendix F.

3.02 Vapor Extraction System Installation

Following shallow source area soil removal, a low-vacuum vapor extraction system was installed. System design includes both horizontal slotted extraction piping in the former excavation, as well as angled wells to extract vapor from beneath the former degreaser area. Refer to installation photos in Appendix G.

A. Angled Extraction Wells

Upon completion of the excavation, two angled vapor extraction wells, designated T-1 and T-2, were installed beneath the building, at the approximate locations shown on Drawing P-1 (Appendix D). Nothnagle Drilling installed the wells during the period 20-23 September 1999, using a Gus Peck drill rig. Test Boring logs for the wells are included in Appendix H.

The derrick of the drill rig was positioned at an entry angle between 21 and 22 degrees from horizontal. At each location a 12-inch core barrel was used to penetrate though the concrete block foundation wall of the existing building. Hollow stem augers measuring 6-1/4 in. inside diameter were then advanced at each boring location. The lineal penetration for wells T-3 and T-4 were 31.7 and 34.0 ft., respectively. Auger refusal on apparent top of bedrock was encountered in Well T-3 at approximately 11.6 ft. (vertically) and 29.5 ft. (horizontally).

Prior to removal of the augers, threaded lengths of 0.020-inch slotted PVC pre-pack wellscreen, consisting of a 3-in. diameter inner well screen inside a 5-in. diameter outer screen, and a filter-sand-filled annular space, were installed into the borings. Additional solid PVC riser pipe was added as required to extend through the foundation wall.

A secondary sandpack was installed in the annular space between the PVC wellscreen and the borehole. The sandpack was installed by placing sand into a 1-inch tremmie pipe and forcing

it into the borehole with pressurized air supplied by an air compressor. Following installation of the sandpack to within 2.0 feet of the foundation wall, concrete forms were erected on the exterior of the foundation wall. Concrete was placed though an opening at the top of the form and allowed to cure overnight. The forms were dismantled and a small amount of concrete was smoothed flush to the wall to finish the surface completion.

B. Horizontal Piping

SAW Environmental installed two sections of slotted, 4-inch corrugated polyethylene (CPEP) piping and associated PVC piping in the excavation on 24 September 1999. The piping was placed at the north and south areas of the excavation perpendicular to the west wall of the courtyard area. The south and north piping were placed 7 feet and 4 feet below ground surface, respectively on a 4-inch lift of 1A pea stone. The deeper section of pipe was placed in the area where the loose wet sand had been excavated. A series of three one-foot lifts of 1A pea stone were placed and compacted to bring the uniform depth of the excavation to 4 feet.

C. PVC Geomembrane

A single sheet of 30 mil PVC Geomembrane sufficient in size to cover the bottom and extend one foot up the sidewalls was placed in the excavation, at the 4-ft. depth, followed by a one-foot lift of fine sand. A copy of the geomembrane order sheet is included in Appendix I. The area of membrane covering monitoring well MW-201D was cut and patched and a 4 foot PVC extension was attached to the well riser to extend it to finished grade elevation. A series of (3)-one foot lifts of 1A crushed stone were placed and compacted to one foot below original ground surface. The remainder of the backfill consisted of two lifts of crusher run stone. The crusher run stone lifts were intentionally pitched toward the east to allow for proper drainage of the subsequent asphalt cover (see below).

D. Riser Pipe, Turbines, and Sampling Ports

SAW Environmental connected 4-inch PVC riser piping at the two horizontal piping and two angled extraction well locations. The PVC piping was secured to the building walls using concrete anchors and metal strapping and extended vertically 2 feet above the existing roofline. An 8-inch PVC adapter and galvanized steel roof turbines were connected to the 4-inch risers and extended 2.5 feet above the roofline. The 8-in diameter turbines are externally braced ventilators as supplied from Grainger, No. 2C529. The manufacturer's data sheet is included in Appendix I. Sampling ports were installed on each of the four PVC risers.

3.03 Backfill and Asphalt Paving

Prior to asphalt placement, the walls of the existing SPDES vault were extended upward by placing and mortaring 4-inch solid concrete blocks to the existing walls. A flush-mount roadbox was also installed at monitoring well MW-201D. Following minor re-grading and proof rolling, a 4-in. layer of asphalt binder and 2-in. topcoat layer were applied to the courtyard area. Kaddis also elected to extend the pavement beyond the courtyard area to provide a continuous trafficable surface to adjoining driveway and loading dock areas.

IV. OPERATION AND MAINTENANCE PLAN

4.01 Operation and Maintenance

The system will be inspected on each site visit (approximately monthly). Items to be inspected include but are not limited to:

- inspect turbines that they spin freely;
- check riser pipes and turbine housings for cracks, breaks, etc.;
- check wall connections for damage to connections or building wall.

This is a passive system and there is no maintenance required for these turbines and associated piping, unless there is visual damage. The turbines do not require lubrication.

4.02 Monitoring

A copy of the Quality Assurance Project Plan (QAPP) is included in Appendix J. The QAPP presents requirements for field and laboratory procedures to produce data of the quality to meet project objectives. All activities performed as part of the remedial system installation and operation will be performed in accordance with QAPP criteria.

Contaminant concentrations in the system air stream will be monitored in the field and in the lab. Periodic sampling and analysis of the groundwater monitoring wells will also be performed. The following schedule of sampling and analysis will be performed:

A. Soil Vapor

On a monthly basis, readings of total volatile organic (VOC) concentrations will be taken from the sampling ports installed in the vapor extraction risers, using a PID. Readings will be recorded on a System Operation Log Sheet. Airflow will be measured using a TSI Velocicalc Plus air velocity meter or equivalent, which will directly read flow rate through the piping. These readings will also be recorded on the log sheets.

On a semi-annual basis, air samples will be obtained from the sampling ports, using Tedlar air sampling bags. The RD/RAP stated that the samples would be submitted to a NYS-certified laboratory and analyzed for VOC's using USEPA Method 8260. It has come to our attention that certified laboratories use a modified TO-14 analysis for toxic organics in ambient air. The modification uses a tedlar bag for sample collection with a standard holding time for sample analysis of 14 days. It is Haley & Aldrich's experience that tedlar bag samples require analysis within 48-hours (maximum) for reliable results. Therefore, this Operation and Maintenance plan proposes a modification to the prior approved RD/RAP and the vapor samples be collected and screened in Haley & Aldrich's in-house laboratory using a Hewlett Packard Gas Chromatograph (GC) equipped with a precalibrated flame ionization detector (FID), with sample screening performed within 48 hours of sample collection.

B. Groundwater

On a semi-annual basis, groundwater samples will be obtained from seven on-site wells (MW-1, MW-2, MW-3, MW-4, MW-5, MW-201D, MW-202), the former Enarc-O supply well, two off-site wells (7880 Martin Rd., 1167 Bragg St.), and one off-site sump (7883 Martin Rd.). Groundwater samples will be analyzed for VOCs using USEPA Method 8260.

4.03 Reporting

Semi-annual summary reports will be prepared and submitted to NYSDEC. The reports will summarize monitoring data, sampling activities, laboratory analyses, and will include tabulations of analytical results for vapor and groundwater. In addition, any modifications or repairs to the system performed during the reporting period will be summarized. The reports will be submitted within 30 days after all data has been received from the laboratory.

V. SUMMARY OF INITIAL MONITORING RESULTS

In accordance with the Revised Remedial Design/Remedial Action Plan (January 1999), the first groundwater sampling and soil vapor monitoring commenced on 27-29 October 1999.

5.01 Soil Vapor

A. Sampling

Total VOC concentrations were measured at the riser sampling ports on 3 November 1999, and were repeated on 5 November 1999. At each sample port, a MiniRae PID was used to obtain the concentrations. Airflow measurements were obtained using a Velocicalc Air Velocity Meter. Data was recorded on a Systems Operation Log Sheet, a copy of which is included in Appendix K.

In addition, air samples were obtained from the sample ports using a Guzzler air pump. Air samples were collected in 1-liter Tedlar bags on 5 November 1999 and delivered to Columbia Analytical Services (CAS) for modified TO-14 analysis. Due to leakage from the T-1 sample (which deflated the bag before analysis) and the results from the CAS analysis (see below), another round of samples was collected on 24 November. This round was analyzed on the same day at Haley & Aldrich's in-house lab, the results are summarized below. The screening and laboratory analytical results are included in Appendix L.

Appendix K includes the operation log sheet. Airflow and PID screening measurements were as follows:

Date	Riser	Air Flow (scfm)	PID Screening (ppm)
11/5/99	T-1	1.99	ND
	T-2	1.23	ND
	T-3	1.29	21-43
	T-4	1.70	9-10
11/24/99*	T-1	0.085	ND
	T-2	0.175	ND
	T-3	0.085	9-15
	T-4	0.175	1-3.5

*PID Screening results shown were taken on 12/1/99

B. Results

Table I summarizes the results of the vapor samples. The 5 November vapor samples were analyzed by CAS on 15 November. Although there is no published holding time for Tedlar bag samples, it is Haley & Aldrich's experience to analyze samples within 48 hours. The CAS analysis was performed ten days after sample collection and the results showed no detectable compounds, in contrast to the detection on the hand-held PID in the field.

The 24 November vapor samples collected and analyzed by Haley & Aldrich were completed on the same day. The results show detections of the site-specific compounds in the T-3 and T-4 stacks which are connected to the angled wells under the former degreaser pit. The T-2 sample showed no detections consistent with the hand held PID. The T-1 sample was not collected due to tedlar bag failure during collection, it was resampled and screened on 1 December 1999 with no detections shown.

5.02 Groundwater

A. Sampling

Seven on-site wells (MW-1, MW-2, MW-3, MW-4, MW-5, MW-201D, MW202), the former Enarco supply well, two off-site wells (7880 Martin Rd., 1162 Bragg St.), and one off-site sump (7883 Martin Rd.) were sampled during the period 27 October through 29 October 1999. The samples were analyzed for VOCs using USEPA Method 8260.

The onsite wells were sampled using dedicated disposable bailers. Field log sheets are included in Appendix M. Field measurements of pH, temperature, dissolved oxygen, ORP (Eh), and conductivity were recorded prior to sampling. The two off-site wells located at 7880 Martin Rd. and 1162 Bragg St. were sampled using the same micro-purge technique used during the Remedial Investigation. Clean dedicated tubing connected to a low-flow submersible pump was used to purge each well. The tubing outlet was attached to a YSI Model 3500 "flow-through" Water Quality Meter. During the purging process the same field parameters as those mentioned for the onsite wells were monitored and documented every five minutes. The groundwater was sampled when the above-noted parameters had stabilized to within 10 percent of each other for three consecutive readings.

The offsite sump located at 7883 Martin Rd. was sampled directly without purging or documenting parameters. Mr. David Napier (NYSDOH) collected a duplicate sample from the sump for analysis.

B. Results

Table II and III summarizes the results of the groundwater analyses. Previous results from the Remedial Investigation sampling events are also included on the table. The last sampling event occurred in August 1995. The results can be found in Appendix N.

The data for the onsite wells indicate concentrations of the primary compounds of concern (1,1,1-TCA and TCE) were within or below the normal range of fluctuation previously observed in these wells, with one exception. Well MW-3 showed a 1,1,1-TCA concentration of 525 parts per billion (ppb), compared to a historical range between 47 and 250 ppb. TCE was detected at 8,650 ppb, compared to a historical range between 510 and 3,200 ppb. The

TCE concentration in well MW-202 also increased slightly from a previous high of 140 ppb to 238 ppb.

The onsite supply well also showed moderate decline in 1,1,1-TCA and TCE concentrations to levels below the previously observed lows.

The offsite data also indicate a decline in contaminant presence. The well at 1167 Bragg St. showed only TCE at 16 ppb, with no other VOCs detected. This was generally consistent with the results from the most recent RI sampling rounds. The well 7880 Martin Rd. did not show detectable levels of any VOCs. The previous total VOC concentration in this well had been 27 ppb.

During pre-sample screening of well MW-201D, it was observed that a floating layer of potential petroleum product approximately 0.3 ft. (4-in.) thick was present in the well. The product layer was dark and petroleum-like in color and odor. A discreet sample of the floating product was obtained and submitted for analysis, in addition to the sample of the water remaining in the well.

Laboratory results indicated the floating layer contained both petroleum and non-petroleum VOCs. An investigation into the potential source for the material revealed two underground storage tanks (USTs) containing virgin cutting oils had previously been located in the courtyard. The presence of the floating product layer may be related to the previous USTs, which were removed prior to the first environmental field investigations performed at the site. A letter dated 16 December 1999 was provided to NYSDEC documenting the presence of the product layer, subsequent thickness measurements and periodic product removal. The layer of product diminished significantly over time. Refer to the 16 December letter for more details on the presence of the floating product.

Tables

TABLE I
ENARC-O MACHINE PRODUCTS, INC.
VAPOR EXTRACTION WELLS
VOLATILE ORGANIC COMPOUNDS

EXTRACTION WELL	Compound DATE	1,1-DCE	1,1,1-TCA	TCE	PCE	Total VOCs
T-1	11/5/99	NA	NA	NA	NA	NA
	11/24/99	NA	NA	NA	NA	NA
	12/1/99	ND	ND	ND	ND	ND
T-2	11/5/99	0.25U	0.18U	0.19U	0.16U	ND
	11/24/99	1U (0.2U)	1U (0.2U)	1U (0.2U)	1U (0.2U)	ND
T-3	11/5/99	0.25U	0.18U	0.19U	0.16U	ND
	11/24/99	0.43 (1.7)	2.4 (13)	3.6 (19)	0.3 (2)	6.7
T-4	11/5/99	0.25U	0.18U	0.19U	0.16U	ND
	11/24/99	ND	0.2 (1.1)	0.58 (3.1)	ND	0.8

NOTES:
11/5/99 - samples collected and submitted to Columbia Analytical Services, analyzed on 11/15/99
11/24/99 - samples collected and screened at H&A in-house lab on same day
BOTH DATES - T-1 tedlar bags were broken during sampling and/or analysis
12/1/99 - T-1 sample collected and screened at H&A in-house lab on same day
CONCENTRATIONS PRESENTED IN ppmV (mg/m³)
J - INDICATES AN ESTIMATED VALUE
U - INDICATES COMPOUND ANALYZED FOR, BUT NOT DETECTED ABOVE THIS VALUE
NA - SAMPLE NOT ANALYZED

1,1 - DCE = 1,1 dichloroethene or vinylidene chloride
1,1,1-TCA = 1,1,1 - Trichloroethane or methyl chloroform
TCE = Trichloroethene
PCE = Tetrachloroethene or perchloroethene

TABLE II
ENARC-O MACHINE PRODUCTS, INC.
ONSITE GROUNDWATER VOLATILES ORGANIC COMPOUNDS

WELL	Compound DATE	1,1,1-TCA	1,2-DCA	1,1-DCE	1,1-DCA	cis-1,2-DCE	trans-1,2-DCE	MeCl2	Acetone	TCE	CHLOR	PCE	Bz	ChBz	Tol	BDCM	MEK	Styrene	VC	TVOC
MW-1	7/14/94									2J										2
	11/2/94									3J										3
	4/14/95									2J										2
	8/23/95									2J										2
	10/27/99												22				44	4		70
MW-2	7/14/94					23J			25J	1400										1448
	11/2/94	6J				29				500										535
	4/14/95	19				12				1600										1631
	8/23/95	1J				27				120							2J			150
	10/27/99	7								586										593
MW-3	7/14/94	130		14J		30J				1100		17J								1291
	11/2/94	250				51J		13J		3200		23J								3537
	4/14/95	190	2J	12	11	98				2500	8J	22								2843
	8/23/95	47		4J	4J	22				510	3J	10								600
	10/27/99	525								8650										9175
MW-4	7/14/94	28								10										38
	11/2/94	15								15										30
	4/14/95	4J								7J										11
	8/23/95	14								10										24
	10/27/99	8								16										24
MW-5	7/14/94	23J				58				510										591
	11/2/94	55		5J		72				1100		9J								1241
	4/14/95	15				63				400		4J								482
	8/23/95	73		7J	3J	67			2J	540		7J				6J				705
	10/27/99	33		7	5					657		6								708
MW-6	7/14/94									3J										3
	11/2/94																			
	4/14/95																			
	8/23/95								2J											2
	10/27/99																			
MW-201D	7/14/94	390J				1100				7400		160J								9050
	11/2/94	100J				830				4000		61J								4991
	4/14/95	200J	11	10	34	680			14	3800		130J							6J	4885
	8/23/95	660				1500			180J	7700		140J								10180
	10/27/99	250								3510										3760
MW-202	7/14/94					11				15									7J	33
	11/2/94					45	3J			25										73
	4/14/95	5J				8J				140										153
	8/23/95	4J				7J				120										131
	10/27/99	5								238										243
SUPPLY	7/14/94																			
	11/2/94																			
	4/14/95	6J				6J	3J			6J		1J								22
	8/23/95			2J	4J	3J				160	3J	4J								176
	10/27/99	3					2			20					2					27

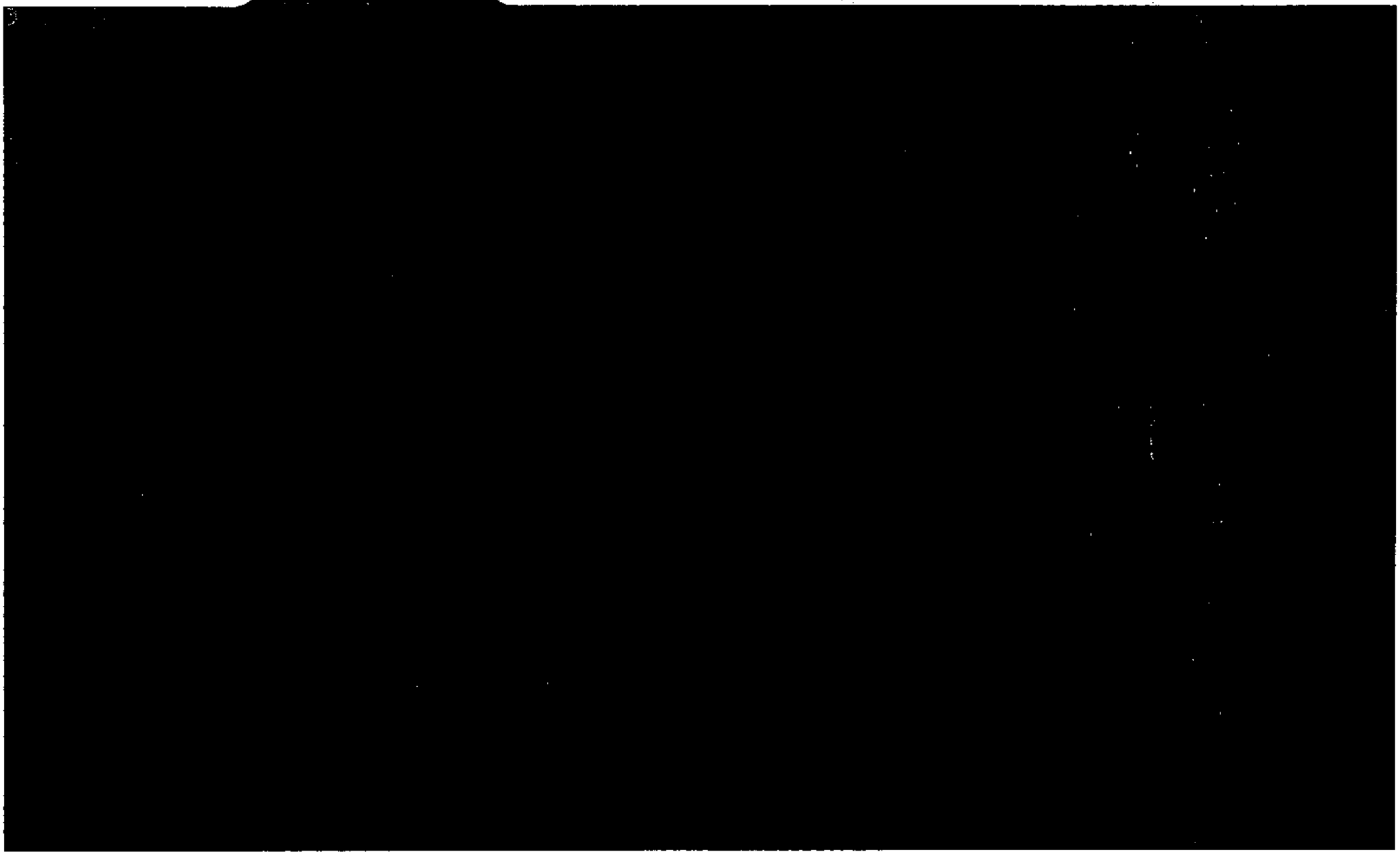
Note: Concentrations in ppb

TABLE III
ENARC-O MACHINE PRODUCTS, INC.
OFFSITE WELLS GROUNDWATER VOLATILE ORGANIC COMPOUNDS

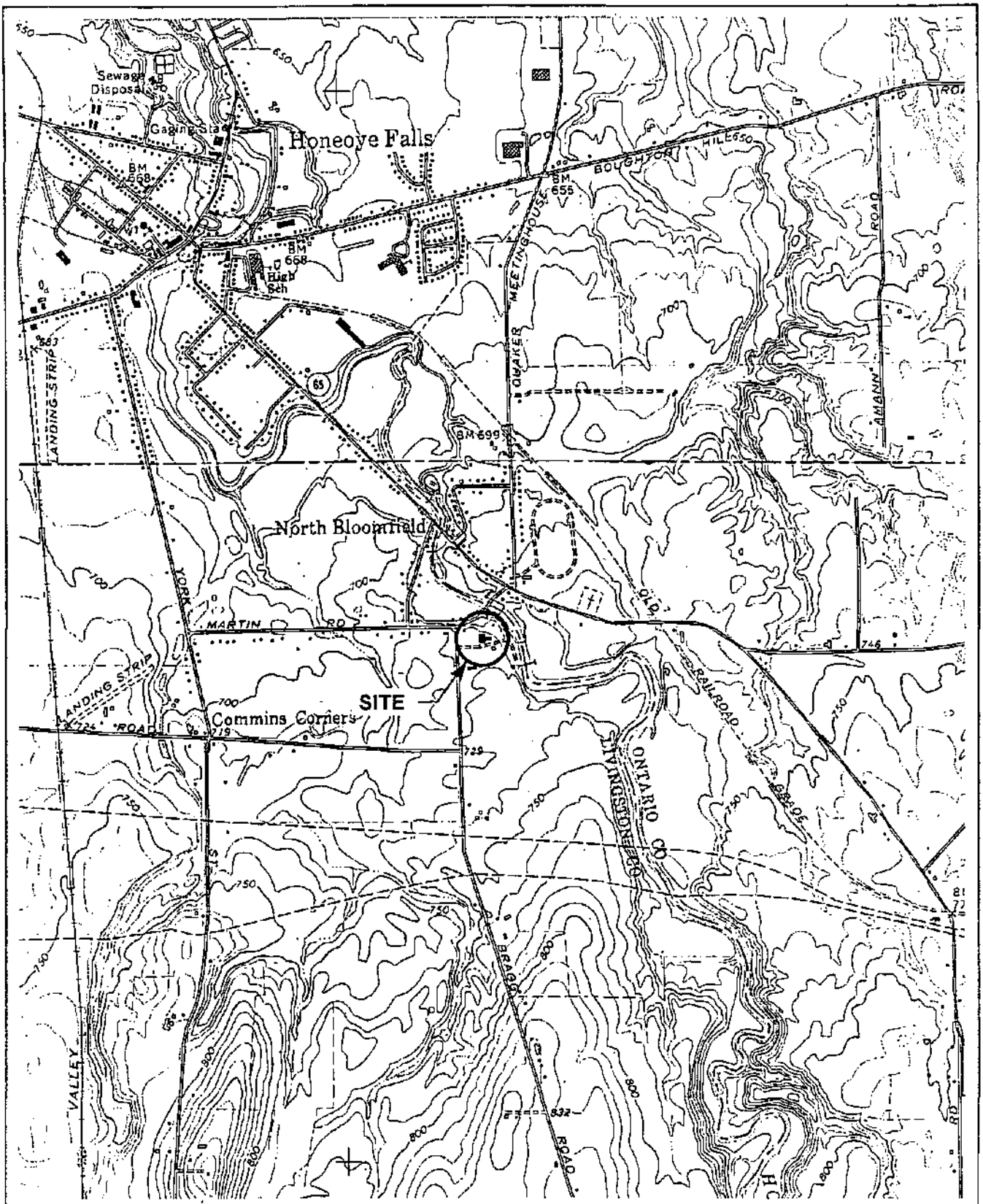
WELL	Compound / DATE	1,1,1-TCA	1,2-DCA	1,1-DCA	cis-1,2-DCE	Acetone	TCE	CHLOR	PCE	Bz	ChBz	Tol	BDCM	MEK	Total VOCs
1167 Bragg St	6/19/85	1	2		21		77								101
	7/1/85	1			17		98								115
	4/13/95				3J		13								16
	8/22/95				2J	2J	9J	1J							14
	10/27/99						16								16
7880 Martin Rd	6/19/85				75		260								335
	7/1/85	2	2		43		197								244
	4/13/95				16		13	2J							31
	8/23/95				8J	5J	6J							8J	27
	10/29/99	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	ND
7883 Martin Rd	6/19/85	8			75		290								373
(SUMP)	7/1/85	3	2		89		318								412
	6/14/91	4			30		118		1						153
	1/15/92	3			65		87	8	1				3		167
	3/3/92	2			28		76	10	1				2		119
	4/19/93	2			5		22	2							31
	8/12/93	2			5		56	5	1						69
	1/25/94	2			9		26	5							42
	8/22/95				4J	6J	19	2J							31
	10/27/99						14								14

NOTES: CONCNTRATIONS IN PPB
J - INDICATES AN ESTIMATED VALUE
U - INDICATES COMPOUND ANALYZED FOR, BUT NOT DETECTED
ND - NOT DETECTED

Figures



169669



LATITUDE: 42° 56' 13"N LONGITUDE: 77° 34' 33"W

QUADRANGLE LOCATION

U.S.G.S. QUADRANGLE: HONEOYE FALLS, N.Y.

H & A OF NEW YORK

Geotechnical Engineers & Environmental Consultants

ENARC-O MACHINE PRODUCTS
LIMA, NEW YORK

PROJECT LOCUS

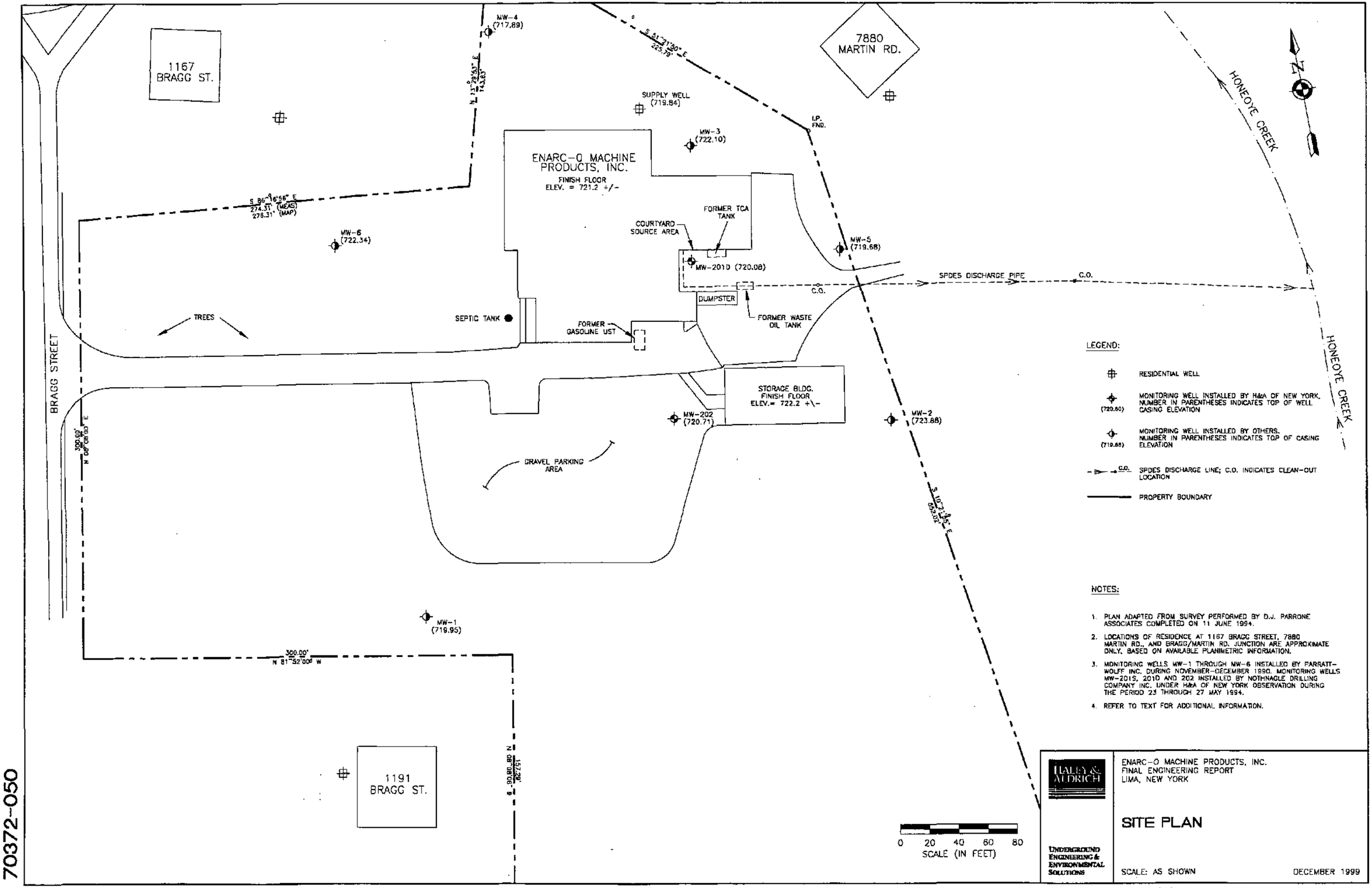
SCALE: 1 IN. = 2000 FT.

OCTOBER 1992

FILE NO. 70372-40

MAKEPEACE

FIGURE 1



NOTES:

1. PLAN ADAPTED FROM SURVEY PERFORMED BY D.J. PARRONE ASSOCIATES COMPLETED ON 11 JUNE 1994.
2. LOCATIONS OF RESIDENCE AT 1167 BRAGG STREET, 7880 MARTIN RD., AND BRAGG/MARTIN RD. JUNCTION ARE APPROXIMATE ONLY, BASED ON AVAILABLE PLANIMETRIC INFORMATION.
3. MONITORING WELLS MW-1 THROUGH MW-6 INSTALLED BY PARRATT-WOLFF INC. DURING NOVEMBER-DECEMBER 1990. MONITORING WELLS MW-201S, 201D AND 202 INSTALLED BY NOTHNAGLE DRILLING COMPANY INC. UNDER H&A OF NEW YORK OBSERVATION DURING THE PERIOD 23 THROUGH 27 MAY 1994.
4. REFER TO TEXT FOR ADDITIONAL INFORMATION.

HALEY & ALDRICH

UNDERGROUND ENGINEERING & ENVIRONMENTAL SOLUTIONS

ENARC-O MACHINE PRODUCTS, INC.
FINAL ENGINEERING REPORT
LIMA, NEW YORK

SITE PLAN

SCALE: AS SHOWN

DECEMBER 1999

70372-050

FILENAME: 70372-050; Fig2_plan.DWG

FIGURE 2

APPENDIX A

Order on Consent
Dated June 1999

HARTER, SECREST & EMERY LLP
ATTORNEYS AT LAW

A LIMITED LIABILITY PARTNERSHIP INCLUDING PROFESSIONAL ASSOCIATIONS

700 MIDTOWN TOWER
ROCHESTER, NEW YORK 14604-2070
716-232-6500
FAX 716-232-2152
E-MAIL: whelferich@hselaw.com

One HSBC Center, Suite 3550
Buffalo, New York 14203-2884
716-853-1616

111 Washington Avenue, Suite 206
Albany, New York 12210-2206
518-434-4377

[illegible] Ridgewood Drive, Suite 103
Naples, Florida 34108-2787
941-598-4444

6719 Winkler Road, Suite 121
Fort Myers, Florida 33919-7200
941-489-1774

Please Reply To: Rochester
Direct Dial: 716-231-1214

-7 70372 1050

CC COPY

COPY

RECEIVED
JUN - 7 1999
M&A OF NEW YORK

COPY

June 4, 1999

Mr. Ronald Iannucci, President
Kaddis Manufacturing Corporation
P.O. Box 92985, 1100 Beahan Road
Rochester, New York 14692-9085

Re: **Enarc-O Machine Products**

Dear Ron:

Enclosed are a copy of Glen Bailey's June 3, 1999 letter and duplicate originals of the Order on Consent, which has been revised to provide for a $35,000 cap. (See paragraph VII, page 10). Please sign both copies on page 18, have your signature notarized, and return both copies to me as soon as possible. I will then forward them to Glen Bailey for execution by DEC.

If you have any questions, please call me.

Very truly yours,

HARTER, SECREST & EMERY LLP

William H. Helferich, III

WHH:jed
Enclosures
cc: Mr. Vincent B. Dick (w/ enc.) ✓

New York State Department of Environmental Conservation
Division of Environmental Enforcement
Western Field Unit
270 Michigan Avenue, Buffalo, New York 14203-2999
Phone: (716) 851-7050 FAX: (716) 851-7067

John P. Cahill
Commissioner

RECEIVED
JUN - 4 1999
WHH

June 3, 1999

William H. Helferich III, Esq.
Harter, Secrest & Emery LLP
700 Midtown Tower
Rochester, New York 14604-2070

Re: Enarc-O Machine Products, Site # 8-26-011
RD/RA Order on Consent

Dear Mr. Helferich:

Enclosed is an Order on Consent for signature to address the remedial program at the Enarc-O facility. This Order contains the cap on administrative expenses of $35,000.00. The RDRAP as submitted in February was approved for incorporation in the Order by letter from Michael Ryan dated February 23, 1999. This is reflected in Paragraph I, where the RDRAP is identified.

Upon receipt of the copies of the Order signed by Mr. Iannucci, I will obtain the signature for the Department and return a fully endorsed original to you for your records.

Sincerely,

Glen R. Bailey
Senior Attorney

GRB:B:JAB
B058ENCO9

Enclosures

cc: M. Ryan
R. Iannucci

STATE OF NEW YORK: DEPARTMENT OF ENVIRONMENTAL CONSERVATION

In the Matter of the Development and Implementation of a Remedial Program for an Inactive Hazardous Waste Disposal Site Under Article 27, Title 13, and Article 71, Title 27 of the Environmental Conservation Law of the State of New York by:	ORDER ON CONSENT Index # B8-0112-84-10
ENARC-O MACHINE PRODUCTS, INC. Respondent	Site Code # 8-26-011

WHEREAS,

1. The New York State Department of Environmental Conservation (the "Department") is responsible for the enforcement of Article 27, Title 13 of the Environmental Conservation Law of the State of New York ("ECL"), entitled "Inactive Hazardous Waste Disposal Sites." This Order is issued pursuant to the Department's authority under ECL Article 27, Title 13 and under ECL 3-0301.

2. Enarc-o Machine Products, Inc. ("Respondent"), a division of Kaddis Manufacturing Corp., operates a manufacturing facility at 1175 Bragg Street in the community of North Bloomfield, Town of Lima, Livingston County, New York (the "Site"). Respondent entered into Order on Consent Index # B8-0112-91-04, effective March 22, 1994, with the Department to conduct a remedial investigation and feasibility study at the Site (the "RI/FS Order"). Having completed the remedial investigation, Respondent now proposes to implement the remedial measure to facilitate the long-term remediation at the Site.

3. The Site is an inactive hazardous waste disposal site, as that term is defined at ECL Section 27-1301.2, and presents a significant threat to the public health or environment. The Site has been listed in the Registry of Inactive Hazardous Waste Disposal Sites in New York State as Site Number 8-26-011. The Department has classified the Site as a Classification "2" pursuant to ECL Section 27-1305.4.b.

4. A. Pursuant to ECL 27-1313.3.a, whenever the Commissioner of Environmental Conservation (the "Commissioner")

> "finds that hazardous wastes at an inactive hazardous waste disposal site constitute a significant threat to the environment, he may order the owner of such site and/or any person responsible for the disposal of hazardous wastes at such site (i) to develop an inactive hazardous waste disposal site remedial program, subject to the approval of the department, at such site, and (ii) to implement such program within reasonable time limits specified in the order."

B. Any person under order pursuant to ECL 27-1313.3.a has a duty imposed by ECL Article 27, Title 13 to carry out the remedial program committed to under order. ECL 71-2705 provides that any person who fails to perform any duty imposed by ECL Article 27, Title 13 shall be liable for civil, administrative and/or criminal sanctions.

C. The Department also has the power, inter alia, to provide for the prevention and abatement of all water, land, and air pollution. ECL 3-0301.1.i.

5. Following a period of public comment, the Department selected a final remedial alternative for the Site in a Record of Decision ("ROD"). The ROD is attached to this Order as

Appendix "A" and is incorporated herein.

6. The Department and Respondent agree that the goals of this Order are for Respondent to (i) develop and implement, in accordance with the ROD, an inactive hazardous waste disposal site remedial program ("Remedial Program") for the Site that shall include design and implementation, and operation, maintenance and monitoring of the selected remedial alternative; and (ii) reimburse the State's administrative costs.

7. Without admitting any facts or any of the Department's determinations, assertions or conclusions of law, and while reserving all other rights available to it, Respondent waives it's right to a hearing herein as provided by law, and consents to the issuance and entry of this Order, and agrees to be bound by its terms. Respondent consents to and agrees not to contest the authority or jurisdiction of the Department to issue or enforce this Order, and agrees not to contest the validity of this Order or its terms.

NOW, having considered this matter and being duly advised, IT IS ORDERED THAT:

I. Remedial Design Contents

Within 30 days after the effective date of this Order, Respondent shall commence implementation of remedial construction for the Remedial Design/Remedial Action Plan (the "RDRAP") prepared by H & A of New York, LLP, as revised and submitted on February 11, 1999 and approved by the Department on February 23, 1999 for incorporation into this Order. The remedial construction shall be completed within the period of time designated in the RDRAP.

II. Remedial Design Construction and Reporting

A. Respondent shall implement the RDRAP in accordance with the Department-approved RDRAP and implementation schedule.

B. During implementation of all construction activities identified in the RDRAP, Respondent shall have on-Site a full-time representative who is qualified to supervise the work done.

C. Within 45 days after completion of the construction activities identified in the RDRAP, Respondent shall submit to the Department a detailed post-remedial operation and maintenance plan ("O&M Plan"); "as-built" drawings and a final engineering report (each including all changes made to the remedial design during construction); and a certification by a professional engineer that the RDRAP was implemented and all construction activities were completed in accordance with the Department-approved RDRAP. The O&M Plan, "as built" drawings, final engineering report, and certification must be prepared, signed, and sealed by a professional engineer.

D. Upon the Department's approval of the O&M Plan, Respondent shall implement the O&M Plan in accordance with the requirements of the Department-approved O&M Plan.

E. After receipt of the "as-built" drawings, final engineering report, and certification, the Department shall notify Respondent in writing whether the Department is satisfied that all construction activities have been completed in compliance with the approved RDRAP.

F. If the Department concludes that any element of the Remedial Program

fails to achieve its objectives or otherwise fails to protect human health or the environment, Respondent shall take whatever action the Department determines necessary to achieve those objectives or to ensure that the Remedial Program otherwise protects human health and the environment, unless objections are raised in accordance with Paragraph IV.C below.

III. Progress Reports

A. Respondent shall submit to the parties identified in Subparagraph XI.B in the numbers specified therein copies of written monthly progress reports that:

1. describe the actions which have been taken toward achieving compliance with this Order during the previous month;

2. include all results of sampling and tests and all other data received or generated by Respondent or Respondent's contractors or agents in the previous month, including quality assurance/quality control information, whether conducted pursuant to this Order or conducted independently by Respondent;

3. identify all work plans, reports, and other deliverables required by this Order that were completed and submitted during the previous month;

4. describe all actions, including, but not limited to, data collection and implementation of work plans, that are scheduled for the next month and provide other information relating to the progress at the Site;

5. include information regarding percentage of completion, unresolved delays encountered or anticipated that may affect the future schedule for implementation of the Respondent's obligations under the Order, and efforts made to mitigate

those delays or anticipated delays;

6. include any modifications to any work plans that Respondent has proposed to the Department or that the Department has approved; and

7. describe all activities undertaken in support of the Citizen Participation Plan during the previous month and those to be undertaken in the next month.

B. Respondent shall submit these progress reports to the Department by the tenth day of every month following the effective date of this Order.

C. Respondent also shall allow the Department to attend, and shall provide the Department at least seven days advance notice of, any of the following activities which are conducted in relation to the Remedial Design: prebid meetings, job progress meetings, substantial completion meeting and inspection, and final inspection and meeting.

IV. Review of Submittals

A. 1. The Department shall review each of the submittals Respondent makes pursuant to this Order to determine whether it was prepared, and whether the work done to generate the data and other information in the submittal was done, in accordance with this Order and generally accepted technical and scientific principles. The Department shall notify Respondent in writing of its approval or disapproval of the submittal, except for the submittal discussed in Paragraph I.B.(7). All Department-approved submittals shall be incorporated into and become an enforceable part of this Order.

2. a. If the Department disapproves a submittal, it shall so notify Respondent in writing and shall specify the reasons for its disapproval. Within 30 days

after receiving written notice that Respondent's submittal has been disapproved, Respondent shall make a revised submittal to the Department that addresses and resolves all of the Department's stated reasons for disapproving the first submittal.

b. After receipt of the revised submittal, the Department shall notify Respondent in writing of its approval or disapproval. If the Department disapproves the revised submittal, Respondent shall be in violation of this Order and the Department may take any action or pursue whatever rights it has pursuant to any provision of statutory or common law. If the Department approves the revised submittal, it shall be incorporated into and become an enforceable part of this Order.

B. Respondent shall modify and/or amplify and expand a submittal upon the Department's direction to do so if the Department determines, as a result of reviewing data generated by an activity required under this Order or as a result of reviewing any other data or facts, that further work is necessary.

C. In the event of a dispute between the Department and Respondent regarding the disapproval of a submittal or the need for modification or amplification of a submittal pursuant to this Paragraph, the parties shall first attempt to resolve the dispute informally between them. If, within thirty (30) days of Respondent's receipt of the notice of the Department's disapproval of a submittal, informal discussions and negotiations do not appear to be resolving the dispute, Respondent shall be entitled to invoke this Subparagraph to resolve the issues in dispute.

1. Within 30 days of the date on which the Department issues a

notification to Respondent of its disapproval, Respondent shall be entitled to serve upon the Department a request for the appointment of an Administrative Law Judge ("ALJ") to resolve the dispute, along with a written statement of the issues in dispute and the relevant facts upon which the dispute is based and the factual data, analyses or opinions supporting Respondent's position, and all other supporting documentation on which Respondent relies ("Statement of Position"), with copies also delivered to Michael J. Ryan and to Glen Bailey in accordance with Paragraph X.A, below.

2. The Department staff shall deliver its Statement of Position to the ALJ and to Respondent no later than fifteen (15) business days after receipt of Respondent's Statement of Position. If desired by the ALJ, a personal appearance before the ALJ to express each party's position may then be scheduled. Personal appearances before the ALJ shall be discretionary with the ALJ, and shall not be required to resolve matters pursuant to this process.

3. The Department shall compile an administrative record of any dispute pursuant to this subparagraph. The record shall include the Statement of Position of each party and any other identified relevant information. The record shall be available for review to all parties and to the public.

4. Upon review of the administrative record, the ALJ shall issue a final decision and order resolving the dispute. Respondent shall have the burden of proving that there is no rational basis for the Department's position giving rise to the dispute. Respondent shall have those rights available pursuant to Article 78 of the Civil Practice Laws and Rules of the State of New York ("CPLR"), provided that a petition under Article 78 is filed

within thirty (30) days of receipt of the decision and order issued by the ALJ.

5. The invocation of the procedures stated in this subparagraph shall not extend, postpone, or modify Respondent's obligations under this Order with respect to any undisputed items. Respondent shall not be in violation of this Order for failure to perform tasks or obligations which are directly related to the issues in dispute or which may be altered or revised in the resolution of the issues in dispute. The invocation of the procedures provided in this subparagraph shall constitute an election of remedies by the party initiating the proceedings, and such election of this remedy shall constitute a waiver of any and all other remedies which may otherwise have been available to the party regarding the issue in dispute.

V. Penalties

A. Respondent's failure to comply with any term of this Order constitutes a violation of this Order and the ECL.

B. Respondent shall not suffer any penalty under this Order or be subject to any proceeding or action if it cannot comply with any requirement hereof because of war, riot, or an unforeseeable disaster arising exclusively from natural causes which the exercise of ordinary human prudence could not have prevented. Respondent shall, within ten days of when it obtains knowledge of any such condition, notify the Department in writing. Respondent shall include in such notice the measures taken and to be taken by Respondent to prevent or minimize any delays and shall request an appropriate extension or modification of this Order. Failure to give such notice within such ten-day period constitutes a waiver of any claim that a delay is not subject to penalties. Respondent shall have the burden of proving that an event is a

defense to compliance with this Order pursuant to this Subparagraph V.B.

VI. Entry upon Site

Respondent hereby consents to the entry upon the Site or areas in the vicinity of the Site which may be under the control of the Respondent by any duly designated employee, consultant, contractor, or agent of the Department or any State agency for purposes of inspection, sampling, and testing and to ensure Respondent's compliance with this Order. Respondent shall provide the Department with suitable office space at the Site, including access to a telephone, and shall permit the Department full access to all records relating to matters addressed by this Order and job meetings.

VII. Payment of State Costs

Within 120 days after receipt of an itemized invoice from the Department, Respondent shall pay to the Department a sum of money, not to exceed $35,000.00 for costs associated with this Order, which shall represent reimbursement for the State's expenses incurred since the date of the ROD, including, but not limited to, direct labor, fringe benefits, indirect costs, travel, analytical costs, and contractor costs incurred by the State of New York for work performed at the Site, as well as for negotiating this Order, reviewing and revising submittals made pursuant to this Order, overseeing activities conducted pursuant to this Order, collecting and analyzing samples, and administrative costs associated with this Order. Such payment shall be made by certified check payable to the Department of Environmental Conservation. Payment shall be sent to the Bureau of Program Management, Division of Environmental Remediation, N.Y.S.D.E.C., 50 Wolf Road, Albany, NY 12233-7010.

Itemization of the costs shall include an accounting of personal services indicating the employee name, title, biweekly salary, and time spent (in hours) on the project during the billing period, as identified by an assigned time and activity code. This information shall be documented by reports of Direct Personal Service. Approved agency fringe benefit and indirect cost rates shall be applied. Non-personal service costs shall be summarized by category of expense (e.g., supplies, materials, travel, contractual) and shall be documented by expenditure reports. Costs incurred prior to the date of the ROD have been resolved pursuant to the terms of the RI/FS Order on Consent with Respondent.

VIII. Department Reservation of Rights

A. Nothing contained in this Order shall be construed as barring, diminishing, adjudicating, or in any way affecting any of the Department's civil, criminal, administrative, or equitable rights or authorities.

B. Nothing contained in this Order shall be construed to prohibit the Commissioner or his duly authorized representative from exercising any summary abatement powers.

IX. Indemnification

Respondent shall indemnify and hold the Department, the State of New York, and their representatives and employees harmless for all claims, suits, actions, damages, and costs of every name and description arising out of or resulting from the fulfillment or attempted fulfillment of this Order by Respondent, and/or Respondent's directors, officers, employees, servants, agents, successors, and assigns.

X. Public Notice

A. Respondent has filed, and shall maintain, a Declaration of Covenants and Restrictions with the Clerk of Livingston County to give all parties who may acquire any interest in the Site notice of this Order.

B. If Respondent proposes to convey the whole or any part of Respondent's ownership interest in the Site, Respondent shall, not fewer than 60 days before the date of conveyance, notify the Department in writing of the identity of the transferee and of the nature and proposed date of the conveyance and shall notify the transferee in writing, with a copy to the Department, of the applicability of this Order.

XI. Communications

A. All written communications required by this Order shall be transmitted by United States Postal Service, by private courier service, or hand delivered as follows:

Communication from Respondent shall be sent to:

Michael J. Ryan, P.E.
Division of Environmental Remediation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-7010

with copies thereof sent to:

1. Director, Bureau of Environmental Exposure Investigation
New York State Department of Health
2 University Place
Albany, New York 12203

and to:

2. New York State Department of Environmental Conservation
Division of Environmental Remediation
6271 East Avon-Lima Road
Avon, New York 14414-0057

3. David Napier
NYS Department of Health
42 S. Washington Street
Rochester, New York 14608

4. Glen R. Bailey, Esq.
New York State Department of Environmental Conservation
Division of Environmental Enforcement
270 Michigan Avenue
Buffalo, New York 14203-2999

B. Copies of work plans and reports shall be submitted as follows:

1. Four copies (one unbound) to Michael J. Ryan, Division of Environmental Remediation.

2. One copy to the Director, Bureau of Environmental Exposure Investigation.

3. One copy to the Division of Environmental Remediation, Region 8, Avon

4. One copy to David Napier, Department of Health, Rochester

5. One copy to Glen Bailey, Division of Environmental Enforcement, Buffalo

C. Within 30 days of the Department's approval of any report submitted

pursuant to this Order, Respondent shall submit to Michael A. Ryan a computer readable magnetic media copy of the approved report in American Standard Code for Information Interchange (ASCII) format.

D. Communication to be made from the Department to Respondent shall be sent to:

Ronald Iannucci, President
Kaddis Manufacturing Corp.
P. O. Box 92985
Rochester, New York 14992-9085

and to:

Vincent B. Dick
Haley & Aldrich of New York
189 North Water Street
Rochester, New York 14604-1151

and to:

William H. Helferich, III, Esq.
Harter, Secrest & Emery, LLP
700 Midtown Tower
Rochester, New York 14604-2070

E. The Department and Respondent reserve the right to designate additional or different addressees for communication or written notice to the other.

XII. Miscellaneous

A. All activities and submittals required by this Order shall address both on-Site and off-Site contamination resulting from the disposal of hazardous wastes at the Site.

B. Respondent shall retain professional consultants, contractors, laboratories, quality assurance/quality control personnel, and data validators acceptable to the Department to perform the technical, engineering, and analytical obligations required by this Order. The experience, capabilities, and qualifications of the firms or individuals selected by

Respondent shall be submitted to the Department within 5 days after the effective date of this Order. The Department's approval of these firms or individuals shall be obtained before the start of any activities for which Respondent and such firms or individuals will be responsible. The responsibility for the performance of the professionals retained by Respondent shall rest solely with Respondent.

C. The Department shall have the right to obtain split samples, duplicate samples, or both, of all substances and materials sampled by Respondent, and the Department also shall have the right to take its own samples. Respondent shall make available to the Department the results of all sampling and/or tests or other data generated by Respondent with respect to implementation of this Order and shall submit these results in the progress reports required by this Order.

D. Respondent shall notify the Department at least 10 working days in advance of any field activities to be conducted pursuant to this Order.

E. Respondent shall obtain all permits, easements, rights-of-way, rights-of-entry, approvals, or authorizations necessary to perform Respondent's obligations under this Order.

F. Respondent and Respondent's officers, directors, agents, servants, employees, successors, and assigns shall be bound by this Order. Any change in ownership or corporate status of Respondent including, but not limited to, any transfer of assets or real or personal property shall in no way alter Respondent's responsibilities under this Order. Respondent's officers, directors, employees, servants, and agents shall be obliged to comply

with the relevant provisions of this Order in the performance of their designated duties on behalf of Respondent.

G. Respondent shall provide a copy of this Order to each contractor hired to perform work required by this Order and to each person representing Respondent with respect to the Site and shall condition all contracts entered into in order to carry out the obligations identified in this Order upon performance in conformity with the terms of this Order. Respondent or Respondent's contractors shall provide written notice of this Order to all subcontractors hired to perform any portion of the work required by this Order. Respondent shall nonetheless be responsible for ensuring that Respondent's contractors and subcontractors perform the work in satisfaction of the requirements of this Order.

H. All references to "professional engineer" in this Order are to an individual registered as a professional engineer in accordance with Article 145 of the New York State Education Law. If such individual is a member of a firm, that firm must be authorized to offer professional engineering services in the State of New York in accordance with Article 145 of the New York State Education Law.

I. All references to "days" in this Order are to calendar days unless otherwise specified.

J. The paragraph headings set forth in this Order are included for convenience of reference only and shall be disregarded in the construction and interpretation of any of the provisions of this Order.

K. 1. The terms of this Order shall constitute the complete and entire

Order between Respondent and the Department concerning the Site. No term, condition, understanding, or agreement purporting to modify or vary any term of this Order shall be binding unless made in writing and subscribed by the party to be bound. No informal advice, guidance, suggestion, or comment by the Department regarding any report, proposal, plan, specification, schedule, or any other submittal shall be construed as relieving Respondent of Respondent's obligation to obtain such formal approvals as may be required by this Order.

2. If Respondent desires that any provision of this Order be changed, Respondent shall make timely written application, signed by Respondent, to the Commissioner setting forth reasonable grounds for the relief sought. Copies of such written application shall be delivered or mailed to Michael J. Ryan and to Glen R. Bailey.

L. The effective date of this Order shall be the date a copy of this Order signed by the Commissioner or his designee is received by Respondent.

DATED: Albany, New York

JOHN P. CAHILL
Commissioner
New York State Department of
Environmental Conservation

By: _____
Michael J. O'Toole, Jr.

CONSENT BY RESPONDENT

Respondent hereby consents to the issuing and entering of this Order, waives Respondent's right to a hearing herein as provided by law, and agrees to be bound by this Order.

ENARC-O MACHINE PRODUCTS, INC.

By:_____

_____
(TYPE NAME OF SIGNER)

Title:_____

Date:_____

STATE OF)
) s.s.:
COUNTY OF)

On this _____ day of _____, 19___, before me personally came _____, to me known, who being duly sworn, did depose and say that he resides in _____; that he is the _____ of _____, the corporation described in and which executed the foregoing instrument; that he knew the seal of said corporation; that the seal affixed to said instrument was such corporate seal; that it was so affixed by the order of the Board of Directors of said corporation and that he signed his name thereto by like order.

_____
Notary Public

APPENDIX B

Record of Decision
Dated February 1998

Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Enarc-O Machine Products, Inc. Site
Lima (T), Livingston County
Site Number 8-26-011

August 1997

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* JOHN P. CAHILL, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Enarc-O Machine Products, Inc. Inactive Hazardous Waste Site
Lima(T), Livingston County, New York
Site No. 8-26-011

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for the Enarc-O Machine Products, Inc. inactive hazardous waste disposal site which was chosen in accordance with the New York State Environmental Conservation Law (ECL). The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300).

This decision is based upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Enarc-O Machine Products Inactive Hazardous Waste Site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A bibliography of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened release of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD, presents a current or potential threat to public health and the environment.

Description of Selected Remedy

Based upon the results of the Remedial Investigation/Feasibility Study (RI/FS) for the Enarc-O Machine Products Site and the criteria identified for evaluation of alternatives the NYSDEC has selected a combination of actions including: excavation and disposal of shallow, contaminated courtyard area soil; separation/treatment of contaminants via low vacuum vapor extraction from soils remaining in place; and control/isolation via a low-permeability cap for soil remaining in place. The components of the remedy are as follows:

- Excavation and offsite disposal of approximately 375 tons of accessible, affected soil from the courtyard to a permitted, solid waste management facility.

- Installation of a soil vapor extraction (SVE) piping and well network beneath the excavated area and existing building, and connection of this network to vertical wind-powered turbine exhaust units.

- Backfill of the courtyard area, diversion of roof drain run-on and capping with a low-permeability asphalt cap.

- Since the remedy results in untreated hazardous waste remaining at the site, an SVE and groundwater monitoring program will be instituted. This sample collection and analysis program will allow the effectiveness of the selected remedy to be monitored and will be a component of the operation and maintenance for the site. As an additional component of the remedy, monthly volatile compound vapor monitoring of the turbines will be conducted using a direct reading instrument.

New York State Department of Health Acceptance

The New York State Department of Health concurs with the remedy selected for this site as being protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

8/12/97
Date

Michael J. O'Toole, Jr., Director
Division of Environmental Remediation

TABLE OF CONTENTS

SECTION 1: SITE LOCATION AND DESCRIPTION

The Enarc-O Machine Products, Inc. site is an active industrial facility located at 1175 Bragg Street in the Town of Lima, Livingston County, New York. (ref. Figure 1). The site is approximately six acres in size. Enarc-O Machine Products has been operating at this location since 1960. The facility is comprised of one main manufacturing building located in the northern portion of the property and a smaller, storage building located southeast of the main building (ref. Figure 2). There is an asphalt access driveway with a gravel parking/loading area. The remainder of the site is covered by a grassy lawn.

The site is bounded on the north and west by residential property and to the east by residential property and Honeoye Creek. The site is bounded to the south by an automobile repair/bodywork shop, residential property and farmland.

The topography in the immediate vicinity of the site is generally flat to the south and west, but slopes off relatively steeply to the east, toward Honeoye Creek.

SECTION 2: SITE HISTORY

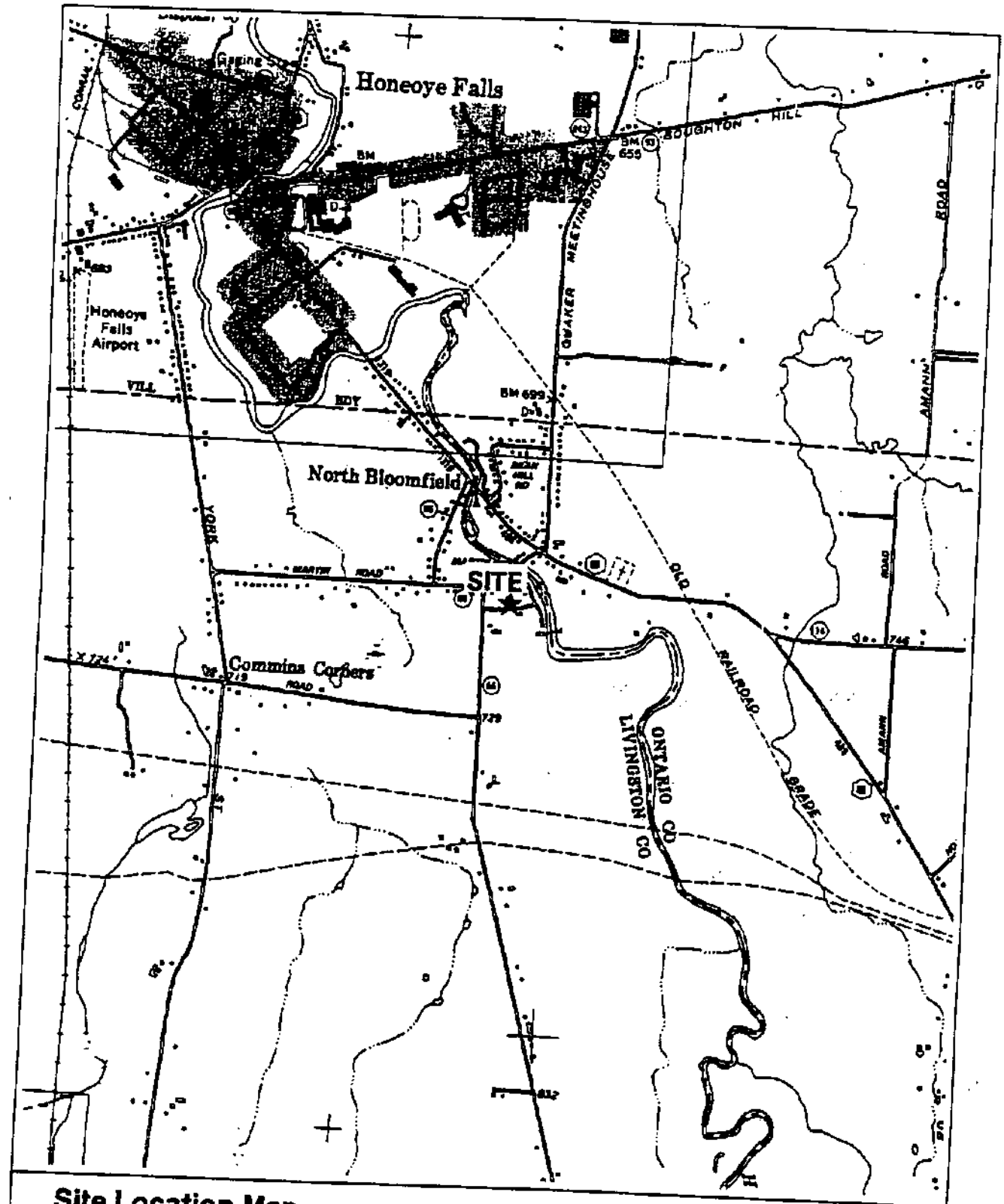
2.1: Operational/Disposal History

Enarc-O Machine Products manufacturing operations began in a nearby residence in 1954. In 1960 the manufacturing operation moved to the current location. Kaddis Manufacturing purchased Enarc-O Machine Products in 1984.

Site manufacturing activities include machining and shaping of small metal parts, followed by a deburring process. Solvent use at the site was limited for a degreasing process which removed oil residues from newly-machined parts. Trichloroethene (TCE) was used in this process until 1980, and 1,1,1-trichloroethane (1,1,1-TCA) between 1980 and 1985. The use of chlorinated solvents in degreasing operations was discontinued in 1985.

Former and current degreasing operations have been performed on the south side of the east wing of the main building (see Figure 2). One degreaser was located on a metal grate over a concrete vault which is depressed approximately 2 ft.$\pm$ below slab grade. Two above-ground tanks were situated on the east side of the production building, south of the degreaser area. Used cutting oil was stored in one tank and TCA was stored in the other. Both of the above-ground tanks, as well as an onsite underground gasoline storage tank, were removed in July 1986.

In 1984, elevated levels of VOCs were detected in the onsite supply well. This prompted residential well sampling in 1985. Results indicated contamination in 21 nearby residential wells.



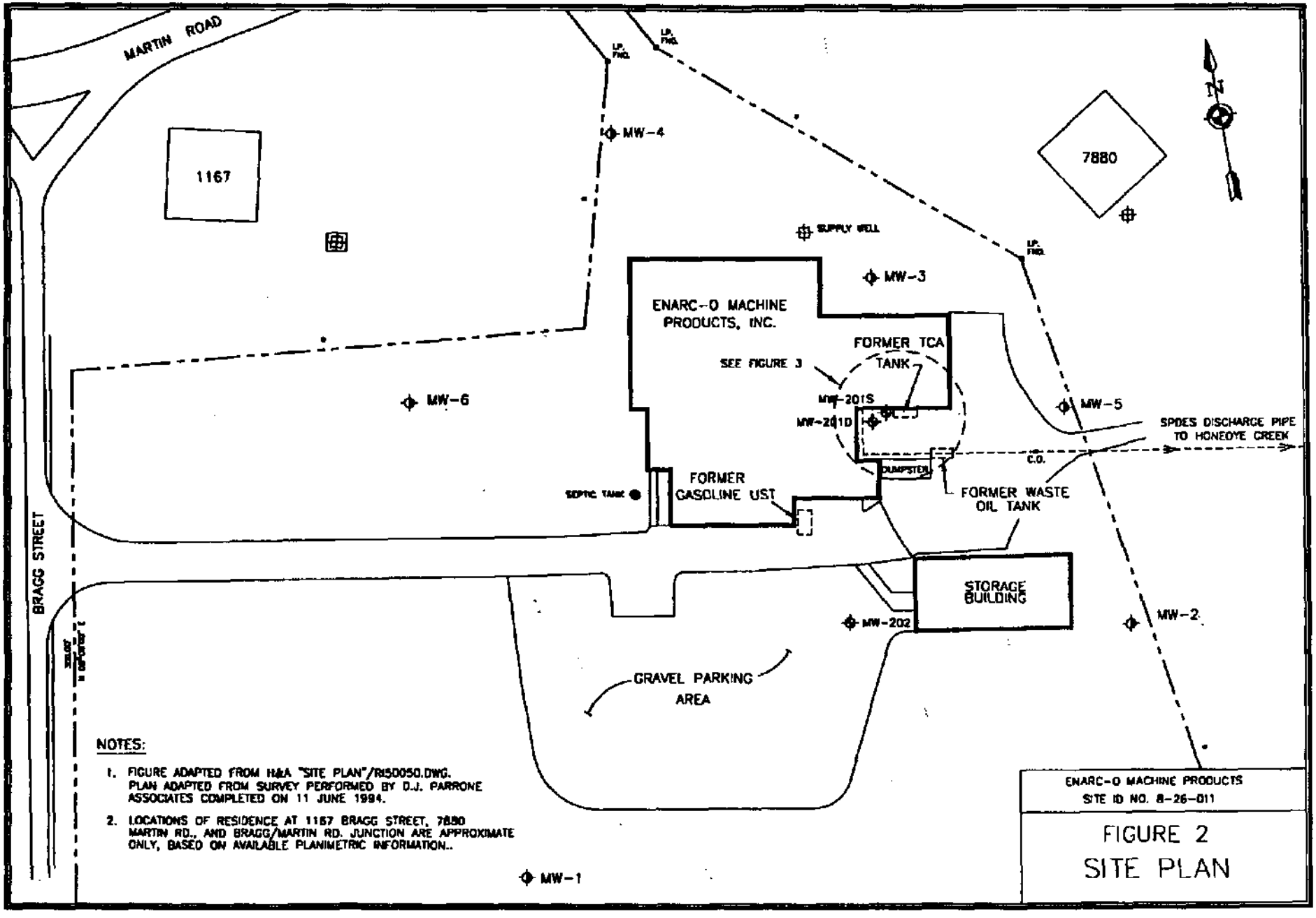
Site Location Map

826011 Enarc-O Machine Products, Inc.

NYSDOT Planimetric Quadrangle(s):

Scale 1:24,000

March 23, 1996


MARTIN ROAD
1167
7880
MW-4
MW-3
MW-6
MW-5
MW-201S
MW-201D
MW-202
MW-2
MW-1
SUPPLY WELL
ENARC-O MACHINE PRODUCTS, INC.
FORMER TCA TANK
SEE FIGURE 3
SPDES DISCHARGE PIPE TO HONEOYE CREEK
C.O.
DUMPSTER
SEPTIC TANK
FORMER GASOLINE UST
FORMER WASTE OIL TANK
STORAGE BUILDING
GRAVEL PARKING AREA
BRAGG STREET
N
NOTES:
1. FIGURE ADAPTED FROM H&A "SITE PLAN"/R150050.DWG. PLAN ADAPTED FROM SURVEY PERFORMED BY D.J. PARRONE ASSOCIATES COMPLETED ON 11 JUNE 1994.
2. LOCATIONS OF RESIDENCE AT 1167 BRAGG STREET, 7880 MARTIN RD., AND BRAGG/MARTIN RD. JUNCTION ARE APPROXIMATE ONLY, BASED ON AVAILABLE PLANIMETRIC INFORMATION..
ENARC-O MACHINE PRODUCTS
SITE ID NO. 8-26-011
FIGURE 2
SITE PLAN

Over 30 surrounding residences were subsequently provided bottled water. In 1988, a public water supply was installed for the affected area.

In 1991, a Site Assessment was conducted at the site and in 1994 an RI was initiated. Based on the results of the RI, the apparent contaminant source area is beneath the floor slab in the vicinity of the degreaser and in the vicinity of the former above-ground storage tanks, south of the degreaser area.

2.2: Remedial History

1984 - Livingston County Health Department (LCHD) found elevated levels of volatile organic compounds (VOCs), specifically the chlorinated solvents TCE and 1,1,1-TCA, in the Enarc-O supply well.

1985 - NYSDEC, NYSDOH and LCHD sampled 38 private residential wells and found 21 to be contaminated with varying levels of chlorinated solvents.

1985 - NYSDEC requested the assistance of the United States Environmental Protection Agency (USEPA) to mitigate the affects of groundwater contamination on area residents. The USEPA provided bottled water to over 30 area residences.

1987 - Enarc-O Machine Products was listed on the NYS Registry of Inactive Hazardous Waste Disposal Sites.

1988 - The installation of a public water supply as an interim remedial measure (IRM) to the affected area was completed. The installation of the public water supply was funded by Kaddis Manufacturing.

1991 - A Site Assessment was performed and a report issued by Kaddis Manufacturing. The site assessment addressed onsite soil and groundwater contamination. Results indicated the presence of VOCs in both soil and groundwater.

March 1994 - Kaddis Manufacturing entered a Consent Order for the Remedial Investigation/Feasibility Study (RI/FS) of the site.

September 1996 -The NYSDEC approved the RI Report.

June 1997 - The NYSDEC approved the FS Report.

SECTION 3: CURRENT STATUS

In response to a determination that the presence of hazardous waste at the Site presents a significant threat to human health and/or the environment, Kaddis Manufacturing has recently completed a Remedial Investigation/Feasibility Study (RI/FS).

3.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. A report entitled *Report on Remedial Investigation, Enarc-O Machine Products, January 1996 (Revised August 1996)* has been prepared describing the field activities and findings of the RI in detail.

The RI included the following activities:

- Residential well field evaluation - Residential wells were evaluated to determine the feasibility of using these wells in the offsite residential well sampling program.
- Soil vapor survey - An onsite soil vapor survey was conducted to better define the limits of soil contamination by VOCs.
- Onsite well installation - Three additional wells were installed on the site, for a total of nine.
- Stream staff gauge installation - A staff gauge was installed along the Honeoye Creek stream bed to provide a surveyed reference point of known elevation from which to measure stream water levels.
- Borehole geophysical logging - Borehole geophysical logging was conducted on four offsite residential wells and the Enarc-O supply well.
- Well sampling - Groundwater samples were collected from both onsite wells and offsite residential wells. In addition, groundwater level elevations were measured at the time of sampling.
- Off-site surface soil sampling - Four offsite surface soil samples were collected in order to help evaluate human exposure pathway routes of exposure.
- Septic tank sampling - The site's septic tank was sampled to determine if VOCs were disposed through the septic system.

To determine which media (soil, groundwater, etc.) contain contamination at levels of concern, the RI analytical data was compared to environmental Standards, Criteria, and Guidance (SCGs). Groundwater, drinking water and surface water SCGs identified for the Enarc-O site were based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of NYS Sanitary Code. NYSDEC TAGM 4046 soil cleanup guidelines for the protection of groundwater, background conditions, and risk-based remediation criteria were used as SCGs for soil.

Based upon the results of the remedial investigation in comparison to the SCGs and potential public health and environmental exposure routes, certain areas and media of the site require remediation. These are summarized below. More complete information can be found in the RI Report.

Chemical concentrations are reported in parts per billion (ppb) and parts per million (ppm).

3.1.1 Nature of Contamination:

As described in the RI Report, soil, groundwater and soil vapor samples were collected at the Site to characterize the nature and extent of contamination. Based on the results of the sampling program, chlorinated VOCs are the predominant contaminants of concern (COCs). The COCs are as follows:

- trichloroethene (TCE)
- 1,1,1-trichloroethane (TCA)
- 1,1-dichloroethene (1,1-DCE)
- 1,2-dichloroethene (1,2-DCE) total
- perchloroethene (PCE)

3.1.2 Extent of Contamination

Table 1 summarizes the extent of contamination for the contaminants of concern in groundwater and compares the data with proposed remedial action levels (SCGs) for the Site. The following are the media which were investigated and a summary of the findings of the investigation.

Groundwater

The groundwater investigation conducted as part of the RI involved sampling of both onsite and offsite wells. All of the wells sampled as part of the RI are bedrock wells as an overburden aquifer was not encountered. Bedrock at the site is situated approximately 12-15 feet below the ground surface. Eleven former residential supply wells were sampled as part of the RI, as well as the former Enarc-O supply well and the sump in the basement of a nearby residence. Each of these wells was sampled at two depths, with the exception of the Enarc-O supply well and the well at 7880 Martin Road, which were sampled at three depths. Seven of the eleven former residential

wells were sampled in both April and August of 1995 to allow a seasonal comparison of data. For all the onsite monitoring wells, RI groundwater monitoring was conducted for four quarterly events, beginning in July of 1994.

The data from the offsite wells indicates that in nearly all of the former residential wells, VOCs have decreased in concentration significantly since 1985. In a number of instances no VOCs were detected. VOC concentrations in six of the eleven wells sampled were below NYS groundwater standards, generally those situated furthest from the Enarc-O site. VOCs also dropped significantly in wells nearer the site, although select compounds were detected at levels above NYS groundwater standards. No discernible pattern was observed with respect to vertical distribution of contaminants.

The quarterly sampling of onsite wells during the RI revealed that the principal compound present is TCE, with lesser levels of 1,1,1-TCA, cis-1,2-DCE and PCE. Groundwater VOC concentrations are highest in well MW-201D, which is situated in the vicinity of the former above-ground storage tanks. This area is referred to as the "courtyard" (see Figure 3). In August 1995, TCE was observed at a concentration of 7,700 ppb. The August sampling program also showed TCE concentrations of 120 ppb, 510 ppb and 540 ppb in wells MW-2, MW-3 and MW-5, respectively.

A comparison of the RI sample data to 1991 sample data shows that the contaminants in onsite monitoring wells, while above NYS standards, have generally diminished in concentration. Only well MW-5 did not show a significant decrease. Evaluation of the recent and historical groundwater data (offsite and onsite) supports the conclusion that continued significant migration of VOCs from the site is not occurring.

Soil

While relatively few soil samples were collected as part of the RI, the site was subject to a comprehensive soil vapor investigation. The findings of the soil vapor study revealed that contaminants in soil are generally concentrated in a limited area in the vicinity of the former degreaser and courtyard area. Maximum VOC values of 345 ppm and 387 ppm in soil vapor samples were detected inside the building and outside the building near the former TCA tank, respectively. Within the courtyard, volatiles are present in an irregular pattern with respect to depth and distance from the degreaser location. The levels of volatile compounds detected in soil vapor in the courtyard and former degreaser area are indicative of a source area at shallow depths within these areas.

Soil vapor concentrations away from the building and courtyard area are limited to low part per million concentrations in the vicinity of a former underground gasoline tank and very low ppm concentrations around the Enarc-O Storage Building and courtyard perimeter. The findings of the soil vapor study, therefore, support that a source area exists in the subsurface soils and that the

source area is generally confined to the courtyard and adjacent location beneath the building, near the former degreaser area. Further, the findings of the RI support the conclusion that this source area has been and continues to act as a continuing source of contamination to the underlying aquifer.

3.2 Interim Remedial Measures:

Interim Remedial Measures (IRMs) are conducted at sites when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS. Several IRMs have been completed at the Enarc-O site.

In 1986, the USEPA authorized the installation of a waterline to provide public water to the affected area. In 1988, the construction of the service was completed. The waterline was financed by Kaddis Manufacturing. Other IRMs completed in response to the identified contamination include the 1986 removal of the solvent storage tank, used cutting oil tank and underground gasoline tank.

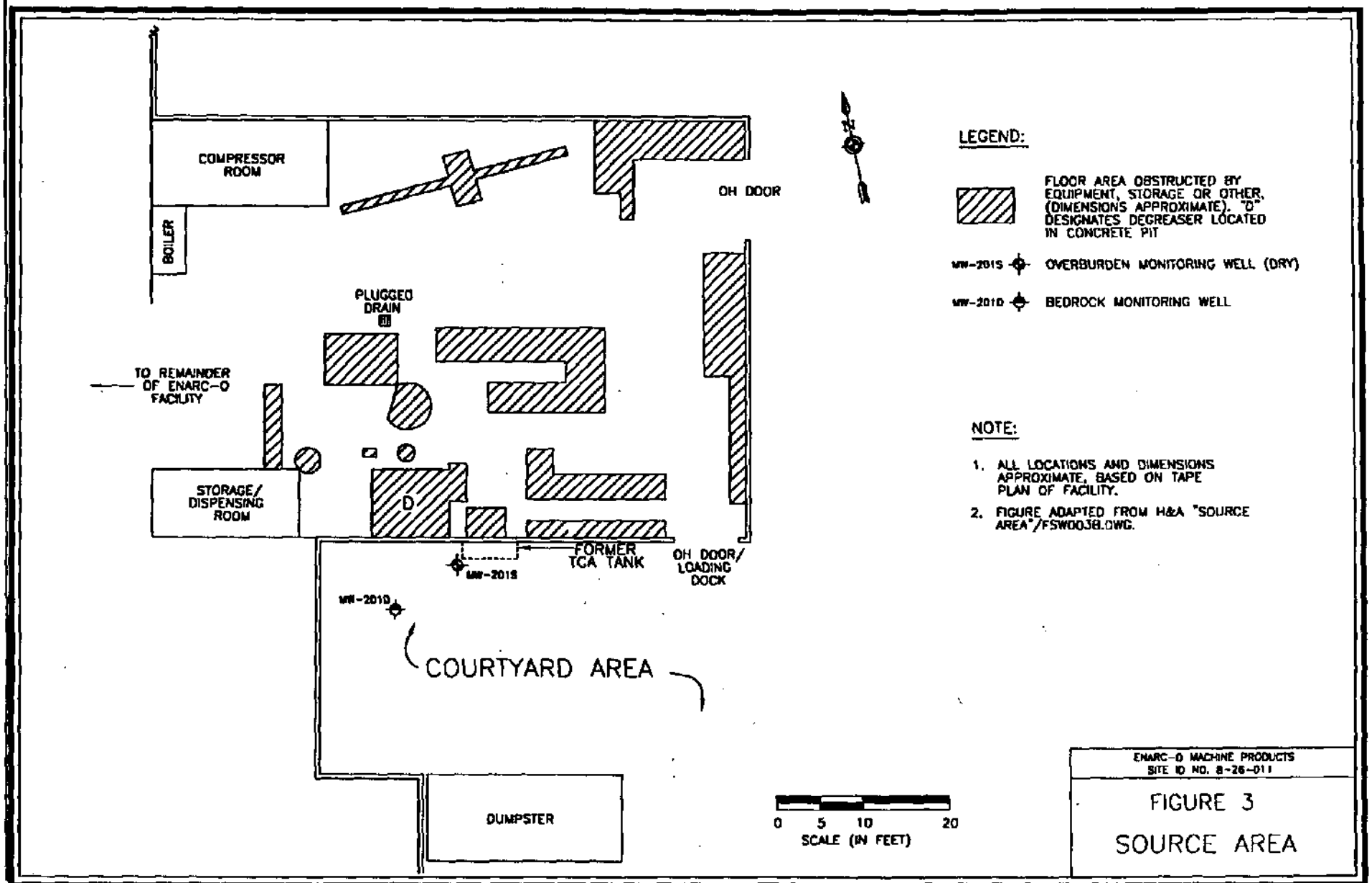
3.3 Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the health risks can be found in Section 6 of the RI Report.

An exposure pathway is how an individual may come into contact with a contaminant. The five elements of an exposure pathway are 1) the source of contamination; 2) the environmental media and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

Completed pathways which are known to or may exist at the site include:

- Inhalation of ambient air by current onsite workers indoors.
- Incidental ingestion of site soils by current onsite workers.
- Inhalation of soil particles during excavation activities by future onsite workers.
- Potential exposure to groundwater by offsite residents.


COMPRESSOR ROOM
BOILER
OH DOOR
PLUGGED DRAIN
TO REMAINDER OF ENARC-O FACILITY
STORAGE/ DISPENSING ROOM
D
FORMER TCA TANK
OH DOOR/ LOADING DOCK
MW-201S
MW-201D
COURTYARD AREA
DUMPSTER
LEGEND:
FLOOR AREA OBSTRUCTED BY EQUIPMENT, STORAGE OR OTHER. (DIMENSIONS APPROXIMATE). "D" DESIGNATES DEGREASER LOCATED IN CONCRETE PIT
MW-201S OVERBURDEN MONITORING WELL (DRY)
MW-201D BEDROCK MONITORING WELL
NOTE:
1. ALL LOCATIONS AND DIMENSIONS APPROXIMATE, BASED ON TAPE PLAN OF FACILITY.
2. FIGURE ADAPTED FROM H&A "SOURCE AREA"/FSW003B.DWG.
0 5 10 20
SCALE (IN FEET)
ENARC-O MACHINE PRODUCTS
SITE ID NO. 8-26-011
FIGURE 3
SOURCE AREA

3.4 Summary of Environmental Exposure Pathways:

This section summarizes the types of environmental exposures which may be presented by the site. The Fish and Wildlife Impact Assessment included in the RI presents a more detailed discussion of the potential impacts from the site to fish and wildlife resources. The following pathway for environmental exposure has been identified:

- Potential contact or ingestion of shallow bedrock groundwater which discharges to the surface in nearby low-lying areas.

SECTION 4: ENFORCEMENT STATUS

The NYSDEC and Kaddis Manufacturing entered into a Consent Order on March 22, 1994. The Order obligated the responsible parties to implement a Remedial Investigation/Feasibility Study program. Upon issuance of the Record of Decision the NYSDEC will approach the PRPs to implement the selected remedy under an Order on Consent.

The RI/FS consent order is referenced as follows: Index No. B8-0112-91-04.

SECTION 5: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. The overall remedial goal is to meet all Standards, Criteria, and Guidance (SCGs) and be protective of human health and the environment.

At a minimum, the remedy selected should eliminate or mitigate all significant threats to the public health and to the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The goals selected for this site are:

- Reduce, eliminate or control, to the extent practicable, the contamination present within the soils on site;
- Reduce, eliminate or control, to the extent practicable, the potential for migration of contaminants to groundwater beneath the site source area;
- Mitigate the impacts of contaminated groundwater to the environment;
- Provide for attainment of SCGs for groundwater quality, to the extent possible; and

- Eliminate the potential for direct human or animal contact with the contaminated soils on site.

SECTION 6: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy should be protective of human health and the environment, be cost effective, comply with other statutory laws and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Enarc-O Machine Products site were identified, screened and evaluated in a Feasibility Study. This evaluation is presented in the report entitled *Report on Feasibility Study, Enarc-O Machine Products, May 1997.*

A summary of the detailed analysis follows. As used in the following text, the time to implement reflects only the time required to implement the remedy, and does not include the time required to design the remedy, procure contracts for design and construction or to negotiate with responsible parties for implementation of the remedy.

6.1: Description of Alternatives

The potential remedies are intended to address the contaminated soil and groundwater at the site.

As discussed in Section 3, the RI concluded that the source area is generally confined to the soils beneath the manufacturing building, in the vicinity of the former degreaser, and to the courtyard area. The RI further suggests that the contaminant distribution in groundwater is limited primarily to bedrock beneath the source area. Recent and historical sampling of onsite and offsite groundwater indicate the contaminant levels have diminished through attenuation to levels at or below the applicable groundwater standards, except in, or very near to the source area. Under natural conditions at the Enarc-O site, the VOC concentrations in the groundwater are expected to continue diminishing over time due to natural degradation and attenuation; however, this process would be enhanced if source area soils were to undergo removal or in-situ remediation, thereby reducing the contaminant mass available to migrate to groundwater.

The FS evaluated recovery and treatment of groundwater (i.e. a "pump-and-treat" option). Citing the potential limited effectiveness of such a system in the fractured bedrock setting (specifically the high permeability and yield potential of the underlying aquifer), the recent and historical sampling of onsite and offsite groundwater, and the fact that the local community is now serviced by a public water system, the FS concluded that groundwater treatment was not a viable option. Rather, the FS supports addressing the source of contamination, thus enhancing/accelerating the attenuation of contamination which is already occurring. Accordingly, the response actions

discussed below include various alternatives to address the identified source of contamination (i.e. the contaminated soils).

Alternative 1
No Action

The no action alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain in an unremediated state. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Alternative 2
On-Site Control/Isolation without Treatment

Present Worth:	$ 84,000
Capital Cost:	$ 15,000
Annual O&M:	$ 8,500
Time to Implement	6 months - 1 year

Under this alternative, the soils in the courtyard area would be isolated by installing a low-permeability cover of asphalt or other material that would prevent: 1) further infiltration of surface water and run-on; 2) human contact with soils; and 3) generation of contaminated soil dust that could potentially be ingested by site workers. The soils located beneath the existing building are currently isolated by virtue of being covered by the floor slab and foundation wall.

In addition to the low-permeability cap, additional measures would be taken to further reduce infiltration. An existing roof drain currently diverts roof rainwater to the courtyard area, increasing the volume of infiltrating surface water and therefore potential contaminant transport. Elimination of this run-on would be performed by reconfiguring the roof drain piping. This would be a permanent, partial remedy that would have immediate benefit.

If future expansion of the existing facility were warranted, it would involve structure expansion to the courtyard area. Such construction would not preclude the control/isolation response action, and would potentially be a more effective barrier to infiltration than a cap. Construction of an occupied space may necessitate installation of measures to prevent VOC vapors from entering the structure. This would include such measures as a vapor barrier and/or sub-slab venting.

This alternative would also include long-term groundwater monitoring to document groundwater quality and detect any migration of COCs at concentrations in excess of the NYSDEC groundwater quality standards.

Alternative 3
Excavation and Offsite Disposal without Treatment

Present Worth:	$ 126,000
Capital Cost:	$ 58,000
Annual O&M:	$ 8,500
Time to Implement	6 months - 1 year

This alternative would involve removing soils by excavation from the identified source area and disposing of the materials at an off-site facility permitted to handle such wastes. Approximately 375 tons of contaminated soil would be removed from the courtyard area, in an excavation 4± ft. deep. The 4-ft. depth limit is based on the presumed depth of the existing building footings. Excavating deeper than these footings would potentially cause structural instability or damage due to settlement. Soils below this depth, therefore, would be left in place as would all contaminated soils beneath the building.

Excavation and disposal would be performed in accordance with applicable regulations. Since the waste soil contains VOCs, a determination would be required from NYSDEC with regard to the waste being potentially classified as either hazardous or solid waste. NYSDEC TAGM 3028 allows for waste soil with relatively low levels of normally hazardous VOC compounds to be handled and disposed as solid waste.

In October 1996 the PRP initiated an investigation to determine the levels of VOCs in the site's source area soils and to identify the portion(s) that could be excavated and disposed. Based on the results of the investigation, the soil would be disposed as a solid waste at a permitted disposal facility.

This alternative would also include long-term groundwater monitoring to document groundwater quality and detect any migration of COCs at concentrations in excess of the NYSDEC groundwater quality standards.

Alternatives 4A and 4B
In-situ Soil Vapor Extraction

In-situ separation of contaminants from unsaturated soil is generally accomplished through soil vapor extraction which was evaluated in two modes by the FS: 1) high-vacuum extraction using vacuum blowers to apply moderate to high vacuum to the vadose zone soils, to achieve a high VOC extraction rate; or 2) low vacuum, which doesn't produce VOC yield as rapid as high-vacuum extraction, but can be effective and have low maintenance over the long term.

Alternative 4A
Low Vacuum Soil Vapor Extraction

Present Worth:	$ 104,000
Capital Cost:	$ 21,000
Annual O&M:	$ 10,000
Time to Implement	6 months - 1 year

Separation of contaminants from unsaturated soil would be accomplished through soil vapor extraction (SVE) performed utilizing a low vacuum system which employs wind-powered turbines to produce a vacuum on soil. Applications of this type of vacuum system are common in petroleum release remediation. The conceptual low vacuum SVE design would entail installation of two angled wells through the building foundation wall to access the contaminated soils beneath the building. Vertical extraction wells, or trenched, horizontal, slotted pipe would be installed within the courtyard area. These wells would be manifolded together and connected to riser pipes which extend above the roof line with wind-driven turbine ventilators attached to each. All wells and piping would be 4-in. PVC with appropriate fittings.

The conceptual turbine has an 8-in. throat and a rated exhaust capacity of 256 cubic feet per minute (cfm) at a wind speed of 4 mph. The vacuum extraction system would employ multiple turbines, each on a vertical section connected to either a well or buried horizontal pipe run.

Often SVE systems require that the extracted vapor be treated at the surface using granular activated carbon (GAC) or other methods which strip the extracted vapor of VOCs. The treated vapor is then discharged to the air. The rates of vapor from a low vacuum system, however, would likely be at levels low enough that exceedence of air discharge permit levels would not occur. Accordingly, vapor treatment for the wind-powered system may not be required.

To monitor ongoing operation of the SVE and the mass of contaminants removed, measurement of vapor effluent contaminant concentrations would be performed on a regular basis. This alternative would also include long-term groundwater monitoring to document groundwater quality and detect any migration of COCs at concentrations in excess of the NYSDEC groundwater quality standards.

Alternative 4B
High Vacuum Soil Vapor Extraction

Present Worth:	$ 410,000
Capital Cost:	$ 78,000
Annual O&M:	$ 41,000
Time to Implement	6 months - 1 year

This type of system would be very similar to that described in Alternative 4A but would employ an electric motor/blower to produce a vacuum on soil, in lieu of wind-powered turbines.

This Alternative is considerably more costly than Alternative 4A in light of the operation and maintenance requirements, including the provision for air treatment. The extracted vapor from the system would likely require treatment at the surface using granular activated carbon (GAC) or other methods which strip the extracted vapor of VOCs, in light of the higher extraction rate. The treated vapor would then be discharged to the air via a stack or stacks above the roof line.

To monitor ongoing operation of the SVE and the mass of contaminants removed, measurement of vapor effluent contaminant concentrations would be performed on a regular basis. This alternative would also include long-term groundwater monitoring to document groundwater quality and detect any migration of COCs at concentrations in excess of the NYSDEC groundwater quality standards.

Alternative 5
Remedial Action Combination: Control/Isolation, Excavation/Disposal, and Soil Vapor Extraction

Present Worth:	$ 180,000
Capital Cost:	$ 97,000
Annual O&M:	$ 10,000
Time to Implement	6 months - 1 year

This alternative would involve the implementation of several of the above actions in combination with the others. The combination proposed includes: 1) excavation and disposal of courtyard soils as solid waste; 2) control/isolation by covering the courtyard with a low-permeability cap; and 3) separation/treatment using vapor extraction for soils left in place (courtyard area and beneath the building).

Since inception of the response to the contaminant release at the site, an alternate source of drinking water has been provided to the area, the 1,1,1- TCA tank has been removed, and several phases of investigation and sampling have been performed. Since these actions, the overall groundwater quality has increased through natural processes. Excavation of courtyard soils, especially if combined with capping of the courtyard, would remove the primary portion of the source area soils that contributes to contamination in groundwater. This is because the courtyard has been subject to infiltration and roof run-on, which has allowed contaminant leaching and downward migration. For the source area soils left in place, a vapor extraction system would provide a viable means of further reducing potential contaminant migration in a setting that has already been demonstrated to have shown marked improvement without the presence of a mechanism for VOC removal.

Although a wind-powered system would not accomplish contaminant separation at a rate comparable to a blower-powered system, it would provide for ongoing reduction in the contaminant mass at a fraction of the cost of a higher-vacuum system. The rates of vapor, and therefore contaminant extraction, would likely be at levels low enough that exceedence of air discharge permit levels would not occur. Thus, vapor treatment would not be required. Further, operation and maintenance efforts for a low-vacuum system would also be relatively minor.

In light of the incremental benefit realized by using the more costly blower-powered system, when utilized in conjunction with Alternatives 2 and 3, a low vacuum system is a more viable alternative. The individual components of this remedial action, therefore, would be as described above in Alternative Nos. 2, 3 and 4A. However, the SVE system in the courtyard area would be installed at the base of the courtyard area excavation. Two alignments of horizontal slotted screen pipe would be installed within the bottom of the excavation created by the courtyard soil removal and manifolded to riser pipes which extend above the building roof line. Like the extraction pipes beneath the building, a wind-driven turbine/ventilator would be connected to each pipe for a total of four.

A monitoring program would be implemented consistent with that described in Alternative 4A.

6.2 Evaluation of Remedial Alternatives

The criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6 NYCRR Part 375). For each of the criteria, a brief description is provided followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is contained in the Feasibility Study.

The first two evaluation criteria are termed threshold criteria and must be satisfied in order for an alternative to be considered for selection.

1. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance.

All of the remedial alternatives would be designed and implemented to meet action-specific SCGs, however, the no action alternative includes no measures to address contravention of pertinent standards. Alternatives 2 and 3 each provide a limited action which, alone, may not fully meet SCGs. Alternative 4A, the low vacuum vapor extraction system, would ultimately comply with pertinent SCGs, though the time frame associated with compliance is uncertain. Alternative 4B would likely comply with pertinent SCGs sooner than Alternative 4A, in light of the higher extraction rate. Alternative 5, the combination of actions, would meet the SCGs.

2. Protection of Human Health and the Environment. This criterion is an overall evaluation of the health and environmental impacts to assess whether each alternative is protective.

The health risk assessment conducted during the RI indicated that existing contaminant levels do not create unacceptable risks to humans. All of the alternatives would provide for a reduction in the concentrations of COCs present, thus reducing the risk to the environment, though no action relies exclusively on natural attenuation. Natural attenuation would take many years and could pose increased risks to public health and the environment with increased contaminant leaching and/or migration. Alternatives 2, 3, 4A and 4B would each provide additional protection to the environment, based on their limited actions. Alternative 5 would rate highest with regard to protection of the environment by removing contaminated soil and containing and treating the areas of contamination which would remain.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

All of the alternatives, except the no action alternative, would involve some degree of construction within the source area. Alternative Nos. 3 and 5, because of the required excavation activities, would be more extensive and present a higher potential for short-term risks to on-site workers and the community during implementation. For these alternatives, a greater degree of mitigative measures would need to be implemented to control potential short-term environmental impacts associated with dust and volatilization of the COCs.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the controls intended to limit the risk, and 3) the reliability of these controls.

The no action alternative would not meet the RAOs for the site. Alternative 2, the control/ isolation alternative, would help prevent future migration of contaminants to groundwater but by itself, the alternative would not address the presence of contaminants in soil. Alternative 3, the excavation/disposal alternative would represent an immediate reduction in the source area contaminant mass, but some waste would remain onsite. Alternatives 4A and 4B would both rate well with regard to long-term effectiveness, although the time frame associated with the remedial action for 4A would be longer and, therefore, more uncertain than Alternative 4B. Alternative 5 would rate highest with regard to long-term effectiveness by achieving each of the site RAOs.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

The no action alternative would not satisfy this criteria. Alternative 2 would reduce the mobility of contaminants by reducing infiltration. Toxicity and volume, however, would not be affected. Alternative 3 would reduce the volume of contamination present, however, as this alternative only addresses one area of contamination (i.e. the courtyard), the toxicity and mobility potential of the remaining areas would not be affected. Alternatives 4A and 4B would allow for a reduction in the contaminant mass and toxicity but the mobility would not be significantly affected. Of the alternatives, Alternative 5 would rate the highest by reducing both the volume and mobility of the contaminants.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction and the ability to monitor the effectiveness of the remedy. For administrative feasibility, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc.

All of the remedial alternatives would be technically feasible and could be implemented at the site. Alternative 1, the no action alternative, and Alternative 2 would rate high with regard to implementability. Each involves straightforward measures. Alternative 3 would require a greater degree of coordination, in light of the required excavation, transport and disposal of contaminated soils. Alternative 5 would also require a high degree of coordination, as three individual actions would be implemented simultaneously: excavation, containment and treatment. Alternative 4B would require the highest degree of coordination in light of the NYSDEC Division of Air involvement, as well as engineering considerations for the system design, placement, operation and maintenance.

7. Cost. Capital and operation and maintenance costs are estimated for each alternative and compared on a present worth basis. Although cost is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, cost effectiveness can be used as the basis for the final decision. The costs for each alternative are presented in Table 2.

This final criterion is considered a modifying criterion and is taken into account after evaluating those above. It is focused upon after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan have been evaluated. The "Responsiveness Summary", included as Appendix A, presents the public comments received and Department's response to the concerns raised. No significant public comments were received.

SECTION 7: SUMMARY OF THE SELECTED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 6, the NYSDEC is selecting **Alternative 5, the Remedial Action Combination: Control/Isolation, Excavation/ Disposal, and Soil Vapor Extraction** as the remedy for this site.

This selection is based upon the evaluation in the Feasibility Study which supports that the alternative which combines these various actions will be the most beneficial remedial action plan for the site. When considered together, the actions will provide an effective and implementable approach to achieving the site's remedial goals. Alternative 5 will provide a combination of methodologies that will achieve the RAOs for the site while generally satisfying the criteria by which the various methods have been evaluated. The combination also represents a cost-effective approach that will be implemented without undue technical or administrative impediments.

The estimated present worth cost to implement the remedy is $180,000. The cost to construct the remedy is estimated to be $97,000 and the estimated average annual operation and maintenance cost for ten years is $10,000.

The elements of the proposed remedy are as follows:

1. A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program. Any uncertainties identified during the RI/FS will be resolved.

2. Excavation and offsite disposal of approximately 375 tons of accessible, affected soil from the courtyard to a permitted, solid waste management facility.

3. Installation of a soil vapor extraction piping and well network beneath the excavated area and existing building, and connection of this network to vertical wind-powered turbine exhaust units.

4. Backfill of the courtyard area, diversion of roof drain run-on and capping with a low-permeability asphalt cap. If advantageous to the site owner, construction of an extension to the building over the courtyard will be an acceptable and potentially preferable alternative to the asphalt cap.

5. Since the remedy results in untreated hazardous waste remaining at the site, an SVE and groundwater monitoring program will be instituted. This sample collection and analysis program will allow the effectiveness of the selected remedy to be monitored and will be a component of the operation and maintenance for the site. As an additional component of the remedy, monthly VOC vapor monitoring of the turbines will be conducted using a direct reading instrument.

6. As a component of the design, performance criteria will be established to verify the effectiveness of the remedy. The criteria will be used to gauge the system's progress toward attainment of remedial goals and to upgrade and/or modify the system, if necessary.

SECTION 8: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation (CP) activities were undertaken in an effort to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for this Operable Unit at the site:

- A repository for documents pertaining to the site was established.
- A site mailing list was established which included nearby property owners, local political officials, local media and other interested parties.
- In February 1994 a Fact Sheet was sent to the site mailing list announcing plans for a public meeting to discuss the planned Remedial Investigation/Feasibility Study.
- On March 17, 1994 the NYSDEC and the NYSDOH held a Public Meeting to explain the purpose of a Remedial Investigation/Feasibility and answer site-related questions.
- In June 1997 a Fact Sheet was sent to the site mailing list announcing the availability of the Proposed Remedial Action Plan and plans for a public meeting to accept comments of the NYSDEC's proposed remedy.
- On July 16, 1997 the NYSDEC and the NYSDOH held a Public Meeting to explain the State's proposed remedy and to accept comments on the PRAP.
- In August 1997 a Responsiveness Summary was prepared and made available to the public, to address the comments received during the public comment period for the PRAP.

Table 1
Nature and Extent of Contamination

MEDIA	CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ppb)	FREQUENCY of EXCEEDING SCGs	SCG (ppb)
Groundwater	Volatile Organic Compounds (VOCs)	Trichloroethylene	ND to 7,700	39 of 66	5
		1,1,1-TCA	ND to 660	18 of 66	5
		1,2 DCE	ND to 1,500	26 of 66	5
		PCE	ND to 160J	10 of 66	5
		1,1-DCE	ND to 12	4 of 66	5
		1,2-DCA	ND to 11	1 of 66	5
		1,1-DCA	ND to 34	2 of 66	5
		Methylene Chloride	ND to 13J	1 of 66	5
		Chloroform	ND to 8J	1 of 66	7
		Acetone	ND to 180J	2 of 66	50(G)
		Vinyl Chloride	ND to 7J	1 of 66	2
		Benzene	ND to 2J	2 of 66	.7

(G) - Value listed is a guidance value

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual O&M	Total Present Worth
No Action	$0	$0	$0
On-Site Control/Isolation without Treatment	$15,000	$8,500	$84,000
Excavation and Off-Site Disposal without Treatment	$58,000	$8,500	$126,000
Low Vacuum Soil Vapor Extraction	$21,000	$10,000	$104,000
High Vacuum Soil Vapor Extraction	$ 78,000	$ 41,000	$ 410,000
Remedial Action Combination: Control/Isolation, Excavation/ Disposal, Soil Vapor Extraction	$97,000	$10,000	$180,000

APPENDIX A

RESPONSIVENESS SUMMARY

Enarc-O Machine Products, Inc. Site
Proposed Remedial Action Plan
Lima (T), Livingston County
Site No. 8-26-011

The Proposed Remedial Action Plan (PRAP) for the Enarc-O Machine Products, Inc. Site, was prepared by the New York State Department of Environmental Conservation (NYSDEC) and issued to the local document repository on June 27, 1997. This Plan outlined the preferred remedial measure proposed for the remediation of the contaminated soils and groundwater at the Enarc-O Machine Products Site. The preferred remedy is a combination of actions including: excavation and disposal of courtyard area soils; control/isolation by covering the courtyard with a low-permeability cap; and separation/treatment using vapor extraction for soils left in place (the deeper courtyard area soil and soil beneath the building).

The release of the PRAP was announced via a notice to the mailing list, informing the public of the PRAP's availability.

A public meeting was held on July 16, 1997 which included a presentation of the Remedial Investigation (RI) and the Feasibility Study (FS) as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site.

The public comment period for the PRAP closed on July 31, 1997, no written comments were submitted.

This Responsiveness Summary responds to all questions and comments raised at the July 16, 1997 public meeting.

The following are the comments received at the public meeting, with the NYSDEC's responses:

Comment 1: In the Proposed Remedial Action Plan (PRAP), how many years does the cost estimate for operation and maintenance (O&M) include? How long do you expect this site will have to be maintained? Who is responsible for paying the cost of O&M?

Response 1: For estimating purposes, a time frame of ten years was assumed for system O&M. This estimate is for costing purposes but also represents a "best guess" of the required duration of system operations. The actual duration of operations may be longer or shorter based on the remedy's impact, as evidenced by the monitoring program.

Subsequent to the issuance of the Record of Decision, negotiations with the site PRP will commence for the design and construction. O&M is an element of the remedy which, pending agreement, will be funded by the site PRP.

Comment 2: Sprint wants to build a phone tower in an area near the site. Should we be concerned about groundwater contamination? They are going to have to put some big holes into the ground to put up the tower.

Response 2: Based on information provided by Costich Engineering (the Civil Engineer for the Tower Project), the proposed tower location is approximately 1000 feet southwest of the Enarc-O main plant building. While the tower location was not sampled as part of the Enarc-O investigation(s), the distance and location of the proposed tower relative to the site, make it unlikely that any site-related contamination would be present in the groundwater at this location. Even if contaminants were shown to be present in this area, this would likely not affect the utilization of this location for the proposed tower, though certain contingencies (e.g. air monitoring, groundwater sampling, proper discharge) may have to be incorporated into the construction permit.

Comment 3: Has any testing been done at the proposed tower site? How far down will they have to dig to put up the tower?

Response 3: No sampling has been conducted at the proposed tower site in conjunction with the Enarc-O site investigations. Information provided by Costich Engineering (the Civil Engineer for the Tower Project) indicates that the proposed tower will sit on three 36" diameter piers, approximately 27' deep. The information also indicates that a test boring was drilled at the proposed location to a depth of 36'-6", with no bedrock evident.

Comment 4: If TCE is found at the proposed tower site, what environmental impact might it have if it is present at levels you have found elsewhere? Whose concern should this be at this point? Who would monitor work done by the company? Sprint is aware of the concern, because they told us the first site they looked at was the Enarc-O property.

Response 4: The potential for site-related contamination at the proposed tower location is believed to be low. The site investigations have shown that the levels of contamination in soil and groundwater, while high in the vicinity of the east wing of the main plant building, drop off considerably with distance from the source area. Further, while there is some seasonal variation in groundwater flow direction, shallow bedrock groundwater flow is generally to the northeast, thus from the proposed tower location toward the site. The placement of a tower at this offsite location should not be affected by the proximity of the Enarc-O site and the low potential for contamination in this area. Although no contamination is believed to exist at this location, some precautions may be appropriate during the construction of the tower, should this project be approved by the Town. First, in light of the concern expressed regarding potential groundwater contamination in this area, the boring logs for the proposed location should be reviewed to determine if groundwater was encountered. If data indicates groundwater was observed, or if the Town wished to take a conservative position, air monitoring for volatile organic compounds should be required when drilling for the piers. Also, if pumping of groundwater encountered in the borings were to be necessary, groundwater sampling would be appropriate to determine the requirements for proper treatment, handling and discharge of the groundwater. These are contingencies which could be incorporated into the permit to construct.

Comment 5: It is correct to say that any concerns about the contamination would only be during the construction phase and not over the long term?

Response 5: While the data from the investigation of the Enarc-O site does not suggest that site-related contamination would be present in the area proposed for the tower, no samples have been collected from this area in conjunction with the investigations conducted to date. Even if contaminants were shown to be present in this area, this would likely not affect the utilization of this location for the proposed tower. The primary concerns associated with such a use, given the known circumstances, are (1) the potential for worker exposure during the drilling/boring program and (2) the disposition of any potentially contaminated groundwater which may be pumped during the construction phase. To alleviate these concerns, provisions for air monitoring during the drilling program and groundwater sampling, should it be necessary (see Response 4), could be included in any agreement/contract with the tower owner.

Comment 6: Are levels found at the closest test spot to the proposed tower location high enough to be a concern?

Response 6: The Remedial Investigation revealed that concentrations of contaminants diminish considerably with distance from the source area. Samples closest to the proposed tower location were consistent with this trend. While elevated levels of volatile compounds were seen in well MW-201D (9,860 ppb), the well within the source area, less contamination was observed in well MW-202 (120 ppb) and well MW-2 (147 ppb) which are south of the source area. No contaminants were seen in well MW-1, the well which is likely the closest to the proposed tower location. Soil vapor data, likewise, showed the same trend. Samples collected within the source area contained high levels of contaminants but samples collected south of the Enarc-O Storage Building, away from the source area, contained very low levels of volatile compounds. These findings support that the likelihood of site-related contamination at the proposed tower location is low.

Comment 7: Could the NYSDEC provide written guidance as to what the Town should require Sprint to do?

Response 7: Yes. A letter which addresses this matter was forwarded to the attention of the Town Supervisor. The letter, dated July 22, 1997, is included as an attachment to this summary.

Comment 8: Are the two major concerns 1) what to do with any groundwater pulled out of the ground during tower construction, and 2) worker safety during construction?

Response 8: Yes, these issues would be the primary concerns if contamination is identified in this area. Note, however, these issues only pertain to the construction phase of the tower project. The disposition of contaminated groundwater, if encountered, would be a concern if the construction of the tower involves pumping of that groundwater. The water would have to be treated and/or properly disposed if compounds are found to be present above

discharge criteria. Worker safety is also a concern and air monitoring for volatile compounds would be advisable (see Response 5).

Comment 9: What is the time frame for the start of work on the Enarc-O clean up?

Response 9: Upon issuance of the Record of Decision, negotiations for the remedial design and construction will commence with the site PRP. Once agreement has been reached and a Consent Order for the work has been signed, work can begin as soon as practicable. As this construction season is drawing to a close, the Spring of 1998 is a likely option.

Comment 10: How long until the site is fully clean?

Response 10: For estimating purposes, a time frame of ten years was assumed for system operation and maintenance. This estimate is for costing purposes but also represents a "best guess" of the required duration of system operations. The actual duration of operations will depend on the effectiveness of the remedy and may be longer or shorter based by the monitoring program data.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 Wolf Road, Albany, New York 12233-7010

John P. Cahill
Commissioner

July 22, 1997

Mr. Lance H. Bassage
Town Supervisor
Town of Lima
7329 East Main Street
Lima, New York 14485

Dear Mr. Bassage:

Re: Enarc-O Machine Products Site,
Lima (T), Livingston County, Site No. 8-26-011

This letter is in response to the concerns you raised at the July 16, 1997 public meeting for the Enarc-O Machine Products Site, regarding the proposal to locate a Sprint Telecommunications Tower in the vicinity of the above referenced inactive hazardous waste disposal site. On behalf of the Town of Lima, you requested the New York State Department of Environmental Conservation's (NYSDEC) input relative to the proposed location of the tower in light of the contamination detected at the Enarc-O site.

The studies conducted at the Enarc-O site have revealed the presence of contamination, specifically volatile organic compounds, in soil and groundwater. The source of this contamination is in the soil beneath and immediately to the south of the plant building's east wing, beyond this area contaminants have not been identified in the soil. The concentration of contaminants in the groundwater is also highest in the immediate vicinity of the building's east wing. As explained at the recent public meeting, the levels of contamination in the groundwater drop off considerably with distance from this source area and furthermore, the contamination except in the immediate area of the source, is limited to the bedrock groundwater. The bedrock groundwater at the site is encountered at an approximate elevation of 693' AMSL, which is approximately 27' below ground surface (bgs).

While the proposed tower location was not sampled as part of the Enarc-O investigation(s), the distance and location of the proposed tower relative to the site, makes it unlikely that any site-related contamination would be present in the groundwater at this location. While there is some seasonal variation, shallow bedrock groundwater flow in the vicinity of the Enarc-O site is generally to the northeast, that is from the proposed tower location toward the Enarc-O site.

Based on information obtained from Costich Engineering (the Civil Engineer for the Tower Project), the proposed tower location is approximately 1000 feet southwest of Enarc-O main plant building. The proposed tower site elevation is 733.9' AMSL, approximately 15' above the Enarc-O site elevation. A test boring installed at the proposed tower location to a depth of 34'-6" bgs, encountered no bedrock. At the Enarc-O site, bedrock was encountered at depths ranging from 10'-18' bgs. The tower project involves the installation of three piers to a depth of 27' bgs to support the tower, which based on the above elevation data would not be expected to encounter the groundwater. Based on the site investigations, groundwater is only present in the bedrock.

As explained at the public meeting, the placement of a tower at this offsite location should not be effected by the proximity of the Enarc-O site and the low potential for contamination in this area. Although no contamination is believed to exist at this location, some precautions may be appropriate during the construction of the tower, should this project be approved by the Town. First, in light of the concern expressed regarding potential groundwater contamination in this area, the boring logs for the proposed location should be reviewed to determine if groundwater was encountered. If any indication of groundwater was observed, or if the Town wished to take a conservative position, air monitoring for volatile organic compounds should be required when drilling for the piers. Also, if pumping of groundwater encountered in the borings were to be necessary, groundwater sampling would be appropriate to determine the requirements for proper treatment, handling and discharge of the groundwater. These are contingencies which could be incorporated into the permit to construct.

In summary, while the data from the investigation of the Enarc-O site does not suggest that site-related contamination would be present in the area proposed for the tower, no samples have been collected from this area in conjunction with the investigations conducted to date. Even if contaminants were shown to be present in this area, this would likely not affect the utilization of this location for the proposed tower. The primary concerns associated with such a use, given the known circumstances, are (1) the potential for worker exposure during the drilling/boring program and (2) the disposition of any potentially contaminated groundwater which may be pumped during the construction phase. To alleviate these concerns, the provisions for air monitoring during the drilling program and groundwater sampling, should it be necessary, discussed above could be included in any agreement/contract with the tower owner.

I hope this letter addresses your concerns. If you have any additional questions, please contact me at (518) 457-4343.

Sincerely,

Michael J. Ryan, P.E.
Project Engineer
Bureau of Western Remedial Action
Division of Environmental Remediation

cc: Dave Napier, NYSDOH
Ralph VanHouten, Livingston County DOH

APPENDIX B

ADMINISTRATIVE RECORD

The following documents, which have been available at the document repositories, constitute the Administrative Record for the Enarc-O Machine Products, Inc. Site, Remedial Investigation/Feasibility Study.

MAY 1991:	Site Assessment
SEPTEMBER 1996:	Remedial Investigation Report
JUNE 1997:	Feasibility Study Report
JUNE 1997:	Proposed Remedial Action Plan

APPENDIX C

Health and Safety Plan

ENVIRONMENTAL HEALTH & SAFETY PLAN

ENARC-O MACHINE PRODUCTS REMEDIATION IMPLEMENTATION, OPERATION AND MAINTENANCE

LIMA, NEW YORK

by

Haley & Aldrich of New York
Rochester, New York

for

Kaddis Manufacturing, Inc.

File No. 70372-050
NOVEMBER 1999

ENVIRONMENTAL HEALTH AND SAFETY REQUIREMENTS

TABLE OF CONTENTS

* Task-specific pages are non-paginated to allow for duplication.

TABLE OF CONTENTS (Cont.)

TABLE OF CONTENTS (Cont.)

EMERGENCY PHONE NUMBERS

Livingston County Emergency Services	**911**
Ambulance Service	**911**
Fire Department	**911**
Police Department	**911**
H&A of New York Project Manager	
Robert J. Mahoney	**327-5535**
Vincent B. Dick	**327-5507**
H&A of New York Health & Safety Representative	
Jim Marschner	**327-5515**
Kaddis Manufacturing Corp. Project Manager	
Ronald Iannucci, Sr.	**465-9000**
Enarc-O Machine Products, Inc. H&S Representative	
Bruce Whitmore	**716-624-3070**
Occupation Health Physician	**275-7795**
Dr. Kenneth Dodgeson	
Strong Memorial Hospital	
601 Elmwood Avenue	
Rochester, New York	
CHEMTREC (CHEMICAL TRANSPORTATION EMERGENCY CENTER)	**1-800-424-9300**
Hospital - Strong Memorial Hospital	**275-4511**
601 Elmwood Ave.	
Rochester, New York	
Emergency Dept. (map next page)	
Poison Control 275-5151	
Strong Memorial Hospital	
New York State Department of Health	423-8071
David Napier	
Livingston County Health Department	243-7280
Ralph van Houten	
New York State Department of Environmental Conservation	
- Region 8 Office, Avon, NY	716-226-2466
- Albany Div. Haz. Waste Remed. - Mike Ryan, P.E.	518-457-4343

Map to Hospital
(attach below)

TASK MODIFICATIONS AND PLAN APPROVAL

LIST BELOW EACH MODIFICATION TO THIS PLAN AND DATE MODIFIED

1.

2.

THE FOLLOWING SIGNATURES CONSTITUTE APPROVAL OF THIS HEALTH & SAFETY PLAN. THIS PLAN SHOULD NOT BE DEVIATED FROM WITHOUT PRIOR WRITTEN OR VERBAL APPROVAL.

THIS PLAN APPROVED BY:		REVISIONS:	
CORPORATE HEALTH & SAFETY MANAGER	DATE	INITIAL/DATE	INITIAL/DATE
H&A BRANCH HEALTH & SAFETY MANAGER	DATE	INITIAL/DATE	INITIAL/DATE
PROJECT MANAGER	DATE	INITIAL/DATE	INITIAL/DATE

HEALTH AND SAFETY BRIEFING:

I HAVE READ, UNDERSTOOD AND AGREE TO FOLLOW THIS HEALTH & SAFETY PLAN.

			REVISIONS:	
NAME	SIGNATURE	DATE	INITIAL/DATE	INITIAL/DATE
NAME	SIGNATURE	DATE	INITIAL/DATE	INITIAL/DATE
NAME	SIGNATURE	DATE	INITIAL/DATE	INITIAL/DATE
NAME	SIGNATURE	DATE	INITIAL/DATE	INITIAL/DATE
NAME	SIGNATURE	DATE	INITIAL/DATE	INITIAL/DATE
NAME	SIGNATURE	DATE	INITIAL/DATE	INITIAL/DATE
NAME	SIGNATURE	DATE	INITIAL/DATE	INITIAL/DATE

I. INTRODUCTION

This document presents the Enarc-O Machine Products Environmental Health and Safety Plan, to be followed by authorized contractors, Haley & Aldrich of New York, and other persons engaged in field activities associated with environmental projects conducted at the Enarc-O Machine Products site. The scope of work covered by this Health and Safety Plan (HSP) includes, but is not limited to, such projects as: soil excavation, well installation, groundwater sampling, soil and groundwater remediation, and remedial system operation and maintenance.

The provisions of this HSP are mandatory for all personnel assigned to the activities described in the work plan for this project. The Health and Safety procedures contained in this document have been developed for the activities associated with this project and will be periodically reviewed and revised as necessary to keep them current and technically correct.

The requirements set forth in this HSP are minimum health and safety protocols and duties to be adhered to and enforced during environmental investigation activities described in the following sections.

Plan Organization

Occupational Safety and Health Administration (OSHA) regulations under 29 CFR 1910.120 require that a project specific health and safety plan be developed for RCRA and CERCLA related hazardous materials/waste investigations and activities. This plan has been developed to meet these requirements and related OSHA criteria such as, but not limited to, respiratory protection, eye and hearing protection, trenching/excavation safety and confined space entry. This plan includes hazard evaluation, engineering controls, administrative controls, personal protective equipment (PPE), monitoring procedures, decontamination procedures, and emergency response provisions to meet the OSHA requirements above.

The plan is organized into two parts. The first part (Section II) contains task-specific health and safety procedures. It is intended to be updated and revised as new tasks are added to the project or new information becomes available which modifies task-specific health & safety needs. The second part (Section III) describes general health and safety procedures and information that applies to all tasks. Personal exposure limits (PELs), odor thresholds and hazardous compound physical properties appear in Table 1. Monitoring instrument action levels and appropriate level of protection responses appear in Table 2. **EMERGENCY CONTACTS AND PHONE NUMBERS ARE LISTED IMMEDIATELY FOLLOWING THE TABLE OF CONTENTS.**

II. TASK SPECIFIC HEALTH & SAFETY PROCEDURES

2.1 MASTER TASK LIST

This section describes health & safety procedures specific to individual tasks associated with the project. Additional task description sheets shall be developed and added to this section as necessary.

A master list of the tasks included in this section is provided below.

	Task Name
1	Excavate Courtyard Soil/Place Backfill
2	Install Angled Extraction Wells, Horizontal Extraction Piping and vent pipes/turbines
3	Operation and Maintenance of Remediation System
4	
5	
6	
7	
8	
9	

2.2 TASK-SPECIFIC HEALTH AND SAFETY REQUIREMENTS

x Initial

___ Revision

Task Name(s)*: 1. **Excavate Courtyard Soil / Place Backfill**

Task Description: **Excavate courtyard area to approximately 4 ft. depth; transport soil to landfill, place clean backfill (after piping installation).**

Duration:

Media Affected: x air x soil ___ surface water ___ waste ___ groundwater

Area Within Site Where Task(s) to be performed:

Source area (courtyard)

2.2.1 HAZARD EVALUATION (check all that apply)

CHEMICAL HAZARDS:**

CHARACTERISTICS:

	FLAMMABLE/COMBUSTIBLE
	CORROSIVE
	REACTIVE
x	TOXIC
x	VOLATILE
	EXPLOSIVE
	RADIOACTIVE
	UNKNOWN
	OTHER

TYPE:

x	SOLID/DUST
___	LIQUID/MIST
___	SLUDGE
x	GAS/VAPOR/FUMES
x	ORGANIC
___	HEAVY METAL
___	INORGANIC
___	PESTICIDE
___	PCB
___	ACID
___	BASE
___	CARCINOGEN
___	FUEL/PETROLEUM PRODUCT
___	OTHER

PHYSICAL HAZARDS:

x	ACTIVE CONSTRUCTION SITE
___	CONFINED SPACE ENTRY
___	ELECTRICAL EQUIPMENT
x	EXCAVATION/TRENCHING
x	UNDERGROUND UTILITIES
___	OVERHEAD UTILITIES
___	OPEN WATER
___	TEMPERATURE EXTREMES
x	NOISE
___	ASBESTOS
___	OTHER _____

* May include individual or related tasks for which hazards and health and safety requirements are common. Refer to General Health and Safety Procedures (Section III) as necessary.

** Verify that compounds that may be encountered are listed in Table 1.

2.2.2 PROTECTIVE AND CONTROL MEASURES

ENGINEERING CONTROLS:
EQUIPMENT:

- ___ VENTILATE AREA
- ___ DISCONNECT/CLEANOUT LINES
- ___ SLOPE EXCAVATION
- x TAPE OFF AREA
- ___ POST WORK/WARNING SIGNS
- ___ PLASTIC SHEETING IN AREA
- x DESIGNATE NO SMOKING AREA
- ___ ESCAPE LADDER
- x UTILITY CLEARANCES OBTAINED (DIG SAFE CONTACTED)
- x PRIVATE UTILITIES CLEARED
- ___ LINES SHIELDED/DE-ENERGIZED LOCKED & TAGGED OUT
- ___ LIFE JACKETS/BARRICADES NEAR WATER
- ___ HEAT OR AIR CONDITIONING SOURCE FOR TEMPERATURE EXTREMES
- ___ OTHER

LEVEL OF PROTECTION:

- x MODIFIED D (HOW MODIFIED) tyvek suits
- ___ LEVEL D
- ___ MODIFIED C (HOW MODIFIED) _____
- ___ LEVEL C
- ___ MODIFIED B (HOW MODIFIED) _____
- ___ LEVEL B

PERSONAL PROTECTIVE

- x SAFETY GLASSES
- ___ EYE/FACE SHIELD
- x GLOVES (CIRCLE TYPES) INNER SHORE EXCAV SILVER SHIELD, OTHER _____
- ___ DUCT TAPE
- ___ EAR PROTECTION (CIRCLE TYPE) EAR PLUGS, EAR PHONES
- x BOOTS (CIRCLE TYPE) STEEL TOE, DISPOSABLE COVERS, LATEX, WADERS, OTHER _____
- x TYVEK COVERALL
- ___ SARANEX COVERALL
- x HARD HAT
- ___ RESPIRATOR (INDICATE TYPE OF CARTRIDGE) GMC-H
- ___ FIRE EXTINGUISHER
- x FIRST AID KIT
- ___ LOUD SIGNALING DEVICE (CIRCLE TYPE) AIR HORN, WHISTLE
- ___ FLASHLIGHT
- SAFETY SHOWER/EYE WASH
- ___ WALKIE-TALKIE
- OTHER: _____

2.2.3 ENVIRONMENTAL MONITORING

Equipment:	Action Thresholds*	Level of Protection
HNU (CIRCLE ONE) 10.2 EV 11.7 EV		
x PHOTOVAC MIRCROTIP (10.6 EV)		
OVA		
EXPLOSIMETER/O_2 METER		
RADIATION METER		
HYDROGEN CYANIDE METER		
PHOTOVAC GC		
DRAEGER TUBE _____		
RESPIRABLE DUST MONITOR		
OTHER Mini Rae PID		

Frequency

- BREATHING ZONE
- PERIMETER

___ * List only those differing from or in addition to Table 2.

x Initial

___ Revision

Task Name(s)*: **2. Install Angled Extraction Wells, Horizontal Extraction Piping and vent pipes/turbines**

Task Description: **Drill and install angled wells through foundation wall, after courtyard excavation is complete (containerize or stockpile/cover contaminated soil); install horizontal piping on base of excavation; connect riser piping and turbines.**

Duration: 1 week

Media Affected: x air x soil ___ surface water ___ waste ___ groundwater

Area Within Site Where Task(s) to be performed:

Source area (courtyard)

2.2.1 **HAZARD EVALUATION** (check all that apply)

CHEMICAL HAZARDS:**

CHARACTERISTICS:

	FLAMMABLE/COMBUSTIBLE
	CORROSIVE
	REACTIVE
x	TOXIC
x	VOLATILE
	EXPLOSIVE
	RADIOACTIVE
	UNKNOWN
	OTHER

TYPE:

	SOLID/DUST
___	LIQUID/MIST
___	SLUDGE
x	GAS/VAPOR/FUMES
x	ORGANIC
___	HEAVY METAL
___	INORGANIC
___	PESTICIDE
___	PCB
___	ACID
___	BASE
___	CARCINOGEN
___	FUEL/PETROLEUM PRODUCT
___	OTHER

PHYSICAL HAZARDS:

x	ACTIVE CONSTRUCTION SITE
___	CONFINED SPACE ENTRY
___	ELECTRICAL EQUIPMENT
___	EXCAVATION/TRENCHING
x	UNDERGROUND UTILITIES
___	OVERHEAD UTILITIES
___	OPEN WATER
___	TEMPERATURE EXTREMES
x	NOISE
___	*ASBESTOS*
	OTHER _____

* May include individual or related tasks for which hazards and health and safety requirements are common. Refer to General Health and Safety Procedures (Section III) as necessary.

** Verify that compounds that may be encountered are listed in Table 1.

2.2.2 PROTECTIVE AND CONTROL MEASURES

ENGINEERING CONTROLS:

EQUIPMENT:

- ___ VENTILATE AREA
- ___ DISCONNECT/CLEANOUT LINES
- ___ SLOPE EXCAVATION
- x TAPE OFF AREA
- ___ POST WORK/WARNING SIGNS
- ___ PLASTIC SHEETING IN AREA
- x DESIGNATE NO SMOKING AREA
- ___ ESCAPE LADDER
- x UTILITY CLEARANCES OBTAINED (DIG SAFE CONTACTED)
- x PRIVATE UTILITIES CLEARED
- ___ LINES SHIELDED/DE-ENERGIZED LOCKED & TAGGED OUT
- ___ LIFE JACKETS/BARRICADES NEAR WATER
- ___ HEAT OR AIR CONDITIONING SOURCE FOR TEMPERATURE EXTREMES
- ___ OTHER

LEVEL OF PROTECTION:

- x MODIFIED D (HOW MODIFIED) tyvek suits
- ___ LEVEL D
- ___ MODIFIED C (HOW MODIFIED) _____
- ___ LEVEL C
- ___ MODIFIED B (HOW MODIFIED) _____
- ___ LEVEL B

PERSONAL PROTECTIVE

- x SAFETY GLASSES
- ___ EYE/FACE SHIELD
- x GLOVES (CIRCLE TYPES) INNER SHORE EXCAV SILVER SHIELD, OTHER _____
- ___ DUCT TAPE
- ___ EAR PROTECTION (CIRCLE TYPE) EAR PLUGS, EAR PHONES
- x BOOTS (CIRCLE TYPE) STEEL TOE, DISPOSABLE COVERS, LATEX, WADERS, OTHER _____
- x TYVEK COVERALL
- ___ SARANEX COVERALL
- x HARD HAT
- ___ RESPIRATOR (INDICATE TYPE OF CARTRIDGE) GMC-H
- ___ FIRE EXTINGUISHER
- x FIRST AID KIT
- ___ LOUD SIGNALING DEVICE (CIRCLE TYPE) AIR HORN, WHISTLE
- ___ FLASHLIGHT
- ___ SAFETY SHOWER/EYE WASH
- ___ WALKIE-TALKIE
- ___ OTHER: _____

2.2.3 ENVIRONMENTAL MONITORING

Equipment:	Action Thresholds*	Level of Protection
HNU (CIRCLE ONE) 10.2 EV 11.7 EV		
x PHOTOVAC MIRCROTIP (10.6 EV)		
OVA		
EXPLOSIMETER/O_2 METER		
RADIATION METER		
HYDROGEN CYANIDE METER		
PHOTOVAC GC		
DRAEGER TUBE _____		
RESPIRABLE DUST MONITOR		
OTHER Mini Rae		

Frequency

- BREATHING ZONE
- PERIMETER

___ * List only those differing from or in addition to Table 2.

_x_ Initial

___ Revision

Task Name(s)*: **3. Operation and Maintenance of Remediation System**

Task Description: **Perform periodic monitoring (air sampling), maintenance and repair of system. Air sampling involves drawing vapor from sampling ports in PVC riser piping.**

Duration: 1 week

Media Affected: _x_ air __ soil ___ surface water ___ waste ___ groundwater

Area Within Site Where Task(s) to be performed:

Courtyard

2.2.1 **HAZARD EVALUATION** (check all that apply)

CHEMICAL HAZARDS:**

CHARACTERISTICS:

	FLAMMABLE/COMBUSTIBLE
	CORROSIVE
	REACTIVE
x	TOXIC
x	VOLATILE
	EXPLOSIVE
	RADIOACTIVE
	UNKNOWN
	OTHER

TYPE:

	SOLID/DUST
___	LIQUID/MIST
___	SLUDGE
x	GAS/VAPOR/FUMES
x	ORGANIC
___	HEAVY METAL
___	INORGANIC
___	PESTICIDE
___	PCB
___	ACID
___	BASE
___	CARCINOGEN
___	FUEL/PETROLEUM PRODUCT
___	OTHER

PHYSICAL HAZARDS:

___	ACTIVE CONSTRUCTION SITE
___	CONFINED SPACE ENTRY
___	ELECTRICAL EQUIPMENT
___	EXCAVATION/TRENCHING
___	UNDERGROUND UTILITIES
___	OVERHEAD UTILITIES
___	OPEN WATER
___	TEMPERATURE EXTREMES
___	*NOISE*
___	ASBESTOS
___	OTHER _____

* May include individual or related tasks for which hazards and health and safety requirements are common. Refer to General Health and Safety Procedures (Section III) as necessary.

** Verify that compounds that may be encountered are listed in Table 1.

2.2.2 PROTECTIVE AND CONTROL MEASURES

ENGINEERING CONTROLS:

EQUIPMENT:

- ___ VENTILATE AREA
- ___ DISCONNECT/CLEANOUT LINES
- ___ SLOPE EXCAVATION
- x ELIMINATE IGNITION SOURCES
- ___ TAPE OFF AREA
- ___ POST WORK/WARNING SIGNS
- ___ PLASTIC SHEETING IN AREA
- x DESIGNATE NO SMOKING AREA
- ___ ESCAPE LADDER
- ___ UTILITY CLEARANCES OBTAINED (DIG SAFE CONTACTED)
- ___ PRIVATE UTILITIES CLEARED
- ___ LINES SHIELDED/DE-ENERGIZED LOCKED & TAGGED OUT
- ___ LIFE JACKETS/BARRICADES NEAR WATER
- ___ HEAT OR AIR CONDITIONING SOURCE FOR TEMPERATURE EXTREMES
- ___ OTHER

LEVEL OF PROTECTION:

- ___ MODIFIED D (HOW MODIFIED)
- x LEVEL D _____
- ___ MODIFIED C (HOW MODIFIED)
- ___ LEVEL C
- ___ MODIFIED B (HOW MODIFIED) _____
- ___ LEVEL B

PERSONAL PROTECTIVE

- x SAFETY GLASSES
- ___ EYE/FACE SHIELD
- x GLOVES INNER LATEX SHORE EXCAV
  ~~NEOPRENE, BUTYL, PVC NITRILE, SILVER SHIELD, OTHER~~ _____
- ___ DUCT TAPE
- ___ EAR PROTECTION (CIRCLE TYPE) EAR PLUGS, EAR PHONES
- ___ BOOTS (CIRCLE TYPE) STEEL TOE, DISPOSABLE COVERS, LATEX, WADERS, OTHER _____
- ___ TYVEK COVERALL
- ___ SARANEX COVERALL
- ___ HARD HAT
- ___ RESPIRATOR (INDICATE TYPE OF CARTRIDGE) GMC-H
- ___ FIRE EXTINGUISHER
- x FIRST AID KIT
- ___ LOUD SIGNALING DEVICE (CIRCLE TYPE) AIR HORN, WHISTLE
- ___ FLASHLIGHT
- ___ SAFETY SHOWER/EYE WASH
- ___ WALKIE-TALKIE
- ___ OTHER: _____

2.2.3 ENVIRONMENTAL MONITORING

Equipment:	Action Thresholds*	Level of Protection
HNU (CIRCLE ONE) 10.2 EV 11.7 EV		
x PHOTOVAC MIRCROTIP (10.6 EV)		
OVA		
EXPLOSIMETER/O_2 METER		
RADIATION METER		
HYDROGEN CYANIDE METER		
PHOTOVAC GC		
DRAEGER TUBE _____		
RESPIRABLE DUST MONITOR		
x OTHER Mini Rae PID		

Frequency

- BREATHING ZONE
- ___ PERIMETER

* List only those differing from or in addition to Table 2.

TABLE 2

MONITORING METHOD, ACTION LEVELS AND PROTECTIVE MEASURES

INSTRUMENT	HAZARD	ACTION LEVEL[1]	ACTION RESPONSE
Respirable Dust Monitor	Contaminant Particles	> 0.05 mg/m^3	Level C Protection
OVA, HNU[2], Photovac Microtip	Organic Vapors	Background 3 ppm > background or lowest OSHA permissible exposure limit, whichever is lower, or as modified for this task (see Section 2.2.3) 50 ppm over background unless lower values required due to respirator protection factors	Level D Level C, site evacuation may be necessary for specific compounds (see Section 2.2.3) Level B[3]
Explosimeter[4]	Explosive Atmosphere	10% Scale Reading 10-15% Scale Reading > 15% Scale Reading	Proceed with work Monitor with extreme caution Evacuate site
O_2 Meter[5]	Oxygen Deficient Atmosphere	19.5% O_2 19.5% - 25% O_2 < 19.5% O_2 > 22% O_2	Monitor with caution Continue with caution Evacuate site; oxygen deficient Evacuate site; fire hazard
Radiation Meter[6]	Ionizing Radiation	0.1 Millirem/Hour > 1 Millirem/Hour	If > 0.1, radiation sources may be present[7] Evacuate site: radiation hazard
Draeger Tube	Vapors/Gases	Species Dependent > 1 ppm Vinyl Chloride > 1 ppm benzene > 1 ppm 1,1-DCE	Consult manual for concentration/toxicity/detection data. Upgrade to Level C and evacuate. Upgrade to Level B if concentrations of compounds exceed thresholds shown at left.
GC	Organic Vapors	3 ppm > background or lowest OSHA permissible exposure limit, whichever is lower	On site monitoring or tedlar bag sample collection for laboratory analysis

Notes:

1. MONITOR BREATHING ZONE
2. *CAN ALSO BE USED TO MONITOR SOME INORGANIC SPECIES.*
3. POSITIVE PRESSURE DEMAND SELF CONTAINED BREATHING APPARATUS
4. LOWER EXPLOSIVE LIMIT (LEL) SCALE IS 0-100%. LEL FOR MOST GASSES IS 15%.
5. NORMAL ATMOSPHERIC OXYGEN CONCENTRATION AT SEA LEVEL IS ~ 20%.
6. BACKGROUND GAMMA RADIATION IS ~ 0.01 - 0.02 MILLIREMS/HOUR.
7. CONTACT H&A HEALTH AND SAFETY STAFF IMMEDIATELY.

2.2.4 DECONTAMINATION EQUIPMENT AND PROCEDURES

DECONTAMINATION EQUIPMENT:

x	TAP WATER
	DISTILLED WATER
	HEXANE
	METHANOL
	ACETONE
x	ALCONOX
x	BRUSHES
x	PLASTIC SHEETING
	DISPOSAL BAGS
x	WASH TUBS (2)
	PAPER TOWELING
x	STEAM CLEANER

SITE CONTROL/DECONTAMINATION PROCEDURES:

DISTINGUISHING FEATURES WHICH DELINEATE ZONES AND APPROXIMATE DIMENSIONS IN FEET:

EXCLUSION ZONE - **courtyard area, approx. 40 ft. x 40 ft.**

CONTAMINATION REDUCTION ZONE - **20 ft. wide buffer on the open east and south sides of courtyard**

SUPPORT ZONE - **outside contam. reduction zone.**

DECONTAMINATION PROCEDURES WHICH ARE TO OCCUR IN:

EXCLUSION ZONE -

CONTAMINATION REDUCTION ZONE - **Steam Cleaning, washing of PPE, containerizing Decon fluid, containerizing used *PPE***

SUPPORT ZONE - **none**

2.2.5 EMERGENCY RESPONSE

SEE EMERGENCY CONTACTS LISTED IMMEDIATELY FOLLOWING THE TABLE OF CONTENTS.

III. GENERAL HEALTH & SAFETY PROCEDURES

3.1 ADMINISTRATIVE CONTROLS

3.1.1 Initial Health and Safety Training

Personnel will not be permitted to participate in or supervise field activities until they have been trained to a level required by their job function and responsibility. Enarc-O employees, contractors, subcontractors, and consultants who have the potential to be exposed to contaminated materials or physical hazards must complete the training described in the following sections.

3.1.2 40-Hour Health and Safety Training

This basic course provides instruction on the nature of hazardous waste work, protective measures, proper use of personal protective equipment, recognition of signs and symptoms which might indicate exposure to hazardous substances, and decontamination procedures. It is required for all personnel working on-site, such as equipment operators, general laborers, electricians, plumbers, supervisors, management, etc. who may be potentially exposed to hazardous substances, health hazards, or safety hazards consistent with 29 CFR 1910.120. The course must be conducted by a qualified instructor in accordance with 29 CFR 1910.120.

3.1.3 8-hour Annual Refresher Training

Personnel with 40-hour health and safety training are required to attend an annual 8-hour refresher course to remain current in their training. This course must also be conducted by a qualified instructor in accordance with 29 CFR 1910.120.

3.1.4 8-Hour Supervisor Training

On-site management and supervisors directly responsible for or who supervise employees engaged in hazardous waste operations must have eight additional hours of Supervisor training in accordance with 29 CFR 1910.120. This course includes, but is not limited to, elements appropriate to supervising hazardous waste related projects (e.g., accident reporting/investigation, regulatory compliance, work practice observations, auditing, emergency response procedures, etc.).

3.1.5 Additional Training for Specific Projects

Contractors will ensure their personnel have received additional training on specific instrumentation, equipment, confined space entry, construction hazards, etc., as necessary to perform their duties. This specialized training will be provided to personnel before engaging in the specific work activities.

3.1.6 Documentation of Training

The Contractor/Consultant Project Manager will be responsible for maintaining and providing to Kaddis documentation of its employees' compliance with required training. Kaddis will only allow properly trained and qualified personnel to perform work at the site.

3.2 MEDICAL SURVEILLANCE PROGRAM

3.2.1 Purpose

The Medical Surveillance Program is conducted to provide an initial baseline of the worker's health. Subsequent medical exams are used to monitor the worker's continued well being. The implementation of a medical surveillance program is the responsibility of the contractor/subcontractor employer.

3.2.2 Requirements

Medical surveillance is required by the Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120 (f): Hazardous Waste Site Operations and Emergency Response. The Contractor/Consultant's medical surveillance program must meet or exceed these regulatory requirements.

These regulatory requirements include the determination by a physician that the individual being examined is physically able to use respiratory protection and is able to perform the work defined within the specific job description. The capability of an individual to perform the specified work will be determined from examinations that may include:

- Medical and occupational history, and past gastrointestinal, hematologic, renal, cardiovascular, reproductive, immunological, and neurological problems as well as a history of respiratory disease and personal smoking habits;
- Physical examination, including blood pressure measurements;
- Pulmonary function test (FVC and FEV1);
- Chest x-ray;
- ECG (Electrocardiogram);
- Eye examination and visual acuity;
- Audiometry;
- Urinalysis; and
- Blood chemistry: Hematology, serum analyses, heavy metals toxicology.

3.2.3 Periodic Monitoring

All personnel are required to have a physical examination within the 12 months prior to the beginning of their work on-site. This period may be shortened if the Contractor/Consultant Medical Consultant deems this appropriate. The physician performing the physical will insure the requirements of 29 CFR 1910.120(f) are fulfilled. Documentation attesting to current medical monitoring compliance must be maintained on-site by the Contractor/Consultant Safety Officer.

3.3 SITE CONTROLS

3.3.1 Work Site Access Control

Access to client property is dependent upon site-specific conditions under owner permission and will be controlled by the Enarc-O Project Manager. It will be the Contractor/Consultant Project Manager's responsibility to control access to a site by means of temporary barriers such as flagging tape or fencing. The barrier will be inspected daily for integrity and adequacy by the Contractor/Consultant Site Coordinator.

For sites requiring Level C to Level B PPE (personal protective equipment) the area of field operations will be subdivided into three distinct areas. The extent of these areas is task and location specific. Access to each zone will be controlled with fencing and/or plastic flagging tape. The three areas are defined as:

- Exclusion Zone

  The exclusion zone is the area where the highest potential for exposure by dermal or inhalation routes exists. Personal protective equipment is required and a daily log will be kept of all personnel entering this zone. The exclusion zone will be marked off with barricades or barrier tape which will be placed a minimum of 50 feet from the active work area. This 50 foot minimum may be altered in the Task-Specific Health & Safety Requirements (Section II) depending upon actual site layout. During field operations this boundary may be expanded by the Contractor/Consultant Site Coordinator based upon observations and/or monitoring measurements. Whenever possible, all field work should be performed upwind from potential contaminant sources.

- Contamination Reduction Zone

  The contamination reduction zone is the area immediately adjacent to the exclusion zone. The probability of dermal and inhalation exposure is lower than in the exclusion zone. Typically, contamination reduction zones include facilities for personnel or equipment decontamination. Personal protective equipment worn in the exclusion zone may not be worn outside the contamination reduction zone except during emergencies.

o Support Zone

Support zones cover all areas outside the contamination reduction zone. Typically, the support area includes facilities for a lunch area, office spaces, and clean equipment and material storage. Protective clothing worn in the exclusion zone may not be worn in a support zone except in emergencies. Emergency contacts are listed immediately following the Table of Contents.

3.3.2 Visitors:

o Visitors and subcontractors entering the site are subject to the same requirements as contractor and consultant personnel and will only be permitted in the immediate area of active operations (i.e., exclusion zone) after receiving written approval from the Contractor/Consultant Project Manager, and supplying a written agreement to comply with this HSP.

o A visitors log will be kept by the Contractor/Consultant Site Coordinator or other designated person.

o Visitor vehicles are restricted to support zones.

3.3.3 Unauthorized Personnel

All established procedures and actions are designed to prohibit unauthorized entry to the work sites. However, if security is violated, the following actions will be taken:

o Unauthorized personnel found within any active site will be reported to the Contractor/Consultant Project Manager, Safety Officer, and Site Coordinator, and Kaddis Project Manager.

o Unauthorized personnel found in the exclusion zone will be escorted through the contamination reduction zone and will be subject to all decontamination procedures established in the project-specific HSP.

o Any unauthorized personnel entering an active site will be escorted from the facility. No re-entry will be permitted.

3.4 ENGINEERING CONTROLS

Engineering controls will be the method of preference to control health and safety hazards. Examples of engineering controls are:

- The use of excavation equipment to take samples from trenches;
- The use of cover material (soil) to suppress vapor emissions;
- The use of air conditioning in heavy equipment cabs to mitigate operator heat stress; and

o The use of ventilation equipment to eliminate hazardous atmospheres from confined spaces.

Administrative controls and personal protective equipment will be used where engineering controls are not feasible or are inadequate. Administrative controls include the exclusion of unnecessary personnel from hazardous areas. It should be noted that scheduled job rotation is not an acceptable administrative control to reduce employee exposure to airborne chemicals.

The hazard control methods to be employed must be described in the task-specific health & safety requirements where they deviate from those described here. As a project progresses, changes to these methods may be necessary. All such changes will be documented as addenda to the task-specific health & safety procedures.

3.4.1 Standard Safe Work Practices

Standard safe work practices applicable to most site activities are listed below. Additional safe work practices unique to specific site tasks must be included in the task-specific health & safety requirements

1. All field personnel must inform the Contractor/Consultant Site Coordinator or designated representative before entering work areas so that their presence can be recorded.

2. Workers must utilize the "buddy system": at least two members of the field crew (including subcontractor personnel) must be in visual contact with each other on-site whenever work is to be performed. If this is not possible, two-way radios will be used.

3. Eating, drinking, chewing gum or tobacco, smoking, or any other activity that increases the probability of hand-to-mouth transfer of contaminated material will not be permitted at the work site.

4. All personal safety equipment and protective clothing will be worn in conformance with Section 3.7 of this HSP.

5. Disposable outer coveralls, boots and gloves will be secured at the wrists and legs, and there will be closure of the suit around the neck.

6. Individuals getting wet to the skin with chemically contaminated liquids must remove clothing and wash the affected area immediately at a location to be identified in the task-specific health & safety requirements. Clothes wet with such liquids, must be changed. Any skin contact with such liquids, whether considered safe or not, will be dealt with immediately and as completely as possible. Medical attention should be sought as necessary.

7. Hands must be washed before eating, drinking, smoking and before using toilets at the facilities provided.

8. Avoid contact with surfaces either suspected or known to be contaminated, such as puddles, mud, or other discolored surfaces. Store equipment on elevated or protected surfaces to reduce the potential of incidental contamination.

9. Only remove personal protective equipment in the contamination reduction zone per Section 3.3.1.

10. Place all disposable coveralls, gloves, and cartridges in appropriate receptacles at the end of every shift or sooner, as directed by the Contractor/Consultant Site Coordinator.

11. Inspect all non-disposable clothing (i.e. hard hat liner, work gloves, cotton overalls) for contamination in the contamination reduction zone. Any clothing found to be contaminated will be decontaminated or disposed of in a manner approved by the Contractor/Consultant Site Coordinator.

12. Report all injuries to the Contractor/Consultant Site Coordinator, Kaddis Project Manager. An accident report, or equivalent must be completed by the Contractor/Consultant Site Coordinator and submitted to the Kaddis Operations Safety Representative or Project Manager for appropriate follow-up.

13. The presence or consumption of alcoholic beverages or illicit drugs on Enarc-O property or during the work day is strictly forbidden.

14. Spillage or splashing of contaminated materials must be prevented. Spills must be contained and follow up calls made as appropriate for the release.

15. Be alert to unsafe conditions or acts and notify the Contractor/Consultant Site Coordinator.

16. Workers need to be familiar with the work area and surroundings, including:

    - Wind direction in relation to the work area;
    - Accessibility of associates, equipment, vehicles;
    - Available communications;
    - Hot zone (areas of known or suspected contamination);
    - Site access;
    - Nearest water sources.

17. The number of personnel and equipment in the exclusion zone must be kept to a minimum.

18. Wastes generated during work activities must be disposed of in accordance with state, federal, and local, regulations.

3.4.2 Safe Work Permits/Hot Work Permits

Safe Work Permits are to be obtained from the Enarc-O Operations Safety Representative before any work is done that involves:

- o Entering vessels, tanks, pits, trenches, manholes, or other confined spaces.
- o Exposure to toxic or infectious material or to abnormal temperatures or pressures when such exposures are outside the employee's daily routine.
- o Using explosives for blasting or demolition.
- o Using flammable or combustible coatings inside buildings. Application of combustible paints by brush or roller is excluded.
- o Excavating and trenching.
- o Working in elevated areas such as roofs.
- o Using temporary heating devices.
- o Working in designated safe work permit areas.

Hot Work Permits are to be obtained from Enarc-O before any work is done that involves:

- o Operating gasoline powered vehicles or equipment inside buildings.
- o Cutting, welding, lead burning, tar kettles, or similar work involving open flames or very high temperatures. In explosion prone areas, this includes any potential source of ignition, such as electric hand tools.

3.4.3 Working in Confined Spaces

A confined space, as defined by OSHA, is any space having a limited means of egress which is subject to the accumulation of toxic or flammable contaminants or has an oxygen deficient atmosphere.

Confined spaces are also areas where occupants are rendered isolated from help in case of need. Confined spaces include, but are not limited to: Ovens, tanks, vessels, bins, boilers, ducts, sewers, pipe chases, manholes, underground utility vaults, tunnels, pipelines, excavations, and trenches.

If waste activities require entrance into a confined space, strict Health and Safety protocol must be followed. Prior to any confined space work activities, written authorization must be obtained (see Section 3.4.3.1).

3.4.3.1 Confined Space Entry

- o A Safe Work Permit will be issued by Kaddis prior to entry into the confined space. This permit must be completed including the signatures of the Contractor/Consultant Safety Officer and Enarc-O Operations Safety Representative.

- o Only authorized, trained personnel may enter a confined space.

- o Open flame devices will not be used to open frozen or otherwise shut manhole covers, hatches or doors. Hot water or steam will be used to remove ice and snow holding such openings closed.

3.4.3.2 Confined Space Ventilation

The confined space will be ventilated to prevent the accumulation of:

- o Flammable vapors above 10% of the Lower Explosive Limit.

- o Concentrations of combustible dust.

- o Toxic and other contaminants in the atmosphere above one half of the TLV.

3.4.3.3 Safety Concerns

A standby employee will be stationed outside the entrance to the confined space to observe or communicate with the employee at all times. Communications (visual, voice, or signal line) will be maintained between all individuals present. The standby employee will be trained and equipped to initiate rescue operation.

3.4.4 Utility Clearance

Utility clearance will be obtained by the Contractor/Consultant Project Manager from Kaddis Facilities personnel and local utilities before the start of any drilling or excavation conducted at the site.

- o Other local utility clearance can be obtained by calling the Underground Facilitites Protection Organization (UFPO) at 1-800-962-7962.

- o All utilities in the work area should be staked at least two weeks prior to the start of work.

- o All activities must be explained in detail to the respective utility by the Contractor/Consultant Site Coordinator. For some activities, such as blasting, the utility may request to have a representative at the site to expedite emergency response.

3.5 DRILLING SAFETY

Drilling and sampling activities present several potential hazards. Minimizing these hazards requires strict adherence to safe operating procedures.

3.5.1 Drill Crews

Drillers will be responsible for the safe operation of the drill rig as well as their crew's adherence to the requirements of the project-specific *HSP*. The driller must ensure that all safety equipment is in proper condition and is properly used. The members of the drill crew will follow all instructions of the driller, wear all appropriate personal protective equipment, and be aware of the hazards and applicable control procedures.

3.5.2 Rig Inspection

Each day, prior to the start of work, the drill rig and associated equipment will be inspected by the driller. The following checks will be made:

- Vehicle condition: Check proper operation of brakes, lights, steering mechanism, and horn.
- Equipment storage: All equipment such as auger flights, split spoon samplers, hammers, hand tools, etc. will be properly stored in an appropriate location and will be secured before moving the rig.
- Wire rope, Cat Line: All wire rope, cable and Cat Line will be inspected for signs of wear such as broken wires, a reduction in rope diameter, abrasion, or signs of rust. Worn, frayed, or otherwise damaged wire, rope or cable will be replaced.
- Safety equipment: Each rig will have at least one fire extinguisher (Type B/C) and one First Aid Kit.

3.5.3 Rig Set-Up

Each drill rig will be properly blocked and levelled prior to raising the derrick. The rig will be moved only after the derrick has been lowered. The leveling jacks will not be raised until the derrick has been lowered.

Blocking provides a more stable drilling structure by evenly distributing the weight of the rig. Proper blocking ensures that a differential settling of the rig does not occur. Wooden blocks, at least 12 by 12 inches and four to eight inches thick, are recommended and should be placed between the jack swivels and the ground. The emergency brake will be engaged and the wheels that are on the ground chocked.

Site drilling will comply with the following rules:

- Before drilling, the Contractor/Consultant Site Coordinator will ensure an adequate safety zone around the drill rig and associated operations.

- Before drilling, the existence of underground utilities in the work area will be determined and conspicuously marked (See Section 3.4.4).

- If drilling is conducted in the vicinity of overhead power lines, proper distance will be maintained between the drill rig and the lines as per OSHA 29 CFR 1926, Subpart N. The proper distance or shielding technique will be stated in the project-specific HSP.

3.5.4 General Operating Procedures

The operator of the drill rig will only operate from the position of the controls. If the operator must leave this position, the transmission must be in neutral.

When working on the derrick platform, the drill crew should not guide drill rods or pipe into racks by taking hold of a moving line. Materials should not be stored or transported within the derrick. Pipe, drill rods, auger flights, hammers, and other drilling tools should be stored in racks and chained in place. During drilling, penetration hammers will be placed at a safe location on the ground.

3.5.5 Emergency Procedure for Electrical Contact

If a drill rig contacts an electrical line, it may or may not be insulated from the ground by its tires. Death or serious injury will result if a person touches the rig and the ground simultaneously.

- Under most circumstances, the operator and other personnel on the seat of the vehicle should remain seated and not leave the vehicle. Do not move or touch any part, particularly a metallic part, of the vehicle or drill rig.

- If it is determined that the rig should be vacated, all personnel should jump clear and as far as possible from the rig. Do not step off -- jump off, and do not hang on the vehicle or any part of the rig when jumping clear.

- If you are on the ground, stay away from rig and do not let others get near the vehicle. Seek assistance immediately by calling the local emergency services contact. Emergency phone numbers are listed on page iii of this HSP.

3.6 EXCAVATION AND TRENCHING SAFETY

3.6.1 General Excavation and Trenching Safety

The following is a list of minimum requirements for trenching and excavating. Each excavation/trench/shoring project is different, therefore the Contractor/Consultant Project

Manager is responsible for evaluating site specific conditions and making appropriate provisions in the task-specific health and safety requirements (Section II) in conformance with 29 CFR 1926 Subpart P - Excavations.

- Contact the proper utilities to obtain clearance. Prior to work, review the utilities in the area and be sure they have been staked properly (See Section 3.4.4). Before work begins, a Safe Work Permit must be obtained from Enarc-O Operations Safety Representative as per Section 3.4.2.

- Be aware that trenches and excavations deeper than four feet are considered confined spaces and require additional safety precautions, such as shoring. If an excavation exceeds four feet in depth, contact the Enarc-O Operations Safety Representative to review the original Safe Work Permit and ensure that it is adequate.

- The walls and faces of all excavations and trenches more than four feet deep, in which an employee is exposed to danger from moving ground, will be guarded by a shoring system, sloping of the ground, or some other equivalent means. The design of shoring systems must be done by a registered Professional Engineer as per 29 CFR 1926 Subpart P.

- For excavations or trenches in which an employee may be required to enter, excavated or other material will be effectively stored and retained at least two feet or more from the edge of the excavation or trench.

- Daily inspections of excavations will be made by the Contractor/Consultant Site Coordinator. If evidence of possible cave-ins or slides is apparent, all work in the excavation will cease until the necessary precautions have been taken to safeguard employees.

- Trenches more than four feet deep will have ladders or steps located so as to require no more than 25 feet of lateral travel.

- Hard hats and other personal protective equipment will be worn at all times during any type of excavating or trenching operation.

- Determine soil composition (e.g., through soil sampling, soil maps, etc.) and other relevant site conditions, with special emphasis on conditions conducive to cave-ins.

- Monitor the atmosphere in and around trenches on a regular basis to check for explosive, toxic or otherwise dangerous gases and vapors.

- The Contractor/Consultant Project Manager will insure that all employees involved in the excavation activity have appropriate training in safe trenching practices, with emphasis on factors such as:

  - utility line identification
  - cave-in prevention measures

- recognition of conditions which may cause cave-ins
- means of egress from trench

o Water will not be allowed to accumulate in any excavation. Utilize ditches, dikes, pumps, or other means to keep surface water out of trenches.

o All open excavations must be well marked and barricaded.

3.6.2 Cave-In Hazards

The following conditions increase the likelihood of cave-in:

o Soil materials composed of unconsolidated, uncompacted, and/or rounded particles (See 29 CFR 1926 Subpart P - Excavation Standard). Special care must be used when trenching in areas which have previously been excavated and backfilled.

o Soils which have a high water content, or have been subjected to freeze-thaw or frost-heaving.

o Loading of trench walls by adjacent equipment, supplies, structures, "back-dirt" piles, etc.

o Vibration due to equipment operating near excavations.

o Trench walls that are steeper than the angle of repose of the material composing the walls.

o Deep trenches (i.e., high trench walls).

The following precautions should be used to prevent cave-ins in all trenches in excess of 4 ft. deep. These precautions should also be used in trenches less than 4 ft. deep whenever those site conditions just listed indicate the likelihood of a cave-in:

o Sloping: Trench walls should be sloped to the correct angle of repose.

o Shoring: Vertical trench walls (unless composed of solid rock) must be shored and braced, or restrained with movable trench boxes, to prevent cave-in. Shoring systems must be designed by a registered professional engineer and meet accepted engineering requirements.

3.7 PERSONAL PROTECTIVE EQUIPMENT

Protective clothing and respiratory protection help protect workers from chemical hazards. Although personal protective equipment is the least preferred method, it may be necessary if engineering controls and work practices are inadequate in preventing workers from coming in contact with potential hazards. Personal protective equipment (PPE) will be selected for the potential hazards anticipated and detailed in the task-specific health & safety requirements.

Personnel at the work site will have their own appropriate and properly fitted safety equipment and protective clothing. Safety equipment and protective clothing will be used as directed by the Contractor/Consultant Safety Officer. All such non-disposable equipment and clothing will be kept clean and maintained in proper condition. PPE will be supplied by the contractors and their subcontractors. Kaddis will only provide PPE to Enarc-O/Kaddis employees. Personnel will be trained in the use of the required protective equipment and equipment will be properly fitted.

The levels of protection to be used on-site will be based on applicable OSHA and Environmental Protection Agency (EPA) regulations, Kaddis/Enarc-O requirements, environmental sampling data, site conditions, and other factors. It will be the responsibility of the Contractor/Consultant Safety Officer to select the most effective PPE based on the anticipated hazards of the task.

3.7.1 Levels of Protection

The following is a description of the specific requirements of various levels of PPE in conformance with EPA nomenclature.

3.7.1.1 Level A Protection

Level A provides the highest level of respiratory and skin protection. Based on site contaminants, historical sampling, and operational data, utilization of this level of protection is not anticipated. This level of protection is anticipated only in extreme situations beyond the scope of this document, (i.e., HazMat Response).

3.7.1.2 Level B Protection

Level B should be worn when the highest level of respiratory protection, but a lesser level of skin protection is required. It is the minimum level of protection required to conduct any initial field work. Once sampling data (soil, water, or air) has been collected and analyzed, the necessity of this level of protection may be re-evaluated.

Level B Personal Protective Equipment (not limited to the following):

- o Supplied-air respirator (MSHA/NIOSH approved):

A) Pressure-demand, self-contained breathing apparatus

or

B) Pressure-demand, airline respirator with escape bottle.

- o Chemical protective clothing: Chemically resistant to anticipated contaminants, (e.g. Saranex or polyethylene coated Tyvek, Chemrel, or Chem-Tuff).
- o Gloves (outer): Chemically resistant to anticipated contaminants.
- o Gloves (inner)

- o Boots (outer): Chemically resistant to anticipated contaminants.

- o Hard hat*
- o 2-Way radio communications* (intrinsically safe).

- o Joints between gloves, boots, and suit must be taped to ensure an adequate seal.

* The need for these items is dependent upon the work to be performed and will be chosen by the Contractor/Consultant Safety Officer.

3.7.1.3 Level C Protection

Level C protection with an air-purifying respirator should be worn routinely in an atmosphere only after the air contaminant(s) is (are) identified, concentrations measured and the criteria for wearing air-purifying respirator met. Generally, Level C provides the same level of skin protection as Level B, but a lesser degree of respiratory protection.

Level C Personal Protective Equipment:

- o Air-purifying respirators, full-face, (half-face with appropriate safety glasses or goggles when potential for liquid splashes is low), canister or cartridge equipped (MSHA/NIOSH approved).

- o Chemical protective clothing: Chemically resistant to anticipated contaminants, e.g. Saranex or polyethylene coated Tyvek, Chemrel, or Chem-Tuff.

- o Gloves (outer): Chemically resistant to anticipated contaminants.

- o Gloves (inner).

- o Boots (outer): Chemically resistant to anticipated contaminants.

- o Hard hat*

- o 2-Way radio communications* (intrinsically safe).

- o Joints between gloves, boots, and suit must be taped to ensure an adequate seal.

* The need for these items is dependent upon the work to be performed and will be chosen by the Contractor/Consultant Safety Officer.

Criteria for Selection of Level C:

Meeting all of the following criteria permits use of Level C protection:

- o Oxygen concentrations not less than 19.5% or no greater than 22% by volume.
- o Personnel inhalation exposure will be reduced by the respirator below the substance's Threshold Limit Value (TLV)/Permissible Exposure Limit (PEL) or XEL, whichever is lowest and the concentration is within the service limit of the canister/cartridge.
- o Atmospheric contaminant concentrations do not exceed IDLH levels, (See Table 1).
- o Atmospheric contaminants, splashes, or other direct contact will not adversely affect any body area left unprotected by chemically resistant clothing.
- o Job functions do not require self-contained breathing apparatus.
- o Atmospheric contaminant concentrations are not in excess of Level C action criteria, (See Table 2).

3.7.1.4 Level D Protection

Level D is the minimum level of protection to be used during any site activities and does not provide respiratory or skin protection.

Level D Personnel Protective Equipment:

- o Coveralls or work uniform.
- o Gloves*
- o Substantial leather chemical-resistant boots or shoes (steel toe and shank is highly recommended).
- o ANSI Z87 *safety glasses*.

Chemical splash goggles*.

- o Hard hat*.
- o Disposable/reusable footwear covers*

* The need for these items is dependent upon the work to be performed and will be chosen by the Contractor/Consultant Safety Officer.

Criteria For Selection of Level D:
Meeting any of these criteria allows use of Level D protection:

- o No contaminants are present.
- o Work functions preclude splashes, immersion, or potential for unexpected inhalation of any hazardous chemicals.

Level D protection is a minimum work uniform. It can be worn only in areas where the possibility of contact with contamination is minimal.

3.7.2 Personal Protective Equipment (PPE) Selection

PPE selection will be based on the task and the nature of hazards (type of contaminants, duration of exposure), engineering controls, and the work practices that are anticipated. The selected equipment will provide protection from the chemicals suspected to be present and which demonstrate the potential for skin exposure. The PPE chosen for each task will be specified in the task-specific health & safety requirements.

3.7.3 Changes in PPE

The Contractor/Consultant Safety Officer will make the decision to upgrade or downgrade the levels of protection. The decision will be primarily based on the results of the air monitoring performed during site activity.

3.8 AIR MONITORING

3.8.1 Air Monitoring Scope

The Contractor/Consultant Site Coordinator will conduct air monitoring during site operations. Should any monitoring indicate concentrations in excess of established action levels, the Contractor/Consultant Site Coordinator will notify Contractor/Consultant Safety Officer and will implement appropriate action to protect project personnel, Kaddis/Enarc-O employees, and the nearby community.

Continuous air monitoring, in worker's breathing zones, for volatile compounds will be performed during the activities for which inhalation has been identified as a potential exposure route. These activities include, but are not limited to:

- o Drilling and soil sampling.
- o Excavation of contaminated soil for remediation.
- o Construction activities involving excavation in areas of known or potential soil or groundwater contamination.
- o Pump tests where organic vapors were detected during well installation or water

samples.

o Well sampling and hand bailing.

The Contractor/Consultant Site Coordinator should make use of both real time direct reading instruments and laboratory analysis of samples obtained by either grab, filter, sorbent, or wet contaminant collection techniques to measure chemical concentrations. Specific equipment is described in Section 3.8.4 of these Requirements.

3.8.2 Sample Locations

3.8.2.1 Personal Monitoring

Personal monitoring will take place at times proposed by the Contractor/Consultant Safety Officer or Site Coordinator and specified in the task-specific health & safety requirements. In scheduling personal monitoring, consideration will be given to collecting samples at times of maximum potential exposure. Samples will be collected in the employees' breathing zone (9 inch radius hemisphere centered at the nose and forward of the shoulders) utilizing direct reading instruments, flow controlled personal sampling pump, or diffusion type dosimeters.

Scheduled personal samples utilizing sampling pump/sorbent tubes or diffusion type dosimeters should be used to collect full-shift exposure data. If the active operations do not require a full shift work schedule, the sample should be collected for the duration of the active operations. Emphasis should be placed on sampling employees in the exclusion zone, however, employees involved in decontamination procedures will be sampled as well. Additional requirements for personal sampling will be specified in the task-specific health and safety requirements.

Non-scheduled personal samples will be collected as directed by the Contractor/Consultant Safety Officer.

3.8.2.2 Perimeter Monitoring

Real-time air monitoring for volatile organic compounds will also be conducted on a regular basis (e.g., hourly) at the downwind site perimeter (exclusion zone as described in Section 3.3.1). If total organic vapor concentrations attributable to excavation, drilling or other activities conducted at the site, exceed 5 ppm above background, work activity must be halted and monitoring continued. At that point, the Community Air Monitoring Plan must be implemented, as described below.

3.8.2.3 Community Air Monitoring Plan

In the event that total organic vapor levels in the breathing zone of filed personnel exceeds 5 parts per million (ppm) above background, real-time air monitoring for volatile compounds at the perimeter of the Site will be required. The community air monitoring plan includes the following criteria:

- If total organic vapor levels exceed 5 ppm above background at the perimeter of the Site, work activities must be halted and monitoring continued under the provisions of a Minor or Major Vapor Emission Response Plan, as detailed herein. All readings will be recorded and be available for NYSDEC and NYSDOH personnel to review.

Minor Vapor Emissions Response Plan

If the ambient air concentration of organic vapors attributable to exploration activities exceeds 5 ppm above background at the perimeter of the Site, activities will be halted and monitoring continued. If the vapor levels decrease below 5 ppm above background, work activities can resume. If the organic vapor levels are greater than 5 ppm but less than 25 ppm over background at the site perimeter, activities can resume provided:

1) the organic vapor level 200 feet downwind of the Site or one-half the distance to the nearest downwind residential or commercial structure, whichever is less, is below 5 ppm over background; AND

2) the vinyl chloride level (as measured with a drager tube) at the perimeter of the Site is less than 0.5 ppm; AND

3) more frequent intervals of monitoring, as directed by the project safety officer, are conducted.

If the total organic vapor level is above 25 ppm, or the vinyl chloride level is over 0.5 ppm at the perimeter of the Site, activities must be stopped. Downwind monitoring will be continued to minimize the potential impact to the nearest downwind residential or commercial structure at the levels specified in the Major Vapor Emissions Response Plan described below.

Major Vapor Emissions Response Plan

If the total organic vapor levels measured 200 feet downwind of the site, or one-half the distance to the nearest downwind residential or commercial structure (whichever is less) is more than 5 ppm over background, air monitoring must be performed within 20 ft. of these structures ("20 ft. Zone").

All active exploration or sampling operations at the Site shall cease and remain down if any of the following vapor levels are observed within the 20 ft. Zone:

1) Total organic vapors at 5 pm or greater over background; OR

2) vinyl chloride levels greater than 0.5 ppm.

If, following cessation of work activities on the Site, efforts to abate the emission

source are unsuccessful, and any of the above levels persist for more than 30 minutes in the 20 ft. zone, the Major Vapor Emissions Response Plan (MVERP) shall be placed into effect. In addition, any of the following conditions *in the 20 ft. Zone* will necessitate activation of the MVERP:

- sustained organic vapor levels greater than 10 ppm over background; or
- vinyl chloride levels over 1 ppm.

Major Vapor Emissions Response Plan Activation

Upon *MVERP* activation, the following activities will be undertaken:

1. The Safety Officer will be notified; all Emergency Response Contacts listed in the Health and Safety Plan will be contacted, including the local police authorities; AND

2. Air monitoring will be conducted at 30-minute intervals within the 20-ft. Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Safety Officer.

All project employees will be briefed with regard to the details of the Minor and Major Vapor Emission Response Plans, including anticipated hazards, safety practices, emergency procedures, and communication pathways, prior to initiating Site activities.

3.8.3 Sample Methods

3.8.3.1 Integrated Sampling

The Contractor/Consultant Safety Officer will determine if there is a project specific need for integrated sampling and include a detailed sampling plan in the task-specific health & safety requirements.

3.8.3.2 Real Time Sampling

Real time monitoring will be conducted with a photoionization detector equipped with an 10.6 eV lamp or a flame ionization detector as specified in the task-specific Health & Safety section (see Section 2.2.3). These instruments are capable of detecting the volatile organic chemical compounds identified in Table 1 to an approximate lower detection limit of 1 ppm. The OSHA TLV's for the compounds listed in Table 1 are at or above the detection limit of the proposed equipment. The rapid response of these instruments allows for quick determination of airborne concentrations and therefore, subsequent changes in the safety procedures can be implemented if needed (See Section 3.8.4). Refer to Section 2.2.3 for frequency of environmental monitoring.

3.8.4 Air Monitoring Equipment

3.8.4.1 Direct Reading Instruments

The instruments used for air monitoring activities may include, but are not limited to, those listed below. The Contractor/Consultant Safety Officer will make the decision as to which instruments must be on a project-specific basis.

- o A flame ionization detector (FID) equal or superior to Foxboro organic vapor analyzer (OVA) Model 128.

- o A photoionization detector (PID) equal or superior to Photovac Microtip. Due to the general contaminant mix at the site the 10.6 eV probe will be utilized during site investigations.

- o A combustible gas indicator/oxygen meter equal or superior to MSA Model 260 or 360.

  Note: During environmental activities, the potential for creating a flammable atmosphere will be monitored, (e.g., prior to confined space entry, initial operations with atmospheres having the potential to exceed IDLH.) Please refer to Table 2 of this HSP for Action Levels.

Each instrument must be intrinsically safe where warranted. Each will be calibrated and maintained in accordance with the manufacturer's recommendations. Calibration records will be maintained in a daily field logbook.

3.8.4.2 Integrated Sampling Equipment/Techniques

Variable flow, belt mounted personal sampling pumps may be used in conjunction with the appropriate sample media to provide exposure estimates where real time analysis is inadequate. The following equipment/techniques may be used:

- o Diffusion or Permeation Type Dosimeters

- o Analysis of Sorbents

3.8.4.3 Specialized Monitoring Equipment and Analyses

Specialized sampling instruments and analyses (e.g., H_2S monitors, solid sorbents, sampling bags) will be used on project sites on an "as needed" basis as determined by the site conditions, sampling history at the site, and the type of work to be performed. The Contractor/Consultant Safety Officer will determine the need for specialized equipment or analyses on a project specific basis and include thorough descriptions of sampling plans/procedures and equipment operation and maintenance in the task-specific health & safety requirements.

3.8.4.4 Spare Monitoring Equipment

Appropriate spare monitoring equipment will be made available either on the Project Site or at a location in the project area, as determined by the Contractor/Consultant Safety Officer. The location of spare equipment will be included in the task-specific health & safety requirements. Field activities will be suspended if the properly calibrated field monitoring instrumentation is not available.

3.8.5 Record Keeping

A Field Logbook will be maintained by the Contractor/Consultant Site Coordinator. It will be updated daily. The entries will include:

o Task description and date

o Location of work site

o Personnel involved:

- Name
- Function
- Level of personal protection (any change in level of protection will be recorded at the time of implementation)

o Health and Safety instrumentation calibration:

- Instrument name (OVA, LEL, etc.)
- Serial number
- Calibration information (i.e. calibration gas)
- Instrument setting (OVA span set)
- Time of calibration

o Meteorological information

- Type of day (sunny, cloudy, rain, etc.)
- Wind speed and direction (estimate)
- Temperature

o Events of the day in chronological order.

o Health and safety instrumentation readings

- Breathing zone concentrations
- Time
- Sample concentration with corresponding identification number

o Any unusual occurrences, problems or observations

o Signature of writer

Field Logbook Health and Safety entries, data sheets, etc. will be reviewed by the Contractor/Consultant Safety Officer on a regular basis. Upon review, each log book will be signed to demonstrate that the data has been reviewed and approved.

3.8.6 Summary of Action Levels

Project action levels will be determined by the Contractor/Consultant Safety Officer based upon site conditions and information and will be presented in the task-specific health & safety requirements. The levels defined in Tables 1 and 2 of this HSP will serve as guidelines for project action levels.

3.9 HEAT AND COLD STRESS

3.9.1 Heat Stress

Heat stress occurs in several forms. By order of increasing severity, they are:

1. Heat Rash
2. Heat Cramps
3. Heat Exhaustion
4. Heat Stroke

The potential for a worker to develop heat stress is related to the ambient temperature, relative humidity, and the nature of the work being performed. The Contractor/Consultant Safety Officer must include project specific information on heat stress identification, care and prevention procedures in the task-specific health & safety requirements (Section II).

3.9.2 Cold Stress

Cold stress, as well as heat stress, occurs in different forms. By order of increasing severity, they are:

1. Trench Foot
2. Frostbite
3. Hypothermia

The potential for a worker to develop cold stress is related to the ambient temperature, wind chill, protective clothing, and the nature of the work being performed. The Contractor/Consultant Safety Officer must include project specific information on cold stress identification, care and prevention procedures in the task-specific health & safety requirements (Section II).

3.10 DECONTAMINATION

Personnel and equipment are subject to decontamination procedures when exiting the exclusion zone. No contaminated material will be removed from the exclusion zone without undergoing proper decontamination procedures.

3.10.1 Personnel Decontamination

No personal protective equipment will be removed from the exclusion zone without proper decontamination or placement in a disposal receptacle.

Specific personal decontamination procedures must be detailed in the task-specific health & safety requirements (Section II). The following are guidelines for developing personnel decontamination procedures contained in the task-specific health & safety requirements (Section II):

A. Tools, etc. will be dropped off onto a plastic sheet in the exclusion zone for subsequent re-use or decontamination.

B. The boot wash station will consist of two plastic or metal tubs, two garden sprayers, and a boot brush. One sprayer will contain a detergent water mixture, the other will contain clean water.

C. The outer layer of disposable protective clothing will be removed by removing outer boots, outer gloves, hood, tape, etc., and placed in a receptacle for disposal. Clothing will be removed by "peeling" off while turning it inside-out. This will minimize contact with possible contamination on the outer surface.

D. Respirators will be removed and cartridges placed in a receptacle for disposal.

E. Inner gloves will be removed by rolling off the hand while turning them inside-out and placed in a receptacle for disposal.

F. If highly toxic, skin-corrosive or skin-absorbable materials are known or suspected to be present, personnel must shower before exiting the site.

NOTE: The Contractor/Consultant Site Coordinator will ensure established personnel decontamination procedures are properly implemented and enforced.

3.10.2 Equipment Decontamination

Equipment, including drill rigs, will arrive at the site free of debris and contamination. Equipment will be cleaned and decontaminated before departure from the site. Decontamination chemically contaminated equipment will be performed at a minimum of Level C protection for steam cleaning and hydro-washing.

Specific equipment decontamination procedures will be based upon the type of work being

performed and anticipated levels of contamination. The following items are guidelines for the establishment of equipment decontamination procedures to be included in the task-specific health & safety requirements:

A. All equipment that has been in the exclusion zone or the contamination reduction zone will be visually inspected and/or wipe sampled to assess the extent of contamination.

B. Sensitive instrumentation should be handled in a manner which will minimize the potential of exposure to hazardous soils and liquids. This care in handling will greatly reduce the amount of decontamination required. Should the conditions in the exclusion zone present an extreme potential for contamination, instrumentation may be wrapped in plastic.

C. All hand tools, safety equipment, and heavy equipment will be decontaminated before leaving the site. (e.g. high pressure, low volume hot water washed, steam cleaned, brushed with low phosphate detergent, and water rinsed.)

D. Heavy equipment must have visible residues removed in the exclusion zone. Wheels, wheel wells and cabs of vehicles must be cleaned before equipment is removed from the exclusion zone. The equipment may then be moved to a more centrally located decontamination pad for more extensive decontamination. This move must be accomplished in a manner that will prevent the spread of contamination along the travel path. A detailed plan for necessary equipment relocation must be included in the task-specific health & safety requirements (Section II).

E. If warranted and required by the Project Work Plan, samples such as equipment blanks will be taken and submitted for project related analysis to confirm the decontamination procedures.

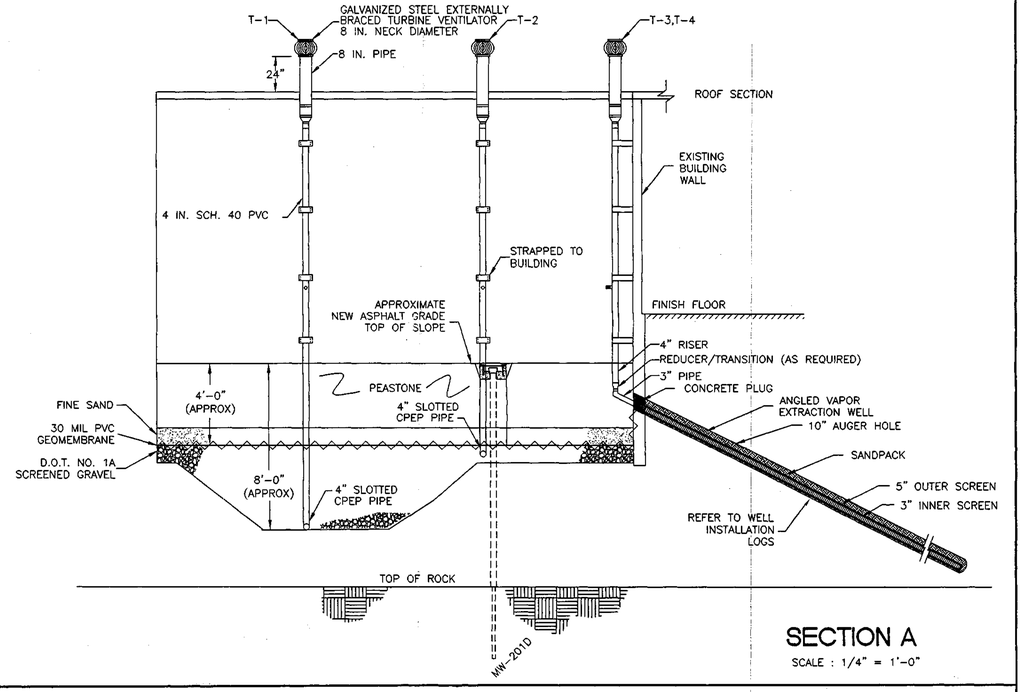
3.10.3 Location of Decontamination Areas

Decontamination areas for project equipment and personnel will be designated by the Kaddis/Enarc-O Project Manager by the following guidelines:

- Each decontamination area will be sited to have access to water and electrical (GFCI protected) supplies as necessary for the decontamination process.
- Access to the decontamination area(s) will be limited and controlled.
- The specific decontamination area(s) for each project will be clearly defined in the task-specific health & safety requirements.

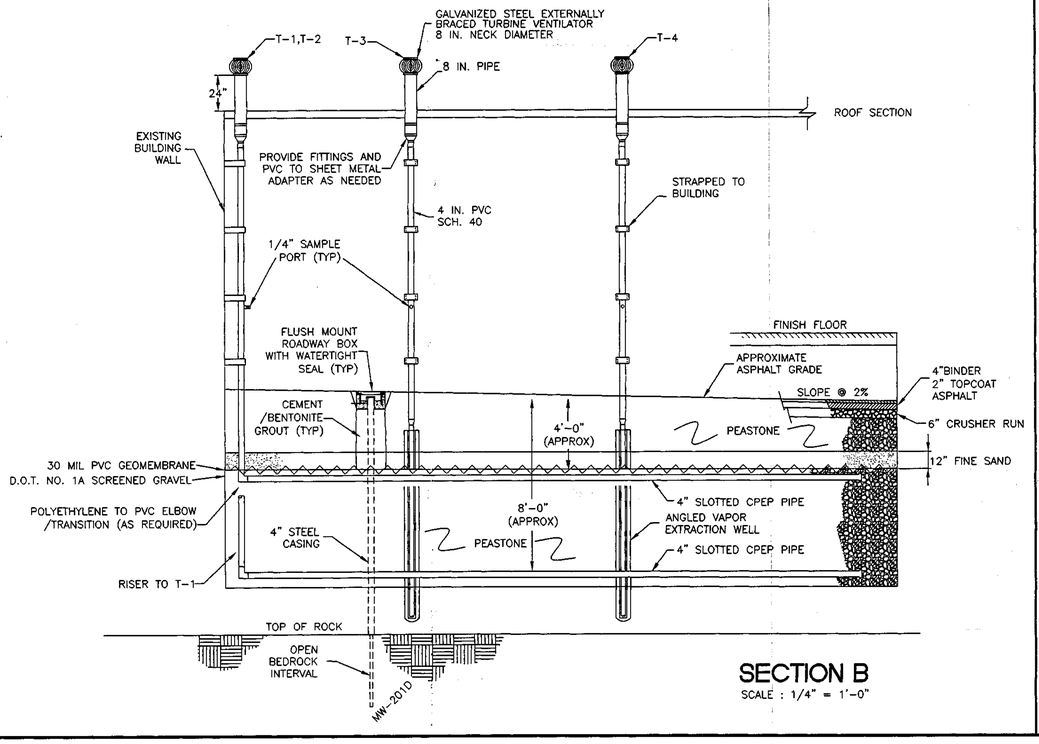
APPENDIX D

Record Drawing, P-1



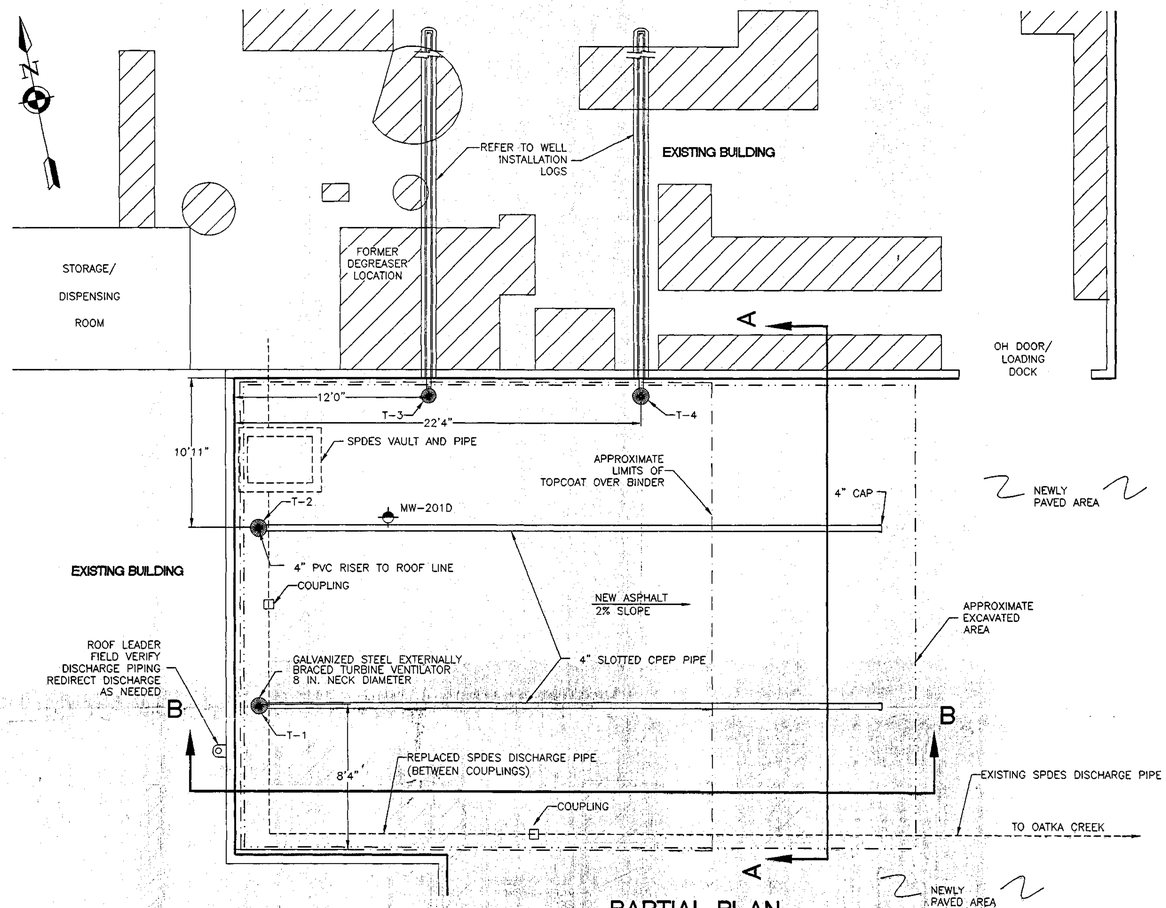
SECTION A

SCALE : 1/4" = 1'-0"



SECTION B

SCALE : 1/4" = 1'-0"



PARTIAL PLAN

NOTES:

1. ALL LOCATIONS AND DIMENSIONS APPROXIMATE TO BE FIELD VERIFIED.
2. 30 MIL PVC GEOMEMBRANE SHOULD COVER ENTIRE EXCAVATED AREA AND SHOULD BE ONE CONTINUOUS PIECE. (GREAT LAKES CONTAINMENT INC. 1-800-455-7800)
3. TOP OF STONE LAYER SHALL BE PREPARED PRIOR TO PLACEMENT OF PVC GEOMEMBRANE. PREPARATION SHALL INCLUDE GRADING AND REMOVAL OF MATERIALS THAT COULD PUNCTURE THE PVC GEOMEMBRANE.
4. CARE SHALL BE TAKEN NOT TO PUNCTURE THE PVC GEOMEMBRANE. HEAVY EQUIPMENT (INCLUDING TRUCKS) SHALL NOT BE DRIVEN OVER THE PLACED SHEETING.
5. SEAL ANY PENETRATIONS OF THE BARRIER MATERIAL FOR PIPING, ETC.
6. ANGLED WELLS BY OTHERS, EXACT LOCATIONS TO BE DETERMINED.
7. 4" SLOTTED CORRUGATED POLYETHYLENE PIPE (CPEP) AS SUPPLIED FROM ADS OR APPROVED EQUAL.
8. EXTERNALLY BRACED TURBINE VENTILATOR AS SUPPLIED FROM GRAINGER NO. 2C529 OR APPROVED EQUAL.
9. PROPERLY SUPPORT ALL PIPING TO BUILDING.
10. PROTECT EXISTING WELLS TO NEW PAVED GRADE AND PROVIDE ROADWAY BOX FOR EACH.
11. PAVEMENT TO BE 4" TYPE 3 NYSDOT ASPHALT OVER 6" CRUSHER RUN. SLOPE ASPHALT AT 2% AWAY FROM BLDG TO MATCH EXISTING GRADE.
12. ALL EXISTING UTILITIES WILL BE PROTECTED DURING CONSTRUCTION AND ROOF LEADER TO BE REDIRECTED IF REQUIRED.
13. SELECT BACKFILL TO BE COMPACTED IN 12 INCH LIFTS.
14. JOINT BETWEEN THE ASPHALT AND EXISTING BLDG WALLS SHALL BE SEALED.

LEGEND:

- FLOOR AREA OBSTRUCTED BY EQUIPMENT, STORAGE OR OTHER, (DIMENSIONS APPROXIMATE).
- APPROX. EXCAVATION LIMITS
- ASPHALT PAVING LIMITS
- MW-201S — OVERBURDEN MONITORING WELL (ABANDONED)
- MW-201D — BEDROCK MONITORING WELL

1/4" = 1'-0"
0 4'-0" 8'-0"
SCALE (IN FEET)

ISSUE	DATE	REVISIONS	BY
1	11/19/99	RECORD DRAWING	H&A
D	01/12/99	REVISED FINAL	H&A
C	10/13/98	FINAL	H&A
B	9/25/98	FINAL DRAFT	H&A
A	08/15/98	ISSUE FOR REVIEW	H&A

STATE OF NEW YORK — WAYNE CHARLES HALEY — 076781 — LICENSED PROFESSIONAL ENGINEER

HALEY & ALDRICH
UNDERGROUND ENGINEERING & ENVIRONMENTAL SOLUTIONS
Haley & Aldrich, Inc.
189 North Water Street
Rochester, New York 14604-1151
Tel: 716.232.7386
Fax: 716.232.6768

ENARC-O MACHINE PRODUCTS, INC.
REMEDIATION CONSTRUCTION
LIMA, NEW YORK

LOW-VACUUM VAPOR EXTRACTION SYSTEM RECORD DRAWING

0 1/2 1
THIS BAR MEASURES 1" AT TRUE SCALE

Project Engineer:	MNR
Designed By:	RJM/VBD
Drawn By:	RJS
Checked By:	WCH
Sheet No.:	1 of 1
Date:	SEPT 1998
File No.	70372-050
Scale:	1/4" = 1'
Filename:	RECORD
Drawing No.	P-1
Issue	1

70372-050

APPENDIX E

Disposal Profiles and Manifests

HIGH ACRES LANDFILL
A WASTE MANAGEMENT COMPANY

425 Perington Parkway
Fairport, NY 14450
(716) 223-6132
(716) 223-6898 Fax

September 2, 1999

Mr. Frank Thomas
SAW Environmental
81 O'Connor Rd.
Fairport, NY 14450

RE: Approvals

Dear Mr. Thomas,

Enclosed is your approval for the following waste stream:

Generator:	**Kaddis Manufacturing Corp.**
Waste Profile:	**CO1984**
Waste Name:	**Contaminated soil**
Approximate volume:	**250 yards**
Valid Until:	**03/01/00**

Please review the approved profile and note any precautions or conditions in Section D. Should you have any questions at all, please contact me directly @ (716)754-0365.

Sincerely,

James L. Callahan

James L. Callahan
Inside Sales Representative

Enc.
cc: File

WASTE MANAGEMENT

GENERATOR'S WASTE PROFILE SHEET

PLEASE PRINT IN INK OR TYPE

Service Agreement on File? ☐YES ☐NO
☐Hazardous ☒Non-Hazardous ☐TSCA

Profile Number: C01984
Renewal Date: 3 1 1 00

A. Waste Generator Information

1. Generator Name: Kaddis Manufacturing Corp.
2. SIC Code: 3479 CEN
3. Facility Street Address: 1127 Boggs St.
4. Phone: (716) 624-3070
5. Facility City: Lima
6. State/Province: NY
7. Zip/Postal Code: 14485
8. Generator USEPA/Federal ID #: NY0002205882
9. County: Livingston
10. State/Province ID #:
11. Customer Name: S.A.W. Environmental Services
12. Customer Phone: (716) 377-5545
13. Customer Contact: Frank Thomas
14. Customer Fax: 716 377 4190
15. Billing Address: 81 O'Connor Road, Fairport, NY ☐Same as above

B. Waste Stream Information

1. Description
   a. Name of Waste: Contaminated Soil
   b. Process Generating Waste: Degreasing Solvent Spill

c. Color	d. Strong odor (describe):	e. Physical state @ 70°F	f. Layers	g. Free liquid range
Brown	--	☒Solid ☐Liquid ☐Gas ☐Sludge ☐Other	☐Single Layer ☐Multi-layer N.A.	to %
				h. pH: Range to %

i. Liquid Flash Point: ☐<73°F ☐73-99°F ☐100-139°F ☐140-199°F ☐≥ 200°F ☒Not applicable

j. Chemical Composition (List all constituents (including halogenated organics, debris, and UHC's) present in any concentration and submit representative analysis):

Constituents	Concentration Range	Constituents	Concentration Range
Soil	100 % ?		
VOCs (unattached)	Trace		

TOTAL COMPOSITION MUST EQUAL OR EXCEED 100%

k. ☐Oxidizer ☐Pyrophoric ☐Explosive ☐Radioactive ☐Carcinogen ☐Infectious ☐Shock Sensitive ☐Water Reactive

l. Does the waste represented by this profile contain any of the carcinogens which require OSHA notification? (list in Section B.1.j)..... ☐YES ☒NO

m. Does the waste represented by this profile contain dioxins? (list in Section B.1.j)..... ☐YES ☒NO

n. Does the waste represented by this profile contain asbestos?..... ☐YES ☒NO
If yes..... ☐friable ☐non-friable

o. Does the waste represented by this profile contain benzene?..... ☐YES ☒NO
If yes, concentration _____ ppm
Is the waste subject to the benzene waste operations NESHAP?..... ☐YES ☒NO

p. Is the waste subject to RCRA Subpart CC controls?..... ☐YES ☒NO
If no, does the waste meet the organic LDR Exemption?..... ☐YES ☒NO
If no, does the waste contain <500 ppmw volatile organic (VO)?..... ☐YES ☒NO
Volatile organic concentration _____ ppmw

q. Does the waste contain any Class I or Class II ozone-depleting substances?..... ☐YES ☒NO

r. Does the waste contain debris? (list in Section B.1.j)..... ☐YES ☒NO

2. Quantity of Waste
Estimated Annual Volume 250 ☐Tons ☒Yards ☐Drums ☐Other (specify) _____

3. Shipping Information
   a. Packaging:
   ☐Bulk Solid; Type/Size: _____ ☐Bulk Liquid; Type/Size: _____
   ☐Drum; Type; Size: _____ ☒Other: Soil - Dump Trucks
   b. Shipping Frequency: Units _____ Per: ☐Month ☐Quarter ☐Year ☐One time ☐Other _____
   c. Is this a U.S. Department of Transportation (USDOT) Hazardous Material? (If no, skip d, e, and f)..... ☐YES ☐NO

WM WASTE MANAGEMENT

GENERATOR'S WASTE PROFILE SHEET

PLEASE PRINT IN INK OR TYPE

d. Reportable Quantity (lbs.;kgs.): "NA" e. Hazard Class/ID #: "NA"
f. USDOT Shipping Name: "NA"
g. Personal Protective Equipment Requirements: LEVEL "D"
h. Transporter/Transfer Station: Silvaple Trucking

C. Generator's Certification (Please check appropriate responses, sign, and date below.)

1. Is this a USEPA hazardous waste (40 CFR Part 261)? If the answer is no, skip to 2 ☐YES ☒NO
   a. If yes, identify ALL USEPA listed and characteristic waste code numbers (D, F, K, P, U)
   b. If a characteristic hazardous waste, do underlying hazardous constituents (UHCs) apply? (if yes, list in Section B.1.j) ☐YES ☐NO
   c. Does this waste contain debris? (if yes, list size and type in Chemical Composition - B.1.) ☐YES ☒NO
2. Is this a state hazardous waste? ☐YES ☒NO
   Identify ALL state hazardous waste codes
3. Is the waste from a CERCLA (40 CFR 300, Appendix B) or state mandated clean-up? ☒YES ☐NO
   If yes, attach Record of Decision (ROD), 104/106 or 122 order or court order that governs site clean-up activity. For state mandated clean-up, provide relevant documentation.
4. Does the waste represented by this waste profile sheet contain radioactive material, or is disposal regulated by the Nuclear Regulatory Commission? ☐YES ☒NO
5. Does the waste represented by this waste profile sheet contain concentrations of Polychlorinated Biphenyls (PCBs) regulated by 40 CFR 761? (if yes, list in Chemical Composition - B.1.j) ☐YES ☒NO
   a. If yes, were the PCBs imported into the U.S.? ☐YES ☐NO
6. Do the waste profile sheet and all attachments contain true and accurate descriptions of the waste material, and has all relevant information within the possession of the Generator regarding known or suspected hazards pertaining to the waste been disclosed to the Contractor? ☒YES ☐NO
7. Will all changes which occur in the character of the waste be identified by the Generator and disclosed to the Contractor prior to providing the waste to the Contractor? ☒YES ☐NO

☐Check here if a Certificate of Destruction or Disposal is required.

Any sample submitted is representative as defined in 40 CFR 261 - Appendix I or by using an equivalent method. I authorize WM to obtain a sample from any waste shipment for purposes of recertification. If this certification is made by a broker, the undersigned signs as authorized agent of the generator and has confirmed the information contained in this Profile Sheet from information provided by the generator and additional information as it has determined to be reasonably necessary. If approved for management, Contractor has all the necessary permits and licenses for the waste that has been characterized and identified by this approved profile.

Certification Signature: Title: V.P. Purch
Name (Type or Print): Ronald D. Iannucci Company Name: Kaiser Date: 8/19/99
☐Check if additional information is attached. Indicate the number of attached pages

D. WM Management's Decision — FOR WM USE ONLY

1. Management Method ☒Landfill ☐Non-hazardous Solidification ☐Bioremediation ☐Incineration ☐Hazardous Stabilization ☐Other (Specify)
2. Proposed Ultimate Management Facility: High Acres
3. Precautions, Special Handling Procedures, or Limitation on Approval: Use as daily cover. Material may be stockpiled, ensure stockpile is properly barred.
4. Waste Form 5. Source 6. System Type
Special Waste Decision ☒Approved ☐Disapproved
Salesperson's Signature: Date:
Division Approval Signature (Optional): Date:
Special Waste Approvals Person Signature: Jan L. Callah Date: 9/2/99

Form WM-4155 (03/97)

Waste Management of New York
High Acres Landfill & Recycling Center
425 Perinton Parkway
Fairport, NY 14450
(716)754-0365 Fax (716)754-0207

SERVICE AGREEMENT
NON-HAZARDOUS WASTE DISPOSAL

The above-named disposal facility and corporation are referred to herein as "Facility" and "Contractor", respectfully.

CUSTOMER'S BILLING NAME:
SAW Environmental Services

CUSTOMER'S BILLING ADDRESS:
81 O'Connor Rd.
Fairport, NY 14450

CUSTOMER CONTACT: Jon Heerkens

PHONE NUMBER: (716)377-5545
FAX NUMBER: (716)377-3861

BANK REFERENCE:
CONTACT NAME: **PHONE NUMBER:**

Credit may be extended to Customer after appropriate credit information, in a form acceptable to Contractor, has been presented to and reviewed by Contractor. Contractor may, in its sole discretion, require a collateral deposit (in the form of cash, letter of credit or surety bond) acceptable to Contractor. It is the responsibility of the Customer to keep said collateral deposit current. Collateral deposits, where utilized, may be adjusted when there is an increase in disposal tonnage and/or rates. Collateral deficiencies must be corrected within 30 days of notice of required adjustment.

This is a legally binding contract, and Contractor agrees to provide and Customer agrees to accept the waste disposal services subject to the terms and conditions specified in this contract.

DESCRIPTION OF WASTE FOR DISPOSAL:
Contaminated soil under various profiles

PRICING:
Disposal: $20.00 per ton
Transportation: N/A

8% Sales tax is charged if Transportation & Disposal are being billed.

The terms and conditions are part of this agreement and shall be attached hereto.

CUSTOMER

Authorized Signature

Title

CONTRACTOR

Representative

Title

High Acres Landfill
425 Perinton Parkway
Fairport, NY 14450
(716)223-6132

Manifest № 8366
Western Expansion Site Permit No. NYS DEC 8-2644-00048/00021-0
High Acres Site Permit No. NYSDEC 8-2644-00048/00003

NON-HAZARDOUS SPECIAL WASTE MANIFEST

Generator Section

Generator of Waste (must be filled in by producer) Kadel's Manufacturing Corp
EPA. ID. NO. NYD982182414

Company Address:
(Print or Type) 1175 Bragg Street, Lima N.Y. 14485
(No.) (Street) (City) (State) (Zip)

Pick-up Address: 1175 Bragg street, Lima, NY 14485
(No.) (Street) (City) (State) (Zip)

Telephone Number: 624-3070

Waste Stream Identification: Petroleum Contaminated Soil PROFILE # CO1984
TCE

This manifest represents a non-hazardous waste as per E.P.A. and N.Y.S. D.E.C. regulations
For Tons: 3 Other (Specify): - 8 Drums

Special Handling instructions, if any: None ✓

This is to certify that the above named materials are properly classified, described, packages, marked and labeled and are in proper condition for transportation according to applicable state and federal law. The wastes were consigned to the transporter named. I certify that the foregoing is true and correct to the best of my knowledge.

Date: 10-11-99 Signature: Frank Thomas, manager SAW - 377-9595
(Name and Title)

Transportation Section

Hauler of Waste (must be filled in by hauler) Silvarole Trucking
ADDRESS: 1167 BRIGHTON HENRIETTA T.L. RD
Pick-up Date: 10-11-99 Truck No. S-16 Vehicle Lic. No.
The above described waste was picked up and hauled by me to the disposal facility named below and was accepted. I certify that the foregoing is true and correct to the best of my knowledge.

Signature of authorized agent and title Rick S. Date:

Disposal Facility

Disposer of Waste (must be filled in by the disposer)
Company Name: High Acres Landfill
Site Location: 425 Perinton Parkway Fairport, NY 14450

Waste subject to this manifest was delivered by the above hauler to this disposal facility and accepted on:

Disposal Date: 10/19/99 Total Tons: Other (Specify):
Signature of authorized agent and title: Lynn O'Leary

White & Canary - Landfill Pink - Hauler Golden Rod - Generator

APPENDIX F

Summary Letter for Water Discharge and Soil Sampling Results
Dated 10 November 1999

HALEY & ALDRICH

UNDERGROUND
ENGINEERING &
ENVIRONMENTAL
SOLUTIONS

Haley & Aldrich of New York
189 North Water Street
Rochester, NY 14604-1151
Tel: 716.232.7386
Fax: 716.232.6768
www.HaleyAldrich.com

HALEY & ALDRICH

10 November 1999
File No. 70372-051

New York State Department of
Environmental Conservation
Division of Hazardous Waste Remediation
50 Wolf Road, Room 267
Albany, New York 12233-7010

Attention: David Chiusano, P.E.

Subject: Summary of Water Discharge and Soil Sampling Results
Enarc-O Machine Products, Inc.
Lima, New York
NYSDEC Registry No. 8-26-011

Dear Mr. Chiusano:

This letter provides a summary of the incident involving inadvertent discharge to the ground surface of water pumped from an excavation at the above-referenced site. The incident occurred during the implementation of remedial actions in accordance with the work plan for the project.

OFFICES
Boston
Massachusetts
Charles Town
West Virginia
Cleveland
Ohio
Denver
Colorado
Hartford
Connecticut
Los Angeles
California
Manchester
New Hampshire
Newark
New Jersey
Portland
Maine
San Diego
California
San Francisco
California
Washington
District of Columbia

Spill Summary

As you are aware, the remedial work involved excavating the building's courtyard area to an approximate depth of four feet below existing grade. In addition, a limited area within the courtyard was excavated to approximately 8 ft. to remove loose, wet sand backfill. The excavation was backfilled with crushed stone in preparation for a drill rig to be used to install the angle wells beneath the building.

On 18 September 1999 a significant rainfall event caused the excavated, stone-backfilled area to become filled with water. S.A.W. Environmental Services (SAW), the primary contractor for the work, made arrangements for a temporary storage tank to be delivered to the site. The tank was provided by Rain For Rent of Sewell, New Jersey. Approximately 1,500 gallons of water was subsequently pumped from the excavated area into the temporary tank, where it was held pending laboratory analyses for disposal characterization.

SAW arranged for Environmental Products and Services (EPS) of Syracuse New York to remove the water from the tank with a vacuum truck and transport the material to its disposal facility. EPS removed the water on 1 October; however, the operator did not completely

remove all of the liquid, nor was the tank cleaned or rinsed at that time. Also on 1 October, a representative of Rain For Rent visited the site and determined the tank had been emptied to a degree acceptable for removal from the site. Later that day, a driver from Rain For Rent removed the tank. In preparation for removal, the driver reportedly opened a drain at the base of the tank, allowing the water remaining in the tank to discharge to the ground surface. The water ran downhill toward the east, onto the adjacent property belonging to Mrs. Cathy Hanson, where it reportedly collected in a relatively small area. This discharge activity was observed by Mrs. Hanson's lawn care service provider, who indicated the collected water volume was significant enough to prevent lawnmowing in the area of puddling at that time.

The actual volume of the water discharged is not known. The Rain For Rent representative estimated it to be approximately 20 gallons, however based on the distance traveled and the fact that the water reportedly collected on Mrs. Hanson's property to a depth of a few inches, the volume was likely greater.

Sampling and Analysis

The analytical results of the tank water sample obtained on 27 September (prior to disposal) revealed contaminants were present at the following concentrations (see laboratory results in Appendix A):

Compound	Concentration (ppb)
Vinyl Chloride	2.2
1,1-DCE	4.3
MTBE	3.1
1,1-DCA	5.9
cis-1,2-DCE	87.1
MEK	8.8
1,1,1-TCA	166.4
TCE	385.3
PERC	66.9

On 13 October, a meeting was held at the site to assess the potentially-affected area, and to determine appropriate locations for sampling to evaluate the potential for adverse impact to the soil. Present at the meeting were: Dave Napier (NYSDOH), Vince Dick (Haley & Aldrich), Frank Thomas (SAW), Ronald F. Iannucci and Ronald D. Iannucci (Kaddis), Bruce Whitmore (Enarc-O), and Mrs. Hanson.

It was agreed that samples would be obtained from three locations: one from alongside the driveway where the water flowed away from the temporary storage tank location, and two from the area where the water reportedly collected on Mrs. Hanson's property (see Figure 1). The sampling was performed the next day (14 October 1999) by Haley & Aldrich. The samples were obtained with dedicated stainless steel sampling utensils, from a depth of 0 to 6

inches below existing grade (sod and vegetative matter were excluded from the sample). The samples were analyzed by Paradigm Environmental Services using USEPA Method 8260 for volatile organic compounds (VOCs).

The results of the analyses indicated the following compounds were present in the soil samples (see laboratory results in Appendix A):

Sample	Compound	Concentration (ppb)
#1	m,p-xylene	15.4
#2	benzene	28.4
#3	m,p-xylene	10.7

The results indicate low concentrations of petroleum compounds in soil, and none of the chlorinated VOCs present in the tank water were detected. Since petroleum compounds were not detected in the tank water sample, it is unlikely their presence in soil is related to the water discharge. In addition, the concentrations are below the Recommended Soil Cleanup Objectives provided by NYSDEC's TAGM 4046 document (January 1994).

Based on these results, it is our opinion no adverse environmental impact resulted from this water discharge, and thus no further action is warranted.

If you need any further information, please contact us.

Sincerely yours,
HALEY & ALDRICH of NEW YORK

Robert J. Mahoney, P.G.
Senior Environmental Geologist

Vincent B. Dick
Vice President

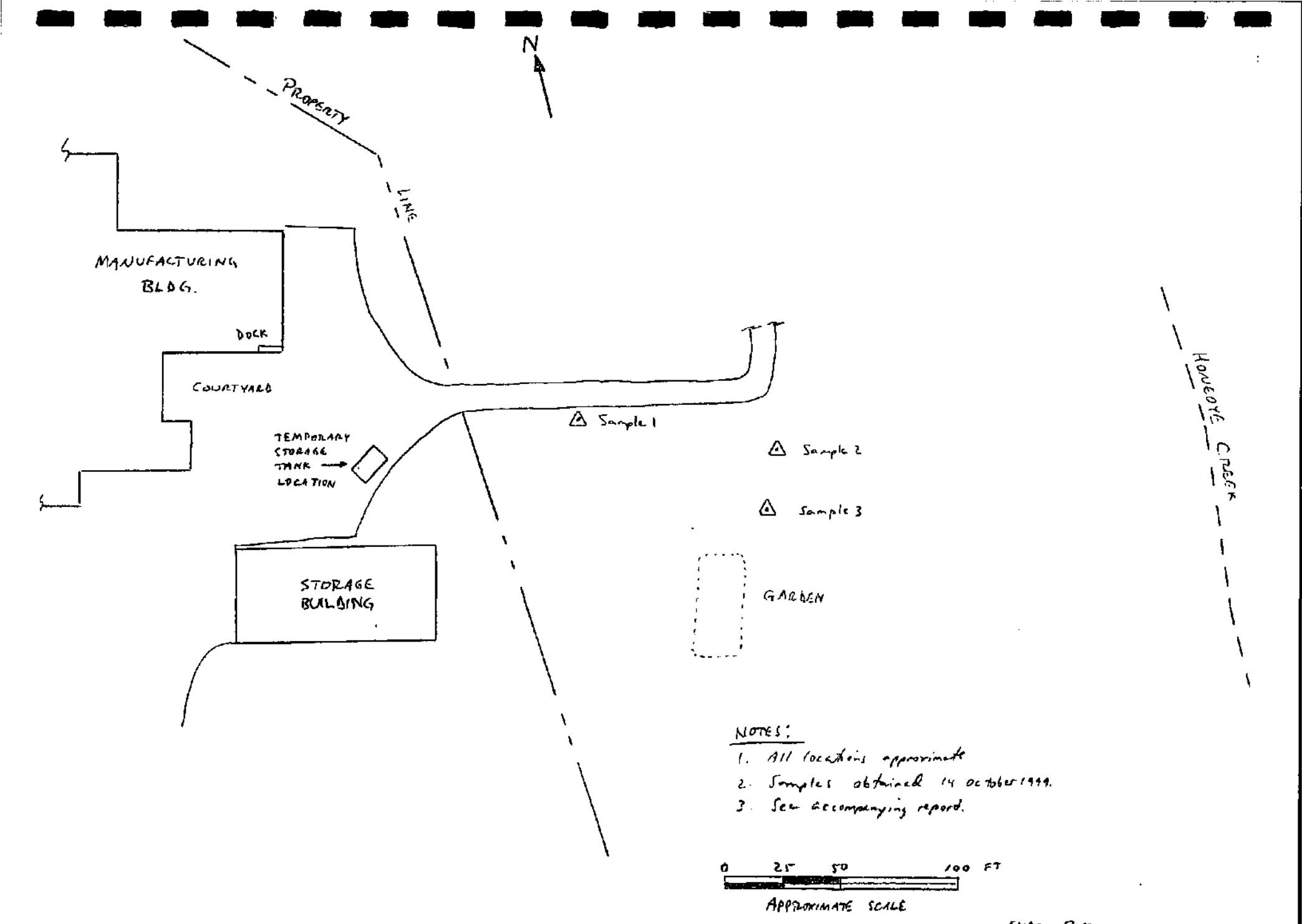
G:\Projects\70372\051\idecspill.doc

c: Ronald D. Iannucci, Kaddis Manufacturing
Frank Thomas, S.A.W. Environmental Services
David Napier, NYSDOH

Attachments:

Figure 1 - Soil Sampling Locations
Appendix A - Laboratory Analytical Results

HALEY & ALDRICH


N
PROPERTY LINE
MANUFACTURING BLDG.
DOCK
COURTYARD
TEMPORARY STORAGE TANK LOCATION
STORAGE BUILDING
Sample 1
Sample 2
Sample 3
GARDEN
HONEOYE CREEK
NOTES:
1. All locations approximate
2. Samples obtained 14 October 1999.
3. See accompanying report.
0 25 50 100 FT
APPROXIMATE SCALE
ENARC-O MACHINE PRODUCTS
SOIL SAMPLING LOCATIONS

APPENDIX A

Laboratory Analytical

Lozier Analytical Group

☐ Lozier Laboratories, Inc., #10390 888 - 841 - 5227

☐ EXPRESSLAB, Inc., #11369 800 - 843 - 5227

LABORATORY REPORT - METHOD 8260

Cust SAW
Address: 81 O'CONNER RD.
FAIRPORT, NY 14450
Attn: FRANK

Phone 377-5545
FAX 377-3861

PO Number:
Project Number:
Project Cust: KADDIS MANUFACT.
Project Site: LIMA
Date FAXED:
Lab Director

SAMPLE DEMOGRAPHICS AND TEST RESULTS

Results in bold type; Detection Limits in small print
Detection Limits* = Soil=ug/kg ppb
*See Individual Limit Water=ug/L ppb

Results shown are: Volatile Organic Analytes
Extraction Method: EPA 5030 Purge & Trap
Analysis Method: EPA 8260 GC/MS

Sample ID (LAB)	28946	
Sample ID#1(CUST)	HOLDING TANK WATER	
Sample ID#2(CUST)		
Matrix	WATER	
Sampled By	TOBY THOMAS	
Date Sampled	09/27/99	09:10
Date Received	09/27/99	10:30
Date Analyzed	09/27/99	
Date Reported	09/28/99	

	Results	Det Limit*		Results	Det Limit*
Dichlorodifluoromethane	<DL(U)	2.0	1,1-Dichloropropene	<DL(U)	2.0
Vinyl Chloride	2.2	2.0	Carbon Tetrachloride	<DL(U)	2.0
Chloromethane	<DL(U)	2.0	1,2-Dichloroethane	<DL(U)	2.0
Bromomethane	<DL(U)	2.0	Trichloroethene	385.3	2.0
Chloroethane	<DL(U)	2.0	1,2-Dichloropropane	<DL(U)	2.0
Trichlorofluoromethane	<DL(U)	2.0	Dibromomethane	<DL(U)	2.0
1,1-Dichloroethene	4.3	2.0	Bromoform	<DL(U)	2.0
Acetone	<DL(U)	20.0	Bromodichloromethane	<DL(U)	2.0
Methylene Chloride	<DL(U)	10.0	1,1,2,2-Tetrachloroethane	<DL(U)	2.0
trans-1,2-Dichloroethene	<DL(U)	2.0	Benzene	<DL(U)	2.0
Methyl-tert-butyl ether	3.1	2.0	cis-1,3-Dichloropropene	<DL(U)	2.0
1,1-Dichloroethane	5.9	2.0	4-Methyl-2-pentanone	<DL(U)	2.0
2,2-Dichloropropane	<DL(U)	2.0	Toluene	<DL(U)	2.0
cis-1,2-Dichloroethene	87.1	2.0	trans-1,3-Dichloropropene	<DL(U)	2.0
Methyl ethyl ketone	8.8	2.0	1,1,2-Trichloroethane	<DL(U)	2.0
Bromochloromethane	<DL(U)	2.0	Tetrachloroethene	66.9	2.0
Chloroform	<DL(U)	2.0	1,3-Dichloropropane	<DL(U)	2.0
1,1,1-Trichloroethane	166.4	2.0	2-Hexanone	<DL(U)	2.0

* DL = Detection Limit

Lozier Analytical Group

☐ Lozier Laboratories, Inc., #10390 888 - 841 - 5227

☐ EXPRESSLAB, Inc., #11369 800 - 843 - 5227

LABORATORY REPORT - METHOD 8260

Cust SAW
Address: 81 O'CONNER RD.
FAIRPORT, NY 14450
Attn: FRANK

Phone 377-5545
FAX 377-3861

PO Number:
Project Number:
Project Cust: KADDIS MANUFACT.
Project Site: LIMA
Date FAXED:
Lab Director

SAMPLE DEMOGRAPHICS AND TEST RESULTS

Results in bold type; Detection Limits in small print
Detection Limits* = Soil=ug/kg ppb
*See Individual Limit Water=ug/L ppb

Results shown are: **Volatile Organic Analytes**
Extraction Method: **EPA 5030 Purge & Trap**
Analysis Method: **EPA 8260 GC/MS**

Sample ID (LAB)	**28946**	
Sample ID#1(CUST)	**HOLDING TANK WATER**	
Sample ID#2(CUST)		
Matrix	**WATER**	
Sampled By	**TOBY THOMAS**	
Date Sampled	**09/27/99**	**09:10**
Date Received	**09/27/99**	**10:30**
Date Analyzed	**09/27/99**	
Date Reported	**09/28/99**	

	Results	Det Limit*		Results	Det Limit*
Dibromochloromethane	**<DL(U)**	2.0	**1,3-Dichlorobenzene**	**<DL(U)**	2.0
1,2-Dibromoethane	**<DL(U)**	2.0	**4-Isopropyltoluene**	**<DL(U)**	2.0
Ethylbenzene	**<DL(U)**	2.0	**1,4-Dichlorobenzene**	**<DL(U)**	2.0
m&p-Xylene	**<DL(U)**	4.0	**1,2-Dichlorobenzene**	**<DL(U)**	2.0
o-Xylene	**<DL(U)**	2.0	**n-Butylbenzene**	**<DL(U)**	2.0
Styrene	**<DL(U)**	2.0	**1,2-Dibromo-3-chloropropane**	**<DL(U)**	2.0
Isopropylbenzene	**<DL(U)**	2.0	**1,2,4-Trichlorobenzene**	**<DL(U)**	2.0
n-Propylbenzene	**<DL(U)**	2.0	**Hexachlorobutadiene**	**<DL(U)**	2.0
1,3,5-Trimethylbenzene	**<DL(U)**	2.0	**Naphthalene**	**<DL(U)**	5.0
tert-Butylbenzene	**<DL(U)**	2.0	**1,2,3-Trichlorobenzene**	**<DL(U)**	2.0
1,2,4-Trimethylbenzene	**<DL(U)**	2.0			
sec-Butylbenzene	**<DL(U)**	2.0			
Chlorobenzene	**<DL(U)**	2.0			
1,1,1,2-Tetrachloroethane	**<DL(U)**	2.0			
Bromobenzene	**<DL(U)**	2.0			
1,2,3-Trichloropropane	**<DL(U)**	2.0			
2-Chlorotoluene	**<DL(U)**	2.0			
4-Chlorotoluene	**<DL(U)**	2.0			

< DL(U)= analyzed but not detected
L= estimated value
B=analyte found in blank
E=exceed calibration range

* DL = Detection Limit

Lozier Analytical Group

☐ Lozier Laboratories, Inc., #10390 888 - 841 - 5227

☐ EXPRESSLAB, Inc., #11369 800 - 843 - 5227

LABORATORY REPORT - METHOD 8270

Cust SAW
Address: 81 O'CONNER RD.
FAIRPORT, NY 14450
Attn: FRANK

Phone 377-5545
FAX 377-3861

PO Number:
Project Number:
Project Cust: KADDIS MANUFACT.
Project Site: LIMA
Date FAXED:
Lab Director

SAMPLE DEMOGRAPHICS AND TEST RESULTS

Results in bold type; Detection Limits in small print
Detection Limits* = Water=ug/ml ppm
*See Individual Limit

Results shown are: PAH COMPOUNDS
Extraction Method: EPA 3510 Liquid/Liquid
Analysis Method: EPA 8270 GC/MS

Sample ID (LAB)	28947	
Sample ID#1(CUST)	HOLDING TANK WATER	
Sample ID#2(CUST)		
Matrix	WATER	
Sampled By	TOBY THOMAS	
Date Sampled	09/27/99	09:10
Date Received	09/27/99	10:30
Date Analyzed	09/28/99	
Date Reported	09/28/99	

	Results	Det Limit*(ppm)
Naphthalene	< DL	0.010
Acenaphthylene	< DL	0.010
Acenaphthene	< DL	0.010
Fluorene	< DL	0.010
Phenanthrene	< DL	0.010
Anthracene	< DL	0.010
Fluoranthene	< DL	0.010
Pyrene	< DL	0.010
Benzo(a)anthracene	< DL	0.010
Chrysene	< DL	0.010
Benzo(b)fluoranthene	< DL	0.010
Benzo(k)fluoranthene	< DL	0.010
Benzo(a)pyrene	< DL	0.010
Indeno(1,2,3-c,d)pyrene	< DL	0.010
Dibenz(a,h)anthracene	< DL	0.010
Benzo(g,h,i)perylene	< DL	0.010

28946 28947 MANILLA COPY

AB

WORKORDER

P.O. Box 40, 5611 Water Street, Middlesex, NY 14507
NY #11369 NJ #73744 CA #2055 SC #91011
Phone #: 800-843-5227
Fax #: 716-554-4114

"Specializing in Environmental Soil Tests"

9/28/99

Date Due: 9/29/99

☐ Standard Service ☒ Rush Service

Customer: SAW ENVIRONMENTAL
Address: 81 O'CONNOR RD
City/State/Zip: FAIRPORT, NY
Phone: (716) 377-5545
Fax: ( ) 377-3861
Contact: FRANK

PO No.:
Project No.:
Project Cust.: KADDIS MANUFACT.
Project Site: LIMA
Spill No.:
Pin No.:

Sample Demographics and Parameters for Analysis

Special Instructions: * 24 HR. TURN !

Suspect Ingredient: ☐ Diesel ☐ Gasoline ☐ Oil

Date	Time	Sample Description & Location	MATRIX: Aqueous	Soil	Other	Parameters for Analysis: EPA METHOD 8260	EPA METHOD 8270				
1. 9-27	9:10	HOLDING TANK WATER	X			X	X				
2. ~~9-27~~	~~9:10~~										
3.											
4.											
5.											
6.											
7.											
8.											
9.											
10.											
11.											

Chain of Custody Record

of Samples: 2
# of Containers: 2
Sampler: Toby Thomas
Signature: Frank Rowe for T.T

Samples Sent By: ☐ ExpressMail ☒ Hand Delivery
Custody Seal Intact? ☐ Yes ☐ No ☑ N/A
Shipment Complete? ☑ Yes ☐ No ☐ N/A
Temperature: 5 °C Fahrenheit

SAMPLES RELINQUISHED BY: Name & Signature	Date & Time	SAMPLES RECEIVED BY: Name & Signature	Date & Time
1	9/27 - 1:27	1	
2		2	
3		Received for Laboratory By:	9/27/99 10:50

"Results when YOU want them!"

LOZIER ANALYTICAL

CONFIDENTIAL INFORMATION

PARADIGM
ENVIRONMENTAL
SERVICES, INC.

179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

Volatile Organic Compound Laboratory Analysis Report For Soil/Sludge

Client: Haley & Aldrich of NY
Client Job Site: Enarc-O
Client Job No: N/A
Field Location: Sample #1
Field ID No: N/A

Lab Project No: 99-1964
Lab Sample No: 6740
Sample Type: Soil
Date Sampled: 10/14/1999
Date Received: 10/14/1999
Date Analyzed: 10/18/1999

VOLATILE HALOCARBONS	RESULTS (ug/Kg)	VOLATILE AROMATICS	RESULTS (ug/Kg)
Bromodichloromethane	ND< 11.7	Benzene	ND< 11.7
Bromomethane	ND< 11.7	Chlorobenzene	ND< 11.7
Bromoform	ND< 11.7	Ethylbenzene	ND< 11.7
Carbon tetrachloride	ND< 11.7	Toluene	ND< 11.7
Chloroethane	ND< 11.7	m,p - Xylene	15.4
Chloromethane	ND< 11.7	o - Xylene	ND< 11.7
2-Chloroethyl vinyl ether	ND< 11.7	Styrene	ND< 11.7
Chloroform	ND< 11.7		
Dibromochloromethane	ND< 11.7		
1,1-Dichloroethane	ND< 11.7		
1,2-Dichloroethane	ND< 11.7		
1,1-Dichloroethene	ND< 11.7		
trans-1,2-Dichloroethene	ND< 11.7	Ketones & Misc.	
1,2-Dichloropropane	ND< 11.7	Acetone	ND< 58.5
cis-1,3-Dichloropropene	ND< 11.7	Vinyl acetate	ND< 29.2
trans-1,3-Dichloropropene	ND< 11.7	2-Butanone	ND< 29.2
Methylene chloride	ND< 29.2	4-Methyl-2-pentanone	ND< 29.2
1,1,2,2-Tetrachloroethane	ND< 11.7	2-Hexanone	ND< 29.2
Tetrachloroethene	ND< 11.7	Carbon disulfide	ND< 29.2
1,1,1-Trichloroethane	ND< 11.7		
1,1,2-Trichloroethane	ND< 11.7		
Trichloroethene	ND< 11.7		
Vinyl Chloride	ND< 11.7		

Analytical Method: EPA 8260 ELAP ID No: 10958

Comments: ND denotes Not Detected

Approved By _____
Laboratory Director

991964V1.XLS

PARADIGM
ENVIRONMENTAL
SERVICES, INC.

179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

Volatile Organic Compound Laboratory Analysis Report For Soil/Sludge

Client:	Haley & Aldrich of NY	**Lab Project No:**	99-1964
		Lab Sample No:	6741
Client Job Site:	Enarc-O		
		Sample Type:	Soil
Client Job No:	N/A		
		Date Sampled:	10/14/1999
Field Location:	Sample #2	**Date Received:**	10/14/1999
Field ID No:	N/A	**Date Analyzed:**	10/18/1999

VOLATILE HALOCARBONS	RESULTS (ug/Kg)	VOLATILE AROMATICS	RESULTS (ug/Kg)
Bromodichloromethane	ND< 11.0	Benzene	28.4
Bromomethane	ND< 11.0	Chlorobenzene	ND< 11.0
Bromoform	ND< 11.0	Ethylbenzene	ND< 11.0
Carbon tetrachloride	ND< 11.0	Toluene	ND< 11.0
Chloroethane	ND< 11.0	m,p - Xylene	ND< 11.0
Chloromethane	ND< 11.0	o - Xylene	ND< 11.0
2-Chloroethyl vinyl ether	ND< 11.0	Styrene	ND< 11.0
Chloroform	ND< 11.0		
Dibromochloromethane	ND< 11.0		
1,1-Dichloroethane	ND< 11.0		
1,2-Dichloroethane	ND< 11.0		
1,1-Dichloroethene	ND< 11.0		
trans-1,2-Dichloroethene	ND< 11.0	Ketones & Misc.	
1,2-Dichloropropane	ND< 11.0	Acetone	ND< 55.1
cis-1,3-Dichloropropene	ND< 11.0	Vinyl acetate	ND< 27.5
trans-1,3-Dichloropropene	ND< 11.0	2-Butanone	ND< 27.5
Methylene chloride	ND< 27.5	4-Methyl-2-pentanone	ND< 27.5
1,1,2,2-Tetrachloroethane	ND< 11.0	2-Hexanone	ND< 27.5
Tetrachloroethene	ND< 11.0	Carbon disulfide	ND< 27.5
1,1,1-Trichloroethane	ND< 11.0		
1,1,2-Trichloroethane	ND< 11.0		
Trichloroethene	ND< 11.0		
Vinyl Chloride	ND< 11.0		

Analytical Method: EPA 8260 ELAP ID No: 10958

Comments: ND denotes Not Detected

Approved By _____
Laboratory Director

991964V2.XLS

PARADIGM
ENVIRONMENTAL
SERVICES, INC.

179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

Volatile Organic Compound Laboratory Analysis Report For Soil/Sludge

Client:	Haley & Aldrich of NY	**Lab Project No:**	99-1964
		Lab Sample No:	6742
Client Job Site:	Enarc-O		
		Sample Type:	Soil
Client Job No:	N/A		
		Date Sampled:	10/14/1999
Field Location:	Sample #3	**Date Received:**	10/14/1999
Field ID No:	N/A	**Date Analyzed:**	10/18/1999

VOLATILE HALOCARBONS	RESULTS (ug/Kg)	VOLATILE AROMATICS	RESULTS (ug/Kg)
Bromodichloromethane	ND< 9.80	Benzene	ND< 9.80
Bromomethane	ND< 9.80	Chlorobenzene	ND< 9.80
Bromoform	ND< 9.80	Ethylbenzene	ND< 9.80
Carbon tetrachloride	ND< 9.80	Toluene	ND< 9.80
Chloroethane	ND< 9.80	m,p - Xylene	10.7
Chloromethane	ND< 9.80	o - Xylene	ND< 9.80
2-Chloroethyl vinyl ether	ND< 9.80	Styrene	ND< 9.80
Chloroform	ND< 9.80		
Dibromochloromethane	ND< 9.80		
1,1-Dichloroethane	ND< 9.80		
1,2-Dichloroethane	ND< 9.80		
1,1-Dichloroethene	ND< 9.80		
trans-1,2-Dichloroethene	ND< 9.80	Ketones & Misc.	
1,2-Dichloropropane	ND< 9.80	Acetone	ND< 49.0
cis-1,3-Dichloropropene	ND< 9.80	Vinyl acetate	ND< 24.5
trans-1,3-Dichloropropene	ND< 9.80	2-Bulanone	ND< 24.5
Methylene chloride	ND< 24.5	4-Methyl-2-pentanone	ND< 24.5
1,1,2,2-Tetrachloroethane	ND< 9.80	2-Hexanone	ND< 24.5
Tetrachloroethene	ND< 9.80	Carbon disulfide	ND< 24.5
1,1,1-Trichloroethane	ND< 9.80		
1,1,2-Trichloroethane	ND< 9.80		
Trichloroethene	ND< 9.80		
Vinyl Chloride	ND< 9.80		

Analytical Method: EPA 8260 ELAP ID No: 10958

Comments: ND denotes Not Detected

Approved By _____
Laboratory Director

PARADIGM ENVIRONMENTAL SERVICES, INC.

179 Lake Avenue
Rochester, NY 14608
(716) 647-2530 • (800) 724-1997
FAX (716) 647-3311

CHAIN OF CUSTODY

REPORT TO:		INVOICE TO:		LAB PROJECT #
COMPANY	Haley & Aldrich	COMPANY	(Same)	99-1964
ADDRESS	189 N. Water St	ADDRESS		
CITY	Rochester STATE NY ZIP 14604	CITY	STATE ZIP	P.O. #
ATT.	Bob Mahoney PHONE# 716.327.5535	ATT.	PHONE#	
PROJECT NAME/SITE NAME:	FAX# 716.232.6768	FAX#		☐ ADDENDUM
Enarc-O	COMMENTS:			
PROJECT #: [redacted]		TURN AROUND TIME (WORKING DAYS)	☐ ONE ☐ THREE ☑ FIVE(STD) ☐ OTHER	
		REPRESENTATIVE:		

	DATE	TIME	COMPOSITE	GRAB	SAMPLE LOCATION/FIELD ID	MATRIX	NUMBER CONTAINERS	8260TCL	REMARKS	PARADIGM LAB SAMPLE NUMBER	ANALYTICAL COSTS
1	10/14/99	0900		✓	Sample # 1	Soil	1	✓		6740	
2	↓	0910		✓	Sample # 2	Soil	1	✓		6741	
3	↓	0920		✓	Sample # 3	Soil	1	✓		6742	
4											
5											
6											
7											
8											
9											
10											
11											
12											

RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	DATE/TIME	SAMPLE CONDITION	CHECK #	TOTAL COST
Robert R Vadala	14 Oct 99 1025	[signature]	10/14/99 1025			
RELINQUISHED BY:	DATE/TIME	RECEIVED BY	DATE/TIME	CARRIER COMPANY	AIR BILL NO.	P.I.F
RELINQUISHED BY:	DATE/TIME	RECEIVED @ LAB BY:	DATE/TIME	CARRIER PHONE #	DATE RESULTS REPORTED BY:	DATE/TIME
		[signature]	10/14/99 1024			

WHITE COPY-SAMPLE YELLOW COPY-FILE PINK COPY-RELINQUISHER

STRAIGHT BILL OF LADING/NON-HAZARDOUS WASTE MANIFEST

No.

1. Generator Information
Generator Name: Kaddis Manufacturing
Generator Mailing Address: 1175 Bragg Street
Lima, NY 14485
Site Address: SAME
Generator Telephone No.: 716 377-5545

2. Destination/Disposal Facility Information
Company Name: Environmental Products & Services, Inc.
Telephone No.: 315 471-0503
Facility Site Address: 532 State Fair Blvd.
Syracuse, NY 13204

3. Transporter Information
Transporter 1 Company Name: Environmental Products & Services, Inc.
Telephone No.: 315 471-0503
License Plate No.: PD1409 (NY)
Transporter 2 Company Name:
Telephone No.:
License Plate No.:

4. Material/Waste Description

	Containers No.	Containers Type	*HM	Material Description/ *Proper Shipping Name/ DOT Hazardous Material	*Hazard Class	ID Number	*Packing Group	Total Weight/ Volume	Unit of Weight/ Volume
a.	001	TT		Waste Non-Rcra Liquid, N.O.S. (Contaminated Water)	Non-Hazardous	NONE	PG	01500	G
b.									
c.								?	
d.									

5. Job No.: R2686
6. Approval Nos.: a. 1911D b. c. d.
7. Purchase Order No.: N/A
8. Additional Information:
9. Required Placard(s): N/A

10. Generator Certification: I hereby certify the above-named materials are properly classified, described, packaged, marked, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.
Generator Name: KADDIS MFG. FOR SAME Generator Signature: Diane Whitmore Shipment Date: 10/12/99

11. Acknowledgement of Receipt of Material - To be Completed by Signatories
Transporter 1 Driver Name (Print): Johnny Ellsbury Signature: Johnny Ellsbury Shipment Date: 10-12-99
Transporter 2 Driver Name (Print): Signature: Shipment Date:

12. Facility Receiving Wastes - Authorized Agent: David Ritter Signature: Receipt Date: 10/12/99

13. Emergency Telephone No.: (315) 471-0503 Contact Name: David Ritter *Required for transportation of DOT Hazardous Material only.

14. Discrepancy Indication Space to be Completed by the Disposal Facility.

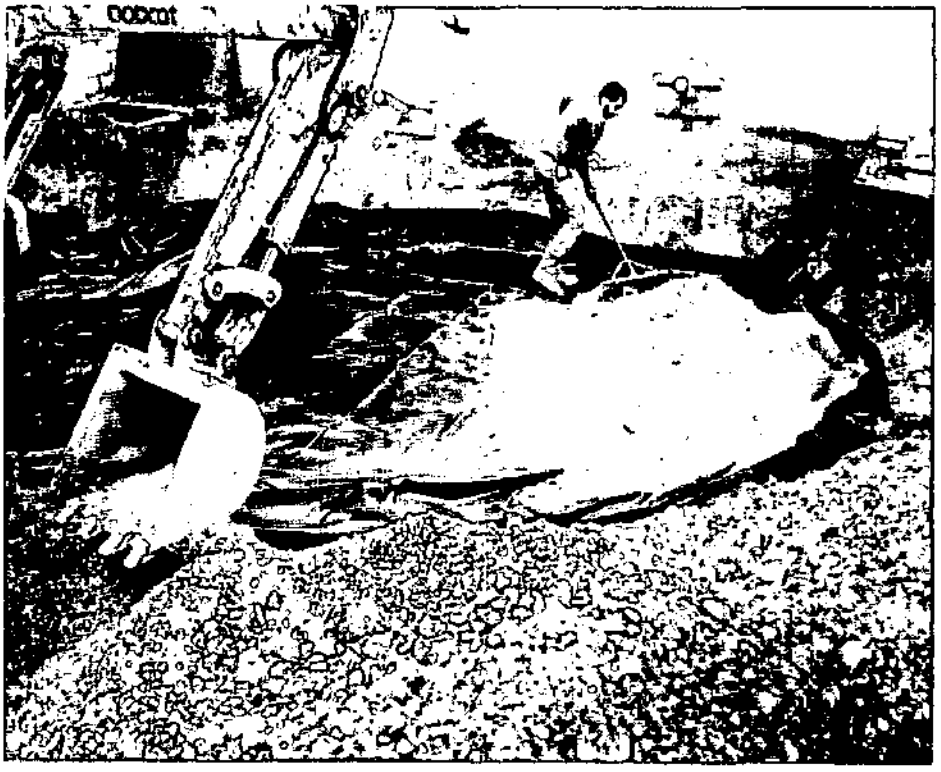
This form may not be used for wastes identified as hazardous under state or RCRA regulations.
White: Retained by TSDF Canary: Mailed by TSDF to EPS Branch Pink: Retained by Generator

APPENDIX G

Construction/Installation Photos

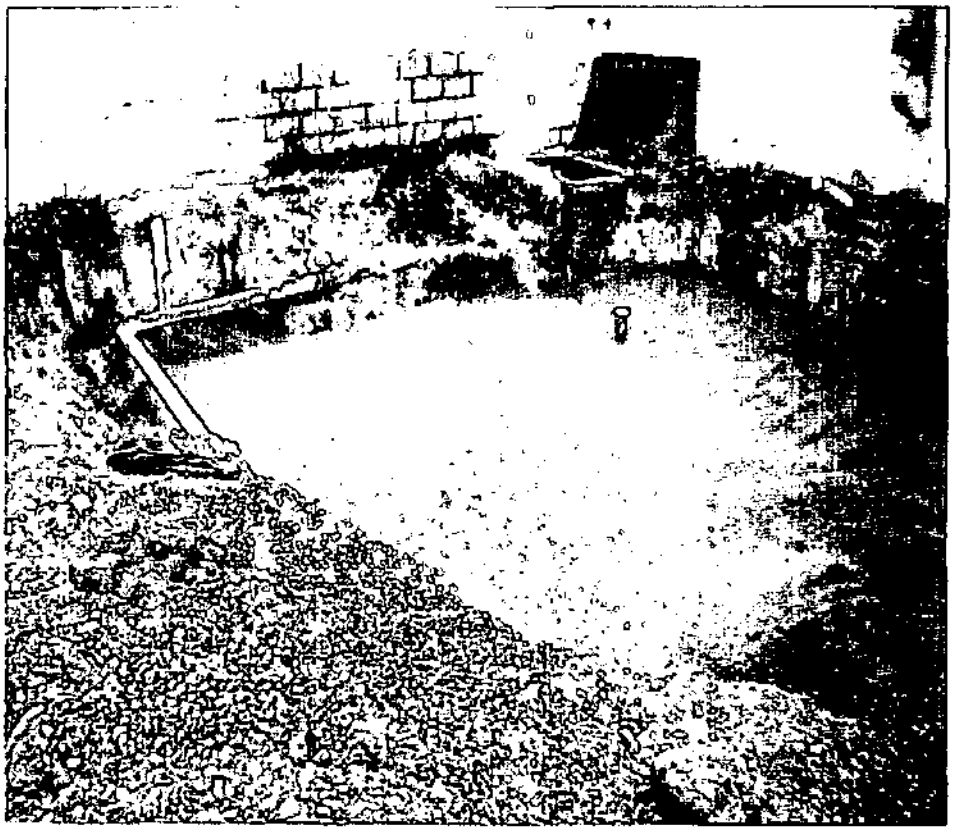
T-1 Horizontal piping installation

T-2 Horizontal piping installation

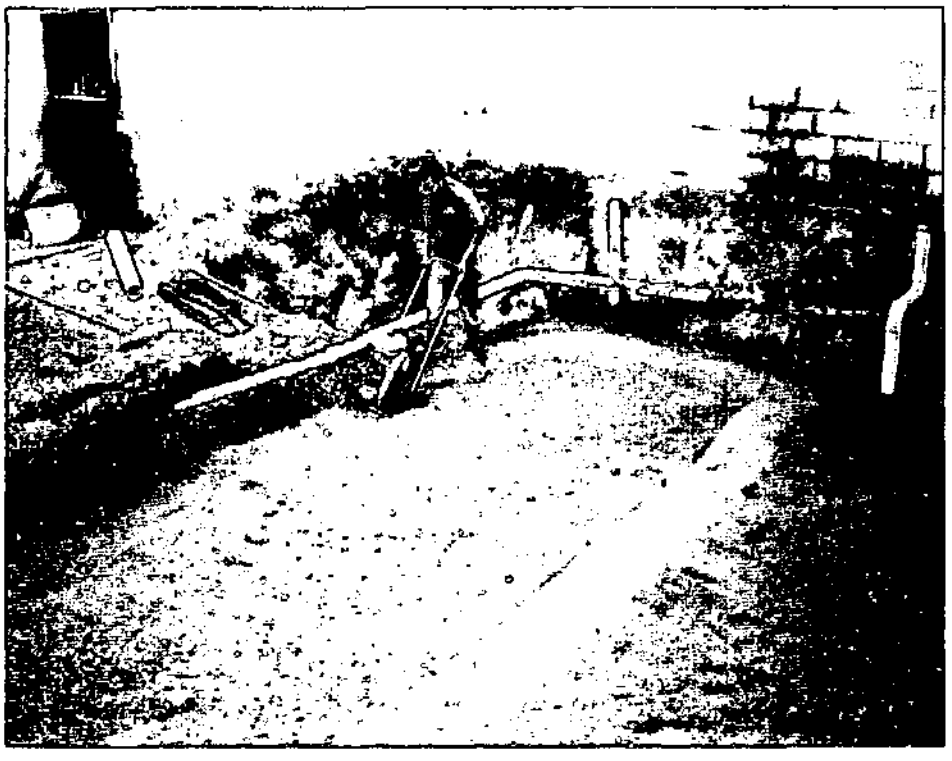


Northwest Geo-liner and Sand Placement

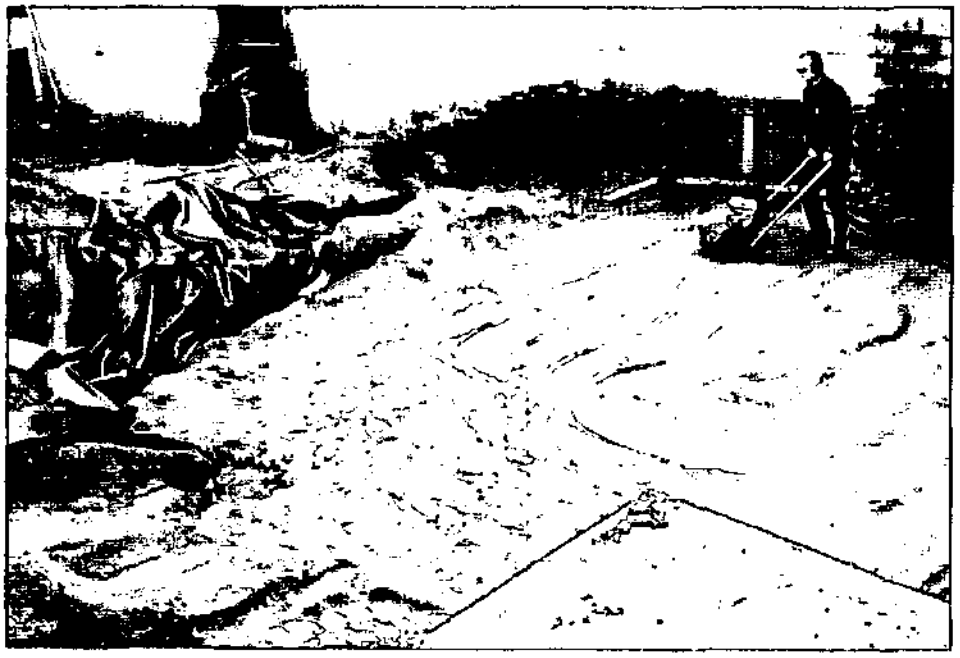
South west Geo-liner and Sand Placement



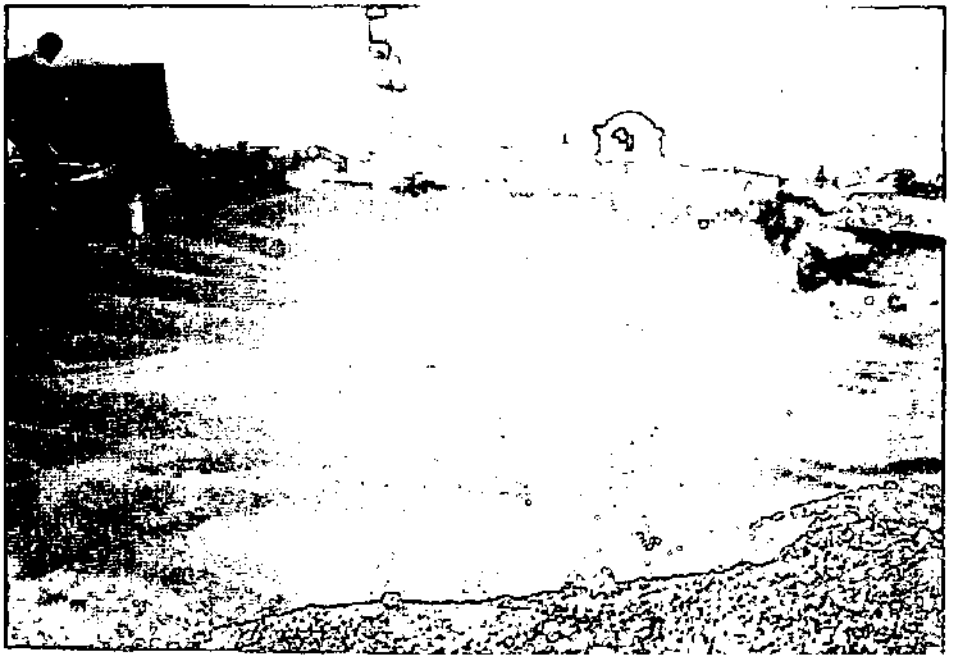
Pea stone Placement
NOTE: Repaired SPDES out-fall piping



Peastone Compaction



Compaction of sand layer over Geo-membrane

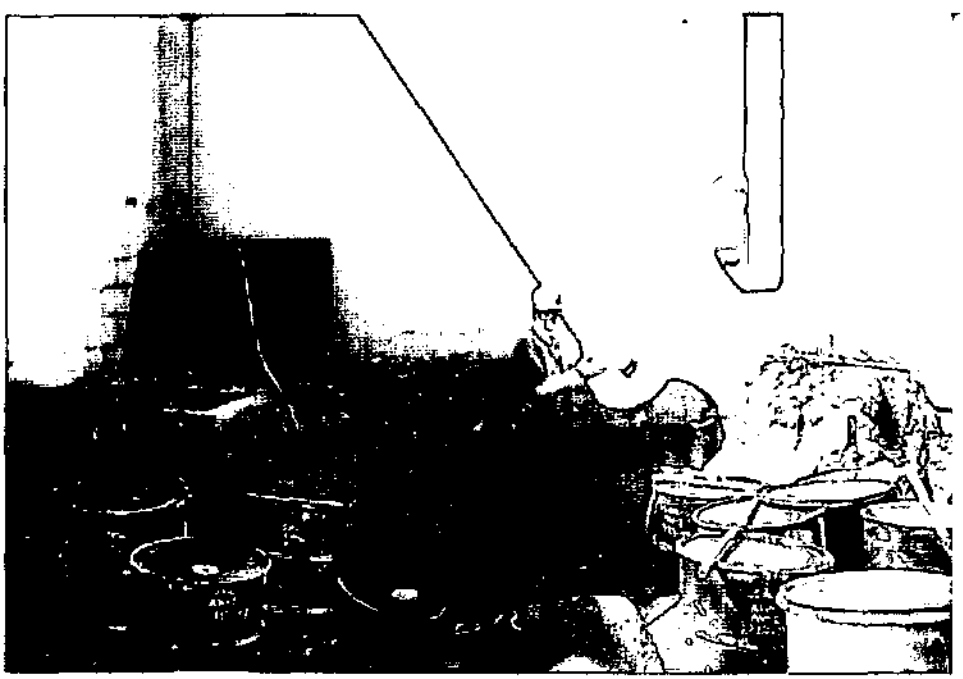


Placement of peastone layer over compacted sand

Advancing augers at Angle Extraction Well No. T-3

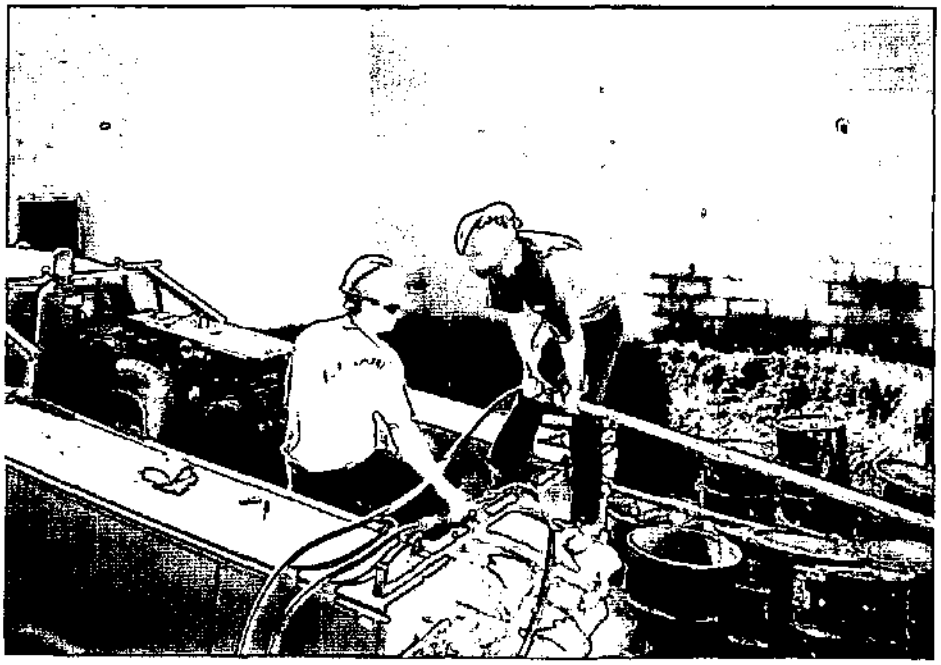
Removing augers at Angle Extraction Well No. T-3

Well prior to surface seal placement

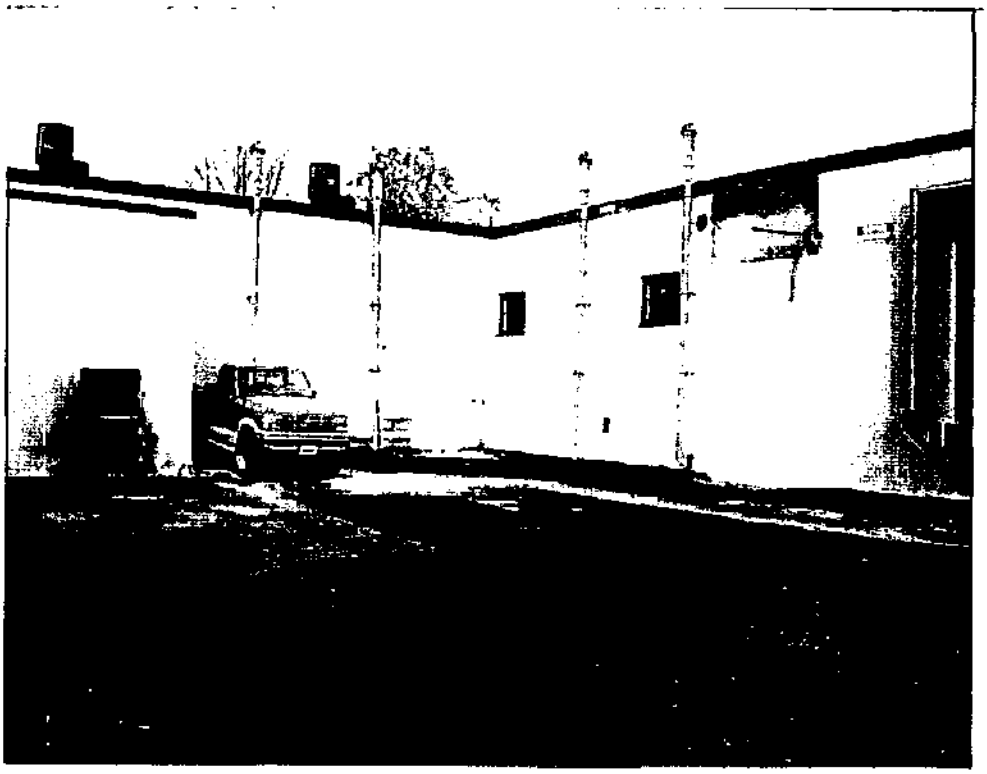


Placement of concrete form for surface seal placement

Placement of sand into tremie pipe for secondary sand pack



Injecting sand into bore hole using compressed air



Excavation area following asphalt placement

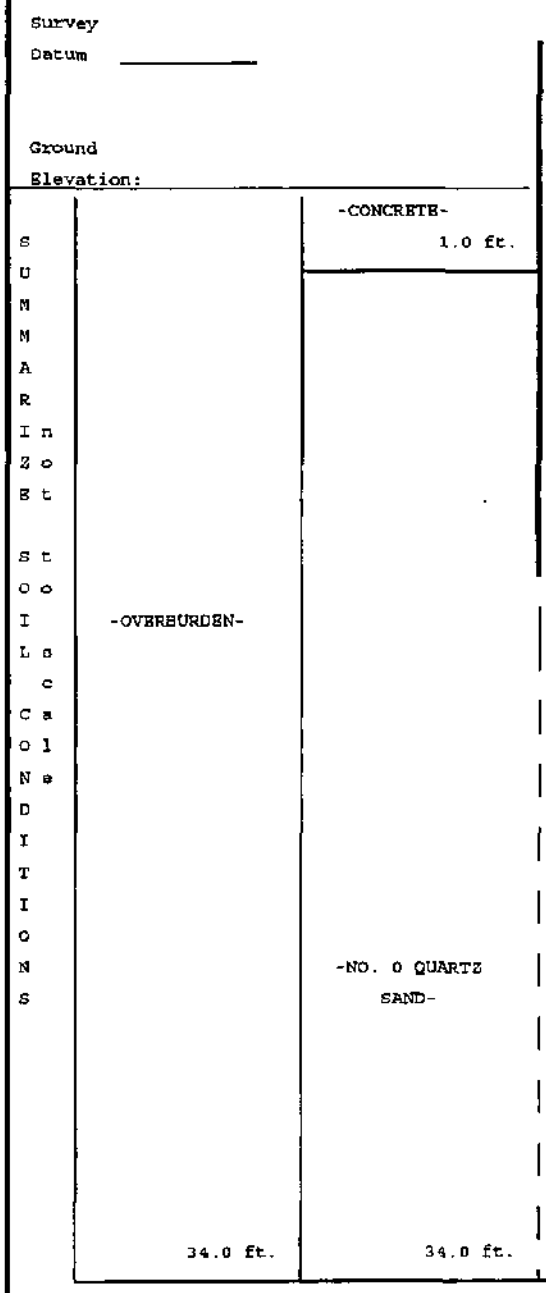
View of entire paved area

APPENDIX H

Angled Well Logs

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	OVERBURDEN GROUNDWATER MONITORING WELL REPORT

PROJECT:	REVISED REMEDIAL DESIGN/REMEDIAL ACTION PLAN	FILE NO.:	70372-050
LOCATION:	HONEOYE FALLS, NEW YORK	WELL NO.:	T-4
CLIENT:	KADDIS MANUFACTURING	LOCATION:	SEE PLAN
CONTRACTOR:	NOTHNAGLE DRILLING		
DRILLER:	K. BUSCH RIG TYPE: GUS PECK	SHEET:	1 OF 1
INSTALLATION DATE:	20-23 SEPTEMBER 1999	INSPECTOR:	D. NOSTRANT



SUMMARIZE STRATIGRAPHY AND WELL CONSTRUCTION DETAILS

Depth/Stickup above/below ground surface of protective casing.	NA
Depth/Stickup above/below ground surface of riser pipe.	NA
Thickness of Surface Seal	1.0 ft.
Type of Surface Seal [indicated all seals showing depth, thickness and type]	Concrete
Type of Protective Casing	NA
Inside Diameter of Protective Casing	NA
Depth of Bottom of Protective Casing	NA
Inside Diameter of Riser Pipe	4.0 in.
Type of Backfill Around Riser	See Diagram
Diameter of Borehole	8.0 +/-
Type of coupling (threaded, welded, etc.)	Threaded
Depth of Bottom of Riser	4.5 ft.
Type of Wellscreen	Prepacked Slotted PVC
Screen Slot Size	0.020
Diameter of Wellscreen	5.0 in.
Type of Backfill Around Wellscreen	No. 0 Quartz Sand
Depth of Bottom of Wellscreen	33.6 ft.
Depth of Bottom of Borehole	34.0 ft.

Remarks: NA - Not applicable. Depth of bottom of borehole determined by measuring length of augers in borehole. Angle of borehole 21 degrees to 22 degrees from horizontal.

Well No. T-4

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	OVERBURDEN GROUNDWATER MONITORING WELL REPORT

PROJECT:	REVISED REMEDIAL DESIGN/REMEDIAL ACTION PLAN	FILE NO.:	70372-050
LOCATION:	HONEOYE FALLS, NEW YORK	WELL NO.:	T-3
CLIENT:	KADDIS MANUFACTURING	LOCATION:	SEE PLAN
CONTRACTOR:	NOTHNAGLE DRILLING		
DRILLER:	K. BUSCH RIG TYPE: GUS PECK MITE-E-MITE	SHEET:	1 OF 1
INSTALLATION DATE:	20-23 SEPTEMBER 1999	INSPECTOR:	D. NOSTRANT

Survey Datum _____

Ground Elevation: _____

SUMMARIZED SOIL CONDITIONS

-OVERBURDEN-

-CONCRETE-

-NO. 0 QUARTZ SAND-

1.2 ft.

31.7 ft.

31.7 ft.

Depth/Stickup above/below ground surface of protective casing.	NA
Depth/Stickup above/below ground surface of riser pipe.	NA
Thickness of Surface Seal	1.2 ft.
Type of Surface Seal [indicated all seals showing depth, thickness and type]	Concrete
Type of Protective Casing	NA
Inside Diameter of Protective Casing	NA
Depth of Bottom of Protective Casing	NA
Inside Diameter of Riser Pipe	4.0 in.
Type of Backfill Around Riser	See Diagram
Diameter of Borehole	8.0 +/-
Type of coupling (threaded, welded, etc.)	Threaded
Depth of Bottom of Riser	2.0 ft.
Type of Wellscreen	Prepacked Slotted PVC
Screen Slot Size	0.020
Diameter of Wellscreen	5.0 in.
Type of Backfill Around Wellscreen	No. 0 Quartz Sand
Depth of Bottom of Wellscreen	31.3 ft.
Depth of Bottom of Borehole	31.7 ft.

Remarks: NA - Not applicable. Depth of bottom of borehole determined by measuring length of augers in borehole. Angle of borehole 21.5 from horizontal.

APPENDIX I

Suppliers Data Sheets

GREAT LAKES CONTAINMENT, INC.

731 S. Cedar • P.O. Box 51
Kalkaska, Michigan 49646
Ph. (231) 258-8800 • Fax (231) 258-5496

Specializing in PVC Liners

SHIPPER/PACKING LIST

SHIPPED TO: ENAZCO MARINE PRODUCTS

ADDRESS: 1175 BRAZE ST

CITY: LIMA NY 14485

ATTENTION:

CUSTOMER'S ORDER NUMBER:	OUR NUMBER:	SHIPPED VIA:	DATE SHIPPED:
			8-27-99

ORDERED	SHIPPED	SIZE	MATERIAL
9138	1	$31\frac{25}{}$ x 50	30 MIL

RECEIVED
SEP - 2 1999

HOW PACKED:	RECEIVED BY:

16" AUTOMATIC ATTIC EXHAUST FANS

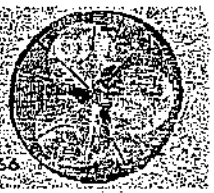
Fans come mounted on automatic shutter for fast, easy installation; or guard mounted (less shutter) for installation with gable vents with built-in shutters. Shutter model requires 17 x 17" opening. Guard model has 18⅜" OC mounting loops. Include separate thermostat for automatic operation. 90 to 130°F range, 15°F fixed differential, mounts on 2 x 4" conduit box. Air deliveries based on AMCA test codes for exhaust systems. Aluminum 3-wing blade. 1/20 HP, 1500 RPM, 1.9 amp, totally enclosed motor. 120V, 60 Hz. Tie-rod type shutter. Zinc finished guard complies with OSHA regulations.

No. 7F667

Guard Complies with OSHA Regulations

ENERGY RIGHT®

Dayton



No. 7F666

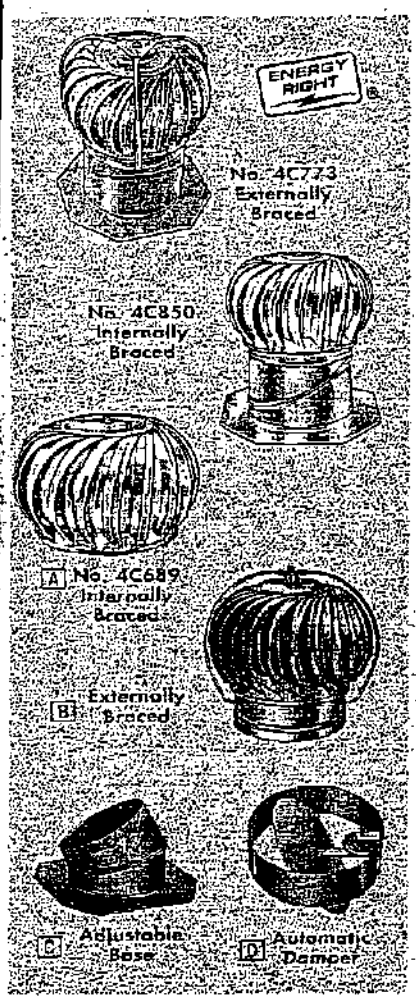
(✓) Denotes energy efficient product.

Fan Model	CFM AIR DELIVERY 0.0" SP	CFM AIR DELIVERY 0.250" SP	Opening Required (In.)	Stock No.	List	Each	Shpg. Wt.
With Shutter	870	460	17 x 17	✓7F667	$295.62	$177.25	19.7
With Guard	960	610	18⅜ Dia.	✓7F666	216.72	129.80	13.7

TURBINE ATTIC VENTILATORS

- Wind powered ventilation
- Slightest breeze rotates turbine
- No electric current needed

Turbine ventilators remove hot attic air in summer and moisture-laden air in winter. These are two causes of damage to roofs and attic insulation. Turbines rotate with a passing breeze and create a strong upward draft. Inside air is drawn out and exhausted outside. (✓) Denotes energy efficient product.



12" TURBINE VENTILATORS WITH BUILT-IN BASE

Dupont Delrin bearing system starts easier, and spins faster and longer in the slightest wind. Rust-resistant galvanized steel; ribbed blades add strength. Built-in adjustable base adapts for installation on 0/12 to 6/12 pitched roofs. 12" diameter throat. 17⅞" high. CertainTeed brand.

Bracing	CertainTeed Model	Stock No.	List	Each	Shpg. Wt.
External	WTE12X	✓4C773	$57.98	$34.95	9.0
Internal	WTI12X	✓4C850	50.08	30.15	8.0

4 TO 24" TURBINE VENTILATORS

[A] Internally braced turbine requires no additional external supports. Low profile design hugs roofline. Hard chrome plated Dupont Delrin bearing system starts easier, and spins longer and faster in the slightest breeze. 24-gauge galvanized steel. 12" diameter neck. CertainTeed brand (WTI12).

✓No. 4C689. Shpg. wt. 6.7 lbs. List $39.52. Each.....$23.78

[B] Externally braced turbine for strength and perfect alignment. Quiet, reliable air circulation in attics, crawl spaces, and other enclosed areas. Bronze oil-impregnated top bearing. 4, 6, and 8" vents have thrust-type bottom pivot bearing with hardened steel ball riding in a hardened steel seat. 12" and larger vents use bottom thrust-type ball bearing. Galvanized steel. Aluminum bracing on 4 to 14" units. Aluminum painted steel bracing on 16 to 24" units. Empire brand.

Key	Neck Diameter (In.)	CFM 4 Mi. Wind	Empire Model	Stock No.	List	Each	Shpg. Wt.
B	4	126	TV04G	✓4C016	$36.66	$24.44	4.8
B	6	147	TV06G	✓2C528	36.75	24.50	6.4
B	8	255	TV08G	✓2C529	39.84	26.60	7.6
B	10	425	TV10G	✓2C530	47.85	31.90	10.0
B	12	631	TV12G	✓2C531	49.17	32.80	14.0
B	14	700	TV14G	✓2C532	82.81	55.25	20.0
B	16	950	TV16G	✓2C533	121.28	80.85	30.0
B	18	1200	TV18G	✓2C534	147.50	98.35	37.0
B	20	1700	TV20G	✓2C802	187.38	124.95	46.0
B	24	2350	TV24G	✓2C803	266.25	177.00	61.0

ACCESSORIES FOR 12" TURBINE VENTILATORS

[C] Adjustable base. Allows vertical mounting of ventilator on 0/12 to 7/12 pitch roofs. 20 x 20" flashing for weatherproof installation. Empire brand (AB-12G).

No. 4C505. Shpg. wt. 6.0 lbs. List $25.01. Each.....$16.68

[D] Automatic damper. Fits inside a 12" turbine base and turbine with base units. Opens fully at 90°F, closes fully at 50°F eliminating need for weather cap in winter. Galvanized steel. Installation and field adjustment instructions in carton. CertainTeed brand (WTD12).

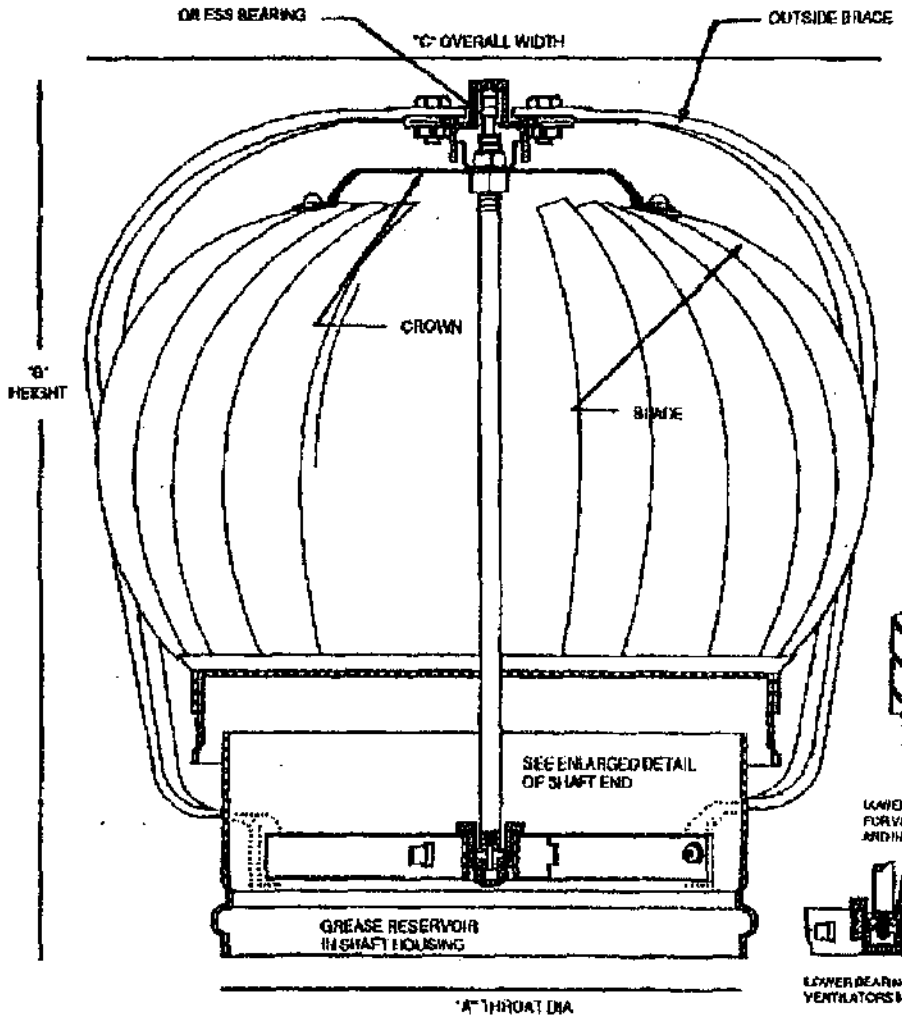
No. 4C713. Shpg. wt. 2.0 lbs. List $31.72. Each.....$18.90

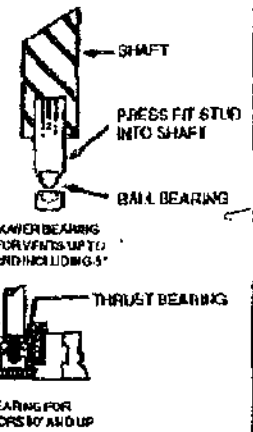
COMPLETE 12" TURBINE VENTILATION SYSTEM

Easy to assemble. Internally or externally braced ventilators available. To order, combine ventilator, base, and damper stock numbers (described above) from the table at right.

System Type	Ventilator	Base	Damper
Internally Braced	4C689	4C505	4C713
Externally Braced	2C531	4C505	4C713

Turbine Ventilators





Construction Specifications

"A" Throat Size	GAUGE			No. of Braces	Brace Material
	Crown Galv.	Blade Galv.	Throat Galv.		
4	24	26	26	3	Alum.
6	24	26	26	3	Alum.
8	24	26	26	3	Alum.
10	24	26	26	3	Alum.
12	24	26	24	3	Alum.
14	22	26	24	3	Alum.
16	22	26	24	3	Steel
18	22	26	24	4	Steel
20	20	26	24	4	Steel
24	20	26	22	4	Steel

Dimensional and Performance Data

"A" Throat Size	"B" Height	"C" Overall Width	Exhaust Capacity *	Approx. Shipping Weight
4	12	16 1/4	129	6
6	14 1/2	12 3/4	147	7
8	15	14 1/4	255	8
10	16 1/4	16 1/4	425	11
12	17	19	631	13
14	19 3/4	22 3/4	700	21
16	21 3/4	25 1/2	950	31
18	24	29	1200	38
20	25 1/4	31 5/8	1700	46
24	29 1/4	35 3/4	2350	59

* 4 MPH Wind CFM

Empire Ventilation Equipment Co., Inc.
35-39 Vernon Boulevard
Long Island City, NY 11106-5195 USA
718 - 728 - 2143

EMPIRE

Drawing #34 62 857
Revised 9/1/87

Bob Wasserman

APPENDIX J

Quality Assurance Project Plan

APPENDIX C

QUALITY ASSURANCE PROJECT PLAN

1.0 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA

A quality assurance/quality control program is designed to produce data of the quality necessary to achieve project objectives and meet or exceed the minimum standard requirements for field and analytical methods. The QA/QC program will include:

- A mechanism for ongoing control and evaluation of data quality.
- A measure of data quality in terms of precision, accuracy, representativeness, completeness, and comparability.

The following is a general discussion of the criteria used to measure the quality at both field and laboratory analytical data. Field data collection and quality assurance will be the responsibility of Haley & Aldrich and its subcontractors retained for field explorations (drillers, etc.). Laboratory data quality assurance as described herein will be the responsibility of the contract analytical laboratory retained for this project.

1.0.1 Precision

Precision measures the reproducibility of measurements under a given set of conditions or is a quantitative measure of the variability of a group of measurements compared to their average value.

Precision is usually stated in terms of standard deviation but other estimates such as the relative percent difference (RPD) expressed as a percentage of the mean, range (maximum value minus minimum value), and a relative range are common.

The overall precision of measurement data is a mixture of sampling and analytical factors. Analytical precision is much easier to control and quantify than sampling precision. There are more historical data related to individual method performance and the "universe" is limited to the samples received within a laboratory. In contrast, sampling precision is unique to each site.

Sampling precision for this project will be determined by collecting and analyzing collocated (split) or field replicate samples and by creating and analyzing laboratory replicates from one or more of the field samples. The analytical results from the collocated or field replicate samples will provide data on sampling precision. Laboratory replicate analysis will provide data on laboratory precision. For the Remedial Program collocated or replicate samples will be collected at a rate of 10% of the total number of samples obtained in a particular sampling effort.

1.0.2 Accuracy

Accuracy relates to the bias in a measurement system. Bias is the difference between the average value of observed measurements and the "true" value. Sources of error are the sampling process, field contamination, preservation, handling, sample matrix, sample preparation and analytical techniques. For the Remedial Program sampling accuracy will be assessed by evaluating the results of field/trip blanks. Field and trip blanks will be collected as appropriate for each sampling effort. Analytical accuracy will be assessed through the use of known QC samples and matrix spikes.

1.0.3 Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population, a parameter variation at a sampling point, or an environmental condition. Representativeness is a qualitative parameter which is most concerned with the proper design of the sampling program. The representativeness criterion is best satisfied by making certain that sampling locations are selected properly and a sufficient number of samples are collected.

Representativeness will be addressed by describing sampling techniques and the rationale used to select sampling locations. Sampling locations may be biased (based on existing data, instrument surveys, observations, etc.) or unbiased (completely random or stratified-random approaches) depending on the situation. The rationale used to determine sampling locations will be explicitly explained.

For the former Remedial Program nearly all sampling will be biased; that is, water samples and monitoring well placement will be dictated by apparent presence or absence of site specific target compounds. Specific sample technique descriptions, which allow consistency, repetitiveness and thus representativeness in sampling, are included in this work plan as described by the specific Work Tasks in this plan.

Representativeness may also be assessed by the use of collocated samples. By definition, collocated samples are collected so that they are equally representative of a given point in space and time. In this way, they provide both precision and representativeness information. As stated previously collocated samples will be collected at a rate of 10% of all samples collected.

1.0.4 Completeness

Completeness is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is essentially the same for all data uses: that a sufficient amount of valid data be generated.

1.0.5 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. Sample data should be comparable with other measurement data for similar samples and sample conditions. This goal is achieved through using standard operating procedures to collect and analyze representative samples and the reporting of analytical results. The standard operating procedures for the various activities to be conducted during this Remedial Program are contained within the attached appendices.

1.1 DOCUMENTATION AND CHAIN-OF-CUSTODY

1.1.1 Field Procedures

The quality of data can be greatly effected by sample collection activities. If the integrity of collected samples is for some reason in question, the data, regardless of its analytical quality will also be in question. Field sampling standard operating procedures will provide for the collection of samples representative of the matrix being investigated.

The following procedures will be used to maintain the integrity of the samples:

- Upon collection, samples will be placed in the proper containers. In general, samples collected for organic analysis will be placed in pre-cleaned glass containers and water samples collected for inorganic and field parameters analysis which will be placed in precleaned plastic (polyethylene) bottles.

- Each sample will be assigned a unique sample I.D. number which will be placed on a sample label securely affixed to the containers. Other information to be placed on the sample label will include: the sample type, the sampler's name, date collected and preservation method. Information on the labels will be completed with a ballpoint or felt-tip waterproof pen.

- Samples will be properly and appropriately preserved by field personnel in order to minimize loss of the constituent(s) of interest due to physical, chemical or biological mechanisms.

- The appropriate sample volumes to be collected will be confirmed prior to initiation of the field program to ensure that method-or contract-required detection limits (or quantification limits) can be successfully obtained and that the required level of quality control relative to both precision and accuracy can be performed.

- A chain-of-custody form will be completed as each sample is collected. The completed forms will accompany the samples to the laboratory. The field personnel collecting the samples will be responsible for the custody of the samples until the samples are relinquished to the laboratory. Sample transfer will require the individuals relinquishing and receiving the samples to sign, date and note the time on the chain-of-custody form.

  On-site headspace analysis of water, soil and soil vapor, if collected and required during the various field operations, will not require chain-of-custody records. However, information

from these analyses will be recorded on one of H&A's standard field forms, and will include information identifying each headspace sample with the correlated laboratory sample split, if one is taken.

- Samples will be shipped or delivered in a timely fashion to the contract laboratory so that holding-times and/or analysis times as prescribed by the chosen methodology can be met. Samples will also be transported in containers (coolers) which will maintain the appropriate temperature for those analytical parameters for which such refrigeration is required in the defined preservation protocols.

Field personnel will be required to keep written records of field activities on applicable preprinted field forms or in a bound field notebook. These records will be written legibly in ink and will contain pertinent field data and observations. Entry errors or changes will be crossed out with a single line, dated and initialed by the person making the correction. Field forms and notebooks will be reviewed by the Quality Assurance Officer.

1.1.2 Laboratory Procedures

The contract laboratory chain-of-custody procedures will be based upon the National Enforcement Investigation Center (NEIC) policies and procedures (EPA-330/9-78-001-R). A full-time sample custodian will be assigned the responsibility of sample control. It will be the responsibility of the sample custodian to receive all incoming samples. Once received, the custodian will: 1) document that each sample is received in good condition (i.e., unbroken, cooled, etc.), and that the associated paperwork, such as chain-of-custody forms have been completed; and 2) will sign the chain-of-custody forms. In special cases, the custodian will document from appropriate subsamples that chain-of-custody with proper preservation has been accomplished. The custodian will also document that sufficient sample volume has been received to complete the analytical program.

The sample custodian will then place the samples into secure limited access storage (refrigerated storage if required).

Consistent with the analyses requested on the chain-of-custody form, analyses by the contract laboratory's analysts will begin in accordance with the appropriate methodologies. Samples will be removed from secure storage only after internal chain-of-custody sign-out procedures have been followed.

Empty sample bottles, when the available volume has been consumed by the analysis, will be returned to secure and limited access storage. Upon completion of the entire analytical work effort, samples will be disposed of by the sample custodian. The length of time that samples are held will be at least thirty (30) days after reports have been submitted.

Disposal of remaining samples will be completed in compliance with RCRA and 6 NYCRR Part 373 regulations.

Empty sample bottles will be disposed of as non-hazardous solid waste consistent with sample exclusion and empty container provisions of RCRA. All liquid and solid samples for disposal will be reviewed by the contract laboratory's management prior to authorization for disposal. If the samples are hazardous by characteristic (reactive, corrosive, ignitable or toxic) or are a TSCA/PCB waste, appropriate controlled disposal will be performed. The contract laboratory will be a permitted generator of hazardous wastes and will have disposal contracts with all necessary types of subtitle-C TSDF facilities. Full documentation of each step of the disposal process, consistent with the requirements of RCRA will be monitored by the contract laboratory's Environmental Health and Safety Officer.

For other non-characteristically hazardous or non-TSCA materials, the contract laboratory will review the available analytical results for the samples in question and dependent on the presence of and/or concentration of hazardous constituents will either dispose of materials as hazardous wastes or exercise its options to dispose of the materials as non-hazardous waste based upon the laboratory samples exclusion provisions of RCRA.

1.2 FIELD INSTRUMENT CALIBRATION PROCEDURES

Several field instruments will be used for both on-site screening of samples and for health and safety air monitoring. On-site screening and off-site air monitoring for health and safety purposes will be accomplished using several different organic vapor detection devices (Foxboro OVA, Draeger tubes).

1.2.1 Organic Vapor Detection Instruments

Instruments including the Foxboro Organic Vapor Analyzer, HNu PI-101 photoionization organic vapor detector, (11.7 eV lamp) Photovac Microtip, and Draeger tubes may be used to monitor air quality during drilling and sampling procedures. General calibration procedures common to each instrument manufacturer's specifications will be followed (except for the Draeger tubes which do not require calibration).

1.2.2 Draeger Multi-Gas Detector System

The Draeger Multi-Gas detector system consists of two primary components, the gas detector pump and the Draeger indicator tubes. Each Draeger indicator tube kit contains specific operating procedures provided by the manufacturer. Operation of the Draeger Multi-Gas detector system will be performed with strict adherence to the manufacturer's gas indicator tube kit specifications.

Prior to each operation of the system, the gas detector pump will be inspected for:

- Leaks within the folds of the bellows
- Proper seating of the indicator tube within the pump head stopper.
- Expiration date of indicator tube to be used.

Satisfactory completion of the pre-operation inspection will be noted on the Field Sampling Record, along with the results of each field measurement.

1.2.3 pH/Conductivity/Temperature Measurements

A field monitoring instrument will be utilized to determine pH, specific electrical conductance and temperature measurements in conjunction with water quality sample collection. The probes will be calibrated immediately prior to each day's operation using NIST traceable reference materials. Calibration data including reference materials and dates of reference material preparation and expiration, and the percent of true value observed will be recorded on the Field Sampling Record.

If calibration verification standard recovery is determined to be outside acceptance criteria of ± 20% of the standard true value, the specific probe will be reconditioned and recalibrated or replaced.

1.3 Laboratory Analytical Procedures

Analytical procedures to be utilized for laboratory analysis of environmental samples as part of the Remediation program will be from the following document:

- "Test Methods for Evaluating Solid Waste" SW-846, USEPA Office of Soils Waste and Emergency Response 3rd Edition, Update December 1987.

1.4 Internal Quality Control Checks

1.4.1 Laboratory Procedures

Procedures which contribute to maintenance of overall laboratory quality assurance and control include proper sampling techniques, appropriately cleaned sample bottles (either by the contract laboratory or purchased as "certified clean"), proper sample identification and logging, applicable sample preservation, storage and analysis within holding times, and use of controlled materials.

The quality control program utilized by the contract laboratory will be based upon recommendations contained in the EPA Handbook for Analytical Quality Control in Water and Waste water Laboratories (March 1979), 600/4-/79-019.

Precision and accuracy charts will be maintained for specific parameters as described in the EPA handbook.

Consistent with general guidance from the EPA Handbook, control charts for internal standards and method surrogates will be maintained for each method to be performed as part of the analysis of each project sample.

Duplicate Samples

A duplicate analysis will be performed for every analytical batch or at a minimum of 10 percent of all project samples analyzed by the contract laboratory. The precision or reproducibility of the data generated will be monitored using a precision quality control chart.

The precision chart used to monitor laboratory precision will be based upon information presented in Section 6 of the EPA Handbook of Analytical Quality Control in Water and Waste water Laboratories (March 1979), 600 5-79-019.

The Upper Control Limit (UCL) will be calculated as follows:

$$UCL = D_{4R}$$
$$= 3.27\ (0.006)$$
$$= 0.0196$$

Where:

D_4 = Shewart factor for ranges based upon duplicate analyses.
R = The mean range of multiple replicate determinations.

The critical R value (R_c) is the upper control limit rounded off to an operationally feasible number; i.e., the $R_c = 0.020$. This R_c or critical R value is the maximum allowable difference between replicate determinations on a single sample. The R value will be plotted every day analyses are performed and the points will be reviewed for trends. If an R value exceeds the R_c value, the data will be considered invalid and the cause for such performance will be investigated and corrected before analyses are resumed.

Matrix Spike Samples

A minimum of 10 percent of all project samples to be analyzed by the contract laboratory will be spiked with known amounts of the target compounds being analyzed. The amount of the compound recovered from the sample compared to the amount added will be expressed as a percent recovery. The percent recovery of an analyte is an indication of the accuracy of an analysis and will be expressed on an accuracy chart.

Percent recovery will be calculated for matrix spike and matrix spike duplicate analyses (MS/MSD).

$$\%\ Recovery = \frac{Spiked\ Sample - Background}{Known\ Value\ of\ Spike} \times 100$$

The standard deviation of the MS/MSD recoveries will be calculated. The upper and lower warning limits will be set at plus and minus 2 standard deviation units. The upper and lower control limits will be set at plus and minus 3 standard deviations.

The acceptance criteria based upon this chart will be defined as follows:

The quality control value indicates acceptable analysis values when it falls between the lower warning limit (LWL) and the upper warning limit (UWL).

If the quality control value falls between the control limit and warning limit (UCL and UWL or LCL and LWL), the analysis should be scrutinized as possibly out-of-control. The sample results will still be acceptable at this point.

If the quality control value falls outside the control limits (UCL or LCL), this indicates an out-of-control situation. The analysis must be stopped until the reason for the problem has been identified and resolved. After it has been corrected, the problem will be documented in the procedure book, with the solution noted.

The contract laboratory will also include the analysis of Standard Reference Materials (SRM's) whenever possible. Standard reference materials will be supplied from independent manufacturer's and traceable to NIST materials with known concentrations of selected parameters. In cases where an independently supplied SRM is not available, one may be prepared by the contract laboratory.

1.4.2 Field Procedures

Field Blanks

Internal quality control checks include analysis of equipment blanks used to validate successful equipment cleaning activities.

Whenever possible, dedicated equipment will be employed to reduce the possibility of cross-contamination of samples.

Equipment used for organic sample collection will be cleaned prior to each usage of the equipment, according to the following procedure:

- Potable Water Rinse
- Alconox detergent (or equivalent) wash
- Potable water rinse
- Deionized water rinse

1.5 CALIBRATION PROCEDURES

The use of materials of known purity and/or quality will be utilized for the analysis of environmental samples as part of the Remedial Program. Field personnel and the contract laboratory will carefully monitor the use of all laboratory materials including solutions, standards and reagents through well-documented procedures.

All solid chemicals and acids/bases used by field personnel and the contract laboratory will be reagent grade or better. All gases will be High Purity or better. All standards or standard solutions will be

obtained from the U.S. Environmental Protection Agency or from reliable Cooperative Research and Development Agreement (CRADA) certified commercial sources.

All Standard Reference Materials or Performance Evaluation Materials will be obtained from the National Institute of Standards and Technology (formerly National Bureau of Standards) or reliable CRADA certified commercial sources.

All materials including standards or standard solutions will be dated upon receipt, and will be identified by material name, lot number, purity or concentration, supplier, receipt/preparation date, recipient/preparer's name, expiration date and all other pertinent information.

Standards or standard solution concentrations will be validated prior to use. This validation may be re-standardization for acids or bases, response factor comparison, standard curve response, comparison to other standards made at a different time and/or by a different analyst. All standards and standard materials will be checked for signs of deterioration including unusual volume changes (solvent loss), discoloration, formation of precipitates or changes in analyte response. All standards and standard solutions will be properly stored and handled and will be labeled with all appropriate information including compound/solution name, concentration, solvent, expiration date, preparation date and initials of the preparer.

All solvent materials or materials used as a part of a given procedure will also be checked. Each new lot of solvent will be analyzed to insure the absence of interfering constituents.

Instruments will be calibrated in order to assure that method required criteria including sensitivity and detection limits can be met. Each instrument will be calibrated with standard solutions appropriate to the type of instrument and method being performed.

1.5.1 Gas Chromatograph/Mass Spectrometer/Data System

The mass spectrometer (MS) will be tuned prior to each analytical event and verified after twelve hours of continuous operation, using decafluorotriphenylphosphine (DFTPP) or bromofluorobenzene (BFB)(as appropriate) according to EPA procedures. The tuning results will be maintained on file.

Standard curves will be prepared based on the analysis of pure chemicals at known concentrations. At least three levels will be analyzed within the dynamic range of the analytical system.

For volatile organics, surrogates will be used to establish purge and trap efficiency. Quantitation will be accomplished via internal standardization techniques.

For semi-volatile organics, surrogates will be added to the raw sample to assess preparatory recoveries; internal standards will be added to all extracts and calibration solutions immediately before analysis for quantitation.

Surrogates and internal standards added to all samples and standards will be monitored daily.

1.5.2 Gas Chromatographs

To verify detector sensitivity and chromatographic performance, calibration curves will be generated from the analysis of pure compounds at known concentrations covering the dynamic range within each analytical batch.

Detector response will be compared to a historical file for each compound or class of compounds to validate acceptable performance. If acceptable standard curves are not generated, corrective measures such as replacing glass injector linings, changing septa, changing columns, and "baking" columns and/or detectors will be employed until proper performance has been established.

1.6 TECHNICAL SYSTEM AUDITS

1.6.1 Field Procedures

Technical Systems audits for field sampling and analysis procedures will be conducted by a qualified Haley & Aldrich staff person who is familiar with the procedures being reviewed, but is not directly involved in the Remedial Program. Systems audits will be conducted for groundwater and soil sampling and will occur at the beginning of each sampling task. An audit checklist will be prepared and used for each audit. It contains the items that pertain to the procedure under review such as well purging during the water quality sampling procedures. The checklists along with the auditor's observations and recommendations will be submitted to the QAO.

The following items will comprise the systems audit and will appear on the checklist:

- Field instrument calibration and appropriate documentation.
- Documentation of field log books and sampling data sheets.
- Potential contamination source minimization.
- Proper sample collection, storage, handling and transportation procedures.
- Compliance with chain-of-custody procedures.

1.6.2 Laboratory Procedures

Generally, for any and all measurement systems, the following chronological steps will be performed at one or more levels of the data generation process:

- sample receipt;
- sample logging, inventory, chain-of-custody;
- sample splitting and preservation (if required);

- sample storage;
- sample preparation (extraction and/or digestion);
- sample analysis (standard, QC and samples);
- data calculation;
- data reporting (internal);
- data review/QC logging;
- re-analysis (if and when required) and assessment;
- report preparation;
- report issuance/central file maintenance;
- data storage on magnetic tape
- sample archival and/or disposal.

Two specific analytical groups will be involved in the analytical protocols for this project. These groups will be GC and GC/MS. The specific means by which each group processes the data will be in general agreement with the steps listed above.

Linearity of the standard curve will be verified through regression analysis and final sample concentrations will be entered in a metals data logbook once quality control information, including the results of the SRM's, is deemed acceptable. These results will be transcribed into a final report form for final data/QC review and subsequent issuance.

Gas Chromatography (including separations laboratory)

The sample processing begins in the separations laboratory where a bound notebook will be maintained for the purpose of recording all pertinent information regarding the extraction and clean-up (if required) for the samples. This logbook will contain the following data:

- analyst
- extraction date
- job number
- sample I.D.
- extracted volume or weight of sample
- final concentration volume

- vial number (for extracts produced)
- analysis type (Base/Neutral, Acid Phase, Pesticide)
- glassware set

The above information will be required for either GC or GC/MS analyses. After samples have been prepared for analysis, the GC department will utilize a series of logs, reporting forms and computers to maintain the necessary data. The first will be a bound injection log which contains the following:

- analyst
- injection date
- job number
- sample I.D. vial number
- instrument run number
- method number (specific column and instrument conditions for the particular analyses)
- detector used

On the day that specific analyses will be performed, a minimum of three (3) point, standard curve will be generated via both computer assisted raw data plotting and regression analyses, using the areas as integrated by the gas chromatograph. The integrations and the standard curves will be reviewed by the analyst for consistency and accuracy, and if found acceptable, the sample concentrations will be calculated using standardized internal report forms. These forms will also contain information relative to field blanks, method blanks and solvent blanks associated with the analysis. Information data required for these calculations will be acquired from both the separations and the injection logbooks.

All chromatographs, standards information, QA/QC results, copies of separations and injection logbook pages and other project specific information will be maintained in separate files and used for data calculation and final report preparation.

Gas Chromatography/Mass Spectrometry (GC/MS)

A bound injection log will be maintained for each GC/MS unit and contains the following information:

- analysis date/time
- analyst
- computer file number

- sample I.D. and extract vial number
- job number
- injected volume
- extracted volume
- final volume and dilution
- column number
- injection port temperature
- GC temperature program
- run time
- column pressure
- multiplier setting
- internal standard retention time and % recovery
- surrogate retention time and % recovery

On each day of analysis, a standard curve will be generated to determine calibration factors. Samples will be searched for the characteristic ions of each compound of interest (as listed in the method) and if the ion's retention time and ratio meet the established criteria, the compound will be qualitatively identified. The analyte concentration will be calculated from the primary ion area. The same type of procedure will be used for the evaluation of field blanks, method blanks and solvent blanks.

The data will be reviewed relative to the appropriate quality control results for that analytical batch. Internal reporting forms will be used for precision and accuracy data from the GC/MS analysis of volatiles and/or base neutral, acid phenolic or pesticide/PCB determinations. Upon approval by the GC/MS group supervisor, the project sample analytical data will be transferred to the report preparation group for final review and report issuance.

1.7 PERFORMANCE AND SYSTEM AUDITS

By NEIC definition, an audit is a systematic check to determine the quality of operation of some function or activity. Audits are further defined as being of two basic types; performance and system audits.

A performance audit is one in which quantitative or qualitative data are independently obtained for comparison with routinely obtained data from a measurement system. Performance audits to be completed by the contract laboratory will incorporate a number of mechanisms including the analyses of performance evaluation samples, U.S. Environmental Protection Agency, NYSDOH, as well as the analysis of commercially available check samples and/or the EPA's quality assurance check sample program. Additionally, the contract laboratory QA Officer will submit blind performance evaluation samples to the laboratory on a semi-annual basis. The routine use of available and applicable SRM's also provides for a continuous performance audit.

System audits, as opposed to performance audits, are strictly qualitative and consist of an on-site review of a laboratory's quality assurance system and physical facilities for calibration and measurement. System audits are routinely performed by NYSDEC Bureau of Technical Services (BTS) personnel as an element of certification programs. Additionally, detailed internal audits will also be performed on a semi-annual basis by the contract laboratory Quality Assurance Officer.

At the conclusion of internal or external system audits, reports will be provided to the contract laboratory's operating divisions for appropriate comment and remedial/corrective action where necessary. Written response to internal as well as external audits will be required. Records of audits and corrective actions will be maintained by the Contract Laboratory QA Officer.

1.8 PREVENTATIVE MAINTENANCE

1.8.1 Field Procedures

The field equipment preventive maintenance program helps to ensure the effective completion of the sampling effort and is designed to minimize equipment down time. Program implementation is concentrated in three areas:

- Maintenance responsibilities.
- Maintenance schedules.
- Inventory of critical spare parts and equipment.

The maintenance responsibilities for field equipment will be assigned to the task leaders in charge of specific field operations. Field personnel will be responsible for daily field checks and calibrations and for reporting any problems with the equipment. The maintenance schedule will follow the manufacturer's recommendations. In addition, the field personnel will be responsible for determining that critical spare parts are included with the field equipment. An adequate inventory of spare parts will be maintained to minimize down time. The inventory will primarily contain parts that are subject to frequent failure, have limited useful lifetimes and/or can't be obtained in a timely manner.

1.8.2 Laboratory Procedures

All analytical equipment at the contract laboratory will be covered by some type of maintenance contract. The degree and extent of outside (contracted) routine and/or preventative maintenance assistance will be a function of the complexity of the equipment, and the contract laboratory expertise relative to repair and/or maintenance of the instrumentation.

Annual preventative maintenance service visits will involve cleaning, adjusting, inspecting and testing procedures designed to deduce product failure and/or extend useful product life. Between visits, routine operator maintenance and cleaning will be performed according to manufacturer's specifications.

1.9 DATA ASSESSMENT PROCEDURES

1.9.2 Field Procedures

Field-generated information such as field logs and forms will be reviewed for validity. The reviewing will include field logbooks/forms, data entry and calculation checks.

1.9.2 Laboratory Procedures

Quality Assurance (QA) procedures are based on the specific methodology utilized for sample analysis. Each analytical procedure includes determination/maintenance of standard response and linearity, instrument tuning, internal standard responses, surrogate recoveries in blanks and samples, spike recoveries and replicate precision. Many of the QA criteria are method based and decisions as to corrective action in the form of re-analysis will be determined by the analyst. Surrogate, internal standard and spike recoveries will be plotted on control charts so that trends in data quality can also be monitored so that appropriate and timely corrective action can be taken.

The contract laboratory's quality assurance/quality control program will include the following:

- Precision, in terms of replicate percent difference (RPD), will be determined by replicate sample analysis at a frequency of one per sample set or one sample in ten (10%) whichever is greater or at the appropriate frequency as defined by the method. RPD is defined as the absolute difference of replicate measurements divided by the mean of these analyses normalized to percentage.

- Accuracy, in terms of percent recovery (recovery of known constituent additions or surrogate recoveries), will be determined by the analysis of spiked and unspiked samples. The objective is to spike with such a quantity as to raise the sample concentration to 75% of the working analytical range. For large on-going projects, it will often times be most advantageous to perform the spiking of a random sample after the initial analysis has been completed. Alternatively and specific to certain methods, matrix spike and matrix spike duplicates are used for expression of accuracy. Recovery data can be gathered in two (2) forms; relative recovery and absolute recovery. Relative recovery is based on a spike being added to project samples while absolute recovery is based upon the SRM's or spiking of laboratory water (matrix spike blank). The frequency of spiking for both absolute and/or

relative recoveries will be one per sample set or one sample in ten (10%) whichever is greater. The selection of relative recovery or absolute recovery will be determined by the volume of sample available for analysis. Generally, if greater than ten samples have been received, a relative and an absolute recovery will be measured.

- With each set of project samples a method blank will be prepared and analyzed. If field blanks are received, this blank will be processed and reported as a project sample. Trip blanks, if received will also be analyzed, processed and reported as a project sample. Trip blanks will be prepared and analyzed with all sample collections for volatile organic analysis. Additionally, holding blanks for volatile analysis and solvent blanks will be prepared as required. Solvent blanks are analyzed based upon method blank results and/or changes in solvent suppliers/lots. Unprocessed solvent blanks will be continually analyzed on the GC and or GC/MS as a routine control measure for these instruments.

- Standard Reference Materials (SRM's) will be used for each analysis. Sources of SRM's include the U.S. Environmental Protection Agency, commercially available material from CRADA certified vendors and/or laboratory produced solutions. SRM's, when available and appropriate, will be processed and analyzed on a frequency of one per set of samples.

- Stock and working standard solutions and separate spiking solutions will be prepared from materials supplied by the U.S. Environmental Protection Agency or purchased from commercially available sources. Standard curves will be generated consistent will methodology. Standard curves will be produced once per day and/or verified by re-analysis of mid-range standards at least every tenth sample. Standard curves for conventional parameters (i.e. cyanide) will not be generated daily but will be verified on a daily basis. Standard curves will also be reviewed for consistency to help identify problems that could be associated with the applicable instruments and/or the standard solutions.

1.10 INVESTIGATIVE CORRECTIVE ACTION

1.10.1 Field Procedures

Corrective action is intended to correct problems that arise when sampling or measurement procedures and environmental data do not meet accepted performance criteria. The Quality Assurance Officer will be responsible for ensuring the quality of the sampling procedures and environmental data and initiating corrective action when appropriate.

The corrective action procedures will be as follows:

- Identify/define the problem.

- Assign responsibility for investigating the problem.

- Investigate/determine the cause of the problem.

- Determine an appropriate corrective action to eliminate the problem.

- Implement the corrective action.

- Evaluate the effectiveness of the corrective action.

- Verify that the corrective action has eliminated the problem.

The above procedures will be implemented through the use of the Systems Audit as described previously or upon any team member becoming aware of the potential need for corrective action. Any member of the project may initiate corrective action procedures by reporting the nature of the suspected problem to the Project Manager or QAO. The Project Manager will begin corrective action by relating the problem to appropriate personnel. A corrective action alternative will be selected, implemented and verified through the use of technical audits.

1.10.2 Laboratory Procedures

Within a laboratory QA/QC program, a percentage of data will not meet all of the established criteria. The following paragraphs defines the corrective action decision process relative to possible non-compliant events within the contract laboratory QA/QC program.

a) If precision, accuracy and SRM (if available) data are all within the established warning limits; proceed with final issuance of data report including all QA/QC results.

b) If precision, accuracy and SRM (if available) are within control limits but one or all of these parameters exceed the warning limits, the source(s) of bias/error needs to be evaluated, but proceed with final issuance of data report including all QA/QC results.

   Source of error/bias may be found in the following:

   - calculation errors
   - transcription errors
   - sample matrix (i.e., high suspended solids in water sample, oily sediment, etc.
   - sample homogeneity
   - level of contaminant measured (validity of the precision measurement is a factor of concentration)
   - analyst error (warning control limits exceeded for one analyst more frequently than others)
   - appropriateness of method(s) based upon sample type (wastewater as opposed to drinking water)

c) If precision, accuracy and/or SRM (if available) are out of control, one of the following approaches to the problem can be used:

   - SRM out-of-control whether or not precision or accuracy are in control;

method based errors are suggested and all data is suspect. If SRM is verified as out-of-control (i.e., standards are checked, etc.) all samples will be re-analyzed or data reported as out-of-control, if no additional sample available.

- SRM (if available) is in control but absolute recovery is out of control; method based error is suspected. If standards and spiking solutions are verified to be accurate as independent solutions, all data is suspect unless reprocessing and re-analysis of absolute recovery sample can be completed to prove only random error. If systematic error (constant out-of-control absolute recovery) is found, all samples will be re-analyzed after corrective action has been taken.

- SRM (if available), absolute recovery and precision are in control but relative recovery is out of control; matrix problems are likely. Proceed to issue data report with appropriate qualifications as to possible matrix effects.

- SRM (if available), absolute recovery and relative recovery are in control but precision is out-of-control; matrix problem likely in the form of sample heterogeneity. If sample appears homogeneous, the sample will be re-analyzed; if data is still out-of-control, data report will be issued with qualifications. If, on the other hand, data is in control, analyst error will be suspected. Each data point from the original sample set will be appropriately qualified.

- SRM and absolute recovery are under control but both relative recovery and precision are out-of-control; matrix effects, sample homogeneity problems and/or analyst error will be suspected. If re-analysis of a well-mixed homogeneous sample by different analyst(s) is still out-of-control, the data will be with a qualifier relative to matrix effects. If upon re-analysis relative recovery is within control limits but precision is still uncontrolled, the data report will be issued with advise of potential errors relative to heterogeneity of sample. If, in the last possible case, re-analysis indicates adequate precision but uncontrolled relative recovery, the final data report will be issued with advise of possible sample matrix effects on this data.

d) Precision limits will be defined by a relative percent difference which, when exceeded, indicates unacceptable analytical performance. Accuracy limits will be expressed in percent recovery of spiked material. A recovery below or above the set criteria will indicate a need for corrective action.

If any analysis has been deemed "out-of-control" corrective action will be taken to insure continued data quality.

The following presents a number of corrective actions which may be employed, depending upon the particular situations.

- Calculations will be rechecked.

- Sampling handling, i.e., digestion, concentration and or extraction logs will be checked for discrepancies in sample handling.

- The target analyte concentration will be reviewed to determine if it has severely influenced the reliability of the precision or recovery calculations.

- The instrument and method performance will be verified by inspecting data on standard reference materials (SRMs) processed in the same data set.

- Quality control data on the other samples in the data set, including surrogate recovery, internal standards, etc., will be reviewed to determine if the problem was method related or sample related.

- If original sample is available, the sample will be assessed for homogeneity.

- If sample is unavailable and no explanation for poor quality control results can be determined, the Project Quality Assurance Officer will be notified and additional sample may be obtained. If additional sample is unavailable, the results will be issued with a qualification as to their accuracy.

1.11 QUALITY ASSURANCE (QA) REPORTS TO MANAGEMENT

Critically important to the successful implementation of the QA Plan is the reporting system which provides the means by which the program can be reviewed, problems identified and programmatic changes made to remediate or improve the plan.

Quality Assurance reports to management take a number of forms as follows:

- Audit reports, internal and external audits with responses

- Performance evaluation sample results; internal and external sources

- Daily QA/QC exception reports corrective actions

- QA charts

QA/QC corrective action reports will be prepared by the Contract laboratory QAO and presented to the contract laboratory management personnel so that performance criteria can be monitored for all analyses from each analytical department. The updated trend/QA charts prepared by the contract laboratory QA/QC personnel will also be distributed at least monthly and reviewed by various levels of the contract laboratory management as well as the Contract laboratory Officer.

APPENDIX K

System Operation Logsheets

HALEY & ALDRICH

ENARC-O MACHINE PRODUCTS
LOW VACUUM SOIL VAPOR EXTRACTION SYSTEM
OPERATIONS LOG SHEET

START DATE: OCTOBER 1999		DATE:	10/29/99	11/3/99	11/5/99	11/24/99	12/1/99				
		TIME:	14:20	08:25	09:10						
		BY:	MMD	MMD	DMN	DMN	DMN				
DESCRIPTION		UNITS	DATA	DATA	DATA	DATA	DATA	DATA	DATA	DATA	DATA
T-1 VAPOR FLOW		SCFM	NS	NS	1.99	0.085	~0				
PID READING		PPM	ND	ND	ND	NA	ND				
		FPM		42-51							
	VAPOR TEDLAR			YES	YES *	YES *	YES				
T-2 VAPOR FLOW		SCFM	NS	NS	1.23	0.175	NO				
PID READING		PPM	ND	ND	ND	NA	ND				
		FPM		42-52							
	TEDLAR			BROKEN	YES	YES	NS				
T-3 VAPOR FLOW		SCFM	NS	NS	1.29	0.085	NO				
PID READING		PPM	16.8	10.1	21-43	NA	9-15				
		FPM		26-33							
	TEDLAR			YES	YES	YES	NS				
T-4 VAPOR FLOW		SCFM	NS	NS	1.70	0.175	NO				
PID READING		PPM	5.5	5.8	9-10	NA	1-3.5				
		FPM		40-45							
	TEDLAR			YES	YES	YES	NS				

GENERAL NOTES: * - TEDLAR MALFUNCTION
10/29/99 - CALM, NO WIND
11/3/99 - TEDLARS NOT SUBMITTED TO LAB, DUE TO HOLDING TIME, WIND VELOCITY @ 94-341 FPM
11/5/99 - TEDLARS SUBMITTED TO C.A.S., WIND VELOCITY @ ~446 FPM, TEMP @ 58°F, HUMIDITY @ 34%, DEWPOINT @ 29°F
11/24/99 - TEDLARS SCREENED @ H&A IN-HOUSE LAB, PID READINGS NOT AVAILABLE DUE TO INSTRUMENT MALFUNCTION
12/1/99 - TEDLAR FOR T-1 COLLECTED & SCREENED @ H&A IN-HOUSE

APPENDIX L

Soil Vapor Analysis

GAS CHROMATOGRAPHY REPORT SHEET
GC SCREENING RESULTS
PURGE AND TRAP

Client: Enarco Machine
File No: 70372-051
Sample Type: Vapor

Date of Run: 11/24/99

Operator: JM
QA/QC: DMC

Sample Identification	Sample Volume (mL)	Target Compound	Ret. Time (min.)	Calibration Ret. Time (min.)	Det. Resp. (Area Cts.)	Cal Fact. (ng/AC)	Conc.	Units
Method Blank	10	1,1-dichloroethene		6.5		1.28E-03	0.0	mg/M^3
	10	methylenechloride		6.7		1.46E-03	0.0	mg/M^3
	10	trans 1,2-dichloroethene		8.6		1.01E-03	0.0	mg/M^3
	10	1,1-dichloroethane		9.05		8.13E-04	0.0	mg/M^3
	10	2-butanone (MEK)		9.7		1.98E-03	0.0	mg/M^3
	10	cis 1,2-dichloroethene		10.6		9.86E-04	0.0	mg/M^3
	10	chloroform		11.07		2.39E-03	0.0	mg/M^3
	10	tetrahydrofuran (THF)		11.8		2.48E-03	0.0	mg/M^3
	10	1,1,1-trichloroethane		12.8		1.23E-03	0.0	mg/M^3
	10	benzene		13.3		2.58E-04	0.0	mg/M^3
	10	trichloroethene		14.7		1.20E-03	0.0	mg/M^3
	10	toluene		17.1		2.61E-04	0.0	mg/M^3
	10	tetrachloroethene		18.6		1.34E-03	0.0	mg/M^3
	10	ethylbenzene		20.01		2.64E-04	0.0	mg/M^3
	10	m-xylene		20.2		2.69E-04	0.0	mg/M^3
	10	o-xylene		20.8		2.63E-04	0.0	mg/M^3
	10	mineral spirits		27.7		5.25E-04	0.0	mg/M^3
		total volatiles					0.0	mg/M^3
Surrogate			15.06	15.06	497411	4.05E-04	100.8	%
T2	10	1,1-dichloroethene		6.5		1.28E-03	0.0	mg/M^3
11/24/99	10	methylenechloride		6.7		1.46E-03	0.0	mg/M^3
	10	trans 1,2-dichloroethene		8.6		1.01E-03	0.0	mg/M^3
	10	1,1-dichloroethane		9.05		8.13E-04	0.0	mg/M^3
	10	2-butanone (MEK)		9.7		1.98E-03	0.0	mg/M^3
	10	cis 1,2-dichloroethene		10.6		9.86E-04	0.0	mg/M^3
	10	chloroform		11.07		2.39E-03	0.0	mg/M^3
	10	tetrahydrofuran (THF)		11.8		2.48E-03	0.0	mg/M^3
	10	1,1,1-trichloroethane		12.8		1.23E-03	0.0	mg/M^3
	10	benzene		13.3		2.58E-04	0.0	mg/M^3
	10	trichloroethene		14.7		1.20E-03	0.0	mg/M^3
	10	toluene		17.1		2.61E-04	0.0	mg/M^3
	10	tetrachloroethene		18.6		1.34E-03	0.0	mg/M^3
	10	ethylbenzene		20.01		2.64E-04	0.0	mg/M^3
	10	m-xylene		20.2		2.69E-04	0.0	mg/M^3
	10	o-xylene		20.8		2.63E-04	0.0	mg/M^3
	10	mineral spirits		27.7		5.25E-04	0.0	mg/M^3
		total volatiles					0.0	mg/M^3
Surrogate			15.078	15.06	463158	4.05E-04	93.8	%
T3	10	1,1-dichloroethene	6.572	6.5	13114	1.28E-03	1.7	mg/M^3
11/24/99	10	methylenechloride		6.7		1.46E-03	0.0	mg/M^3
	10	trans 1,2-dichloroethene		8.6		1.01E-03	0.0	mg/M^3
	10	1,1-dichloroethane		9.05		8.13E-04	0.0	mg/M^3
	10	2-butanone (MEK)		9.7		1.98E-03	0.0	mg/M^3
	10	cis 1,2-dichloroethene		10.6		9.86E-04	0.0	mg/M^3
	10	chloroform		11.07		2.39E-03	0.0	mg/M^3
	10	tetrahydrofuran (THF)		11.8		2.48E-03	0.0	mg/M^3
	10	1,1,1-trichloroethane	12.639	12.8	104879	1.23E-03	12.8	mg/M^3
	10	benzene		13.3		2.58E-04	0.0	mg/M^3
	10	trichloroethene	14.754	14.7	161072	1.20E-03	19.3	mg/M^3
	10	toluene		17.1		2.61E-04	0.0	mg/M^3
	10	tetrachloroethene	18.618	18.6	14565	1.34E-03	2.0	mg/M^3
	10	ethylbenzene		20.01		2.64E-04	0.0	mg/M^3
	10	m-xylene		20.2		2.69E-04	0.0	mg/M^3
	10	o-xylene		20.8		2.63E-04	0.0	mg/M^3
	10	mineral spirits		27.7		5.25E-04	0.0	mg/M^3
		total volatiles					35.8	mg/M^3
Surrogate			15.065	15.06	315093	4.05E-04	63.8	%
T4	10	1,1-dichloroethene		6.5		1.28E-03	0.0	mg/M^3
11/24/99	10	methylenechloride		6.7		1.46E-03	0.0	mg/M^3
	10	trans 1,2-dichloroethene		8.6		1.01E-03	0.0	mg/M^3
	10	1,1-dichloroethane		9.05		8.13E-04	0.0	mg/M^3
	10	2-butanone (MEK)		9.7		1.98E-03	0.0	mg/M^3
	10	cis 1,2-dichloroethene		10.6		9.86E-04	0.0	mg/M^3
	10	chloroform		11.07		2.39E-03	0.0	mg/M^3
	10	tetrahydrofuran (THF)		11.8		2.48E-03	0.0	mg/M^3
	10	1,1,1-trichloroethane	12.637	12.8	9183	1.23E-03	1.1	mg/M^3
	10	benzene		13.3		2.58E-04	0.0	mg/M^3
	10	trichloroethene	14.754	14.7	26279	1.20E-03	3.1	mg/M^3
	10	toluene		17.1		2.61E-04	0.0	mg/M^3
	10	tetrachloroethene		18.6		1.34E-03	0.0	mg/M^3
	10	ethylbenzene		20.01		2.64E-04	0.0	mg/M^3
	10	m-xylene		20.2		2.69E-04	0.0	mg/M^3
	10	o-xylene		20.8		2.63E-04	0.0	mg/M^3
	10	mineral spirits		27.7		5.25E-04	0.0	mg/M^3
		total volatiles					4.3	mg/M^3
Surrogate			15.061	15.06	490508	4.05E-04	99.4	%

GAS CHROMATOGRAPHY REPORT SHEET
GC SCREENING RESULTS
PURGE AND TRAP

Client: Enarco Machine
File No: 70372-051
Sample Type: Vapor

Date of Run: 11/24/99

Operator: JM
QA/QC: DMC

Sample Identification	Sample Volume (mL)	Target Compound	Ret. Time (min.)	Calibration Ret. Time (min.)	Det. Resp. (Area Cts.)	Cal Fact. (ng/AC)	Conc.	Units
Blank	5	1,1-dichloroethene		6.5		1.28E-03	0.0	mg/M^3
12/1/99	5	methylene chloride		6.7		1.46E-03	0.0	mg/M^3
	5	trans 1,2-dichloroethene		8.6		1.01E-03	0.0	mg/M^3
Non-Detect	5	1,1-dichloroethane		9.05		8.13E-04	0.0	mg/M^3
	5	2-butanone (MEK)		9.7		1.98E-03	0.0	mg/M^3
	5	cis 1,2-dichloroethene		10.6		9.86E-04	0.0	mg/M^3
	5	chloroform		11.07		2.39E-03	0.0	mg/M^3
	5	tetrahydrofuran (THF)		11.6		2.48E-03	0.0	mg/M^3
	5	1,1,1-trichloroethane		12.6		1.23E-03	0.0	mg/M^3
	5	benzene		13.3		2.58E-04	0.0	mg/M^3
	5	trichloroethene		14.7		1.20E-03	0.0	mg/M^3
	5	toluene		17.1		2.61E-04	0.0	mg/M^3
	5	tetrachloroethene		18.6		1.34E-03	0.0	mg/M^3
	5	ethylbenzene		20.01		2.64E-04	0.0	mg/M^3
	5	m-xylene		20.2		2.69E-04	0.0	mg/M^3
	5	o-xylene		20.8		2.63E-04	0.0	mg/M^3
	5	mineral spirits		27.7		5.25E-04	0.0	mg/M^3
		total volatiles					0.0	mg/M^3
Surrogate				15.06		4.05E-04		
T1	5	1,1-dichloroethene		6.5		1.28E-03	0.0	mg/M^3
12/1/99	5	methylene chloride		6.7		1.46E-03	0.0	mg/M^3
	5	trans 1,2-dichloroethene		8.6		1.01E-03	0.0	mg/M^3
	5	1,1-dichloroethane		9.05		8.13E-04	0.0	mg/M^3
	5	2-butanone (MEK)		9.7		1.98E-03	0.0	mg/M^3
	5	cis 1,2-dichloroethene		10.6		9.86E-04	0.0	mg/M^3
	5	chloroform		11.07		2.39E-03	0.0	mg/M^3
	5	tetrahydrofuran (THF)		11.6		2.48E-03	0.0	mg/M^3
	5	1,1,1-trichloroethane		12.6		1.23E-03	0.0	mg/M^3
	5	benzene		13.3		2.58E-04	0.0	mg/M^3
	5	trichloroethene		14.7		1.20E-03	0.0	mg/M^3
	5	toluene		17.1		2.61E-04	0.0	mg/M^3
	5	tetrachloroethene		18.6		1.34E-03	0.0	mg/M^3
	5	ethylbenzene		20.01		2.64E-04	0.0	mg/M^3
	5	m-xylene		20.2		2.69E-04	0.0	mg/M^3
	5	o-xylene		20.8		2.63E-04	0.0	mg/M^3
	5	mineral spirits		27.7		5.25E-04	0.0	mg/M^3
		total volatiles					0.0	mg/M^3
Surrogate			15.158	15.06	441633	4.05E-04	89.5	%

Columbia Analytical Services inc.

1 Mustard St.,Suite 250
Rochester, NY 14609

Date: November 18, 1999
Number of pages: 4

To:

Mr. Robert Mahoney
Haley & Aldrich of New York
189 North Water Street
Rochester, NY 14604

Phone: 716/232-7386

Fax: 716/232-6768

CC:

From:

Karen Bunker /Michael Perry

Phone: (716) 288-5380

Fax: (716) 288-8475

RUSH REPORT

Submission #: 9911000086
Project Reference: ENARCO KADDIS MANUFACTURING

HOLIDAY CLOSURE SCHEDULE

The holiday season is upon us once again and CAS will be closed on the following days:

Thanksgiving: Thursday, Friday & Saturday November 25-27, 1999

Christmas: Friday & saturday December 24-25, 1999

New Years: Friday December 31, 1999 Saturday January 1, 2000

y samples shipped a day before these holidays will not be received until the following Monday. Please contact your oject Chemist if you have any questions. Samples with short holding times should be received at the lab 2 days prior.

Thanks, Mike

COLUMBIA ANALYTICAL SERVICES

VOLATILE ORGANICS
METHOD TO-14 MODIFIED
Reported: 11/18/99

Haley & Aldrich of New York
Project Reference: ENARCO KADDIS MANUFACTURING
Client Sample ID : T-2

Date Sampled : 11/05/99 **Order #:** 339120 **Sample Matrix:** AIR
Date Received: 11/05/99 **Submission #:** 9911000086 **Analytical Run** 45251

ANALYTE	PQL	RESULT	UNITS
DATE ANALYZED : 11/15/99			
ANALYTICAL DILUTION: 1.00			
ACETONE	0.84	0.84 U	PPM
BENZENE	0.31	0.31 U	PPM
BROMODICHLOROMETHANE	0.15	0.15 U	PPM
BROMOFORM	0.10	0.10 U	PPM
BROMOMETHANE	0.26	0.26 U	PPM
2-BUTANONE (MEK)	0.68	0.68 U	PPM
CARBON DISULFIDE	0.64	0.64 U	PPM
CARBON TETRACHLORIDE	0.16	0.16 U	PPM
CHLOROBENZENE	0.22	0.22 U	PPM
CHLOROETHANE	0.38	0.38 U	PPM
CHLOROFORM	0.21	0.21 U	PPM
CHLOROMETHANE	0.48	0.48 U	PPM
DIBROMOCHLOROMETHANE	0.12	0.12 U	PPM
1,1-DICHLOROETHANE	0.25	0.25 U	PPM
1,2-DICHLOROETHANE	0.25	0.25 U	PPM
1,1-DICHLOROETHENE	0.25	0.25 U	PPM
TRANS-1,2-DICHLOROETHENE	0.25	0.25 U	PPM
CIS-1,2-DICHLOROETHENE	0.25	0.25 U	PPM
1,2-DICHLOROPROPANE	0.21	0.21 U	PPM
CIS-1,3-DICHLOROPROPENE	0.22	0.22 U	PPM
TRANS-1,3-DICHLOROPROPENE	0.22	0.22 U	PPM
ETHYLBENZENE	0.23	0.23 U	PPM
2-HEXANONE	0.48	0.48 U	PPM
METHYLENE CHLORIDE	0.29	0.29 U	PPM
4-METHYL-2-PENTANONE	0.48	0.48 U	PPM
STYRENE	0.24	0.24 U	PPM
1,1,2,2-TETRACHLOROETHANE	0.16	0.16 U	PPM
TETRACHLOROETHENE	0.16	0.16 U	PPM
TOLUENE	0.27	0.27 U	PPM
1,1,1-TRICHLOROETHANE	0.18	0.18 U	PPM
1,1,2-TRICHLOROETHANE	0.18	0.18 U	PPM
TRICHLOROETHENE	0.19	0.19 U	PPM
VINYL CHLORIDE	0.39	0.39 U	PPM
O-XYLENE	0.23	0.23 U	PPM
M+P-XYLENE	0.23	0.23 U	PPM

COLUMBIA ANALYTICAL SERVICES

VOLATILE ORGANICS
METHOD TO-14 MODIFIED
Reported: 11/18/99

Haley & Aldrich of New York
Project Reference: ENARCO KADDIS MANUFACTURING
Client Sample ID : T-3

Date Sampled : 11/05/99 **Order #:** 339121 **Sample Matrix:** AIR
Date Received: 11/05/99 **Submission #:** 9911000086 **Analytical Run** 45251

ANALYTE	PQL	RESULT	UNITS
DATE ANALYZED : 11/15/99			
ANALYTICAL DILUTION: 1.00			
ACETONE	0.84	0.84 U	PPM
BENZENE	0.31	0.31 U	PPM
BROMODICHLOROMETHANE	0.15	0.15 U	PPM
BROMOFORM	0.10	0.10 U	PPM
BROMOMETHANE	0.26	0.26 U	PPM
2-BUTANONE (MEK)	0.68	0.68 U	PPM
CARBON DISULFIDE	0.64	0.64 U	PPM
CARBON TETRACHLORIDE	0.16	0.16 U	PPM
CHLOROBENZENE	0.22	0.22 U	PPM
CHLOROETHANE	0.38	0.38 U	PPM
CHLOROFORM	0.21	0.21 U	PPM
CHLOROMETHANE	0.48	0.48 U	PPM
DIBROMOCHLOROMETHANE	0.12	0.12 U	PPM
1,1-DICHLOROETHANE	0.25	0.25 U	PPM
1,2-DICHLOROETHANE	0.25	0.25 U	PPM
1,1-DICHLOROETHENE	0.25	0.25 U	PPM
TRANS-1,2-DICHLOROETHENE	0.25	0.25 U	PPM
CIS-1,2-DICHLOROETHENE	0.25	0.25 U	PPM
1,2-DICHLOROPROPANE	0.21	0.21 U	PPM
CIS-1,3-DICHLOROPROPENE	0.22	0.22 U	PPM
TRANS-1,3-DICHLOROPROPENE	0.22	0.22 U	PPM
ETHYLBENZENE	0.23	0.23 U	PPM
2-HEXANONE	0.48	0.48 U	PPM
METHYLENE CHLORIDE	0.29	0.29 U	PPM
4-METHYL-2-PENTANONE	0.48	0.48 U	PPM
STYRENE	0.24	0.24 U	PPM
1,1,2,2-TETRACHLOROETHANE	0.16	0.16 U	PPM
TETRACHLOROETHENE	0.16	0.16 U	PPM
TOLUENE	0.27	0.27 U	PPM
1,1,1-TRICHLOROETHANE	0.18	0.18 U	PPM
1,1,2-TRICHLOROETHANE	0.18	0.18 U	PPM
TRICHLOROETHENE	0.19	0.19 U	PPM
VINYL CHLORIDE	0.39	0.39 U	PPM
O-XYLENE	0.23	0.23 U	PPM
M+P-XYLENE	0.23	0.23 U	PPM

COLUMBIA ANALYTICAL SERVICES

VOLATILE ORGANICS
METHOD TO-14 MODIFIED
Reported: 11/18/99

Haley & Aldrich of New York
Project Reference: ENARCO KADDIS MANUFACTURING
Client Sample ID : T-4

Date Sampled : 11/05/99 **Order #:** 339122 **Sample Matrix:** AIR
Date Received: 11/05/99 **Submission #:** 9911000086 **Analytical Run** 45251

DATE ANALYZED : 11/15/99
ANALYTICAL DILUTION: 1.00

ANALYTE	PQL	RESULT	UNITS
ACETONE	0.84	0.84 U	PPM
BENZENE	0.31	0.31 U	PPM
BROMODICHLOROMETHANE	0.15	0.15 U	PPM
BROMOFORM	0.10	0.10 U	PPM
BROMOMETHANE	0.26	0.26 U	PPM
2-BUTANONE (MEK)	0.68	0.68 U	PPM
CARBON DISULFIDE	0.64	0.64 U	PPM
CARBON TETRACHLORIDE	0.16	0.16 U	PPM
CHLOROBENZENE	0.22	0.22 U	PPM
CHLOROETHANE	0.38	0.38 U	PPM
CHLOROFORM	0.21	0.21 U	PPM
CHLOROMETHANE	0.48	0.48 U	PPM
DIBROMOCHLOROMETHANE	0.12	0.12 U	PPM
1,1-DICHLOROETHANE	0.25	0.25 U	PPM
1,2-DICHLOROETHANE	0.25	0.25 U	PPM
1,1-DICHLOROETHENE	0.25	0.25 U	PPM
TRANS-1,2-DICHLOROETHENE	0.25	0.25 U	PPM
CIS-1,2-DICHLOROETHENE	0.25	0.25 U	PPM
1,2-DICHLOROPROPANE	0.21	0.21 U	PPM
CIS-1,3-DICHLOROPROPENE	0.22	0.22 U	PPM
TRANS-1,3-DICHLOROPROPENE	0.22	0.22 U	PPM
ETHYLBENZENE	0.23	0.23 U	PPM
2-HEXANONE	0.48	0.48 U	PPM
METHYLENE CHLORIDE	0.29	0.29 U	PPM
4-METHYL-2-PENTANONE	0.48	0.48 U	PPM
STYRENE	0.24	0.24 U	PPM
1,1,2,2-TETRACHLOROETHANE	0.16	0.16 U	PPM
TETRACHLOROETHENE	0.16	0.16 U	PPM
TOLUENE	0.27	0.27 U	PPM
1,1,1-TRICHLOROETHANE	0.18	0.18 U	PPM
1,1,2-TRICHLOROETHANE	0.18	0.18 U	PPM
TRICHLOROETHENE	0.19	0.19 U	PPM
VINYL CHLORIDE	0.39	0.39 U	PPM
O-XYLENE	0.23	0.23 U	PPM
M+P-XYLENE	0.23	0.23 U	PPM

Columbia Analytical Services INC.
An Employee-Owned Company

Mustard St., Suite 250, Rochester, NY 14609-69245
(716) 288-5380 • FAX (716) 288-8475

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

134

DATE 11/5/99 PAGE 1 OF 1

PROJECT NAME ENMECO - KADIS Manufacturing
PROJECT MANAGER/CONTACT R. Mooney
COMPANY/ADDRESS Haley & Aldrich of NY
189 N. Water St. Rochester NY 14604
TEL (716) 327-3535 FAX (716) 325-6768
SAMPLER'S SIGNATURE

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	FOR OFFICE USE ONLY LAB I.D.	SAMPLE MATRIX	# OF CONTAINERS	GC/MS VOA's ☐ 8260 ☐ 624 ☐ 95-1	GC/MS SVOA's ☐ 8270 ☐ 625 ☐ 95-2	GC VOA's ☐ 8021 ☐ 601/602	PESTICIDES/PCB's ☐ 8081 ☐ 608 ☐ 95-3	STARS LIST 8021 VOA's ☐ TOTAL ☐ TCLP	STARS LIST 8270 SVOA's ☐ TOTAL ☐ TCLP	TCLP ☐ METALS ☐ VOA's ☐ SVOA's ☐ H/P	WASTE CHARACTERIZATION ☐ React ☐ Corros. ☐ Ignit.	METALS, TOTAL (LIST BELOW)	METALS, DISSOLVED (LIST BELOW)	TO/14/1000							PRESERVATION pH < 2.0	pH > 12	Other
T-1	11/5/99	0910		V												1									
T-2	11/5/99	0915		V												1									
T-3	11/5/99	0925		V												1									
T-4	11/5/99	0930		V												1									

RELINQUISHED BY:
Signature
Printed Name Irwin M. Nosten
Firm Haley & Aldrich of NY
Date/Time 11/5/99 1145

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time 11/5/99 1145

RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

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

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

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

SAMPLE RECEIPT:
Shipping Via:
Shipping #:
Temperature:
Submission No:

SPECIAL INSTRUCTIONS/COMMENTS:
METALS
ORGANICS: ☐ TCL ☐ PPL ☐ AE Only ☐ BN Only ☐ Special List

APPENDIX M

Groundwater Sampling Logs

HALEY & ALDRICH, INC.
MONITORING WELL SAMPLING FIELD FORM

Monitoring Well I.D.: Emaco Southwell	Date: 10/24/95	Time Started:	Field Personnel: MMD+DN
Weather Conditions: Sunny, cloudy ~50s			
Comments: Depth of pump at 135.0 ft			

Initial Readings

Measured Well Bottom (TOR - ft) NR		Riser Pipe Diameter (in) 6"	
Measured Water Level (TOR - ft) NR		Conversion Factor (gal/lineal ft)	1.25" = 0.08 2" = 0.17 3" = 0.38
Calculated Water Column Height (ft) NR		(Circle One)	4" = 0.66 6" = 1.50 8" = 2.60
One Well Volume (gals.)		Three Well Volumes (gals.)	

Notes: H2O level beperlow 100'

Well Conditions

Well Riser Type (Circle one): Stainless Steel (Carbon Steel) PVC

Casing Condition:	(OK)	Repair Required: Needs Paint
Cap Condition:	OK	Repair Required:
Paint Condition:	OK	Repair Required: Needs Paint
Lock Condition:	OK	Repair Required: No Lock
Inner Casing Condition:	OK	Repair Required: NO Inner casing
Surface Seal Condition:	OK	Repair Required: cracked, Broke

Other:

Micro-Purge Information

Purging Method (Circle one): Stainless Steel Bailer Peristaltic Pump (Grundfos Pump)
Teflon Bailer Polyethylene Bailer Other:

Well Volume	Gallons Purged (gal)	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments
16:21	NA	12.6	7.29	0.85		3.04	-135	Cond @ 20 A+C units
16:26	0.5	12.0	7.33	0.88		2.34	-145	
16:31	~~5~~ 4.0	13.5	7.32	0.87		1.70	-154	
16:36	~~10~~ 6.5	14.9	7.31	0.88		1.59	-163	
16:41	9.5	15.1	7.31	0.87		1.27	-166	

Water Level After Purging (TOR ft): Calculated 95% Recovery Water Level:

Comments:

Sampling Information

Date: Time Sampled: Field Personnel:

Measured Water Level (TOR ft.):

Sampling Method (Circle one): Stainless Steel Bailer Peristaltic Pump (Grundfos Pump)
Teflon Bailer Polyethylene Bailer Other:

	Sample I.D.	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments
10.5 gal	16:46	15.2	7.31	0.86		1.20	-169	
12.5 gal	16:51	15.3	7.31	0.85		1.10	-173	

QA/QC Samples Taken:

Comments: Sampled using SS bail EPA Method 8260

Signature

Sampler (Print):	Sampler (signature):	Date:

HALEY & ALDRICH, INC.
MONITORING WELL SAMPLING FIELD FORM

Monitoring Well I.D.: 111 T Broad St. Date: 10/27/99 Time Started: 1:04 Field Personnel: DN + MD

Weather Conditions: Cold, overcast ~40's

Comments:

Depth of Pump: 126' Below Top of Casing, Casing @ 4.5' BGS

Initial Readings

Measured Well Bottom (TOR - ft)	~130-135'	Riser Pipe Diameter (in)	4"
Measured Water Level (TOR - ft)	100' (~110')	Conversion Factor (gal/lineal ft)	1.25" = 0.08 2" = 0.17 3" = 0.38
Calculated Water Column Height (ft)		(Circle One)	4" = 0.66 6" = 1.50 8" = 2.60
One Well Volume (gals.)		Three Well Volumes (gals.)	

Notes:

Well Conditions

Well Riser Type (Circle one): Stainless Steel Carbon Steel PVC

Casing Condition:	OK	Repair Required:
Cap Condition:	OK	Repair Required:
Paint Condition:	OK	Repair Required:
Lock Condition:	OK	Repair Required:
Inner Casing Condition:	OK	Repair Required:
Surface Seal Condition:	OK	Repair Required:

Other:

Micro-Purge Information

Purging Method (Circle one): Stainless Steel Bailer Peristaltic Pump (Grundfos Pump)

Teflon Bailer Polyethylene Bailer Other:

YSI Meter Readings

Well Volume Note	Gallons Purged (gal)	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments
13:10		10.0	7.01	0.82		4.38	148	Conductivity: 2.04 ms
13:13		10.0	7.25	0.88		3.80	121	
13:16		10.3	7.39	0.89		3.01	108	
13:21		11.1	7.42	0.889		1.63	88	
13:26		11.9	7.44	0.89		1.45	76	

Water Level After Purging (TOR ft): Calculated 95% Recovery Water Level:

Comments: H2O Pumped through YSI Meter

Sampling Information

Date: Time Sampled: Field Personnel:

Measured Water Level (TOR ft.):

Sampling Method (Circle one): Stainless Steel Bailer Peristaltic Pump Grundfos Pump

Teflon Bailer Polyethylene Bailer (Other: YSI Meter)

Sample I.D.	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments
13:31	12.8	7.42	0.89		1.60	068	
13:36	13.3	7.43	0.89		1.70	062	
13:41	13.6	7.41	0.90		1.72	056	

QA/QC Samples Taken:

Comments: Total gallons purged = 5gal

Signature

Sampler (Print):	Sampler (signature):	Date:

HALEY & ALDRICH, INC.
MONITORING WELL SAMPLING FIELD FORM

Monitoring Well I.D.: MW-4	Date: 10/28/99	Time Started:	Field Personnel: M.M. D. & D.N.
Weather Conditions: Partly Cloudy, ~ 50's			
Comments:			

Initial Readings

Measured Well Bottom (TOR - ft)	34.42	Riser Pipe Diameter (in)	4"
Measured Water Level (TOR - ft)	24.21'	Conversion Factor (gal/lineal ft)	1.25" = 0.08 2" = 0.17 3" = 0.38
Calculated Water Column Height (ft)	10.21	(Circle One)	4" = 0.66 6" = 1.50 8" = 2.60
One Well Volume (gals.)	10.73'	Three Well Volumes (gals.)	20.7

Notes: Sticky bottom, Dry @ 5.0 gal., Dry @ 2.0 gal.

Well Conditions

Well Riser Type (Circle one):	Stainless Steel	Carbon Steel (PVC)
Casing Condition:	(OK)	Repair Required:
Cap Condition:	(OK)	Repair Required:
Paint Condition:	OK	Repair Required: Needs Paint
Lock Condition:	OK	Repair Required: Need Lock
Inner Casing Condition:	(OK)	Repair Required:
Surface Seal Condition:	OK	Repair Required: Cracked / Broken
Other:		

Micro-Purge Information

Purging Method (Circle one): Stainless Steel Bailer; Peristaltic Pump; Grundfos Pump; Teflon Bailer; (Polyethylene Bailer); Other:

Well Volume	Gallons Purged (gal)	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments
1	7.0	11.7	7.57	0.63	/	10.53	-093	

Water Level After Purging (TOR ft): Calculated 95% Recovery Water Level:

Comments: Parameters observed via YSI cell

Sampling Information

Date:	Time Sampled:	Field Personnel:

Measured Water Level (TOR ft.):

Sampling Method (Circle one): Stainless Steel Bailer; Peristaltic Pump; Grundfos Pump; Teflon Bailer; (Polyethylene Bailer); Other:

Sample I.D.	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments

QA/QC Samples Taken:

Comments: EPA Method 8260

Signature

Sampler (Print):	*Sampler (signature):*	Date:

HALEY & ALDRICH, INC.
MONITORING WELL SAMPLING FIELD FORM

Monitoring Well I.D. MW-	Date: 10/28/95	Time Started:	Field Personnel: YMD & DN
Weather Conditions: Partly cloudy ~ 50's			
Comments:			

Initial Readings

Measured Well Bottom (TOR - ft)	34.80	Riser Pipe Diameter (in)	4"		
Measured Water Level (TOR - ft)	25.73	Conversion Factor (gal/lineal ft)	1.25" = 0.08	2" = 0.17	3" = 0.38
Calculated Water Column Height (ft)	9.07	(Circle One)	(4" = 0.66)	6" = 1.50	8" = 2.60
One Well Volume (gals.)	5.98	Three Well Volumes (gals.)	18.0		

Notes: DY @ 7.0 Gal. DY @ 7.0 Gal.

Well Conditions

Well Riser Type (Circle one):		Stainless Steel	Carbon Steel (PVC)
Casing Condition:	(OK)	Repair Required:	
Cap Condition:	(OK)	Repair Required:	/
Paint Condition:	OK	Repair Required:	NEEDS PAINT
Lock Condition:	~~OK~~	Repair Required:	NEEDS LOCK
Inner Casing Condition:	(OK)	Repair Required:	
Surface Seal Condition:	~~OK~~	Repair Required:	CRACKED

Other:

Micro-Purge Information

Purging Method (Circle one): Stainless Steel Bailer | Peristaltic Pump | Grundfos Pump | Teflon Bailer | (Polyethylene Bailer) | Other:

Well Volume	Gallons Purged (gal)	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments
1.5	14.0	10.9	7.08	0.65		8.46	132	

Water Level After Purging (TOR ft): Calculated 95% Recovery Water Level:

Comments:

Sampling Information

Date: Time Sampled: Field Personnel:

Measured Water Level (TOR ft.):

Sampling Method (Circle one): Stainless Steel Bailer | ~~Peristaltic Pump~~ | Grundfos Pump | Teflon Bailer | (Polyethylene Bailer) | Other:

Sample I.D.	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments

QA/QC Samples Taken:

Comments: EPA Method 8260

Signature

Sampler (Print):	Sampler (signature):	Date:

HALEY & ALDRICH, INC.
MONITORING WELL SAMPLING FIELD FORM

2d (Hanson well) * See field Book (MB) for well location.

Monitoring Well I.D.: 1088MW2d	Date: 10/29/99	Time Started:	Field Personnel: MMD + DN
Weather Conditions: Sunny / ~50's			
Comments:			

Initial Readings

Measured Well Bottom (TOR - ft) NR	Riser Pipe Diameter (in) 4"		
Measured Water Level (TOR - ft) 94.4	Conversion Factor (gal/lineal ft)	1.25" = 0.08	2" = 0.17	3" = 0.38
Calculated Water Column Height (ft) NR	(Circle One)	4" = 0.66	6" = 1.50	8" = 2.60
One Well Volume (gals.) NR	Three Well Volumes (gals.)			

Notes: Depth to well bottom deeper than 100', Pump @ 111.0' from Ground Surface

Well Conditions

Well Riser Type (Circle one): Stainless Steel Carbon Steel (PVC)

Casing Condition:	OK	Repair Required:	Below Ground surface
Cap Condition:	OK	Repair Required:	No cap only a Plastic lid @ surface
Paint Condition:	OK	Repair Required:	N/A
Lock Condition:	OK	Repair Required:	No lock
Inner Casing Condition:	(OK)	Repair Required:	
Surface Seal Condition:	OK	Repair Required:	No Seal @ Surface

Other:

Micro-Purge Information

Purging Method (Circle one): Stainless Steel Bailer Peristaltic Pump (Grundfos Pump)
Teflon Bailer Polyethylene Bailer Other:

Well Volume	Gallons Purged (gal)	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments
10:40	~~0~~ -	11.8	7.57	0.85	—	8.03	070	
10:45	2.0	12.1	7.54	0.87	—	7.98	064	
10:50	4.5	14.3	7.54	0.87		7.76	063	
10:55	~~5~~ 5.5	14.5	7.54	0.86		7.85	059	
11:00	8.0	14.6	7.52	0.86		7.86	053	

Water Level After Purging (TOR ft): Calculated 95% Recovery Water Level:

Comments: Parameters Measured via YSI Cell, Well Sampled @ lowest depth of 100's GS EG

Sampling Information

Date:	Time Sampled:	Field Personnel:

Measured Water Level (TOR ft.):

Sampling Method (Circle one): Stainless Steel Bailer Peristaltic Pump (Grundfos Pump)
Teflon Bailer Polyethylene Bailer Other:

Sample I.D.	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments

QA/QC Samples Taken:

Comments:

Signature

Sampler (Print):	Sampler (signature):	Date:

HALEY & ALDRICH, INC.
MONITORING WELL SAMPLING FIELD FORM

Monitoring Well I.D.: MW-2	Date: 10/28/99	Time Started:	Field Personnel: MWD & DN
Weather Conditions: Partly Cloudy ~50's			
Comments:			

Initial Readings

Measured Well Bottom (TOR - ft)	33.73	Riser Pipe Diameter (in)	4"
Measured Water Level (TOR - ft)	28.21	Conversion Factor (gal/lineal ft)	1.25" = 0.08 2" = 0.17 3" = 0.38
Calculated Water Column Height (ft)	5.52	(Circle One)	(4" = 0.66) 6" = 1.50 8" = 2.60
One Well Volume (gals.)	3.6	Three Well Volumes (gals.)	11.0
Notes:			

Well Conditions

Well Riser Type (Circle one):	Stainless Steel Carbon Steel (PVC)	
Casing Condition:	(OK)	Repair Required:
Cap Condition:	(OK)	Repair Required:
Paint Condition:	~~OK~~	Repair Required: NEEDS Paint
Lock Condition:	~~OK~~	Repair Required: NEEDS Lock
Inner Casing Condition:	(OK)	Repair Required:
Surface Seal Condition:	~~OK~~	Repair Required: Cracked
Other:		

Micro-Purge Information

Purging Method (Circle one): Stainless Steel Bailer Peristaltic Pump Grundfos Pump Teflon Bailer (Polyethylene Bailer) Other:

Well Volume	Gallons Purged (gal)	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments
3	11	11.3	6.88	.64	~	504	169	

Water Level After Purging (TOR ft): Calculated 95% Recovery Water Level:

Comments: Parameters Measured Via YSI cell

Sampling Information

Date:	Time Sampled:	Field Personnel:

Measured Water Level (TOR ft.):

Sampling Method (Circle one): Stainless Steel Bailer Peristaltic Pump Grundfos Pump Teflon Bailer (~~Polyethylene Bailer~~) Other:

Sample I.D.	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments

QA/QC Samples Taken:

Comments: EPA Method 8260

Signature

Sampler (Print):	*Sampler (signature):*	Date:

HALEY & ALDRICH, INC.
MONITORING WELL SAMPLING FIELD FORM

Monitoring Well I.D.: MW-201D Date: 10129 Time Started: Field Personnel: MAD + DW

Weather Conditions: Sunny ~60°

Comments:

Initial Readings

Measured Well Bottom (TOR - ft)	29.30	Riser Pipe Diameter (in)	2"
Measured Water Level (TOR - ft)	26.0	Conversion Factor (gal/lineal ft)	1.25" = 0.08 **2" = 0.17** 3" = 0.38
Calculated Water Column Height (ft)	3.3'	(Circle One)	4" = 0.66 6" = 1.50 8" = 2.60
One Well Volume (gals.)	0.56	Three Well Volumes (gals.)	1.68

Notes:

Well Conditions

Well Riser Type (Circle one): Stainless Steel Carbon Steel **PVC**

Casing Condition:	OK	Repair Required:
Cap Condition:	OK	Repair Required:
Paint Condition:	OK	Repair Required:
Lock Condition:	OK	Repair Required: No lock
Inner Casing Condition:	OK	Repair Required:
Surface Seal Condition:	OK	Repair Required:

Other:

Micro-Purge Information

Purging Method (Circle one): *Stainless Steel Bailer* *Peristaltic Pump* *Grundfos Pump*

Teflon Bailer Polyethylene Bailer Other:

Well Volume	Gallons Purged (gal)	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments
	1.5							
Well Contained DNAPL Product.								

Water Level After Purging (TOR ft): Calculated 95% Recovery Water Level:

Comments:

Sampling Information

Date: Time Sampled: Field Personnel:

Measured Water Level (TOR ft.):

Sampling Method (Circle one): Stainless Steel Bailer Peristaltic Pump Grundfos Pump

Teflon Bailer **Polyethylene Bailer** Other:

Sample I.D.	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments

QA/QC Samples Taken:

Comments: Sampled LNAPL + H2O.

Signature

Sampler (Print):	*Sampler (signature):*	Date:

HALEY & ALDRICH, INC.
MONITORING WELL SAMPLING FIELD FORM

Monitoring Well I.D.: MW-3	Date: 10/28/99	Time Started:	Field Personnel: MMD & DN
Weather Conditions: P. Cloudy, ~50s.			
Comments:			

Initial Readings

Measured Well Bottom (TOR - ft)	34.55'	Riser Pipe Diameter (in)	4"
Measured Water Level (TOR - ft)	31.91'	Conversion Factor (gal/lineal ft)	1.25" = 0.08 2" = 0.17 3" = 0.38
Calculated Water Column Height (ft)	2.64	(Circle One)	(4" = 0.66) 6" = 1.50 8" = 2.60
One Well Volume (gals.)	1.74	Three Well Volumes (gals.)	5.2

Notes: Soft bottom. Dry @ 1.0 gal. Dry 1.0 gal.

Well Conditions

Well Riser Type (Circle one):	Stainless Steel	Carbon Steel (PVC)
Casing Condition:	(OK)	Repair Required:
Cap Condition:	(OK)	Repair Required:
Paint Condition:	OK	Repair Required: Needs Paint
Lock Condition:	OK	Repair Required: Needs lock
Inner Casing Condition:	(OK)	Repair Required:
Surface Seal Condition:	OK	Repair Required: Cracked

Other:

Micro-Purge Information

Purging Method (Circle one): Stainless Steel Bailer | Peristaltic Pump | Grundfos Pump | Teflon Bailer | (Polyethylene Bailer) | Other:

Well Volume	Gallons Purged (gal)	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments
1.0	2.0	13.5	7.23	0.29	—	5.36	137	

Water Level After Purging (TOR ft): Calculated 95% Recovery Water Level:

Comments: Parameters Measured via YSI cell

Sampling Information

Date:	Time Sampled:	Field Personnel:

Measured Water Level (TOR ft.):

Sampling Method (Circle one): Stainless Steel Bailer | Peristaltic Pump | Grundfos Pump | Teflon Bailer | (Polyethylene Bailer) | Other:

Sample I.D.	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments

QA/QC Samples Taken:

Comments: EPA Method 8260

Signature

Sampler (Print):	Sampler (signature):	Date:

HALEY & ALDRICH, INC.
MONITORING WELL SAMPLING FIELD FORM

Monitoring Well I.D.:	883 MARTIN	Date:	10/27	Time Started:	13:24	Field Personnel:	MHD, DLM
Weather Conditions:	Cold, ~40's Cloudy				
Comments:	FOOT SAMPLE FROM SUMP in basement NO Readings taken on water Bailed.				

Initial Readings

Measured Well Bottom (TOR - ft)		Riser Pipe Diameter (in)		
Measured Water Level (TOR - ft)	3.70	Conversion Factor (gal/lineal ft)	1.25" = 0.08	2" = 0.17	3" = 0.38
Calculated Water Column Height (ft)		(Circle One)	4" = 0.66	6" = 1.50	8" = 2.60
One Well Volume (gals.)		Three Well Volumes (gals.)		
Notes:				

Well Conditions

Well Riser Type (Circle one): Stainless Steel Carbon Steel PVC

Casing Condition:	OK	Repair Required:
Cap Condition:	OK	Repair Required:
Paint Condition:	OK	Repair Required:
Lock Condition:	OK	Repair Required:
Inner Casing Condition:	OK	Repair Required:
Surface Seal Condition:	OK	Repair Required:

Other:

Micro-Purge Information

Purging Method (Circle one): Stainless Steel Bailer Peristaltic Pump Grundfos Pump
Teflon Bailer Polyethylene Bailer Other:

Well Volume	Gallons Purged (gal)	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments

Water Level After Purging (TOR ft): Calculated 95% Recovery Water Level:

Comments:

Sampling Information

Date: Time Sampled: Field Personnel:

Measured Water Level (TOR ft.):

Sampling Method (Circle one): Stainless Steel Bailer Peristaltic Pump Grundfos Pump
Teflon Bailer Polyethylene Bailer Other:

Sample I.D.	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments

QA/QC Samples Taken:

Comments:

Signature

Sampler (Print): *Sampler (signature):* Date:

HALEY & ALDRICH, INC.
MONITORING WELL SAMPLING FIELD FORM

Monitoring Well I.D.: MW202	Date: 10/29/99	Time Started: 1340	Field Personnel: DMN
Weather Conditions: Clear, Sunny 65°			
Comments:			

Initial Readings

Measured Well Bottom (TOR - ft)	34.55	Riser Pipe Diameter (in)	4
Measured Water Level (TOR - ft)	25.40	Conversion Factor (gal/lineal ft)	1.25" = 0.08 2" = 0.17 3" = 0.38
Calculated Water Column Height (ft)	9.15	(Circle One)	(4" = 0.66) 6" = 1.50 8" = 2.60
One Well Volume (gals.)	6.0	Three Well Volumes (gals.)	18.0

Notes:

Well Conditions

Well Riser Type (Circle one): Stainless Steel Carbon Steel (PVC)

Casing Condition:	(OK)	Repair Required:
Cap Condition:	(OK)	Repair Required:
Paint Condition:	OK	Repair Required: N/A
Lock Condition:	(OK)	Repair Required:
Inner Casing Condition:	(OK)	Repair Required:
Surface Seal Condition:	(OK)	Repair Required:

Other:

Micro-Purge Information

Purging Method (Circle one): Stainless Steel Bailer Peristaltic Pump Grundfos Pump
Teflon Bailer (Polyethylene Bailer) Other:

Well Volume	Gallons Purged (gal)	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments
(INSUFFICIENT VOLUME OF WATER TO MEASURE PARAMETERS)								

Water Level After Purging (TOR ft): Calculated 95% Recovery Water Level:

Comments: DRY AT 5.5 gal, 6.0 gal

Sampling Information

Date: 10/29/99 Time Sampled: 1515 Field Personnel: DMN

Measured Water Level (TOR ft.):

Sampling Method (Circle one): Stainless Steel Bailer Peristaltic Pump Grundfos Pump
Teflon Bailer Polyethylene Bailer Other:

Sample I.D.	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments

QA/QC Samples Taken:

Comments:

Signature

Sampler (Print): DAVID M. MOSTRANT	Sampler (signature):	Date: 10/29/99

HALEY & ALDRICH, INC.
MONITORING WELL SAMPLING FIELD FORM

Monitoring Well I.D.: MW-5	Date: 10/28/14	Time Started:	Field Personnel: MMD + DN
Weather Conditions: Partly cloudy ~50's			
Comments:			

Initial Readings

Measured Well Bottom (TOR - ft)	31.51	Riser Pipe Diameter (in)	4"
Measured Water Level (TOR - ft)	24.77 ~~23.93~~	Conversion Factor (gal/lineal ft)	1.25" = 0.08 2" = 0.17 3" = 0.38
Calculated Water Column Height (ft)	7.58	(Circle One)	(4" = 0.66) 6" = 1.50 8" = 2.60
One Well Volume (gals.)	5.0/15.0	Three Well Volumes (gals.)	15.0
Notes: Soft bottom			

Well Conditions

Well Riser Type (Circle one):	Stainless Steel Carbon Steel (PVC)	
Casing Condition:	(OK)	Repair Required:
Cap Condition:	(OK)	Repair Required:
Paint Condition:	OK	Repair Required: Needs Paint
Lock Condition:	OK	Repair Required: Needs Lock
Inner Casing Condition:	(OK)	Repair Required:
Surface Seal Condition:	OK	Repair Required: Cracked
Other:		

Micro-Purge Information

Purging Method (Circle one): Stainless Steel Bailer Peristaltic Pump Grundfos Pump Teflon Bailer (Polyethylene Bailer) Other:

Well Volume	Gallons Purged (gal)	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments
3	15	12.3	7.18	0.67	—	3.58	139	

Water Level After Purging (TOR ft): Calculated 95% Recovery Water Level:

Comments: Parameters Measured Via YSI Cell

Sampling Information

Date:	Time Sampled:	Field Personnel:

Measured Water Level (TOR ft.):

Sampling Method (Circle one): Stainless Steel Bailer Peristaltic Pump Grundfos Pump Teflon Bailer (Polyethylene Bailer) Other:

Sample I.D.	Temperature (deg C)	pH (S.U.)	Specific Conductivity (mhos)	Turbidity (NTU's)	Dissolved Oxygen (mg/L)	ORP (mV)	Comments

QA/QC Samples Taken:

Comments: EPA Method 8260

Signature

Sampler (Print):	*Sampler (signature):*	Date:

APPENDIX N

Groundwater Analysis

PARADIGM
ENVIRONMENTAL
SERVICES, INC.

179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

Volatile Laboratory Analysis Report For Non-Potable Water

Client:	Haley & Aldrich of New York	**Lab Project No.:**	99-2098
Client Job Site:	*Enarco Well Sampleing*	**Lab Sample No.:**	7177
Client Job No.:	70372-050	**Sample Type:**	Water
Field Location:	Supply Well	**Date Sampled:**	10/28/99
		Date Received:	11/01/99
Field ID No.:	N/A	**Date Analyzed:**	11/03/99

VOLATILE HALOCARBONS	RESULTS (ug/L)	VOLATILE AROMATICS	RESULTS (ug/L)
Bromodichloromethane	ND< 2.00	Benzene	ND< 2.00
Bromomethane	ND< 2.00	Chlorobenzene	ND< 2.00
Bromoform	ND< 2.00	Ethylbenzene	ND< 2.00
Carbon tetrachloride	ND< 2.00	Toluene	2.07
Chloroethane	ND< 2.00	*m,p - Xylene*	ND< 2.00
Chloromethane	ND< 2.00	o - Xylene	ND< 2.00
2-Chloroethyl vinyl ether	ND< 2.00	Styrene	ND< 2.00
Chloroform	ND< 2.00		
Dibromochloromethane	ND< 2.00		
1,1-Dichloroethane	ND< 2.00		
1,2-Dichloroethane	ND< 2.00		
1,1-Dichloroethene	ND< 2.00	Ketones & Misc.	
trans-1,2-Dichloroethene	2.41	Acetone	ND< 10.0
1,2-Dichloropropane	ND< 2.00	Vinyl acetate	ND< 5.00
cis-1,3-Dichloropropene	ND< 2.00	2-Butanone	ND< 5.00
trans-1,3-Dichloroproper	ND< 2.00	4-Methyl-2-pentanone	ND< 5.00
Methylene chloride	ND< 5.00	2-Hexanone	ND< 5.00
1,1,2,2-Tetrachloroethar	ND< 2.00	Carbon disulfide	ND< 5.00
Tetrachloroethene	ND< 2.00		
1,1,1-Trichloroethane	2.54		
1,1,2-Trichloroethane	ND< 2.00		
Trichloroethene	19.8		
Vinyl Chloride	ND< 2.00		

Analytical Method: EPA 8260 ELAP ID No.: 10958

Comments: ND denotes Not Detected

Approved By _____
For: Laboratory Director

92098V1.XLS

PARADIGM
ENVIRONMENTAL
SERVICES, INC.

179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

Volatile Laboratory Analysis Report For Non-Potable Water

Client:	Haley & Aldrich of New York	**Lab Project No.:**	99-2098
Client Job Site:	Enarco Well Sampleing	**Lab Sample No.:**	7178
Client Job No.:	70372-050	**Sample Type:**	Water
Field Location:	Equip Blk	**Date Sampled:**	10/29/99
		Date Received:	11/01/99
Field ID No.:	N/A	**Date Analyzed:**	11/03/99

VOLATILE HALOCARBONS	RESULTS (ug/L)	VOLATILE AROMATICS	RESULTS (ug/L)
Bromodichloromethane	ND< 2.00	Benzene	ND< 2.00
Bromomethane	ND< 2.00	Chlorobenzene	ND< 2.00
Bromoform	ND< 2.00	Ethylbenzene	ND< 2.00
Carbon tetrachloride	ND< 2.00	Toluene	ND< 2.00
Chloroethane	ND< 2.00	m,p - Xylene	ND< 2.00
Chloromethane	ND< 2.00	o - Xylene	ND< 2.00
2-Chloroethyl vinyl ether	ND< 2.00	Styrene	ND< 2.00
Chloroform	ND< 2.00		
Dibromochloromethane	ND< 2.00		
1,1-Dichloroethane	ND< 2.00		
1,2-Dichloroethane	ND< 2.00		
1,1-Dichloroethene	ND< 2.00	Ketones & Misc.	
trans-1,2-Dichloroethene	ND< 2.00	Acetone	ND< 10.0
1,2-Dichloropropane	ND< 2.00	Vinyl acetate	ND< 5.00
cis-1,3-Dichloropropene	ND< 2.00	2-Butanone	ND< 5.00
trans-1,3-Dichloroproper	ND< 2.00	4-Methyl-2-pentanone	ND< 5.00
Methylene chloride	ND< 5.00	2-Hexanone	ND< 5.00
1,1,2,2-Tetrachloroethar	ND< 2.00	Carbon disulfide	ND< 5.00
Tetrachloroethene	ND< 2.00		
1,1,1-Trichloroethane	ND< 2.00		
1,1,2-Trichloroethane	ND< 2.00		
Trichloroethene	ND< 2.00		
Vinyl Chloride	ND< 2.00		

Analytical Method: EPA 8260 ELAP ID No.: 10958

Comments: ND denotes Not Detected

Approved By _____
For: Laboratory Director

92098V2.XLS

PARADIGM
ENVIRONMENTAL
SERVICES, INC.

179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

Volatile Laboratory Analysis Report For Non-Potable Water

Client:	Haley & Aldrich of New York	**Lab Project No.:**	99-2098
Client Job Site:	Enarco Well Sampleing	**Lab Sample No.:**	7179
Client Job No.:	70372-050	**Sample Type:**	Water
Field Location:	7880 Martin Rd.	**Date Sampled:**	10/29/99
		Date Received:	11/01/99
Field ID No.:	N/A	**Date Analyzed:**	11/04/99

VOLATILE HALOCARBONS	RESULTS (ug/L)	VOLATILE AROMATICS	RESULTS (ug/L)
Bromodichloromethane	ND< 2.00	Benzene	ND< 2.00
Bromomethane	ND< 2.00	Chlorobenzene	ND< 2.00
Bromoform	ND< 2.00	Ethylbenzene	ND< 2.00
Carbon tetrachloride	ND< 2.00	Toluene	ND< 2.00
Chloroethane	ND< 2.00	m,p - Xylene	ND< 2.00
Chloromethane	ND< 2.00	o - Xylene	ND< 2.00
2-Chloroethyl vinyl ether	ND< 2.00	Styrene	ND< 2.00
Chloroform	ND< 2.00		
Dibromochloromethane	ND< 2.00		
1,1-Dichloroethane	ND< 2.00		
1,2-Dichloroethane	ND< 2.00		
1,1-Dichloroethene	ND< 2.00	Ketones & Misc.	
trans-1,2-Dichloroethene	ND< 2.00	Acetone	ND< 10.0
1,2-Dichloropropane	ND< 2.00	Vinyl acetate	ND< 5.00
cis-1,3-Dichloropropene	ND< 2.00	2-Butanone	ND< 5.00
trans-1,3-Dichloroproper	ND< 2.00	4-Methyl-2-pentanone	ND< 5.00
Methylene chloride	ND< 5.00	2-Hexanone	ND< 5.00
1,1,2,2-Tetrachloroethar	ND< 2.00	Carbon disulfide	ND< 5.00
Tetrachloroethene	ND< 2.00		
1,1,1-Trichloroethane	ND< 2.00		
1,1,2-Trichloroethane	ND< 2.00		
Trichloroethene	ND< 2.00		
Vinyl Chloride	ND< 2.00		

Analytical Method: EPA 8260 ELAP ID No.: 10958

Comments: ND denotes Not Detected

Approved By _____
For: Laboratory Director

92098V3.XLS

PARADIGM
ENVIRONMENTAL
SERVICES, INC.

179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

Volatile Laboratory Analysis Report For Non-Potable Water

Client:	Haley & Aldrich of New York	**Lab Project No.:**	99-2098
Client Job Site:	Enarco Well Sampleing	**Lab Sample No.:**	7180
Client Job No.:	70372-050	**Sample Type:**	Water
Field Location:	MW-1	**Date Sampled:**	10/29/99
		Date Received:	11/01/99
Field ID No.:	N/A	**Date Analyzed:**	11/04/99

VOLATILE HALOCARBONS	RESULTS (ug/L)	VOLATILE AROMATICS	RESULTS (ug/L)
Bromodichloromethane	ND< 2.00	Benzene	22.1
Bromomethane	ND< 2.00	Chlorobenzene	ND< 2.00
Bromoform	ND< 2.00	Ethylbenzene	ND< 2.00
Carbon tetrachloride	ND< 2.00	Toluene	ND< 2.00
Chloroethane	ND< 2.00	*m,p* - Xylene	ND< 2.00
Chloromethane	ND< 2.00	o - Xylene	ND< 2.00
2-Chloroethyl vinyl ether	ND< 2.00	Styrene	3.66
Chloroform	ND< 2.00		
Dibromochloromethane	ND< 2.00		
1,1-Dichloroethane	ND< 2.00		
1,2-Dichloroethane	ND< 2.00		
1,1-Dichloroethene	ND< 2.00	Ketones & Misc.	
trans-1,2-Dichloroethene	ND< 2.00	Acetone	ND< 10.0
1,2-Dichloropropane	ND< 2.00	Vinyl acetate	ND< 5.00
cis-1,3-Dichloropropene	ND< 2.00	2-Butanone	43.6
trans-1,3-Dichloroproper	ND< 2.00	4-Methyl-2-pentanone	ND< 5.00
Methylene chloride	ND< 5.00	2-Hexanone	ND< 5.00
1,1,2,2-Tetrachloroethar	ND< 2.00	Carbon disulfide	ND< 5.00
Tetrachloroethene	ND< 2.00		
1,1,1-Trichloroethane	ND< 2.00		
1,1,2-Trichloroethane	ND< 2.00		
Trichloroethene	ND< 2.00		
Vinyl Chloride	ND< 2.00		

Analytical Method: EPA 8260 ELAP ID No.: 10958

Comments: ND denotes Not Detected

Approved By _____
For: Laboratory Director

92098V4.XLS

PARADIGM
ENVIRONMENTAL
SERVICES, INC.

179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

Volatile Laboratory Analysis Report For Non-Potable Water

Client:	Haley & Aldrich of New York	**Lab Project No.:**	99-2098
Client Job Site:	Enarco Well Sampleing	**Lab Sample No.:**	7181
Client Job No.:	70372-050	**Sample Type:**	Water
Field Location:	MW-5	**Date Sampled:**	10/28/99
		Date Received:	11/01/99
Field ID No.:	N/A	**Date Analyzed:**	11/04/99

VOLATILE HALOCARBONS	RESULTS (ug/L)	VOLATILE AROMATICS	RESULTS (ug/L)
Bromodichloromethane	ND< 2.00	Benzene	ND< 2.00
Bromomethane	ND< 2.00	Chlorobenzene	ND< 2.00
Bromoform	ND< 2.00	Ethylbenzene	ND< 2.00
Carbon tetrachloride	ND< 2.00	Toluene	ND< 2.00
Chloroethane	ND< 2.00	m,p - Xylene	ND< 2.00
Chloromethane	ND< 2.00	o - Xylene	ND< 2.00
2-Chloroethyl vinyl ether	ND< 2.00	Styrene	ND< 2.00
Chloroform	ND< 2.00		
Dibromochloromethane	ND< 2.00		
1,1-Dichloroethane	4.75		
1,2-Dichloroethane	ND< 2.00		
1,1-Dichloroethene	6.74	Ketones & Misc.	
trans-1,2-Dichloroethene	ND< 2.00	Acetone	ND< 10.0
1,2-Dichloropropane	ND< 2.00	Vinyl acetate	ND< 5.00
cis-1,3-Dichloropropene	ND< 2.00	2-Butanone	ND< 5.00
trans-1,3-Dichloroproper	ND< 2.00	4-Methyl-2-pentanone	ND< 5.00
Methylene chloride	ND< 5.00	2-Hexanone	ND< 5.00
1,1,2,2-Tetrachloroethar	ND< 2.00	Carbon disulfide	ND< 5.00
Tetrachloroethene	6.02		
1,1,1-Trichloroethane	33.1		
1,1,2-Trichloroethane	ND< 2.00		
Trichloroethene	657 *		
Vinyl Chloride	ND< 2.00		

Analytical Method: EPA 8260 ELAP ID No.: 10958

Comments: ND denotes Not Detected
* Concentration calculated from diluted sample run

Approved By _____
Laboratory Director

92098V5.XLS

PARADIGM
ENVIRONMENTAL
SERVICES, INC.

179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

Volatile Laboratory Analysis Report For Non-Potable Water

Client:	Haley & Aldrich of New York	**Lab Project No.:**	99-2098
Client Job Site:	Enarco Well Sampleing	**Lab Sample No.:**	7184
Client Job No.:	70372-050	**Sample Type:**	Water
Field Location:	MW-2	**Date Sampled:**	10/28/99
		Date Received:	11/01/99
Field ID No.:	N/A	**Date Analyzed:**	11/04/99

VOLATILE HALOCARBONS	RESULTS (ug/L)	VOLATILE AROMATICS	RESULTS (ug/L)
Bromodichloromethane	ND< 2.00	Benzene	ND< 2.00
Bromomethane	ND< 2.00	Chlorobenzene	ND< 2.00
Bromoform	ND< 2.00	Ethylbenzene	ND< 2.00
Carbon tetrachloride	ND< 2.00	Toluene	ND< 2.00
Chloroethane	ND< 2.00	m,p - Xylene	ND< 2.00
Chloromethane	ND< 2.00	o - Xylene	ND< 2.00
2-Chloroethyl vinyl ether	ND< 2.00	Styrene	ND< 2.00
Chloroform	ND< 2.00		
Dibromochloromethane	ND< 2.00		
1,1-Dichloroethane	ND< 2.00		
1,2-Dichloroethane	ND< 2.00		
1,1-Dichloroethene	ND< 2.00	Ketones & Misc.	
trans-1,2-Dichloroethene	ND< 2.00	Acetone	ND< 10.0
1,2-Dichloropropane	ND< 2.00	Vinyl acetate	ND< 5.00
cis-1,3-Dichloropropene	ND< 2.00	2-Butanone	ND< 5.00
trans-1,3-Dichloropropen	ND< 2.00	4-Methyl-2-pentanone	ND< 5.00
Methylene chloride	ND< 5.00	2-Hexanone	ND< 5.00
1,1,2,2-Tetrachloroethar	ND< 2.00	Carbon disulfide	ND< 5.00
Tetrachloroethene	ND< 2.00		
1,1,1-Trichloroethane	6.71		
1,1,2-Trichloroethane	ND< 2.00		
Trichloroethene	586 *		
Vinyl Chloride	ND< 2.00		

Analytical Method: EPA 8260 ELAP ID No.: 10958

Comments: ND denotes Not Detected
* Concentration calculated from diluted sample run

Approved By _____
For: Laboratory Director

92098V6.XLS

PARADIGM
ENVIRONMENTAL
SERVICES, INC.

179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

Volatile Laboratory Analysis Report For Non-Potable Water

Client:	Haley & Aldrich of New York	**Lab Project No.:**	99-2098
Client Job Site:	Enarco Well Sampleing	**Lab Sample No.:**	7185
Client Job No.:	70372-050	**Sample Type:**	Water
Field Location:	MW-3	**Date Sampled:**	10/28/99
		Date Received:	11/01/99
Field ID No.:	N/A	**Date Analyzed:**	11/04/99

VOLATILE HALOCARBONS	RESULTS (ug/L)	VOLATILE AROMATICS	RESULTS (ug/L)
Bromodichloromethane	ND< 100	Benzene	ND< 100
Bromomethane	ND< 100	Chlorobenzene	ND< 100
Bromoform	ND< 100	Ethylbenzene	ND< 100
Carbon tetrachloride	ND< 100	Toluene	ND< 100
Chloroethane	ND< 100	m,p - Xylene	ND< 100
Chloromethane	ND< 100	o - Xylene	ND< 100
2-Chloroethyl vinyl ether	ND< 100	Styrene	ND< 100
Chloroform	ND< 100		
Dibromochloromethane	ND< 100		
1,1-Dichloroethane	ND< 100		
1,2-Dichloroethane	ND< 100		
1,1-Dichloroethene	ND< 100	Ketones & Misc.	
trans-1,2-Dichloroethene	ND< 100	Acetone	ND< 500
1,2-Dichloropropane	ND< 100	Vinyl acetate	ND< 250
cis-1,3-Dichloropropene	ND< 100	2-Butanone	ND< 250
trans-1,3-Dichloroproper	ND< 100	4-Methyl-2-pentanone	ND< 250
Methylene chloride	ND< 250	2-Hexanone	ND< 250
1,1,2,2-Tetrachloroethar	ND< 100	Carbon disulfide	ND< 250
Tetrachloroethene	ND< 100		
1,1,1-Trichloroethane	525		
1,1,2-Trichloroethane	ND< 100		
Trichloroethene	8,650		
Vinyl Chloride	ND< 100		

Analytical Method: EPA 8260 ELAP ID No.: 10958

Comments: ND denotes Not Detected

Approved By: _____
For: Laboratory Director

92098v7

PARADIGM
ENVIRONMENTAL
SERVICES, INC.

179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

Volatile Laboratory Analysis Report For Non-Potable Water

Client:	Haley & Aldrich of New York	**Lab Project No.:**	99-2098
Client Job Site:	Enarco Well Sampleing	**Lab Sample No.:**	7186
Client Job No.:	70372-050	**Sample Type:**	Water
Field Location:	MW-202	**Date Sampled:**	10/29/99
		Date Received:	11/01/99
Field ID No.:	N/A	**Date Analyzed:**	11/04/99

VOLATILE HALOCARBONS	RESULTS (ug/L)	VOLATILE AROMATICS	RESULTS (ug/L)
Bromodichloromethane	ND< 5.00	Benzene	ND< 5.00
Bromomethane	ND< 5.00	Chlorobenzene	ND< 5.00
Bromoform	ND< 5.00	Ethylbenzene	ND< 5.00
Carbon tetrachloride	ND< 5.00	Toluene	ND< 5.00
Chloroethane	ND< 5.00	m,p - Xylene	ND< 5.00
Chloromethane	ND< 5.00	o - Xylene	ND< 5.00
2-Chloroethyl vinyl ether	ND< 5.00	Styrene	ND< 5.00
Chloroform	ND< 5.00		
Dibromochloromethane	ND< 5.00		
1,1-Dichloroethane	ND< 5.00		
1,2-Dichloroethane	ND< 5.00		
1,1-Dichloroethene	ND< 5.00	Ketones & Misc.	
trans-1,2-Dichloroethene	ND< 5.00	Acetone	ND< 25.0
1,2-Dichloropropane	ND< 5.00	Vinyl acetate	ND< 12.5
cis-1,3-Dichloropropene	ND< 5.00	2-Butanone	ND< 12.5
trans-1,3-Dichloroproper	ND< 5.00	4-Methyl-2-pentanone	ND< 12.5
Methylene chloride	ND< 12.5	2-Hexanone	ND< 12.5
1,1,2,2-Tetrachloroethar	ND< 5.00	Carbon disulfide	ND< 12.5
Tetrachloroethene	ND< 5.00		
1,1,1-Trichloroethane	5.15		
1,1,2-Trichloroethane	ND< 5.00		
Trichloroethene	238		
Vinyl Chloride	ND< 5.00		

Analytical Method: EPA 8260 ELAP ID No.: 10958

Comments: ND denotes Not Detected

Approved By _____
For: Laboratory Director

92098V8.XLS

PARADIGM
ENVIRONMENTAL
SERVICES, INC.

179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

Volatile Laboratory Analysis Report For Non-Potable Water

Client:	Haley & Aldrich of New York	**Lab Project No.:**	99-2098
Client Job Site:	Enarco Well Sampleing	**Lab Sample No.:**	7187
Client Job No.:	70372-050	**Sample Type:**	Water
Field Location:	MW-201D	**Date Sampled:**	10/29/99
		Date Received:	11/01/99
Field ID No.:	N/A	**Date Analyzed:**	11/05/99

VOLATILE HALOCARBONS	RESULTS (ug/L)	VOLATILE AROMATICS	RESULTS (ug/L)
Bromodichloromethane	ND< 100	Benzene	ND< 100
Bromomethane	ND< 100	Chlorobenzene	ND< 100
Bromoform	ND< 100	Ethylbenzene	ND< 100
Carbon tetrachloride	ND< 100	Toluene	ND< 100
Chloroethane	ND< 100	m,p - Xylene	ND< 100
Chloromethane	ND< 100	o - Xylene	ND< 100
2-Chloroethyl vinyl ether	ND< 100	Styrene	ND< 100
Chloroform	ND< 100		
Dibromochloromethane	ND< 100		
1,1-Dichloroethane	ND< 100		
1,2-Dichloroethane	ND< 100		
1,1-Dichloroethene	ND< 100	Ketones & Misc.	
trans-1,2-Dichloroethene	ND< 100	Acetone	ND< 500
1,2-Dichloropropane	ND< 100	Vinyl acetate	ND< 250
cis-1,3-Dichloropropene	ND< 100	2-Butanone	ND< 250
trans-1,3-Dichloroproper	ND< 100	4-Methyl-2-pentanone	ND< 250
Methylene chloride	ND< 250	2-Hexanone	ND< 250
1,1,2,2-Tetrachloroethar	ND< 100	Carbon disulfide	ND< 250
Tetrachloroethene	ND< 100		
1,1,1-Trichloroethane	250		
1,1,2-Trichloroethane	ND< 100		
Trichloroethene	3,510		
Vinyl Chloride	ND< 100		

Analytical Method: EPA 8260 ELAP ID No.: 10958

Comments: ND denotes Not Detected

Approved By _____
for: Laboratory Director

PARADIGM
ENVIRONMENTAL
SERVICES, INC.

179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

Volatile Laboratory Analysis Report For Non-Potable Water

Client:	Haley & Aldrich of New York	**Lab Project No.:**	99-2098
Client Job Site:	Enarco Well Sampleing	**Lab Sample No.:**	7188
Client Job No.:	70372-050	**Sample Type:**	Water
Field Location:	MW-4	**Date Sampled:**	10/28/99
		Date Received:	11/01/99
Field ID No.:	N/A	**Date Analyzed:**	11/04/99

VOLATILE HALOCARBONS	RESULTS (ug/L)	VOLATILE AROMATICS	RESULTS (ug/L)
Bromodichloromethane	ND< 2.00	Benzene	ND< 2.00
Bromomethane	ND< 2.00	Chlorobenzene	ND< 2.00
Bromoform	ND< 2.00	Ethylbenzene	ND< 2.00
Carbon tetrachloride	ND< 2.00	Toluene	ND< 2.00
Chloroethane	ND< 2.00	m,p - Xylene	ND< 2.00
Chloromethane	ND< 2.00	o - Xylene	ND< 2.00
2-Chloroethyl vinyl ether	ND< 2.00	Styrene	ND< 2.00
Chloroform	ND< 2.00		
Dibromochloromethane	ND< 2.00		
1,1-Dichloroethane	ND< 2.00		
1,2-Dichloroethane	ND< 2.00		
1,1-Dichloroethene	ND< 2.00	Ketones & Misc.	
trans-1,2-Dichloroethene	ND< 2.00	Acetone	ND< 10.0
1,2-Dichloropropane	ND< 2.00	Vinyl acetate	ND< 5.00
cis-1,3-Dichloropropene	ND< 2.00	2-Butanone	ND< 5.00
trans-1,3-Dichloroproper	ND< 2.00	4-Methyl-2-pentanone	ND< 5.00
Methylene chloride	ND< 5.00	2-Hexanone	ND< 5.00
1,1,2,2-Tetrachloroethar	ND< 2.00	Carbon disulfide	ND< 5.00
Tetrachloroethene	ND< 2.00		
1,1,1-Trichloroethane	8.29		
1,1,2-Trichloroethane	ND< 2.00		
Trichloroethene	16.4		
Vinyl Chloride	ND< 2.00		

Analytical Method: EPA 8260 ELAP ID No.: 10958

Comments: ND denotes Not Detected

Approved By _____
For: Laboratory Director

92098V10.XLS

PARADIGM
ENVIRONMENTAL
SERVICES, INC.

179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

Volatile Laboratory Analysis Report For Non-Potable Water

Client:	Haley & Aldrich of New York	**Lab Project No.:**	99-2098
Client Job Site:	Enarco Well Sampleing	**Lab Sample No.:**	7189
Client Job No.:	70372-050	**Sample Type:**	Water
Field Location:	7883 Martin Rd.	**Date Sampled:**	10/27/99
		Date Received:	11/01/99
Field ID No.:	N/A	**Date Analyzed:**	11/04/99

VOLATILE HALOCARBONS	RESULTS (ug/L)	VOLATILE AROMATICS	RESULTS (ug/L)
Bromodichloromethane	ND< 2.00	Benzene	ND< 2.00
Bromomethane	ND< 2.00	Chlorobenzene	ND< 2.00
Bromoform	ND< 2.00	Ethylbenzene	ND< 2.00
Carbon tetrachloride	ND< 2.00	Toluene	ND< 2.00
Chloroethane	ND< 2.00	m,p - Xylene	ND< 2.00
Chloromethane	ND< 2.00	o - Xylene	ND< 2.00
2-Chloroethyl vinyl ether	ND< 2.00	Styrene	ND< 2.00
Chloroform	ND< 2.00		
Dibromochloromethane	ND< 2.00		
1,1-Dichloroethane	ND< 2.00		
1,2-Dichloroethane	ND< 2.00		
1,1-Dichloroethene	ND< 2.00	Ketones & Misc.	
trans-1,2-Dichloroethene	ND< 2.00	Acetone	ND< 10.0
1,2-Dichloropropane	ND< 2.00	Vinyl acetate	ND< 5.00
cis-1,3-Dichloropropene	ND< 2.00	2-Butanone	ND< 5.00
trans-1,3-Dichloroproper	ND< 2.00	4-Methyl-2-pentanone	ND< 5.00
Methylene chloride	ND< 5.00	2-Hexanone	ND< 5.00
1,1,2,2-Tetrachloroethar	ND< 2.00	Carbon disulfide	ND< 5.00
Tetrachloroethene	ND< 2.00		
1,1,1-Trichloroethane	ND< 2.00		
1,1,2-Trichloroethane	ND< 2.00		
Trichloroethene	14.5		
Vinyl Chloride	ND< 2.00		

Analytical Method: EPA 8260 ELAP ID No.: 10958

Comments: ND denotes Not Detected

Approved By _____
Fed. Laboratory Director

92098V11.XLS

PARADIGM
ENVIRONMENTAL
SERVICES, INC.

179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

Volatile Laboratory Analysis Report For Non-Potable Water

Client:	Haley & Aldrich of New York	**Lab Project No.:**	99-2098
Client Job Site:	Enarco Well Sampleing	**Lab Sample No.:**	7190
Client Job No.:	70372-050	**Sample Type:**	Water
Field Location:	1167 Brays St.	**Date Sampled:**	10/27/99
		Date Received:	11/01/99
Field ID No.:	N/A	**Date Analyzed:**	11/04/99

VOLATILE HALOCARBONS	RESULTS (ug/L)	VOLATILE AROMATICS	RESULTS (ug/L)
Bromodichloromethane	ND< 2.00	Benzene	ND< 2.00
Bromomethane	ND< 2.00	Chlorobenzene	ND< 2.00
Bromoform	ND< 2.00	Ethylbenzene	ND< 2.00
Carbon tetrachloride	ND< 2.00	*Toluene*	ND< 2.00
Chloroethane	ND< 2.00	m,p - Xylene	ND< 2.00
Chloromethane	ND< 2.00	o - Xylene	ND< 2.00
2-Chloroethyl vinyl ether	ND< 2.00	Styrene	ND< 2.00
Chloroform	ND< 2.00		
Dibromochloromethane	ND< 2.00		
1,1-Dichloroethane	ND< 2.00		
1,2-Dichloroethane	ND< 2.00		
1,1-Dichloroethene	ND< 2.00	Ketones & Misc.	
trans-1,2-Dichloroethene	ND< 2.00	Acetone	ND< 10.0
1,2-Dichloropropane	ND< 2.00	Vinyl acetate	ND< 5.00
cis-1,3-Dichloropropene	ND< 2.00	2-Butanone	ND< 5.00
trans-1,3-Dichloroproper	ND< 2.00	4-Methyl-2-pentanone	ND< 5.00
Methylene chloride	ND< 5.00	2-Hexanone	ND< 5.00
1,1,2,2-Tetrachloroethar	ND< 2.00	Carbon disulfide	ND< 5.00
Tetrachloroethene	ND< 2.00		
1,1,1-Trichloroethane	ND< 2.00		
1,1,2-Trichloroethane	ND< 2.00		
Trichloroethene	16.0		
Vinyl Chloride	ND< 2.00		

Analytical Method: EPA 8260 ELAP ID No.: 10958

Comments: ND denotes Not Detected

Approved By _____
For: Laboratory Director

92098V12.XLS

PARADIGM
ENVIRONMENTAL
SERVICES, INC.

179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

Volatile Laboratory Analysis Report For Non-Potable Water

Client:	Haley & Aldrich of New York	**Lab Project No.:**	99-2098
Client Job Site:	Enarco Well Sampleing	**Lab Sample No.:**	N/A
Client Job No.:	70372-050	**Sample Type:**	VOA Method Blank
Field Location:	N/A	**Date Sampled:**	N/A
		Date Received:	N/A
Field ID No.:	N/A	**Date Analyzed:**	11/03/99

VOLATILE HALOCARBONS	RESULTS (ug/L)	VOLATILE AROMATICS	RESULTS (ug/L)
Bromodichloromethane	ND< 2.00	Benzene	ND< 2.00
Bromomethane	ND< 2.00	Chlorobenzene	ND< 2.00
Bromoform	ND< 2.00	Ethylbenzene	ND< 2.00
Carbon tetrachloride	ND< 2.00	Toluene	ND< 2.00
Chloroethane	ND< 2.00	m,p - Xylene	ND< 2.00
Chloromethane	ND< 2.00	o - Xylene	ND< 2.00
2-Chloroethyl vinyl ether	ND< 2.00	Styrene	ND< 2.00
Chloroform	ND< 2.00		
Dibromochloromethane	ND< 2.00		
1,1-Dichloroethane	ND< 2.00		
1,2-Dichloroethane	ND< 2.00		
1,1-Dichloroethene	ND< 2.00	Ketones & Misc.	
trans-1,2-Dichloroethene	ND< 2.00	Acetone	ND< 10.0
1,2-Dichloropropane	ND< 2.00	Vinyl acetate	ND< 5.00
cis-1,3-Dichloropropene	ND< 2.00	2-Butanone	ND< 5.00
trans-1,3-Dichloroproper	ND< 2.00	4-Methyl-2-pentanone	ND< 5.00
Methylene chloride	ND< 5.00	2-Hexanone	ND< 5.00
1,1,2,2-Tetrachloroethar	ND< 2.00	Carbon disulfide	ND< 5.00
Tetrachloroethene	ND< 2.00		
1,1,1-Trichloroethane	ND< 2.00		
1,1,2-Trichloroethane	ND< 2.00		
Trichloroethene	ND< 2.00		
Vinyl Chloride	ND< 2.00		

Analytical Method: EPA 8260 ELAP ID No.: 10958

Comments: ND denotes Not Detected

Approved By _____
Laboratory Director

PARADIGM
ENVIRONMENTAL
SERVICES, INC.

179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

Volatile Laboratory Analysis Report For Non-Potable Water

Client:	Haley & Aldrich of New York	**Lab Project No.:**	99-2098
Client Job Site:	Enarco Well Sampleing	**Lab Sample No.:**	N/A
Client Job No.:	70372-050	**Sample Type:**	VOA Method Blank
Field Location:	N/A	**Date Sampled:**	N/A
		Date Received:	N/A
Field ID No.:	N/A	**Date Analyzed:**	11/04/99

VOLATILE HALOCARBONS	RESULTS (ug/L)	VOLATILE AROMATICS	RESULTS (ug/L)
Bromodichloromethane	ND< 2.00	Benzene	ND< 2.00
Bromomethane	ND< 2.00	Chlorobenzene	ND< 2.00
Bromoform	ND< 2.00	Ethylbenzene	ND< 2.00
Carbon tetrachloride	ND< 2.00	Toluene	ND< 2.00
Chloroethane	ND< 2.00	m,p - Xylene	ND< 2.00
Chloromethane	ND< 2.00	o - Xylene	ND< 2.00
2-Chloroethyl vinyl ether	ND< 2.00	Styrene	ND< 2.00
Chloroform	ND< 2.00		
Dibromochloromethane	ND< 2.00		
1,1-Dichloroethane	ND< 2.00		
1,2-Dichloroethane	ND< 2.00		
1,1-Dichloroethene	ND< 2.00	Ketones & Misc.	
trans-1,2-Dichloroethene	ND< 2.00	Acetone	ND< 10.0
1,2-Dichloropropane	ND< 2.00	Vinyl acetate	ND< 5.00
cis-1,3-Dichloropropene	ND< 2.00	2-Butanone	ND< 5.00
trans-1,3-Dichloroproper	ND< 2.00	4-Methyl-2-pentanone	ND< 5.00
Methylene chloride	ND< 5.00	2-Hexanone	ND< 5.00
1,1,2,2-Tetrachloroethar	ND< 2.00	Carbon disulfide	ND< 5.00
Tetrachloroethene	ND< 2.00		
1,1,1-Trichloroethane	ND< 2.00		
1,1,2-Trichloroethane	ND< 2.00		
Trichloroethene	ND< 2.00		
Vinyl Chloride	ND< 2.00		

Analytical Method: EPA 8260 ELAP ID No.: 10958

Comments: ND denotes Not Detected

Approved By _____
For: Laboratory Director

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

VOLATILES
LABORATORY CONTROL SAMPLE RECOVERY SUMMARY FORM
Water Method

		Percent Recovery				
Lab Sample ID	Field Location	1,1-Dichloro ethene	Trichloro ethene	Benzene	Toluene	Chloro benzene
LCS	N/A	76	103	98	98	104
LCS Dup	N/A	76	101	97	100	106
6289MS	MW-5 MS	72	121	96	99	105
6289MSD	MW-5 MSD	70	109	96	97	103

	VOLATILE	(CLP SOW)	(SW846)
LCS Recovery	1,1-Dichloroethene	61-145%	D-234%
Windows	Trichloroethene	71-120%	71-157%
CLP SOW OLM01.0	Benzene	76-127%	37-151%
SW-846 8240	Toluene	76-125%	47-150%
	Chlorobenzene	75-130%	37-160%

PARADIGM ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue
Rochester, NY 14608
(716) 647-2530 • (800) 724-1997
FAX (716) 647-3311

1 of 2

CHAIN OF CUSTODY

REPORT TO:		INVOICE TO:		LAB PROJECT #
COMPANY	Hadley & Aldrich P.N.Y.	COMPANY	Hadley & Aldrich P.N.Y.	71-0078
ADDRESS	189 N. Water St	ADDRESS	Same	
CITY	Rochester STATE NY ZIP 14604	CITY	STATE ZIP	P.O. #
ATT.	B. Mahoney PHONE# 227-5535	ATT.	PHONE#	
PROJECT NAME/SITE NAME:	FAX# 232-6768	FAX#		☐ ADDENDUM
Supply well sampling	COMMENTS:			
PROJECT #: 70372-050		TURN AROUND TIME (WORKING DAYS)	☐ ONE ☐ THREE ☑ FIVE(STD) ☐ OTHER	
		REPRESENTATIVE:	Marsha Dotcore Dave Postant	

	DATE	TIME	COMPOSITE	GRAB	SAMPLE LOCATION/FIELD ID	MATRIX	NUMBER CONTAINERS	REQUESTED ANALYSIS: Sm 8260	REMARKS	PARADIGM LAB SAMPLE NUMBER	ANALYTICAL COSTS
1	10/28	11:51		X	SUPPLY WELL	AQ	2	X		7177	
2	10/29	15:41		X	EQUIP BLK	AQ	2	X		7178	MD
3					~~340 Hudson~~ MD						
4	10/29	11:01		X	7880 MAHLON RD.	AQ	2	X		7179	
5	10/29	9:16		X	MW-1	AQ	2	X		7180	
6	10/28	15:20		X	MW-5	AQ	2	X		7181	
7	10/28	15:20		X	MW-5MS	AQ	2	X		7182	MS
8	10/28	15:20		X	MW-5MSD	AQ	2	X		7183	MSD
9	10/28	12:45		X	MW-2	AQ	2	X		7184	
10	10/28	15:30		X	MW-3	AQ	2	X		7185	
11	10/29	15:15		X	MW-202	AQ	2	X		7186	
12	10/29	14:45			MW-201D	AQ	2	X		7187	

RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	DATE/TIME	SAMPLE CONDITION	CHECK #	TOTAL COST
	10/29/99		10/29/99			
RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	DATE/TIME	CARRIER COMPANY	AIR BILL NO.	P.I.F
RELINQUISHED BY:	DATE/TIME	RECEIVED @ LAB BY:	DATE/TIME	CARRIER PHONE #	DATE RESULTS REPORTED BY:	DATE/TIME
			10/29/99			

WHITE COPY-SAMPLE YELLOW COPY-FILE PINK COPY-RELINQUISHER

2 of 2

PARADIGM ENVIRONMENTAL SERVICES, INC.

179 Lake Avenue
Rochester, NY 14608
(716) 647-2530 • (800) 724-1997
FAX (716) 647-3311

CHAIN OF CUSTODY

REPORT TO:		INVOICE TO:		LAB PROJECT #
COMPANY	Haley + Aldrich, of NY	COMPANY	Same	97-2098
ADDRESS	159 N. Water St #0	ADDRESS		
CITY	Rochester STATE NY ZIP 14604	CITY	STATE ZIP	P.O. #
ATT.	Rob Nahonay PHONE# 327-5535	ATT.	PHONE#	
	FAX# 232-6711	FAX#		☐ ADDENDUM

PROJECT NAME/SITE NAME: Smoke Well Sampling
PROJECT #: 70372-050
COMMENTS:
TURN AROUND TIME (WORKING DAYS) ☐ ONE ☐ THREE ☒ FIVE(STD) ☐ OTHER
REPRESENTATIVE:

	DATE	TIME	COMPOSITE	GRAB	SAMPLE LOCATION/FIELD ID	MATRIX	NUMBER CONTAINERS	EPA 8260	REMARKS	PARADIGM LAB SAMPLE NUMBER	ANALYTICAL COSTS
1	10/26	17:30		X	MW-4	AQ	2	X		7185	
2	10/27	14:29		X	7883 Marino Rd	AQ	2	X		7187	
3	10/27	13:42		X	1167 Bragg St.	AQ	2	X		7190	
4						TB				7191	
5											
6											
7											
8											
9											
10											
11											
12											

RELINQUISHED BY:	DATE/TIME 10/29/99 14:50	RECEIVED BY:	DATE/TIME 10/29/99 14:50	SAMPLE CONDITION	CHECK # / TOTAL COST
RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	DATE/TIME	CARRIER COMPANY	AIR BILL NO. / P.I.F
RELINQUISHED BY:	DATE/TIME	RECEIVED @ LAB BY:	DATE/TIME 10/29/99 0810	CARRIER PHONE #	DATE RESULTS REPORTED BY: / DATE/TIME

WHITE COPY-SAMPLE YELLOW COPY-FILE PINK COPY-RELINQUISHER

PARADIGM
ENVIRONMENTAL
SERVICES, INC. 179 Lake Avenue Rochester, New York 14608 716-647-2530 FAX 716-647-3311

Volatile Organic Compound Laboratory Analysis Report For Soil/Sludge/Oil

Client:	Haley & Aldrich of New York	**Lab Project No:**	99-2141
		Lab Sample No:	7325
Client Job Site:	Kaddis		
		Sample Type:	Oil
Client Job No:	70372-050		
		Date Sampled:	10/29/99
Field Location:	MW 201D N	**Date Received:**	11/04/99
Field ID No:	N/A	**Date Analyzed:**	11/11/99

VOLATILE HALOCARBONS	RESULTS (ug/Kg)	VOLATILE AROMATICS	RESULTS (ug/Kg)
Bromodichloromethane	ND< 5,260	Benzene	ND< 5,260
Bromomethane	ND< 5,260	Chlorobenzene	ND< 5,260
Bromoform	ND< 5,260	Ethylbenzene	22,400
Carbon tetrachloride	ND< 5,260	Toluene	ND< 5,260
Chloroethane	ND< 5,260	m,p - Xylene	25,800
Chloromethane	ND< 5,260	o - Xylene	69,100
2-Chloroethyl vinyl ether	ND< 5,260	Styrene	ND< 5,260
Chloroform	ND< 5,260		
Dibromochloromethane	ND< 5,260		
1,1-Dichloroethane	ND< 5,260		
1,2-Dichloroethane	ND< 5,260		
1,1-Dichloroethene	ND< 5,260		
trans-1,2-Dichloroethene	ND< 5,260	**Ketones & Misc.**	
1,2-Dichloropropane	ND< 5,260	Acetone	ND< 26,300
cis-1,3-Dichloropropene	ND< 5,260	Vinyl acetate	ND< 10,500
trans-1,3-Dichloropropene	ND< 5,260	2-Butanone	ND< 10,500
Methylene chloride	ND< 13,200	4-Methyl-2-pentanone	ND< 10,500
1,1,2,2-Tetrachloroethane	ND< 5,260	2-Hexanone	ND< 10,500
Tetrachloroethene	88,500	Carbon disulfide	ND< 10,500
1,1,1-Trichloroethane	99,600		
1,1,2-Trichloroethane	ND< 5,260		
Trichloroethene	1,582,000 *		
Vinyl Chloride	ND< 5,260		

Analytical Method: EPA 8260B ELAP ID No: 10958

Comments: ND denotes Not Detected
* Concentration calculated from dilute run.

Approved By _____
Laboratory Director

PARADIGM ENVIRONMENTAL SERVICES, INC.

179 Lake Avenue
Rochester, NY 14608
(716) 647-2530 • (800) 724-1997
FAX (716) 647-3311

CHAIN OF CUSTODY

REPORT TO:		INVOICE TO:		LAB PROJECT #
COMPANY	HALEY & ALDRICH OF NY	COMPANY		99-1141
ADDRESS	189 N. WATER ST	ADDRESS		
CITY	Rochester STATE NY ZIP 14604	CITY STATE ZIP		P.O. #
ATT.	R. MAHONEY PHONE# 327-5515	ATT. PHONE#		
PROJECT NAME/SITE NAME:		FAX# 232-6768	FAX#	☐ ADDENDUM
PROJECT #:	7037R-050	COMMENTS:	Please Hold for R. Mahoney to notify RE: Ready Set	
			TURN AROUND TIME (WORKING DAYS) ☐ ONE ☐ THREE ☐ FIVE(STD) ☐ OTHER	
			REPRESENTATIVE:	

	DATE	TIME	COMPOSITE	GRAB	SAMPLE LOCATION/FIELD ID	MATRIX	NUMBER CONTAINERS	REQUESTED ANALYSIS	REMARKS	PARADIGM LAB SAMPLE NUMBER	ANALYTICAL COSTS
1	10/29/99	1350		X	MW 201D N	O	1	VOCs 8260		7325	
2											
3											
4											
5											
6											
7											
8									Rec'd 1330 11/4/99		
9									Rec'd Vince C. Nelson 1505		
10											
11											
12											

RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	DATE/TIME	SAMPLE CONDITION	CHECK #	TOTAL COST	
	10/29/99 1700		10/29/99 1700				
RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	DATE/TIME	CARRIER COMPANY	AIR BILL NO.	P.I.F	
RELINQUISHED BY:	DATE/TIME	RECEIVED @ LAB BY:	DATE/TIME	CARRIER PHONE #	DATE RESULTS REPORTED BY:		DATE/TIME
			11/4/99 1510				

WHITE COPY-SAMPLE YELLOW COPY-FILE PINK COPY-RELINQUISHER