Phase II
Environmental Site Assessment:
Site Characterization

Location:

Barthelmes Manufacturing
15 Cairn Street
Rochester, New York

Prepared for:

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LaBella Project No. 201045

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I. Introduction

The purpose of this report is to detail the cumulative findings of recent sub-surface investigations at the above referenced Site. These activities were conducted by LaBella Associates, P.C. on behalf of Harter, Secrest, & Emery and Barthelmes Manufacturing. Haley and Aldrich of New York has also recently joined the project team in order to provide additional remedial experience and expertise to the project.

The Site consists of approximately 7.59 acres of land occupied by an approximately 61,000 square foot building. The Site is in an industrial area, surrounded by various other commercial properties. The adjacent properties are a junkyard to the north, a former major oil storage facility to the south, a railroad to the west, and Cairn Street to the east. Based on review of available historical information, including City of Rochester Building Information System Records, City of Rochester Plat Maps, and City of Rochester Sanborn Maps, and discussions with Mr. Arthur and Richard Wischmeyer, it appears that the Site has been occupied by Barthelmes Manufacturing since approximately 1921. Barthelmes Manufacturing Company, Inc., is a contract metal fabrication facility. Their processes include stamping, machining, arc and spot welding, powder and spray painting, metal finishing, and assembling. Prior to Barthelmes Manufacturing, other development in the vicinity of the Site appears to have included a glass company, American Fruit & Produce Company, and Nunn Brass Works, Inc.

The Site is listed as a RCRA Small Quantity Generator (EPA ID# NYD002215119). It is also listed under the Toxic Release Inventory Reporting System and the AIRS database, which tracks air pollution.

The findings of this report are based on the scopes of work and project objectives that were agreed upon by LaBella Associates, P.C., and Harter, Secrest & Emery.

In December 2000 environmental questions arose during legal negotiations that were being conducted on behalf of Barthelmes Manufacturing Company, Inc. These negotiations required an environmental assessment of the property at 15 Cairn Street to assess any environmental liabilities at the property.

Interviews with Mr. Arthur and Richard Wischmeyer in December 2000 indicated several areas where Recognized Environmental Conditions may have existed at the Site:

- Former TCE vapor degreasing tank;
- Storm water pond;
- Former drum storage area;
- North property line bordering junkyard;
- South property line bordering former Major Oil Storage Facility.

II. Objectives

The Scope of Work that was designed and implemented at the Site was developed to accomplish the following objectives:

- Identify apparent sub-surface conditions in the five areas where Recognized Environmental Conditions were identified;

- Roughly quantify costs associated with remedial measures for any areas of subsurface impairment;
- Establish the feasibility and estimated costs associated with remedial measures that may be necessary to correct areas of subsurface impairment at the Site.

III. Summary of Findings

Overburden Summary of Findings

Site characterization activities have been conducted at the Site including:

- The advancement and sampling of 32 geoprobe borings
- The installation and sampling of 10 overburden groundwater monitoring wells
- The collection of one pond sediment sample
- The collection of one basement sump water sample
- The collection of a combined wastewater sample

Analytical data generated from the laboratory analysis of soil and groundwater samples from these borings and groundwater monitoring wells indicate that shallow groundwater has been impacted with Trichloroethene (TCE). These levels of TCE exceed New York State Department of Environmental Conservation (NYSDEC) groundwater standards.

In addition, limited areas of impaired soil exist at the Site that contain levels of TCE above NYSDEC guidance values.

These areas of impaired soil are generally located in the former drum storage area. The area of groundwater impaired with chlorinated solvents appears to be located under the building at the Site, in the former drum storage area, and appears to migrate to the south.

The sediment sample analyzed from a storm water pond previously used for wastewater discharge did not contain elevated levels of TCE above method detection limits (9.93ug/l). This sample did contain elevated levels of Chromium (151mg/kg). However, the levels of chromium were below the levels that would cause the sediment sample to fail Toxicity Characteristics.

Groundwater that is pumped from the basement sump contains elevated levels of TCE (535 ug/l). This wastewater is discharged to the municipal sewer, along with sanitary and industrial wastewater from the plant. Analysis of this combined flow to the sewer indicates that the concentration of TCE (84.2 ug/l) being discharged from groundwater, from the facility on the sampling date of June 5, 2001, is well below the Monroe County Pure Waters (MCPW) allowable total Volatile Organic Compound level of 2.1 parts per million.

Bedrock Summary of Findings

Additional investigation of the shallow bedrock groundwater table has also been performed at the Site in order to fully characterize the impairment and to evaluate remedial measures. Bedrock Site characterization activities consisted of the following:

- The installation and sampling of three shallow bedrock monitoring wells;

- The sampling of two previously installed production wells at the Site.

This sampling has shown the presence of trichlorethene and cis-1,2-dichloroethene above NYSDEC Groundwater Standards in the shallow (south) production well. Additionally, there were levels of Trichloroethene above NYSDEC Groundwater Standards in the three bedrock-monitoring wells. The levels of cis-1,2-dichloroethene were above the NYSDEC Guidance Values in two of the bedrock monitoring wells. The deeper production well was below NYSDEC Guidance Values.

Using the Site Characterization, LaBella Associates will be able to develop feasibility and cost analyses for various remedial alternatives and propose a remediation plan to the NYSDEC.

IV. Summary of Geologic and Hydrogeologic Conditions

Site geologic features are based primarily on information obtained from the advancement of 32 geoprobe borings and three drill rig advanced borings at the Site.

Based on field observations overburden appears to be approximately twenty-three feet (RW#1) to thirty feet (RW#2) thick. Based on field observations and surveyed groundwater elevations, groundwater flow appears to be generally to the south/southwest.

- The bedrock in the area is Lockport Dolomite.
- The soils at the Site consist of loose to medium sands with gravel.
- Groundwater flow in the overburden is generally to the south/southwest.
- The horizontal gradient in the overburden aquifer appears to be approximately 0.003.

The velocity of groundwater flow in the overburden aquifer can be estimated using Darcy's Law:

$$V=KI/e$$

Where V equals the velocity of groundwater flow, K equals the hydraulic conductivity (permeability), I equals hydraulic gradient, and e equals the effective porosity. The effective porosity is the volume of pore space through which groundwater flow actually occurs. The lower the value of effective porosity, the higher the resulting groundwater velocity. The median range of effective porosity and permeability for similar aquifers typically is reported to be in the range of 25% to 50%. The hydraulic conductivity is estimated to be about 10^{-2} cm/sec, based on published values for similar aquifers.

The rate of groundwater movement in the overburden aquifer is estimated to be in the range of less than 0.5 ft/day calculated assuming an effective porosity of 37.5% and a hydraulic conductivity of 10^{-2} cm/sec. Actual localized rates of groundwater movement will vary in response to local hydrogeologic conditions.

A groundwater contour map for the Site is included as Figure 3.

V. Investigation Methodology

Overburden Soil Borings and Monitoring Wells

Soil borings at the Site were advanced with a geoprobe direct push, sampling system. The use of direct push technology allows for rapid sampling, observation, and characterization of relatively shallow overburden soils. The geoprobe utilizes a four-foot macro-core sampler, with disposable polyethylene sleeves. Soil cores are retrieved in four-foot sections, and can be easily cut from the polyethylene sleeves for observation and sampling. The macro-core sampler was decontaminated between samples and borings using an alconox and water solution.

All soil cores were screened for evidence of impairment by a LaBella Associates Environmental Analyst. Field air monitoring readings of soil samples were conducted with a Mini-Rae 2000 Photoionization detector calibrated to a response factor of 1.00.

Soil samples were collected and placed directly into laboratory supplied, glass samples jars with a Teflon sealed lid. All samples were placed in coolers with chemical ice packs and transported under Chain of Custody procedures to Paradigm Laboratories, Inc, of Rochester, New York for analysis.

Monitoring wells were installed at ten of the boring locations at the Site. All monitoring wells utilized 1 inch well screen. The monitoring wells were set at depths varying from 19.5 feet to 16 feet, each with 10 feet of .010 inch slotted PVC screen intersecting the water table, connected to an appropriate length of PVC riser to complete the well installation. All wells were sand packed to 2 to 3 feet above the well screen, bentonite sealed to 1 foot below the ground surface, and grouted to the ground surface. Each well was finished with a locking cap and flush mount cover.

Each well received a dedicated PVC bailer. Prior to sampling each monitoring well was developed and purged by bailing at least 3 well volumes.

Samples were collected in laboratory supplied sample jars and vials. All samples were placed in coolers with chemical ice packs and transported under chain of custody procedures to Paradigm Laboratories, Inc. of Rochester, New York for analysis.

Four groundwater monitoring wells advanced on the exterior of the building were elevated and compared to an onsite specific elevation. In addition, one groundwater monitoring well (IB-1/MW-1) advanced on the interior of the building was surveyed to establish its relative elevation.

Boring logs and monitoring well construction diagrams are attached as Appendix 1.

Bedrock Monitoring Wells

The shallow bedrock monitoring wells were installed by a specialized rotary drilling contractor. The contractor utilized a Brainerd-Killman 81 truck mounted drill rig to advance 6 ¼" interior diameter hollow stem augers. Continuous overburden sampling was completed using split spoon samples in accordance with ASTM 1586. The drilling equipment was decontaminated prior to use and between borings used an alconox and water wash, followed by a water rinse.

The decontamination water, development water, and cuttings were containerized in 55-gallon drums and remained at the Site for further characterization and proper disposal. The contractor advanced the borings using hollow-stem augers with continuous soil sampling to the top of bedrock. The contractor then seated temporary steel casing to the top of bedrock as necessary to maintain the borehole and seal the overburden, as well as preventing the discharge of drilling fluids to the ground surface. The contractor then advanced 5 7/8" nominal rollerbit seven feet into the bedrock. Clean water was used as the drilling fluid. The drilling fluid was circulated for a sufficient period of time to clean the borehole of cuttings.

To complete the well, a ten foot length of 0.01" slotted PVC was installed, and connected to an appropriate length of PVC riser casing. The bottom of the screen was equipped with a cap. The annular space was gravel-packed with Morie #0 quartz sand to a depth of two feet above the top of the screen, and a two-foot seal of bentonite pellets was installed above the gravel pack. The temporary casing was then gradually withdrawn. The remaining annular space was tremmie-grouted to within one foot of the ground surface, using a cement and bentonite grout mixture. The monitoring wells were then sealed with a flush-mounted casing with a lockable inner cap.

These monitoring wells were also surveyed and elevated to determine groundwater flow parameters.

Boring logs and well construction diagrams are attached as Appendix 1.

VI. Fieldwork and Findings

VIa. Initial Subsurface Investigation

Introduction

Initial Site Investigation Activities were conducted at the Site on December 19, 2000 and January 19 and 24, 2001. During this time frame, a total of twelve geoprobe borings, one pond sediment sample, and five shallow groundwater monitoring wells were advanced at the Site to preliminarily characterize subsurface conditions at the Site.

Scope of Work

The workplan that was developed was designed to provide initial coverage of the Site in the areas most likely to have contributed to, or be affected by, a potential petroleum or chemical release at the Site. The Scope of Work is based on LaBella's discussions with Mr. Richard and Arthur Wischmeyer, Harter, Secrest, & Emery, and on information regarding current and historical Site processes. The initial work plan that was implemented at the Site is as follows:

1. LaBella Associates worked with Barthelmes Manufacturing to determine the areas of potential concern/migration pathways at the Site as they relate to Site objectives and issues. Part of this task also involved LaBella Associates conducting limited Phase I ESA related research for the facility to uncover additional issues at the Site that required investigation.

2. An Underground Facilities Protection Organization (UFPO) stakeout was conducted at the Site, to locate any subsurface utilities in the areas where the subsurface assessment and delineation took place.

3. LaBella Associates retained the services of a specialized contractor to implement a direct push "geoprobe" soil boring and sampling program at the Site. A total of three days of borings were conducted at the Site.

4. LaBella reviewed available information and the information provided by the utility stakeout to determine the appropriate locations for soil borings. A total of twelve borings were implemented at the following locations:

    - In the area of the drain lines that lead to the storm water pond.
    - In the area near the former TCE vapor degreaser.
    - In the area of the Site along the south property line closest to the former major oil storage facility.
    - In the area of the Site near the storm water pond, along the west and north property line where shallow ditches appear to lead onto the Site.
    - In the areas of the Site near drum storage, paint booth, and loading dock areas.
    - Along the northern property line closest to the current junkyard.

    In addition, one pond sediment sample was taken from the bottom of the pond, directly underneath the discharge pipe coming from the manufacturing facility.

5. Five 1-inch diameter monitoring wells were installed, based on evidence of impairment observed in the soil borings, these include the following locations:

    - One well in the vicinity of the former TCE vapor degreasing tank inside the plant (MW#1)
    - One well along the south property line near the former major oil storage facility (MW#2)
    - One well along the northwest property line in the vicinity of the storm water pond (MW#3)
    - Two wells in the former drum storage area (MW#4, 5)

Field Activities

Twelve borings were advanced at the Site. All of the borings were advanced to total depths ranging from 16 feet to 26 feet below grade. Based on field observations, groundwater monitoring wells were installed at the soil boring near the former TCE vapor degreasing tank (MW #1), soil boring #2 near the south property line (MW #2), soil boring #4 in the northwest corner of the property near the pond and the property line with the junkyard (MW #3), soil boring #5 (MW #4) and soil boring #7 (MW#5), both in the former drum storage area.

All soil cores were continuously assessed by a LaBella Associates Environmental Analyst for soil type and evidence of impairment.

Soils at the Site consisted primarily of medium to coarse sands with some clay and silts at the shallower depths and an occasional clay/silt lenses at greater depths.

The boring locations at the Site are illustrated in Figure 1. Copies of the boring logs are included in Appendix 1.

Initial Subsurface Analytical Results - Soils

Soil samples were sent under Chain of Custody proccdures to Paradigm Laboratories, Inc. of Rochester, New York for petroleum and solvent related VOC analysis by USEPA Method 8260 STARS and for Semi-VOC analysis by USEPA Method 8270 STARS Compounds only, as well as the 8 RCRA Metals by USEPA Method 6010.

The analytical results for those compounds detected above method detection limits from the soil samples for Volatile Organic Compound analysis (VOC), Semi-Volatile Organic Compound analysis (SVOC), and 8 RCRA Metals are summarized in Tables 1, 2 and 3, respectively. The individual constituents are compared to the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 Soil Cleanup Objectives to Protect Groundwater Quality.

TABLE 1
Volatile Organic Compound Laboratory Analysis for Soil Samples
(USEPA Method 8260) (ug/kg)

Parameter	IB-1 (12'-14')	B-3 (8'-12')	B-4 (8'-12')	B-7 (0'-4')	B-7 (12'-14')	B-10 (8'-12')	NYSDEC TAGM 4046 Soil Cleanup Objective to Protect Groundwater Quality
Bromodichloromethane	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	N/A
Bromomethane	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	N/A
Bromoform	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	N/A
Carbon Tetrachloride	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	600
Chloroethane	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	1,900
Chloromethane	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	N/A
2-Chlorotheyl Vinyl Ether	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	N/A
Chloroform	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	300
Dibromochloromethane	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	N/A
1,1-Dichloroethane	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	200
1,2-Dichloroethane	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	100
1,1-Dichloroethene	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	400

TABLE 1 (continued)
Volatile Organic Compound Laboratory Analysis for Soil Samples
(USEPA Method 8260) (ug/kg)

Parameter	BB-1 (12'-14')	B-3 (8'-12')	B-4 (8'-12')	B-7 (0'-4')	B-7 (12'-14')	B-10 (8'-12')	NYSDEC TAGM 4046 Soil Cleanup Objective to Protect Groundwater Quality
Cis-1,2-Dochloroethene	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	N/A
trans-1,2-Dichloroethene	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	300
1,2-Dichloropropane	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	N/A
cis-1,3-Dichloropropene	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	N/A
trans-1,3-Dichloropropene	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	N/A
Methylene chloride	ND<21.2	ND<25.0	ND<27.9	ND<269	ND<19.9	ND<28.5	100
1,1,2,2-Tetrachloroethane	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	600
Tetrachloroethene	ND<8.5	106	ND<11.2	ND<108	ND<7.96	ND<11.4	1,400
1,1,1-Trichloroethane	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	760
1,1,2-Trichloroethane	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	N/A
Trichloroethene	ND<8.5	ND<10.0	ND<11.2	**10,300**	13.5	ND<11.4	700
Vinyl Chloride	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	120
Benzene	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	60
Chlorobenzene	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	1,700
Ethylbenzene	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	5,500
Toluene	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	1,500
m,p-Xylene	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	1,200
o-Xylene	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	1,200
Sytrene	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.96	ND<11.4	N/A
Acetone	ND<42.5	ND<50.0	ND<55.8	ND<539	ND<39.8	ND<57.1	110
Vinyl Acetate	ND<21.2	ND<25.0	ND<27.9	ND<269	ND<19.9	ND<28.5	N/A
2-Butanone	ND<21.2	ND<25.0	ND<27.9	ND<269	ND<19.9	ND<28.5	300
4-Methyl-2-pentanone	ND<21.2	ND<25.0	ND<27.9	ND<269	ND<19.9	ND<28.5	1,000
2-Hexanone (MEK)	ND<21.2	ND<25.0	ND<27.9	ND<269	ND<19.9	ND<28.5	N/A
Carbon Disulfide	ND<21.2	ND<25.0	ND<27.9	ND<269	ND<19.9	ND<28.5	2,700
Methyl tert-Butyl Ether	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.97	ND<11.4	120
Isopropylbenzene	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.97	ND<11.4	4,740
n-Propylbenzene	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.97	ND<11.4	14,000
1,3,5-Trimethylbenzene	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.97	ND<11.4	3,330
tert-Butylbenzene	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.97	ND<11.4	N/A
1,2,4-Trimethylbenzene	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.97	ND<11.4	13,000
sec-Butylbenzene	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.97	ND<11.4	24,910
p-Isopropyltoluene	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.97	ND<11.4	10,570
n-Butylbenzene	ND<8.5	ND<10.0	ND<11.2	ND<108	ND<7.97	ND<11.4	17,620
Naphthalene	ND<21.2	ND<25.0	ND<27.9	ND<269	ND<19.9	ND<28.5	13,000

All sample results and guidance values in ug/kg = ppb
ND = Not Detected
N/A=Not Applicable
Bold denotes constituents above NYSDEC Guidance Values

All sediment results for Volatile Organic Compounds by USEPA Method 8260 were non-detect.

TABLE 2
Semi - Volatile Organic Compound Laboratory Analysis for Soil Samples
(USEPA Method 8270) (ug/kg)

Parameter	IB-1 (12'-14')	B-3 (8'-12')	B-4 (8'-12)	B-7 (0'-4')	B-7 (12'-14')	NYSDEC TAGM 4046 Soil Cleanup Objectives to Protect Groundwater Quality
Napthalene	ND<321	ND<354	ND<40 9	ND<71 1	ND<366	13,000
Acenaphthene	ND<321	ND<354	ND<40 9	1,160	558	90,000
Flourene	ND<321	ND<354	ND<40 9	1,250	624	350,000
Flouranthene	ND<321	ND<354	ND<40 9	14,800	3,580	1,900,000
Anthracene	ND<321	ND<354	ND<40 9	3,020	1,150	700,000
Phenanthrene	ND<321	ND<354	ND<40 9	11,200	4,150	220,000
Benzo (a) anthracene	ND<321	ND<354	ND<40 9	**8,760**	2,100	3,000
Chrysene	ND<321	ND<354	ND<40 9	**7,130**	**2,100**	400
Pyrene	ND<321	ND<354	ND<40 9	13,000	6,470	665,000
Benzo (b) flouranthene	ND<321	ND<354	ND<40 9	**10,800**	**1,610**	1,100
Benzo (k) flouranthene	ND<321	ND<354	ND<40 9	6,280	**3,360**	1,100
Benzo (g,h,i) perylene	ND<321	ND<354	ND<40 9	785	800	800,000
Benzo (a) pyrene	ND<321	ND<354	ND<40 9	6,480	1,370	11,000
Dibenz (a,h) anthracene	ND<321	ND<354	ND<40 9	898	ND<366	165,000,000
Indeno (1,2,3-cd) pyrene	ND<321	ND<354	ND<40 9	**3,470**	827	3,200

All sample results and guidance values in ug/kg = ppb
ND = Not Detected
N/A = Not Applicable
Bold denotes constituents above NYSDEC Guidance Values

All sediment results for Semi-Volatile Organic Compounds by USEPA Method 8270 STARS Compounds Only, were non-detect.

TABLE 3
8 RCRA Metals Analysis for Soil Samples (mg/kg)

Parameter	B-1 (12'-14')	B-3 (8'-12')	B-7 (0'-4')	NYSDEC TAGM 4046 Eastern USA Background	NYSDEC TAGM 4046 Recommended Cleanup Objectives
Arsenic	1.78	0.958	6.47	3-12	7.5 or SB
Barium	13.4	18.6	**464**	15-600	300 or SB
Cadmium	<0.523	<0.499	**56.9**	0.1-1	1 or SB
Chromium	4.81	6.72	**299**	1.5-40	10 or SB
Lead	1.67	2.11	**366**	*200-500	SB
Mercury	<0.036	<0.0870	<0.0765	0.001-0.2	0.1
Selenium	0.0836	<0.499	<0.522	0.1-3.9	2 or SB
Silver	<1.04	<1.00	**6.59**	N/A	SB

* Background levels for lead vary widely. Average levels in undeveloped, rural areas may range from 4-61 ppm. Average background levels in metropolitan or suburban areas or near highways are much higher and typically range from 200-500 ppm

All sample results and guidance values are listed in mg/kg=ppm

N/A - Not Applicable

ND = Not Detected

Bold denotes constituents above NYSDEC Guidance Values

SB= Site Background

The results of the initial subsurface soil boring and sampling investigation indicated that slightly impaired soils were present next to the clean out for the drainage pipe that leads to the storm water pond; however, the concentration was below DEC soil cleanup guidelines. Elevated levels of VOC's, SVOC's and several metals were present within the former drum storage area and in the vicinity of the former TCE tank.

Initial Subsurface Investigation Analytical Results – Sediment

Because of historical discharges to the storm water pond, one sediment sample was obtained from the pond for analysis. This sample was obtained from the bottom of the pond, directly underneath the discharge pipe coming from the manufacturing facility.

This sample was analyzed for VOCs by USEPA Method 8260 plus STARS compounds, for Semi-VOCs by USEPA Method 8270 STARS Compounds Only, and for 8 RCRA Metals.

The analyses for VOCs and SVOCs were non-detect. The analysis for 8 RCRA metals did indicate the presence of chromium above published Eastern USA Background Levels.

TABLE 6
Volatile Organic Compound Laboratory Analysis for Groundwater Samples
(USEPA Method 8260) (ug/L)

Parameter	MW-1	MW-2	MW-3	MW-4	MW-5	NYSDEC Part 703 Groundwater Standards
Bromodichloromethane	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	50*
Bromomethane	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
Bromoform	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	50*
Carbon Tetrachloride	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
Chloroethane	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	50
Chloromethane	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	N/A
2-Chlorotheyl Vinyl Ether	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	N/A
Chloroform	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	7
Dibromochloromethane	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	50*
1,1-Dichloroethane	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
1,2-Dichloroethane	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
1,1-Dichloroethene	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
Cis-1,2-Dichloroethene	483	ND<2.0	ND<2.0	ND<200	ND<200	5
trans-1,2-Dichloroethene	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
1,2-Dichloropropane	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
cis-1,3-Dichloropropene	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
Cis 1,2-Dichcloropropene	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5

TABLE 6 (continued)
Volatile Organic Compound Laboratory Analysis for Groundwater Samples
(USEPA Method 8260) (ug/L)

Parameter	MW-1	MW-2	MW-3	MW-4	MW-5	NYSDEC Part 703 Groundwater Standards
trans-1,3-Dichloropropene	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
Methylene chloride	ND<500	ND<5.0	ND<5.0	ND<500	ND<500	5
1,1,2,2-Tetrachloroethane	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
Tetrachloroethene	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
1,1,1-Trichloroethane	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
1,1,2-Trichloroethane	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
Trichloroethene	**8,140**	**257**	ND<2.0	**2,980**	**15,600**	5
Vinyl Chloride	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	2
Benzene	ND<70	ND<0.700	ND<0.700	ND<70	ND<70	1
Chlorobenzene	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
Ethylbenzene	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
Toluene	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
m,p-Xylene	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
o-Xylene	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
Sytrene	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	50
Acetone	ND<1,000	ND<10.0	ND<10.0	ND<1,000	ND<1,000	50*
Vinyl Acetate	ND<500	ND<5.0	ND<5.0	ND<500	ND<500	N/A
2-Butanone	ND<500	ND<5.0	ND<5.0	ND<500	ND<500	N/A
4-Methyl-2-pentanone	ND<500	ND<5.0	ND<5.0	ND<500	ND<500	N/A
2-Hexanone (MEK)	ND<500	ND<5.0	ND<5.0	ND<500	ND<500	N/A
Carbon Disulfide	ND<200	3.59	ND<2.0	ND<200	ND<200	10
Methyl tert-Butyl Ether	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
Isopropylbenzene	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
n-Propylbenzene	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
1,3,5-Trimethylbenzene	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
tert-Butylbenzene	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
1,2,4-Trimethylbenzene	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
sec-Butylbenzene	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
p-Isopropyltoluene	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
n-Butylbenzene	ND<200	ND<2.0	ND<2.0	ND<200	ND<200	5
Naphthalene	ND<500	ND<5.0	ND<5.0	ND<500	ND<500	10

All sample results and guidance values in ug/kg = ppb
ND = Not Detected
N/A = Not Applicable
Bold denotes constituents above NYSDEC Standard
* denotes Guidance Value

All Groundwater results for Semi-Volatile Organic Compounds by USEPA Method 8270, STARS Compounds Only, were non-detect.

TABLE 7
8 RCRA Metals Analysis for Groundwater Samples (mg/L)

Parameter	MW-5	NYSDEC Part 703 Groundwater Standard
Arsenic	<0.005	0.025
Barium	0.281	1
Cadmium	<0.005	0.01
Chromium	0.047	0.05
Lead	0.065	0.025
Mercury	<0.0002	0.002
Selenium	<0.005	0.01
Silver	<0.01	0.05

Water elevation data gathered from the four monitoring wells that have been installed at the Site indicate that the flow of groundwater at the Site is to the south.

Based on the observations made during the soil boring and groundwater sampling study elevated levels of Trichloroethene in the soils were present in the surface soils in the drum storage area. Trichloroethene impaired groundwater was present under the building and in the south center portion of the Site. The monitoring well in the northwest corner of the site has not been impacted. Based on the analytical data, the highest levels of Trichloroethene in the groundwater were detected in the former drum storage area and in the vicinity of the former TCE Vapor Degreaser. Tetrachloroethene was found in soils at levels below DEC soil clean up guidelines next to the drainage pipe clean out.

Based on the observations at the time of the fieldwork and the analytical data, it was determined that groundwater impairment was present at the Site. Additional soil and groundwater investigation was necessary to determine the source of this impairment.

VIb. Interior Subsurface Investigation

Introduction

On April 17, 2001, five additional soil borings and monitoring wells were installed inside the building in the vicinity of the former TCE Vapor Degreaser to add further definition to the area of impairment.

Scope of Work

The work plan that was developed was designed to provide concentrated coverage of the interior portions of the Site in the areas most likely to have contributed to, or be affected by, a potential release of trichloroethylene and the associated compounds at the Site. The Scope of Work is based on LaBella's discussions with Harter, Secrest, & Emery, Mr. Richard and Arthur Wischmeyer, impairment and groundwater flow direction information gathered in the Initial Subsurface Investigation, and on information regarding current and historical Site processes.

Samples were collected in laboratory supplied sample jars and vials. All samples were placed in coolers with chemical ice packs and transported under chain of custody procedures to Paradigm Laboratories, Inc. of Rochester, New York for analysis.

Field Activities

Five borings were advanced in the interior of the structure located at the Site. All of the borings were advanced to total depths ranging from 15 feet to 18 feet below ground surface. Because soil impairment in the drum storage area did not seem to present the vertical profile to explain the levels of impairment in the groundwater, groundwater monitoring wells were installed at each of the five soil borings in the vicinity of the former TCE degreaser. The average depth to groundwater for these borings was approximately six feet below ground surface.

All soil cores were continuously assessed by a LaBella Associates Environmental Analyst for soil type and evidence of impairment.

Soils at the Site consisted primarily of medium to fine sands.

One soil boring (IB-2) exhibited elevated PID readings, staining, and odors. One soil sample was retained from this boring for laboratory analysis.

The boring locations at the Site are illustrated in Figure 1. Copies of the boring logs are included in Appendix 1.

Interior Subsurface Analytical Results - Soil

The soil sample was sent under Chain of Custody procedures to Paradigm Laboratories, Inc. of Rochester, New York for VOC analysis by USEPA Method 8260.

The analytical results for those compounds detected above method detection limits from the soil samples for Volatile Organic Compound analysis (VOC), are summarized in Table 8. The individual constituents are compared to the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 Soil Cleanup Objectives to Protect Groundwater Quality.

TABLE 8
Volatile Organic Compound Laboratory Analysis for Soil Samples
(USEPA Method 8260) (ug/kg)

Parameter	IB-2 (5'-7')	NYSDEC TAGM 4046 Soil Cleanup Objective to Protect Groundwater Quality
Bromodichloromethane	ND<35.5	N/A
Bromomethane	ND<35.5	N/A
Bromoform	ND<35.5	N/A
Carbon Tetrachloride	ND<35.5	600

TABLE 8 (continued)
Volatile Organic Compound Laboratory Analysis for Soil Samples
(USEPA Method 8260) (ug/kg)

Parameter	IB-2 (5'-7')	NYSDEC TAGM 4046 Soil Cleanup Objective to Protect Groundwater Quality
Chloroethane	ND<35.5	1,900
Chloromethane	ND<35.5	N/A
2-Chlorotheyl Vinyl Ether	ND<35.5	N/A
Chloroform	ND<35.5	300
Dibromochloromethane	ND<35.5	N/A
1,1-Dichloroethane	ND<35.5	200
1,2-Dichloroethane	ND<35.5	100
1,1-Dichloroethene	ND<35.5	400
Cis-1,2-Dichloroethene	ND<35.5	N/A
trans-1,2-Dichloroethene	ND<35.5	N/A
1,2-Dichloropropane	ND<35.5	N/A
cis-1,3-Dichloropropene	ND<35.5	300
trans-1,3-Dichloropropene	ND<35.5	N/A
Methylene chloride	ND<88.7	100
1,1,2,2-Tetrachloroethane	ND<35.5	600
Tetrachloroethene	ND<35.5	1,400
1,1,1-Trichloroethane	ND<35.5	760
1,1,2-Trichloroethane	ND<35.5	N/A
Trichloroethene	ND<35.5	700
Vinyl Chloride	ND<35.5	120
Benzene	ND<35.5	60
Chlorobenzene	ND<35.5	1,700
Ethylbenzene	ND<35.5	5,500
Toluene	ND<35.5	1,500
m,p-Xylene	ND<35.5	1,200
o-Xylene	ND<35.5	1,200
Sytrene	ND<35.5	N/A
Acetone	ND<177	110
Vinyl Acetate	ND<88.7	N/A
2-Butanone	ND<88.7	300
4-Methyl-2-pentanone	ND<88.7	1,000
2-Hexanone (MEK)	ND<88.7	N/A
Carbon Disulfide	ND<88.7	2,700
Methyl tert-Butyl Ether	ND<35.5	120
Isopropylbenzene	ND<35.5	4,740
n-Propylbenzene	ND<35.5	14,000

TABLE 8 (continued)
Volatile Organic Compound Laboratory Analysis for Soil Samples
(USEPA Method 8260) (ug/kg)

Parameter	IB-2 (5'-7')	NYSDEC TAGM 4046 Soil Cleanup Objective to Protect Groundwater Quality
1,3,5-Trimethylbenzene	267	3,330
tert-Butylbenzene	ND<35.5	N/A
1,2,4-Trimethylbenzene	327	13,000
sec-Butylbenzene	ND<35.5	24,910
p-Isopropyltoluene	257	10,570
n-Butylbenzene	ND<35.5	17,620
Naphthalene	ND<88.7	13,000

All sample results and guidance values in ug/kg = ppb
ND = Not Detected
N/A = Not Applicable
Bold denotes constituents above NYSDEC Guidance Values

The results of the soil boring and sampling study indicated that slightly impaired soils from lighter and gasoline type VOCs are present in the area of IB-2 below DEC soil cleanup objectives. No chlorinated solvents were detected in this soil sample.

Interior Subsurface Investigation Analytical Results - Groundwater

These monitoring wells were developed, purged, and sampled on April 21, 2001.

Groundwater samples were sent under Chain of Custody Procedures to Paradigm Laboratories, Inc. of Rochester, New York. The analytical results for those compounds detected above method detection limits from the groundwater samples for Volatile Organic Compound analysis (VOC) are summarized in Table 9. The individual constituents are compared to the NYSDEC Part 703 Groundwater Standards.

TABLE 9
Volatile Organic Compound Laboratory Analysis for Groundwater Samples
(USEPA Method 8260) (ug/L)

Parameter	MW-6	MW-7	MW-8	MW-9	MW-10	NYSDEC Part 703 Groundwater Standards
Bromodichloromethane	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	50*
Bromomethane	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	5
Bromoform	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	50*
Carbon Tetrachloride	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	5
Chloroethane	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	50
Chloromethane	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	N/A
2-Chlorotheyl Vinyl Ether	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	N/A

TABLE 9 (continued)
Volatile Organic Compound Laboratory Analysis for Groundwater Samples
(USEPA Method 8260) (ug/L)

Parameter	MW-6	MW-7	MW-8	MW-9	MW-10	NYSDEC Part 703 Groundwater Standards
Chloroform	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	7
Dibromochloromethane	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	50*
1,1-Dichloroethane	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	5
1,2-Dichloroethane	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	5
1,1-Dichloroethene	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	N/A
Cis-1,2-Dichloroethene	**371**	**117**	**187**	**750**	**8,600**	5
trans-1,2-Dichloroethene	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	5
1,2-Dichloropropane	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	5
cis-1,3-Dichloropropene	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	5
trans-1,3-Dichloropropene	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	5
Methylene chloride	ND<50.0	ND<25.0	ND<50.0	ND<250	ND<250	5
1,1,2,2-Tetrachloroethane	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	5
Tetrachloroethene	ND<20.0	**59.8**	ND<20.0	ND<100	ND<100	5
1,1,1-Trichloroethane	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	5
1,1,2-Trichloroethane	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	5
Trichloroethene	**2,390**	**801**	**1,990**	**4,400**	**223**	5
Vinyl Chloride	ND<20.0	ND<10.0	ND<20.0	ND<100	**5,770**	5
Benzene	ND<7.0	ND<3.50	ND<7.00	ND<35.0	ND<35.0	2
Chlorobenzene	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	1
Ethylbenzene	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	5
Toluene	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	5
m,p-Xylene	**27.5**	ND<10.0	ND<20.0	ND<100	ND<100	5
o-Xylene	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	5
Sytrene	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	50
Acetone	**713**	ND<50.0	**101**	**622**	ND<500	50
Vinyl Acetate	ND<50.0	ND<25.0	ND<50.0	ND<250	ND<250	50*
2-Butanone	ND<50.0	ND<25.0	ND<50.0	ND<250	ND<250	N/A
4-Methyl-2-pentanone	ND<50.0	ND<25.0	ND<50.0	ND<250	ND<250	N/A
2-Hexanone (MEK)	ND<50.0	ND<25.0	ND<50.0	ND<250	ND<250	N/A
Carbon Disulfide	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	N/A
Methyl tert-Butyl Ether	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	10
Isopropylbenzene	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	5
n-Propylbenzene	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	5
1,3,5-Trimethylbenzene	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	5
tert-Butylbenzene	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	5
1,2,4-Trimethylbenzene	**25.6**	ND<10.0	ND<20.0	ND<100	ND<100	5
sec-Butylbenzene	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	5
p-Isopropyltoluene	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	5
n-Butylbenzene	ND<20.0	ND<10.0	ND<20.0	ND<100	ND<100	5
Naphthalene	ND<50.0	ND<25.0	ND<50.0	ND<250	ND<250	5

All sample results and guidance values in ug/L = ppb
ND = Not Detected, N/A = Not Applicable
Bold denotes constituents above NYSDEC Standard
* denotes Guidance Value

The five groundwater-monitoring wells were developed, purged and sampled on April 21, 2001.

Based on the observations at the time of the fieldwork and the analytical data, it was determined that significant groundwater impairment is present at the Site, however it appears that there are two separate sources of this impairment. The first source area appears to be the former drum storage area, while the second source area appears to be the former degreaser. The results of the groundwater monitoring study indicated levels of Trichloroethene and cis-1,2-Dichloroethene impairment under the building at the Site. In MW-6, there were also slightly elevated levels of m,p-xylene and 1,2,4-Trimethylbenzene. In MW-10, elevated levels of vinyl chloride were also detected.

The fact that MW-10 contained some of the highest levels of VOCs detected at the Site was considered a significant deviation of site trends, as MW-10 is located approximately 45 feet upgradient of the suspected source area at the former TCE vapor degreaser.

During discussions with Mr. Arthur and Richard Wischmeyer regarding this abnormal migration of TCE, it became apparent that a subsurface sump exists under the building structure in close proximity to MW-10. The presence of this sump creates a hydraulic gradient toward the sump disrupting the natural flow of groundwater to the southwest.

VIc. Industrial Wastewater and Groundwater Discharge Issues

Interior Sump Water Sample

Based on the results of the initial two stages of soil and groundwater investigation, the known groundwater impairment under the building, and the existence of a basement type sub-grade sump equipped with a sump pump at the facility, it was determined that a sample should be obtained from the sump as an additional data point, and to evaluate potential sanitary sewer discharge concentrations.

On May 21, 2001, a water sample was collected from the sump, which is located in the building under the floor of the production office area in what was formerly the boiler room. This sump prevents flooding of the office area.

The sample was collected in laboratory supplied sample jars and vials and placed in coolers with chemical ice packs and transported under Chain of Custody procedures to Paradigm Laboratories, Inc. of Rochester, New York for analysis. This sample was analyzed for VOCs by USEPA Method 8260.

The analytical results for those compounds detected above method detection limits from the sump water samples for Volatile Organic Compound analysis (VOC) are summarized in Table 10. The individual constituents are compared to the NYSDEC Part 703 Groundwater Standards.

TABLE 10
Volatile Organic Compound Laboratory Analysis for Sump Water Sample (USEPA Method 8260) (ug/L)

Parameter	Sump Water Sample	NYSDEC Part 703 Groundwater Standards
Bromodichloromethane	ND<10.0	50*
Bromomethane	ND<10.0	5
Bromoform	ND<10.0	50*
Carbon Tetrachloride	ND<10.0	5
Chloroethane	ND<10.0	50
Chloromethane	ND<10.0	N/A
2-Chlorotheyl Vinyl Ether	ND<10.0	N/A
Chloroform	ND<10.0	7
Dibromochloromethane	ND<10.0	50*
1,1-Dichloroethane	ND<10.0	5
1,2-Dichloroethane	ND<10.0	5
1,1-Dichloroethene	ND<10.0	N/A
Cis-1,2-Dichloroethene	**401**	5
trans-1,2-Dichloroethene	ND<10.0	5
1,2-Dichloropropane	ND<10.0	5
cis-1,3-Dichloropropene	ND<10.0	5
trans-1,3-Dichloropropene	ND<10.0	5
Methylene chloride	ND<25.0	5
1,1,2,2-Tetrachloroethane	ND<10.0	5
Tetrachloroethene	ND<10.0	5
1,1,1-Trichloroethane	ND<10.0	5
1,1,2-Trichloroethane	ND<10.0	5
Trichloroethene	**535**	5
Vinyl Chloride	ND<10.0	5
Benzene	ND<10.0	2
Chlorobenzene	ND<10.0	1
Ethylbenzene	ND<10.0	5
Toluene	ND<10.0	5
m,p-Xylene	ND<10.0	5
o-Xylene	ND<10.0	5
Sytrene	ND<10.0	5
Acetone	ND<50.0	5
Vinyl Acetate	ND<25.0	50*
2-Butanone	ND<25.0	N/A
4-Methyl-2-pentanone	ND<25.0	N/A
2-Hexanone (MEK)	ND<25.0	N/A
Carbon Disulfide	ND<25.0	N/A

All sample results and guidance values in ug/L = ppb
ND = Not Detected
N/A = Not Applicable
Bold denotes constituents above NYSDEC Standards
* denotes Guidance Value

The results of the sump water sampling indicated elevated levels of Trichloroethene and cis-1,2-Dichloroethene were present in the sump water collected in the sump.

The sump discharges to the sanitary sewer along with wastewater from the industrial processes at the Site.

Sanitary Discharge Sample

In order to evaluate concentrations of TCE being discharged to the sanitary sewer system, a combined wastewater sample was obtained from the main sanitary sewer line leaving the building during normal operations and while the sump was running.

This sample was analyzed for VOCs. The analytical results of the sample are presented below:

TABLE 11
Volatile Organic Compound Laboratory Analysis for Sanitary Sewer Water Discharge Sample (USEPA Method 8260) (ug/L)

Parameter	Sanitary Sewer Discharge Water Sample	NYSDEC Part 703 Groundwater Standards
Bromodichloromethane	ND<2.0	50*
Bromomethane	ND<2.0	5
Bromoform	ND<2.0	50*
Carbon Tetrachloride	ND<2.0	5
Chloroethane	ND<2.0	50
Chloromethane	ND<2.0	N/A
2-Chlorotheyl Vinyl Ether	ND<2.0	N/A
Chloroform	ND<2.0	7
Dibromochloromethane	ND<2.0	50*
1,1-Dichloroethane	ND<2.0	5
1,2-Dichloroethane	ND<2.0	5
1,1-Dichloroethene	ND<2.0	N/A
Cis-1,2-Dichloroethene	ND<2.0	5
trans-1,2-Dichloroethene	ND<2.0	5
1,2-Dichloropropane	ND<2.0	5
cis-1,3-Dichloropropene	ND<2.0	5
trans-1,3-Dichloropropene	ND<2.0	5
Methylene chloride	ND<5.0	5
1,1,2,2-Tetrachloroethane	ND<2.0	5
Tetrachloroethene	ND<2.0	5
1,1,1-Trichloroethane	ND<2.0	5
1,1,2-Trichloroethane	ND<2.0	5
Trichloroethene	**84.2**	5
Vinyl Chloride	ND<2.0	5
Benzene	ND<2.0	2
Chlorobenzene	ND<2.0	1

TABLE 11 (continued)
Volatile Organic Compound Laboratory Analysis for Sanitary Sewer Water Discharge Sample
(USEPA Method 8260) (ug/L)

Parameter	Sanitary Sewer Discharge Water Sample	NYSDEC Part 703 Groundwater Standards
Ethylbenzene	ND<2.0	5
Toluene	ND<2.0	5
m,p-Xylene	ND<2.0	5
o-Xylene	ND<2.0	5
Sytrene	ND<2.0	5
Acetone	ND<10.0	50
Vinyl Acetate	ND<5.0	50*
2-Butanone	ND<5.0	N/A
4-Methyl-2-pentanone	ND<5.0	N/A
2-Hexanone (MEK)	ND<5.0	N/A
Carbon Disulfide	ND<5.0	N/A

All sample results and guidance values in ug/L = ppb
ND = Not Detected
N/A = Not Applicable
Bold denotes constituents above NYSDEC Groundwater Standards
* denotes Guidance Value

The level of TCE in the sewer discharge sample is 84.2 ppb, which is 0.0842 ppm. The allowable level of total VOCs permitted for sewer discharge is 2.1 ppm, as stated in the Monroe County Pure Waters (MCPW) Sewer Use Law.

Barthelmes manufacturing with the assistance of the project team is in the process of obtaining a MCPW industrial wastewater discharge permit for the discharge of this water.

VId. Additional Definition of Former Drum Storage Area

Introduction

Based on the previous fieldwork, and conversations with Mr. Arthur and Richard Wischmeyer, it was suspected that one of the source areas for the impairment was located in or near the former drum storage area. As such, further investigation was needed in this vicinity to characterize a suspected source of the impairment. On June 4, 2001 fifteen additional soil borings well were installed in a grid pattern in the former drum storage area surrounding the area of known impairment.

Field Activities

Fifteen borings were advanced using a geoprobe in the former drum storage area. All of the borings were advanced to total depths ranging from 14 feet to 20 feet below ground surface. The average depth to groundwater for these borings was approximately eight feet below ground surface.

All soil cores were continuously assessed by a LaBella Associates Environmental Analyst for soil type and evidence of impairment.

Soils at the Site consisted primarily of medium to fine sands with some rock fragments, and fill.

The boring locations at the Site are illustrated in Figure 1. Copies of the boring logs are included in Appendix 1.

Analytical Results

TABLE 12
Photoionization Detector Readings for Drum Storage Area Borings (ppm)

Soil Boring	Depth 0'-2'	Depth 2'-4'	Depth 4'-6'	Depth 6'-8'	Depth 8'-10'	Depth 10'-12'	Depth 12'-14'	Depth 14'-16'
B-12	9.9	13.1	16.1	13.1	4.7	4.3	17.1	0.8
B-13	54.3	16.7	32.7	154*	24.1	8.3	3.4	3.4
B-14	0	0	0	0	0	0	0	0
B-15	51	82	134*	80	39	24	63	23
B-16	68	28	34	1056*	202	224	184	--
B-17	246*	10	2.6	3.1	0.2	0	0	0
B-18	2.1	3	80	14	13	10	17	102
B-19	22	2	0	0	0	0	0	7.1
B-20	3.9	22	34	15	33	7	9.3	3.4
B-21	2.1	1.7	8.3	--	6.7	5.4	1.5	3.3
B-22	84	11	4.6	--	3.9	0.4	3.3	0.3
B-23	473*	74	15	13.7	52	21	0	0
B-24	27	29	13	22	3.4	2.1	0	0
B-25	7	3	132*	--	16	7	0.3	0
B-26	0	0	0	0	0	0	0	0

--- denotes no field screen PID reading collected
* denotes sample retained and analyzed for Volatile Organic Compounds Method 8260

A total of six soil samples were retained from these borings and were sent under Chain of Custody procedures to Paradigm Laboratories, Inc. of Rochester, New York for VOC analysis by USEPA Method 8260.

The analytical results for those compounds detected above method detection limits from the soil samples for Volatile Organic Compound analysis (VOC), are summarized in Table 13. The individual constituents are compared to the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 Soil Cleanup Objectives to Protect Groundwater Quality.

TABLE 13
Volatile Organic Compound Laboratory Analysis for Soil Samples
(Former Storage Area)
(USEPA Method 8260) (ug/kg)

Parameter	SB-13 6'-8'	SB-15 4'-6'	SB-16 6'-8'	SB-17 0'-2'	SB-23 0'-2'	SB-25 4'-6'	NYSDEC TAGM 4046 Soil Cleanup Objective to Protect Groundwater Quality
Bromodichloromethane	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	N/A
Bromomethane	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	N/A
Bromoform	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	N/A
Carbon Tetrachloride	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	600
Chloroethane	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	1,900
Chloromethane	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	
2-Chlorotheyl Vinyl Ether	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	N/A
Chloroform	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	300
Dibromochloromethane	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	N/A
1,1-Dichloroethane	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	200
1,2-Dichloroethane	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	100
1,1-Dichloroethene	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	400
Cis-1,2-Dichloroethene	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	N/A
trans-1,2-Dichloroethene	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	N/A
1,2-Dichloropropane	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	N/A
cis-1,3-Dichloropropene	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	300
trans-1,3-Dichloropropene	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	N/A
Methylene chloride	ND<24.1	ND<22.8	ND<19.6	ND<44.8	ND<216	ND<28.9	100
1,1,2,2-Tetrachloroethane	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	600
Tetrachloroethene	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	1,400
1,1,1-Trichloroethane	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	760
1,1,2-Trichloroethane	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	N/A
Trichloroethene	45.1	397	49.1	ND<17.9	**2,450**	**889**	700
Vinyl Chloride	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	120
Benzene	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	60
Chlorobenzene	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	1,700
Ethylbenzene	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	5,500
Toluene	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	1,500
m,p-Xylene	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	1,200
o-Xylene	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	1,200
Sytrene	ND<9.65	ND<9.12	ND<7.84	ND<17.9	ND<86.2	ND<11.6	N/A
Acetone	ND<48.3	ND<45.6	ND<39.2	ND<89.6	ND<431	ND<57.9	110

TABLE 13 (continued)
Volatile Organic Compound Laboratory Analysis for Soil Samples
(Former Storage Area)
(USEPA Method 8260) (ug/kg)

Parameter	SB-13 13 6'-8'	SB-15 15 4'-6'	SB-16 16 6'-8'	SB-17 17 0'-2'	SB-23 23 0'-2'	SB-25 25 4'-6'	NYSDEC TAGM 4046 Soil Cleanup Objective to Protect Groundwater Quality
Vinyl Acetate	ND<24.1	ND<22.8	ND<19.6	ND<44.8	ND<216	ND<28.9	N/A
2-Butanone	ND<24.1	ND<22.8	ND<19.6	ND<44.8	ND<216	ND<28.9	300
4-Methyl-2-pentanone	ND<24.1	ND<22.8	ND<19.6	ND<44.8	ND<216	ND<28.9	1,000
2-Hexanone (MEK)	ND<24.1	ND<22.8	ND<19.6	ND<44.8	ND<216	ND<28.9	N/A
Carbon Disulfide	ND<24.1	ND<22.8	ND<19.6	ND<44.8	ND<216	ND<28.9	2700

All sample results and guidance values in ug/kg = ppb
ND = Not Detected
N/A = Not Applicable
Bold denotes constituents above NYSDEC Guidance Values

The results of the soil boring and sampling study indicated that impaired surface soils are present in the former drum storage area and seem to be localized around B-7/MW-5, SB-23, and SB-25. This area of impairment is depicted on Figure 2.

Based on the observations at the time of the fieldwork and the analytical data, it was determined that limited overburden soil impairment is present at the Site in the vicinity of B=7/MW-5, SB-23 and SB-25.

VIe. Indoor Air Quality Assessment

In order to determine if VOCs present in the shallow soil and groundwater under the concrete slab floor of the building could be negatively affecting the indoor air quality, one passive organic vapor-monitoring badge (OVM) was deployed at the Site on May 21, 2001 for a 458-minute (approximately 7.5 hour) period. This OVM was placed in the plant near the former degreaser area to measure any impacts to indoor air from the area where the greatest groundwater exceedances were present beneath the floor of the plant.

The OVM badge was collected and was submitted under Chain of Custody procedures for TCE, DCE and Vinyl Chloride analysis.

The results of analyses indicated that TCE, DCE, and Vinyl Chloride were not detected in the indoor air. Detection limits or the OVM were approximately 0.030 mg.

Analytical results or the indoor air quality sample are attached as Appendix 5.

VIf. Shallow Bedrock Groundwater Monitoring Wells

Introduction

On August 28 to August 31, 2001, three shallow bedrock borings and monitoring wells were installed at the Site to add further definition to the impairment. They were installed at the following locations:

- North of the building in the north parking lot at the Site (RW#1)
- Adjacent to MW-2 (south edge of property) (RW#2)
- Adjacent to SB-26 (South edge of former drum storage area) (RW#3)

These bedrock well locations are depicted on the attached Figures.

Scope of Work

The work plan that was developed was designed to provide general coverage of the bedrock at the Site in bordering the areas of known impairment, to determine the extent of the impairment. The Scope of Work is based on LaBella's discussions with Harter, Secrest, & Emery, Mr. Richard and Arthur Wischmeyer, Haley & Aldrich, information gathered in the Initial Subsurface Investigation, and on information regarding current and historical Site processes.

Samples were collected in laboratory supplied sample jars and vials. All samples were placed in coolers with chemical ice packs and transported under chain of custody procedures to Paradigm Laboratories, Inc. of Rochester, New York for analysis.

Field Activities

Three borings were advanced at the Site in the locations outlined above and shown on the figures. All of the borings were advanced to total depths ranging from thirty feet to thirty-seven feet below ground surface. Groundwater monitoring wells were installed at each of the three borings. The average depth to groundwater for these borings ranged from approximately 10.5 feet to 22.6 feet below ground surface (September, 2001).

All cores were continuously assessed by a LaBella Associates Environmental Analyst for soil and rock type and evidence of impairment.

Soils at the Site consisted primarily of medium to fine sands to a depth of approximately fourteen feet. From approximately fourteen feet to approximately eighteen feet soils consisted primarily of medium to fine sands with medium gravel. From a depth of approximately eighteen feet to a depth of approximately twenty-five feet, the soils consisted primarily of sand with fractured dolomite. The top of rock (dolomite) was encountered and depths ranging from twenty-three feet to thirty feet.

The shallow bedrock monitoring wells were installed by a specialized rotary drilling contractor. The contractor utilized a Brainerd-Killman 81 truck mounted drill rig to advance 6 ¼" interior diameter hollow stem augers. Continuous overburden sampling was completed using split spoon samples in accordance with ASTM 1586. The drilling equipment was decontaminated prior to use and between borings used an alconox and water wash, followed by a water rinse. All drilling decontamination water and drilling process water and fluids were recovered and drummed pending analysis and proper disposal.

To complete the well, a ten foot length of 0.01" slotted PVC was installed, and connected to an appropriate length of PVC riser casing. The bottom of the screen was equipped with a cap. The annular space was gravel-packed with Morie #0 quartz sand to a depth of two feet above the top of the screen, and a two-foot seal of bentonite pellets was installed above the gravel pack. The temporary casing was then gradually withdrawn. The remaining annular space was tremmie-grouted to within one foot of the ground surface, using a cement and bentonite grout mixture. The monitoring wells were then sealed with a flush-mounted casing with a lockable inner cap.

These monitoring wells were also surveyed and elevated to determine groundwater flow parameters.

The boring locations at the Site are illustrated in Figure 1. Copies of the boring logs are included in Appendix 1.

Shallow Bedrock Wells Analytical Results - Groundwater

Groundwater samples were sent under Chain of Custody Procedures to Paradigm Laboratories, Inc. of Rochester, New York. The analytical results for those compounds detected above method detection limits from the groundwater samples for Volatile Organic Compound analysis (VOC) are summarized in Table 14. The individual constituents are compared to the NYSDEC Part 703 Groundwater Standards.

TABLE 14
Volatile Organic Compound Laboratory Analysis for Groundwater Samples
(USEPA Method 8260) (ug/L)

Parameter	RW-1	RW-2	RW-3	NYSDEC Part 703 Groundwater Standards
Bromodichloromethane	ND<2.00	ND<2.00	ND<2.00	50*
Bromomethane	ND<2.00	ND<2.00	ND<2.00	5
Bromoform	ND<2.00	ND<2.00	ND<2.00	50*
Carbon Tetrachloride	ND<2.00	ND<2.00	ND<2.00	5
Chloroethane	ND<2.00	ND<2.00	ND<2.00	50
Chloromethane	ND<2.00	ND<2.00	ND<2.00	N/A
2-Chlorotheyl Vinyl Ether	ND<2.00	ND<2.00	ND<2.00	N/A
Chloroform	ND<2.00	ND<2.00	ND<2.00	7
Dibromochloromethane	ND<2.00	ND<2.00	ND<2.00	50*
1,1-Dichloroethane	ND<2.00	ND<2.00	ND<2.00	5
1,2-Dichloroethane	ND<2.00	ND<2.00	ND<2.00	5
1,1-Dichloroethene	ND<2.00	ND<2.00	ND<2.00	N/A
Cis-1,2-Dichloroethene	4.75	**7.21**	**18.5**	5
trans-1,2-Dichloroethene	ND<2.00	ND<2.00	ND<2.00	5
1,2-Dichloropropane	ND<2.00	ND<2.00	ND<2.00	5
cis-1,3-Dichloropropene	ND<2.00	ND<2.00	ND<2.00	5
trans-1,3-Dichloropropene	ND<2.00	ND<2.00	ND<2.00	5
Methylene chloride	ND<5.00	ND<5.00	ND<5.00	5
1,1,2,2-Tetrachloroethane	ND<2.00	ND<2.00	ND<2.00	5
Tetrachloroethene	ND<2.00	ND<2.00	ND<2.00	5
1,1,1-Trichloroethane	ND<2.00	2.74	2.5	5
1,1,2-Trichloroethane	ND<2.00	ND<2.00	ND<2.00	5

TABLE 14 (Continued)
Volatile Organic Compound Laboratory Analysis for Groundwater Samples
(USEPA Method 8260) (ug/L)

Trichloroethene	**19.6**	**31.2**	**30.6**	5
Vinyl Chloride	ND<2.00	ND<2.00	ND<2.00	5
Benzene	ND<2.00	ND<2.00	ND<2.00	2
Chlorobenzene	ND<2.00	ND<2.00	ND<2.00	1
Ethylbenzene	ND<2.00	ND<2.00	ND<2.00	5
Toluene	ND<2.00	ND<2.00	ND<2.00	5
m,p-Xylene	ND<2.00	ND<2.00	ND<2.00	5
o-Xylene	ND<2.00	ND<2.00	ND<2.00	5
Sytrene	ND<2.00	ND<2.00	ND<2.00	50
Acetone	ND<10.00	ND<10.00	ND<10.00	50
Vinyl Acetate	ND<5.00	ND<5.00	ND<5.00	50*
2-Butanone	ND<5.00	ND<5.00	ND<5.00	N/A
4-Methyl-2-pentanone	ND<5.00	ND<5.00	ND<5.00	N/A
2-Hexanone (MEK)	ND<5.00	ND<5.00	ND<5.00	N/A
Carbon Disulfide	ND<5.00	ND<5.00	ND<5.00	N/A

All sample results and guidance values in ug/L = ppb
ND = Not Detected
N/A = Not Applicable
Bold denotes constituents above NYSDEC Standard
* denotes Guidance Value

The three groundwater-monitoring wells were developed, purged and sampled on September 11, 2001. A copy of the analytical data is included in Appendix 5.

Based on this analytical data, it was determined that low levels of cis-1,2-dichloroethene are present in all three monitoring wells. Low levels of 1,1,1-trichloroethane are present in RW-2 and RW-3. The levels of cis-1,2-dichloroethene and 1,1,1,-trichloroethane are below NYSDEC Part 703 Groundwater Standards. There are also levels of TCE in all three monitoring wells, which exceed NYSDEC Part 703 Groundwater Standards.

The levels chemical contaminants present in the upgradient well (RW-1), are likely indicative of background concentrations in the vicinity of the Site.

Production Well Sampling

There are two production wells that are no longer in use but were installed at the Site. These two wells were installed to provide cooling water for industrial processes at the Site. They are both located on the west side of the building at the Site. The shallow (south) production well depth is approximately 30.5' below ground surface. The deeper (north) production well depth is approximately 94' below ground surface. On September 26, 2001, these wells were sampled. These wells were not developed and sampled, but a water sample was obtained from the approximate center depth of the water column of each well. These were sampled to obtain additional data points and to aid in determining the depth of the impairment.

The approximate locations of these two wells are depicted on Figure 1.

The results are as follows:

TABLE 15
Volatile Organic Compound Laboratory Analysis for Groundwater Samples
(USEPA Method 8260) (ug/L)

Parameter	Shallow Production Well	Deep Productio n Well	NYSDEC Part 703 Groundwate r Standards
Bromodichloromethane	ND<20.0	12.0	50*
Bromomethane	ND<20.0	ND<2.00	5
Bromoform	ND<20.0	ND<2.00	50*
Carbon Tetrachloride	ND<20.0	ND<2.00	5
Chloroethane	ND<20.0	ND<2.00	50
Chloromethane	ND<20.0	ND<2.00	N/A
2-Chlorotheyl Vinyl Ether	ND<20.0	ND<2.00	N/A
Chloroform	ND<20.0	**18.5**	7
Dibromochloromethane	ND<20.0	ND<2.00	50*
1,1- Dichloroethane	ND<20.0	ND<2.00	5
1,2-Dichloroethene	ND<20.0	ND<2.00	N/A
Cis-1,2-Dichlorethene	**325**	ND<2.00	5
Trans-1,2-Dichlorethene	ND<20.0	ND<2.00	5
1,2-Dichloropropane	ND<20.0	ND<2.00	5
Cis-1,3-Dichloropropene	ND<20.0	ND<2.00	5
Trans-1,3-Dichloropropene	ND<20.0	ND<2.00	5
Methylene Chloride	ND<50.0	ND<5.00	5
1,1,2,2-Tetrachloroethane	ND<20.0	ND<2.00	5
Tetrachlorethene	ND<20.0	ND<2.00	5
1,1,1-Trichloroethane	ND<20.0	ND<2.00	5
1,1,2-Trichlorethane	ND<20.0	ND<2.00	5
Trichloroethene	**2,110**	3.55	5
Vinyl Chloride	ND<20.0	ND<2.00	5
Benzene	ND<20.0	ND<2.00	2
Chlorobenzene	ND<20.0	ND<2.00	1
Ethylbenzene	ND<20.0	ND<2.00	5
Toluene	ND<20.0	ND<2.00	5
M,p-Xylene	ND<20.0	ND<2.00	5
o-Xylene	ND<20.0	ND<2.00	5
Sytrene	ND<20.0	ND<2.00	50
Acetone	ND<100.0	ND<10.00	50
Vinyl Acetate	ND<50.0	ND<5.00	50
2-Butanone	ND<50.0	ND<5.00	N/A
4-Methyl-2-pentanone	ND<50.0	ND<5.00	N/A
2-Hexanone (MEK)	ND<50.0	ND<5.00	N/A
Carbon Disulfide	ND<50.0	ND<5.00	N/A

All sample results and guidance values in ug/L = ppb
ND = Not Detected
N/A = Not Applicable
Bold denotes constituents above NYSDEC Standard
* denotes Guidance Value

Based on these results it is clear that Trichloroethene was present in both production wells, however it was present above NYSDEC Part 703 Groundwater Standards only in the shallow production well. In the shallow production well cis-1,2,-dichlorethene was also present above guidance values.

A copy of the analytical data is included in Appendix 6.

VII. Discussion of Findings

Site characterization activities have been conducted at the Site. Analytical data indicate that shallow groundwater has been most severely impacted with Trichloroethene (TCE). These levels of TCE exceed New York State Department of Environmental Conservation groundwater standards. In addition, limited areas of impaired soil and shallow bedrock groundwater exist at the Site that contains levels of TCE above NYSDEC Part 703 Groundwater Standards.

The area of identified soil impairment is located in the former drum storage area. The area of identified groundwater impairment is generally located underneath the south portion of the building at the Site and under the former drum storage area, under and near an area that historically has been used for degreasing. The area of groundwater impairment may migrate off the Site to the south.

The sediment sample analyzed from the storm water pond did not contain elevated levels of TCE. This sample did contain elevated levels of Chromium (151 mg/kg). However, the levels of chromium were below the levels that would cause the sediment sample to fail Toxicity Characteristics.

Groundwater that is pumped from the basement sump contains elevated levels of TCE (535 ug/l). This wastewater is discharged to the municipal sewer, along with sanitary and industrial wastewater from the plant. Analysis of this combined flow to the sewer indicates that the concentration of TCE (84.2 ug/l) on June 5, 2001 from the facility was well below the Monroe County Pure Waters (MCPW) allowable total Volatile Organic Compound level of 2.1 parts per million. Barthelmes Manufacturing with assistance from the project team is in the process of obtaining a MCPW industrial wastewater permit for the discharge of this water.

The analytical data discussed above support the observations made at the time of the fieldwork. The analytical data indicate that there have been releases of TCE to the soil and groundwater at the Site from the historical activities at the Site. It appears that this impairment is much more widespread in the groundwater than in the soil. The surface soil impairment appears to be limited to an areal extent, and is estimated at approximately 300 tons in the former drum storage area (actual amounts could vary from these estimates).

Based on observations made during the direct push "geoprobe" soil boring and sampling program, the shallow bedrock boring and sampling program, and the comparison of the analytical data to the NYSDEC Part 703 Groundwater Standards, there appears to be a remedial concern with regard to the TCE impaired groundwater at the Barthelmes Manufacturing property.

The use of groundwater as a supply of potable water in the vicinity of the Site is precluded by City of Rochester laws. City of Rochester, Code of the City of Rochester, Health and Sanitation-Article III, Section 59-27, Water Supply.

VIII. Conclusions and Recommendations

The following measures are recommended for the Site:

1) Submit reports to the NYSDEC and meet with the NYSDEC to enroll the Site in the NYSDEC voluntary cleanup program; this will involve coming to a mutual agreement with the NYSDEC regarding any additional requested or required investigation by the NYSDEC.
2) Develop reasonable Site specific clean up objectives based on risk-based criteria.
3) Develop conceptual remedial plans to achieve Site specific cleanup objectives.
4) Develop a final remedial strategy for the Site that incorporates the NYSDEC's input.
5) Implement remedial programs at the Site.

Please feel free to contact us at (716) 454-6110 with any questions or comments regarding the contents of this report.

R1J22GS1

LABELLA
LaBella Associates, P.C.
300 State Street
Rochester, New York 14614

Figures

Junkyard

Junkyard

B-8

RW-1
Top of Rock Elevation = 75.24'

Parking Lot

Metal-Sided Addition

B-4 (MW-3)

Deep Production Well

B-9

B-11

Railroad Right of Way

Drainage Pipe Clean Out

Pond

SED-1

B-3

B-10

IB-6 (MW-10)

IB-3 (MW-7)

IB-1 (MW-1)

IB-2 (MW-6)

IB-5 (MW-9)

IB-4 (MW-8)

Shallow Production Well

Loading Dock

Former Drum Storage Area

Driveway

RW-3
Top of Rock Elevation = 75.92'

RW-2
Top of Rock Elevation = 74.43'

B-2 (MW-2)

B-6

B-1

Former Oil Storage Facility

Cairn Street

NORTH

PROJECT TITLE:

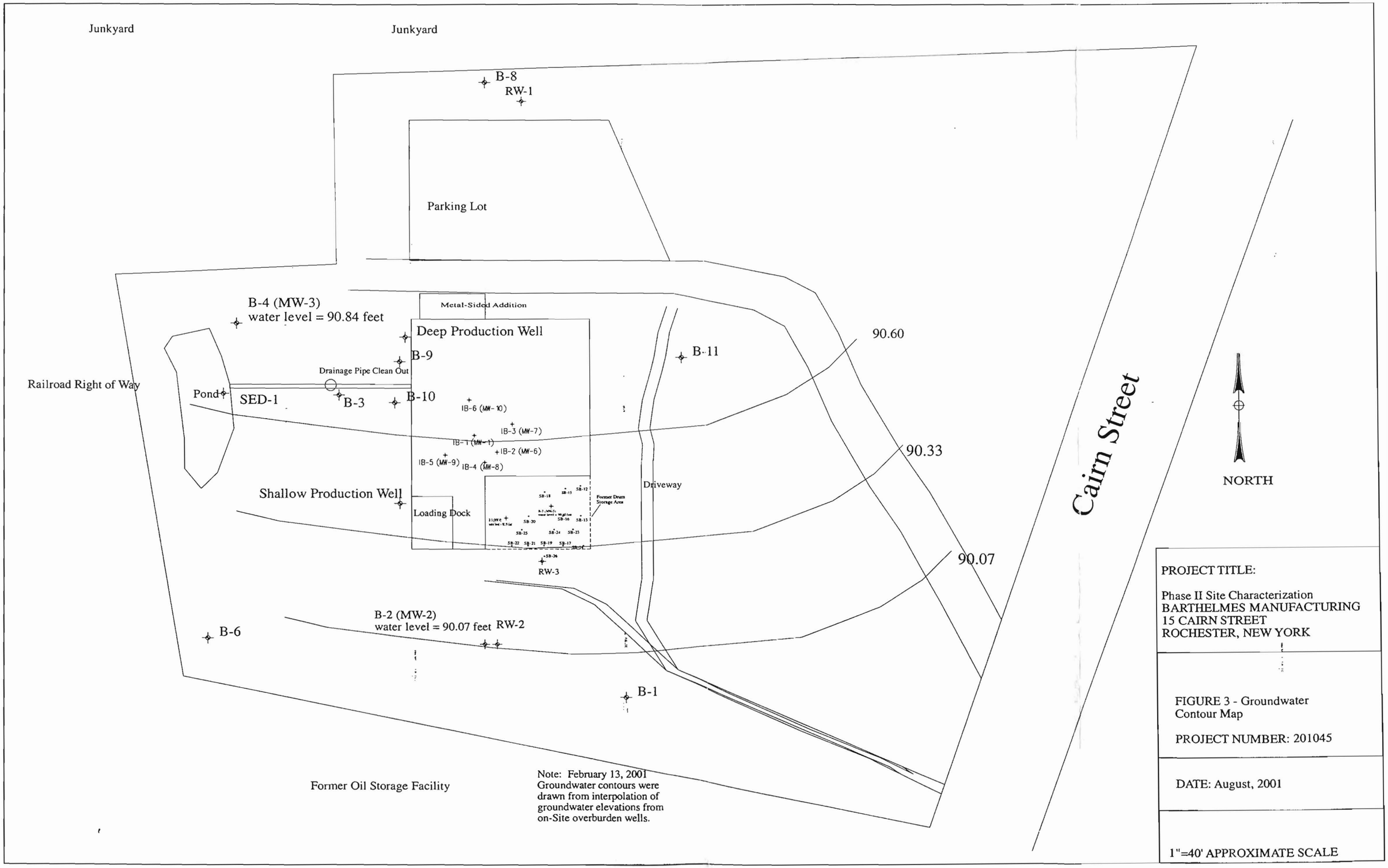
Phase II Site Characterization
BARTHELMES MANUFACTURING
15 CAIRN STREET
ROCHESTER, NEW YORK

FIGURE 1 - Soil Boring and Monitoring Well Locations

PROJECT NUMBER: 201045

DATE: FEBRUARY, 2001

1"=40' APPROXIMATE SCALE



Note: February 13, 2001 Groundwater contours were drawn from interpolation of groundwater elevations from on-Site overburden wells.

PROJECT TITLE:

Phase II Site Characterization
BARTHELMES MANUFACTURING
15 CAIRN STREET
ROCHESTER, NEW YORK

FIGURE 3 - Groundwater Contour Map

PROJECT NUMBER: 201045

DATE: August, 2001

1"=40' APPROXIMATE SCALE

Junkyard

Junkyard

B-8

RW-1
TCE = 19.6 ppb

Parking Lot

Metal-Sided Addition

B-4 (MW-3)

Deep Production Well
TCE = 3.55 ppb

B-9

B-11

Drainage Pipe Clean Out

Railroad Right of Way

Pond

SED-1

B-3

B-10

IB-6 (MW-10)
TCE = 223 ppb

IB-3 (MW-7)
TCE = 801 ppb

IB-1 (MW-1)
TCE = 8,140 ppb

IB-2 (MW-6)
TCE = 2,390 ppb

IB-5 (MW-9)
TCE = 4,400 ppb

B-4 (MW-8); TCE = 1,990 ppb

Shallow Production Well
TCE = 2,110 ppb

Former Drum Storage Area

Driveway

Loading Dock

B-7 (MW-5)
TCE = 15,600 ppb

RW-3
TCE = 30.6 ppb

RW-2
TCE = 31.2 ppb

B-6

B-2 (MW-2)
TCE = 257 ppb

B-1

Cairn Street

NORTH

Low Exeedance Wells
(above NYSDEC Groundwater
Standards, below 200 ppb of TCE)

Higher Exeedance Wells
(above NYSDEC Groundwater
Standards, above 200 ppb of TCE)

Former Oil Storage Facility

PROJECT TITLE:

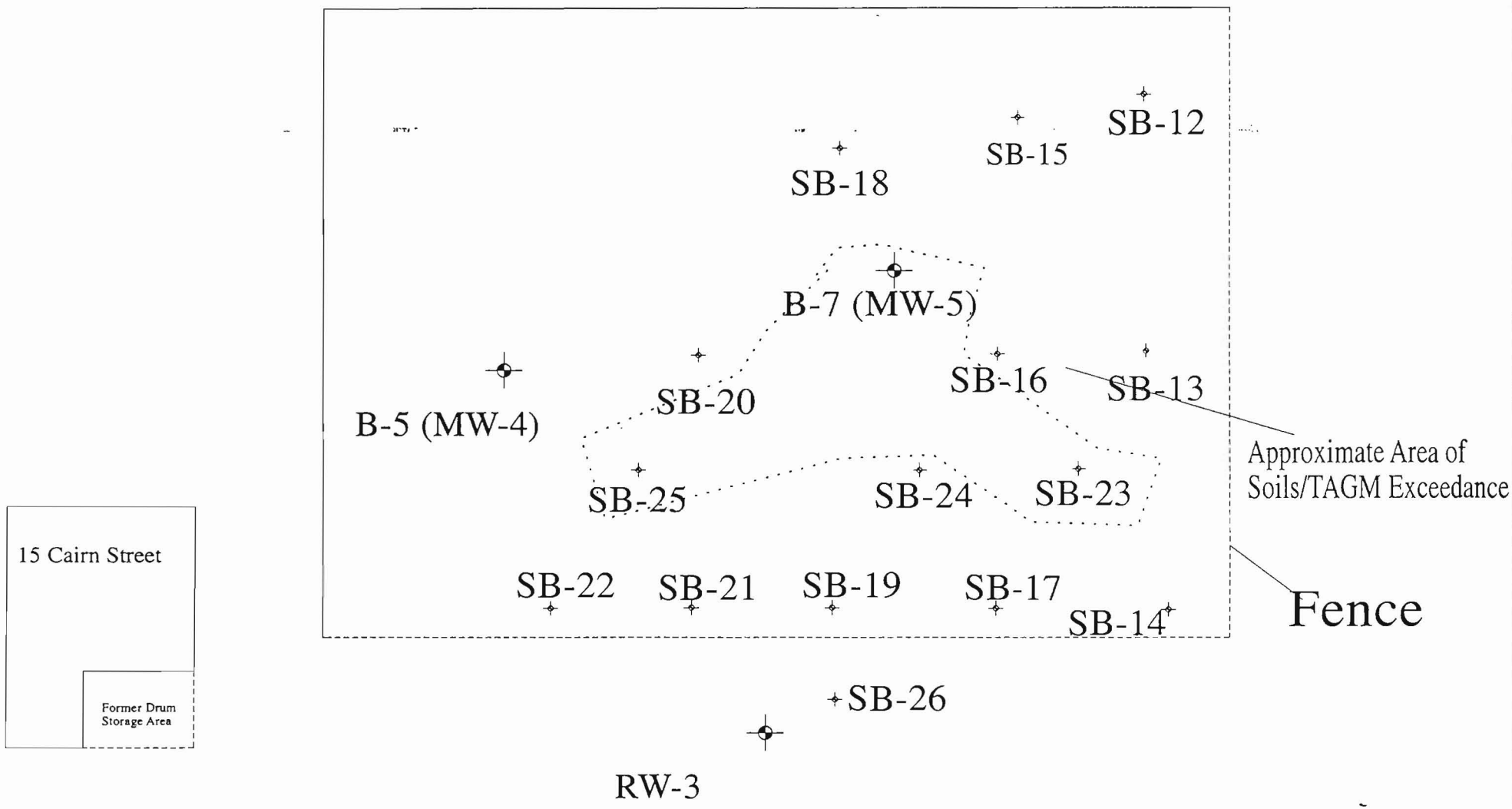
Phase II Site Characterization
BARTHELMES MANUFACTURING
15 CAIRN STREET
ROCHESTER, NEW YORK

FIGURE 4 - Groundwater Exceedances

PROJECT NUMBER: 201045

DATE: August, 2001

1"=40' APPROXIMATE SCALE



NORTH

FIGURE 2 - Former Drum Storage Area
Soil Boring Locations
BARTHELMES MANUFACTURING
15 CAIRN STREET

DATE: June, 2001

PROJECT NO. 201045

DRAWN BY: TMS

Scale Approximately 1"=20'