Environmental Management Plan

10 Felix Street
Rochester, NY
NYSDEC Spill #9804126

Prepared By:
City of Rochester Department of Environmental Services
Division of Environmental Quality

May, 2012

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1. Introduction

This site-specific Environmental Management Plan (EMP) was developed for the property located at 10 Felix Street, City of Rochester, County of Monroe, New York (Site). This site is owned by the City of Rochester. The location of the Site is depicted on the project locus map included as Figure 1.

Previous investigations identified and documented the existence of soil and groundwater contamination (mostly gasoline related constituents with limited amounts of chlorinated volatile organic compounds (VOCs) due to historical operations at the Site (i.e., fueling operations, vehicle maintenance/repair, etc.).

Extensive Interim Remedial Measures (IRMs) and other contaminated soil removal and groundwater treatment remedial actions, completed in 2009, successfully addressed most of the petroleum and chlorinated VOCs at the Site, however some residual contamination still exists. Additionally, engineering controls (i.e., vapor barrier, and sub-slab vapor mitigation systems) were installed during construction of new buildings on the site. This EMP should be implemented when work performed at the Site has the potential to disturb soil/fill and/or groundwater on the Site.

The purpose of this EMP is to:

1. Manage soil/fill impacted with elevated concentrations of metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and other constituents of environmental concern (if encountered);

2. Manage groundwater impacted with elevated concentrations of VOCs and other constituents of environmental concern (if encountered):

3. Establish goals, procedures, and appropriate response actions to be used by on-site personnel should impacted material be encountered and disturbed; and,

4. Implement engineering controls to reduce potential environmental impacts, if warranted, depending upon the redevelopment plans.

5. Satisfy the NYSDEC requirements for closure of Spill File #9804126.

2. Site Description

The 7.4 acre City of Rochester Water Bureau Complex located at 10 Felix Street has been used to house the former City Department of Public Works (DPW) and the Bureau of Water, Street Lighting, and Parking Meters for over one hundred years. The primary long-term operations that have led to the identified sub-surface environmental issues at the site include: vehicle fueling operations, automotive repair and maintenance, and painting of both vehicles and utility parts.

The former Water Bureau Complex consisted of six buildings. These six buildings were demolished in the spring/summer of 2005. The former building structures at the site are depicted on Figures 2A and 4A. Site history, supported by previous investigations and the Remedial Investigation (RI), indicated that releases of petroleum products, chlorinated solvents and limited areas of elevated metals occurred at several locations across the site.

The City of Rochester re-developed the Water Bureau Complex and performed extensive remediation in

2005/2006. The redevelopment of the site included the following new building structures:

New Structures – Post 2006

Building No.	Building Size, Function and Uses	Finished Floor Elevation**	Average Elevation of Water Table **	Average Distance Between Floor Elevation and Water Table
Buildings No. 1, 2, and 3	19,500 sq.ft. Primary Office Space, Conference Rooms, Locker Rooms	510.5'	503.5'	6.9'
Building No. 4	18,750 sq.ft. Truck Loading Dock, Workshops, Storage, Boiler Room, Three Offices	510.5' at south end decreasing to 508' on north end	501.2'	6.7'
Building No. 5	24,343 sq.ft. Vehicle Parking	508'	501.2'	6.7'
Building No. 6	6,500 sq. ft. Outdoor Storage	505.75	501.2	4.5'

**All elevations are with respect to the North American Datum of 1983 (NAD 1983).

The new buildings are depicted on Figures 2B and 4A. A summary of the previous investigations and remedial activities is provided below:

Remediation of Northern 1.7 Acres (1998-2004)

The City initiated a series of subsurface investigations and a remedial investigation (RI) of the northern 1.7 acre portion of the site in 1998. This portion of the site was used by the City for several decades until the early 1980s as a gasoline station and refueling depot that formerly contained underground and aboveground storage tanks, and for repair and staging of City equipment and vehicles. According to records, the former refueling depot also contained a groundwater depression system which discharged to the former canal bed on the western portion of the site. The RI consisted of advancement of test borings, installation of monitoring wells, excavation of test pits, and soil and groundwater analysis. The RI also included an evaluation of the Monroe County Pure Waters trunk sewer for evidence of potential petroleum seeps into the trunk sewer. The trunk sewer is located on the northern property line in the general location of Deep Hollow Creek, a former tributary of the Genesee River. The RI identified limited free petroleum product or light non-phase aqueous liquids (LNAPL) in the vicinity of the former refueling depot, and a plume of petroleum contaminated soil and groundwater, with a primary source area in the vicinity of the former refueling depot, and a smaller secondary source area located in the vicinity of the groundwater depression system and the associated discharge area for the system. A Correction Action Plan (CAP) was developed by Sear Brown and subsequently approved by the NYSDEC to remediate this portion of the Site. The objective of the CAP

activities was to remediate the Site to the extent required to inactivate NYSDEC Spill File No. 9870407, and to mitigate observed petroleum contaminant impacts to acceptable levels for the future use of the site as a parking lot and open-air covered material storage area for the City's Water Bureau and Street Lighting Department. The CAP was implemented in 2002 and 2004, and included the completion of the following remedial measures:

- Installation and operation of a free product (LNALP) recovery system which was successful in removing approximately 1,185 gallons of petroleum product and groundwater. Post recovery sampling confirmed that no measurable product was present in this portion of the site.
- Excavation, segregation and staging or direct loading of grossly petroleum-impacted soils and fill materials (i.e., source removal) which resulted in the excavation of 6,311 tons of petroleum-contaminated soil and fill material in the vicinity of the former refueling depot, and in the vicinity of the former groundwater depression system. All petroleum-contaminated soil and fill materials were disposed off-site at a permitted landfill.
- The collection and analysis of confirmatory soil samples to evaluate the effectiveness of the source removal program
- Removal of concrete foundations associated with former buildings to the extent necessary to allow excavation of impacted soils;
- Removal of the former groundwater depression system components including piping and underground structures.

The results of the confirmatory soil sampling program indicate that the source removal program was successful in removing the source of petroleum contamination at the Site. Post-source removal groundwater monitoring documented that the concentrations of dissolved phase VOCs in groundwater declined or remained stable, indicating that the source removal program has assisted in the attenuation and/or stabilization of the groundwater plume. Based on the results of the implementation of this remedial measure, the NYSDEC spill file for northern portion of the site was inactivated by the NYSDEC.

Remediation of Central and Southern 5.7 Acres (2004-2012)

The City initiated a series of subsurface investigations and a remedial investigation (RI) of the central and southern 5.7 acre portion of the site in 2004. This portion of the site was used by the City's Department of Public Works for more than 80 years, and contained several buildings which have been used for vehicle fleet and large equipment (e.g., loaders, excavators, etc.) repair, vehicle painting and collision work, vehicle power washing, street painting, refueling of vehicles, battery storage, vehicle fluid storage and rack systems to transfer new fluids to vehicles. This portion of the site contained numerous aboveground storage tanks, several large diameter floor drains in repair areas, several dry wells, and an oil-water separator.

The RI's consisted of advancement of test borings, installation of monitoring wells, excavation of test pits, and extensive soil and groundwater analysis. The RI identified large a plume of petroleum contaminated soil and groundwater with high concentrations of VOCs in the central portion of the site, and a smaller secondary sources of petroleum, metal, and chlorinated VOCs in several discrete areas. At NYSDEC's request an additional off-site groundwater monitoring well (identified as MW-LBSB28) was installed on City-owned land on the east side of Dewey

Avenue, downgradient of the source areas (see Figure 5 for location). Laboratory analysis of a groundwater sample from this off-site well did not reveal any petroleum related compounds above laboratory detection limits indicating that the plume was limited in nature and did not extend to this off-site location. A Correction Action Plan (CAP) was developed by LaBella Associates, P.C. (LaBella) in January 2005, and a supplemental CAP was developed by LaBella in September 2005. Both CAPS were submitted to and approved by the NYSDEC to remediate this portion of the site. The objective of the CAP activities was to remediate this portion of the site to facilitate the construction of a new City Water Bureau Operations Center and to close or inactivate NYSDEC Spill File No. 9870407. The CAP was implemented starting in May 2005 with the demolition of buildings, and the project was substantially complete in November 2006. The CAP and remediation of the site included the completion of the following remedial measures and engineering controls:

- **Construction Waste Management Plan:** To prevent the commingling of contaminated C&D waste with non-contaminated C&D waste, a Construction Waste Management Plan was developed and implemented. This plan included the on-site screening of waste streams generated during demolition.

- **Sub-grade Structure Assessment and Management:** Based on the history of the site, it was known that a significant number of subsurface structures existed that known or suspected sources of environmental contamination. As part of the demolition phase of the project, all sub-grade structures associated with the former buildings and site operations were evaluated for environmental impacts, decommissioned, removed, and disposed of in accordance with State and federal regulations.

- **Interim Remedial Measures (IRMs):** The objective of the IRMs was to remediate discrete areas of impacted soils that were not located within the areal extent of the primary plume. The IRMs included the remediation of petroleum and chlorinated VOCs, and allowed the City to expedite the demolition and the redevelopment of the site unhindered by the environmental issues at these specific locations.

- **Source Removal Program:** To address the primary source area located in the central portion of the site which contained widespread soil and groundwater contaminated with VOCs associated with petroleum fuels and lubricants, as well as a smaller area of chlorinated VOCs, the City implemented an aggressive source removal program that included the removal and off-site disposal of approximately 20,000 tons of contaminated soil. In a large portion of the excavation, soil was removed down to the top of competent bedrock (14 to 18 feet below grade).

- **Groundwater Remediation:** A Post-Source Removal Groundwater Evaluation was completed to evaluate groundwater conditions associated with the petroleum plume after completion of the large source removal. The results indicated that the areal extent and magnitude of the overburden groundwater plume decreased as a direct result of the source removal program; however, the concentration of petroleum and chlorinated VOCs in the center portion of the plume required active groundwater treatment. A multiphase approach was designed and installed to treat the overburden groundwater plume. Groundwater treatment consisted of the following:

- A localized area of groundwater contaminated with chlorinated VOCs was addressed with the direct injection of more than 600 pounds of a hydrogen releasing compound (Regenesis: HRC-X), resulting in the anaerobic degradation process known as reductive dechlorination. This process is the mechanism by which chlorinated compounds are biodegraded to innocuous compounds. The HRC-X was injected into the overburden on 10 foot centers in the vicinity of a former oil-water separator which appeared to be the source of the chlorinated VOCs. Chlorinated VOCs were reduced to non-detect in the anaerobic treatment zone with no significant post-treatment rebound.

- The second groundwater remedial system was installed to drive the site to an aerobic condition via the injection of high concentrations of oxygen into the overburden aquifer. This process is the mechanism by which petroleum based VOCs such as Benzene and select chlorinated VOCs (e.g. vinyl chloride) are biodegraded. This second groundwater treatment system consisted of the installation and operation of fifty-seven (57) point Oxygen Injection System (OIS). The majority of this system (47 points) was installed under the new buildings constructed at the site. This system also includes a 10 point bio-barrier located on the downgradient edge of the plume parallel to Dewey Avenue. This row of injection points acts as an aerobic bio-barrier to prevent the potential off-site migration of residual VOCs. Activation of the portion of the OIS downgradient of the HRC-X treatment area was initiated on October 13, 2006. On average BTEX was reduced by 95% after 1 year of remediation with minimal post-treatment rebound in the former source area.

The City intends to decommission the OIS and groundwater monitoring wells upon notification from the NYSDEC that the status of the spill file has been changed to inactive. This remedial work and the installation of engineering controls for the new buildings is detailed in the Corrective Action Report (CAP) dated March 2007 prepared by LaBella Associates, P.C. (selected tables and figures from the CAP report are attached to this EMP and an electronic file of the full CAP report is included on CD in Attachment 1). Tables and figures presenting data from the most recent groundwater sampling event for the Site are also attached to this EMP.

3. Geology and Hydrogeology

The depth of the overburden at the southern and central portions of the site ranges from 11.9 to 14.5 feet below grade. Soil consists of sand with lesser amounts of gravel and silt. The depth of the overburden increases significantly on the northern portion of the site in the vicinity of the former Deep Hollow Creek, a former tributary to the Genesee River. The horizontal and vertical extent of fill materials, as well as the composition of the fill materials present at the site vary considerably, with fill materials ranging in depth from approximately two to four feet over central portion of the site, to a maximum of approximately 30 feet below grade on the very northern portion of the site in the vicinity of the former Deep Hollow Creek. In addition, the former Erie Canal and subway bed on the western side of the site has been filled with various fill materials, including street sweepings, construction and demolition debris, and other miscellaneous debris.

The bedrock at the site is Penfield Dolostone described as fine to medium-grained, thin-bedded dolomitic limestone with no visible cross-bedding or other depositional features. The upper 10 feet of bedrock is fractured with an average rock quality designation of 54%.

Groundwater is generally encountered at depths ranging from seven to 11 feet bgs. The hydraulic gradient at the site is relatively flat, with a slight north to northeastern groundwater flow direction.

4. Environmental Management Plan

This EMP provides procedures to mitigate exposure to petroleum, chlorinated solvent, and fill impacted media that could be encountered during future construction activities or commercial use of the Site. In addition, this EMP provides information on how to identify impacted material, and also provides options for the management, disposal and/or re-use of impacted subsurface material. The procedures presented herein are intended to reduce potential exposure to construction workers and building occupants during future operation of the Site should impacted material be encountered that requires management.

During construction activities that have the potential to disturb impacted subsurface materials, a qualified environmental professional must monitor and document the work completed for compliance with the requirements of this EMP. It is recommended that the New York State Department of Environmental Conservation (NYSDEC) Spills Unit be notified two business days before intrusive site work is initiated. Additionally, the NYSDEC must be notified within two hours if residual impacted media is encountered. The owner of the Site is responsible for impacted media unless a different entity acceptable to the NYSDEC is indentified as the responsible party.

4.1 Potentially Impacted Media

This section describes the types of impacted media documented at the Site and provides information on the identification, handling, analytical laboratory testing, disposal or re-use of these materials.

4.2 Identification of Impacted Media

Identification of potentially impacted media will be part of the construction process, so that appropriate actions can be taken. A qualified environmental professional must be present during any future intrusive work at the Site to monitor for evidence of impacted media via visual and olfactory observations and screening for VOCs using a photoionization detector (PID). The City of Rochester (owner) will be responsible for the proper handling and disposal of impacted media if it is encountered at this site in the future. The following sub-sections provide guidance for this identification process:

4.2.1 Heterogeneous Fill

Heterogeneous fill material may be located across the Site extending to variable depths. The fill generally consists of fine to medium sand and gravel with varying quantities of cinder, ash, slag, concrete, brick, metal pipe, rebar and apparent rubble from demolished buildings. This fill material may contain elevated concentrations of various metals, SVOCs and VOCs. Except when in contact with petroleum-impacted materials, this fill material did not emit discernable odors, and may not result in positive responses when the ambient air above the material is screened with a PID. For purposes of this EMP, heterogeneous fill material throughout the Site should be considered to be impacted by selected metals, SVOCs and/or VOCs and handled as such unless testing is done to quantify the constituents in this material.

4.2.2 Petroleum-Impacted Soil

Based on the previous studies completed at the Site, it is known that residual petroleum-impacted

soil is present in the vicinity of Buildings 3, 4, and 5 at the Site. Additionally, it is possible that isolated areas of petroleum and/or VOC-impacted soil or fill material could be encountered during intrusive site work on other areas of the Site. If petroleum impacts are present, the soil or fill may appear stained black, gray, etc. and emit petroleum-like odors or other odors. In addition, screening the ambient air above this material could result in positive responses on a PID. [Note: heavier non-volatile petroleum-related constituents, such as polynuclear aromatic hydrocarbon SVOCs, might not result in a positive PID response]. For purposes of this EMP, soil/fill exhibiting the properties described above should be considered to be petroleum-impacted and handled as such unless testing is done to quantify the constituents in this material.

4.2.3 Groundwater

The depth to groundwater was previously measured to be approximately 7 to 11 feet below the ground surface at the Site. Previous testing shows groundwater on some portions of the Site generally contained petroleum and chlorinated solvent-related VOCs. Petroleum and chlorinated solvent impacted groundwater may be identified by the presence of petroleum/chemical odors or sheen on the water. Additionally, screening the ambient air above samples of groundwater from these areas may result in positive PID responses.

4.3 Handling and Disposal

Impacted soil/fill that is excavated or disturbed should be removed, segregated from non-impacted media, and placed on, and covered with, plastic sheeting. Alternatively, the impacted material can be placed in 55-gallon drums or a roll-off disposal container (depending on the quantity of material generated), or the material may be directly loaded onto trucks for off-site disposal if pre-approved by the disposal facility. If impacted material is to be staged on-site, any disposal, treatment, etc. must be conducted within 60 days, unless otherwise authorized by the appropriate regulatory agency. Representative samples of the stockpiled media will be collected and analyzed by a New York State Department of Health (NYSDOH) approved laboratory. Laboratory testing of petroleum/chemical impacted soils will typically include target compound list (TCL) VOCs, as well as additional waste characterization parameters as required by the disposal facility. Following the receipt of the laboratory results, approval from a permitted disposal facility will be obtained and the soil will be properly transported to by a licensed waste hauler and disposed of at the disposal facility.

Impacted groundwater or standing water removed from excavations must be containerized (i.e., placed in sealed New York State Department of Transportation (NYSDOT)-approved 55-gallon drums or a holding tank) prior to characterization and disposal. Once the impacted groundwater has been transferred to the storage container, options for the proper disposal of the water will be evaluated. Options include 1) discharge to the municipal sewer system after first performing waste characterization analysis and obtaining a temporary sewer discharge permit and 2) off-site disposal at an approved facility following proper characterization.

4.3.1 Analytical Laboratory Testing

Based on previous test results for samples from the Site, the recommended analytical laboratory testing program for petroleum and chlorinated VOC impacted media (soil, fill, groundwater) is summarized below:

- NYSDEC Spill Technology and Remediation Series (STARS)-Target Compound List (TCL VOCs) via USEPA Method TCL 8260 + STARS
- NYSDEC STARS-list SVOCs via USEPA Method 8270

The actual analytical laboratory testing program may vary depending on the nature of the soil, fill, and groundwater encountered, and requirements of the disposal facility or publicly-owned treatment works (POTW).

The analytical laboratory test results for characterization of soil and groundwater samples should be compared to the appropriate criteria listed below.

- NYSDEC Part 375 Soil Cleanup Objectives (SCOs) to assist in determining if soil or fill media require removal, off-site disposal and/or treatment, or can be re-used on-site.
- NYSDEC CP-51 Soil Cleanup Guidance to assist in determining if soil or fill media require removal, off-site disposal and/or treatment, or can be re-used on-site.
- Technical and Operational Guidance Series (NYSDEC TOGS 1.1.1) groundwater standards and guidance values to assist in determining if groundwater: 1) can be discharged on-site; 2) requires pre-treatment and/or can be discharged to the public combined sewer system under a sewer use permit; or 3) requires off-site disposal at a regulated treatment/disposal facility.
- Applicable portions of the Monroe County Pure Waters (MCPW) Rules and Regulations, and Sewer Use Law, to assist in determining if water from the Site (groundwater, excavation water, well water, etc.) requires pre-treatment and/or can be discharged to the public combined sewer under a Sewer Use Permit, or requires off-site disposal at a treatment/disposal facility.

4.3.2 Disposal of Petroleum Impacted Media

Comparison of analytical laboratory test results to the appropriate criteria may indicate that petroleum-impacted soil and/or fill encountered during construction activities at the Site requires disposal off-site in accordance with applicable regulations. In addition, excavated subsurface material may require off-site disposal due to construction requirements (e.g., geotechnical considerations, space available on-site for storage and subsequent re-use, etc.). Based on existing data and information, the petroleum-impacted fill and/or soil that contains VOCs described herein will likely be characterized as non-hazardous waste.

Water (e.g., groundwater, standing water) that is generated/removed during construction activities (if any) that meet TOGS 1.1.1 groundwater standards and guidance values can be discharged on-site. Water that is generated and removed during construction activities at the Site (if any) that does not meet TOGS 1.1.1 groundwater standards and guidance values must be: 1) discharged to the public combined sewer under a sewer use permit; or, 2) transported and disposed off-site at a regulated facility. If the water contains free phase gasoline, petroleum sheen, or a total VOC and SVOC concentration greater than 2.13 mg/l, it should be anticipated that MCPW will require pre-treatment and confirmatory sampling prior to authorizing discharge to the public combined sewer system under a sewer use permit.

Transporters removing contaminated media from the Site must have the appropriate regulatory permits (e.g., NYSDEC Part 364 permit, etc.), and the selected disposal facility of each waste stream (e.g., soil/fill to landfill, water to POTW, etc.) must be approved by the appropriate regulatory agency for accepting the specific waste. This includes contaminated material that may be defined as non-hazardous waste and hazardous waste.

4.3.3 Re-Use of Soil or Fill

Soil or fill material that does not contain petroleum constituents above NYSDEC Part 375 Unrestricted Use SCOs can be left in place, or re-used on or off-site. Any soils to be used off-Site must be approved by the NYSDEC. However, to the extent deemed appropriate, geotechnical properties of the soil or fill should be considered prior to it being re-used on or off-site.

4.4 Health and Safety Monitoring

During future construction work at the Site that has the potential to encounter petroleum impacted media, such as that described in Section 4.1, a site-specific Health and Safety Plan (HASP) must be developed and implemented. The HASP will outline policies and procedures to protect workers and the public from potential environmental hazards posed during future site activities, including redevelopment activities.

4.5 Management of Potential Future Disturbances

Workers involved with future on-site work (e.g., new installation/repair of buried utilities, etc.) that have the potential to disturb petroleum-impacted soil, fill and/or groundwater should be made aware of the potential exposure hazards. The owner of the Site will be responsible for notifying future on-site workers of potential exposure hazards. Workers should be provided with the previous reports, the exposure assessment, and this EMP. These documents contain information on the type and location of petroleum impact encountered at the Site and address how to handle, treat, transport, dispose, or re-use the impacted materials in a manner that precludes exposure. Precautions should be implemented to minimize disturbance of soil or fill that result in air-borne release of particulates. Areas where work has been completed should be repaired (e.g., clean soil/fill re applied, paved, etc.).

5. Engineering Controls

Engineering controls in the form of a vapor barrier under the concrete slab floor and a sub-slab depressurization system (SSDS) were installed under the new buildings at the site when they were constructed in 2005/2006. The SSDS must remain operational.

The potential for vapor intrusion into future buildings (if constructed) should also be evaluated. In the event engineering controls are deemed necessary for new construction, the appropriate regulatory agencies (i.e., MCDOH, the NYSDEC, and/or the NYSDOH) should be consulted to approve or accept the proposed controls.

6. Institutional Controls

Upon the NYSDEC issuing a "No Further Action" letter and changing the status of the spill file to closed or inactive, the Site's location will be "flagged" in the City's Activities Use Limitations (AUL) Institutional Controls system requiring City DEQ site review prior to the issuance of any building or construction permits.

7. Site Contacts

Contact information for the NYSDEC and other parties this EMP will be distributed to is as follows:

NYSDEC Region 8
6274 East Avon-Lima Road
Avon, New York 14414
Phone (585) 226-5438 or 1-800-457-7362
Contact Michael Zamiarski

Monroe County Department of Health
111 Westfall Road Room 914
Rochester, New York 14620
Contact: Jeffrey Kosmala, P.E.
Senior Public Health Engineer

City of Rochester
Division of Environmental Quality
City Hall Room 300B
30 Church Street
Rochester, New York 14614
Contact: Joseph Biondolillo
Phone (585) 428-6649

Figures

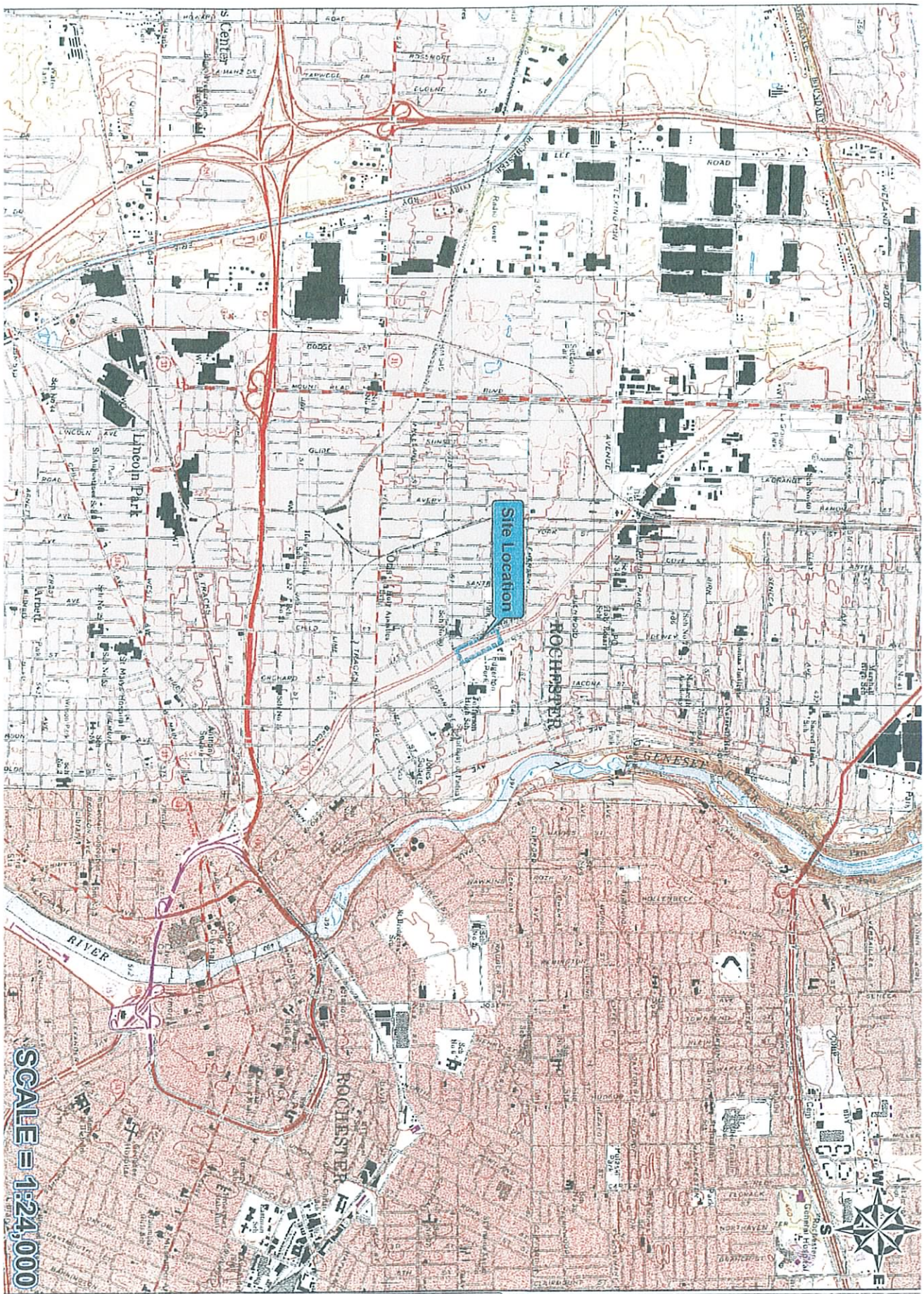

FIGURE 1

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SITE LOCATION MAP

NEW OPERATIONS CENTER BUREAU of WATER
LIGHTING & PARKING METERS

CITY OF ROCHESTER DEPARTMENT
OF ENVIRONMENTAL SERVICES

16 Felix Street
Rochester, NY 14605

LABELLA Associates, P.C.

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ROCHESTER, NY 14614
P: (585) 454-6110
F: (585)454-3066

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NEW OPERATIONS CENTER
BUREAU of WATER,
LIGHTING & PARKING METERS

CITY OF ROCHESTER DEPARTMENT
OF ENVIRONMENTAL SERVICES

Horizontal Extent of Source Removal with Former Structures

DATE November 2008

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Figure 2A

Horizontal Extent of Source Removal With New Structures

REVIEW

DATE November 2006

NEW OPERATIONS CENTER
BUREAU of WATER,
LIGHTING & PARKING METERS

CITY OF ROCHESTER DEPARTMENT
OF ENVIRONMENTAL SERVICES

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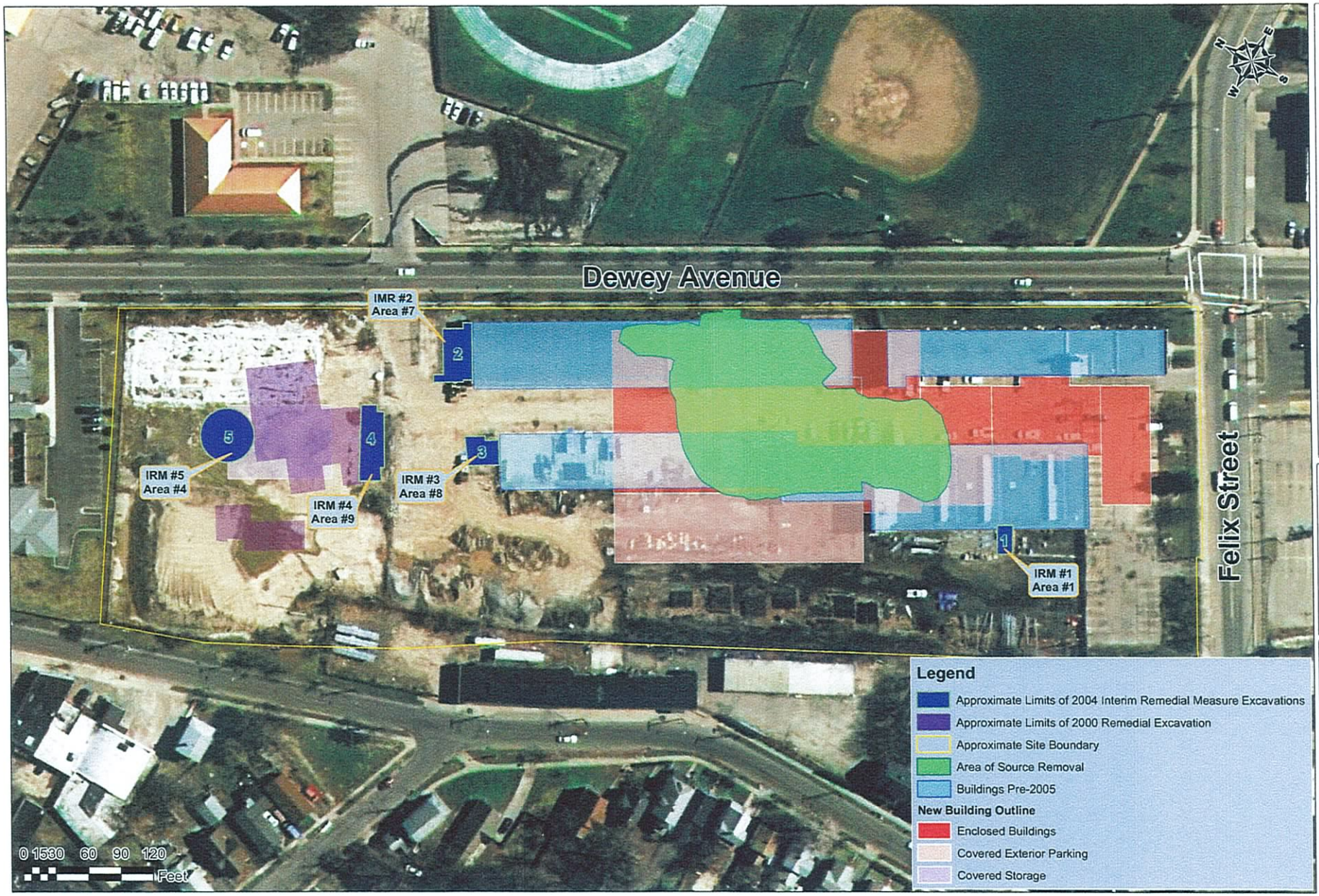
Figure 2B



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NEW OPERATIONS CENTER
BUREAU of WATER,
LIGHTING & PARKING METERS

CITY OF ROCHESTER DEPARTMENT
OF ENVIRONMENTAL SERVICES

Areas of Excavation From
Remedial Investigation

REVISED
DATE November 2006

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Figure 4A

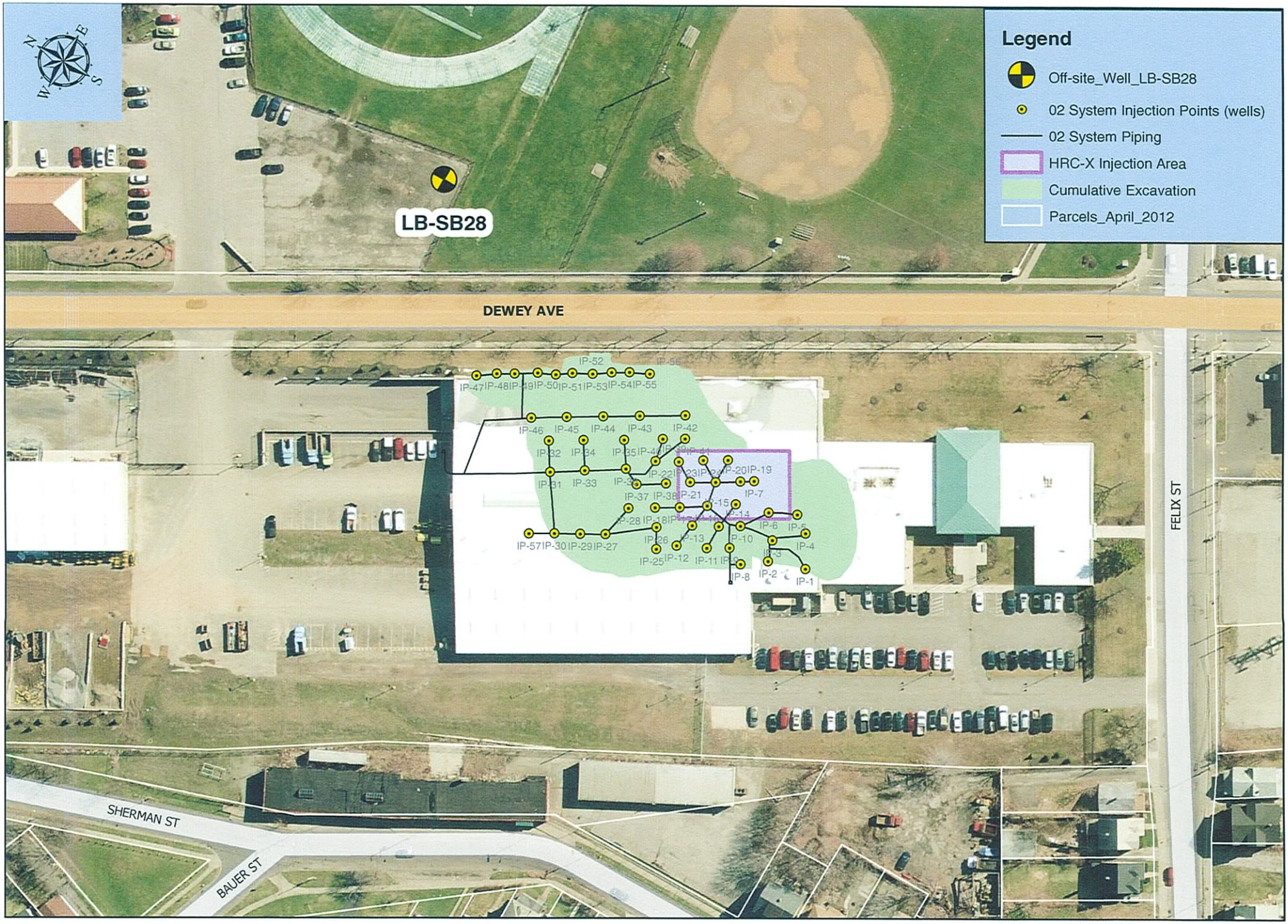
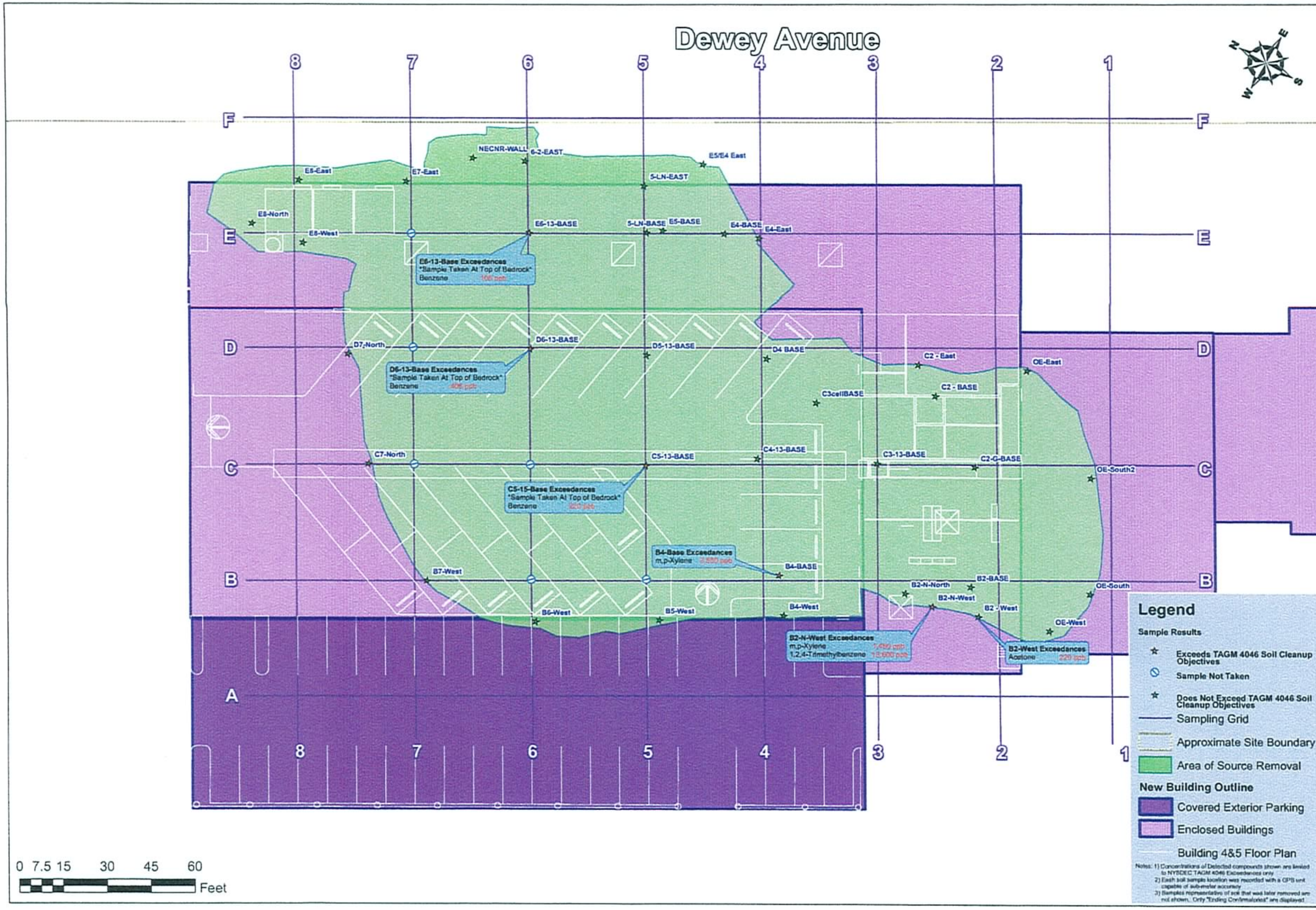


Figure 5 - 10 Felix Street Site
Off-Site Well LB-SB28 (400 Dewey Avenue)



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NEW OPERATIONS CENTER
BUREAU of WATER,
LIGHTING & PARKING METERS

CITY OF ROCHESTER DEPARTMENT
OF ENVIRONMENTAL SERVICES

Excavation Closure
Sample Location Map

REVIEW
DATE November 2006
JJW
JJW
DEP

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Figure 6

10 Felix Street Groundwater Remediation Systems

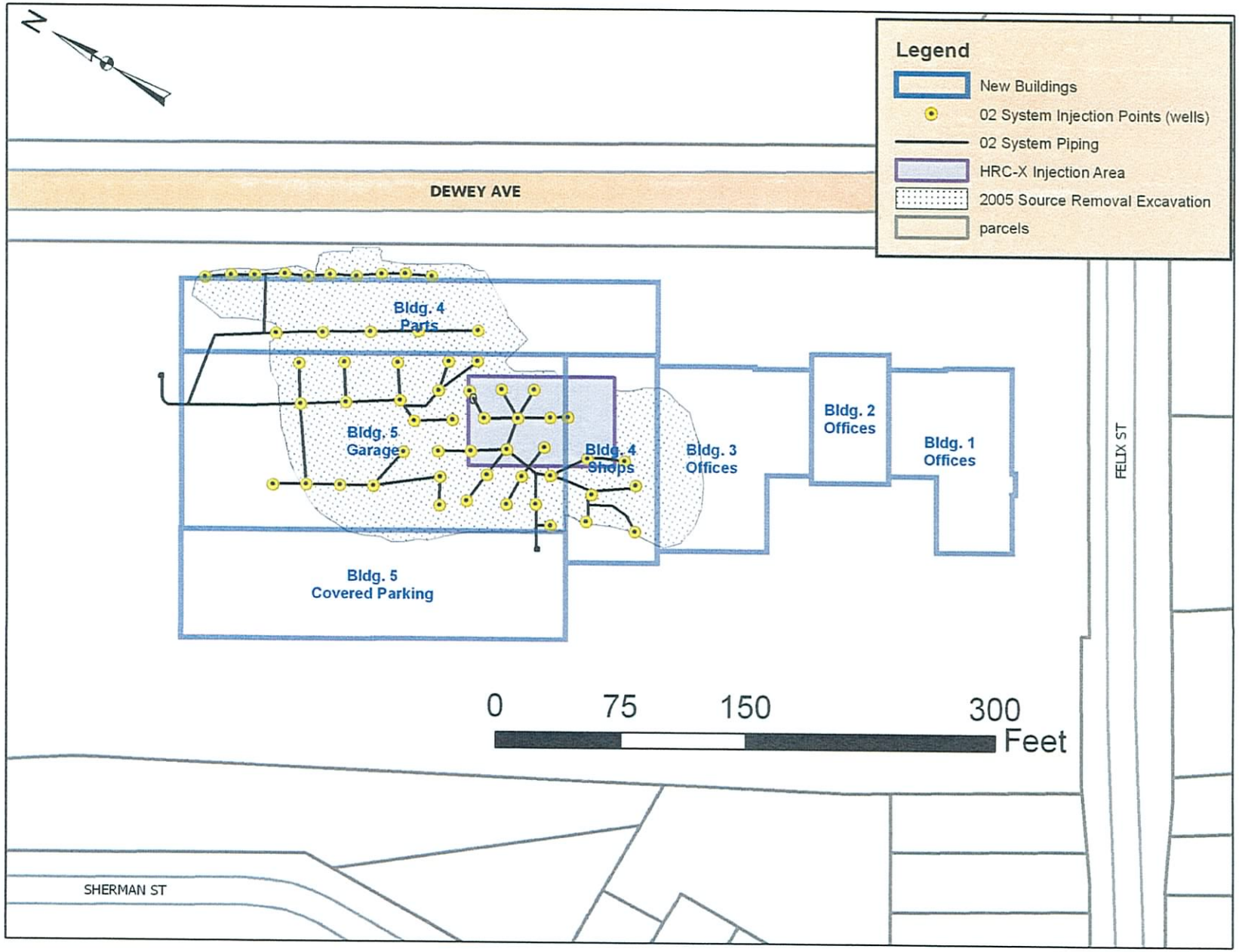

Figure 1

10 Felix Street Groundwater Remediation Systems

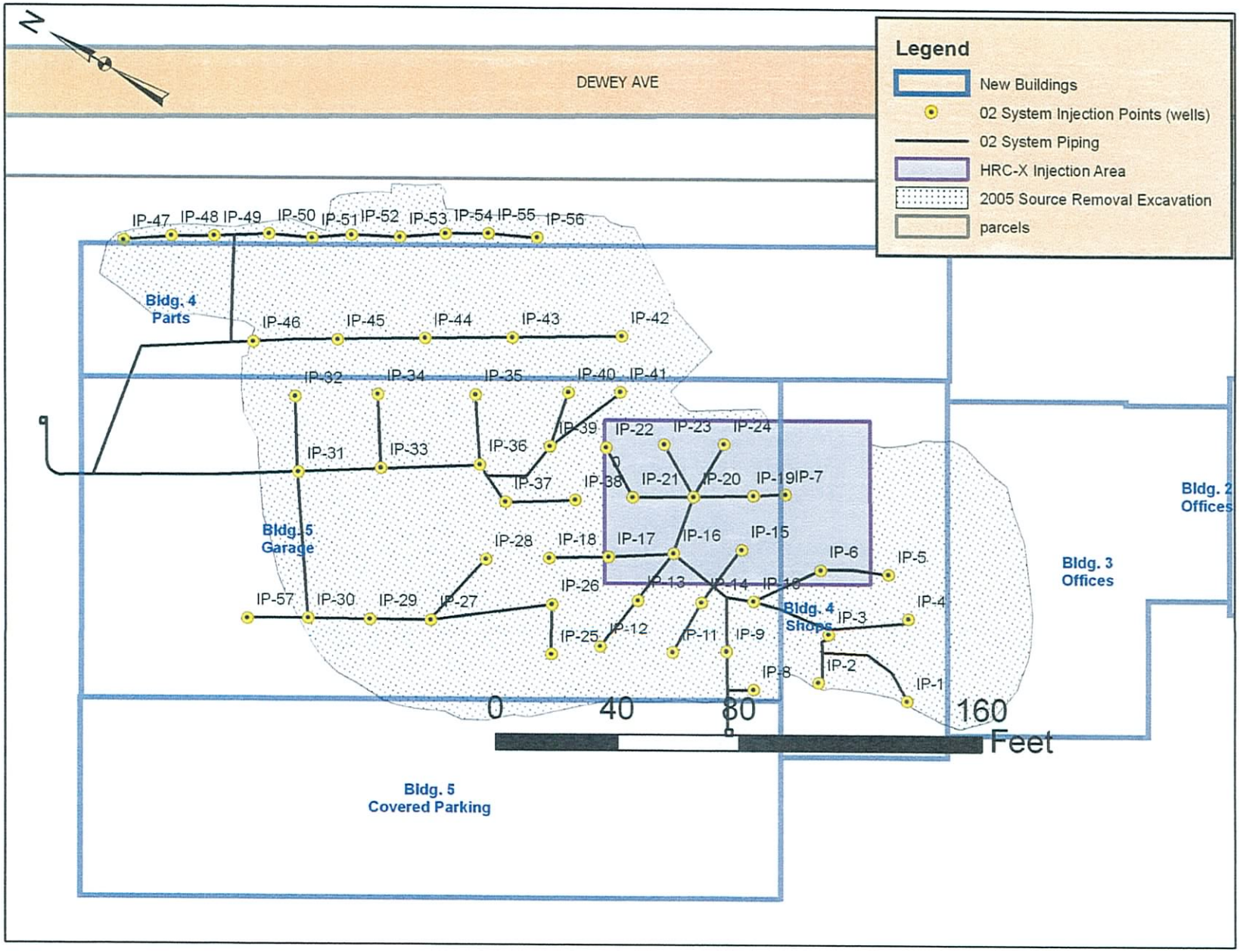

Figure 1a

10 Felix Street O2 Injection System
Groundwater Elevation 10-17-2008

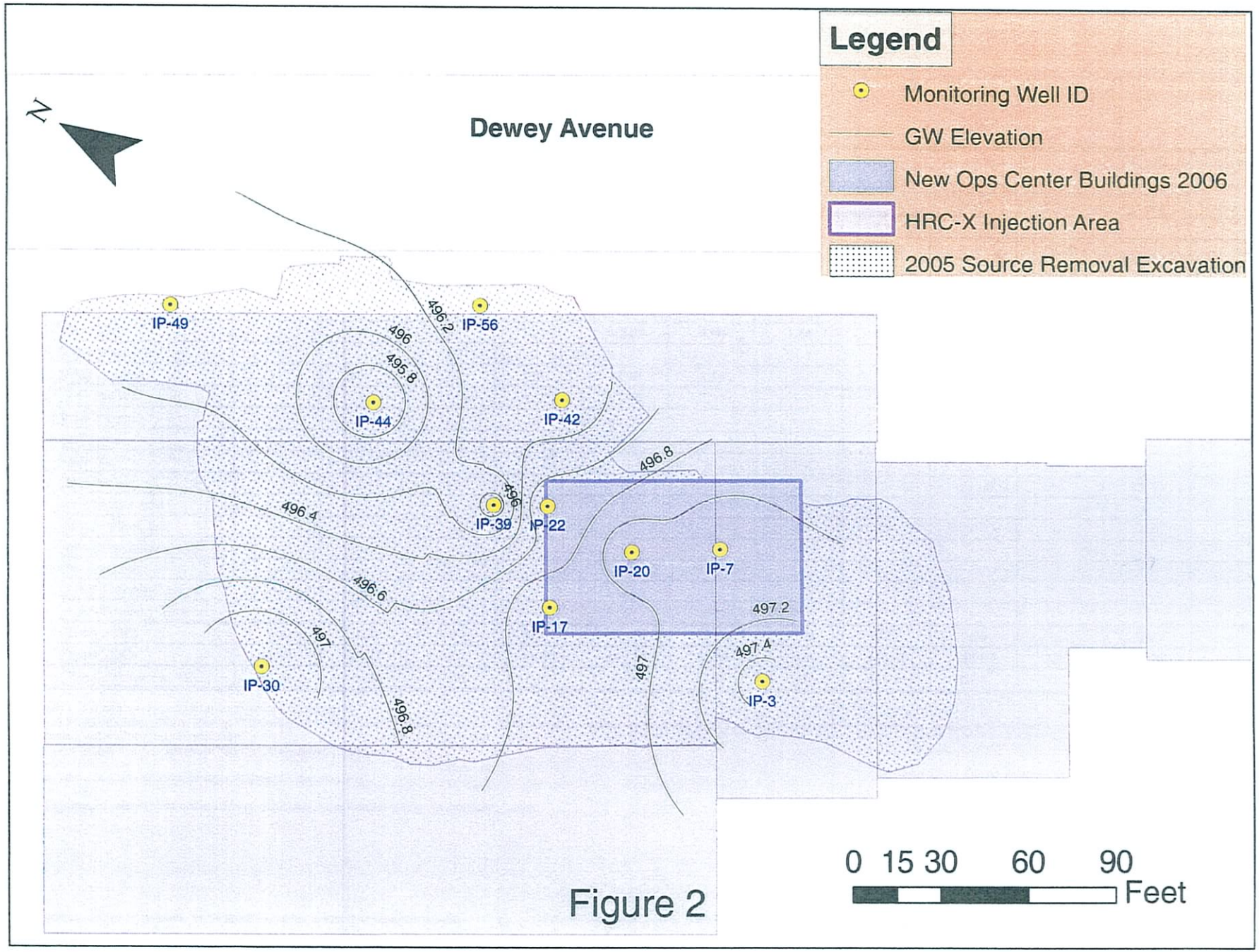

Figure 2

Tables

Table 2
City of Rochester - Division of Environmental Qualtity
Rochester Water Bureau - 10 Felix Street
Rochester, New York

Groundwater Analysis Results
Summary of Detected Compounds
July 14, 2010

Analysis Method	Constituent	IP-3	IP-7	IP-17	IP-20	IP-22	IP-30	IP-39	IP-42	IP-44	IP-49	IP-56	T.O.G.s 1.1.1 Guidance Value (1)
8260 B	1,1 Dichloroethene	--	--	--	--	--	--	--	--	--	--	--	5
	cis-1,2-Dichloroethene	3.22	--	--	--	--	--	--	**74.50**	--	**21.60**	--	5
	trans-1,2-Dichloroethene	--	--	--	--	--	--	--	**99.80**	--	**3.68**	--	5
	Trichloroethene	--	--	--	--	--	--	--	--	--	--	--	5
	Vinyl chloride	--	--	--	--	--	--	--	**77.30**	--	**14.70**	--	2
	Benzene	--	--	**3.95**	**13.10**	**754.00**	**10.10**	**11.70**	**121.00**	--	**136.00**	--	1
	Chlorobenzene	--	--	--	--	--	--	--	--	--	**21.20**	--	5
	Ethylbenzene	--	--	--	--	**53.60**	**114.00**	--	--	--	--	--	5
	Toluene	--	--	--	--	**82.10**	--	--	--	--	--	--	5
	m,p-Xylene	--	--	--	--	**49.60**	--	--	--	--	--	--	5
	o-Xylene	--	--	--	--	--	--	--	--	--	--	--	5
	Acetone	--	--	--	--	--	--	--	--	--	--	--	50
	2-Butanone	--	17.20	--	--	--	--	--	--	24.80	--	--	NA
	n-Propylbenzene	--	--	--	--	--	--	--	--	--	--	--	5
	Isopropylbenzene	--	--	--	--	--	--	--	--	--	--	--	5
	p-Isopropyltoluene	--	--	--	--	--	--	--	--	--	--	--	5
	Naphthalene	--	--	--	--	--	--	--	--	--	--	--	10
	1,2,4-Trimethylbenzne	--	--	--	--	**59.50**	--	--	--	--	--	--	5
	1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--	--	--	5
	Total BTEX	0.00	0.00	3.95	13.10	939.30	124.10	11.70	121.00	0.00	157.20	0.00	NA
	Total VOCs	3.22	17.20	3.95	13.10	998.80	124.10	11.70	372.60	24.80	197.18	0.00	NA
	Total Chlorinated VOCs	3.22	0.00	0.00	0.00	0.00	0.00	0.00	251.60	0.00	39.98	0.00	NA

All results expressed in micrograms per liter (ug/L) or parts per billion (ppb)

(1) - New York State Department of Environmental Conservation (NYSDEC) June 1998 Division of Water Technical and Operational and Guidance Series 1.1.1 (TOGS 1.1.1) Ambient Groundwater Standards and Guidance Values as ammended by April 2000 Supplemental Table.

Bold text denotes analyte was detected above NYSDEC Groundwater Standards

NS denotes well not sampled

-- denotes analyte was not detected above the reported laboratory detection limit

NA denotes Not Applicable

IP-3 Shaded cells indicate active injection of oxygen at this location during this monitoring period

Table 3
City of Rochester - Division of Environmental Quality
Rochester Water Bureau - 10 Felix Street
Rochester, New York

Historical VOC Concentrations

Constituent and Sampling Date	Well ID IP3	IP7	IP17	IP20	IP22	IP30	IP39	IP42	IP44	IP49	IP56	T.O.G.S. 1.1.1 Guidance Value (1)
Benzene												
8/24/2006 baseline		ND	**309.00**	**183.00**	**3,400.00**	**36.60**	**5,140.00**	NS	**41.6**	**2,990.00**	NS	1
1/17/2007	**4.35**	ND	**153.00**	**22.50**	**1,960.00**	**20.10**	**2,030.00**	**NS**	**12.3**	**32.80**	**NS**	1
4/26/2007	**2.28**	**1.16**	**252.00**	**31.30**	**1,000.00**	**12.90**	**16.50**	**27.7**	**2.8**	**11.70**	ND	1
9/28/2007	**1.96**	ND	ND	**7.97**	ND	**27.50**	**32.10**	**639.00**	**2.81**	**483.00**	ND	1
1/14/2008	**ND**	ND	ND	**1.86**	**473.00**	**31.50**	**47.10**	**1,250.00**	**19.60**	**28.70**	**11.50**	1
6/26/2008	NS	NS	NS	NS	NS	NS	NS	**1,310.00**	NS	NS	NS	1
10/17/2008	ND	ND	ND	**20.40**	**542.00**	**4.90**	**1.20**	**7.17**	ND	**1.56**	ND	1
5/1/2009	ND	ND	ND	ND	**490.00**	**10.10**	**3.26**	**203.00**	ND	ND	ND	1
12/4/2009	2.11	ND	1.80	5.09	**720.00**	**11.00**	**9.32**	**473.00**	ND	76.00	0.71	1
7/14/2010	--	--	**3.95**	**13.10**	**754.00**	**10.10**	**11.70**	**121.00**	--	**136.00**	--	1
Total BTEX												
8/24/2006 baseline	23.25	ND	430.50	236.90	8,162.00	1,793.70	7,140.00	NS	41.6	3,102.80	NS	N/A
1/17/2007	4.35	ND	191.20	58.40	4,039.00	47.72	3,526.00	NS	12.3	35.30	NS	N/A
4/26/2007	2.28	1.16	369.85	245.90	2,073.00	22.39	18.90	27.7	2.8	11.70	ND	N/A
9/28/2007	1.96	ND	ND	7.97	0.00	425.10	36.93	672.10	2.81	483.00	ND	N/A
1/4/2008	ND	ND	ND	1.86	473.00	416.60	47.10	1,400.50	19.60	47.60	11.50	N/A
6/26/2008	NS	NS	NS	NS	NS	NS	NS	1,474.40	NS	NS	NS	N/A
10/17/2008	ND	ND	ND	37.64	761.70	12.81	1.20	7.17	ND	1.56	ND	N/A
5/1/2009	ND	ND	ND	ND	490.00	184.77	3.26	236.35	ND	ND	ND	N/A
12/4/2009	2.11	ND	1.80	5.09	720.00	116.00	9.32	521.50	ND	91.60	0.71	N/A
7/14/2010	0.00	0.00	3.95	13.10	939.30	124.10	11.70	121.00	0.00	157.20	0.00	N/A
Total acetone and 2-Butanone												N/A
8/24/2006 baseline	150.40	888.00	180.60	736.00	ND1000	256.00	ND500	NS	2,924.00	ND200	NS	N/A
1/17/2007	ND10	654.00	1,005.00	976.00	ND1000	ND10	460.00	NS	94.90	25.00	NS	N/A
4/26/2007	ND10	201.30	348.00	1,136.00	ND100	ND10	ND10	ND10	26.00	92.30	71.20	N/A
9/28/2007	19.20	204.20	ND10	65.80	60.00	ND100	102.80	ND100	78.70	62,720956.7 *	1,027.00	N/A
1/4/2008	ND10	ND10	ND10	ND10	ND1,000	ND100	ND100	ND100	ND10	ND10	ND10	N/A
6/26/2008	NS	NS	NS	NS	NS	NS	NS	ND100	NS	NS	NS	N/A
10/17/2008	ND10	14.30	ND10	11.20	ND100	ND10	13.40	ND10	134.80	ND10	18.70	N/A
5/1/2009	ND	42.50	ND	15.50	ND1000	ND	ND	ND	ND	ND	12.70	N/A
12/4/2009	ND	ND	ND	ND	ND	ND	ND	ND	ND	12.60	ND	N/A
7/14/2010	--	17.20	--	--	--	--	--	--	24.80	--	--	N/A
Total Chlorinated VOCs												N/A
8/24/2006 baseline	53.50	0.00	6.41	0.00	0.00	0.00	0.00	NS	0.00	0.00	NS	N/A
1/17/2007	34.32	24.60	0.00	0.00	0.00	0.00	36.00	NS	0.00	38.52	NS	N/A
4/26/2007	20.15	36.00	6.23	5.45	116.40	0.00	0.00	410.16	0.00	10.48	0.00	N/A
9/28/2007	24.61	3.49	0.00	0.00	0.00	0.00	0.00	433.40	0.00	0.00	0.00	N/A
1/4/2008	2.29	0.00	0.00	0.00	0.00	0.00	0.00	1,487.00	0.00	60.98	0.00	N/A
6/26/2008	NS	NS	NS	NS	NS	NS	NS	1,014.00	NS	NS	NS	N/A
10/17/2008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	411.15	0.00	41.09	0.00	N/A
5/1/2009	4.22	0.00	0.00	0.00	0.00	0.00	0.00	607.31	0.00	0.00	0.00	N/A
12/4/2009	8.82	0.00	0.00	0.00	0.00	0.00	0.00	1,027.00	0.00	63.37	0.00	N/A
7/14/2010	3.22	0.00	0.00	0.00	0.00	0.00	0.00	251.60	0.00	39.98	0.00	
Total VOCs												
8/24/2006 baseline	240.75	888.00	632.36	972.90	15,817.00	2,803.30	7,687.00	NS	2,965.6	3,196.90	NS	N/A
1/17/2007	38.67	678.60	1,196.20	1,034.40	6,420.00	54.00	4,403.00	NS	107.0	96.00	NS	N/A
4/26/2007	22.43	262.76	765.28	1,420.51	2,608.40	24.95	21.30	437.9	28.8	114.48	71.20	N/A
9/28/2007	45.77	207.69	ND	73.77	71.20	425.10	36.93	1,105.5	81.5	1,441.70	1,027.00	N/A
1/4/2008	2.29	ND	ND	1.86	473.00	416.60	47.10	2,887.50	19.60	108.58	11.50	N/A
6/26/2008	NS	NS	NS	NS	NS	NS	NS	2,488.40	NS	NS	NS	N/A
10/17/2008	0.00	14.30	0.00	48.84	883.70	12.81	1.20	418.32	134.80	51.00	18.70	N/A
5/1/2009	4.22	42.50	0.00	15.50	490.00	240.11	3.26	843.66	0.00	0.00	12.70	N/A
12/4/2009	10.93	0.00	1.80	5.09	720.00	116.00	9.32	1,548.50	0.00	167.57	0.71	N/A
7/14/2010	3.22	17.20	3.95	13.10	998.80	124.10	11.70	372.60	24.80	197.18		N/A

All results expressed in micrograms per liter (ug/L) or parts per billion (ppb)
(1) - New York State Department of Environmental Conservation (NYSDEC) June 1998 Division of Water Technical and Operational and Guidance Series 1.1.1 (TOGS 1.1.1)
Ambient Groundwater Standards and Guidance Values as ammended by April 2000 Supplemental Table
Bold text denotes analyte was detected above NYSDEC Groundwater Standards

NS denotes well not sampled

ND denotes analyte was not detected above the reported laboratory detection limit

NA denotes Not Applicable

IP-3 Shaded cells indicate active injection of oxygen at this location during this monitoring period

* Well IP-49 data reflects the sample event on 9/28/07 that contained high levels of acetone (7,620 ppb) and 2-butanone (55,100 ppb) which were attributed to the PVC glue used for injection point repair and the resample event on 10/29/07

G:\ENVQUAL\DENNIS\Jobs\Water Bureau - 10 Felix Street\Quarterly Reports\2010-7-14 Table 3 VOCs vs time

TABLE 6
Refer to Figure 6
City of Rochester Water Bureau
Corrective Action Confirmatory Soil Samples
Volatile Organic Compounds by USEPA Method 8260B
All Results Expressed in micrograms per Kilogram (µg/Kg)

Sample ID	OE-Floor	OE-South	OE-West	OE-East	OE-South-2	OE-Floor-2	B2-West	B2-Base	C2-Base	B2-N-West	B2-N-North	C2-East	NYSDEC TAGM 4046 Soil Cleanup Objective to Protect Groundwater Quality
Sample Date	**8/1/2005**	**8/1/2005**	**8/1/2005**	**8/2/2005**	**8/2/2005**	**8/2/2005**	**8/8/2005**	**8/8/2005**	**8/10/2005**	**8/11/2005**	**8/11/2005**	**8/11/2005**	
cis-1,2-Dichloroethene	ND<8.05	ND<8.92	ND<10.4	ND<8.14	ND<8.61	ND<8.22	ND<20.8	7.35	44.0	ND<687	ND<15.7	ND<8.01	10,000*
Tetrachloroethene	ND<8.05	ND<8.92	ND<10.4	ND<8.14	ND<8.61	ND<8.22	81.4	ND<6.16	ND<8.84	ND<687	ND<15.7	ND<8.01	1,400
Trichloroethene	ND<8.05	ND<8.92	ND<10.4	ND<8.14	ND<8.61	ND<8.22	ND<20.8	ND<6.16	70.7	ND<687	ND<15.7	ND<8.01	700
Vinyl chloride	ND<8.05	ND<8.92	ND<10.4	ND<8.14	ND<8.61	ND<8.22	ND<20.8	11.6	ND<8.84	ND<687	ND<15.7	ND<8.01	120
Benzene	ND<8.05	ND<8.92	ND<10.4	ND<8.14	ND<8.61	ND<8.22	ND<20.8	ND<6.16	12.5	ND<687	ND<15.7	ND<8.01	80
Chlorobenzene	ND<8.05	ND<8.92	ND<10.4	ND<8.14	ND<8.61	ND<8.22	ND<20.8	ND<6.16	ND<8.84	ND<687	ND<15.7	ND<8.01	1,700
Ethylbenzene	ND<8.05	ND<8.92	10.5	13.2	ND<8.61	ND<8.22	30.1	ND<6.16	ND<8.84	ND<687	ND<15.7	ND<8.01	5,500
Toluene	ND<8.05	ND<8.92	ND<10.4	ND<8.14	ND<8.61	ND<8.22	ND<20.8	ND<6.16	ND<8.84	ND<687	ND<15.7	ND<8.01	1,500
m,p-Xylene	ND<8.05	ND<8.92	ND<10.4	44.5	ND<8.61	ND<8.22	112	ND<6.16	ND<8.84	**1,460**	ND<15.7	ND<8.01	1,200
o-Xylene	ND<8.05	ND<8.92	22.6	29.0	ND<8.61	ND<8.22	73.8	ND<6.16	ND<8.84	749	ND<15.7	ND<8.01	1,200
Styrene	ND<8.05	ND<8.92	ND<10.4	ND<8.14	ND<8.61	ND<8.22	ND<20.8	ND<6.16	ND<8.84	ND<687	ND<15.7	ND<8.01	10,000*
1,2-Dichlorobenzene	ND<8.05	ND<8.92	12.3	ND<8.14	ND<8.61	ND<8.22	ND<20.8	ND<6.16	ND<8.84	ND<687	ND<15.7	ND<8.01	7,900
Acetone	ND<40.3	ND<44.6	ND<51.9	ND<40.7	ND<43.0	ND<41.1	**220**	**188**	ND<44.2	ND<3,430	ND<78.3	ND<40.1	110
n-Butylbenzne	ND<8.05	ND<8.92	ND<10.4	ND<8.14	ND<8.61	ND<8.22	234	ND<6.16	ND<8.84	2,710	ND<15.7	ND<8.01	12,000
sec-Butylbenzene	ND<8.05	ND<8.92	ND<10.4	21.2	ND<8.61	ND<8.22	86.9	ND<6.16	ND<8.84	ND<687	ND<15.7	ND<8.01	11,000
n-Propylbenzene	ND<8.05	ND<8.92	ND<10.4	43.9	ND<8.61	ND<8.22	52	ND<6.16	ND<8.84	ND<687	ND<15.7	ND<8.01	3,700
Isopropylbenzene	ND<8.05	ND<8.92	ND<10.4	9.13	ND<8.61	ND<8.22	ND<20.8	ND<6.16	ND<8.84	ND<687	ND<15.7	ND<8.01	2,300
p-Isopropyltoluene	ND<8.05	ND<8.92	12.7	28.9	ND<8.61	ND<8.22	112	ND<6.16	ND<8.84	1,120	ND<15.7	ND<8.01	11,000
Naphthalene	ND<20.2	ND<22.3	ND<26.0	370	ND<21.5	ND<20.5	179	ND<15.4	ND<22.1	ND<1,720	ND<39.1	ND<20.0	13,000
1,2,4-Trimethylbenzne	ND<8.05	ND<8.92	ND<10.4	669	ND<8.61	ND<8.22	1,370	ND<6.16	ND<8.84	**13,600**	ND<15.7	ND<8.01	13,000
1,3,5-Trimethylbenzene	ND<8.05	ND<8.92	35	135	ND<8.61	ND<8.22	352	ND<6.16	ND<8.84	**3,250**	ND<15.7	ND<8.01	3,300
Total VOCs	None Detected	None Detected	93	1,364	None Detected	None Detected	2,903	207	127	22,889	None Detected	None Detected	10,000*

Note:
(1) ND = Non Detect
(2) Micrograms per Kilograms is approximately equivalent to parts per billion (ppb)
(3) * Per NYSDEC TAGM 4046, the sum of individual Volatile Organic Compounds may not exceed 10,000 ppb
(4) **Bold** denotes compound detected above NYSDEC TAGM guidance value

TABLE 6 (Continued)
Refer to Figure 6
City of Rochester Water Bureau
Corrective Action Confirmatory Soil Samples
Volatile Organic Compounds by USEPA Method 8260B
All Results Expressed in micrograms per Kilogram (µg/Kg)

Sample ID	C3-Base	C4-Base	D4-East	D4-Base	C4-W-West	C3-G-West	C2-G-Base	5-LN-Base	E5-Base	C3-Cell-Base	C5-13-Base	C4-13-Base	NYSDEC TAGM 4046 Soil Cleanup Objective to Protect Groundwater Quality
Sample Date	**8/11/2005**	**8/15/2005**	**8/15/2005**	**8/15/2005**	**8/17/2005**	**8/18/2005**	**8/18/2005**	**8/24/2005**	**8/24/2005**	**8/24/2005**	**9/7/2006**	**9/7/2005**	
cis-1,2-Dichloroethene	ND<8.34	ND<159	ND<7.98	ND<34.8	ND<29.7	ND<8.43	ND<6.10	ND<10.2	ND<15.3	ND<6.66	ND<15.1	ND<48.2	10,000*
Tetrachloroethene	ND<8.34	ND<159	ND<7.98	164	ND<29.7	ND<8.43	ND<6.10	ND<10.2	ND<15.3	ND<6.66	ND<15.1	ND<48.2	1,400
Trichloroethene	ND<8.34	ND<159	ND<7.98	ND<34.8	ND<29.7	ND<8.43	ND<6.10	ND<10.2	ND<15.3	ND<6.66	ND<15.1	ND<48.2	700
Vinyl chloride	ND<8.34	ND<159	ND<7.98	ND<34.8	ND<29.7	ND<8.43	ND<6.10	ND<10.2	ND<15.3	ND<6.66	ND<15.1	ND<48.2	120
Benzene	ND<8.34	ND<159	ND<7.98	56.8	ND<29.7	ND<8.43	ND<6.10	14.4	27.8	ND<6.66	220	ND<48.2	80
Chlorobenzene	ND<8.34	ND<159	ND<7.98	ND<34.8	ND<29.7	ND<8.43	ND<6.10	ND<10.2	ND<15.3	ND<6.66	ND<15.1	ND<48.2	1,700
Ethylbenzene	70.5	1,170	ND<7.98	110	171.0	ND<8.43	ND<6.10	160	48.0	ND<6.66	45.3	ND<48.2	5,500
Toluene	ND<8.34	ND<159	ND<7.98	40.9	42.7	ND<8.43	ND<6.10	54.2	32.3	ND<6.66	188.0	ND<48.2	1,500
m,p-Xylene	38.2	4,450	ND<7.98	243	286.0	ND<8.43	ND<6.10	203	103	ND<6.66	78.3	ND<48.2	1,200
o-Xylene	21.1	274	ND<7.98	ND<34.8	72.0	ND<8.43	ND<6.10	76.0	46.3	ND<6.66	211	ND<48.2	1,200
Styrene	ND<8.34	ND<159	ND<7.98	ND<34.8	ND<29.7	ND<8.43	ND<6.10	ND<10.2	ND<15.3	ND<6.66	ND<15.1	ND<48.2	10,000*
1,2-Dichlorobenzene	ND<8.34	ND<159	ND<7.98	ND<34.8	ND<29.7	ND<8.43	ND<6.10	ND<10.2	ND<15.3	ND<6.66	ND<15.1	ND<48.2	7,900
Acetone	ND<41.7	ND<795	ND<39.9	ND<174	ND<149	ND<42.2	ND<30.5	ND<50.9	ND<76.7	ND<33.3	ND<75.6	ND<241	110
n-Butylbenzne	254	ND<159	ND<7.98	ND<34.8	ND<29.7	ND<8.43	ND<6.10	ND<10.2	ND<15.3	ND<6.66	ND<15.1	ND<48.2	12,000
sec-Butylbenzene	145	ND<159	ND<7.98	ND<34.8	115.00	ND<8.43	ND<6.10	10.6	ND<15.3	ND<6.66	ND<15.1	ND<48.2	11,000
n-Propylbenzene	135	383	ND<7.98	50.8	175	ND<8.43	ND<6.10	53.6	ND<15.3	ND<6.66	ND<15.1	ND<48.2	3,700
Isopropylbenzene	54.6	323	ND<7.98	43.2	128	ND<8.43	ND<6.10	35.2	ND<15.3	ND<6.66	ND<15.1	ND<48.2	2,300
p-Isopropyltoluene	216	279	ND<7.98	43.9	246	ND<8.43	ND<6.10	19.4	ND<15.3	ND<6.66	ND<15.1	ND<48.2	11,000
Naphthalene	ND<20.8	2,220	ND<19.9	205	986	ND<21.1	ND<15.2	199	154	ND<16.7	ND<37.8	ND<120	13,000
1,2,4-Trimethylbenzne	435	3,980	ND<7.98	365	1,400	ND<8.43	ND<6.10	550	161	ND<6.66	56.9	ND<48.2	13,000
1,3,5-Trimethylbenzene	ND<8.34	1,610	ND<7.98	68	663	ND<8.43	7.0	167	56	12.9	76.6	ND<48.2	3,300
Total VOCs	1,369	14,689	None Detected	1,390	4,285	None Detected	7	1,542	628	13	876	None Detected	10,000*

Note:
(1) ND = Non Detect
(2) Micrograms per Kilograms is approximately equivalent to parts per billion (ppb)
(3) * Per NYSDEC TAGM 4046, the sum of individual Volatile Organic Compounds may not exceed 10,000 ppb
(4) **Bold** denotes compound detected above NYSDEC TAGM guidance value

TABLE 6 Continued)
Refer to Figure 6
City of Rochester Water Bureau
Corrective Action Confirmatory Soil Samples
Volatile Organic Compounds by USEPA Method 8260B
All Results Expressed in micrograms per Kilogram (µg/Kg)

Sample ID	D5-13-Base	E6-13-Base	D6-13-Base	C3-13-Base	NE-CNR-Wall	6-2-East Elev 498.2	E8-North	E8-East	E8-West	C7-North	D7-North	E7-East	NYSDEC TAGM 4046 Soil Cleanup Objective to Protect Groundwater Quality
Sample Date	**9/7/2005**	**9/8/2005**	**9/8/2005**	**9/8/2005**	**9/12/2005**	**9/13/2005**	**9/19/2005**	**9/19/2005**	**9/19/2005**	**9/20/2005**	**9/20/2005**	**9/20/2005**	
cis-1,2-Dichloroethene	ND<20.7	ND<41.2	ND<27.6	ND<9.35	ND<8.60	ND<8.82	ND<8.58	ND<9.94	ND<7.47	ND<8.45	193	ND<7.97	10,000*
Tetrachloroethene	ND<20.7	ND<41.2	ND<27.6	ND<9.35	ND<8.60	ND<8.82	ND<8.58	ND<9.94	ND<7.47	ND<8.45	ND<71.1	ND<7.97	1,400
Trichloroethene	ND<20.7	ND<41.2	ND<27.6	ND<9.35	ND<8.60	ND<8.82	ND<8.58	ND<9.94	ND<7.47	ND<8.45	ND<71.1	ND<7.97	700
Vinyl chloride	ND<20.7	ND<41.2	ND<27.6	ND<9.35	ND<8.60	ND<8.82	ND<8.58	ND<9.94	ND<7.47	ND<8.45	ND<71.1	ND<7.97	120
Benzene	73.2	**108**	**406**	ND<9.35	45.8	ND<8.82	ND<8.58	ND<9.94	ND<7.47	ND<8.45	ND<71.1	ND<7.97	80
Chlorobenzene	ND<20.7	ND<41.2	ND<27.6	ND<9.35	ND<8.60	ND<8.82	ND<8.58	ND<9.94	ND<7.47	ND<8.45	705	ND<7.97	1,700
Ethylbenzene	66.9	ND<41.2	114	ND<9.35	ND<8.60	ND<8.82	ND<8.58	ND<9.94	ND<7.47	ND<8.45	ND<71.1	ND<7.97	5,500
Toluene	79.5	58.1	234	ND<9.35	52.9	ND<8.82	ND<8.58	ND<9.94	ND<7.47	ND<8.45	ND<71.1	ND<7.97	1,500
m,p-Xylene	ND<20.7	ND<41.2	231	ND<9.35	ND<8.60	ND<8.82	ND<8.58	ND<9.94	ND<7.47	ND<8.45	ND<71.1	ND<7.97	1,200
o-Xylene	ND<20.7	ND<41.2	33	ND<9.35	21.3	ND<8.82	ND<8.58	ND<9.94	ND<7.47	ND<8.45	ND<71.1	ND<7.97	1,200
Styrene	ND<20.7	ND<41.2	ND<27.6	ND<9.35	ND<8.60	ND<8.82	ND<8.58	ND<9.94	ND<7.47	ND<8.45	ND<71.1	ND<7.97	10,000*
1,2-Dichlorobenzene	ND<20.7	ND<41.2	ND<27.6	ND<9.35	ND<8.60	ND<8.82	ND<8.58	ND<9.94	ND<7.47	ND<8.45	ND<71.1	ND<7.97	7,900
Acetone	ND<104	ND<206	ND<138	107	ND<43.0	ND<44.1	ND<42.9	ND<49.7	ND<37.4	ND<42.3	ND<356	ND<39.9	110
n-Butylbenzne	ND<20.7	ND<41.2	ND<27.6	ND<9.35	ND<8.60	ND<8.82	ND<8.58	ND<9.94	ND<7.47	ND<8.45	ND<71.1	ND<7.97	12,000
sec-Butylbenzene	ND<20.7	ND<41.2	ND<27.6	ND<9.35	ND<8.60	ND<8.82	ND<8.58	ND<9.94	ND<7.47	ND<8.45	ND<71.1	ND<7.97	11,000
n-Propylbenzene	ND<20.7	ND<41.2	ND<27.6	ND<9.35	ND<8.60	ND<8.82	ND<8.58	ND<9.94	ND<7.47	ND<8.45	ND<71.1	ND<7.97	3,700
Isopropylbenzene	ND<20.7	ND<41.2	ND<27.6	ND<9.35	ND<8.60	ND<8.82	ND<8.58	ND<9.94	ND<7.47	ND<8.45	ND<71.1	ND<7.97	2,300
p-Isopropyltoluene	ND<20.7	ND<41.2	ND<27.6	ND<9.35	ND<8.60	ND<8.82	ND<8.58	ND<9.94	ND<7.47	ND<8.45	ND<71.1	ND<7.97	11,000
Naphthalene	ND<51.8	ND<103	ND<68.9	ND<23.4	ND<21.5	ND<22.0	ND<21.4	ND<24.9	ND<18.7	ND<21.1	ND<178	ND<19.9	13,000
1,2,4-Trimethylbenzne	ND<20.7	ND<41.2	43.9	ND<9.35	ND<8.60	ND<8.82	ND<8.58	ND<9.94	ND<7.47	ND<8.45	ND<71.1	ND<7.97	13,000
1,3,5-Trimethylbenzene	ND<20.7	ND<41.2	ND<27.6	ND<9.35	ND<8.60	ND<8.82	ND<8.58	ND<9.94	ND<7.47	ND<8.45	ND<71.1	ND<7.97	3,300
Total VOCs	220	166	1,062	107	120	None Detected	None Detected	None Detected	None Detected	None Detected	898	None Detected	10,000*

Note:
(1) ND = Non Detect
(2) Micrograms per Kilograms is approximately equivalent to parts per billion (ppb)
(3) * Per NYSDEC TAGM 4046, the sum of individual Volatile Organic Compounds may not exceed 10,000 ppb
(4) **Bold** denotes compound detected above NYSDEC TAGM guidance value

TABLE 6 Continued)
Refer to Figure 6
City of Rochester Water Bureau
Corrective Action Confirmatory Soil Samples
Volatile Organic Compounds by USEPA Method 8260B
All Results Expressed in micrograms per Kilogram (µg/Kg)

Sample ID	E4-Base	B7-West	B6-West	B5-West	B4-West	E4-East	B4-Base	E5/E4-East	NYSDEC TAGM 4046 Soil Cleanup Objective to Protect Groundwater Quality
Sample Date	**9/26/2005**	**9/26/2005**	**9/26/2005**	**9/26/2005**	**9/26/2005**	**9/26/2005**	**9/26/2005**	**10/3/2005**	
cis-1,2-Dichloroethene	ND<41.5	ND<7.78	ND<6.54	ND<8.23	ND<8.58	ND<7.91	ND<67.0	ND<8.21	10,000*
Tetrachloroethene	ND<41.5	ND<7.78	ND<6.54	ND<8.23	ND<8.58	ND<7.91	ND<67.0	ND<8.21	1,400
Trichloroethene	ND<41.5	ND<7.78	ND<6.54	ND<8.23	ND<8.58	ND<7.91	ND<67.0	ND<8.21	700
Vinyl chloride	ND<41.5	ND<7.78	ND<6.54	ND<8.23	ND<8.58	ND<7.91	ND<67.0	ND<8.21	120
Benzene	ND<41.5	ND<7.78	ND<6.54	ND<8.23	ND<8.58	ND<7.91	ND<67.0	ND<8.21	80
Chlorobenzene	ND<41.5	ND<7.78	ND<6.54	ND<8.23	ND<8.58	ND<7.91	ND<67.0	ND<8.21	1,700
Ethylbenzene	108	ND<7.78	ND<6.54	ND<8.23	ND<8.58	ND<7.91	998	ND<8.21	5,500
Toluene	ND<41.5	ND<7.78	ND<6.54	ND<8.23	ND<8.58	ND<7.91	258	ND<8.21	1,500
m,p-Xylene	51.0	ND<7.78	ND<6.54	ND<8.23	ND<8.58	ND<7.91	**3,550**	ND<8.21	1,200
o-Xylene	ND<41.5	ND<7.78	ND<6.54	ND<8.23	ND<8.58	ND<7.91	550	ND<8.21	1,200
Styrene	ND<41.5	ND<7.78	ND<6.54	ND<8.23	ND<8.58	ND<7.91	110	ND<8.21	10,000*
1,2-Dichlorobenzene	ND<41.5	ND<7.78	ND<6.54	ND<8.23	ND<8.58	ND<7.91	ND<67.0	ND<8.21	7,900
Acetone	ND<207	ND<38.9	ND<32.7	ND<41.2	ND<42.9	ND<39.5	ND<335	ND<41.0	110
n-Butylbenzne	ND<41.5	ND<7.78	ND<6.54	ND<8.23	ND<8.58	ND<7.91	ND<67.0	ND<8.21	12,000
sec-Butylbenzene	55.8	ND<7.78	ND<6.54	ND<8.23	ND<8.58	ND<7.91	112	ND<8.21	11,000
n-Propylbenzene	128	ND<7.78	ND<6.54	ND<8.23	ND<8.58	ND<7.91	368	ND<8.21	3,700
Isopropylbenzene	106	ND<7.78	ND<6.54	ND<8.23	ND<8.58	ND<7.91	320	ND<8.21	2,300
p-Isopropyltoluene	109	ND<7.78	ND<6.54	ND<8.23	ND<8.58	ND<7.91	187	ND<8.21	11,000
Naphthalene	ND<104	ND<19.5	ND<16.3	ND<20.6	ND<21.4	ND<19.8	745	ND<20.5	13,000
1,2,4-Trimethylbenzne	ND<41.5	ND<7.78	ND<6.54	ND<8.23	ND<8.58	ND<7.91	3,390	ND<8.21	13,000
1,3,5-Trimethylbenzene	65.8	ND<7.78	ND<6.54	ND<8.23	ND<8.58	ND<7.91	1,770	ND<8.21	3,300
Total VOCs	624	None Detected	None Detected	None Detected	None Detected	None Detected	12,358	None Detected	10,000*

Note:
(1) ND = Non Detect
(2) Micrograms per Kilograms is approximately equivalent to parts per billion (ppb)
(3) * Per NYSDEC TAGM 4046, the sum of individual Volatile Organic Compounds may not exceed 10,000 ppb
(4) **Bold** denotes compound detected above NYSDEC TAGM guidance value