INTERIM REMEDIAL MEASURE WORK PLAN

Kirstein Building Associated Parking Lot
37 Bittner Street
Rochester, New York 14604

NYSDEC BCP #: C828127

Prepared for:

234-250 Andrews Street, LLC
1100 University Ave., Suite 204
Rochester, NY 14607

Prepared by:

Passero Associates
100 Liberty Pole Way
Rochester, NY 14604
585-325-1000

February 7, 2011

P.N. 25030.08

Table of Contents

page

EXECUTIVE SUMMARY viii
1 INTRODUCTION 1
1.1 Site Location and Description 1
1.2 Contemplated Redevelopment Plan 1
1.3 Description of Surrounding Property 2

2 DESCRIPTION OF REMEDIAL INVESTIGATION FINDINGS 2
2.1 Summary of Remedial Investigations Performed 2
2.1.1 Soil Borings and Wells 2
2.1.2 Samples Collected 3
2.1.3 Chemical Analytical Work Performed 3
2.1.4 Geophysical Work, Test Pits, Other 3
2.2 Summary of RI findings 4

3 SITE HISTORY 4
3.1 Past Uses and Ownership 4
3.2 Phase I and Phase II Reports 4
3.3 Sanborn® Maps 5
3.4 Geological Conditions 5
3.5 Contamination Conditions 5
3.5.1 On-Site 5
3.5.2 Off-Site 5

4 DESCRIPTION OF AREAS OF CONCERN 6

5 SUMMARY OF SOIL/FILL DATA 6
5.1 Comparison of Soil/Fill with SCGs 6

6 SUMMARY OF GROUNDWATER DATA 6
6.1 Comparison of Groundwater with SCGs 6

7 SUMMARY OF SOIL VAPOR DATA 7

8 ENVIRONMENTAL AND PUBLIC HEALTH ASSESSMENTS 7
8.1 Qualitative Human health Exposure Assessment 7
8.1.1 Contaminant Source 8
8.1.2 Contaminant Release and Transport Mechanism 8
8.1.3 Points of Exposure 8
8.2 Potential Exposure Pathways for Soil 9
8.2.1 Current and Potential Future Exposure Pathways if Remediation Were Not Conducted 9
8.2.2 Potential Exposure During Remediation and Construction Activities 9
8.2.3 Potential Exposure Pathways that Could Remain After Remediation 9
8.3 Potential Exposure Pathways for Groundwater 9
8.3.1 Current and Potential Future Exposure Pathways if Remediation Were Not Conducted 9
8.3.2 Potential Exposure During Remediation and Construction Activities 10
8.3.3 Potential Exposure Pathways that Could Remain After Remediation 10
8.4 Current and Potential Future Pathways for Soil Gas and Air 10
8.4.1 Current and Potential Future Exposure Pathways if Remediation Were Not Conducted 10
8.4.2 Potential Exposure During Remediation and Construction Activities 10
8.4.3 Potential Exposure Pathways that Could Remain After Remediation 11
8.5 Fish & Wildlife Resources Impact Analysis 11

Table of Contents (Cont'd)

page

9 REMEDIAL ACTION OBJECTIVES 11
9.1 Groundwater 12
9.1.1 RAOs for Public Health Protection 12
9.1.2 RAOs for Environmental Protection 12
9.2 Soil 12
9.2.1 RAOs for Public Health Protection 12
9.2.2 RAOs for Environmental Protection 12
9.3 Surface Water 13
9.3.1 RAOs for Public Health Protection 13
9.3.2 RAOs for Environmental Protection 13
9.4 Sediment 13
9.4.1 RAOs for Public Health Protection 13
9.4.2 RAOs for Environmental Protection 13

10 DESCRIPTION OF IRM ACTION PLAN 14
10.1 Remedial Strategy 14
10.2 Soil 14
10.2.1 Soil Characterization 15
10.2.2 Reuse of Soil 16
10.3 Groundwater 17
10.3.1 Off-Site Well 19
10.4 Confirmatory Soil Samples 20
10.5 Confirmatory Groundwater Samples 21
10.6 Groundwater Accumulation in Pit 22

11 Evaluation of Remedial Alternatives 22
11.1 Protection of Human Health and the Environment 22
11.2 Compliance with Standards, Criteria, and Guidelines (SCGs) 22
11.3 Short and Long Term Effectiveness and Impacts 22
11.4 Implementability 22
11.5 Cost Effectiveness 22
11.6 Community Acceptance 23
11.7 Land Use 23
11.8 Selection of the Preferred Remedy 23

12 HEALTH AND SAFETY PLAN 23
12.1 Personnel Contact Information 23
12.2 Background 24
12.3 Chemical Hazards 24
12.4 Responsibilities of Safety Personnel 25
12.5 Safe Work Practices 25
12.6 Site Security 26
12.7 Respiratory Protection 26
12.8 Air Monitoring 26
12.9 Decontamination 27
12.10 Personal Protection Equipment 29
12.11 Emergency Procedure and Contacts 29
12.12 Regulatory Contacts 29
12.13 Personal Injury in the Work Zone 30
12.14 Fire/Explosion 30
12.15 Route to Hospital 30
12.15.1 Directions to Highland Hospital: 30
12.16 Additional Health and Safety Parameters 31

Table of Contents (Cont'd)

page

13 COMMUNITY AIR MONITORING PLAN (CAMP) 31
13.1 Fugitive Dust 32
13.2 Vapor Emission Response Plan 33
13.3 Major Vapor Emission 33
13.4 Major Vapor Emission Response Plan 34

14 CONTRACTORS SITE OPERATIONS PLAN 34
14.1 Project Organization 34
14.2 Remedial Engineer 35
14.3 IRM Action Construction Schedule 35
14.4 Work Hours 36
14.5 Site Security 36
14.6 Traffic Control 36
14.7 NYSDEC BCP Signage 37

15 SITE PREPARATION 37
15.1 Mobilization 37
15.2 Erosion and Sedimentation Controls 38
15.3 Stabilized Construction Entrance(s) 38
15.4 Utility Marker and Easements Layout 38
15.5 Decontamination Area 38
15.6 Truck Decontamination Area 38
15.7 Site Fencing 39
15.8 Demobilization 39
15.9 Daily Reports 39
15.10 Reporting 40
15.11 Other Reporting 40
15.12 Handling of Groundwater Accumulation 40
15.13 Complaint Management Plan 41
15.14 Deviations from the IRM Work Plan 41

16 INTERIM REMEDIAL MEASURES: MATERIAL REMOVAL FROM SITE 41
16.1 End-Point Sampling Frequency 41
16.2 Reporting of Results 42
16.3 QA/QC 43
16.4 DUSR 43
16.5 Estimation Removal Quantities 44
16.6 Stockpile Methods 44
16.7 Materials Excavation and Load Out 44
16.8 Materials Transport Off-Site 45
16.9 Materials Disposal Off-Site 46
16.10 Fluids Management 46
16.11 Stormwater Pollution Prevention 47
16.12 Contingency Plan 48

17 ENGINEERING CONTROLS COMPOSITE COVER SYSTEM 48

18 ENGINEERING CONTROLS: TREATMENT SYSTEMS 48

19 CRITERIA FOR COMPLETION OF REMEDIATION/TERMINATION OF REMEDIAL SYSTEMS 48

Table of Contents (Cont'd)

		page
20	INSTITUTIONAL CONTROLS	49
20.1	Environmental Easement	49
21	INTERIM REMEDIAL MEASURE CONSTRUCTION COMPLETION REPORT (IRM CCR)	49

TABLES

Table 1 Day-Soil Samples, 2004
Table 2 Day-Groundwater Samples, 2004
Table 3 Soil - Vapor Samples, September 9, 2008
Table 4 Borehole PID Data, August 6-7, 2007
Table 5 Borehole Boundary PID Data, August 6-7, 2007
Table 6 Soil – VOCs, August 6-7, 2007
Table 7 Soil – SVOCs, September 4, 2007
Table 8 Soil – Pesticides/Aroclors, August 6-7, 2007
Table 9 Soil – TAL Metals, August 6-7, 2007
Table 10 Waste Characterizations –TCLP, August 7, 2007
Table 11 Waste Characterization-Landfill Application, August 7, 2007
Table 12 Groundwater-VOCs, September 2007 & May 2008
Table 13 Groundwater-SVOCs, September 2007 & May 2008
Table 14 Groundwater-Pesticides/PCBS, September 2007
Table 15 Groundwater-TAL Metals, September 2007

FIGURES

Figure 1 Location Map
Figure 2 Tax Map
Figure 3 Proposed Excavation
Figure 4 Geoprobe® and Sample Location Map
Figure 5 PID, 0′-4′ Depth
Figure 6 PID, 4′-8′ Depth
Figure 7 PID, 8′-12′ Depth
Figure 8 Groundwater Data
Figure 9 September 2007, Groundwater Contours
Figure 10 May 2008, Groundwater Contours
Figure 11 Boundary Vapor Points
Figure 12 ALTA/ACSM Survey
Figure 13 Route to Hospital
Figure 14 Maintenance & Protection of Traffic Plan
Figure 15 Remedial Site Plan
Figure 16 Off-Site Well Location
Figure 17 Directions to Mill Seat Landfill from 37 Bittner Street

APPENDICES

Appendix 1 Metes & Bounds
Appendix 2 Sanborn® Maps
Appendix 3 Community Air Monitoring Plan/Fugitive Dust and Particulate Monitoring
Appendix 4 Sample CAMP Logs, PID Screening Logs, and Daily Report Logs
Appendix 5 Technical Guidance Documents, FWRIA Decision Key and CP-43
Appendix 6 Soil Boring Logs, Well Construction Diagrams and Soil Vapor Log
Appendix 7 Carbon Filter Data Sheet and Schematic and Draft BCP Sign
Appendix 8 Personnel Qualifications

LIST OF ACRONYMS

Acronym	Definition
AOC	Areas of Concern
ASP	Analytical Services Protocol
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
CAMP	Community Air Monitoring Plan
CFR	Code of Federal Regulations
COC	Certificate of Completion
CQAP	Construction Quality Assurance Plan
DER	Department of Environmental Resources
DSHM	Division of Solid & Hazardous Materials
DUSR	Data Usability Summary Report
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Accreditation Program
FWRIA	Fish and Wildlife Resources Impact Analysis
H&S	Health and Safety
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
IC/ECs	Institutional/Engineering Controls
IRM CCR	Interim Remedial Measures Construction Completion Report
IRM WP	Interim Remedial Measures Work Plan
JPEG	Joint Photographic Experts Group
LLC	Limited Liability Company
MCDOH	Monroe County Department of Health
NYCRR	New York Codes Rules and Regulations
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OSHA	Occupational Safety and Health Administration
OVM	Organic Vapor Meter
PCB	Polychlorinated Biphenyl
PDF	Portable Document Format (Adobe/Acrobat)
PID	Photoionization Detector
QAPP	Quality Assurance Project Plan
QHHEA	Qualitative Human Health Exposure Assessment
RAOs	Remedial Action Objectives
RCRA	Resource Conservation & Recovery Act of 1976
RI	Remedial Investigation
SCG	Standards, Criteria and Guidance
SCO	Standards, Criteria and Objectives
SMP	Site Management Plan

Acronym	Definition
SOP	Contractors Site Operations Plan
SPDES	State Pollutant Discharge Elimination System
SVOC	Semi-Volatile Organic Compounds
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TIC	Tentatively Identified Compounds
TOGS	Technical and Operational Guidance Series
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound
YWCA	Young Woman's Christian Association

EXECUTIVE SUMMARY

SITE DESCRIPTION/PHYSICAL SETTING/SITE HISTORY

The Kirstein Building Associated Parking Lot property (hereinafter referred to as the "Site") is located at 37 Bittner Street parcel, on the west side of Bittner Street and at the north side of the Kirstein Building parcel located at 242 Andrews Street in downtown Rochester (see Figure 1). The Site is presently utilized as a public parking lot.

Prior to the City reconfiguring streets in the site area circa 1980, Bittner Street was the northern extension of Franklin Street. Sanborn® Fire Insurance maps and Polk City directories indicate that the Site was historically comprised of two parcels listed as 191 and 201 Franklin Street.

The historical northern parcel (201 Franklin Street) comprising the Site was utilized as a public gas station from 1925 through 1965; it was listed as Franklin Street parking lot and gas station, Monroe Union Oil Co., Inc. gas station, and John J. DeCamilla gas station.

In November and December 2004, Day Environmental, Inc. (Day) identified soil and groundwater contamination on the north side of the Site associated with the historical gas station operations from 1925 to 1965.

The entity 234-254 Andrew Street, LLC is participating as a Volunteer in the Brownfield Cleanup Program (BCP) to facilitate remediation of the Site (NYSDEC BCA Index No. Index #B8- 0692-05-04, Site No. C828127, dated August 31, 2005).

SUMMARY OF THE REMEDIAL INVESTIGATION (RI) ACTIONS

Day Environmental (Day)

- In 2004, Day performed a test boring investigation and installed three monitoring wells at the Site (see Figure 11).

Passero Associates

The Passero Associates Remedial Investigation (RI) consisted of the following actions:

- We conducted an electromagnetic survey (EM) by EM-61 on January 7, 2007 to investigate for underground storage tanks (USTs).

- A test pit investigation of EM anomalies was completed on July 14, 2007. Piedmont Equipment Inc. was contracted to excavate the test pits. Three test pits approximately 3 feet (ft) wide by 8ft long by 12 ft deep were excavated.

- On September 9, 2008, we conducted a boundary vapor investigation with four data points on the north, south, east and west site boundaries.

- From August 6, 2007 to August 8, 2007, Passero Associates conducted a subsurface investigation of the Site. Four subsurface soil samples were collected using a Geoprobe® direct push drill rig on the north, south, east, and west sides of the Site to satisfy BCP boundary investigation requirements. To delineate identified contamination, the area of concern was divided into a 15-foot by 15-foot grid and twenty three (23) soil borings were advanced with a Geoprobe®. Soil samples were screened with a RAE® Systems MiniRAE 2000 organic vapor meter equipped with a photoionization detector (PID). Soil sample locations are depicted on Figure 4.

- One contaminated soil sample was collected in the vicinity of borehole D5 between 8 and 12 ft below ground surface (BGS) on August 7, 2007 and submitted for full Toxicity Characteristic Leaching Procedure (TCLP) analysis and for RCRA characterization. The results were used to characterize soils for landfill approval.

- Passero Associates installed five boundary monitoring wells on August 6 to August 10, 2007. MW D1 is a deep well (33 feet), which was clustered with an existing, shallow well installed by Day in 2004 (MW S1). MW-2 and MW-4 are on the north boundary. MW-5 is on the west boundary. MW-6 is on the south boundary. Wells S1, MW-3 and MW-7 are existing Day wells (see Figure 11).

RI INVESTIGATION RESULTS

Day Environmental

Day installed three groundwater monitoring wells in 2004; two groundwater samples exhibited petroleum contamination at orders of magnitude greater than NYSDEC TOGS 1.1.1 Groundwater Standards. Day's data is tabulated in Tables 1 & 2 at the end of this document.

Passero Associates

Our contractor, Geomatrix Consultants (Geomatrix) established a grid to facilitate data location and conduct the EM-61 survey across the extent of the Site. Their report, including the EM-61 data, is presented in Appendix 2 of Passero's March 2010 RI report.

No USTs were discovered during the test pit excavation activities. During the conduct of test pit excavation activities, concrete with rebar, metal piping, a water heater, and a hydraulic lift system were identified and removed.

The results of the Boundary Vapor Sampling are tabulated in Table 3 at the end of this document. These sub-surface boundary vapor data do not appear to be of concern because there are no occupied structures on the Site at this time. This deferment will be addressed in the Site Management Plan to ensure that the need to conduct a soil vapor intrusion investigation will be evaluated in the event that future development takes place at the Site. It is anticipated that if contaminated soils are removed, the source of the sub-surface vapors will be mitigated.

The results of the sub-surface soil investigation are tabulated in Tables 4-9 at the end of this document. The boundary soils analysis revealed no VOCs exceeding the Part 375 Restricted and Unrestricted Standards, Criteria and Objectives (SCOs). Based on the PID measurements, approximately 2,400 tons of contaminated soil have been identified. The majority of contaminated soils were encountered between the depths of 8 ft BGS to 15 ft BGS. The approximate dimensions of the highly contaminated zone are 75 feet by 75 feet by 7 feet in thickness; this computes to approximately 39,375 cubic feet, or approximately 1,460 cubic yards of contaminated soils. Using a conversion factor of 1.6 tons of soil per cubic yard, approximately 2,400 tons of contaminated soils are present.

Based on the results of the TCLP analysis, contaminated soil will be acceptable for disposal as "cover soil" at Waste Management's Mill Seat Landfill.

Two rounds of groundwater sampling were conducted on September 13-15, 2007 and on May 29-30, 2008. Based on the NYSDEC review of the September 2007 groundwater data, it was determined that the second round of groundwater samples would be analyzed for VOCs and SVOCs only. The results of the groundwater analysis are tabulated in Tables 12-15 at the end of this document. As indicated on Figure 8, groundwater collected from monitoring wells MW Sl, MW D1, MW-2, MW-3, MW-4, MW-5, and MW-7 contain petroleum hydrocarbons at concentrations above the TOGS 1.1.1 Groundwater Standards.

GEOLOGY/HYDROGEOLOGY

Soils identified at the Site during this investigation consist of fine- to medium-grained sands over a silt/clay till layer. Saturated conditions were encountered at an average depth of 13 ft BGS. Bedrock was encountered at a depth of 33.5 ft BGS.

Based on groundwater elevation data, groundwater flow direction beneath the Site is to the northwest (see Figures 9 & 10).

The Genesee River is approximately 0.15 miles west of the Site.

There is public water serving the area, and the City of Rochester does not permit the use of groundwater for drinking water, or any other purposes.

QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

Summary of Human Exposure Pathways

Human populations at or near the Site are considered potential receptors. These populations include construction and remediation workers at the Site who could potentially encounter contaminants in soil and/or groundwater on a short-term basis during construction activities such as soil excavation.

The following exposure pathways are considered most applicable to the Site:

- Dermal absorption through direct contact with soil and water;
- Incidental soil ingestion, and;
- Inhalation of airborne volatiles and particulates.

POTENTIAL EXPOSURE PATHWAYS FOR SOIL

Current and Potential Future Exposure Pathways if Remediation Were Not Conducted

The Site is currently used as a public parking lot. Contaminated soils are identified at an approximate depth of 8 ft BGS to 15 ft BGS; there is no potential for contaminated soil exposure with continued use as a parking lot. The area is served by public water; therefore, there is no potential for contaminated groundwater exposure.

Potential Remediation and Construction Activities

There will be potential for the remediation contractors to come into contact with contaminated soils. By following the requirements of the site health and safety plan including dermal protection and air monitoring and respiratory protection to mitigate concerns relative to exposure during contaminated soil excavation, the potential for contact with contaminated soils is minimized.

Potential Exposure Pathways that Could Remain After Remediation

We propose to remove all soils with contamination levels greater than Part 375 Unrestricted SCO. Based on the proposed Track 1 cleanup, all soil/fill material with contamination greater than 6NYCRR Part 375 Unrestricted Use SCOs for all compounds will be excavated and disposed off-site according to applicable state and federal regulations. When remediation is complete, there will be no soils remaining with concentrations greater than SCOs; therefore, there will be no potential for future exposure to contaminated soils at the Site.

POTENTIAL EXPOSURE PATHWAYS FOR GROUNDWATER

Current and Potential Future Exposure Pathways if Remediation Were Not Conducted

Since groundwater is not used in the City of Rochester, there are no potential exposure pathways for contact with the contaminated groundwater.

Potential Remediation and Construction Activities

During the course of remediation activities, groundwater will be encountered. We propose to remove up to 50,000 gallons of contaminated groundwater during remediation; therefore, there

will be potential for the contractors to come into contact with the contaminated groundwater. By following the requirements of the site health and safety plan, which includes dermal protection and air monitoring and respiratory protection to mitigate concerns relative to exposure during groundwater removal, the potential for contact with contaminated groundwater is minimized.

Potential Exposure Pathways that Could Remain After Remediation

If groundwater sumps are installed in the basement of the proposed building, the potential would exist for exposure to residual contaminated groundwater in the sump if the remedial measures do not achieve TOGS 1.1.1 Groundwater Standards.

CURRENT AND POTENTIAL FUTURE EXPOSURE PATHWAYS FOR SOIL GAS AND AIR

Current and Potential Future Exposure Pathways if Remediation Were Not Conducted

The property will be developed as a mixed use residential/commercial development. Parking and commercial space are proposed for the basement and first floor; the upper floors will be used as residential apartments. If remediation were not conducted, contractors on-site during redevelopment would be exposed to contaminated soils and groundwater. Further, there would be potential vapor intrusion into the new site building.

Potential Exposure During Remediation and Construction Activities

There is potential for the remediation contractors to be exposed to contaminated soils and/or groundwater during remediation. By following the requirements of the site health and safety plan, which includes dermal protection and air monitoring and respiratory protection to mitigate concerns relative to exposure during groundwater removal, the potential for contact with contaminated groundwater is minimized.

POTENTIAL EXPOSURE PATHWAYS THAT COULD REMAIN AFTER REMEDIATION

The source of soil vapors is the contaminated soils and groundwater beneath the north side of the Site. The contaminated soil and groundwater removal will mitigate the source area. Potential future exposures could occur in the proposed building on the Site until the remediation activities have resulted in compliance with the TOGS 1.1.1 Groundwater Standards.

It should be noted that visitors to the construction site could also be exposed to vapors or fugitive dust released during construction activities. However, their exposures would be occasional (during a visit) and for relatively short periods of time (i.e. one to two hours) so that their overall exposures would be less than the exposures to construction workers.

SUMMARY OF ENVIRONMENTAL IMPACTS

Based on this assessment, potential exposures were found to occur only during site remediation, but not under future use scenarios, thus not impacting future occupants of the proposed site building. The following potential exposure pathways were determined to be complete during the construction activities:

- Potential exposures of construction and remediation workers to soil and groundwater during construction activities.

After the remediation has been completed, a Vapor Intrusion Plan should be prepared to evaluate the potential for vapor intrusion for any new buildings on the Site.

SUMMARY OF THE REMEDY

Soil

- Based on the proposed Track 1 cleanup, all soil/fill material with contamination greater than 6NYCRR Part 375 Unrestricted Use SCOs for all compounds will be excavated and disposed off-site according to all applicable state and federal regulations.

- Passero Associates will inspect the excavated soils and segregate soils based on visual appearance, odors, and organic vapor readings.

- In general, soils that exhibit organic vapor readings less than 5 parts per million (ppm) and appear visually uncontaminated will be staged for characterization and potential re-use off-site.

- The contaminated soils will be loaded directly into trucks for off-site disposal.

- Prior to re-use off-site, the excavated soils will be sampled in conformance with DER-10 Table 5.4(e) 10 (See Table 5.4(e)10 in Section 10.2.1). If compliance with the SCOs is verified, these soils will be re-used off-site in accordance with DER-10 Table 5.4 (e)4 (See Table 5.4(e)10 in Section10.4). If the soils are not in compliance with SCOs, they will be disposed of in accordance with all applicable state and federal regulations.

- Confirmatory soil samples will be collected from the bucket based on the field screening results (i.e. visual, odor, and PID results).

The analytical parameters for the confirmatory soil samples will be TCL VOCs plus TICs, TCL SVOCs plus TICs, TAL Metals plus Cyanide, Pesticides, and PCBs to confirm compliance with 6NYCRR Part 375 Unrestricted Use SCOs.

The laboratory analysis will be performed by a NYDOH Environmental Laboratory Approval Program (ELAP) approved laboratory. The laboratory data deliverables package will be ASP Category B deliverable.

The number of confirmatory soil samples will be based on the size of the excavation and will be in accordance with Section 5.4(b) 5. i and ii (1) and (2) of DER-10 (See Section 10.4)

Groundwater

- Contaminated groundwater will be pumped from the excavation, as needed, to dewater the contaminated soils.

- The groundwater will be pumped into a 21,000-gallon fractionalization tank and sampled for waste disposal characterization.

  The pumped groundwater will be treated (if required) and discharged to the City of Rochester sewer system. A sanitary sewer use permit will be obtained from the Monroe County Division of Pure Waters District #8575 prior to the discharge of any groundwater collected at the Site to the City's sanitary sewer system. A copy of the issued sewer use permit will be provided to the NYSDEC prior to the discharge of groundwater to the City of Rochester's sanitary sewer system.

  If the total volatile organic levels exceed 2.31 ppm, all stored groundwater will be treated through activated carbon prior to discharge. The water treatment system will be the United Manufacturing International, Model AFD-55 or its equivalent, which uses a carbon filter to reduce the contaminants. The product data sheet and Schematic for the filter is in Appendix 7.

- The liquids generated at the Site will be discharged into the sanitary sewer in accordance with the sanitary sewer use permit obtained from the Monroe County Pure Waters. The wastewater samples collected will be analyzed as stipulated in the sanitary sewer use permit issued to the Site. The wastewater will be discharged in accordance with the requirements of the sanitary sewer use permit.

- As indicated on Figure 3, the proposed limits of the excavation will be to the north of existing monitoring well MW-7; wells MW-S1 and -D1, MW- 2, and MW-4 are within the area to be excavated and will be destroyed during soil excavation. As we do not propose to backfill the excavation, we will not replace the monitoring wells that have been removed.

- The groundwater monitoring wells at the Site will be decommissioned in accordance with Commissioners Policy on Monitoring Well Decommissioning (CP-43) (Appendix 5).

- The damaged well casing on deep well MW-Dl will be repaired to allow future sampling of this well. Once the IRM has been implemented, a meeting will be held between the

NYSDEC, the NYSDOH, Passero Associates, and the Applicant to determine the best approach to address the groundwater monitoring issues, such as reinstallation of groundwater monitoring wells and groundwater monitoring frequency.

If it is later decided that backfilling the excavation is necessary, then any backfill material to be imported to the Site will be in accordance with 6NYCRR Part 375-6.7(d). Sampling of the backfill material to be imported to the Site will be in accordance with Section 5.4(e) of DER-10 (See Table 5.4(e)10 in Section 10.2.1). The analytical results will be submitted to the NYSDEC for review. The NYSDEC will either approve or reject the backfill material for use at the Site. NYSDEC approval will be obtained prior to the importing of backfill material to the Site. The imported backfill material will meet Part 375 Unrestricted Use SCOs for all compounds.

The laboratory analysis will be performed by a NYDOH ELAP-approved laboratory.

The attorneys for 235-250 Andrews Street are negotiating with the owners Kovalsky Carr Electric Supply, whose parking lot is located hydraulically downgradient (northwest) of the Site, to install an off-site well for the purpose of ascertaining the potential impacts of the contaminated groundwater on off-site parcels (see Figure 16).

Engineering/Institutional Controls

- 6NYCRR Part 375 states that the most rigorous remedial effort is the Track 1 for Unrestricted Use approach. In order to maximize their Site options, 234 - 250 Andrews Street, LLC will attempt to achieve Track 1 remedial goals. Track 1 requires that land and groundwater use restrictions or institutional/engineering controls (IC/ECs) will not be employed to obtain the remedial action objectives for the site. One exception is that if groundwater contamination has been reduced to asymptotic levels and other Track 1 goals are achieved, groundwater use restrictions may be employed.

1 INTRODUCTION

The entity 234-250 Andrews Street, LLC entered into a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) on June 13, 2005, to investigate and remediate a 0.315-acre property located at Kirstein Building Associated Parking Lot at 37 Bittner Street in the City of Rochester, Monroe County, New York (hereinafter referred to as the "Site"). The entity 234-250 Andrews Street, LLC is a Volunteer in the Brownfield Cleanup Program (BCP). Mixed residential and commercial uses are proposed for the Site. The basement and first floor of the proposed building will be utilized for parking and commercial space; the upper floors will be residential apartments. Refer to the BCP application for additional details.

This Interim Remedial Measure Work Plan (IRMWP) summarizes the nature and extent of contamination as determined from data gathered during the Remedial Investigation (RI), performed between November 2004 and September 2008. It provides an evaluation of a Track 1 cleanup and is consistent with the procedures defined in DER-10 and complies with all applicable standards, criteria and guidance. The remedy described in this document also complies with all applicable Federal, State and local laws, regulations and requirements. The RI for this Site did not identify fish and wildlife resources.

1.1 Site Location and Description

The Site is located in the County of Monroe, in the City of Rochester, New York and is identified as Tax Account 106.790-0001-022.000 on the City of Rochester Tax Map, Figure 2. The Site is situated on an approximately0.315-acre parcel bound by Kolvalsky-Carr Electric Supply building's parking lot to the west, the Kirstein Building to the east-southeast, Bittner Street to the north, and parking lots to the west (see Figure 1). The ALTA Survey is Figure 12 and the Metes and Bounds are in Appendix 1.

1.2 Contemplated Redevelopment Plan

The IRM Action to be performed under the IRMWP is intended to make the Site protective of human health and the environment consistent with the contemplated end use. The proposed redevelopment plan and end use is described here to provide the basis for this assessment. However, the IRM Action contemplated under this IRMWP may be implemented independent of the proposed redevelopment plan.

The property will be developed as a mixed residential/commercial use building; the basement and first floor are proposed for parking and commercial space and the upper floors will be residential apartments.

1.3 Description of Surrounding Property

The Site is situated in a commercial area in downtown Rochester. It is bound by Kolvalsky-Carr Electric Supply building's parking lot to the west, the Kirstein Building to the east southeast, Bittner Street to the north, and parking lots to the west (see Figure 1). The Young Woman's Christian Association (YWCA) is located across Bittner Street to the north-northeast, and a commercial office building at 222 Andrew Street is located to the southwest.

The Kirstein Building is being renovated as a mixed residential and commercial building.

The Genesee River is approximately 0.15 miles west of the Site.

2 DESCRIPTION OF REMEDIAL INVESTIGATION FINDINGS

The Site was investigated in accordance with the scope of work presented in the NYSDEC-approved RI Work Plan dated October 6, 2006.

2.1 Summary of Remedial Investigations Performed

2.1.1 Soil Borings and Wells

Passero Associates RI consisted of the following elements:

- On September 9, 2008, sub-surface boundary vapor investigation with four data points on the north, south, east and west site boundaries (see Figure 11) was conducted.

- From August 6, 2007 to August 8, 2007, Passero Associates conducted a subsurface investigation of the Site. Four subsurface soil samples were collected using a Geoprobe® direct push drill rig on the north, south, east, and west sides of the Site to satisfy BCP boundary investigation requirements. To delineate identified contamination, the area of concern was divided into a 15-foot by 15-foot grid and twenty three (23) soil borings were advanced with a Geoprobe®. Soil samples were screened with a RAE® Systems MiniRAE 2000 organic vapor meter equipped with a photoionization detector (PID). Soil sample locations are depicted on Figure 4.

- Passero Associates installed five boundary monitoring wells on August 6 to August 10, 2007. MW D1 is a deep well (33 feet), which was clustered with an existing, shallow well installed by Day in 2004 (MW S1). MW-2 and MW-4 are located on the north

boundary. MW-5 is located on the west boundary. MW-6 is located on the southern boundary. Wells MW S1, MW-3 and MW-7 are existing Day wells.

2.1.2 *Samples Collected*

- Eight soil samples (North C1, D1, South Boundary, West Boundary, Northeast A1, East A3, A2 and Deep A2) were collected for laboratory analysis. The soil sample locations are shown on Figure 4. Samples A2 and Deep A2 were taken from the same location;
- One of the contaminated soil samples was collected for full TCLP analysis and for RCRA characterization;
- Two groundwater sampling events (sixteen total samples) were conducted; and
- Four soil gas samples were collected.

2.1.3 *Chemical Analytical Work Performed*

The Remedial Investigation's laboratory analytical data are tabulated in Tables 1-15 at the end of this document.

2.1.4 *Geophysical Work, Test Pits, Other*

2.1.4.1 Electromagnetic Survey

To investigate for USTs, an electromagnetic survey (EM) by EM-61 was conducted on January 7, 2007. Our contractor, Geomatrix established a grid to facilitate data location and conduct the EM-61 survey across the extent of the Site. The EM-61 anomalies were investigated on July 14, 2007, as described below.

2.1.4.2 Test Pits

A test pit investigation of the EM-61 anomalies was conducted on July 14, 2007. Piedmont Equipment Inc. was contracted to excavate the test pits. Three test pits measuring approximately 3 ft wide by 8 ft long by 12 ft deep were excavated. The excavated material was stockpiled for re-use as backfill. Additional excavation was conducted to remove concrete with rebar, metal piping, a water heater, and a hydraulic lift system that were revealed during test pit activities. No USTs were discovered during the test pit excavations. The test pits were backfilled with the stockpiled material and approximately 10 cubic yards of

crushed stone. The backfill material was compacted, and the surface was covered with compacted crushed stone. The unregulated concrete and metal debris were disposed of in a scrap yard/recycling facility.

2.2 Summary of RI findings

During the RI, petroleum contamination was confirmed in both Site soils and groundwater.

The sub-surface boundary vapor data do not appear to be of concern because there are no occupied structures on the Site at this time. This deferment will be addressed in the Site Management Plan to ensure that the need to conduct a soil vapor intrusion investigation will be evaluated in the event that future development takes place.

It is anticipated that if the contaminated soils are removed, the source of the sub-surface vapors will be mitigated.

3 SITE HISTORY

3.1 Past Uses and Ownership

The Kirstein Building Associated Parking Lot at 37 Bittner Street parcel (the Site) is currently used as a parking lot; prior to the City reconfiguring streets in the subject area in circa 1980, Bittner Street was the northern extension of Franklin Street. Sanborn® Fire Insurance maps and Polk City directories indicate that the Site was historically comprised of two parcels listed as 191 and 201 Franklin Street. The northern parcel (201 Franklin Street) was utilized as a public gas station from at least 1930 through 1960; it was listed as Franklin Street parking lot and gas station, Monroe Union Oil Co., Inc. gas station, and John J. DeCamilla gas station.

3.2 Phase I and Phase II Reports

Passero Associates Conducted a Phase I Environmental Site Assessment (ESA) of the Site and the adjoining Kirstein Building property, dated March 14, 2005. In our ESA we concluded the following relative to the subject of this IRMWP:

The northern portion of the Kirstein Building Associated Parking Lot at 37 Bittner Street parcel, historically listed as 201 Franklin Street, was a public gas station from at least 1930 through 1960. Day identified an approximate area of soil contamination 65-feet long by 50-feet wide of gasoline-impacted soils. Two groundwater samples collected by Day also revealed petroleum contamination greater than the NYSDEC Groundwater standard.

It is unknown whether underground gasoline tanks remain on site.

3.3 Sanborn® Maps

The 1892, 1911, 1950 and 1971 Sanborn® Fire Insurance maps are included in Appendix 2.

The Site is currently used as a parking lot; prior to the City reconfiguring streets in the subject area in circa 1980, Bittner Street was the northern extension of Franklin Street. Sanborn® Fire Insurance maps and Polk City directories indicate that the Site was historically comprised of two parcels listed as 191 and 201 Franklin Street. The northern parcel (201 Franklin Street) was utilized as a public gas station from at least 1930 through 1960; it was listed as Franklin Street parking lot and gas station, Monroe Union Oil Co., Inc. gas station, and John J. DeCamilla gas station.

The 1950 Sanborn® Fire Insurance map indicates that the filling station had several tanks.

3.4 Geological Conditions

Soils identified at the Site during this investigation consist of fine- to medium-grained sands over a silt/clay till layer. Saturated conditions were encountered at an average depth of 13 feet BGS. Bedrock was encountered at a depth of 33.5 feet BGS. The soil boring logs are included in Appendix 6.

Groundwater depth and flow direction calculated for September 2007 and May 2008 events are depicted on Figures 9 & 10. The Genesee River is approximately 0.15 miles west of the Site.

3.5 Contamination Conditions

3.5.1 On-Site

Approximately 2,400 tons of contaminated soils have been identified at the Site. The majority of contaminated soils were encountered between the depths of 8 ft BGS to 15 ft BGS. The approximate dimensions of the highly contaminated zone are 75 feet by 75 feet by 7 feet in thickness; this computes to approximately 39,375 cubic feet, or approximately 1,460 cubic yards of contaminated soils. Using a conversion factor of 1.6 tons of soil per cubic yard, approximately 2,400 tons of contaminated soils are present.

3.5.2 Off-Site

No off-site investigation has been completed. The attorneys for 235-250 Andrews Street are negotiating with the owners of Kovalsky Carr Electric Supply, whose parking lot is located hydraulically downgradient (northwest) of the Site, to install an off-site well for the purpose of ascertaining the potential impacts of the groundwater contamination off-site (see Figure 16).

4 DESCRIPTION OF AREAS OF CONCERN

As indicated on Figure 8, groundwater collected from the monitoring wells located on the northern portion of the Site (MW Sl, MW D1, MW-2, MW-3, MW-4, MW-5 and MW-7) contain petroleum hydrocarbons at concentrations above the TOGS 1.1.1 Groundwater Standards. This on-site groundwater investigation confirmed that contaminated groundwater is present that requires remediation. A Remedial Action Plan will address the groundwater plume after the IRM Actions have been implemented at the Site.

5 SUMMARY OF SOIL/FILL DATA

Approximately 2,400 tons of petroleum-contaminated soils are estimated at the Site. The majority of contaminated soils were encountered between the depths of 8 ft BGS to 15 ft BGS. The approximate dimensions of the highly contaminated zone are 75 feet by 75 feet by 7 feet in thickness; this computes to approximately 39,375 cubic feet, or approximately 1,460 cubic yards of contaminated soils. Using a conversion factor of 1.6 tons of soil per cubic yard, approximately 2,400 tons of contaminated soils are identified.

5.1 Comparison of Soil/Fill with SCGs

The results of the soil analysis were compared to the applicable 6NYCRR Part 375 Track 1 Unrestricted Use Soil Cleanup Objective.

The boundary soils analysis revealed no VOCs exceeding the Part 375 Restricted and Unrestricted SCOs.

The compounds identified in the Site soils are tabulated in Tables 6-9 at the end of this document.

6 SUMMARY OF GROUNDWATER DATA

Groundwater collected from the monitoring wells on the northern portion of the Site (MW S1, MW D1, MW-2, MW-3, MW-4, MW-5 and MW-7) contain VOCs above the TOGS 1.1.1 Groundwater Standards. The compounds identified in groundwater are presented in Tables 12-15 at the end of this document.

The groundwater investigation confirmed that there is an on-site condition that requires remediation. A Remedial Action Plan will address this groundwater plume after the IRM Actions have been implemented at the Site.

6.1 Comparison of Groundwater with SCGs

The results of the groundwater analysis were compared to the TOGS 1.1.1 Groundwater Standards in Tables 12-15 at the end of this document.

7 SUMMARY OF SOIL VAPOR DATA

The results of the September 2008 sub-surface boundary vapor sampling are tabulated in Table 3 at the end of this document.

The sub-surface boundary vapor data do not appear to be of concern because there are no occupied structures on the Site at this time. This deferment will be addressed in the Site Management Plan to ensure that the need to conduct a soil vapor intrusion investigation will be evaluated in the event that future development takes place. It is anticipated that, if the petroleum-contaminated soils are removed, the source of the sub-surface vapors will be mitigated.

8 ENVIRONMENTAL AND PUBLIC HEALTH ASSESSMENTS

8.1 Qualitative Human health Exposure Assessment

This Section presents the Qualitative Human Health Exposure Assessment (QHHEA) and includes a discussion of remedial options under consideration to address the contamination identified by the RI. The QHHEA is performed in conformance with NYSDEC (DER-10) and NYSDOH guidance and is performed to characterize the exposure setting to identify the exposure pathway, and evaluate the contaminant fate and transport.

As stated in the NYSDOH protocol, a complete exposure pathway must have the following five elements present: (1) a contaminant source; (2) contaminant release and transport mechanisms; (3) a point of exposure; (4) a route of exposure; and (5) a receptor population.

The contaminant source is the location where contaminants were released to the environment (any waste disposal area or point of discharge).

Contaminant release and transport mechanisms carry contaminants from the source to a point where people may be exposed.

The point of exposure is a location where actual or potential human contact with a contaminated medium may occur.

The route of exposure is the manner in which a contaminant actually enters or contacts the body (e.g. ingestion, inhalation, or direct contact). The receptor population is the people who are, or may be, exposed to contaminants at a point of exposure.

A potential exposure pathway exists when any one or more of the five elements comprising an exposure pathway is not documented.

An exposure pathway may be eliminated from further evaluation when any one of the five elements comprising an exposure pathway has not existed in the past, does not exist in the present, and will not exist in the future.

8.1.1 Contaminant Source

The contaminant source is the historical gas station that was operated at the Site from 1925 through 1965, resulting in petroleum-contaminated soils and groundwater beneath the asphalt parking lot on the northern portion of the Site.

8.1.2 Contaminant Release and Transport Mechanism

If the VOCs exceeding the 6NYCRR Part 375 SCOs are untreated and left in place, they will continue to be a source of groundwater contamination.

The flow of contaminated groundwater is one transport mechanism for site contaminants. The groundwater potentiometric surface maps indicate that the transport mechanism is the northwesterly flow of groundwater beneath the Site (see Figures 9 & 10).

Contaminant vapor migration is another potential transport mechanism.

8.1.3 Points of Exposure

Human populations at or near the Site are considered potential receptors. These populations include construction and remediation workers, trespassers, local residents/workers, and occupation workers at the Site who could encounter contaminants in soil or groundwater on a short- term basis during construction activities.

The property will be developed as a mixed use residential/commercial development. The basement and first floor are proposed for parking and commercial space and the upper floors will be used for residential apartments.

The following exposure pathways are considered most applicable to the Site:

- Dermal absorption through direct contact with soil and water;
- Incidental soil or water ingestion; and
- Inhalation of airborne volatiles and particulates.

8.2 Potential Exposure Pathways for Soil

The grossly contaminated soils are at an approximate depth of 8 ft BGS to 15 ft BGS. These soils are proposed for removal.

8.2.1 Current and Potential Future Exposure Pathways if Remediation Were Not Conducted

There is potential of exposure under the current use of the parking lot to construction/utility workers who may perform work in or adjacent to the parking lot area.

8.2.2 Potential Exposure During Remediation and Construction Activities

There will be potential for the remediation contractors to come into contact with the contaminated soils and groundwater. By following the requirements of the site health and safety plan, which includes dermal protection and air monitoring and respiratory protection to mitigate concerns relative to exposure during groundwater removal, the potential for contact with contaminated soil is minimized.

8.2.3 Potential Exposure Pathways that Could Remain After Remediation

We propose to remove all soils with contamination levels greater than Part 375 Unrestricted SCO. When remediation is complete, there will be no soils remaining with concentrations greater than SCOs, therefore, no potential for future exposure to contaminated soils will remain.

8.3 Potential Exposure Pathways for Groundwater

Groundwater collected from monitoring wells MW-S1, MW-D1, MW-2, MW-3, MW-4, MW-5 and MW-7 contain volatile organic compounds and semi-volatile organic compounds above the TOGS 1.1.1 Groundwater Standards.

The City of Rochester code prohibits the use of wells for potable water uses within the City's limits.

8.3.1 Current and Potential Future Exposure Pathways if Remediation Were Not Conducted

- There is a potential exposure to groundwater under the site's current use as a parking lot to construction/utility workers performing job duties within and/or adjacent to the Site.

8.3.2 Potential Exposure During Remediation and Construction Activities

- During the course of remediation activities, groundwater will be encountered. We propose to remove up to 50,000 gallons of contaminated groundwater during remediation; therefore, there will be potential for the contractors to come into contact with the contaminated groundwater. By following the requirements of the site health and safety plan, which includes dermal protection and air monitoring and respiratory protection to mitigate concerns relative to exposure during groundwater removal, the potential for contact with contaminated groundwater is minimized.

8.3.3 Potential Exposure Pathways that Could Remain After Remediation

- If groundwater sumps are installed in the basement of the proposed building and the remedial measures fail to achieve TOGS 1.1.1 Groundwater Standards, the potential would exist for exposure to contaminated groundwater in the sump.

- There is a potential for soil and groundwater exposure to construction workers during the redevelopment phase of the Site.

8.4 Current and Potential Future Pathways for Soil Gas and Air

8.4.1 Current and Potential Future Exposure Pathways if Remediation Were Not Conducted

- Contractors during Site development would be exposed to contaminated soils and groundwater.

- There would be potential vapor intrusion into the new Site building.

8.4.2 Potential Exposure During Remediation and Construction Activities

- There is potential for the remediation contractors to be exposed to contaminated soils and/or groundwater. By following the requirements of the site health and safety plan, which includes dermal protection and air monitoring and respiratory protection to mitigate concerns relative to exposure during construction, the potential for contact with contaminated media is minimized.

- There is a potential exposure of nearby residents/workers via fugitive dust and vapor emissions. The Community Air Monitoring Program (CAMP) will be implemented during the duration of the IRM activities. See Appendix 3 for the CAMP.

8.4.3 Potential Exposure Pathways that Could Remain After Remediation

- The source of soil vapors is the contaminated soil and groundwater beneath the northern side of the Site. The contaminated soil and groundwater removal will mitigate the source area. Potential future exposures could occur in the proposed building on Site until the groundwater remediation has achieved TOGS 1.1.1 Groundwater Standards.

- It should be noted that visitors to the construction site could also be exposed to vapors or fugitive dust released during construction activities. However, their exposures would be occasional (during a visit) and for relatively short periods of time (i.e. one to two hours) so that their overall exposures would be less than the exposures to construction workers.

8.5 Fish & Wildlife Resources Impact Analysis

NYSDEC DER-10 requires an on-site and off-site Fish and Wildlife Resources Impact Analysis (FWRIA). However, based on the requirements stipulated in Section 3.10 and Appendix 3C of DER-10, there was no need to prepare an FWRIA for this BCP since there are no fish or wildlife in the adjacent to this commercial site in downtown Rochester. As discussed throughout this IRMWP, the following Site characteristics (as outlined in DER-10 Section 3.10.1) indicate that no FWRIA is needed (Appendix 5)

The remediation is directed toward a specific spill that does not adversely impact fish and wildlife resources.

The Site is a point source of contamination to the groundwater (i.e. historical gas station), which will be prevented from discharging to surface water, and there is no widespread soil contamination of habitat of an endangered, threatened, or special concern species present.

9 REMEDIAL ACTION OBJECTIVES

Based on the results of the RI, the following Remedial Action Objectives (RAOs) have been established for the Site.

9.1 Groundwater

9.1.1 RAOs for Public Health Protection

- To meet the NYSDEC TOGs 1.1.1 Groundwater Standards and Guidance values.
- Prevent ingestion of groundwater containing contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of, volatiles emanating from contaminated groundwater.

9.1.2 RAOs for Environmental Protection

- To meet the NYSDEC TOGs 1.1.1 Groundwater Standards and Guidance values.
- Restore groundwater aquifer, to the extent practicable, to pre-disposal/pre-release conditions.
- Prevent the discharge of contaminants to surface water.
- Remove the source of ground or surface water contamination.

9.2 Soil

9.2.1 RAOs for Public Health Protection

- To meet Track 1 cleanup and 6NYCRR Part 375-6.8(a): Unrestricted Use Soil Cleanup Objectives.
- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure to contaminants volatilizing from contaminated soil.

9.2.2 RAOs for Environmental Protection

- To meet Track 1 cleanup and 6NYCRR Part 375-6.8(a): Unrestricted Use Soil Cleanup Objectives.
- Prevent migration of contaminants that would result in groundwater or surface water contamination.

- Prevent impacts to biota due to ingestion/direct contact with contaminated soil that would cause toxicity or bioaccumulation through the terrestrial food chain.

9.3 Surface Water

9.3.1 RAOs for Public Health Protection

- Prevent ingestion of contaminated water.
- Prevent contact or inhalation of contaminants from impacted water bodies.
- Prevent surface water contamination that may result in fish advisories.

9.3.2 RAOs for Environmental Protection

- Restore surface water to ambient water quality standards for each contaminant of concern.
- Prevent impacts to biota due to ingestion/direct contact with contaminated surface water that would cause toxicity or bioaccumulation through the marine or aquatic food chain.

9.4 Sediment

9.4.1 RAOs for Public Health Protection

- Prevent direct contact with contaminated sediments.

9.4.2 RAOs for Environmental Protection

- Prevent release(s) of contaminant(s) from sediments that would result in surface water levels in excess of (ambient water quality criteria).
- Prevent impacts to biota due to ingestion/direct contact with contaminated sediments that would cause toxicity or bioaccumulation through the marine or aquatic food chain.

10 DESCRIPTION OF IRM ACTION PLAN

The IRM fieldwork activities will commence within four (4) weeks (weather permitting) from the date that the NYSDEC grants approval.

The NYSDEC will be notified at least seven (7) days in advance of any field activities so that appropriate field oversight can be arranged.

10.1 Remedial Strategy

6NYCRR Part 375 states that the most rigorous remedial effort is Track 1 for Unrestricted Use. In order to maximize their Site options, 234 - 250 Andrews Street, LLC will attempt to achieve Track 1 remedial goals. Track 1 requires that land and groundwater use restrictions or institutional/engineering controls (IC/ECs) will not be employed to obtain the remedial action objectives for the Site. One exception is that if groundwater contamination has been reduced to asymptotic levels and other Track 1 goals are achieved, groundwater use restrictions may be employed.

During the RI, petroleum contamination was confirmed in both Site soils and groundwater. In order to determine whether Track 1 Unrestricted Use Soil Cleanup Objectives (SCOs) are obtainable, we propose to excavate soil/fill material that exceeds 6NYCRR Part 375 Unrestricted Use Cleanup Objectives for all compounds. The excavated soils will be disposed of off-site according to all applicable state and federal regulations.

All deviations from the approved IRMWP will be documented in the Interim Remedial Measure Construction Completion Report (IRM CCR).

10.2 Soil

Passero Associates will inspect the excavated soils and segregate soils based on visual appearance, odors, and organic vapor readings (PID readings). In general, soil that exhibits organic vapor readings less than 5 ppm and appears visually uncontaminated will be staged for characterization and potential re-use as backfill. The contaminated soils (organic vapor readings of 5 ppm or greater) will be loaded directly into trucks for off-site disposal.

These soils have been characterized as a non-hazardous petroleum-contaminated waste. We propose final soil disposition at the Waste Management Mill Seat Landfill.

- The extent of soil removal will be based on the Part 375 Unrestricted Use SCOs.

- Impacts that extend beyond the property boundaries, if encountered, will be left in place.

- The impacts at the property boundary will be documented by analytical results and presented in the IRM CCR.

- The volume of material excavated and disposed off-site will be dependent upon laboratory analytical data regardless at what depth the contaminated soil/fill material is found.

- A PID reading of 5ppm will be used as a screening tool to segregate soils. Each backhoe bucket of material will be screened based on visual appearance, odors, and PID readings.

- Soils with a PID reading of 5ppm or greater will be direct loaded into trucks for disposal off-site in accordance with applicable state and federal regulations.

- Soil being staged on the Site will be staged on, and covered (daily) with a double layer of 6-mil poly to prevent precipitation runoff and wind erosion.

- Impacts that extend beyond the property boundary will be defined at the property boundary. The sampling results and any screening results will be presented in the IRM CCR.

After the contaminated soils have been removed, the Site will be enclosed by a chain-link fence for security purposes. Upon receipt of analytical results confirming that sufficient soils have been removed, the excavation will remain open for later construction of a proposed underground parking garage.

The staged soils that register less than 5 ppm will be characterized by laboratory analysis. If the data indicates that the soil/fill material meets the Part 375 Unrestricted Use Cleanup objectives for all compounds and the NYSDEC approval has been obtained then this material will be transported off-site for use as granular fill soil on a yet-to-be determined construction project.

10.2.1 Soil Characterization

The staged soils are proposed to be characterized for laboratory analysis in conformance with DER-10 Table 5.4(e)4 below. If confirmed to be in compliance with Part 375 Unrestricted Use SCO's, these soils are proposed for re-use off site as granular fill soils or a yet-to be-determined construction project(s).

The number of samples collected for determining if the soil/fill material can be transported for re-use off site staged will be dictated by the volume of staged soil/fill material. Soil fill material samples to be analyzed for VOCs will be grab/discrete samples. The following table NYSDEC DER-10 Table 5.4(e) 10 will be used as guidance for the number of samples to be collected. The soil/fill material will meet Part 375 Unrestricted Use SCOs for all compounds in order to be re-used off-site. If the soil/fill material cannot be re-used off-site is will be disposed of in accordance with all applicable state and federal regulations.

DER 10-Table 5.4(e)10 Recommended Number of Soil Samples for Soil Imported to or Exported From a Site			
Contaminant	**VOCs**	**SVOCs, Inorganics & PCBs/Pesticides**	
Soil Quantity (cubic yards)	Discrete Samples	Composite	Discrete Samples/Composite
0-50	1	1	3-5 discrete samples from different locations in the fill being provided will comprise a composite sample for analysis
50-100	2	1	
100-200	3	1	
200-300	4	1	
300-400	4	2	
400-500	5	2	
500-800	6	2	
800-1000	7	2	
1000	Add an additional 2 VOC and 1 composite for each additional 1000 cubic yards or consult with DER		

10.2.2 Reuse of Soil

DER 10-Table 5.4 (e)4 Reuse of Soil [for Paragraph 5.4(e)4]		
Soil on the Site Meets:	**Reuse on the Site:**	**Off-site Export & Reuse:**
Unrestricted Soil SCGs	Without restrictions	Without restrictions
Meets the applicable Use-based and Groundwater Protection SCG and where appropriate Protection of Ecological Resources Soil SCGs for a Site w/an IC & SMP.	In the soil cover/cap or as backfill within the area of the site subject to the IC	Not allowed, unless going to a site with IC subject to a 6NYCRR Part 360 Beneficial Use Determination (BUD).
Meets Site-specific Background soil Levels.	Without restrictions. (Does not apply to sites in the BCP.)	Not allowed, unless going to a site with IC subject to a 6NYCRR Part 360 BUD
Site-specific cleanup goals for subsurface soil	Placement below the soil cover/cap within the area of the site subject to the IC	Not allowed, unless going to a site with IC subject to a 6NYCRR Part 360 BUD

The laboratory analysis will be performed by a NYDOH ELAP-approved laboratory.

Any soil/fill material exported from the Site that does not meet Part 375 Unrestricted Use SCOs will be disposed in accordance with all applicable state and federal regulations.

The contaminated soils will be loaded directly into trucks for off-site disposal. These soils have been characterized as a non-hazardous petroleum-contaminated waste. We propose final disposition of these soils at Waste Management's Mill Seat Landfill.

All soil/fill material from the Site that will be used as either on-site or off-site fill material will be characterized by laboratory analysis for TCL VOCs plus TICs, TCL SVOCs plus TICs, TAL Metals, Cyanide, PCBs, and Pesticides and NYSDEC approval will be obtained before the soil/fill material is used on-site or transported off-site.

The proposed limits of the excavation will be to the north of existing monitoring well MW-7; wells MW-Sl and -D1, MW-2, and MW-4 are within the area to be excavated, and will be destroyed during soil excavation (see Figure 3). As we do not propose to backfill the excavation; we will not replace the monitoring wells that have been removed.

The extent of soil removal will be based on the Part 375 Unrestricted Use SCOs.

Impacts that extend beyond the property boundaries will be left in place, if encountered.

If it is later decided that backfilling the excavation is necessary then any backfill material to be imported to the Site it will be in accordance with 6NYCRR Part 375-6.7(d). Sampling of the backfill material to be imported to the Site will be in accordance with Section 5.4(e) of DER-10 (see Table 5.4(e)10 in section 10.2.1). The analytical results will be submitted to the NYSDEC for review. The NYSDEC will either approve or reject the backfill material for use at the Site. NYSDEC approval will be obtained prior to the importing of backfill material to the Site. The imported backfill material will meet Part 375 Unrestricted Use SCOs for all compounds. The NYSDEC will be consulted as to the necessity of replacing the monitoring wells.

10.3 Groundwater

We propose to pump contaminated groundwater from the excavation, as needed to dewater the contaminated soils. Groundwater will be pumped into a 21,000-gallon fractionalization tank and sampled for characterization purposes. The pumped groundwater will be treated (if necessary) and discharged to the City of Rochester sanitary sewer system. A sanitary sewer use permit will be obtained from the Monroe

County Division of Pure Waters District #8575 prior to the discharge of any groundwater collected at the Site to the City's sanitary sewer system. A copy of the issued sanitary sewer use permit will be provided to the NYSDEC prior to the discharge of groundwater to the City of Rochester's sanitary sewer system.

If the total VOC concentration exceeds 2.31 ppm, all stored groundwater will be treated through activated carbon prior to discharge. The water treatment system will be the United Manufacturing International, Model AFD-55 or its equivalent, which uses a carbon filter to reduce the contaminants. The product data sheet and Schematic for the filter is in Appendix 7. The used/spent activated carbon will be managed as specified by the supplier or disposed off-site in accordance with all applicable state and federal regulations.

Groundwater that is pumped out of the excavation as part of dewatering activities will be pumped into the fractionalization tank that will be staged on-Site (see Figure 15). The fractionalization tank, containers, and drums that used as part of Site IRM activities will be managed to ensure that there are no releases to the environment due to breakage, rupture, or vandalism.

Any drums/containers that contain any liquid will be placed within secondary containment berms constructed with a double layer of 6mil. Polyethylene sheeting and 4x4 timbers (see Figure 15). However, filled drums/containers will be emptied into the fractionalization tank if they are not in use and will be emptied at the end of each workday.

Liquid waste that is generated as a result of Site activities will be managed according to Section 3.3(e)(5)(ii) of DER-10 that is hereby incorporated by reference.

The liquids generated at the Site will be discharged into the sanitary sewer in accordance with the sanitary sewer use permit obtained from the Monroe County Pure Waters. The wastewater samples collected will be analyzed as stipulated in the sanitary sewer use permit issued to the Site. The wastewater will be discharged in accordance with the requirements of the sanitary sewer use permit.

The proposed limits of the excavation will be to the north of existing monitoring well MW-7; wells MW-Sl and -D1, MW-2, and MW-4 are within the area to be excavated, and will be destroyed during soil excavation (see Figure 3). As we do not propose to backfill the excavation, we will not replace the monitoring wells that have been removed.

The groundwater monitoring wells at the Site will be decommissioned in accordance with CP-43: Commissioners Policy on Monitoring Well Decommissioning (Appendix 5) which states the following:

Within its boring zone, a successfully decommissioned well prevents the following:

1. Migration of existing or future contaminants into an aquifer or between aquifers;
2. Migration of existing or future contaminants within the vadose zone;
3. Potential for vertical or horizontal migration of fluids in the well or adjacent to the well; and
4. Any change in the aquifer yield and hydrostatic head, unless due to natural conditions.

These goals will be achieved by removing any of the existing groundwater monitoring wells within the footprint of the excavation while performing the IRM activities.

The damaged well casing on deep well MW-Dl will be repaired to allow future sampling of this well.

Once the IRM has been implemented, a meeting will be held between the NYSDEC, the NYSDOH, Passero Associates, and the Applicant to determine the best approach to address the groundwater monitoring issues, such as reinstallation of groundwater monitoring wells and groundwater monitoring frequency.

If it is later decided that backfilling the excavation is necessary then any backfill material to be imported to the Site it will be in accordance with 6NYCRR Part 375-6.7(d). Sampling of the backfill material to be imported to the Site will be in accordance with Section 5.4(e) of DER-10 (See Table 5.4(e)10 in Section 10.2.1). The analytical results will be submitted to the NYSDEC for review. The NYSDEC will either approve or reject the backfill material for use at the Site. NYSDEC approval will be obtained prior to the importing of backfill material to the Site. The imported backfill material will meet Part 375 Unrestricted Use SCOs for all compounds. The NYSDEC will be consulted as to the necessity of replacing the monitoring wells.

10.3.1 Off-Site Well

Based on the groundwater collected on-site, a VOC and SVOC-impacted groundwater is migrating off-site and the groundwater contours indicate the plume is moving in a north-northwesterly direction. VOC and SVOC contaminated groundwater has the potential to impact off-site properties such as Kovalsky Carr Electric Supply and Salem United Church of Christ. As per the NYSDEC. a groundwater monitoring well be installed at an off-site location downgradient of the Site to determine if the contaminated groundwater plume is impacting those off-site parcels.

The attorneys for 235-250 Andrews Street are negotiating with the owners of Kovalsky Carr Electric Supply, whose parking lot is located hydraulically downgradient (northwest) of the Site, to install an off-site well for the purpose of ascertaining the potential impacts of contaminated groundwater on off-site parcels (see Figure 16).

10.4 Confirmatory Soil Samples

To confirm that Part 375 Unrestricted Use SCOs are achieved, confirmatory soil samples will be collected after the contaminated soils have been excavated in compliance with DER-10, Technical Guidance for Site Investigation and Remediation, dated May 2010. The approximate dimensions of the soil excavation will be 75 ft by 75 ft, or an approximate perimeter of 280 linear feet. In compliance with DER-10, post remediation confirmatory sampling frequency will be one sample from the bottom of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area. Approximately 10 excavation sidewall samples and 6 excavation bottom samples are proposed. Confirmatory samples will be analyzed for TCL VOCs plus TICs, TCL SVOCs plus TICs, TAL Metals, Cyanide, PCBs, and Pesticides by ASP methodology with Category B deliverable package.

The laboratory analysis will be performed by a NYDOH ELAP-approved laboratory.

Confirmatory samples will be collected from the 0 to 6-inch interval within 24 hours of excavation.

The confirmatory soil samples will be collected from the bucket based on the field screening results (i.e. visual, odor, and PID results).

The analytical parameters for the confirmatory soil samples will be TCL VOCs plus TICs, TCL SVOCs plus TICs, TAL Metals plus Cyanide, Pesticides, and PCBs to confirm compliance with 6NYCRR Part 375 Unrestricted Use SCOs.

The number of confirmatory soil samples will be based on the size of the excavation and will be in accordance with Section 5.4(b) 5.i and ii (1) and (2) of DER-10, which states:

> 5. The following are the minimum confirmation sampling frequencies for soil excavations of:
>
> i. less than 20 feet in perimeter, include one bottom sample and one sidewall sample biased in the direction of surface runoff;
>
> ii. 20 to 300 feet in perimeter, where the remedy is seeking to achieve:

(1) surface soil levels, one sample from the top of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area; and

(2) subsurface soil cleanup levels, one sample from the bottom of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.

Based on the size of the Site, the excavated area is not anticipated to exceed 300 feet in perimeter.

10.5 Confirmatory Groundwater Samples

As indicated on Figure 3, the proposed limits of the excavation will be to the north of existing monitoring well MW-7; wells MW-S1 and -D1, MW-2, and MW-4 are within the area to be excavated, and will be destroyed during soil excavation. As we do not propose to backfill the excavation, we will not replace the monitoring wells that have been removed. The damaged well casing on deep well MW-Dl will be repaired to allow future sampling of this well.

The groundwater monitoring wells at the Site will be decommissioned in accordance with CP-43: Commissioners Policy on Monitoring Well Decommissioning (Appendix 5) which states the following:

Within its boring zone, a successfully decommissioned well prevents the following:

1. Migration of existing or future contaminants into an aquifer or between aquifers;
2. Migration of existing or future contaminants within the vadose zone;
3. Potential for vertical or horizontal migration of fluids in the well or adjacent to the well; and
4. Any change in the aquifer yield and hydrostatic head, unless due to natural conditions.

These goals will be achieved by removing any of the existing groundwater monitoring wells within the footprint of the excavation while performing the IRM activities.

Once the IRM has been implemented, a meeting will be held between the NYSDEC, the NYSDOH, Passero Associates, and the Applicant to determine the best approach to address the groundwater monitoring issues, such as reinstallation of groundwater monitoring wells and groundwater monitoring frequency. Issues surrounding vapor intrusion, such as when to evaluate potential for vapor intrusion with respect to the development of the Site, will also be addressed at this time.

10.6 Groundwater Accumulation in Pit

Once excavation activities are complete, permanent fencing will be installed around the Site. The excavation will be periodically inspected (i.e. during and subsequent to storm events and weekly) to determine if significant amounts of stormwater and groundwater have accumulated. Significant amounts of stormwater and groundwater that might accumulate over time will be removed by pumping water directly into an on-site fractionalization tank to maintain a safe excavation. Extracted stormwater and groundwater will be sampled and analyzed for EPA 601/602 compounds including BTEX and MTBE. If appropriate BTEX levels are met we will secure a discharge permit for Monroe County sanitary sewer. If levels remain too high, on-site treatment will be completed to bring the levels into compliance, then discharged to the Monroe County sanitary sewer, or the water may be pumped and transported for disposal by a NYSDEC Part 364 licensed hauler to a licensed NYSDEC TSDF.

11 Evaluation of Remedial Alternatives

We are proposing a Track 1 remediation that will remove all soils with contamination greater than the Part 375 Unrestricted Use SCOs and all groundwater with contamination greater than the TOGS 1.1.1 Groundwater Standards.

11.1 Protection of Human Health and the Environment

As we are proposing a Track 1 remediation, the protection of human health and the environment is assured.

11.2 Compliance with Standards, Criteria, and Guidelines (SCGs)

As we are proposing a Track 1 remediation, compliance with SCGs is assured.

11.3 Short and Long Term Effectiveness and Impacts

Track 1 remediation is effective in both the short- and long-term.

11.4 Implementability

Source removal is a successful and acceptable remedy.

11.5 Cost Effectiveness

As there are no on-going operational and maintenance costs associated with operating a remediation system, source removal is cost effective.

11.6 Community Acceptance

As we are proposing a Track 1 remediation, Community Acceptance is presumed.

11.7 Land Use

As we are proposing a Track 1 remediation, the land will be suitable for unrestricted residential and commercial development.

11.8 Selection of the Preferred Remedy

As we are selecting a Track 1 remediation, it is acceptable to all criteria (i.e. soil, groundwater, soil vapor, zoning, land use, protection of human health and the environment).

12 HEALTH AND SAFETY PLAN

The Health and Safety Plan (HASP) will be followed during all IRM work conducted at the Site. The HASP outlines specific health and safety practices and procedures associated with the IRM Action conducted at the Site under the BCP. The HASP presents information and procedures, including the assignment of responsibilities, personnel protection requirements, work practices and emergency response procedures for Passero Associates and the contractors who will be conducting excavation of contaminated soils, removal of contaminated groundwater, environmental monitoring, soil and groundwater sampling and health and safety oversight. The HASP is based on an assessment of potential health hazards at the Site, using available historical information.

The HASP will be followed in conformance with regulations found in 29 CFR 1910.120 (OSHA Hazardous Waste Operations and Emergency Response [HAZWOPER]) and 29 CFR 1926 (OSHA Safety and Health Regulations for Construction).

All personnel and subcontractors who enter the Site during field operations and are involved with IRM activities will be required to comply with this HASP.

All individuals involved in the implementation of the remedy will have completed the 40 hour OSHA HAZWOPER training and/or have a current 8 hour OSHA HAZWOPER refresher course certification. The certifications will be made available upon request.

12.1 Personnel Contact Information

PROJECT MANAGER:
Name: Gary W. Passero, P.E.
Telephone: Office: (585) 325-1000

SITE HEALTH AND SAFETY COORDINATOR
Name: Elizabeth Primus
Telephone: Office: (585) 325-1000

FIELD MANAGER
Name: Peter S. Morton, C.P.G.
Telephone: Office: (585) 325-1000
Telephone: Cell: (585) 233-7982

MONROE COUNTY DEPARTMENT OF HEALTH
Name: Jeffrey Kosmala
Telephone: Office: (585) 753-5470

NEW YORK STATE DEPARTMENT OF HEALTH
Name: Katie Fish
Telephone: Office: (585) 423-8156

This HASP addresses the requirements set forth in the OSHA regulations contained in 29 CFR Parts 1910 and 1926. Emergency Contacts have been included in Section 11.11 of the HASP, and can be readily detached in the event of an emergency requiring site evacuation, medical treatment, etc.

12.2 Background

Historical documents indicate that the Site was operated as a public gas station from at least 1930 to 1960. Day's Phase II work in November and December 2004 identified gasoline-impacted soil and groundwater beneath the northern portion of the Site. From August 6, 2007 to August 8, 2007, Passero Associates conducted a subsurface investigation of the Site. Based on the investigations completed, the approximate dimensions of the highly contaminated zone are 75 feet by 75 feet by 7 feet in thickness.

12.3 Chemical Hazards

OSHA states that the HASP should be based on a thorough site characterization and analysis to determine the nature and extent of the actual hazards on a site. The Phase II data generated by Day (Tables 1-2 at the end of this document) in 2004 and the data generated by Passero Associates during the RI are used as a basis for this HASP. The only contaminants are gasoline-related compounds (Tables 6 & 7 at the end of this document).

12.4 Responsibilities of Safety Personnel

The following roles have been identified for Passero project personnel:

Project Manager - The Project Manager has full responsibility for implementing and executing an effective program of employee protection and accident prevention. The Project Manager is responsible for ensuring that Passero field personnel and subcontractors are properly trained.

Site Health and Safety Coordinator/Field Manager - The Site Health and Safety Coordinator or his/her designee will be responsible for enforcement of the HASP for personnel at the Site. Ambient air levels will be monitored with an organic vapor meter (OVM) during all excavation activities.

If unsafe work conditions are identified, the Site Health and Safety Coordinator is authorized to order site personnel to stop work. Resolution of all on-site health and safety problems will be coordinated through the Project Manager.

12.5 Safe Work Practices

Site work will be carried out in conformance with OSHA HAZWOPER and Construction Safety regulations.

The recommended general safety practices for working around the excavation subcontractor's equipment are as follows:

- The excavation contractors will wear hard hats, protective footwear, in conformance with 29 CFR 1926.
- The excavation contractor's equipment will always be inspected prior to use to check for obvious structural damage, loose nuts and bolts, loose or missing guards, cable guides or protective covers, fluid leaks, damaged hoses, cables, pressure gauges or pressure relief valves, and damaged tools and equipment.
- Heavy equipment will not be operated within 20 feet of overhead wires. The site will be clear to ensure the project staff can move around the equipment safely.
- Hard hats and safety boots will be worn in the vicinity of the heavy equipment.

- The excavation contractor will keep the Site and work area tidy. This will prevent personnel from tripping and will allow the safe and expeditious exit from the Site.

12.6 Site Security

Passero Associates will assure that no unauthorized personnel enter the Site while the IRM activities are being conducted.

An orange snow fence will be erected around the perimeter of the work zone, for security, when activities have been halted for the day.

If the excavation is to be left open overnight it will be securely fenced around the perimeter prior to our leaving the Site.

After the contaminated soils have been removed, the Site will be enclosed by a 7-foot chain-link fence with barbed wire in accordance with City of Rochester Code.

Signs reading "Do Not Enter," "No Trespassing," and "Authorized Personnel Only," will be posted on the fencing and entrance gates of the Site.

A BCP sign will be posted, near the entrance to the Site, facing Bittner Street (see Figure 15).

12.7 Respiratory Protection

- Level D respiratory protection will be utilized, and will be upgraded as described below.

- During all excavation activities, ambient air will be screened with an OVM. If reading greater than 25 ppm above background level is registered consistently for a five (5) minute period, Level C respiratory protection will be required.

- If readings greater than 50 ppm above background, work will be halted and health and safety issues will be re-evaluated.

12.8 Air Monitoring

The Community Air Monitoring Plan (CAMP) will be implemented during all intrusive activities at the Site. See Appendix 3 for the CAMP.

Temporary upwind and downwind points will be monitored. Wind direction will be monitored throughout the workday; the locations of the monitoring points will be changed according to the wind direction.

The NYSDOH and NYSDEC will receive copies of the weekly reporting of the CAMP data.

12.9 Decontamination

Prior to the start of field activities, the contractors will construct a decontamination pad with 4x4 timbers and polyethylene sheeting. The location of the decontamination pad is shown on Figure 15.

Excavation equipment will arrive at the Site decontaminated; any equipment arriving at the Site not decontaminated from the previous job will not be granted entrance into the Site.

Equipment Decontamination

Equipment cleaning will be utilized to prevent the transport of waste materials that may be present on the equipment used for intrusive activities (e.g. excavators, loaders). The excavation contractor will select and Passero Associates will approve the methods and approach for equipment decontamination activities. Specific equipment cleaning procedures will be required, at a minimum, to include the following:

- The equipment decontamination pad will be constructed of a double layer of 6 mil. Polyethylene sheeting and 4x4s (see Figure 15). The decontamination water generated will be pumped to the fractionalization tank.

Truck Decontamination

- Vehicles that are driven on-site will be restricted to traveling on a clean ground surface so that when leaving the Site, no contamination is carried off-site. The part of Bittner Street immediately adjacent to the Site entrance will be kept tidy with a shovel to ensure that no significant accumulation of dust and debris is present.

- Vehicles, equipment and materials will be visually inspected for signs of contamination; significant debris and dust will be removed with brooms and if necessary the vehicle or equipment will be moved into the decontamination area (see Figure 14) and washed prior to leaving the Site. Decontamination wastewater will be pumped into the fractionalization tank on-Site (see Figure 14).

Trucks will be inspected and decontaminated (e.g. brushed/swept off and/or pressure washed) prior to leaving the Site.

A truck decontamination pad will be constructed and staged on-site adjacent to the fractionalization tank (see Figure 14). Its construction will include the following, where necessary, to resist rips and tears:

- The decontamination pad dimensions will be approximately 40 feet (length) by 15 feet (width), long and wide enough to contain vehicles, equipment and materials that require decontamination;
- The pad will slope toward a center low point sump to allow for collection of decontamination water and its transfer into the fractionalization tank;
- The pad will be constructed of 60 mil high density polyethylene (HDPE) liner material overlain by a geotextile, and a minimum of 12 inches of clean sub-angular stone will be back filled over the HDPE liner and geotextile;
- A 12-inch high containment berm constructed of clean sub-angular stone will be placed around the perimeter of the decontamination pad; and
- The pad will be equipped with 3-feet high splashguards dropped inside the bermed pad to prevent over spray.

No soil/fill material will be tracked onto the streets surrounding the Site. If soil/fill material is tracked on the roadways/streets surrounding the Site, this material will be cleaned up immediately and containerized for disposal off-Site according to all applicable State and Federal regulations.

Material handling equipment that has come into contact with waste-containing soils will be cleaned in the equipment cleaning area before it enters non-work areas, handles "clean" materials (e.g., backfill), or leaves the site. Equipment cleaning will likely be performed manually, utilizing a high-pressure water spray, and/or steam cleaning.

Liquid materials, such as decontamination water and other residual material collected during equipment decontamination will be pumped to the fractionalization-tank.

No soil/fill material will be tracked onto the streets surrounding the Site. If soil/fill material is tracked onto the roadways/streets surrounding the Site, this material will be cleaned up immediately and containerized for disposal off-site in accordance with all applicable state and federal regulations. The trucks will not be allowed to stand idling for any period of time.

Other measures that will be taken will include scraping the site surface with a front end loader to collect any contaminated soil that may have accumulated on site ground surfaces and staging that soil for proper off-site transportation and disposal with

consideration and proper assessment relative to its mixture with excavated contaminated soil that will be properly characterized through sampling and analyses prior to off-site transportation and disposal.

The wastewater will be pumped into the fractionalization tank and will be sampled and analyzed for EPA 601/602 compounds including BTEX and MTBE. Permitting and on-site treatment will be completed where required prior to discharging to the Monroe County sanitary sewer system.

12.10 Personal Protection Equipment

Field work will be performed utilizing Level D protective gear (i.e. work boots, safety glasses, etc.). Disposable gloves (e.g. nitrile) will be worn while collecting environmental samples. Workers will wear hard hats and steel-toed boots, in conformance with OSHA 1926.

12.11 Emergency Procedure and Contacts

The following standard emergency procedures will be used by on-site personnel. The Site Safety Officer shall be notified of any on-site emergencies and be responsible for ensuring that the appropriate procedures are followed.

- A list of emergency contacts and phone numbers is provided below:
- 911 - Emergency situations requiring immediate response from police, fire department, or ambulance.
    - (800) 457-7362 - NYSDEC Spill hotline
    - (585) 226-5354 - NYSDEC Project Manager Charlotte B. Theobald
    - (518) 423-8156 - NYSDOH
    - (585) 753-5470 - MCDOH
    - (800) 424-9300 - Chemtrec (chemical emergencies)
    - (404) 633-5313 - Centers for Disease Control (biological agents)
    - (800) 424-8802 - National Response Center
    - (202) 426-0656 - USDOT Office of Hazardous Operations
    - (202) 426-8802 - USDOT Regulatory Matters
    - (800) 424-9346 - USEPA RCRA-Superfund Hotline

12.12 Regulatory Contacts

NYSDEC Region 8 Project Manager:	Charlotte B. Theobald	585-226-5354
Monroe County Department of Health:	Jeffrey Kosmala	585-753-5470
NYS Department of Health:	Katie Fish	585-423-8156

12.13 Personal Injury in the Work Zone

Upon notification of an injury in the Work Zone, the affected person will be decontaminated to the extent possible prior to movement. Contact will be made for an ambulance and with the designed medical facility. No persons shall re-enter the work area until the cause of the injury or symptoms is determined.

If the cause of the injury or loss of the injured person does not affect the performance of site personnel, operations may continue. If the injury increases the risk to others, all site personnel shall move to the designated area determined prior to start of project. On-site activities will stop until the added risk is removed or minimized.

12.14 Fire/Explosion

Upon notification of a fire or explosion on-site, all site personnel will be assembled and the fire department will be alerted; all personnel will be moved to a safe distance from the involved area.

- In all situations, when on-site emergency results in evacuation of the work area, personnel shall not re-enter until:
- The conditions resulting in the emergency have been corrected.
- The hazards have been re-assessed.
- The Site Safety Plan has been reviewed.
- Site personnel have been briefed on any changed in the Site Safety Plan.

12.15 Route to Hospital

In the event of a medical emergency, the nearest hospital is Highland Hospital.

12.15.1 Directions to Highland Hospital:

1. South on Bittner Street.
2. Go right on Andrews Street to Left on St. Paul.
3. Merge with South Avenue Highland Hospital on left. Map attached (see Figure 13).

12.16 Additional Health and Safety Parameters

In addition to the Site BCP Health & Safety Plan, our contractor will comply with the following H&S parameters:

Comply with all OSHA, state and local standards or regulations relating to worker safety and occupational vapor exposure.

Have a worker protection plan on file that is available to all employees and is approved by any state or local regulating agencies that require such a plan.

Ensure that appropriate safety equipment such as hard hats, face shields, earplugs, steel-toe boots, and protective gloves are available on the job site during excavation.

Our contractor will ensure that respiratory protection conforms with the requirements in the NIOSH Guide to Industrial Respiratory Protection.

All IRM work performed under this plan will be in full compliance with governmental requirements, including Site and worker safety requirements mandated by Federal OSHA.

234-254 Andrew Street, LLC and associated parties preparing the IRM documents submitted to the State and those performing the construction work, are completely responsible for the preparation of an appropriate Health and Safety Plan and for the appropriate performance of work according to that plan and applicable laws.

The HASP and requirements defined in this IRMWP pertain to remedial and invasive work performed at the Site until the issuance of a Certificate of Completion.

The Site Safety Coordinator will be Elizabeth Primus. A résumé is provided in Appendix 8.

13 COMMUNITY AIR MONITORING PLAN (CAMP)

A Community Air Monitoring Plan (CAMP) (See Appendix 3) requires real time monitoring for VOCs and particulates (i.e. dust) at the downwind perimeter of each designated work area during all ground intrusive activities at the Site. Its intent is to provide a measure of protection for the downwind community (i.e. off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of the IRM work activities.

This IRMWP will be conducted in conformance with the CAMP from DER-10 Appendix 1A (See Appendix 3 of this document).

The NYSDOH and NYSDEC will receive copies of the weekly reporting of the CAMP data.

13.1 Fugitive Dust

A flexible hose will be run from a potable water source inside the adjacent Kirstein Building to the excavation location for the purpose of dust suppression. In order to ensure that fugitive dust does not migrate off-site, a dust monitor will be placed at the downwind boundary of the Site. The dust monitor will be logged every 15 minutes. If particulate levels are detected in excess of 150µg/m^3, dust suppression methods will be employed. The Fugitive Dust and Particulate Monitoring guidelines from DER-10 Appendix 1B will be followed during the duration of the excavation activities. The CAMP and the Fugitive Dust and Particulate Monitoring guidelines will be followed during the duration of the excavation work (Appendix 3).

If necessary, depending on site conditions, real time particulate monitors will be used to continuously monitor dust levels over a sampling period of 15 minutes or less at temporary particulate monitoring stations located down wind and within the work area. Actions to be taken based on measured levels of particulates are presented in the table below. All readings must be recorded and be available for the NYSDEC and the Monroe County and/or New York State Department of Health's review.

Particulate Monitoring, Response Levels, and Actions

Location	Meter Reading	Action
Downwind	> 100 mcg/m	Dust suppression techniques must be employed
Downwind	> 150 mcg/m	Work must be stopped and re-evaluation of activities initiated

Continuous monitoring shall be required for all ground intrusive activities (e.g. soil/waste excavation, test pits).

Periodic monitoring for VOCs shall be required for non-intrusive activities (e.g. collection of soil and sediment samples, collection of groundwater samples from existing monitoring wells). Periodic monitoring may include, but is not limited to, readings taken at the initiation of activities, the removal of a well cap and during bailing and/or purging, etc.

If dust suppression is required during site activities, the following techniques must be implemented where appropriate:

- Wetting equipment and excavation faces;
- Spraying water on buckets during excavation and dumping;
- Covering materials that are being hauled; and
- Restricting equipment speeds.

13.2 Vapor Emission Response Plan

If the ambient air concentration of organic vapors exceeds 5 ppm above background at the perimeter of the excavation, activities will be halted, and monitoring continued. Biosolve will be applied to the excavation areas using a pressure washer. If the organic vapor level decreases below 5 ppm above background, excavation activities can resume provided:

- The organic vapor level 200 feet downwind or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background.

- If the organic vapor level is greater than 25 ppm above background in the breathing zone, work activities will be shut down. When work shutdown occurs, down-wind air monitoring will be conducted to ensure that vapor emissions do not impact the nearest residential or commercial structure.

13.3 Major Vapor Emission

In accordance with NYSDEC DER-10 Generic Community Air Monitoring Plan (Appendix 3), if the total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

If either of the following criteria is exceeded in the determined downwind zone, then the Major Vapor Emission Response Plan shall automatically be implemented.

- Sustained organic vapor levels approaching 5 ppm above background for a period of more than 30 minutes, or

- Organic vapor levels greater than 5 ppm above background for any time period.

13.4 Major Vapor Emission Response Plan

Upon activation, the following activities will be undertaken:

1. The local police authorities will be contacted and advised of the situation;

2. Air monitoring will be conducted at 30-minute intervals within the determined downwind zone. If two successive reading below action level are measure, air monitoring may be halted or modified; and

3. All Emergency contacts will go into effect as appropriate.

If necessary, depending on site conditions, appropriate equipment should be used to continuously monitor VOCs in 15 minute running average concentrations at temporary monitoring stations located down wind and within the work area. Actions to be taken based on measured levels of VOCs are presented in the table below. All readings must be recorded and be available for NYSDEC and Monroe County and/or New York State Health Department personnel to review.

VOC Monitoring, Response Levels, and Actions

Location	**Meter Reading**	**Action**
Downwind Perimeter	> 5 ppm	Work activities temporarily halted and monitoring continued until levels fall beneath 5 ppm
Downwind Perimeter/Exclusion Zone	> 5 ppm, < 25 ppm	Work activities halted, source identified, corrective actions taken and monitoring continued until levels fall beneath 5 ppm
Work Area	> 25 ppm	Work activities must be shutdown

14 CONTRACTORS SITE OPERATIONS PLAN

Passero Associates has reviewed all plans and submittals for this remedial project (including those listed above and contractor and subcontractor document submittals) and confirms that they are in compliance with this IRMWP. Passero Associates is responsible to ensure that all later document submittals for this remediation project, including contractor and subcontractor document submittals, are in compliance with this IRMWP. All remediation documents will be submitted to NYSDEC and NYSDOH in a timely manner and prior to the start of work.

14.1 Project Organization

Résumés of key personnel involved in the IRM Action are included in Appendix 8.

14.2 Remedial Engineer

The Remedial Engineer for this project will be Gary Passero. The Remedial Engineer is a registered Professional Engineer licensed by the State of New York. The Remedial Engineer will have primary direct responsibility for implementation of the remedial program for the Site (NYSDEC BCA Index No. B8-0692-05- 04 Site No. C828127). The Remedial Engineer will certify in the IRM CCR that the IRM activities were observed by qualified environmental professionals under his supervision and that the remediation requirements set forth in the IRMWP and any other relevant provisions of ECL 27-1419 have been achieved in full conformance with that Plan. Other Remedial Engineer certification requirements are listed later in this IRMWP.

The Remedial Engineer will coordinate the work of other contractors and subcontractors involved in all aspects of IRM activities , including soil excavation, stockpiling, characterization, removal and disposal, air monitoring, emergency spill response services, import of back fill material, and management of waste transport and disposal. The Remedial Engineer will be responsible for all appropriate communication with NYSDEC and NYSDOH.

The Remedial Engineer will review all pre-remedial plans submitted by contractors for compliance with this IRMWP and will certify compliance in the IRM CCR.

14.3 IRM Action Construction Schedule

Anticipated schedule for the IRM Action Elements presented in number of weeks from time that NYSDEC approves of our IRMWP:

Action	IRMWP Sections:	Time Frame
1. Waste approval with Waste Management, contractor scheduling and utility stakeout	15.9	2 weeks
2. Site excavation, groundwater pumping and discharge	10	4 weeks
3. Confirmatory pit soil sample collection	15.1	4 weeks
4. Confirmatory staged soil sample collection	10.4	1 week
5. Soil sample analysis	10.2	1 week
6. Groundwater analysis	10.5	1 week
7. Report	20	90 days

The soil and groundwater analytical parameters are presented in Section 10.

Based on this projection, we anticipate that the IRM activities will be completed in 13 to 15 weeks from the time that NYSDEC approves of our IRMWP.

14.4 Work Hours

During this remediation project, the length of our field days will be constrained by the operating hours at Mill Seat Landfill. We anticipate that the waste hauling activities will take place between 8:00 A.M. and 3:00 P.M. on a daily basis.

14.5 Site Security

Passero Associates will assure that no unauthorized personnel enter the site while the IRM activities are being conducted.

An orange snow fence will be erected around the perimeter of the work zone, for security, when activities have been halted for the day.

If the excavation is to be left open overnight it will be securely fenced around the perimeter prior to our leaving the site.

After the contaminated soils have been removed, the Site will be enclosed by a 7-foot chain-link fence with barbed wire in accordance with City of Rochester Code.

Signs reading "Do Not Enter," "No Trespassing," and "Authorized Personnel Only," will be posted on the fencing and entrance gates of the Site.

A BCP sign will be posted, near the entrance to the Site, facing Bittner Street (see Figure15).

14.6 Traffic Control

Traffic cones will be placed on an as-needed basis to ensure that the trucks hauling soil from the Site do not interfere with local traffic.

The Maintenance and Protection of Traffic Plan outlined in Figure 14 will be followed for the duration of the remediation.

In order to avoid blocking traffic, trucks will be dispatched to the Site as needed thereby eliminating off-site staging of waiting trucks. The drivers will be in communication with the site personnel; only one truck on-site at any time. The contaminated soils will be disposed of at Mill Seat Landfill. Figure 17 contains directions and a map of the truck route from the Site to the Mill Seat Landfill.

There will be additional personnel, trained in traffic control and equipped with a flag and high visibility clothing, to facilitate truck traffic while entering and exiting the Site.

14.7 NYSDEC BCP Signage

A project sign will be erected on the south side of the main entrance to the Site prior to the start of any IRM activities. The sign will indicate that the project is being performed under the New York State BCP.

The sign requirements will be as follows:

Size:	Horizontal format-96" wide by 48" high
Construction Materials:	Aluminum or wood, land sign with vinyl sheeting

Text	Color	Type
DEC logo	PMS 301 Blue PMS 355 Green	
Copy surrounding logo "NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION"	PMS 355	Center each line of copy with small caps and initial caps
Brownfield Cleanup Program	PMS 301	Caslon 540
Kirstein Building Associated Parking Lot at Bittner Street, NYSDEC BCP # C828127, 235-250 Andrews Street LLC	PMS 355	Caslon 540
Andrew M. Cuomo, Governor. Joe Martens, Acting Commissioner. R. Carlos Carballada, Acting Mayor *	PMS 301	Caslon 540
*or current officials		

Production Notes: 96' wide by 48" high aluminum blanks will be covered with vinyl sheeting to achieve background color. Copy and logo will be silk screened on this surface. A Draft copy of the BCP sign is included in Appendix 7.

15 SITE PREPARATION

15.1 Mobilization

Excavation equipment and a fractionalization tank will be mobilized to the Site the day before the IRM activities commence.

All equipment, materials and/or vehicles that will be used on-site will be inspected prior to being permitted on-site to ensure that they are not contaminated (i.e. "free of accumulations of hazardous substances and petroleum products"). Equipment, materials and/or vehicles that arrive to the Site contaminated and not decontaminated from the previous job, will not be granted entrance into the Site.

15.2 Erosion and Sedimentation Controls

At the commencement of this excavation, we will instruct our contractor to place straw bales around the perimeter of the excavation to prevent erosion from runoff.

15.3 Stabilized Construction Entrance(s)

The construction entrance is the asphalt entrance to the Bittner Street parking lot; no stabilization will be required.

15.4 Utility Marker and Easements Layout

Prior to IRM activities, our contractor will call for a utility stakeout two full working days prior to the excavation in compliance with the NYS Underground Facilities Protection Organization (UFPO) requirements.

15.5 Decontamination Area

Prior to the start of field activities, our contractors will construct a decontamination pad with 4x4 timbers and a double layer of 6 mil polyethylene sheeting. The decontamination water generated will be pumped to the fractionalization tank.

15.6 Truck Decontamination Area

A truck decontamination pad will be constructed and staged on-site adjacent to the fractionalization tank (see Figure 14). Its construction will include the following, where necessary, to resist rips and tears:

- The decontamination pad dimensions will be approximately 40 feet (length) by 15 feet (width), long and wide enough to contain vehicles, equipment and materials that require decontamination;
- The pad will slope toward a center low point sump to allow for collection of decontamination water and its transfer into the fractionalization tank;
- The pad will be constructed of 60 mil high density polyethylene (HDPE) liner material overlain by a geotextile, and a minimum of 12 inches of clean sub-angular stone will be backfilled over the HDPE liner and geotextile;
- A 12-inch high containment berm constructed of clean sub-angular stone will be placed around the perimeter of the decontamination pad; and

- The pad will be equipped with 3-feet high splashguards dropped inside the bermed pad to prevent over spray.

15.7 Site Fencing

If any portion of the excavation is to be left open overnight it will be securely fenced around the perimeter prior to our leaving the site.

Signs reading "Do Not Enter," "No Trespassing," and "Authorized Personnel Only," will be posted on the fencing and entrance gates of the Site.

15.8 Demobilization

The decontamination pad will be removed. All drummed decontamination water and development water will be characterized for sanitary sewer discharge. A sanitary sewer use permit will be obtained from the Monroe County Division of Pure Waters District #8575 prior to the discharge of any groundwater collected at the Site to the City's sanitary sewer system. A copy of the issued sewer use permit will be provided to the NYSDEC prior to the discharge of groundwater to the City of Rochester's sanitary sewer system.

The liquids generated at the Site will be discharged into the sanitary sewer in accordance with the sanitary sewer use permit obtained from the Monroe County Pure Waters. The wastewater samples collected will be analyzed as stipulated in the sanitary sewer use permit issued to the Site. The wastewater will be discharged in accordance with the requirements of the sanitary sewer use permit.

All drums will be removed upon completion and disposed off in accordance with all state and federal regulations.

All equipment will be decontaminated and removed upon completion.

All material generated as part of the decontamination activities associated with the trucks will be containerized, characterized, and disposed in accordance with all applicable state and federal regulations.

15.9 Daily Reports

The Daily Reports will include:

- Notable site conditions,
- CAMP logs,
- PID screening logs,

- A tally of the number of trucks loads and tonnage, and
- Quantity of water removed from the Site.

15.10 Reporting

All daily and monthly Reports will be included in the IRM CCR.

Weekly reports will be submitted to NYSDEC and will include:

- An update of progress made during the week;
- Locations of work and quantities of material imported and exported from the Site;
- A summary of any and all complaints with relevant details (names, phone numbers);
- A summary of CAMP finding, including excursions; and
- An explanation of notable site conditions.

15.11 Other Reporting

Photographs will be taken of all IRM activities and included in our IRM CCR. Photos will illustrate all remediation program elements and will be of acceptable quality. Representative photos of the Site prior to any IRM actions will be provided. Representative photos will be provided of each contaminant source, source area and site structures before, during and after remediation.

15.12 Handling of Groundwater Accumulation

Once excavating activities are complete, permanent fencing will be installed around the Site. The excavation will be periodically inspected (e.g. during and subsequent to storm events and weekly) to determine if significant amounts of stormwater and groundwater have accumulated. Significant amounts of stormwater and groundwater that might accumulate over time will be removed by pumping water directly into an on-site fractionalization tank ensuring that no water overflows from the excavation. Extracted stormwater and groundwater will be sampled and analyzed for EPA 601/602 compounds including BTEX and MTBE. If appropriate BTEX levels are met we will secure a discharge permit for Monroe County sanitary sewer. If levels remain too high, on-site treatment will be completed to bring the levels into compliance, then discharge to the Monroe County sanitary sewer, or the water may be pumped and transported for disposal by a NYSDEC Part 364 licensed hauler to a licensed NYSDEC TSDF.

15.13 Complaint Management Plan

Passero Associates will work with NYSDEC and City of Rochester officials to resolve any public complaints that may arise during this project.

15.14 Deviations from the IRM Work Plan

No deviations from the approved IRMWP will be performed without prior NYSDEC approval.

If any changes to the IRMWP are warranted based on unknown conditions encountered during excavation, the work will cease and no further work will be conducted without NYSDEC approval.

Any deviations will not affect our goal of performing a Track 1 remediation by source removal.

All deviations from the approved IRMWP will be documented in the IRM CCR.

16 INTERIM REMEDIAL MEASURES: MATERIAL REMOVAL FROM SITE

16.1 End-Point Sampling Frequency

Approximately 10 excavation wall samples and 6 excavation bottom samples are proposed.

Confirmatory sample locations and depths will be biased towards the areas and depths of greatest contamination.

The number of confirmatory soil samples will be based on the size of the excavation and will be in accordance with Section 5.4(b) 5.i and ii (1) and (2) of DER-10, which states:

The following are the minimum confirmation sampling frequencies for soil excavations of:

i. less than 20 feet in perimeter, include one bottom sample and one sidewall sample biased in the direction of surface runoff;

ii. 20 to 300 feet in perimeter, where the remedy is seeking to achieve:

(1) surface soil levels, one sample from the top of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area; and

(2) subsurface soil cleanup levels, one sample from the bottom of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.

Based on the size of the Site, the excavated area is not anticipated to exceed 300 feet in perimeter.

The impacts at the property boundary will be documented by analytical results and presented in the IRM CCR.

For health and safety purposes, the excavation will not be entered after completed. We will direct our contractor where to sample the excavation walls and bottom with the equipment. We will load the soil directly into sample jars from the bucket of the excavator.

The confirmatory soil samples will be analyzed for TCL VOCs plus TICs, TCLSVOCs plus TICs, TAL Metals plus Cyanide, PCBs, and Pesticides.

Construction at the Site will not commence until the laboratory analytical show that the Part 375 Unrestricted Use Cleanup Objectives for all compounds have been met and NYSDEC approval obtained.

16.2 Reporting of Results

In conformance with Section 5.8 of DER-10, the IRM CCR will include but not limited to the following:

- A summary of the IRM Actions from the IRMWP;
- A summary by area of concern of all IRM actions completed, which includes:
- A description of any problems encountered during construction and their resolution;
- A description of changes to the design documents and why the changes were made;
- Quantities and concentration of contaminants removed or treated;
- A listing of the waste streams, quantity of materials disposed and where they were disposed;
- A list of the remediation standards applied to the IRM actions;

- Tables and figures pursuant to Section 3.14 (Remedial Investigation Report) containing all pre- and post IRM data keyed appropriately so that completion of the IRM activities is documented. The figures will clearly indicate the volume of contaminated soil or sediment which was remediated;

- A detailed description of site restoration activities pursuant to Section 5.4 (c);

- A detailed description of source and quality of fill pursuant to Section 5.4 (c);

- A detailed report of actual costs including bid tabulations and change orders, if any State funding is provided;

- "As-built" drawings stamped by a professional engineer licensed in New York State;

- Fully executed manifests documenting any off-site transport of waste material; and

- The impacts at the property boundary will be documented by analytical results and presented in the IRM CCR.

16.3 QA/QC

QA/QC will be conducted in accordance with Section 2 of the NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation. Our laboratory analysis will be in accordance with Chapter 2 of DER-10 (Appendix 5).

All field work will be performed in conformance with this IRMWP. Laboratory analysis of the soil samples collected at the Site will consist of the TCL VOCs plus TICs, TCL SVOCs plus TICs, TAL Metals, Cyanide, PCBs, and Pesticides. All laboratory analyses will be performed by ASP Methodologies with Category B deliverables.

The laboratory analysis will be performed by a NYDOH Environmental Laboratory Approval Program (ELAP) approved laboratory.

16.4 DUSR

All data generated will be subject to DUSR validation. The development of the DUSRs will be completed in accordance with DER-10 Appendix 2B (Appendix 5 of this document). The DUSRs and the data deliverable package will be submitted to the NYSDEC for review.

The DUSRs will be completed by KR Applin and Associates located at 8806 NYS Route 256, Dansville, New York 14437.

16.5 Estimation Removal Quantities

The following estimate is made of quantities of soil removal that will be required to obtain out Track 1 remedial objective:

All soil/fill material from the Site that will be used as either on-site or off-site fill material will be characterized by laboratory analysis TCL VOCs plus TICs, TCL SVOCs plus TICs, TAL Metals, Cyanide, PCBs, and Pesticides and NYSDEC approval will be obtained before the soil/fill material is used on-site or off site.

Based on the proposed Track 1 cleanup, all soil/fill material with contamination greater than 6NYCRR Part 375 Unrestricted Use SCOs for all compounds will be excavated and disposed off-site at a permitted landfill facility according to all applicable state and federal regulations.

Impacts that extend beyond the property boundaries will be left in place, if encountered. The impacts of the soil contamination at the property boundary will be documented by analytical results and presented in the IRM CCR.

The estimated quantity of contaminated soil to be removed from the Site is 2,400 tons.

Visual, olfactory, and PID soil screening and assessment will be performed by Passero Associates during all IRM excavation activities and will include all excavation and invasive work performed during the IRM.

16.6 Stockpile Methods

Soil being staged on the Site will be staged on a double layer of 6-mil polyethylene sheeting and covered (daily) with 6-mil polyethylene sheeting to prevent precipitation runoff and wind erosion. Damaged covers will be replaced as needed.

16.7 Materials Excavation and Load Out

Loaded vehicles leaving the Site will be appropriately covered, manifested, and placarded in accordance with appropriate federal, state, local, and NYSDOT requirements (and all other applicable transportation requirements).

Locations where vehicles enter or exit the Site shall be inspected daily for evidence of off-site soil tracking.

Trucks will be inspected and decontaminated (e.g. brushed/swept off and/or pressure washed) prior to leaving the Site.

A truck decontamination pad will be constructed and staged on-site adjacent to the fractionalization tank (see Figure 14). Its construction will include the following, where necessary, to resist rips and tears:

- The decontamination pad dimensions will be approximately 40 feet (length) by 15 feet (width), long and wide enough to contain vehicles, equipment and materials that require decontamination;
- The pad will slope toward a center low point sump to allow for collection of decontamination water and its transfer into the fractionalization tank;
- The pad will be constructed of 60 mil high density polyethylene (HDPE) liner material overlain by a geotextile, and a minimum of 12 inches of clean sub-angular stone will be back filled over the HDPE liner and geotextile;
- A 12-inch high containment berm constructed of clean sub-angular stone will be placed around the perimeter of the decontamination pad; and
- The pad will be equipped with 3-feet high splashguards dropped inside the bermed pad to prevent over spray.

No soil/fill material will be tracked onto the streets surrounding the Site. If soil/fill material is tracked on the roadways/streets surrounding the Site, this material will be cleaned up immediately and containerized for disposal off-Site according to all applicable state and federal regulations.

Each hotspot and structure to be remediated (e.g. USTs, vaults and associated piping, transformers) will be removed and end-point remedial performance sampling completed before excavations related to Site development commence proximal to the hotspot or structure.

Development-related grading cuts and fills will not be performed without NYSDEC approval and will not interfere with, or otherwise impair or compromise, the performance of remediation required by this plan.

All primary contaminant sources (including but not limited to tanks and hotspots) identified during Site Characterization, Remedial Investigation, and IRM will be surveyed by a surveyor licensed to practice in the State of New York. The survey information will be shown on maps to be reported in the IRM CCR.

16.8 Materials Transport Off-Site

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

All material generated as part of the decontamination activities associated with the trucks will be containerized, characterized, and disposed off-site in accordance with all applicable state and federal regulations.

16.9 Materials Disposal Off-Site

The contaminated soils will be disposed of at Waste Management's Mill Seat Landfill. Any disposal location established at a later date will be reported to the NYSDEC Project Manager.

All soil/fill/solid waste excavated and removed from the site will be treated as contaminated and regulated material and will be disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations.

If disposal of soil/fill from this Site is proposed for unregulated disposal (i.e., clean soil removed for development purposes), a formal request with an associated plan will be made to NYSDEC's Project Manager. Unregulated off-site management of materials from this Site is prohibited without first obtaining formal NYSDEC approval.

Material that does not meet Track 1 Unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

The IRM CCR will include an accounting of the destination of all material removed from the Site during this IRM Action, including excavated soil, contaminated soil, solid waste, and hazardous waste, non- regulated material, and fluids. Documentation associated with disposal of all material will include records and approvals for receipt of the material. This information will also be presented in a tabular form in the IRM CCR.

A Bill of Lading system (or equivalent) will be used for off-site movement of non-hazardous wastes and contaminated soils. This information will be reported in the IRM CCR.

16.10 Fluids Management

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Liquids discharged into the City of Rochester sanitary sewer system will be addressed through approval by a sanitary sewer use permit issued by Monroe County Division of Pure Waters District #8575. A copy of the issued sanitary sewer use permit will be provided to the NYSDEC prior to the discharge of groundwater to the City of Rochester's sanitary sewer system.

The liquids generated at the Site will be discharged into the sanitary sewer in accordance with the sanitary sewer use permit obtained from the Monroe County Pure

Waters. The wastewater samples collected will be analyzed as stipulated in the sanitary sewer use permit issued to the Site. The wastewater will be discharged in accordance with the requirements of the sanitary sewer use permit.

A 21,000-gallon fractionalization tank will be staged on-site for the storage of all project-generated water. Water that collects in the excavation areas; either groundwater or surface water runoff will be pumped to the fractionalization tank using a submersible pump or two inch trash pump. Wash water used for the purpose of equipment decontamination will also be pumped to the fractionalization tank. At the completion of the project or as needed, a water sample will be collected and analyzed for discharge parameters. It is anticipated that water collected during the project will be able to be discharged to Monroe County Pure Water sewer system. Prior to discharge the water will be sampled and analyzed for EPA 601/602 compounds including BTEX and MTBE and any sanitary use permit discharge parameters.

If the total VOC concentrations exceed 2.31 ppm all stored water will be treated through activated carbon prior to discharge. The water treatment system will be the United Manufacturing International, Model AFD-55 or its equivalent, which uses a carbon filter to reduce the contaminants. The product data sheet and schematic for the filter is in Appendix 7.

All material generated as part of the decontamination activities associated with the trucks will be containerized, characterized, and disposed in accordance with all applicable state and federal regulations.

16.11 Stormwater Pollution Prevention

The Site is less than one acre in size and is not adjacent to a watershed; therefore, a SWPP is not required. The contractor will place straw bales around the staged soils to prevent storm water runoff (see Figure 15).

Soil being staged on the Site will be staged on a double layer of 6-mil polyethylene sheeting and covered (daily) with 6-mil polyethylene sheeting to prevent precipitation runoff and wind erosion. Damaged covers will be replaced as needed.

Once excavating activities are complete, permanent fencing will be installed around the Site. The excavation will be periodically inspected (e.g. during and subsequent to storm events and weekly) to determine if significant amounts of stormwater and groundwater have accumulated. Significant amounts of stormwater and groundwater that might accumulate over time will be removed by pumping water directly into an on-site fractionalization tank ensuring that no water overflows from the excavation. Extracted stormwater and groundwater will be sampled and analyzed for EPA 601/602 compounds including BTEX and MTBE and any sanitary use permit discharge parameters. If appropriate BTEX levels are met, we will secure a discharge permit for Monroe County sanitary sewer. If levels remain too high, on-site treatment

will be completed to bring the levels into compliance, then discharge to the Monroe County sanitary sewer, or the water may be pumped and transported for disposal by a NYSDEC Part 364 licensed hauler to a licensed NYSDEC TSDF.

16.12 Contingency Plan

If any underground storage tanks (USTs) are identified during the excavation activities at the Site, the USTs will be registered and properly closed in accordance with applicable state and federal regulations.

Identification of unknown or unexpected contaminated media identified by screening during invasive Site work will be promptly communicated by phone to NYSDEC's Project Manager. These findings will be also included in daily and periodic electronic media reports.

17 ENGINEERING CONTROLS COMPOSITE COVER SYSTEM

Based on our proposed Track 1 soil removal, no cover systems will be required upon completion.

18 ENGINEERING CONTROLS: TREATMENT SYSTEMS

6NYCRR Part 375 states that the most rigorous remedial effort is the Track 1 for Unrestricted Use approach. In order to maximize Site options, 234 - 250 Andrews Street, LLC will attempt to achieve Track 1 remedial goals. Track 1 requires that land and groundwater use restrictions or institutional/engineering controls (IC/ECs) will not be employed to obtain the remedial action objectives for the site. One exception is that if groundwater contamination has been reduced to asymptotic levels and other Track 1 goals are achieved, groundwater use restrictions may be employed.

During this IRM Action, petroleum contamination was confirmed in both Site soils and groundwater. In order to determine whether Track 1 Unrestricted Use Soil Cleanup Objectives (SCOs) are obtainable, we propose to excavate all soil/fill material that exceeds 6NYCRR Part 375 Unrestricted Use Cleanup Objectives for all compounds will be excavated and disposed off-site according to all applicable state and federal regulations.

19 CRITERIA FOR COMPLETION OF REMEDIATION/TERMINATION OF REMEDIAL SYSTEMS

Once the IRM has been implemented, a meeting will be held between the NYSDEC, the NYSDOH, Passero Associates, and the Applicant to determine the best approach to address the groundwater monitoring issues, such as reinstallation of groundwater monitoring wells, groundwater monitoring frequency. Issues surrounding vapor intrusion, such as when to evaluate potential for vapor intrusion with respect to the development of the Site, will also be addressed at that time.

20 INSTITUTIONAL CONTROLS

As we propose to pursue a Track 1 remedy, no institutional controls will be required upon completion.

20.1 Environmental Easement

An environmental easement with a groundwater restriction is not necessary at this Site because the City of Rochester prohibits the use of groundwater for any purpose.

21 INTERIM REMEDIAL MEASURE CONSTRUCTION COMPLETION REPORT (IRM CCR)

After the IRM has been implemented at the Site then an IRM Construction Completion Report (IRM CCR) will need to be developed and submitted to the NYSDEC and NYSDOH for review and approval. As such, there will be a certification needed for the IRM CCR. Table 1.5 on Page 21 of DER-10 provides the details of which documents require what certifications and where to find that language in DER-10. The certification language needed for the IRM CCR will be as follows:

I, Gary Passero, certify that I am currently a NYS registered professional engineer, I had primary direct responsibility for the implementation of the subject construction program and I certify that the IRM Work Plan was implemented and that all construction activities were completed in substantial conformance with the DER-approved IRM Work Plan.

The IRM CCR will include written and photographic documentation of all IRM work performed under this IRMWP.

The IRM CCR will include the destination of all material removed from the Site, including excavated contaminated soil and fluids. Documentation associated with disposal of all material will include records and approvals for receipt of the material.

All project reports will be submitted in digital form on electronic media (PDF).

We, Peter S. Morton and Gary W. Passero, certify we are the people with primary responsibility for the day to day performance of the activities under Brownfield Site Cleanup Agreement Index # B8-0693-05-06 for NYSDEC Site #C828127 (Kirstein building associated parking lot, 37 Bittner Street) and that all activities will be performed in full accordance with the Interim Remedial Measures Work Plan.

Respectfully Submitted,

Peter S. Morton, CPG
Certified Professional Geologist

Gary W. Passero, P.E., REM
Chief Executive Officer

TABLES

Table 1: Day-Soil Samples
2004

Sample ID Sampling Date Sample Depth Units	Remedial Action Work Plan 2010 VOCs and Naphthalene (ppm) 01 TB-1 11/09/04 (8′-12) (ppm)	02 TB-4 11/09/04 (10′-12′) (ppm)	03 TB-11 11/09/04 (10′-11′) (ppm)	04 TB-12 11/09/04 (8′-12′) (ppm)	05 TB-1 11/09/04 (3′) (ppm)	06 TB-18 11/09/04 (10′-12′) (ppm)	07 TB-17 11/09/04 (8′-10′) (ppm)	6 NYCRR Part 375-6.8 (a): Urestricted Use SCO (ppm)
sec-Butylbenzene	0.179	0.0874	0.0752	ND	ND	ND	0.022	11
Ethylbenzene	0.327	ND	ND	3.480	ND	ND	ND	1
n-Propylbenzene	0.898	0.374	0.149	**6.180**	ND	ND	ND	3.9
Isopropylbenzene	0.368	0.0803	0.0208	2.700	ND	ND	ND	NS
p-Isopropyltoluene	0.312	0.132	0.0397	1.460	ND	ND	0.042	NS
Toluene	ND	ND	ND	0.194	ND	ND	ND	0.7
1,2,4-Trimethylbenzene	3.330	0.3240	ND	**23.500E**	ND	ND	ND	3.6
1,3,5-Trimethylbenzene	2.650	0.147	ND	**12.800**	ND	ND	ND	8.4
Xylenes (total)	0.322	ND	ND	**16.500**	ND	ND	ND	0.26
Total VOCs	8.386	1.1447	0.285	**66.814**	ND	ND	64	NS
Total TICs	23.957	8.393	11.980	146.310	200.1	ND	5.435	NS
Total VOCs & TICs	32.343	9.5377	12.265	213.124	200.1	ND	5.499	NS
Napthalene	0.437	ND	ND	7.980	ND	ND	ND	12

Bold: Exceeds Soil Cleanup Objectives

ND: Non-detect.

NS: No Standard

SCOs: Soil Cleanup Objectives.

Table 2: Day-Groundwater Samples
2004

Remedial Action Work Plan 2010				
VOCs Naphthalene and Lead (ug/L)				
Sample ID Sampling Date	**Day's MW-1 12/10/04**	**Day's MW-2 12/10/04**	**Day's MW-3 12/10/04**	**NYSDEC TOGS 1.1.1 Groundwater Standard or Guidance Value**
Benzene	ND	ND	**51.3**	1
Ethylbenzene	ND	**934**	**1,400**	5
n-Propylbenzene	ND	**214**	**210**	5
Isopropylbenzene	ND	**115**	**115**	5
Toulene	ND	ND	**34**	5
1,2,4-Trimethylbenzene	**5.03**	**1,900**	**970**	5
1,3,5-Trimethylbenzene	ND	**657**	**592**	5
Xylenes	ND	**1,080**	**421**	5
Napthalene	ND	**599**	**684**	10
Metals				
Lead	NT	**49**	24	25
Bold: Exceeds Groundwater Standards				
ND: Non-detect.				
NS: No Standard				

TABLE 3: Soil -Vapor Samples
September 9, 2008

Remedial Action Work Plan 2010				
Sample ID **Sampling Date** **Sampling Time** **Units**	**North Boundary SG-1** **9/9/08** **9:33-11:57** **(ug/m^3)**	**East Boundary SG-2** **9/9/08** **9:50-11:52** **(ug/m^3)**	**South Boundary SG-3** **9/9/08** **11:10-1:17** **(ug/m^3)**	**West Boundary SG-4** **9/9/08** **12:04-2:08** **(ug/m^3)**
1,1,1-Trichloroethane	0.20	ND	ND	ND
1,2,4-Trimethylbenzene	15	14	21	20
1,3,5-Trimethylbenzene	3.3	2.9	4.9	4.3
2,2,4-trimethylpentane	1.7	0.22	0.59	0.31
4-ethyltoluene	4.8	4.3	7.6	5.7
Acetone	66	73	87	84
Benzene	7.4	0.98	2.3	1.4
Carbon disulfide	1.3	0.42	1.6	0.64
Chloroform	0.37	0.17	0.25	ND
Chloromethane	ND	0.27	0.16	0.19
Cyclohexane	100	3.0	8.3	3.4
Ethyl acetate	ND	0.24	ND	0.52
Ethylbenzene	5.9	2.9	7.2	4.5
Freon11	0.21	0.16	0.39	0.15
Freon12	0.44	0.52	0.25	0.31
Heptane	20	2.0	3.9	2.5
Hexane	130	2.5	11	5.0
m&p-Xylene	20	11	29	17
Methyl Ethyl Ketone	ND	2.7	8.2	6.0
Methylene chloride	ND	0.17	ND	ND
o-Xylene	6.1	3.5	9.4	5.4
Styrene	1.0	0.53	1.2	0.86
Tetrachloroethylene (PCE)	.20	0.12	0.19	0.13
Toluene	14	5.7	11	8.7
Trichloroethene (TCE)	3.5	0.20	0.27	0.22

TABLE 4: Borehole PID Data
August 6-7, 2007

BH-A1	PID		**BH-A2**	PID		**BH-A3** East Boundary	PID
0' - 4'	2.4		0' - 4'	11.0		0' - 4'	0.0
4' - 8'	0.0		4' - 8'	14.9		4' - 8'	0.0
8' - 12'	1040		8' - 11.1'	1232		8' - 12'	1510
12' - 14'	1600						
BH-A5	PID		BH-A6	PID		BH-B2	PID
0' - 4'	0.0		0' - 4'	22		0' - 4'	0.0
4' - 8'	0.0		4' - 8'	13.4		4' - 8'	0.0
8' - 11.6'	309		8' - 12'	2.1		7' - 9.6'	1886
BH-B6	PID		BH-C1 North Boundary	PID		BH-C5	PID
0' - 4'	39		0' - 4'	12.3		0' - 4'	
4' - 8'	22		4' - 8'	8.0		4' - 8'	29
8' - 12'	36		8' - 12'	1210			

BH-C6	PID		BH-D1	PID		BH-D2	PID
0' - 4'	62		0' - 4'	23		0' - 4'	36
4' - 8'	19.9		4' - 8'	5.6		4' - 8'	18
8' - 12'	20		8' - 12'	1894		8' - 12'	2000
			12' - 15.2	519			
BH-D5	PID		BH-D6	PID		BH-E1	PID
0' - 4'	0.0		0' - 4'	24		0' - 4'	12.4
4' - 8'	0.0		4' - 8'	21		4' - 8'	7.7
8 ' - 12 '	1776		8 ' - 12 '	19		8 ' - 12 '	781
BH-E2	PID		BH-E3	PID		BH-E4	PID
0' - 4'	2.6		0' - 4'	15.9		0' - 4'	10.0
4' - 8'	0.0		4' - 6'	8.8		4' - 8'	12.1
4.5' - 8'	4.3		4' - 8'			8 ' - 12 '	6.1
8 ' - 12 '	1780		8 ' - 12 '	9.0			
12' - 15'	41.8						

BH-E6	PID		BH-F1	PID		BH-F2	PID
0' - 4'	24.9		0' - 4'	8.8		0' - 4'	5.9
4' - 8'	21.5		4' - 8'	8.8		4' - 8'	7.1
8 ' - 12 '	19		8 ' - 12 '	6.1		8 ' - 12 '	2.1
West Boundary	PID		South Boundary	PID			
0' - 4'	7.9		0' - 4'	0.0			
4' - 8'	15.0		4' - 8'	5.6			
8 ' - 12 '	0.0		8 ' - 12 '	15			

TABLE 5: Borehole Boundary PID Data
August 6-7, 2007

Grid No.	Interval	PID
A, 3 (east boundary)	11 ft. to 12 ft. BGS	1510
C, 1 (north boundary)	10 ft. to 11 ft. BGS	1210
West Boundary:	7 ft. to 8 ft. BGS	15
South Boundary:	11 ft. to 12 ft. BGS	15

TABLE 6:- Soil – VOCs
August 6-7, 2007

	Remedial Action Work Plan 2010								
	VOCs								
Sample ID **Depth** **Sampling Date** **Units**	**North C1** **11'-12'** **8/6/07** **(ppm)**	**D1** **12'** **8/6/07** **(ppm)**	**South Boundary** **11'-12'** **8/7/07** **(ppm)**	**West Boundary** **11'-12'** **8/7/07** **(ppm)**	**Northeast A1** **11'-12'** **8/6/07** **(ppm)**	**A2** **11'-11.4'** **8/6/07** **(ppm)**	**Deep A2** **33'** **8/7/07** **(ppm)**	**East A3** **11'-12'** **8/7/07** **(ppm)**	**Table 375** **Unrestricted SCO** **(ppm)**
Acetone	ND	ND	0.012	0.009J	ND	ND	0.006J	0.017	0.05
Carbon Disulfide	ND	0.004J	ND	ND	0.001J	0.006J	ND	ND	NS
Chloroform	0.016J	0.007J	ND	ND	ND	ND	ND	ND	0.37
Toluene	ND	0.002J	ND	ND	ND	ND	ND	ND	0.7
Ethylbenzene	ND	ND	ND	ND	ND	0.009J	ND	ND	1
Methylcyclohexane	3.000J	0.080J	ND	ND	0.026J	4.500J	ND	ND	NS
Total TICs	11.180	2.37	0.04	0.043	2.130	14.8	0.045	0.299	NS
Total TCL	14.196	2.463	0.052	0.052	2.157	19.315	0.051	0.038	NS
Bold: Exceeds Soil Cleanup Objectives									
ND: Non-detect.									
NS: No Standard									
SCOs: Soil Cleanup Objectives.									

TABLE 7:- Soil – SVOCs
September 4, 2007

Remedial Action Work Plan 2010					
SVOCs					
Sample ID **Depth** **Sampling Date** **Units**	**A3 East Boundary 11'-12' 9/4/07 (ppm)**	**C1 North Boundary 10'-11' 9/4/07 (ppm)**	**South Boundary 10'-11' 9/4/07 (ppm)**	**West Boundary 11' 9/4/07 (ppm)**	**Table 375 Unrestricted SCO (ppm)**
Naphthalene	0.019J	ND	ND	ND	12
2-Methynaphthalene	0.048J	ND	ND	ND	NS
Flourene	ND	ND	ND	0.021J	100
Pyrene	ND	ND	ND	0.021J	100
Benzo (a) anthracene	ND	ND	ND	0.016J	1
Chrsene	ND	ND	ND	0.017	1
Total TICs	2.692	0.083	ND	0.086	NS
Total TCL	2.759	0.083	ND	0.161	100
Bold: Exceeds Soil Cleanup Objectives					
ND: Non-detect.					
NS: No Standard					
SCOs: Soil Cleanup Objectives.					

TABLE 8:- Soil - Pesticides/Aroclors

August 6-7, 2007

Remedial Action Work Plan 2010					
Pesticides/Arclors					
Sample ID **Depth** **Sampling Date** **Units**	**East A3** **11'-12'** **8/7/07** **(ppm)**	**North C1** **11'-12'** **8/6/07** **(ppm)**	**South Boundary** **11'-12'** **8/7/07** **(ppm)**	**West Boundary** **11'-12'** **8/7/07** **(ppm)**	**Table 375 Unrestricted SCO (ppm)**
Heptachlor epoxide	.00055J	.00085J	ND	ND	0.077
gamma-Chlordane	.00059J	.00045J	ND	ND	NS
Bold: Exceeds Soil Cleanup Objectives					
ND: Non-detect.					
NS: No Standard					
SCOs: Soil Cleanup Objectives.					

Organic Qualifiers

B:	Analyte detected in the associated Method Blank
H:	Holding times for preparation or analysis exceeded
JN:	Non-routine analyte. Qauntitation estimated.
S:	Spike Recovery outside accepted recovery limits
E:	Value above quantitation range
J:	Analyte detected at or below quantitation limits
ND:	Not Detected at the Reporting Limit
R:	Rejected
NS:	Not Specified
NT:	Not Tested
Bold:	Exceeds Guidance Value

TABLE 9:- Soil -TAL Metals
August 6-7, 2007

Remedial Action Work Plan 2010					
TAL METALS					
Sample ID Depth Sampling Date Units	**East A3 11'-12' 8/7/07 (ppm)**	**North C1 11'-12' 8/6/07 (ppm)**	**South Boundary 11'-12' 8/7/07 (ppm)**	**West Boundary 11'-12' 8/7/07 (ppm)**	**Table 375 Unrestricted SCO (ppm)**
Aluminum	3430	6020	4880	3590	NS
Arsenic	1.9B	2.2	2.3	2.1	13
Barium	41.3	69.0	54.6	31.8	350
Beryllium	0.19B	0.32B	0.25B	0.21B	7.2
Cadmium	0.3B	0.2B	0.2B	0.1B	2.5
Calcium	56100	68500	41400	45700	NS
Chromium	5.8	9.7	7.5	5.7	30
Cobalt	3.2B	4.9	3.9B	3.4B	NS
Copper	9.8	9.4	7.8	6.3	50
Iron	9400	12500	11000	9100	NS
Lead	4.7	4.5	3.0J	3.4J	63
Magnesium	8980	11900	10600	12300	NS
Manganese	340	391	346	287	1600
Mercury	ND	0.005B	ND	ND	0.18
Nickel	6.0	10.7	8.0	6.2	30
Potassium	712	1130	872	851	NS
Sodium	117	230B	338B	179B	NS
Vanadium	11.7	14.9	13.1	10.5	NS
Zinc	26.6	25.0	20.9	18.3	109
Bold: Exceeds Soil Cleanup Objectives					
ND: Non-detect.					
NS: No Standard					
SCOs: Soil Cleanup Objectives.					

TABLE 10: Waste Characterization-TCLP
August 7, 2007

Remedial Action Work Plan 2010		
VOC Analysis of TCLP Extract		
Non Detect for all compounds		
SVOC Analysis of TCLP Extract		
Non Detect for all compounds		
TCLP Metal Series		
Compound	**Result (mg/L)**	**Regulatory Limit (mg/L)**
Barium	1.56	100.0
Lead	2.06	5.0

TABLE 11: Waste Characterization-Landfill Application
August 7, 2007

Remedial Action Work Plan 2010	
Characteristic	**Result (mg/Kg)**
Cyanide Reactivity	ND<0.10 Non Reactive
Sulfide Reactivity	ND<0.10 Non Reactive
Flashpoint Results (°C)	>70°C
pH Results (S.U.)	8.90

TABLE 12: Groundwater-VOCs
September 2007 & May 2008

Remedial Action Work Plan 2010																			
VOC's																			
Sample ID	**D-1**		**S-1**		**MW-2**		**MW-3**		**Field Dup. MW-2**		**MW-4**		**MW-5**		**MW-6**		**MW-7**		**TOGS 1.1.1 (ug/L)**
Sampling Date	**Sept. '07 (ug/L)**	**May '08 (ug/L)**	**Sept. '07 (ug/L)**	**May '08 (ug/L)**	**Sept. '07 (ug/L)**	**May '08 (ug/L)**	**Sept. '07 (ug/L)**	**May '08 (ug/L)**	**Sept. '07 (ug/L)**	**May '08 (ug/L)**	**Sept. '07 (ug/L)**	**May '08 (ug/L)**	**Sept. '07 (ug/L)**	**May '08 (ug/L)**	**Sept. '07 (ug/L)**	**May '08 (ug/L)**	**Sept. '07 (ug/L)**	**May '08 (ug/L)**	
Units																			
Acetone	ND	**88J**	ND	ND	ND	**86J**	44	69J	ND	ND	35J	ND	ND	ND	ND	ND	ND	ND	50
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2J	ND	ND	ND	ND	ND	ND	ND	7
Chloromethane	ND	30J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS
2-Butanone	ND	ND	8J	ND	ND	ND	18J	ND	ND	ND	18J	ND	ND	ND	ND	ND	ND	ND	50
Trichloroethene	**8J**	4J	ND	ND	4J	**5**	**8J**	ND	**6J**	4J	**5J**	4J	ND	ND	ND	ND	ND	ND	5
Benzene	**170**	**110**	**2J**	ND	**3J**	ND	**310**	**110**	ND	2J	**24J**	**14J**	ND	ND	ND	ND	ND	ND	1
4-Methyl-2-pentanone	13	7	13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS
2-Hexanone	ND	ND	4J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50
Toulene	**130**	**98**	**10**	ND	**6J**	4J	**28J**	**19J**	ND	ND	**7J**	**5J**	ND	ND	ND	ND	ND	ND	5
Ethylbenzene	**630D**	**700**	**1400D**	**1100**	**810D**	**570**	**760D**	**860**	**620**	**780D**	**56**	**37J**	**14J**	3J	2J	2J	4J	0.8J	5
Styrene	ND	ND	**11**	ND	1	ND	**6J**	**8J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Total Xylenes	**760E**	**970**	**2100D**	**1300**	**840D**	**390**	**950**	**1100**	**420**	**810D**	**300**	**230**	**21J**	4J	3J	ND	**6J**	ND	5
Cyclohexane	350D	400	510D	610	540D	560	500	800	640	520D	800D	690	12J	3J	2J	2J	3J	ND	NS
Methylcyclohexane	36	52	230D	340	190	250	180	380	280	190	200	340	2J	ND	ND	ND	ND	ND	NS
Isopropylbenzene	**20**	**24J**	**85**	**100**	**58**	**79**	**75**	**100**	**86**	57	**89**	**53**	ND	ND	ND	ND	ND	ND	5
Total TICs	6340	5,250	5410	4860	5960	5040	4670	4450	5830	5930	5490	5190	54	6	6	0	8	0	NS
Total TCL	8457	7733	9783	8310	8412	6984	7549	7896	7882	8293	7026	6726	103	16	13	4	21	0.8	NS

Bold: Exceeds Groundwater Standards
ND: Non-detect.
NS: No Standard
Bold: Exceeds Groundwater Standards
TOGS: Technical and Operational Guidance Series

TABLE 13: Groundwater-SVOCs
September 2007 & May 2008

Remedial Action Work Plan 2010																			
SVOC's																			
Sample ID	**D-1**		**S-1**		**MW-2**		**MW-3**		**MW-4**		**MW-5**		**MW-6**		**MW-7**		**Field Dup. MW-2**		**TOGS 1.1.1 (ug/L)**
Sampling Date Units	**Sept. '07 (ug/L)**	**May '08 (ug/L)**	**Sept. '07 (ug/L)**	**May '08 (ug/L)**	**Sept. '07 (ug/L)**	**May '08 (ug/L)**	**Sept. '07 (ug/L)**	**May '08 (ug/L)**	**Sept. '07 (ug/L)**	**May '08 (ug/L)**	**Sept. '07 (ug/L)**	**May '08 (ug/L)**	**Sept. '07 (ug/L)**	**May '08 (ug/L)**	**Sept. '07 (ug/L)**	**May '08 (ug/L)**	**Sept. '07 (ug/L)**	**May '08* (ug/L)**	
Benzaldehyde	10J	24	84D	110	43J	54	36J	52	32J	45	0.7	ND	ND	ND	0.4J	ND	43J	NT	NS
Phenol	0.8J	ND	ND	ND	0.6J	ND	**2J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.8J	NT	1
2-Methylphenol	ND	ND	ND	ND	2J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2J	NT	NS
Acetophenone	2J	ND	5J	ND	2J	ND	ND	12J	ND	ND	ND	ND	ND	ND	ND	ND	ND	NT	NS
4-Methylphenol	0.8J	0.5J	1J	ND	1J	ND	7J	4J	4J	ND	ND	ND	ND	ND	ND	ND	1J	NT	NS
2,4-Dimethylphenol	2J	1J	3J	ND	1J	ND	3J	2J	1J	5J	ND	ND	ND	ND	ND	ND	1J	NT	50
Naphthalene	**18**	**75**	**400D**	**430**	**91D**	**140**	**240D**	**310**	**180D**	**96**	2	0.8J	0.7J	0.6J	0.8J	0.3J	**56**	NT	10
Di-n-butyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	5J	10J	ND	ND	ND	ND	ND	ND	ND	NT	50
2-Methylnaphthalate	ND	ND	18	37	2J	9J	4J	11J	ND	ND	ND	ND	ND	ND	ND	ND	ND	NT	NS
Biphenyl	ND	ND	0.3J	ND	ND	ND	0.3J	ND	ND	ND	1J	ND	ND	ND	ND	ND	ND	NT	NS
Bis (2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	ND	ND	ND	36J	ND	ND	ND	ND	ND	24J	ND	ND	NT	5
Di-n-octyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	1J	ND	ND	ND	ND	ND	ND	ND	ND	NT	50
Diethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1J	ND	ND	ND	ND	ND	ND	NT	50
Pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3J	ND	NT	50
TICs	394	537	1577	2346	801	1233	764	1676	755	1127	49	10	9	2	5	0	806	NT	NS
TCL	427.6	637.5	2083.3	2923	943.6	1436	1056.3	2067	1014	1283	53.7	10.8	9.7	2.6	30.7	0.6	908.8	NT	NS

Bold: Exceeds Groundwater Standards
ND: Non-detect.
NS: No Standard
Bold: Exceeds Groundwater Standards
TOGS: Technical and Operational Guidance Series
NT: Not Tested

TABLE 14: Groundwater-Pesticides/PCBs
September 2007

Remedial Action Work Plan 2010										
Pesticides/PCBs										
Sample ID Sampling Date Units	**D-1 Sept. '07 ug/L**	**S-1 Sept. '07 ug/L**	**MW-2 Sept. '07 ug/L**	**MW-3 Sept. '07 ug/L**	**MW-4 Sept. '07 ug/L**	**MW-5 Sept. '07 ug/L**	**MW-6 Sept. '07 ug/L**	**MW-7 Sept. '07 ug/L**	**Field Dup MW-2 Sept. '07 ug/L**	**TOGS 1.1.1 ug/L**
Alpha-BHC	ND	0.019R	0.017J	0.016JN	ND	ND	ND	ND	0.012JP	NS
beta-BHC	0.34J	0.011R	ND	ND	ND	ND	ND	ND	ND	NS
delta-BHC	0.013JP	ND	ND	0.032JP	ND	ND	ND	ND	ND	NS
gamma-BHC (Lindane)	0.012J	ND	ND	ND	ND	ND	ND	ND	ND	NS
Heptachlor epoxide	0.021J	ND	0.019JP	ND	ND	0.011R	ND	ND	0.020JP	0.03
Endosulfan I	ND	ND	ND	0.021J	ND	ND	ND	ND	ND	NS
Endosulfan II	ND	ND	ND	0.021	ND	0.0094R	ND	ND	ND	NS
Endosulfan Sulfate	ND	ND	ND	ND	ND	ND	0.017JN	ND	ND	NS
4,4'-DDT	ND	ND	ND	0.032J	0.011R	ND	ND	ND	0.027J	0.2
Endrin ketone	ND	ND	ND	ND	ND	0.018R	ND	ND	ND	5
Endrin aldehyde	0.026JP	ND	ND	ND	0.060R	0.036JN	0.016R	ND	ND	5
gamma-Chlordane	ND	ND	ND	ND	ND	0.0016R	0.0095R	0.011J	ND	NS
Bold: Exceeds Groundwater Standards										
ND: Non-detect.										
NS: No Standard										
Bold: Exceeds Groundwater Standards										
TOGS: Technical and Operational Guidance Series										

Organic Qualifiers

B:	Analyte detected in the associated Method Blank
H:	Holding times for preparation or analysis exceeded
JN:	Non-routine analyte. Quantitation estimated.
S:	Spike Recovery outside accepted recovery limits
E:	Value above quantitation range
J:	Analyte detected at or below quantitation limits
ND:	Not Detected at the Reporting Limit
R:	Rejected
D:	Compounds identified in an analysis at the secondary dilution factor.
P:	For CLP methodology only. For Pesticide/Aroclor target analytes, when a difference for detected concentrations between the two GC columns is greater than 25% the lower of the two values is reported on the data page and flagged with a "P"

TABLE 15: Groundwater-TAL Metals
September 2007

Remedial Action Work Plan 2010										
TAL-Metals										
Sample ID Sampling Date Units	**D-1 Sept. '07 ug/L**	**S-1 Sept. '07 ug/L**	**MW-2 Sept. '07 ug/L**	**MW-3 Sept. '07 ug/L**	**MW-4 Sept. '07 ug/L**	**MW-5 Sept. '07 ug/L**	**MW-6 Sept. '07 ug/L**	**MW-7 Sept. '07 ug/L**	**Field Dup. MW-2 Sept. '07 ug/L**	**TOGS 1.1.1 ug/L**
Aluminum	918	402	148B	488	15.4B	29.0B	175B	702	114B	NS
Antimony	ND	**3.8B**	ND	**4.1B**	ND	ND	ND	ND	ND	3
Arsenic	3.8B	3.6B	5.6B	6.8B	4.6B	ND	ND	ND	3.5BB	25
Barium	445	384	177B	366	313	18.6B	114B	26.4B	171B	1000
Beryllium	0.15B	0.14B	0.06B	0.07B	0.11B	0.22B	0.12B	0.13B	0.07B	3
Cadmium	ND	ND	ND	ND	ND	ND	ND	1.3B	ND	5
Calcium	64500	81000	70600	51800	128000	213000	91000	48900	71300	NS
Chromium	2.0B	ND	ND	ND	ND	ND	ND	2.0B	ND	50
Cobalt	2.0B	1.2B	0.69B	1.0B	1.3B	4.4B	0.81B	0.96B	0.99B	NS
Copper	1.9B	1.3B	ND	0.82B	ND	1.8B	ND	ND	ND	200
Iron	**3370**	**5470**	**2280**	**8730**	**4560**	51.1B	218	**1060**	2030	300
Magnesium	**87300**	**73600**	**35800**	**54600**	**58400**	**82600**	25700	**39300**	35800	35000
Manganese	82.4	**323**	144	168	188	**513**	36.1	44.1	152	300
Nickel	4.7B	2.8B	2.9B	3.4B	3.5B	6.9B	3.1B	3.2B	3.2B	100
Potassium	9090	3950B	6570	4640B	11500	49300	11300	8280	6570	NS
Sodium	**382000**	**289000**	**212000**	**529000**	**202000**	**440000**	104000	429000	204000	20000
Vanadium	1.7B	ND	ND	1.1B	ND	ND	ND	1.4B	ND	NS
Zinc	12.5B	3.9B	3.7B	4.3B	4.7B	7.0B	4.0B	59.7	2.1B	2000

Bold: Exceeds Groundwater Standards
ND: Non-detect.
NS: No Standard
Bold: Exceeds Groundwater Standards
TOGS: Technical and Operational Guidance Series

Inorganic Qualifiers

J or **B:**	Value greater than or equal to the instrument detection limit, but less than the quantition limit.
H:	Holding times for preparation or analysis exceeded
N:	Spike sample recovery is not within the quality control limits.
S:	Value determined by the Method of Standard Addition.
E:	Value estimated or not reported due to the presence of interferences.
ND:	Not Detected at the Reporting Limit
G:	Value greater than of equal to the project reporting limit but less than the laboratory quantitation limit.
*	Spike of duplicate analysis is not within the quality control limits
+	Correlation coefficient for the Method of Standard Addition is less than 0.995

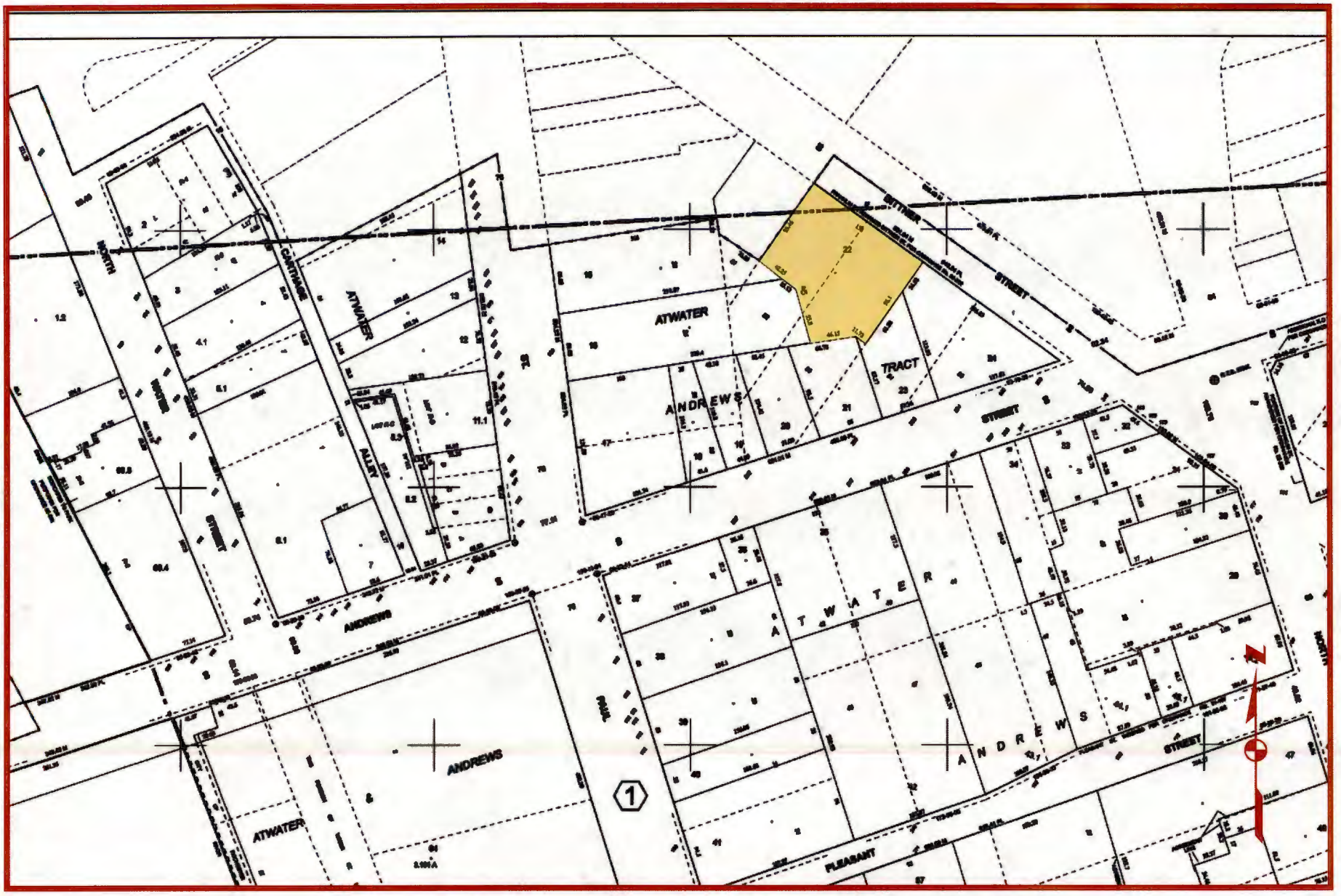
FIGURES

FIGURE 1

Location Map
37 Bittner Street
Rochester, NY

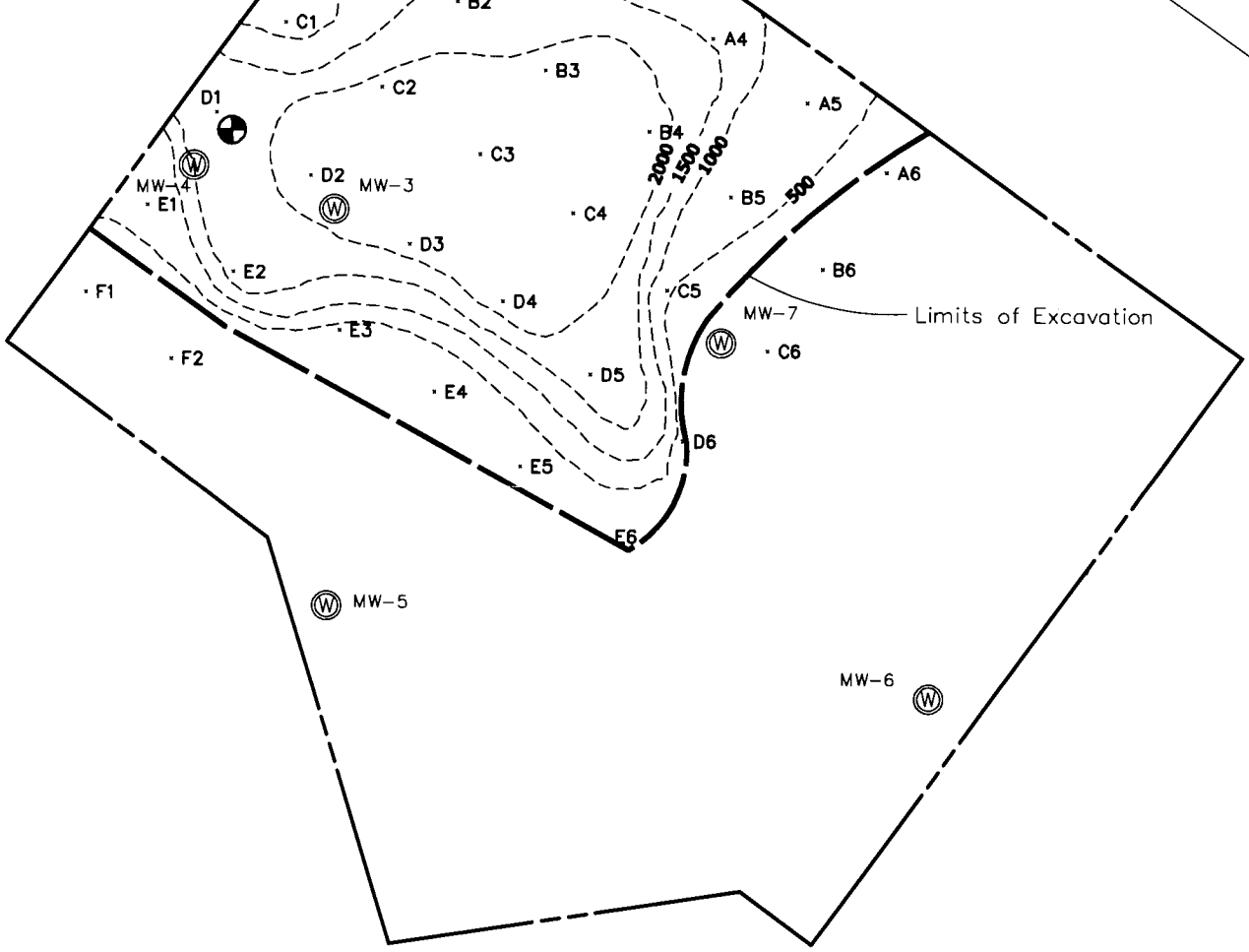
TAX MAP

Kirstein Building Associated Parking Lot
37 Bittner Street
Rochester, NY 14604



Landmax Data Systems, Inc. www.landmaxdata.com - Map ID: maps/ROCH/106_79.tif

Figure 2



Z:\2005\25030\25030.06\DRAWINGS\SURVEY\25030 06 37 BITTNER ST PROPOSED EXCAVATION.DWG 8/5/2010 1:36 PM Richard Celestino

Explanation

- PID readings presented in parts per million (ppm)
- Contour interval = 500 ppm

- Proposed post-excavation Monitoring Well

Passero Associates
100 Liberty Pole Way, Rochester, NY 14604
585-325-1000 FAX: 585-325-1691
www.passero.com

Engineering Surveying
Architecture Planning

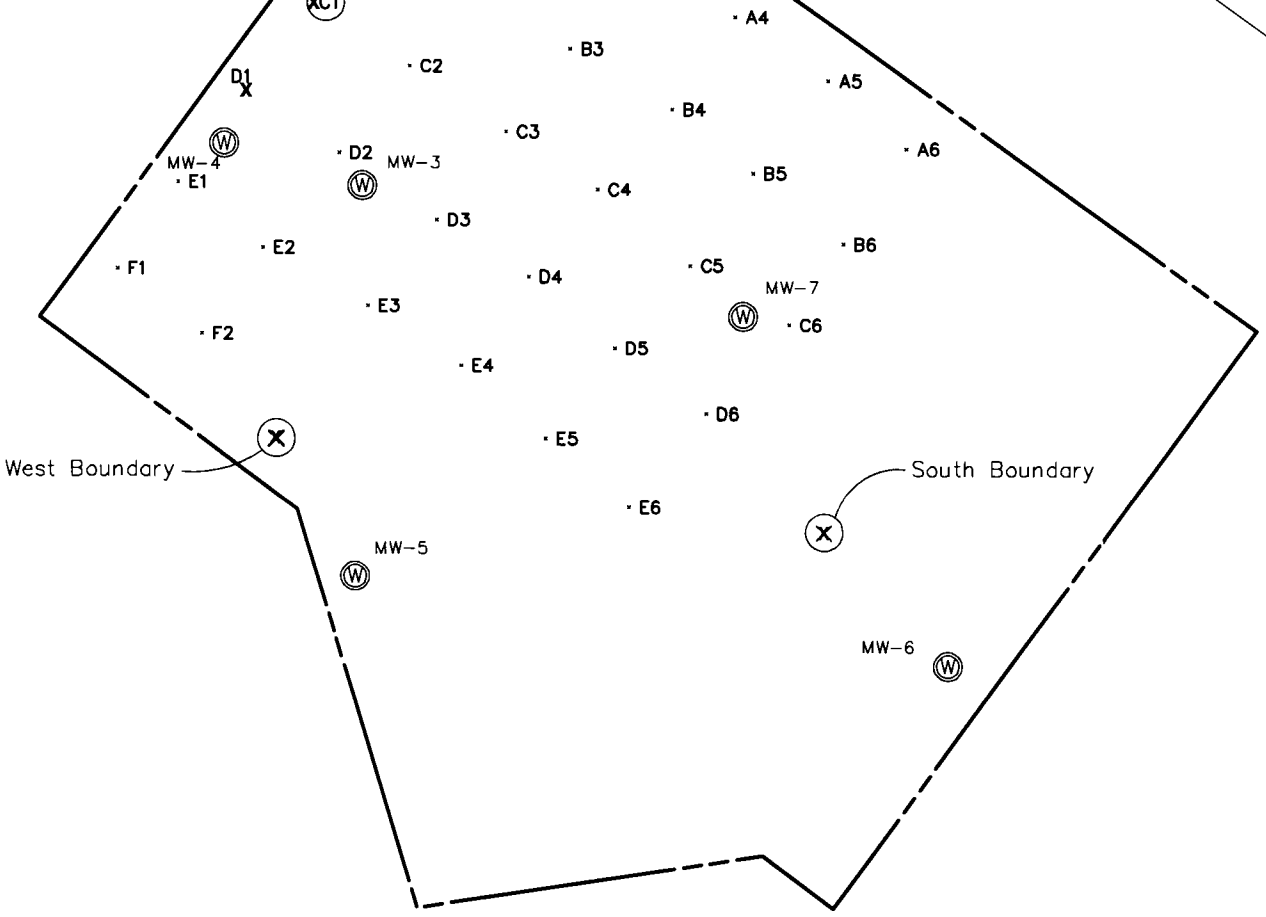
Project: **37 Bittner Street**
Part of Lots 52, 53, 54 & 55 of the Atwater & Andrews Tract in the City of Rochester, Monroe County, New York State

Drawing: **Proposed Excavation**

Client: 234-250 Andrews Street LLC, New York State D.E.C.

Principal-in-Charge: Gary W. Passero, P.E.
Project Manager: Peter S. Morton, C.P.G.
Designed by: Richard Celestino

Project No.: 25030.06
Drawing No.: Figure 3
Scale: 1" = 20'
Date: 06-22-09



Explanation

- PID readings presented in parts per million (ppm)
- Contour interval = 10 ppm

Legend

: Site Boundary

x: Soil Sample Location

Passero Associates
100 Liberty Pole Way, Rochester, NY 14604
585-325-1000 FAX: 585-325-1691
www.passero.com

Engineering Surveying
Architecture Planning

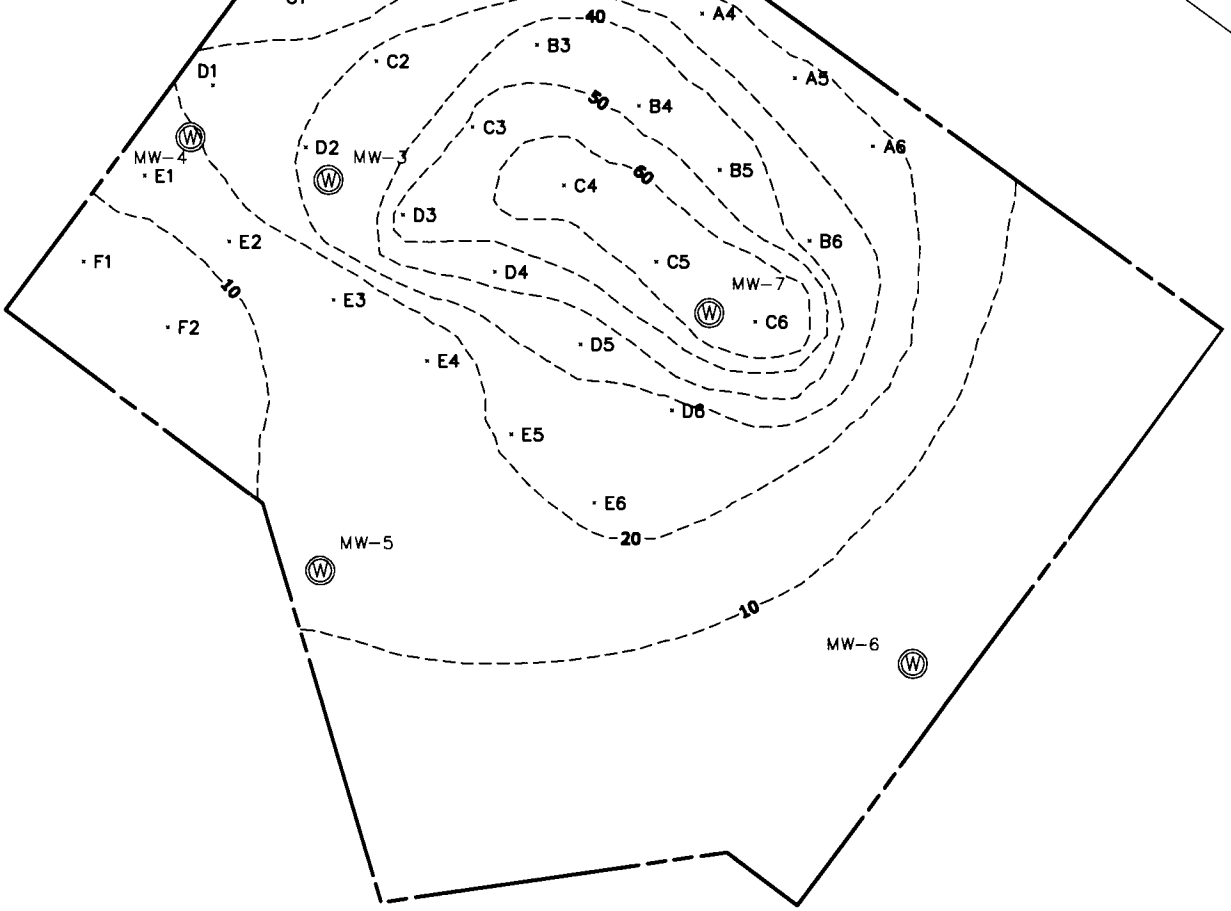
Project: **37 Bittner Street**
Part of Lots 52, 53, 54 & 55 of the Atwater & Andrews Tract in the City of Rochester, Monroe County, New York State

Drawing: **Geoprobe & Sample Location Map**

Client: 234-250 Andrews Street LLC
New York State D.E.C.

Principal-in-Charge: John Caruso, P.E.
Project Manager: Ed Freeman, P.L.S.
Designed by: Richard Celestino

Project No.: **25030.06**
Drawing No.: **Figure 4**
Scale: **1" = 20'**
Date:



Explanation

- PID readings presented in parts per million (ppm)
- Contour interval = 10 ppm

Legend

Site Boundary

Passero Associates
100 Liberty Pole Way, Rochester, NY 14604
585-325-1000 FAX: 585-325-1691
www.passero.com

Engineering Surveying
Architecture Planning

Project: **37 Bittner Street**
Part of Lots 52, 53, 54 & 55 of the Atwater & Andrews Tract in the City of Rochester, Monroe County, New York State

Drawing: **PID, 0'-4' Depth**

Client: 234-250 Andrews Street LLC
New York State D.E.C.

Principal-in-Charge: John Caruso, P.E.
Project Manager: Ed Freeman, P.L.S.
Designed by: Richard Celestino

Project No.: **25030.06**
Drawing No.: **Figure 5**
Scale: **1" = 20'**
Date: **06-22-09**

Explanation

- PID readings presented in parts per million (ppm)
- Contour interval = 5 ppm

Legend

——— — — ——— : Site Boundary

Passero Associates
100 Liberty Pole Way, Rochester, NY 14604
585-325-1000 FAX: 585-325-1691
www.passero.com

Engineering Surveying
Architecture Planning

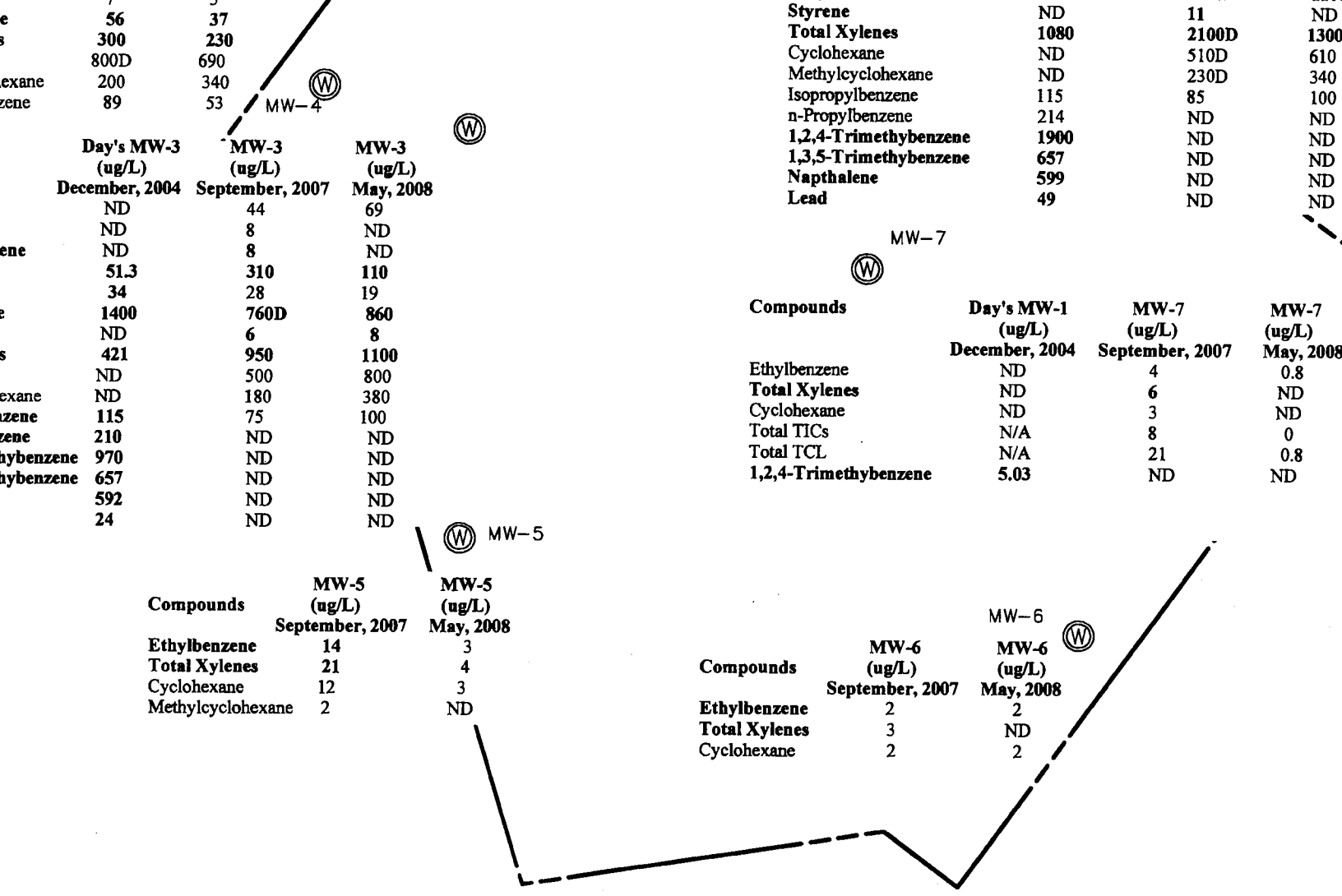
Project
37 Bittner Street
Part of Lots 52, 53, 54 & 55 of the Atwater & Andrews Tract in the City of Rochester, Monroe County, New York State

Drawing
4'-8' Depth

Client: 234-250 Andrews Street LLC, New York State D.E.C.

Principal-in-Charge: John Caruso, P.E.
Project Manager: Ed Freeman, P.L.S.
Designed by: Richard Celestino

Project No.: 25030.06
Drawing No.: Figure 6
Scale: 1" = 20'
Date: 06-22-09



	Day's MW-3 (ug/L) December, 2004	MW-3 (ug/L) September, 2007	MW-3 (ug/L) May, 2008
	ND	44	69
	ND	8	ND
ene	ND	8	ND
	51.3	**310**	**110**
	34	28	19
e	**1400**	**760D**	**860**
	ND	**6**	**8**
s	**421**	**950**	**1100**
	ND	500	800
exane	ND	180	380
zene	**115**	75	100
ene	**210**	ND	ND
hybenzene	**970**	ND	ND
hybenzene	**657**	ND	ND
	592	ND	ND
	24	ND	ND

Compounds	MW-5 (ug/L) September, 2007	MW-5 (ug/L) May, 2008
Ethylbenzene	**14**	3
Total Xylenes	**21**	4
Cyclohexane	12	3
Methylcyclohexane	2	ND

Compounds	MW-6 (ug/L) September, 2007	MW-6 (ug/L) May, 2008
Ethylbenzene	2	2
Total Xylenes	3	ND
Cyclohexane	2	2

Styrene	ND	**11**	ND
Total Xylenes	**1080**	**2100D**	**1300**
Cyclohexane	ND	510D	610
Methylcyclohexane	ND	230D	340
Isopropylbenzene	115	85	100
n-Propylbenzene	214	ND	ND
1,2,4-Trimethybenzene	**1900**	ND	ND
1,3,5-Trimethybenzene	**657**	ND	ND
Napthalene	**599**	ND	ND
Lead	**49**	ND	ND

Compounds	Day's MW-1 (ug/L) December, 2004	MW-7 (ug/L) September, 2007	MW-7 (ug/L) May, 2008
Ethylbenzene	ND	4	0.8
Total Xylenes	ND	**6**	ND
Cyclohexane	ND	3	ND
Total TICs	N/A	8	0
Total TCL	N/A	21	0.8
1,2,4-Trimethybenzene	**5.03**	ND	ND

Legend

: Site Boundary

Bold Text: **Exceeds TOGs 1.1.1**

Passero Associates
100 Liberty Pole Way, Rochester, NY 14604
585-325-1000 FAX: 585-325-1691
www.passero.com

Engineering Surveying
Architecture Planning

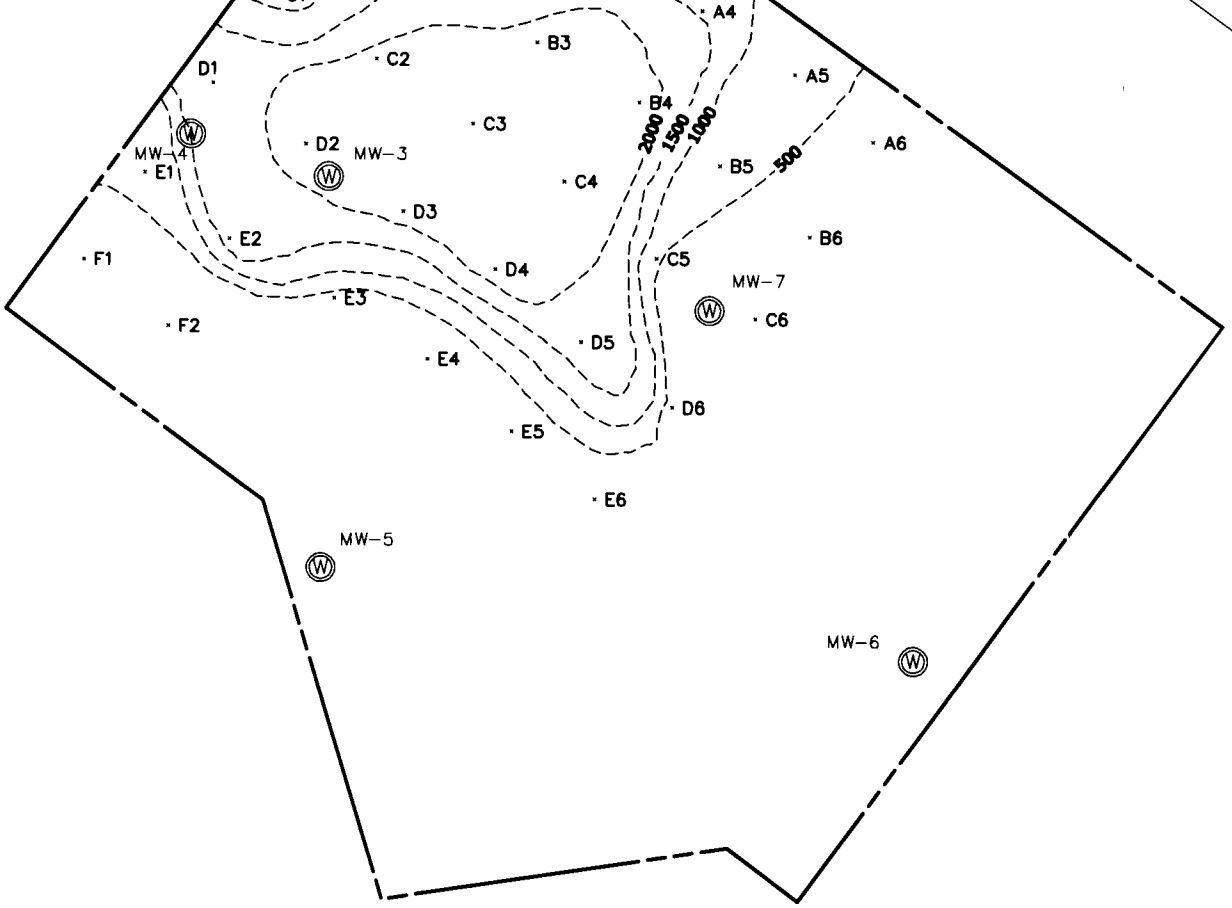
Project
37 Bittner Street
Part of Lots 52, 53, 54 & 55 of the Atwater & Andrews Tract in the City of Rochester, Monroe County, New York State

Drawing
Groundwater Data

Client 234-250 Andrews Street LLC
New York State D.E.C.

Principal-in-Charge Gary W. Passero, P.E.
Project Manager Peter S. Morton, C.P.G.
Designed by Richard Celestino

Project No. 25
Drawing No. Fig
Scale: 1
Date



Explanation

- PID readings presented in parts per million (ppm)
- Contour interval = 500 ppm

Legend

: Site Boundary

Passero Associates
100 Liberty Pole Way, Rochester, NY 14604
585-325-1000 FAX: 585-325-1691
www.passero.com

Engineering Surveying
Architecture Planning

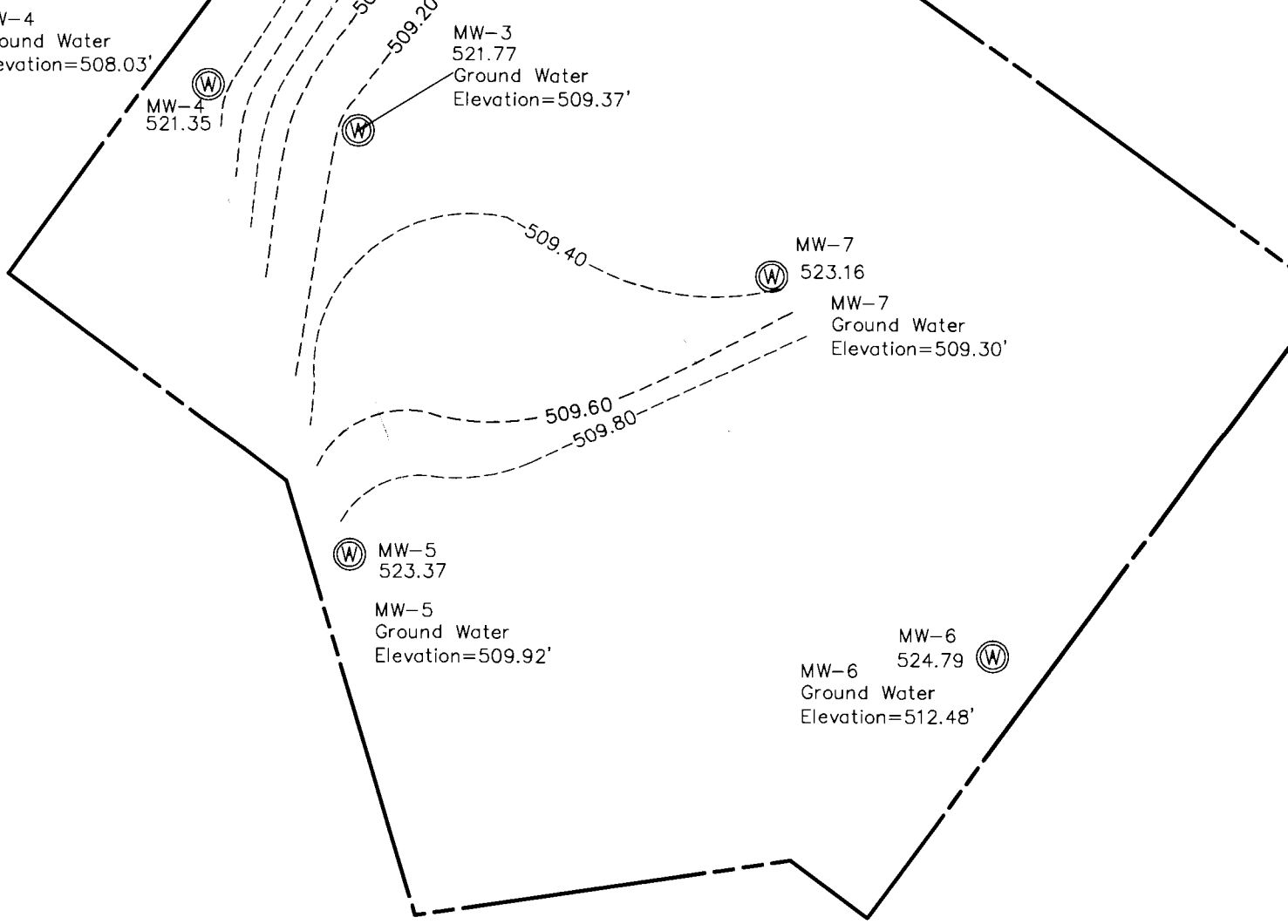
Project
37 Bittner Street
Part of Lots 52, 53, 54 & 55 of the Atwater & Andrews Tract in the City of Rochester, Monroe County, New York State

Drawing
8'-12' Depth

Client: 234-250 Andrews Street LLC, New York State D.E.C.

Principal-In-Charge: John Caruso, P.E.
Project Manager: Ed Freeman, P.L.S.
Designed by: Richard Celestino

Project No.: 25030.06
Drawing No.: Figure 7
Scale: 1" = 20'
Date: 06-22-09



Passero Associates
100 Liberty Pole Way, Rochester, NY 14604
585-325-1000 FAX: 585-325-1691
www.passero.com

Engineering Surveying
Architecture Planning

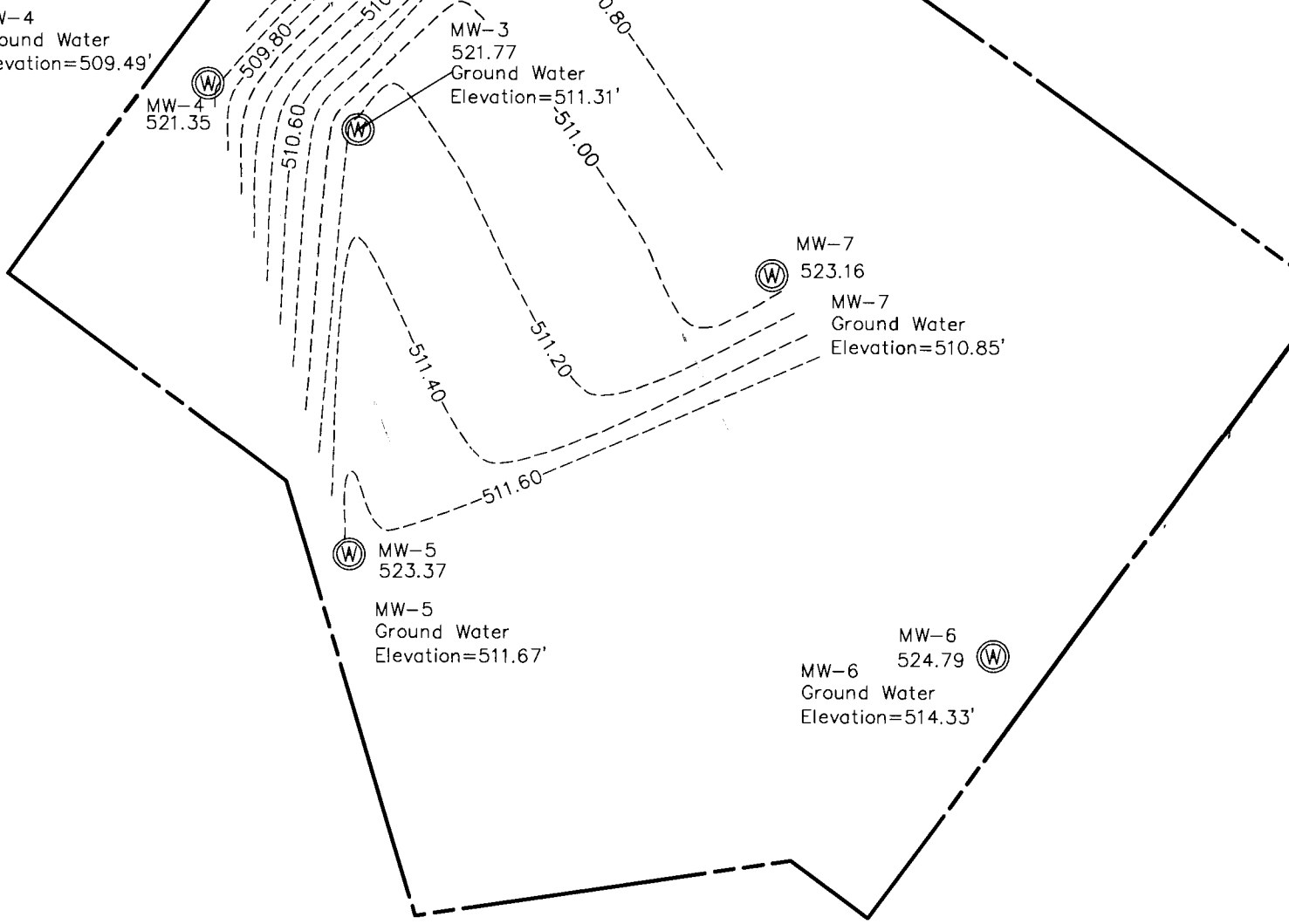
Project
37 Bittner Street
Part of Lots 52, 53, 54 & 55 of the Atwater & Andrews Tract in the City of Rochester, Monroe County, New York State

Drawing
September, 2007 Groundwater Contours

Client 234-250 Andrews Street LLC
New York State D.E.C.

Principal-in-Charge Gary W. Passero, P.E.
Project Manager Peter S. Morton, C.P.G.
Designed by Richard Celestino

Project No. 250
Drawing No. Figu
Scale: 1"
Date



Legend

: Site Boundary

Passero Associates
100 Liberty Pole Way, Rochester, NY 14604
585-325-1000 FAX: 585-325-1691
www.passero.com

Engineering Surveying
Architecture Planning

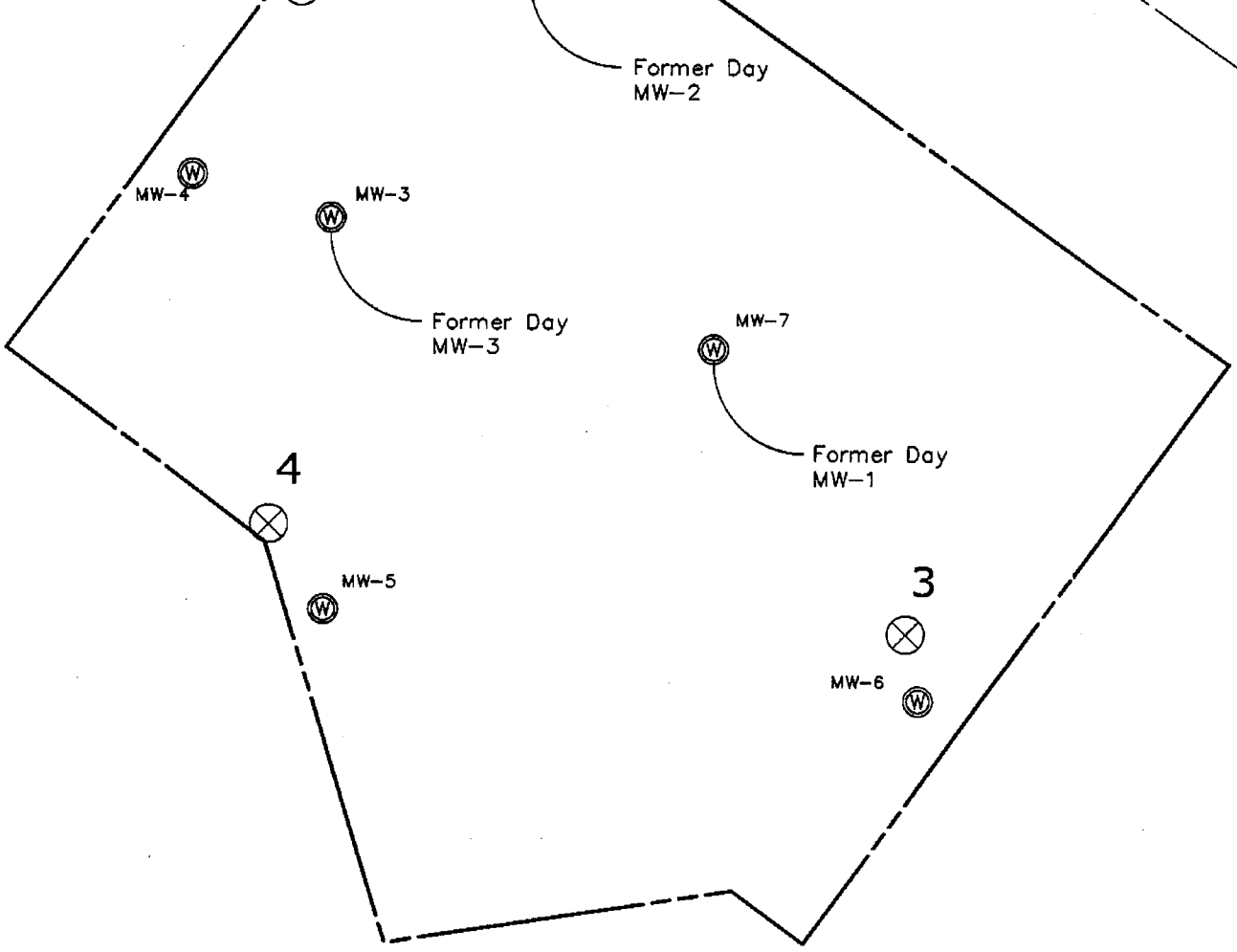
Project
37 Bittner Street
Part of Lots 52, 53, 54 & 55 of the Atwater & Andrews Tract in the City of Rochester, Monroe County, New York State

Drawing
May, 2008 Groundwater Contours

Client 234-250 Andrews Street LLC
New York State D.E.C.

Principal-in-Charge Gary W. Passero, P.E.
Project Manager Peter S. Morton, C.P.G.
Designed by Richard Celestino

Project No. 250
Drawing No. Figu
Scale: 1"
Date



Explanation

- PID readings presented in parts per million (ppm)
- Contour interval = 10 ppm

Legend

: Site Boundary

: Boundary Vapor Points

25030.05h TS Bittner St.dwg

Passero Associates
100 Liberty Pole Way, Rochester, NY 14604
585-325-1000 FAX: 585-325-1691
www.passero.com

Engineering Surveying
Architecture Planning

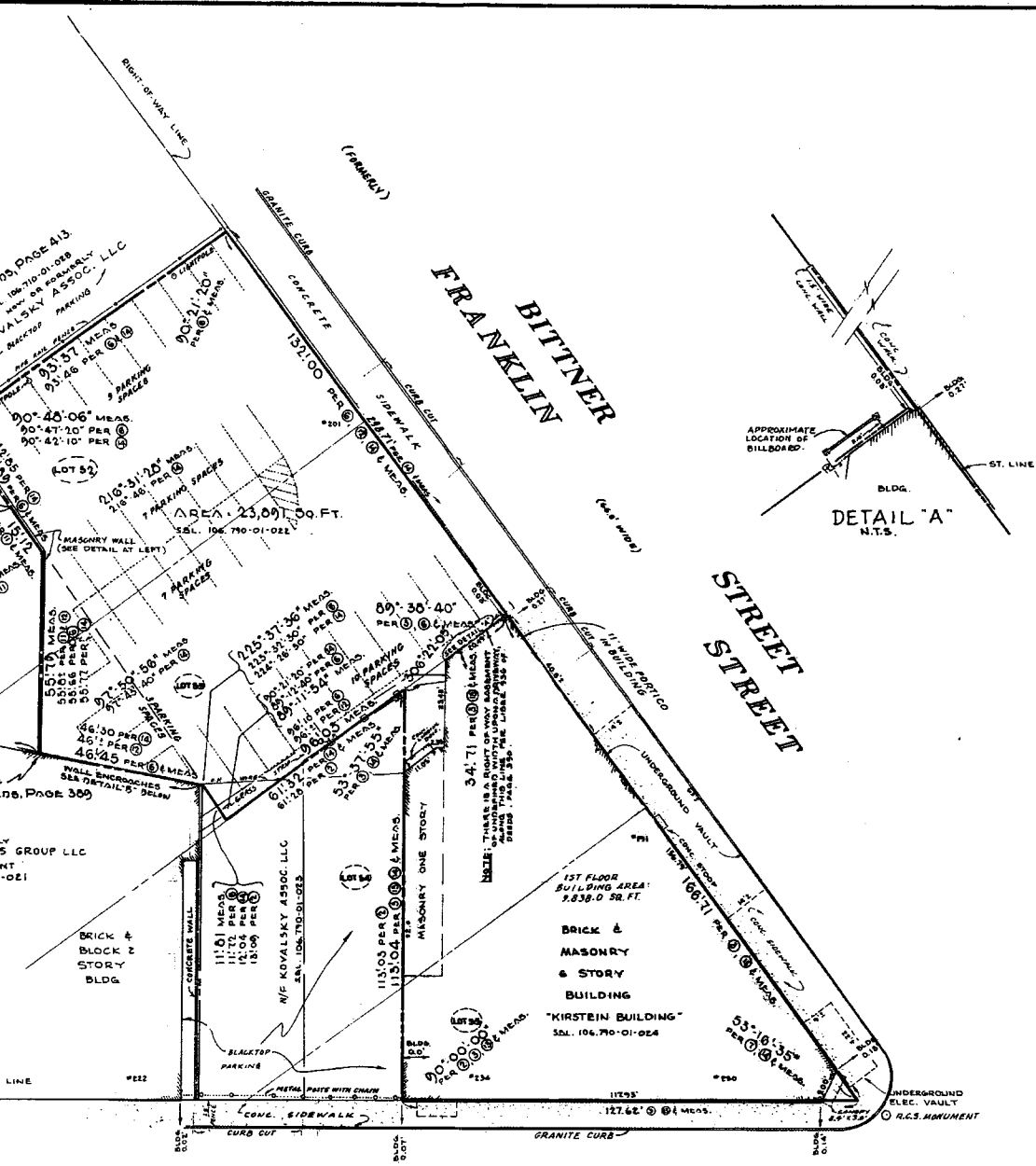
Project
234-250 Adrews St. & 37 Bittner St.
Part of Lots 52, 53, 54 & 55 of the Atwater & Andrews Tract in the City of Rochester, Monroe County, New York State

Drawing
Boundary Vapor Points

Client: 234-250 Andrews Street LLC, New York State D.E.C.

Principal-in-Charge: John Caruso, P.E.
Project Manager: Ed Freeman, P.L.S.
Designed by: Richard Celestino

Project No. 25030.06
Drawing No. Figure 11
Scale: 1" = 20'
Date



REFERENCE:

1. ATWATER & ANDREWS TRACT LIBER 2 OF MAPS, PG. 54 & 55.
2. LIBER 936 OF DEEDS, PG. 390. (R.O.W.)
3. LIBER 8470 OF DEEDS, PG. 51 (MAP ATTACHED)
4. LIBER 5346 OF DEEDS, PG. 256.
5. LIBER 5415 OF DEEDS, PG. 155.
6. MAP OF STEIN, BLOCH CO. PROPERTY, BY J.C. RYAN L.S. APRIL 1912
7. INFORMATION FROM CITY OF ROCHESTER MAPS AND RECORDS & PRECISE SURVEY OFFICES.
8. ABSTRACT OF TITLE BY PUBLIC ABSTRACT CORP., NO. E0774, LAST DATED NOV. 30, 1977.
9. ABSTRACT OF TITLE BY PUBLIC ABSTRACT CORP., NO. E0775, LAST DATED NOV. 30, 1977.
10. LIBER 1628 OF DEEDS, PAGE 413.
11. " 1644 " " " 389.
12. " 1903 " " " 524.
13. " 1462 " " " 423.
14. " 5024 - MORT. " 466

ABSTRACT OF TITLE BY MONROE ABSTRACT & TITLE COPORATION NO. 89890 . LAST UPDATED APRIL 14, 1983.

NOTES:

1. VAULTS ALONG ANDREWS STREET WERE FILLED AND ABANDON IN 1981.
2. TIES TAKEN TO BUILDING WATERTABLE ALONG ANDREWS & BITTNER ST. STREETS.
3. CORNICES & SILLS EXTEND INTO STREET
4. 36 PARKING SPACES AS SHOWN ON PLAT.

Certificate of Survey.
ALTA/ACSM Land Title Survey

To: 234 - 250 Andrews Street LLC
The Community Preservation Corporation
State of New York Mortgage Agency

This is to certify that this map or plat and the survey on which it is based were made in accordance with "Minimum Standard Detail Requirements for ALTA/ACSM Land Titke Surveys", jointly established and adopted by ALTA, ACSM, and NSPS in 1999, and includes items 3,4,7–10, and 13 of Table A thereof. Pursuant to the Accuracy Standards as adopted by ALTA, NSPS, and ACSM and in effect on the date of this certification, undersigned further certifies that the Positional Uncertainties resulting from the survey measurements made on the survey do not exceed the Positional Tolerance.

To the best of my knowledge and belief the within Plat represents a survey made uncer my supervision. The field work for this survey was performed on May 12, 1982, with additional field work completed November 05, 2004. and September 03, 2008.

STATE OF NEW YORK
RICHARD J. FREEMAN
049771
LICENSED LAND SURVEYOR

Richard J. Freeman
N.Y.S. Land Surveyor No. 049771
September 03, 2008

Flood Note:
Parcel in Zone "C" – Not in Flood Area
Per Community Panel No. 360 431 0020B
Dated: 11/78

...LE BY COLONY ABSTRACT CORP.
...; DATED 6-13-90
... @ LIBER 6394 O, PG. 162
...NROE TITLE INSURANCE CORP SEARCH
...DATED APRIL 03, 1998.
...DEEDS, PAGE 51
...TLE PREPARED BY MONROE TITLE
...ORATION, ABST. NO. 89890 DATED
...EEDS, PAGE 340.
...BY MARATHON ABSTRACT LLC,
...-111 DATED MAY 20, 2004

CERTIFICATION INDICATED HEREON SHALL RUN ONLY TO THE PERSON FOR WHOM THE SURVEY IS PREPARED, AND ON HIS BEHALF TO THE AGENCIES LISTED HEREON. CERTIFICATIONS ARE NOT TRANSFERABLE TO ADDITIONAL INSTITUTIONS OR SUBSEQUENT OWNERS.

UNAUTHORIZED ALTERATION OR ADDITION TO THIS SURVEY MAP IS A VIOLATION OF SECTION 7209, SUB-DIVISION 2, OF THE N.Y.S. EDUCATION LAW.

REVISIONS		
Date	Description	By
5-27-83	COMPLETED MAP	E.L.
6-23-89	SUBDIVISION OF LOTS 1 & 2	R.P.B.
9-22-89	AMENDED CERTIFICATION	D.C.
7-2-90	R. REBATE	K.J.Y.
5-8-98	R. REBATE	D.S.C.
04-11-2000	INSTRUMENT REINSPECTION	DPS
11-05-04	INSTRUMENT SURVEY REINSPECTION	D.S.
9-03-08	INSTRUMENT SURVEY REINSPECTION	D.S.

PASSERO ASSOCIATES, P.C.
ARCHITECTS – ENGINEERS – SURVEYORS
190 LIBERTY POLE WAY 716-325-1000 ROCHESTER, N.Y. 14604

Project: PART OF LOTS 52, 53, 54 & 55 OF THE ATWATER & ANDREWS TRACT, IN THE CITY OF ROCHESTER, MONROE CO., N.Y.
Drawing: 234-250 ANDREWS ST. & 57. BITTNER ST.
ALTA/ACSM SURVEY
Client: GLOBE DEVELOPERS INC. 410 PARK AVE. #790 NEW YORK CITY, N.Y. 10022
Scale: 1"=20'
Engineer: N.B.G.
Date: APRIL 2000
Drawn By: B.L.C.
Drawing No.: Figure 12

MAPQUEST

Route Highland Hospital

from 37 Bittner Street

Figure 13

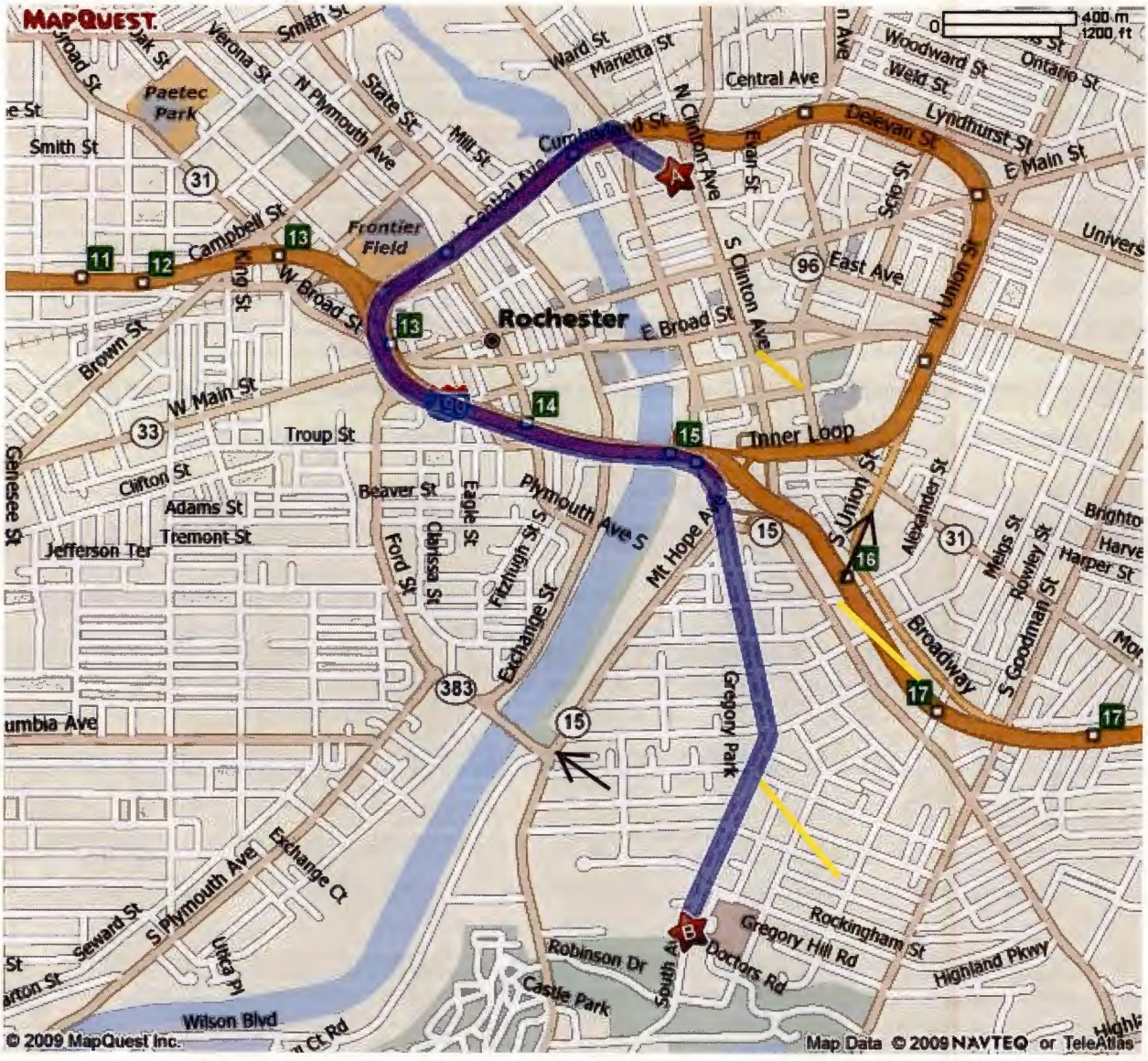
Total Time: 6 minutes **Total Distance: 2.74 miles**

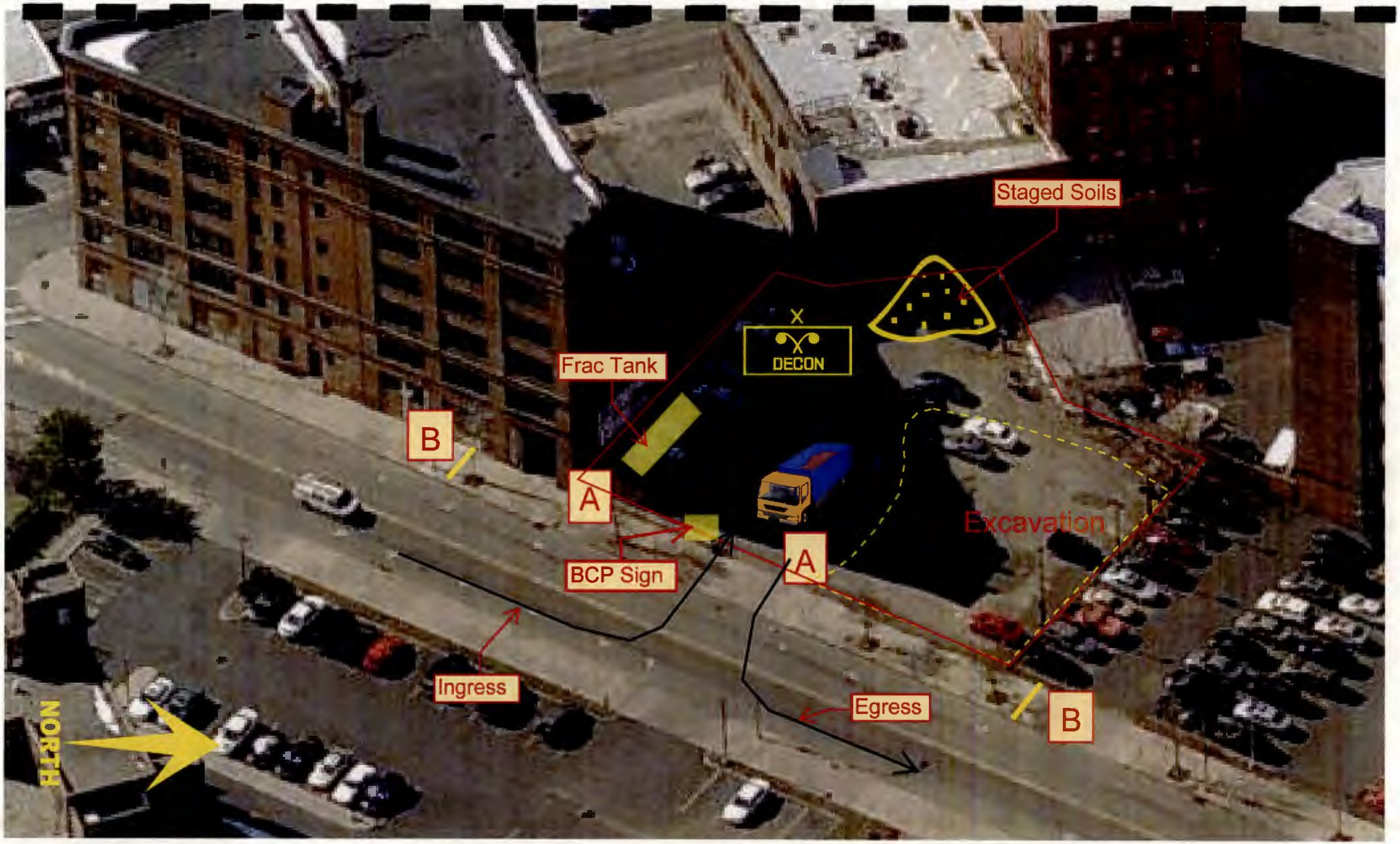
A: 37 Bittner St, Rochester, NY 14604-1129

START	1: Start out going NORTHWEST on BITTNER ST toward ST PAUL ST.	0.1 mi
	2: Turn SLIGHT RIGHT onto ST PAUL ST.	0.0 mi
RAMP	3: Turn LEFT to take the INNER LOOP WEST ramp.	0.1 mi
	4: Merge onto INNER LOOP.	0.3 mi
EAST 490	5: Merge onto I-490 E via the exit on the LEFT toward INNER LOOP.	1.0 mi
15 EXIT	6: Take the SOUTH AVE exit, EXIT 15, toward RT-15.	0.1 mi
	7: Turn SLIGHT LEFT onto SOUTH AVE.	1.0 mi
END	8: End at 990 South Ave # 203 Rochester, NY 14620	

B: Highland Hospital-Rochester: 990 South Ave # 203, Rochester, NY 14620, (585) 341-8097

Total Time: 6 minutes Total Distance: 2.74 miles

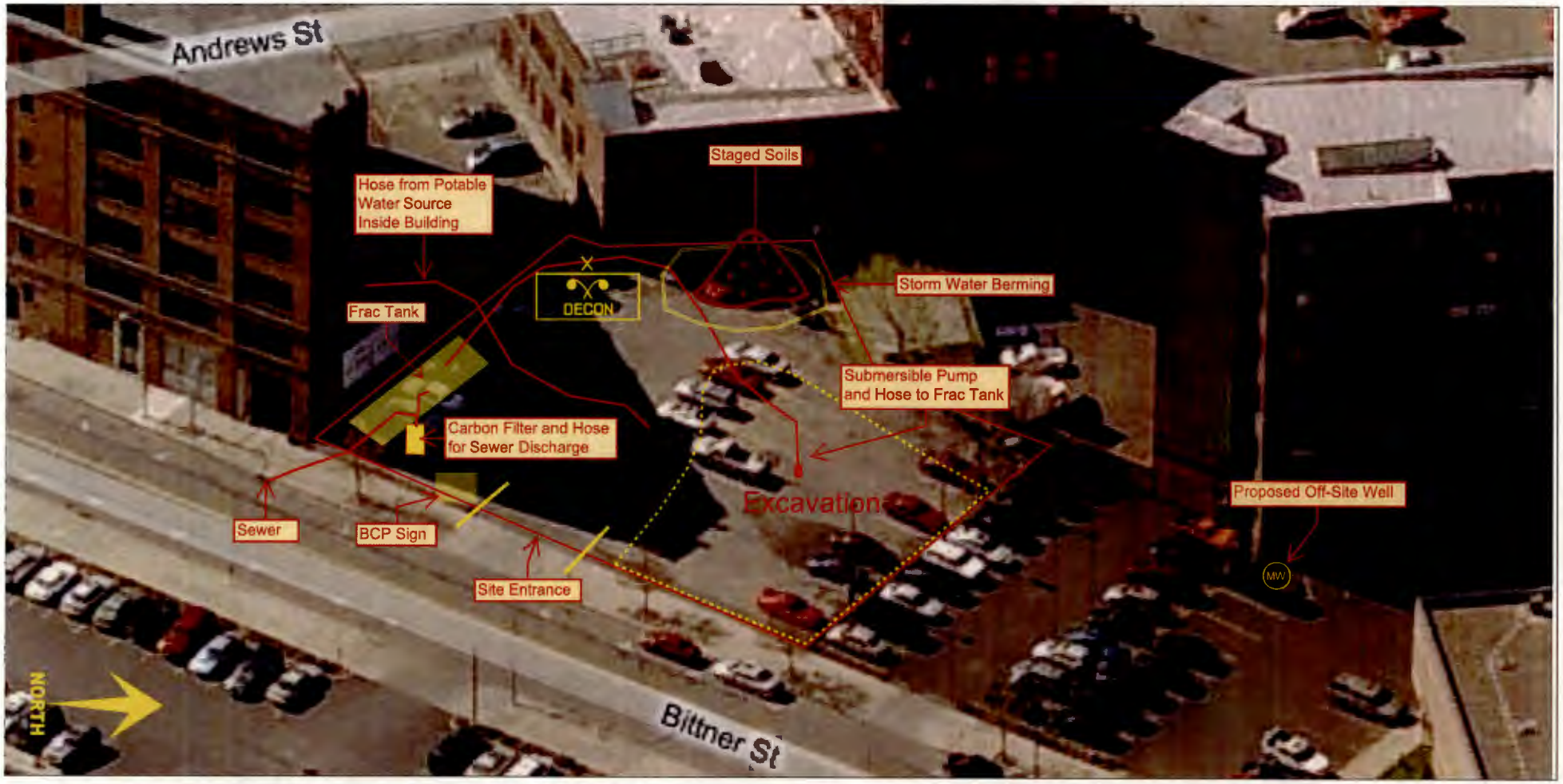




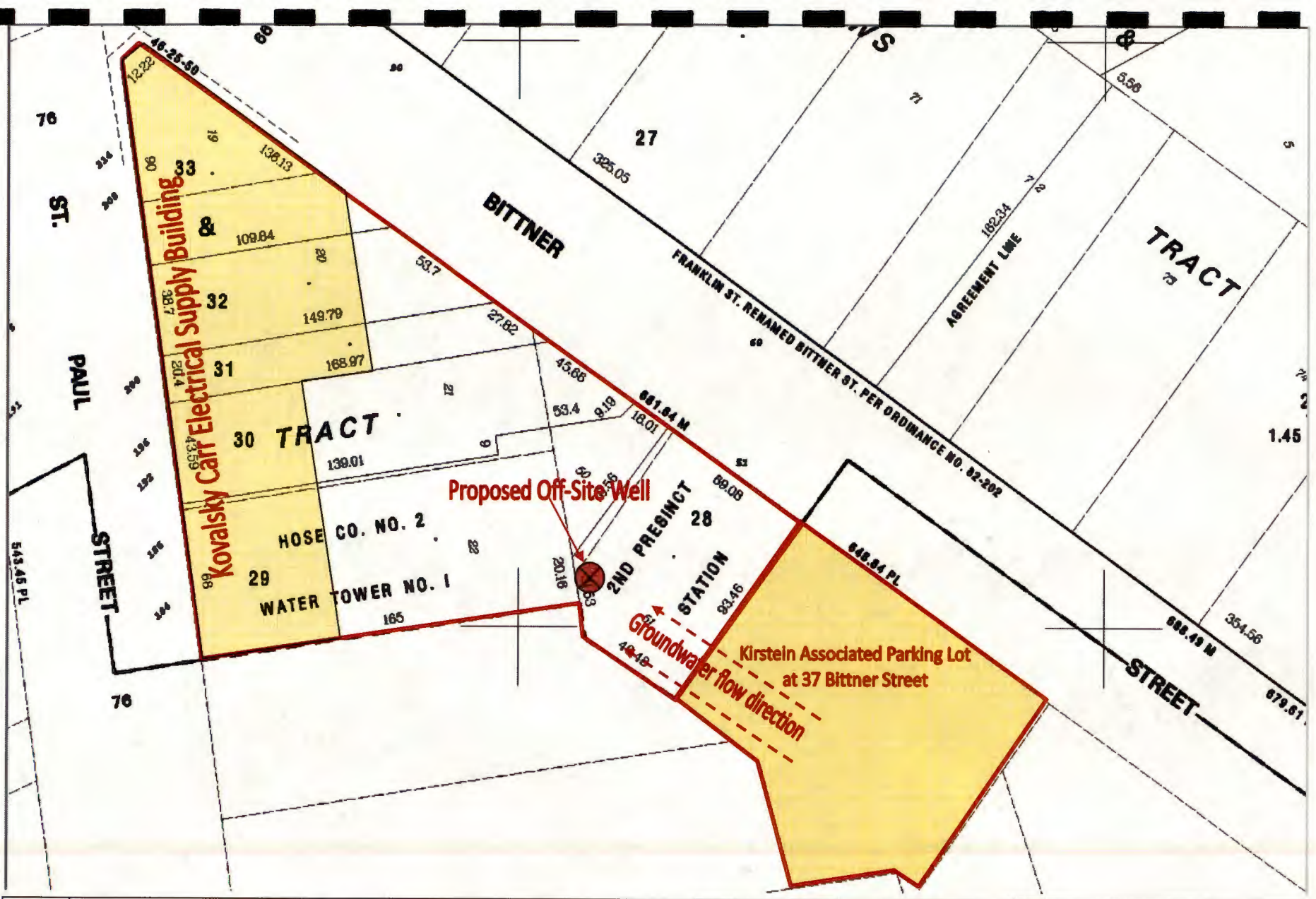
SIGN TEXT:
SIGNS SHALL BE PER THE FHA MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
A=SIDEWALK CLOSED
B=SIDEWALK CLOSED USE OTHER SIDE

PERMITS
CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND PAYING FOR ALL REQUIRED PERMITS

Project	**Kirstein Building Associated Parking Lot at 37 Bittner Street Part of Lots 52, 53, 54 &55 of the Atwater & Andrews Tract in the City of Rochester, Monroe County, New York State**			Project No.	**25030.08**
Drawing	**MAINTENANCE & PROTECTION OF TRAFFIC PLAN**			Drawing No.	**Figure 14**
Client	234-250 Andrews Street LLC New York State Department of Conservation	Principal-in-Charge	**Gary W. Passero, P.E**		
		Project Manager	**Peter S. Morton**	Date	**08-04-10**
		Designed by	**Elizabeth Primus**		



Project:	Kirstein Building Associated Parking Lot at 37 Bittner Street Part of Lots 52, 53, 54 &55 of the Atwater & Andrews Tract in the City of Rochester, Monroe County, New York State			Project No.:	25030.08
Drawing:	Remedial Site Plan			Drawing No.:	Figure 15
Client:	234-250 Andrews Street LLC New York State Department of Conservation	Principal –In-Charge:	Gary W. Passero, P.E		
		Project Manager:	Peter S. Morton		
		Designed by:	Elizabeth Primus	Date:	08-05-10



Project	**Kirstein Building Associated Parking Lot at 37 Bittner Street** **Part of Lots 52, 53, 54 &55 of the Atwater & Andrews Tract in the City of Rochester, Monroe County, New York State**			Project No.	**25030.08**
Drawing	**Off-Site Well Location**			Drawing No.	**Figure 16**
Client	234-250 Andrews Street LLC, & New York State Department of Conservation	Principal-in-Charge	**Gary W. Passero, P.E**		
		Project Manager	**Peter S. Morton**	Date	**08-05-10**
		Designed by	**Elizabeth Primus**		

Google maps

Directions to Mill Seat Landfill A Waste Co
303 Brew Road, Bergen, NY 14416-9310 - (585) 494-3000
20.8 mi – about **24 mins**

Figure 17

37 Bittner St, Rochester, NY 14604

1.	Head **northwest** on **Bittner St** toward **St Paul St**	go 0.1 mi total 0.1 mi
2.	**Turn left onto the Inner Loop W ramp**	**go 0.1 mi** total 0.2 mi
3.	Merge onto **Inner Loop**	go 0.4 mi total 0.6 mi
4.	**Merge onto I-490 W via the ramp to Buffalo** About 19 mins	**go 18.7 mi** total 19.4 mi
5.	Take exit **2** for **NY-33/New York 33 A** toward **Bergen/Batavie**	go 0.3 mi total 19.6 mi
6.	**Keep left at the fork, follow signs for New York 33 a E**	**go 308 ft** total 19.7 mi
7.	Turn **left** at **New York 33A E** About 1 min	go 0.3 mi total 20.0 mi
8.	**Take the 1st right onto Brew Rd/Co Rd 196** Destination will be on the right About 2 mins	**go 0.8 mi** total 20.8 mi

Mill Seat Landfill A Waste Co
303 Brew Road, Bergen, NY 14416-9310 - (585) 494-3000

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

APPENDIX 1

Metes & Bounds

P.N. 24762.01
December 4, 2004
E.J.F.

Description

Tax Account Number 106.790-01-022

Al that tract or parcel of land, situated in part of Lots 52 & 53 of the Atwater & Andrews Tract, in the City of Rochester, County of Monroe, and State of New York, and being more particularly described as follows:

Commencing on the northerly right of way of Andrews Street, (60' row) at with its intersection with the westerly right of way of Bittner Street, (66' row); thence, northwesterly, along the westerly right of way of Bittner Street, a distance of 166.71 feet to the point of beginning; thence,

1. Southwesterly, forming an angle to the right with the right of way of Bittner Street of 90°21'20", a distance of 96.03 feet to a point; thence,
2. Northerly, forming an interior angle with course no. 1 of 89°11'54", a distance of 11.81 feet to a point; thence,
3. Westerly, forming an interior angle with course no. 2 of 225°37'36", a distance of 46.45 feet to a point; thence,
4. Northerly, forming an interior angle with course no. 3 of 97°50'56", a distance of 55.79 feet to a point; thence,
5. Northwesterly, forming an interior angle with course no. 4, of 216°31'28", a distance of 42.89 feet to a point; thence,
6. Northeasterly, forming an interior angle with course no. 5, of 90°48'06", a distance of 93.37 feet to a point on the westerly right of way of Bittner Street; thence,
7. Southeasterly, forming an interior angle with course no. 6 of 90°21'20", along said right of way, a distance of 132.00 feet to the point of beginning, encompassing 0.316 acres of land, more or less.

APPENDIX 2

Sanborn Maps

EDR™ Environmental Data Resources Inc

"Linking Technology with Tradition"®

Sanborn® Map Report

Ship To: Pete Morton
Passero Associates
100 Liberty Pole Way
Rochester, NY 14604

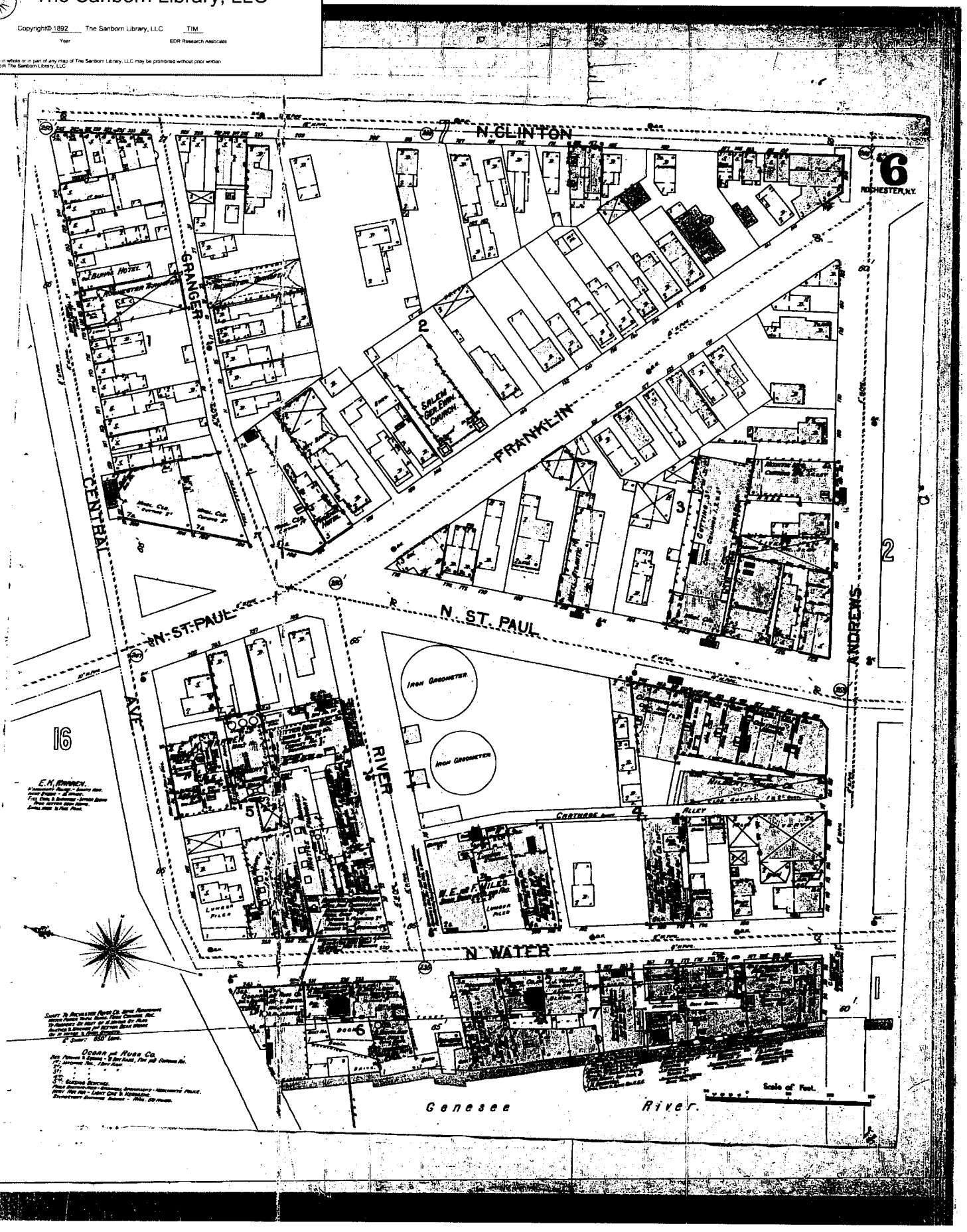
Order Date: 3/10/2005 **Completion Date:** 3/11/2005
Inquiry #: 1376628.2s
P.O. #: 25030.02
Site Name: The Kirstein Building
Address: 242 Andrews St.
City/State: Rochester, NY 14604
Cross Streets:

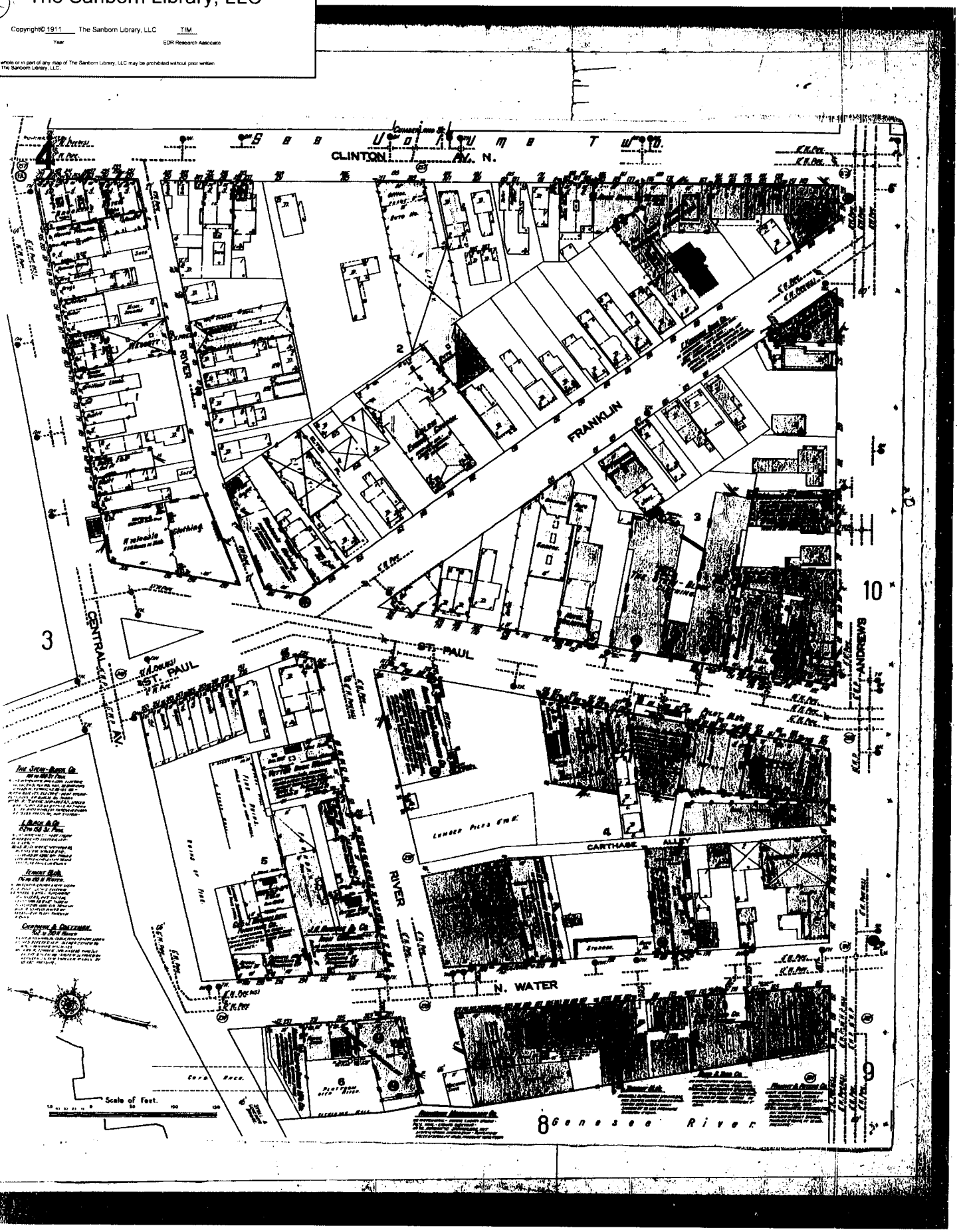
Customer Project: 25030.02
1019138ERK 585-325-1000

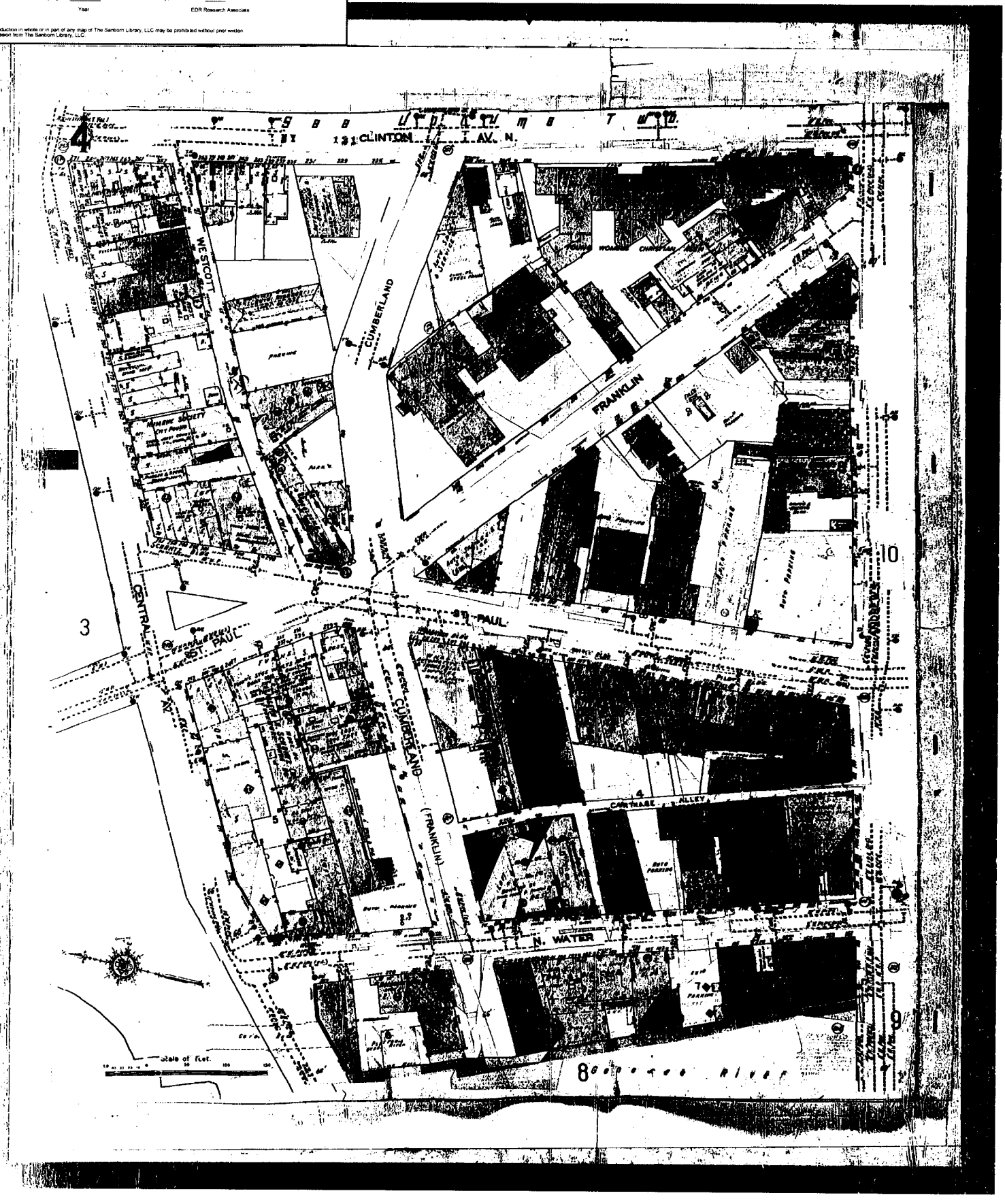
Based on client-supplied information, fire insurance maps for the following years were identified

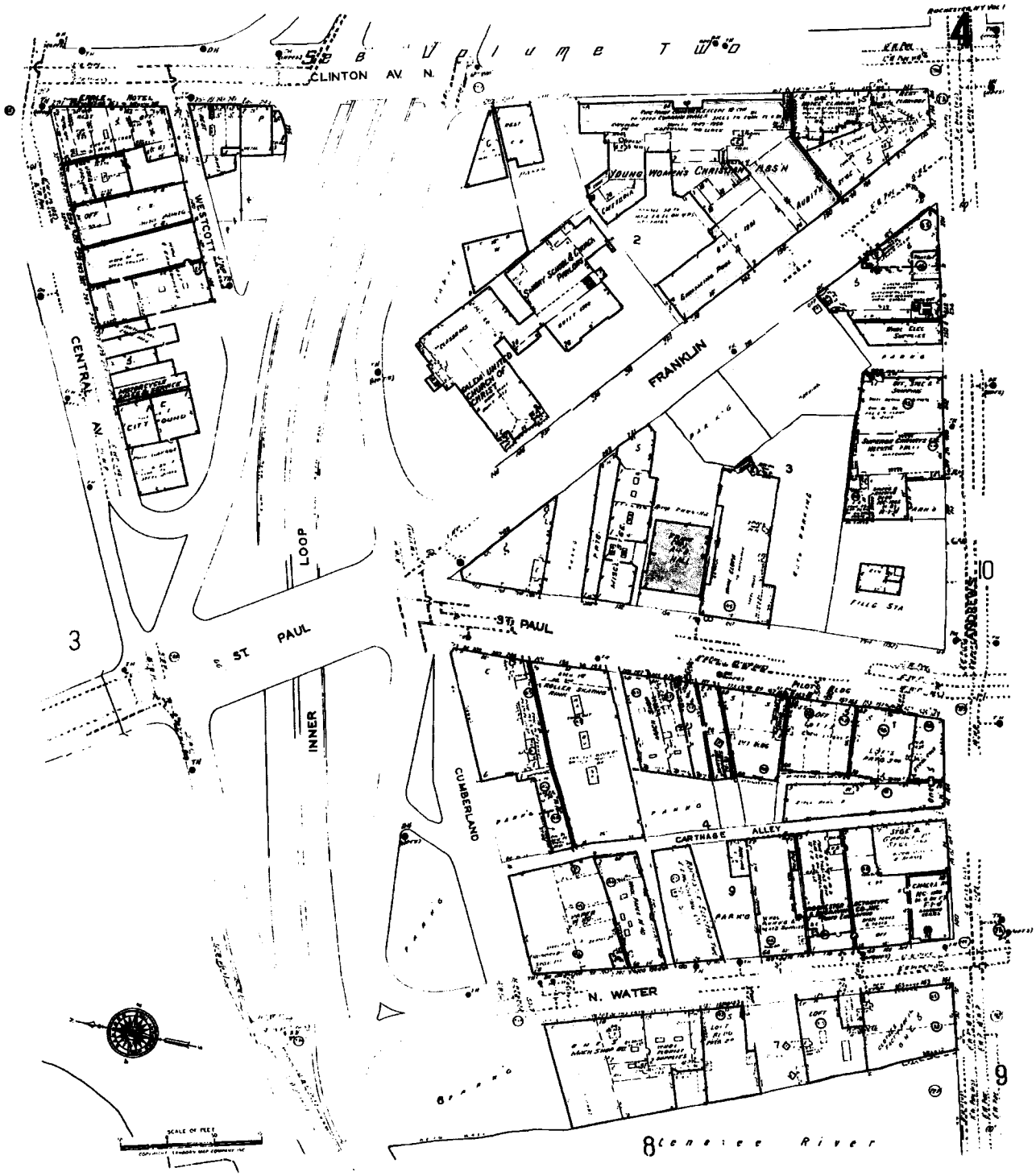
1892 - 1 Map
1911 - 1 Map
1950 - 1 Map
1971 - 1 Map

Limited Permission to Photocopy Total Maps: 4









APPENDIX 3

Community Air Monitoring Plan/
Fugitive Dust and Particulate Monitioring

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50° C (14 to 122° F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

APPENDIX 4

Sample CAMP Logs, PID Screening Logs,
Daily Report Logs

Community Air Monitoring Log

Site: ______________________________ Date: ______________

Time	PID	DUST	Comments

PID Screening Log

Site: ____________________________________ Date: ________________

Time	PID	Location	Sample	Comments

Daily Report

Site: _____ Date:_____

Temperature	
Weather Conditions	
Wind Direction	
Equipment Location	
Equipment Calibration	
Truck Tally and Tonnage.	
Location of Excavation	
Notable Site conditions	

APPENDIX 5

Technical Guidance Documents,
FWRIA Decision Key and CP-43

APPENDIX 3C

Fish and Wildlife Resources Impact Analysis Decision Key

		If YES Go to:	If NO Go to:
1.	Is the site or area of concern a discharge or spill event?	(13.)	2.
2.	Is the site or area of concern a point source of contamination to the groundwater which will be prevented from discharging to surface water? Soil contamination is not widespread, or if widespread, is confined under buildings and paved areas.	13.	3
3.	Is the site and all adjacent property a developed area with buildings, paved surfaces and little or no vegetation?	4.	9.
4.	Does the site contain habitat of an endangered, threatened or special concern species?	Section 3.10.1	5.
5.	Has the contamination gone off site?	6.	14.
6.	Is there any discharge or erosion of contamination to surface water or the potential for discharge or erosion of contamination?	7.	14.
7.	Are the site contaminants PCBs, pesticides or other persistent, bioaccumulable substances?	Section 3.10.1	8.
8.	Does contamination exist at concentrations that could exceed SCGs or be toxic to aquatic life if discharged to surface water?	Section 3.10.1	14.
9.	Does the site or any adjacent or downgradient property contain any of the following resources? a. Any endangered, threatened or special concern species or rare plants or their habitat b. Any NYSDEC designated significant habitats or rare NYS Ecological Communities c. Tidal or freshwater wetlands d. Stream, creek or river e. Pond, lake, lagoon f. Drainage ditch or channel g. Other surface water feature h. Other marine or freshwater habitat i. Forest j. Grassland or grassy field k. Parkland or woodland l. Shrubby area m. Urban wildlife habitat n. Other terrestrial habitat	11.	10.
10.	Is the lack of resources due to the contamination?	Section 3.10.1	14.
11.	Is the contamination a localized source which has not migrated and will not migrate from the source to impact any on-site or off-site resources?	14.	12.
12.	Does the site have widespread soil contamination that is not confined under and around buildings or paved areas?	Section 3.10.1	13.
13.	Does the contamination at the site or area of concern have the potential to migrate to, erode into or otherwise impact any on-site or off-site habitat of endangered, threatened or special concern species or other fish and wildlife resource? (See #9 for list of potential resources. Contact NYSDEC for information regarding endangered species.)	Section 3.10.1	(14.)
14.	No Fish and Wildlife Resources Impact Analysis needed.		

CHAPTER 2 SAMPLING, ANALYSIS and QUALITY ASSURANCE

2.1 Sampling and Analysis Requirements

(a) Selection of analytical parameters.

1. All initial investigations must analyze and report on:

i. for organic contaminants the full target compound list plus the 30 (10 volatile organic compounds and 20 semi-volatile organic compounds) highest concentration tentatively identified compounds (TICs). The full target compound list plus the 30 (TCL+30), as defined in paragraph 2.4(d)15; and

ii. for inorganic compounds, the full target analyte list (TAL), as defined in paragraph 2.4(d)13.

2. Samples from an area of concern or a site may be analyzed for a limited contaminant list as approved by DER once the nature of the contamination is fully characterized.

3. For investigations of known petroleum releases, sample analysis must be for the suite of contaminants shown in the fuel oil and gasoline tables (tables 2 and 3) contained in the Commissioner Policy on *Soil Cleanup Guidance* (CP-Soil).

4. For investigation of non-petroleum storage and discharge areas, sample analysis must use the methods appropriate for the stored or discharged material.

5. Analysis must be conducted by a laboratory that is accredited pursuant to the NYSDOH Environmental Laboratory Accreditation Program (ELAP) for the category of parameters analyzed.

(b) Laboratory analytical methods. Except as provided in paragraph 1 below, samples collected by the remedial party will be analyzed by an analytical method included in the most current DEC Analytical Services Protocol (ASP), available on DEC's website identified in the table of contents.

1. An alternative to the ASP may be proposed if an analytical method, as described in the most current ASP:

i. does not exist for a specific contaminant or parameter (e.g., pH, dissolved oxygen) within a specific matrix;

ii. is demonstrated to be inappropriate for the matrix analyzed; or

iii. cannot achieve an acceptable detection limit or minimum reporting limit as provided in a DER-approved work plan.

2. Where one of the exceptions in paragraph 1 exists, the remedial party will:

i. select an appropriate method from another source;

ii. document the rationale for selecting the method;

iii. develop a standard operating procedure for the method, including a quality control section; and

iv. propose the method and standard operating procedure for such method to DEC for its consideration and approval.

3. The method selected must achieve a detection limit or minimum reporting limit that is below the applicable cleanup level for all contaminants that may be present in the medium being sampled and analyzed.

4. Unless otherwise provided in a DER-approved work plan, the Lloyd Kahn method must be used for the determination of total organic carbon in soil and sediment. This method is available on DEC's website identified in the table of contents.

5. Except for tissue samples (see subdivision 2.1 (d) below), gas chromatography methods with a mass spectrometer detector system must be used for analysis of semi-volatile contaminants (exclusive of herbicides, pesticides and PCBs). Other chromatography methods (e.g., high-performance liquid chromatography) with appropriate detector systems must be used for the analysis of organic analytes amenable only to non-gas chromatographic methods. A mass spectrometer detector system is preferable but not required if the site has already been characterized to the extent that all contaminants are known.

6. The procedures (including quality control and quality assurance) specified in the ASP analytical method must be followed unless an alternate procedure is included in the approved work plan.

(c) Field-testing technologies and methods.

1. DER accepts the use of field-testing technologies (e.g., immunoassay test kits, x-ray fluorescence devices, direct-sensing down-hole tools) when supported by ELAP approved analytical methods, provided the data are not used to make final determinations relative to impacts of contamination on public health. The role of field testing technologies for programs for which this guidance applies is described in Appendix 2A.

2. Field-testing technologies are encouraged in the following circumstances:

i. for contaminant delineation if contaminant identity is known or if there is reasonable certainty that a specific contaminant may be present (e.g., benzene, toluene, ethyl benzene, xylene in the case of sampling for a gasoline release);

ii. to bias sample location to the specific location of greatest suspected contamination;

iii. for testing or analysis of intermediate samples;

iv. to collect data in support of engineering design or remedy optimization; or

v. for segregating wastes for off-site disposal or treatment.

3. Where a field-testing technology is proposed to be used:

i. a standard operating procedure must be provided for DER approval that includes:

(1) a detailed step-by-step procedure for the analysis method;
(2) qualifications of the technician responsible for performing the field testing; and
(3) quality assurance procedures (e.g., calibration standards, blanks) as specified by the method;

ii. laboratory analysis of split samples must be performed to evaluate the correlation between the field testing technology and the ELAP-certified laboratory results. A minimum of 10% of the samples must be analyzed by the ELAP-certified laboratory using a standard ASP method. In general, sufficient correlation occurs if the field testing and laboratory results are within 30 relative percent difference;

iii. 10% of sample analyses using the field-testing technology must be performed in duplicate;

iv. there should be no bias in the selection of duplicate or correlation samples, such as selecting only positive detections for duplicate or correlation sampling. The duplicate or correlation analysis should be done on every tenth sample, selected in the order they are collected and presented for analysis; and

v. the field testing must be performed by a field technician with the following minimum qualifications:

(1) completion of a certification course or training by an experienced technician who has demonstrated proficiency in the method; or
(2) demonstration of proficiency by correlation of the technician's field-testing technology results with fixed laboratory analysis results collected from a previous site.

(d) Tissue analysis. Where the analysis of tissue samples is required, the sampling and analysis included in any work plan must be in accordance with this subdivision.

1. For tissue analysis. Methods and sampling plans must be specified in the work plan and approved prior to implementation. EPA SW-846 methods are not appropriate for biological tissue as these methods, for example, often underestimate PCB/organochlorine concentrations.

2. Analysis of lipid content is required for all organochlorine compounds using EPA3540C Soxhlet extraction with 1:1 hexane/acetone ratio or other approved method. The percent lipids should be determined from the same aliquot as that used to determine the organochlorine concentration.

3. Tissue sampling should follow the current procedures set forth in the most current DEC guidance documents for biota collection, preparation and analysis.

(e) Soil vapor intrusion sampling. When soil vapor, sub-slab vapor, crawl space air, indoor air or outdoor air sampling is required the NYSDOH document, *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (October 2006) or the most current version with appropriate updates, must be

used.

(f) Determination of the presence of non-aqueous-phase liquid (NAPL).

1. Methods acceptable to DER must be used to determine the presence of NAPL in soil or water. Such methods include, without limitation, visual identification of sheens or other visible product, measurable thickness of product on the water table, the use of field instruments, ultraviolet fluorescence, soil-water agitation, centrifuging and hydrophobic dye testing.

2. NAPL is suspected to be present in groundwater where:

i. concentration is equal to or greater than 1% of the water solubility of the contaminant; or

ii. a mixture of such contaminants in (i) above is present, then the effective water solubility of the contaminant should be estimated for this determination.

3. NAPL is suspected to be present in soil where a single contaminant is present at concentrations greater than 10,000 mg/kg.

(g) Alteration of groundwater samples collected for metals analysis.

1. Provision for the alteration of groundwater samples (filtration as defined in section 2.4) for metals analysis is only acceptable when the rationale for any proposed filtration is prepared in accordance with this subdivision and, if a field decision, must be reviewed and approved in accordance with subdivision 1.6(d) by the DER project manager prior to any filtration of samples.

2. Alteration of groundwater samples will not be approved unless the following conditions can be documented:

i. the target turbidity level of 50 NTUs for development and sampling of groundwater monitoring well is or will be exceeded;

ii. the well(s) being sampled was (were) properly designed, installed, constructed, developed, maintained and sampled;

iii. attempts have been made to repurge and/or redevelop the well; and

iv. replacement of the well(s) with documentation of proper well construction and installation where necessary, has been considered and is not justified.

3. Any request to filter groundwater samples must include a justification which addresses the conditions listed in paragraph 2 above and include a filtering protocol which:

i. is consistent with the methods in the November 1986 Environmental Protection Agency document entitled Test Methods for Evaluating Solid Waste (EPA-SW846);

ii. is a filtration methodology which minimizes changes in the water chemistry of the sample;

iii. provides that any precipitates which may form upon removal of the sample from the well (e.g., iron floc) must not be filtered out but dissolved by acid/preservation; and

iv. provides that a filtered sample would not be collected without an accompanying unfiltered sample.

4. When collecting filtered groundwater samples:

i. the sample must be collected using a minimally disturbing method (e.g., low-rate bladder or peristaltic pumping, bailing);

ii. the turbidity of the samples must be recorded at the time of collection;

iii. two samples must be collected:

(1) one of which must be preserved immediately in an unaltered state; and
(2) the second must be filtered and preserved; and

iv. if split samples are required, then both the filtered and unfiltered samples must be split.

5. When analyzing the samples:

i. if the unfiltered sample does not exceed SCGs, there is no need to analyze the filtered sample; and

ii. if there is a question whether metal contaminants are naturally occurring or were introduced through human-made activities, upgradient and background wells may be sampled using the same procedure, with best efforts made to obtain an uncontaminated sample of the horizon which is being screened, to allow a comparison of contaminant data to naturally occurring metal ion concentrations in the aquifer matrix.

2.2 Reporting Requirements

(a) Unless otherwise approved in advance by DER, laboratory data deliverables must be as defined in this subdivision.

1. Category B laboratory data deliverables. Category B data deliverables which are defined in the ASP and summarized in Appendix 2B:

i. must be submitted for the following types of samples, except for sites subject to section 5.5 (UST closure):

(1) samples representing the final delineation of the nature and extent of contamination for a SC or RI completed pursuant to Chapter 3;
(2) correlation samples as defined in section 2.4;
(3) confirmation and documentation samples as defined in paragraphs 1.3(b)3 and 11 and collected pursuant to section 5.4; and/or

(4) samples to determine closure of a system pursuant to sections 6.4 and/or 6.5; and

ii. must include the preparation of a Data Usability Summary Report (DUSR) prepared by a party independent from the laboratory performing the analysis for all samples when Category B data deliverables are provided. This party must also be independent from any direct involvement with the project, e.g. Project Manager or property owner. The required content of a DUSR and qualifications for the person preparing the DUSR are detailed in Appendix 2B.

2. Category A and Category Spills laboratory data deliverables. Category A or Category Spills data deliverables, which are defined in the ASP and summarized in Appendix 2B must be submitted for all analyses not identified in paragraph 1 above.

3. Analytical cleanup. Any analytical cleanup methods required must be:

i. in accordance with subdivision 2.3(c);

ii. identified in the work plan; and

iii. if employed, identified in the data deliverable package.

4. Tentatively identified compounds (TICs). TICs identified by the analysis of a sample in accordance with subparagraph 2.1(a)1.ii must be reported in the data deliverables in the following cases:

i. all samples analyzed as part of a SC, RI or pre-design sampling effort undertaken to delineate the nature and extent of contamination;

ii. all samples in all phases of a project when (a) TIC(s) has/have been identified as a contaminant of concern; or

iii. if TICs are present and included on the discharge limits for a treatment system.

(b) Submission of data. Final/validated analytical data, with applicable data qualifiers are to be summarized in tables for all reports prepared in accordance with this guidance.

1. When reporting analytical results below the method detection limit (MDL) or method reporting limit (MRL), the result will be shown as non-detect (ND) along with the appropriate MDL or MRL.

2. The data from individual samples, QA information (e.g., chromatograms) and other supporting documentation identified by this section are not to be included in appendices or otherwise included in the reports or work plans. This information and other supporting data identified in subdivision 3.13(c) are to be included in a separate electronic data submission provided at the time of the submission of the report/work plan.

(c) Electronic submissions. All required documentation identified by this Chapter must be provided in an electronic format in accordance with section 1.15.

2.3 Quality Assurance Requirements

(a) The remedial party must ensure that suitable and verifiable data result from sampling and analysis. To achieve this objective the quality assurance procedures detailed in this section must be followed for all sampling and laboratory analysis activities.

1. Determination of need for a quality assurance officer (QAO). The remedial party shall consult with DER during the development of the work plan, pursuant to section 3.3, to determine whether a QAO will be required. A QAO will generally be necessary for large or complex projects, such as those requiring non-routine analytical methods or sampling techniques (e.g., field testing technologies).

2. Role of the QAO. Where required, the QAO:

i. will review sampling procedures and certify that the data was collected and analyzed using the appropriate procedures;

ii. shall not be directly involved in the collection and analysis of samples from the site for which they are the QAO.; and

iii. acts in conjunction with the project manager in the development of the sampling and analytical portion of a site-specific quality assurance project plan (QAPP);

3. QAO qualifications. The QAO:

i. must not have another position on the project, such as a project or task manager, that involves project productivity or profitability as a job performance criteria;

ii. must, at a minimum, hold a bachelors degree:

(1) in a relevant natural or physical science; or
(2) engineering; and

iii. must be familiar with analytical methods, data interpretation and validation, the development of sampling plans, quality control procedures and auditing requirements and techniques.

3. As required by the approved work plan, during the course of the sampling and analytical portion of the project the QAO or a designee may:

i. conduct periodic field and sampling audits;

ii. interface with the analytical laboratory to resolve problems; and

iii. interface with the data validator and/or the preparer of the DUSR to resolve problems.

(b) Data acceptance.

1. DER will reject analytical data from any laboratory which does not have a current and

appropriate certification for the parameters analyzed.

2. Laboratories performing the analysis of tissue samples must provide documentation of the demonstration of capability (e.g., analysis of reference samples) for approval by DER prior to conducting any tissue analysis.

3. DER may reject data that do not meet the data quality objectives (e.g., if minimum reporting limits specified in the approved work plan are not achieved, if the pressure in an air canister is outside of the acceptable ranges, if holding times or temperature ranges are not met, etc.).

(c) Specific sampling and analytical requirements.

1. Laboratories will follow all quality assurance/quality control procedures specified in the approved analytical methods.

2. Sampling methods, sample preservation requirements, sample holding times, decontamination procedure for field equipment and frequency for field blanks, field duplicates and trip blanks for aqueous samples should conform to the ASP, unless an alternate method/procedure has been approved in the work plan. Duplicate and matrix/matrix-spike duplicates are required at a frequency of 1 per 20 samples. Aqueous trip blanks are required at the same frequency for samples that are to be analyzed for volatiles. Field and/or rinsate blanks may also be required at the same frequency.

3. Sample matrix cleanup. Sample matrix cleanup (in laboratory) must occur when chemical interferences may be causing elevated reporting limits or inadequate contaminant identification or quantitation. Sample matrix cleanup must conform to the procedures specified in the ASP.

4. Results from analysis of soils and sediments will be reported on a dry-weight basis, except for those results required by the method to be otherwise reported. Analysis of vegetation tissue shall be on a dry-weight basis. All other tissue analysis shall be reported on a wet-weight basis.

5. Samples must be sent to the laboratory as soon as practicable. Generally, samples should be received by the laboratory within 48 hours of sampling.

(d) Soil vapor or air sampling and analysis. Where soil vapor, sub-slab vapor, crawl space air, indoor air or outdoor air sampling is required, the work plan is to be prepared using the NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (October 2006) or the most current version must be used.

(e) A glossary of quality assurance terms is provided in subdivision 2.4(d).

2.4 Quality Assurance Project Plan

(a) All work plans must include quality assurance procedures to be followed for sampling and analysis. All work plans and the QAPP, undertaken pursuant to an oversight document in accordance with subdivision 1.2(d), must be submitted and approved in advance of sampling.

1. These procedures will be incorporated into the work plan or be supplied as a separate stand alone document. If a separate QAPP is submitted, a summary of the sample information identified in subparagraph 2.v below must also be included in the work plan.

2. The following should be included in either the work plan QAPP section or a standalone QAPP:

i. the project scope and project goals as well as how the project relates to the overall site investigation or remediation strategy;

ii. project organization, including the designation of a project manager, QAO and field analyst, (if field analysis is planned). Resumes of these individuals must be included;

iii. sampling procedures, data quality usability objectives and equipment decontamination procedures;

iv. site map showing sample locations;

v. an "Analytical Methods/Quality Assurance Summary Table" which must include the following information for all environmental, performance evaluation and quality control samples:

(1) matrix type;
(2) number or frequency of samples to be collected per matrix;
(3) number of field and trip blanks per matrix;
(4) analytical parameters to be measured per matrix;
(5) analytical methods to be used per matrix with minimum reporting requirements;
(6) number and type of matrix spike and matrix spike duplicate samples to be collected;
(7) number and type of duplicate samples to be collected;
(8) sample preservation to be used per analytical method and sample matrix;
(9) sample container volume and type to be used per analytical method and sample matrix; and
(10) sample holding time to be used per analytical method and sample matrix; and

vi. a detailed description of sampling methods to be used and sample storage in the field.

(b) If tissue samples are being collected, the QAPP for tissue analysis should follow the outline in the USEPA publication *Preparation Aids for the Development of Category I Quality Assurance Project Plans* (EPA/600/8-91/003).

(c) Analytical data must be provided in an electronic format in accordance with section 1.15.

(d) Quality assurance glossary. Quality assurance terms and definitions presented in this subdivision must be used in preparing all documents related to quality assurance or control.

1. "Alteration" means altering a sample collected for analysis in any way other than by adding a preservative, such as nitric acid to lower pH. Examples of alteration include, but are not limited to: filtering, settling and decanting, centrifuging and decanting and acid extracting.

2. "Analytical Services Protocol" or "ASP" means DEC's compilation of approved EPA laboratory methods for sample preparation, analysis and data handling procedures.

3. "Correlation sample" means a sample taken, when using a field-testing technology, to be analyzed by an ELAP-certified laboratory to determine the correlation between the laboratory and field analytical results.

4. "Effective solubility" means the theoretical aqueous solubility of an organic constituent in groundwater that is in chemical equilibrium with a separate-phase (NAPL) mixed product (product containing several organic chemicals). The effective solubility of a particular organic chemical can be estimated by multiplying its mole fraction in the product mixture by its pure-phase solubility.

5. "Environmental Laboratory Accreditation Program" or "ELAP" means a program conducted by the NYSDOH which certifies environmental laboratories through on-site inspections and evaluation of principles of credentials and proficiency testing. Information regarding ELAP is available at the NYSDOH Wadsworth Laboratory website .

6. "Filtration" means the filtering of a groundwater or surface water sample, collected for metals analysis, at the time of collection and prior to preservation. Filtering includes but is not limited to the use of any membrane, fabric, paper or other filter medium, irrespective of pore size, to remove particulates from suspension.

7. "Final delineation sample" means a sample taken to make a decision regarding the extent of contamination at a site during the investigation and the design of the remedy or confirmation/documentation sampling during remedial construction, which is to be analyzed by an ELAP-certified laboratory.

8. "Intermediate sample" means a sample taken during the investigation or remediation process that will be followed by another sampling event to confirm that remediation was successful or to confirm that the extent of contamination has been defined to below a level of concern.

9. "Method detection limit" or "MDL" means the minimum concentration of a substance that can be measured and reported with a 99 percent confidence that the analyte concentration is greater than zero and is determined from the analysis of a sample in a given matrix containing the analyte.

10. "Minimum reporting limit" means the lowest concentration at which an analyte can be detected and which can be reported with a reasonable degree of accuracy. It is the lowest concentration that can be measured, a lab-specific number, developed from minimum detection limits, and is also referred to as the practical quantitation limit (PQL).

11. "Nephelometric Turbidity Unit" or "NTU" is the unit by which turbidity in a sample is measured.

12. "Preservation" means preventing the degradation of a sample due to precipitation, biological action, or other physical/chemical processes between the time of sample collection and analysis. The most common examples involve refrigeration at 4 degrees Celsius and lowering sample pH by the addition of acid to keep dissolved metals in solution or to reduce the biodegradation of dissolved organic analytes.

13. "Target analyte list" or "TAL" means the list of inorganic compounds/elements designated for analysis as contained in the version of the *EPA Contract Laboratory Program Statement of Work for Inorganics Analysis, Multi-Media, Multi-Concentration* in effect as of the date on which the laboratory is performing the analysis. For the purpose of this chapter, a Target Analyte List scan means the analysis of a sample for Target Analyte List compounds/elements.

14. "Targeted compound" means a contaminant for which a specific analytical method is designed to detect that potential contaminant both qualitatively and quantitatively.

15. "Target compound list plus 30" or "TCL+30" means the list of organic compounds designated for analysis (TCL) as contained in the version of the EPA *Contract Laboratory Program Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration* in effect as of the date on which the laboratory is performing the analysis, and up to 30 non-targeted organic compounds (plus 30) as detected by gas chromatography/mass spectroscopy (GC/MS) analysis.

16. "Tentatively identified compound or TIC" means a chemical compound that is not on the target compound list but is detected in a sample analyzed by a GC/MS analytical method. TICs are only possible with methods using mass spectrometry as the detection technique. The compound is tentatively identified using a mass spectral instrumental electronic library search and the concentration of the compound estimated.

17. "Well development" means the application of energy to a newly installed well to establish a good hydraulic connection between the well and the surrounding formation. During development, fine-grained formation material that may have infiltrated the sand pack and/or well during installation is removed, allowing water from the formation to enter the well without becoming turbid and unrepresentative of groundwater in the formation.

Appendix 2B
Guidance for Data Deliverables and the Development of Data Usability Summary Reports

1.0 Data Deliverables

(a) DEC Analytical Services Protocol Category A Data Deliverables:

1. A Category A Data Deliverable as described in the most current DEC Analytical Services Protocol (ASP) includes:

i. a Sample Delivery Group Narrative;

ii. contract Lab Sample Information sheets;

iii. DEC Data Package Summary Forms;

iv. chain-of-custody forms; and,

v. test analyses results (including tentatively identified compounds for analysis of volatile and semi-volatile organic compounds)

2. For a DEC Category A Data Deliverable, a data applicability report may be requested, in which case it will be prepared, to the extent possible, in accordance with the DUSR guidance detailed below.

(b) DEC Analytical Services Protocol Category B Data Deliverables

1. A Category B Data Deliverable is includes the information provided for the Category A Data Deliverable, identified in subdivision (a) above, plus related QA/QC information and documentation consisting of:

i. calibration standards;

ii. surrogate recoveries;

iii. blank results;

iv. spike recoveries;

v. duplicate results;

vi. confirmation (lab check/QC) samples;

vii. internal standard area and retention time summary;

viii. chromatograms;

ix. raw data files; and

x. other specific information as described in the most current DEC ASP.

2. A DEC Category B Data Deliverable is required for the development of a Data Usability Summary Report (DUSR).

2.0 Data Usability Summary Reports (DUSRs)

(a) Background. The Data Usability Summary Report (DUSR) provides a thorough evaluation of analytical data with the primary objective to determine whether or not the data, as presented, meets the site/project specific criteria for data quality and data use.

1. The development of the DUSR must be carried out by an experienced environmental scientist, such as the project Quality Assurance Officer, who is fully capable of conducting a full data validation. The DUSR is developed from:

i. a DEC ASP Category B Data Deliverable; or

ii. the *USEPA Contract Laboratory Program National Functional Data Validation Standard Operating Procedures for Data Evaluation and Validation.*

2. The DUSR and the data deliverables package will be reviewed by DER staff. If full third party data validation is found to be necessary (e.g. pending litigation) this can be carried out at a later date on the same data package used for the development of the DUSR.

(b) Personnel Requirements. The person preparing the DUSR must be pre-approved by DER. The person must submit their qualifications to DER documenting experience in analysis and data validation. Data validator qualifications are available on DEC's website identified in the table of contents.

(c) Preparation of a DUSR. The DUSR is developed by reviewing and evaluating the analytical data package. In order for the DUSR to be acceptable, during the course of this review the following questions applicable to the analysis being reviewed must be answered in the affirmative.

1. Is the data package complete as defined under the requirements for the most current DEC ASP Category B or USEPA CLP data deliverables?

2. Have all holding times been met?

3. Do all the QC data; blanks, instrument tunings, calibration standards, calibration verifications, surrogate recoveries, spike recoveries, replicate analyses, laboratory controls and sample data fall within the protocol required limits and specifications?

4. Have all of the data been generated using established and agreed upon analytical protocols?

5. Does an evaluation of the raw data confirm the results provided in the data summary sheets and quality control verification forms?

6. Have the correct data qualifiers been used and are they consistent with the most current DEC ASP?

7. Have any quality control (QC) exceedances been specifically noted in the DUSR and have the corresponding QC summary sheets from the data package been attached to the DUSR?

(d) Documenting the validation process in the DUSR. Once the data package has been reviewed and the above questions asked and answered the DUSR proceeds to describe the samples and the analytical parameters, including data deficiencies, analytical protocol deviations and quality control problems are identified and their effect on the data is discussed.

CP-43:Groundwater Monitoring Well Decommissioning Policy

New York State Department of Environmental Conservation

DEC POLICY

Issuing Authority: Commissioner Alexander B. Grannis

Date Issued: November 3, 2009	**Latest Date Revised:**

I. Summary:

Groundwater monitoring wells provide essential access to the subsurface for scientific and engineering investigations (including monitoring wells installed for leak detection purposes). To a degree, every monitoring well is an environmental liability because of the potential to act as a conduit for pollution to reach the groundwater. To limit the environmental risk, a groundwater monitoring well must be properly decommissioned when its effective life has been reached. This document provides procedures to satisfactorily decommission groundwater monitoring wells in New York State. This policy also pertains to other temporary wells such as observation wells, test wells, de-watering wells and other small diameter, non-potable water wells. It does not pertain to water supply wells.

II. Policy:

Environmental monitoring wells should be decommissioned when:

1. they are no longer needed and re-use by another program is not an option; or
2. the well's integrity is suspect or compromised.

The method for decommissioning will be determined based upon well construction and environmental parameters. The method selected must be designed to protect groundwater and implemented according to current best engineering practices while following all applicable federal, state and local regulations. *Groundwater Monitoring Well Decommissioning Procedures* shall be maintained as an addendum to this policy.

This policy is applicable to all New York State Department of Environmental Conservation (DEC) programs that install, utilize and maintain monitoring wells for the study of groundwater, except monitoring wells for landfills regulated under 6 NYCRR Part 360 decommissioned in accordance with those regulations [*see* 6 NYCRR 360-2.11(a)(8)(vi)] and wells installed under the Oil, Gas and Solution Mining Law, Environmental Conservation Law Article 23. There is no specific time frame to dictate when to decommission a well; timing is dependent upon the use and condition of the well

and shall be determined on an individual basis. Best professional judgment must be exercised when using the decommissioning procedures. Outside of DEC use, this policy is mandatory when incorporated into the specifications of a state contract, an Order on Consent or a permit. In all other situations, it shall serve as guidance.

III. Purpose and Background:

This document establishes a monitoring well decommissioning policy and provides technical guidance. Synonyms for well decommissioning include "plugging," "capping" and "abandoning. For consistency, only the term "decommissioning" is used within this document.

Unprotected, neglected and improperly abandoned monitoring wells are a serious environmental liability. They can function as a pollution conduit for surface contaminants to reach the subsurface and pollute our groundwater. They also can cause unwanted mixing of groundwater, which degrades the overall water quality within an aquifer. Improperly constructed, poorly maintained or damaged monitoring wells can yield anomalous poor data that can compromise the findings of an environmental investigation or remediation project. Unneeded or compromised monitoring wells should be properly decommissioned in order to prevent harm to our groundwater.

Since 1980, the DEC has installed, directed or overseen the installation of thousands of monitoring wells throughout New York for various state and federal programs, such as Superfund, solid waste, Resource Conservation and Recovery Act (RCRA), spill response, petroleum bulk storage and chemical bulk storage. This guidance addresses the environmental liability associated with this aging network of wells.

Within its boring zone, a successfully decommissioned well prevents the following:

1. Migration of existing or future contaminants into an aquifer or between aquifers;
2. Migration of existing or future contaminants within the vadose zone;
3. Potential for vertical or horizontal migration of fluids in the well or adjacent to the well; and
4. Any change in the aquifer yield and hydrostatic head, unless due to natural conditions.

Monitoring well construction in New York varies considerably with factors such as age of the well, local geology and either the presence or absence of contamination. The predominant type of monitoring well in New York is the shallow, watertable monitoring well constructed of polyvinyl chloride plastic (PVC). The best method for decommissioning should be selected to suit the conditions and circumstances. Each decommissioning situation is to be evaluated separately using this guidance before a method is chosen and implemented.

IV. Responsibility:

The Division of Environmental Remediation (DER) is responsible for updating this policy and the *Groundwater Monitoring Well Decommissioning Procedures* (addendum) in consultation with the Division of Solid and Hazardous Materials (DSHM) and the Division of Water (DOW). Compliance with the guidance does not relieve any party of the obligation to properly decommission a monitoring well. Oversight responsibility will be carried out by the DEC Regional Engineer.

V. Procedure:

Groundwater Monitoring Well Decommissioning Procedures, the addendum to this policy, provides guidance on proper decommissioning of monitoring wells in New York State.

VI. Related References:

- Groundwater Monitoring Well Decommissioning Procedures, October 1986. Prepared by Malcolm Pirnie, Inc. for the New York State Department of Environmental Conservation, Division of Environmental Remediation.
- Standard Guide for the Decommissioning of Ground Water Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities, ASTM D 5299-99. American Society for Testing and Materials (ASTM). Philadelphia. 2005.
- 6 NYCRR Part 360 Solid Waste Management Facilities, New York State Department of Environmental Conservation, Division of Solid and Hazardous Materials.
- Specifications for Abandoning Wells and Boreholes in Unconsolidated Materials, New York State Department of Environmental Conservation, Region 1 - Water Unit, undated.
- Handbook of Suggested Practices for the Design and Installation of Groundwater Monitoring Wells, EPA 600/4-89/034, United States Environmental Protection Agency (EPA).

[Page Intentionally Left Blank]

Final - August 2009

GROUNDWATER MONITORING WELL DECOMMISSIONING PROCEDURES

New York State Department of Environmental Conservation
Division of Environmental Remediation

[Page Intentionally Left Blank]

TABLE OF CONTENTS

INTRODUCTION 3

1.0 PREPARATION 3

2.0 DECOMMISSIONING METHODS 4
- 2.1 Grouting In-Place 5
- 2.2 Casing Perforating/Grouting In-Place 6
- 2.3 Casing Pulling 6
- 2.4 Over-Drilling 7

3.0 SELECTION PROCESS AND IMPLEMENTATION 8
- 3.1 Bedrock Wells 8
- 3.2 Uncontaminated Overburden Wells 9
- 3.3 Contaminated Overburden Monitoring Wells/Piezometers 9
- 3.4 Telescoped Riser 10

4.0 LOCATING AND SETTING-UP ON THE WELL 10

5.0 REMOVING THE PROTECTIVE CASING 10

6.0 SELECTING, MIXING, AND PLACING GROUT 11
- 6.1 Standard Grout Mixture 11
- 6.2 Special Mixture 12
- 6.3 Grout Mixing Procedure 12
- 6.4 Grout Placement 12

7.0 BACKFILLING AND SITE RESTORATION 13

8.0 DOCUMENTATION 13

9.0 FIELD OVERSIGHT 14

10.0 RELATED REFERENCES 14

FIGURES

FIGURE 1 - MONITORING WELL FIELD INSPECTION LOG

FIGURE 2 - DECOMMISSIONING PROCEDURE SELECTION

FIGURE 3 - WELL DECOMMISSIONING RECORD

APPENDICES

APPENDIX A - REPORTS

APPENDIX A1 - INSPECTOR'S DAILY REPORT

APPENDIX A2 - PROBLEM IDENTIFICATION REPORT

APPENDIX A3 - CORRECTIVE MEASURES REPORT

INTRODUCTION

This document, *Groundwater Monitoring Well Decommissioning Procedures*, is the addendum to CP-43, Groundwater Monitoring Well Decommissioning Policy, which provides acceptable procedures to be used as guidance when decommissioning monitoring wells in New York State. Please note that this document does not address some site-specific special situations that may be encountered in the field. Compliance with the procedures set forth in this document does not relieve any party of the obligation to properly decommission a monitoring well.

Unprotected, neglected and improperly abandoned monitoring wells are a serious environmental liability. They can function as a pollution conduit for surface contaminants to reach the subsurface and pollute our groundwater. They also can cause unwanted mixing of groundwater, which degrades the overall water quality within an aquifer. Improperly constructed, poorly maintained or damaged monitoring wells can yield anomalous poor data that can compromise the findings of an environmental investigation or remediation project. Unneeded or compromised monitoring wells should be properly decommissioned in order to prevent harm to our groundwater.

Previous versions of this guidance have been issued since 1995. Originally developed as a specification for well decommissioning at Love Canal, the procedures were rewritten to make them applicable across the state. From an engineering standpoint, the guidance has changed very little. Most situations do not require a complex procedure.

If you have any questions, please contact Will Welling at (518) 402-9814.

Sincerely,

Gerald J. Rider, Jr., P.E.
Chief, Remedial Section D
Remedial Bureau E
Division of Environmental Remediation

1.0 PREPARATION

If an unneeded monitoring well remains in good usable condition, an alternative to decommissioning might be the reuse by another agency program. DEC encourages reuse in situations where a well will continue to be used and cared for responsibly.

When reuse is not an option, the first step in the well decommissioning process is to review all pertinent well construction information. One must know the well depth and construction details. GPS coordinates and permanent labeling (if available) will be useful in confirming the well to be decommissioned. An inspection must be performed prior to decommissioning in order to verify the construction and condition of each well. Specific details and subsurface conditions form the basis for decisions throughout the decommissioning process.

Well Details

1. Is the well a single stem riser (all one diameter)?
2. Is the well a simple overburden well (no penetration into bedrock)?
3. Does the well riser consist of telescoping diameters of pipe which decrease with depth?
4. Is the well seal compromised (leaking, inadequate or damaged)?
5. If the well is PVC, is it 25 feet or shallower and not grouted into rock?
6. Can the riser be pulled and is removal of the well desired?
7. Is the well a bedrock well?
8. If the monitoring well is a bedrock well, does it have an open hole?
9. Is there a well assembly (riser and screen) installed within the bedrock hole?

Subsurface Conditions

10. Is the soil contaminated?
11. Does the well penetrate a confining layer?
12. If the well penetrates a confining layer, might overdrilling or casing pulling cause contamination to travel up or down through a break in the confining layer?
13. Does the screened interval cross multiple water-bearing zones?

For additional collection and verification of information, the "Monitoring Well Field Inspection Log" (Figure 1) can be used during a field inspection. After the well has been located and the information gathered, one is ready to select the decommissioning procedure in accordance with Section 2.

Special conditions, such as access problems, well extensions through capped and covered non-Part 360 landfills and seasonal weather patterns affecting construction, should be assessed in the planning stage. Decommissioning work requiring the use of heavy vehicular equipment on landfill caps should be scheduled during dry weather (if possible) so as to minimize damage to the cover. If work must be performed during the spring, winter or inclement weather, special measures to reduce ruts should be employed to maintain the integrity of a completed landfill cover system. As an example, placement of plywood under vehicular equipment can eliminate deep ruts that would require repair.

2.0 DECOMMISSIONING METHODS

The primary rationale for well decommissioning is to remove any potential groundwater pathway. A secondary rationale, often important to the property owner or owner of the well, is to physically remove the well. Removed well materials may be recycled and will not interfere with future construction excavation. The previous versions of these decommissioning procedures have stressed that physical removal of the well by pulling is preferable to leaving casing in the ground. Due to the added effort, expense and risk involved with pulling, the decision of whether to pull or not should be a separate consideration aside from selecting the sealing procedure.

One should select a decommissioning procedure that takes into account the geologic and hydrogeologic conditions at the well site; the presence or absence of contamination in the groundwater; and original well construction details. The selection process for well decommissioning procedures is provided by the flow chart, Figure 2. Answers to the questions

in the preceding section are the input for this flow chart. The four primary well decommissioning methods are:

1. Grouting in-place;
2. Perforating the casing followed by grouting in-place;
3. Grouting in-place followed by casing pulling;
4. Over-drilling and grouting with or without a temporary casing.

In a complex situation, one or more decommissioning procedures may be used for different intervals of the same well.

The remainder of Section 2 discusses the well decommissioning methods and the selection process. Refer to Figure 2 for a flow chart diagram of the complete procedure selection process. The DEC Project Manager has the discretion to deviate from the flow chart, (Figure 2), based on site conditions and professional judgment.

2.1 Grouting In-Place

Grouting in-place is the simplest and most frequently used well decommissioning method and grouting itself is the essential component of all the decommissioning methods. The grout seals the borehole and any portion of the monitoring well that may be left in the ground. Because dirt and foreign objects can fall into an open well, whenever possible a well should be sealed first with grout before attempting subsequent decommissioning steps.

For the purpose of these decommissioning procedures, the well seal is defined as the bentonite seal above the sand pack. Aside from obvious channeling by in-flowing surface water around the well, an indication of the well seal integrity may be obtained through review of the boring logs and/or a comparison of groundwater elevations if the well is part of a cluster. Any problems noted on the boring logs pertaining to the well seal, such as bridging of bentonite pellets or running sands, or disparities between field notes (if available) and the well log would indicate the potential for a poor (compromised) well seal.

If the well seal is not compromised and there is no confining layer present, a single-stem, 2-inch PVC, monitoring well can be satisfactorily decommissioned by grouting it in-place. If the seal is compromised, casing perforation may be called for as discussed in Section 2.2.

As discussed in Section 2.4 and its sub-sections, this method is specified for the bedrock portion of a well, and is used for decommissioning small diameter cased wells. Grouting in-place involves filling the casing with grout to a level of five feet below the land surface, cutting the well casing at the five-foot depth, and removing the top portion of the casing and associated well materials from the ground. The casing must be grouted according to the procedures in Section 6. In addition, the upper five feet of the borehole is filled to land surface and restored according to the procedures described in Section 7.

For open-hole bedrock wells, the procedure involves filling the opening with grout to the top of rock according to the procedures in Section 5. A thicker grout may be required to fill any bedrock voids. If excessive grout is being lost down-hole, consider grouting in stages to reduce the pressure caused by the height of the grout column.

The standard mix with the maximum amount of allowable water will be required to penetrate the well screen and sand pack when a well assembly has been installed within a bedrock hole. For an assembly such as this, the grout should be mixed thinly enough to penetrate the slots and sand pack. The grout mixes are discussed in Sections 6.1 and 6.2.

2.2 Casing Perforating/Grouting In-Place

Casing perforation followed by grouting in-place is the preferred method to use if there is poor documentation of the grouting of the well annulus, or the annulus was allowed to be back-filled with cuttings. The grout will squeeze through the perforations to seal any porous zones along the outside of the casing. The procedure involves puncturing, cutting or splitting the well casing and screen followed by grouting the well. A variety of commercial equipment is available for perforating casings and screens in wells with four-inch or larger inside diameters. Due to the diversity of applications, experienced contractors must recommend a specific technique based on site-specific conditions. A minimum of four rows of perforations several inches long around the circumference of the pipe and a minimum of five perforations per linear foot of casing or screen is recommended (American Society for Testing and Materials, Standard D 5299-99, 1999). After the perforating is complete, the borehole must be grouted according to the procedures in Section 6 and the upper five feet of borehole restored according to the procedures in Section 7.

2.3 Casing Pulling

Casing pulling should be used in cases where the materials of the well assembly are to be recycled, or the well assembly must be removed to clear the site for future excavation or re-development. Casing pulling is an acceptable method to use when no contamination is present; contamination is present but the well does not penetrate a confining layer; and when both contamination and a confining layer are present but the contamination cannot cross the confining layer. Additionally, the well construction materials and well depth must be such that pulling will not break the riser. When contamination is likely to cross the confining layer during pulling, a temporary casing can be used. See Section 2.4.

Casing pulling involves removing the well casing by lifting. Grout is to be added during pulling; the grout will fill the space once occupied by the material being withdrawn. An acceptable procedure to remove casing involves puncturing the bottom of the well or using a casing cutter to cut away the screen, grouting, using jacks to free casing from the hole, and lifting the casing out by using a drill rig, backhoe, crane, or other suitable equipment. Additional grout must be added to the casing as it is withdrawn. Grout mixing and placement procedures are provided in Section 6. In wells or well points in which the bottom cannot be punctured, the casing or screened interval will be perforated or cut away prior to being filled with grout. This procedure should be followed for wells installed in collapsible formations or for highly contaminated wells.

At sites in which well casings have been grouted into the top of bedrock, the casing pulling procedure should not be attempted unless the casing can be first cut or freed from the rock.

2.4 Over-Drilling

Over-drilling is the technique used to physically remove an entire monitoring well, its sand pack and the old grout column and fill. In situations where PVC screens and risers are expected to sever and removal of all well materials is required, over-drilling will be required. Over-drilling is called for when a riser can't be pulled and it penetrates a confining layer. Compared to the other procedures, over-drilling is the least common method of well decommissioning.

A "temporary casing" may be necessary when extraordinary conditions are present, such as a high concentration of mobile contaminants in the overburden, depth to water is shallow, there is poor construction documentation or shoddy construction practices. The approach involves installing a large diameter steel casing around the outside of the well followed by drilling / pulling /grouting within this casing. The casing is withdrawn at the end of pulling, grouting and (perhaps) drilling. If the confining layer is less than 5 feet thick, the casing should be installed to the top of the confining layer. Otherwise, it is installed to a depth of 2 feet below the top of the confining layer. After the outer casing has been set, the well can be removed and grouted through pulling if possible or removed and grouted by drilling inside the casing.

Over-drilling is used where casing pulling is determined to be unfeasible, or where installation of a temporary casing is necessary to prevent cross-contamination, such as when a confining layer is present and contamination in the deeper aquifer could migrate to the upper aquifer as the well is pulled. The over-drilling method should:

- Follow the original well bore;
- Create a borehole of the same or greater diameter than the original boring; and
- Remove all of the well construction materials.

In over-drilling the difficulty lies in keeping the augers centered on the old well as the bit is lowered; it will tend to wander off. As a precaution, the well column should be filled with grout before over-drilling. Then without allowing the grout to dry, the driller proceeds with over-drilling the well. Grouting first guarantees that if the drill wanders off the old well and the effort is less than 100% successful, the remaining well portion will at least have been grouted. There are many methods for over-drilling. Please note that the following methods are not suitable for all types of casing, and the advice of an experienced driller should be sought.

- Conventional augering (i.e., a hollow stem auger fitted with a pilot bit). The pilot bit will grind the well construction materials, which will be brought to the well surface by the auger.
- A conventional cable tool rig to advance "temporary" casing having a larger diameter than the original boring. The cable tool kit is advanced within the casing to grind the well construction materials and soils, which are periodically removed with large diameter bailer. This method is not applicable to bedrock wells.

- An over-reaming tool with a pilot bit nearly the same size as the inside diameter of the casing and a reaming bit slightly larger than the original borehole diameter. This method can be used for wells with steel casings.

- A hollow-stem auger with outward facing carbide cutting teeth having a diameter two to four inches larger than the casing.

Prior to over-drilling, the bottom of the well should be perforated or cut away, and the casing filled with grout as with casing removal by pulling.

In all cases above, over-drilling should advance beyond the original bore depth by a distance of half a foot to ensure complete removal of the construction materials. Oversight attention should be focused on the drill cuttings, looking for fragments of well materials. Absence of these indicators is a sign that the drill has wandered off the well. If wandering is suspected, having previously filled the well with grout, the remaining portion which cannot be over-drilled can be considered grouted in-place. When the over-drilling is complete, grout should be tremied within the annular space between the augers and well casings. The grout level in the borehole should be maintained as the drilling equipment and well materials are sequentially removed. As with all the other methods, the upper five feet of borehole should be restored according to the procedures in Section 7.

3.0 SELECTION PROCESS AND IMPLEMENTATION

The decommissioning procedure selection flow chart, Figure 2, is to be used to select decommissioning methods. The selection process first identifies the basic monitoring well type. There are only two types of monitoring wells described in this guidance, overburden wells and bedrock wells. Bedrock wells typically have an overburden portion which in the selection process is to be treated as an overburden well. Techniques are specified for wells based upon their type and the other physical conditions present. Decommissioning techniques called for by the selection process have their practical limits; construction details dictate when a well stem can be pulled without breaking and when it cannot be pulled. The DEC project manager has the discretion to deviate from the flow chart, (Figure 2), based on site conditions, budgetary concerns and professional judgment. The remainder of this section will discuss types of monitoring wells in various settings along with recommended decommissioning techniques.

3.1 Bedrock Wells

Referring to Figure 2 and Section 2.1, if the well extends into bedrock, the rock hole portion of the well is to be grouted in-place to the top of the rock. The grout mix, however, may vary according to the conditions. A thicker grout may be required to fill voids and a thinner grout may be necessary to penetrate well screen and sand pack. Refer to the grout mixture specifications given in Section 6.1 and 6.2.

Prior to grouting, the depth of the well will be measured to determine if any silt or debris has plugged the well. If plugging has occurred, all reasonable attempts to clear it should be made before grouting. The borehole will then be tremie grouted according to Section 6.4 from the bottom of the well to the top of bedrock to ensure a continuous grout column.

After the rock hole is grouted, the overburden portion of the well is decommissioned using appropriate techniques described below. If the bedrock extends to the ground surface, grouting can extend to the ground surface or to slightly below so that the site can be restored as appropriate in accordance with Section 7.

3.2 Uncontaminated Overburden Wells

For overburden wells and the overburden portion of bedrock wells, the first factor in determining the decommissioning method is whether the overburden portion of the well exhibits contamination, as determined through historical groundwater and/or soil sampling results. If the overburden is uncontaminated, the next criteria considers whether the well penetrates a confining layer. In the case that the overburden portion of the well does not penetrate a confining layer, the casing can either be tremie-grouted and pulled or tremie grouted and left in place. As a general rule, PVC wells greater than 25-feet deep should not be pulled unless site-specific conditions or other factors indicate that the well can be pulled without breaking. If the well cannot be pulled, the well should be grouted in-place as accordance with Sections 2.1 and 2.2.

If a non-telescoped overburden well penetrates a confining layer, the casing should be removed by pulling (if possible) in accordance with Section 2.3. If the casing cannot be removed by pulling, the well should be grouted in-place or where complete removal is required, removed by over-drilling. Over-drilling will be based upon the site-specific conditions and requirements. If pulling is attempted and fails (i.e., a portion of the riser breaks) the remaining portion of the well should be removed by using the conventional augering procedure identified in Section 2.4. Note that if the riser is broken during pulling, it is highly unlikely that the driller will be able to target it to over-drill it. This is the reason why all wells should be grouted first. In all cases, after the well construction materials have been removed to the extent possible, the borehole will be grouted in accordance with Section 6 and the upper five feet will be restored in accordance with Section 7.

3.3 Contaminated Overburden Monitoring Wells/Piezometers

Contamination in the overburden plays a role in the selection process. Any contamination present in the overburden must not be allowed to spread as a result of the decommissioning construction. For wells and piezometers suspected or known to be contaminated with light non-aqueous phase liquid (LNAPL) and/or dense non-aqueous phase liquid (DNAPL), often referred to as "product," the decision to decommission the well should be reviewed. Such gross contamination is a special condition and requires design of the decommissioning procedure. If decommissioning is determined to be the proper course of action, measurement of the non-aqueous phase liquid volume will be determined and this liquid will be removed.

If an overburden well (or the overburden portion of a bedrock well) is contaminated with LNAPL, DNAPL and /or dissolved fractions as indicated by historical sampling results, one must evaluate the potential for contamination to cross an overburden confining layer (if one exists) during decommissioning. A rock or soil horizon of very low permeability is known as a confining layer. Contamination in the overburden lying above a confining layer is a significant condition to recognize. To prevent mobile contaminants from crossing a confining layer during pulling or over-drilling, a temporary casing should be installed to isolate the work zone. One should follow the procedure selection flow chart. Some contaminated conditions call for over-

drilling or a specially designed procedure.

A well in contaminated overburden may be grouted in-place as long as the grout fully seals the well and boring zone. If a well in contaminated overburden was constructed allowing formation collapse as annular backfill or if the well has a compromised well seal, one must either physically remove the well or thoroughly perforate the riser and grout it in-place.

If physical removal of the well is required and the overburden contaminants are likely to be dragged upward or downward during decommissioning, a temporary casing should be used to seal off the construction work zone. Casing pulling and overdrilling can be safely accomplished within the temporary casing. Section 2.4 discusses the temporary casing technique.

3.4 Telescoped Riser

If the riser is telescoped in one or more outer casings, the decommissioning approach depends upon the integrity of the well seal. If there is no evidence that the well seal integrity is compromised, the riser should be grouted in-place in accordance with Sections 2.1 or 2.2 and the upper 5 feet of the well surface should be restored in accordance with Section 7. If indications are that the well seal is not competent, it will be necessary to design and implement a special procedure to perforate and grout or remove the well construction materials. The presence and configuration of the outer casing(s) will be specific in the individual wells and will be a key factor in the decommissioning approach. The special procedure must mitigate the potential for cross-contamination during removal of the well construction materials.

4.0 LOCATING AND SETTING-UP ON THE WELL

Prior to mobilizing to decommission a monitoring well, one should notify the property owner and/or other interested parties including the governing regulatory agency. It is advisable that when at the well location, one should review the proposed well decommissioning procedure. Verify well locations and identification by their identifying markers and GPS coordinates. Lastly, verify the depth of each well with respect to depth recorded on the well construction log.

5.0 REMOVING THE PROTECTIVE CASING

Most monitoring wells installed in non-traffic locations are finished with an elevated, protective casing (guard pipe) and a concrete rain pad. Wells at gasoline stations, usually being in high-traffic areas, are typically finished with a flush-mount, curb box and protective 8" dia steel inspection plate rather than a stick-up riser. The curb box is usually easily removed from around the flush-mount well before pulling or over-drilling. In the case of stick-up wells, the riser pipe may be bonded to the guard pipe and rain pad. When the protective casing and concrete pad of a stick-up monitoring well are "yanked out," a PVC riser will typically break off at the bottom of the guard pipe several feet below grade. Once this happens, it may become impossible to center a drill rig upon the well. The riser may become splintered and structurally unstable for pulling. Unless grouted first, the well may fill with dirt. Before pulling a casing or over-drilling a well, a method must be devised for removing these protective surface pieces without jeopardizing the remaining decommissioning effort.

Generally, unless the protective casing is loose and can be safely lifted off by hand, *one*

should fill the monitoring well with grout before removing the outer protective casing. This will ensure that the well is properly sealed regardless of any problems later when removing the protective casing. Remove the protective casing or road box vault initially only if the stick-up or vault will interfere with subsequent down-hole work which must be done before grouting. This down-hole work may include puncturing, perforating or cutting the screen or riser. But as a general procedure don't remove the protective casing or road box until after initial grouting is complete.

The procedure for removing the protective casing of a well depends upon the decommissioning method specified for the monitoring well. The variety of protective casings available preclude developing a specific removal procedure but often one can simply break up the concrete seal surrounding the casing and jack or hoist the protective casing out of the ground. A check should be made during pulling to ensure that the inner well casing is not being hoisted with the protective casing. If this occurs, the well casing should be cut off after the base of the protective casing is lifted above the land surface. At well locations where the riser has been extended, the burial of a previous concrete pad may require the excavation of soil to the top of the concrete pad to remove the well.

Steel well casing should be removed approximately five feet below the land surface so as to be below the frost line and out of the way of any subsequent shallow digging. The upper five feet of casing and the protective casing can be removed in one operation if a casing cutter is used.

Waste handling and disposal must be consistent with the methods used for the other well materials unless an alternate disposal method can be employed (i.e., steam cleaning followed by disposal as non-hazardous waste).

6.0 SELECTING, MIXING, AND PLACING GROUT

This section gives recipes for the "standard grout mixture" and the thicker "special grout mixture." Mixing and placing grout is also discussed in this section. The goal of well decommissioning is to eliminate the capability of water to travel up or down within the volume of the former well and its boring. Success depends upon the correct grout mixture and placement where it is needed. There are two types of grout mixes that may be used to seal monitoring wells: a standard mix and a special mix. Both mixes use Type 1 Portland cement and four percent bentonite by weight. However, the special mix uses a smaller volume of water and is used in situations where excessive loss of the standard grout mix is possible (e.g., highly-fractured bedrock or coarse gravels).

6.1 Standard Grout Mixture

For most boreholes, the following standard mixture will be used:

- One 94-pound bag Type I Portland cement;
- 3.9 pounds powdered bentonite; and
- 7.8 gallons potable water.

Slightly more water may be used in order to penetrate a sand pack when a well screen transects multiple flow zones. This mixture results in a grout with a bentonite content of four percent by weight and will be used in all cases except in boreholes where excessive use of grout is anticipated. In these cases a special thicker mixture will be used.

6.2 Special Mixture

In cases where excessive use of grout is anticipated, such as high permeability formations and highly fractured or cavernous bedrock formations, the following special mixture will be used:

- one 94-pound bag type I Portland cement;
- 3.9 pounds powdered bentonite;
- 1 pound calcium chloride; and
- 6.0-7.8 gallons potable water (depending on desired thickness).

The special mixture results in a grout with a bentonite content of four percent by dry weight. It is thicker than the standard mixture because it contains less water. This grout is expected to set faster than the Standard Grout Mixture due to the added calcium chloride. The least amount of water that can be added for the mixture to be readily pumpable is 6 gallons per 94-pound bag of cement.

6.3 Grout Mixing Procedure

To begin the grout-mixing procedure, calculate the volume of grout required to fill the borehole. If possible, the mixing basin should be large enough to hold all of the grout necessary for the borehole.

Mix grout until a smooth, homogeneous mixture is achieved. Grout can be mixed manually or with a mechanized mixer. Colloidal mixers should not be used as they tend to excessively decrease the thickness of the grout for the above recipes.

6.4 Grout Placement

This guidance requires that grout be placed in the well from the bottom to the top by means of a "tremie." A tremie is a pipe, a hose or a tube extending from the grout supply to the bottom of the well. The tremie delivers the grout all the way down through the water column without its being diluted and mixed with the water that may be present in the well. The tremie pipe or tube is withdrawn as (or after) the well is filled with grout.

Using the tremie, grout is placed in the borehole filling from the bottom to the top. Two-inch and larger wells should use tremie tubing of not less than 1-inch diameter. Smaller diameter wells will call for a smaller tremie pipe. Grout will then be pumped in until the grout appears at the land surface (when grouting open holes in bedrock, the grout level only needs to reach above the bedrock surface). Any groundwater displaced during grout placement, if known to be contaminated, will be contained for proper disposal.

At this time the rate of settling should be observed. If grouting the well in place, the well

casing remains in the hole. But if the decommissioning method has involved down-hole tools such as hollow-stem augers or temporary casing for overdrilling, these will be removed from the hole. As each section is removed, grout will be added to keep the level between 0 and 5 feet below grade. If the grout level drops below the land surface to an excessive degree, an alternate grouting method must be used. One possibility is to grout in stages; i.e., the first batch of grout is allowed to partially cure before a second batch of grout is added.

As previously described in Section 5.0, the outer protective casing "stick-up" should be removed only after a well has been properly filled with grout. This will ensure that the well is properly sealed regardless of any breakage which may occur when removing the stick-up. It is important to reiterate that when either casing pulling or over-drilling are required, due to the uncertainty of successfully pulling a well or over-boring a well, we insist that the driller tremie grout the well first. Then without allowing the grout to dry, the driller proceeds with pulling the casing or over-drilling the well.

Upon completion of grouting, ensure that the final grout level is approximately five feet below land surface. A ferrous metal marker will be embedded in the top of the grout to indicate the location of the former monitoring well. Lastly, a fabric "utility" marking should be placed one foot above the grout so an excavator can see it clearly.

7.0 BACKFILLING AND SITE RESTORATION

The uppermost five feet of the borehole at the land surface should be filled with material physically similar to the natural soils. The surface of the borehole should be restored to the condition of the area surrounding the borehole. For example, concrete or asphalt will be patched with concrete or asphalt of the same type and thickness, grassed areas will be seeded, and topsoil will be used in other areas. All solid waste materials generated during the decommissioning process must be disposed of properly.

8.0 DOCUMENTATION

A form which may be used in the field to record the decommissioning construction is included as Figure 3. Additional documentation may be required by a DEC project manager and samples are included in Appendix A. Programs within the DEC that maintain geographic data on monitoring wells strive to keep that data up to date. Owners of these data sets must be notified when a well is decommissioned. Historical groundwater quality data is linked to monitoring well locations so when a well is decommissioned, existing GIS data must be updated to reflect that fact but the coordinate location in the GIS database should not be eliminated. A metal detector may not be able to detect a deeply buried marker so if this locator is important for future utility runs or foundations, a map should be submitted to the property owner and the town engineer showing the decommissioned well locations. Global Positioning System (GPS) coordinates should be indicated on this map. Lastly, whatever documentation is produced should be provided to the property owner, the DEC, and all other parties involved.

9.0 FIELD OVERSIGHT

Over-drilling requires careful observation to detect whether the drill has wandered off the well. Grout preparation and tremie work should be carefully observed. The successful implementation of a decommissioning work plan depends upon proper direction, observation and oversight. Methods to be employed must be clearly worked through and all parties must understand what they have to do before going into the field. Flexibility is allowed where necessary but the work effort must be thorough and effective to protect our groundwater.

10.0 RELATED REFERENCES

- *Groundwater Monitoring Well Decommissioning Procedures*, October 1986. Prepared by Malcolm Pirnie, Inc., for the New York State Department of Environmental Conservation, Division of Environmental Remediation.

- American Society for Testing and Materials, A.S.T.M. D 5299-99, Standard Guide for the Decommissioning of Ground Water Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities. A.S.T.M.. Philadelphia. 2005.

- New York State Department of Environmental Conservation, Division of Solid and Hazardous Materials, 6 NYCRR Part 360, Solid Waste Management Facilities.

- New York State Department of Environmental Conservation, Region I - Water Unit, Specifications for Abandoning Wells and Boreholes in Unconsolidated Materials, undated.

- United States Environmental Protection Agency, The Handbook of Suggested Practices for the Design and Installation of Groundwater Monitoring Wells, EPA 600/4-89/034.

FIGURES

FIGURE 1 - MONITORING WELL FIELD INSPECTION LOG

FIGURE 2 - DECOMMISSIONING PROCEDURE SELECTION

FIGURE 3 - WELL DECOMMISSIONING RECORD

APPENDICES

APPENDIX A - REPORTS

APPENDIX A1 - INSPECTOR'S DAILY REPORT

APPENDIX A2 - PROBLEM IDENTIFICATION REPORT

APPENDIX A3 - CORRECTIVE MEASURES REPORT

[Page Intentionally Left Blank]

FIGURE 1

MONITORING WELL FIELD INSPECTION LOG

FIGURE 1

SITE NAME:

SITE ID.: _____
INSPECTOR: _____
DATE/TIME: _____
WEll ID.: _____

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO
WELL VISIBLE? (If not, provide directions below)		
WELL I.D. VISIBLE?		
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)		

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: .....

	YES	NO
SURFACE SEAL PRESENT?		
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)		
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)		

HEADSPACE READING (ppm) AND INSTRUMENT USED..... _____
TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable) _____
PROTECTIVE CASING MATERIAL TYPE: ..... _____
MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): ..... _____

	YES	NO
LOCK PRESENT?		
LOCK FUNCTIONAL?		
DID YOU REPLACE THE LOCK?		
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		
WELL MEASURING POINT VISIBLE?		

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): ..... _____
MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): ..... _____
MEASURE WELL DIAMETER (Inches): ..... _____
WELL CASING MATERIAL: ..... _____
PHYSICAL CONDITION OF VISIBLE WELL CASING: ..... _____
ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE ..... _____
PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES..... _____

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

REMARKS:

FIGURE 2

DECOMMISSIONING PROCEDURE SELECTION

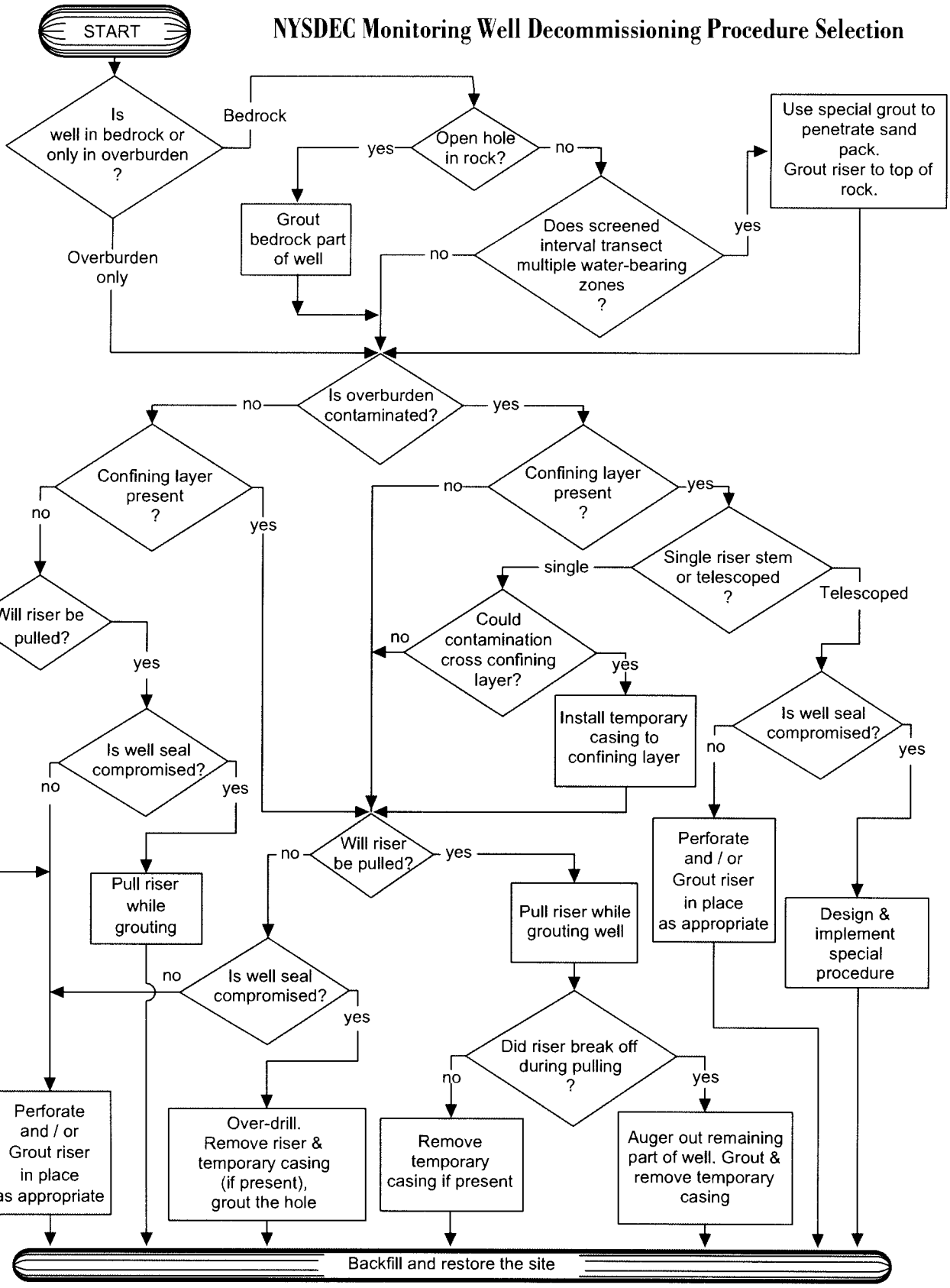

NYSDEC Monitoring Well Decommissioning Procedure Selection
START
Is well in bedrock or only in overburden ?
Bedrock
Overburden only
Open hole in rock?
yes
no
Grout bedrock part of well
Does screened interval transect multiple water-bearing zones ?
yes
no
Use special grout to penetrate sand pack. Grout riser to top of rock.
Is overburden contaminated?
no
yes
Confining layer present ?
no
yes
Will riser be pulled?
no
yes
Is well seal compromised?
no
yes
Pull riser while grouting
Confining layer present ?
no
yes
Single riser stem or telescoped ?
single
Telescoped
Could contamination cross confining layer?
no
yes
Install temporary casing to confining layer
Is well seal compromised?
no
yes
Will riser be pulled?
no
yes
Is well seal compromised?
no
yes
Pull riser while grouting well
Did riser break off during pulling ?
no
yes
Perforate and / or Grout riser in place as appropriate
Design & implement special procedure
Perforate and / or Grout riser in place as appropriate
Over-drill. Remove riser & temporary casing (if present), grout the hole
Remove temporary casing if present
Auger out remaining part of well. Grout & remove temporary casing
Backfill and restore the site

FIGURE 2

FIGURE 3

WELL DECOMMISSIONING RECORD

FIGURE 3

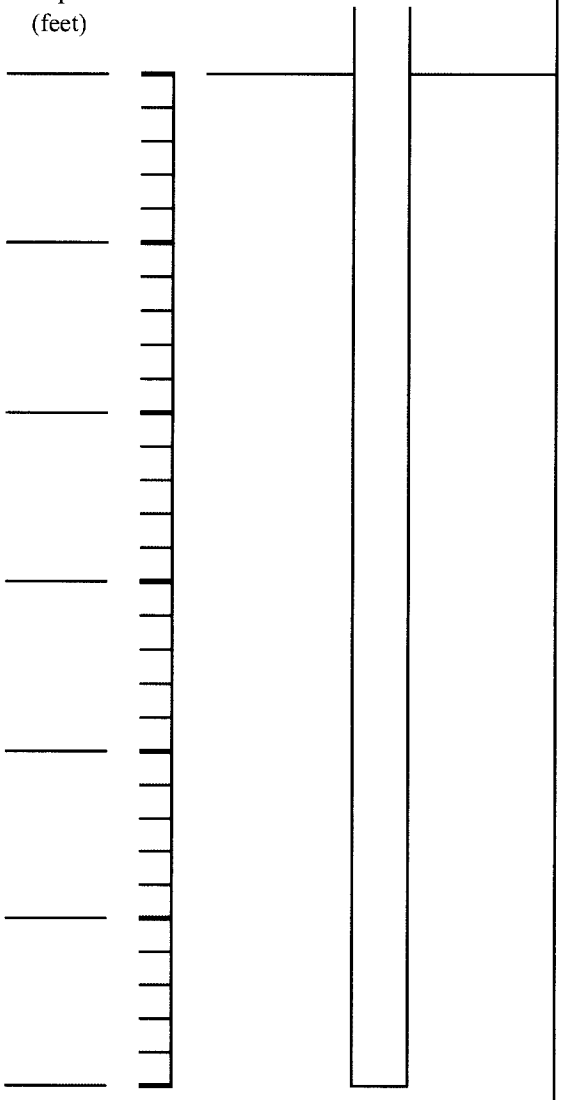
WELL DECOMMISSIONING RECORD

Site Name:	Well I.D.:
Site Location:	Driller:
Drilling Co.:	Inspector:
	Date:

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	
Casing retrieved (feet)	
Casing type/dia. (in)	
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	
# of batches prepared	
For each batch record:	
Quantity of water used (gal.)	
Quantity of cement used (lbs.)	
Cement type	
Quantity of bentonite used (lbs.)	
Quantity of calcium chloride used (lbs.)	
Volume of grout prepared (gal.)	
Volume of grout used (gal.)	

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

APPENDIX A - REPORTS

APPENDIX A1 - INSPECTOR'S DAILY REPORT

APPENDIX A2 - PROBLEM IDENTIFICATION REPORT

APPENDIX A3 - CORRECTIVE MEASURES REPORT

[Page Intentionally Left Blank]

Appendix A1

Inspector's Daily Report

CONTRACTOR:
ADDRESS:

TELEPHONE:
LOCATION _____ FROM _____ TO _____
WEATHER _____ TEMP _____ A.M. _____ P.M. _____ DATE _____

CONTRACTOR'S WORK FORCE AND EQUIPMENT

DESCRIPTION	*H*	*#*	*DESCRIPTION*	*H*	*#*	*DESCRIPTION*	*H*	*#*	*DESCRIPTION*	*H*	*#*
Field Engineer						Equipment			Front Loader Ton		
Superintendent			Ironworker			Generators			Bulldozer		
						Welding Equip.					
Laborer Foreman			Carpenter								
Laborer									Backhoe		
Operating Engineer			Concrete Finisher								
Carpenter						Paving Equip. & Roller					
						Air compressor					

SEE REVERSE SIDE FOR SKETCH YES ☐ NO ☐ _____

WORK PERFORMED: _____

PAY ITEMS

CONTRACT		STA		DESCRIPTION	QUANTITY	REMARKS
Number	ITEM	FROM	TO			

TEST PERFORMED: _____
PICTURES TAKEN: _____

VISITORS: _____

QA PERSONNEL
SIGNATURE _____

REPORT NUMBER _____
SHEET _____ Of _____

[Page Intentionally Left Blank]

PROBLEM IDENTIFICATION REPORT

Date _____

Project _____ Job Number _____

Contractor _____

Subject _____

Day | Su | M | T | W | Th | F | Sa |

Sky/Precip.	Clear	Partly Cloudy	Cloudy	Rainy	Snow
TEMP.	<32F	32-40F	40-70F	70-80F	80-90F
WIND	No	Light	Strong		
HUMIDITY	Dry	Mod.	Humid		

PROBLEM DESCRIPTION Reference Daily Report Number 1: _____

PROBLEM LOCATION - REFERENCE TEST RESULTS AND LOCATION (Note: Use sketches on back of form as appropriate):

PROBABLE CAUSES: _____

SUGGESTED CORRECTIVE MEASURES: _____

APPROVALS:

QA ENGINEER: _____

PROJECT MANAGER: _____

Distribution:
1. Project Manager
2. Field Office
3. File
4. Owner

QA Personnel
Signature: _____

MEETINGS HELD AND RESULTS

REMARKS

REFERENCES TO OTHER FORMS

SKETCHES

SAMPLE LOG

SAMPLE NUMBER

APPROXIMATE LOCATION OF STOCKPILE

NUMBER OF STOCKPILE

DATE OF COLLECTION

CLIMATIC CONDITIONS

FIELD OBSERVATION

SHEETS OF

Appendix A3

CORRECTIVE MEASURES REPORT

Date _____

Project _____ Job Number _____

Day | Su | M | T | W | Th | F | Sa |

Contractor _____

Subject _____

Sky/Precip.	Clear	Partly Cloudy	Cloudy	Rainy	Snow
TEMP.	<32F	32-40F	40-70F	70-80F	80-90F
WIND	No	Light	Strong		
HUMIDITY	Dry	Mod.	Humid		

CORRECTIVE MEASURES TAKEN (Reference Problem Identification Report No.): _____

RETESTING LOCATION: _____

SUGGESTED METHOD OF MINIMIZING RE-OCCURRENCE: _____

SUGGESTED CORRECTIVE MEASURES: _____

APPROVALS:

QA ENGINEER: _____

PROJECT MANAGER: _____

Distribution:

1. Project Manager
2. Field Office
3. File
4. Owner

QA Personnel

Signature: _____

APPENDIX 6

Soil Boring Logs, Well Construction Diagrams and
Soil Vapor Log

Subject Site: 37 Bittner Street
Rochester, NY

Date: August 7-8, 2007

MW-2

	C	BLOWS ON SAMPLER 0″/6″	6″/12″	12″/18″	18″/24″	SAMPLE PID	SAMPLE DEPTH	SOIL AND ROCK INFORMATION REMARKS
			4	3	2	0.0	0-2	Cinder to tan moist SILT some gravel
		2	2	3	4	0.0	2-4	Tan moist SILT some gravel
		2	2	5	11	0.0	4-6	Tan moist SILT and clay, some gravel
		6	15	19	20	0.0	6-8	Black layer at 6′ tan fine SAND and silt some trace gravel
		18	33	40	50	800	8-10	Moist tan fine SAND and silt some gravel
		10	50/5			1300	10-12	Tan to gray medium SAND and silt some gravel
		48	60/4			900	12-14	Tan fine SAND and silt some gravel
		50/4				52	14-16	Moist fine SAND and silt some gravel
		52	50/3			29	16-18	Moist fine SAND and silt some gravel
		50/3				7.0	18-20	Tan fine SAND and silt some gravel

Notes: Stopped at 20′ for night to see if we get water. 20′ well, screened to 10′ water at 13′.

Subject Site: 37 Bittner Street
Rochester, NY

Date: August 7-8, 2007

MW-4

	C	BLOWS ON SAMPLER 0″/6″	6″/12″	12″/18″	18″/24″	SAMPLE PID	SAMPLE DEPTH	SOIL AND ROCK INFORMATION REMARKS
			6	6	6	0.0	0-2	Cinder fill to damp fine SAND
		3	2	2	2	-	2-4	Tan fine SAND
		3	2	1	9	-	4-6	Tan coarse to medium SAND over brick
		8	25	29	50/5	-	6-8	Brick, fine SAND, rock fragments
		10	29	37	40	280	8-10	Fine SAND trace medium sand trace gravel
		12	35	31	50/5	600	10-12	Same, moist black at 6′ with petro odor
		9	49	50/4		1050	12-14	Same, at +/- 7.5′ fine silt/clay till
		14	50	50/3		565	14-16	Same
		39	50/3			59	16-18	Tan and black fine Sand and till
		19	50/4			64	18-20	Gray moist silt/clay and gravel
		50/4				8	20-22	Red, gray moist SILT and gravel

Table Continues on Next Page.

		97				91	22-24	Gray moist SILT trace fine sand and gravel
		50/4				6.9	24-26	Gray silt/clay some gravel
		50/4				25	26-26.5	Gray fine SAND trace gravel and silt
Notes: Screened from 26.5′ to 6.5 because of dry soils; nearly dry well had groundwater +/- 13′ measured next day.								

Subject Site: 37 Bittner Street
Rochester, NY

Date: August 7-8, 2007

MW-Deep 1

	C	BLOWS ON SAMPLER 0″/6″	6″/12″	12″/18″	18″/24″	SAMPLE PID	DEPTH	SOIL AND ROCK INFORMATION REMARKS
				47	50/3	582	12-14	Moist brown medium SAND some silt, some gravel
		35	37	39	50/5	1273	14-16	Black, petro odor medium SAND
		50/5				114	16-18	Saturated black, gray medium SAND, petro odor
		42	50/3			36.7	18-20	Gray till
		43	50/3			20.9	20-22	Gray till
		50/5				31.6	22-24	Moist till
		50/5				54	24-26	Till to silt/clay
		50/4				33	26-28	Wet till
		50/4				26	28-30	Medium SAND some gravel
		50/4				19.5	30-32	Wet red/gray medium SAND with gravel
		45	50/3	50/0		12.9	32-33.5	Refusal at 33.5′

Notes: Started split spoon at 12 feet. Refusal at 33.5′. 10′ screen, sand to 22′ bentonite 19′.

Subject Site: 37 Bittner Street
Rochester, NY

Date: August 7-8, 2007

MW-5

	C	BLOWS ON SAMPLER 0″/6″	6″/12″	12″/18″	18″/24″	SAMPLE PID	DEPTH	SOIL AND ROCK INFORMATION REMARKS
			7	8	10	15.2	0-2	Asphalt, fill material, bricks
		6	7	6	50/5	12.3	2-4	Fill material, bricks
		4	8	8	8	7.4	4-6	Fill material
		8	18	12	29	5.0	6-8	Cinder layer to brown medium SAND, trace clay, trace gravel.
		11	30	47	50/5	7.0	8-10	Brown medium SAND, trace clay, trace gravel.
		13	32	50/5		0	10-12	Brown medium SAND to SILT, trace gravel
		12	42	50/3		0	12-14	SILT trace gravel
		18	50/3			0	14-16	Moist SILT, trace clay trace gravel
		45	50/3			0	16-18	Moist till layer
		21	50/4			0	18-20	Moist till layer

Refusal at 20′ screened to 10′

Subject Site: 37 Bittner Street
Rochester, NY

Date: August 7-8, 2007

MW-6

	C	BLOWS ON SAMPLER 0″/6″	6″/12″	12″/18″	18″/24″	SAMPLE PID	DEPTH	SOIL AND ROCK INFORMATION REMARKS
			10	6	6	0	0-2	Asphalt to brown fine SAND, some gravel, trace clay
		6	7	6	50/4	0	2-4	Brown fine SAND, some gravel, trace clay
		4	7	8	50/3	5.2	4-6	Brown fine SAND, some gravel, trace clay
		8	18	12	16	6.7	6-8	Brown fine SAND, some gravel, trace clay
		11	30	47	50/5	4.6	8-10	Brown fine to medium SAND, some gravel, trace clay, cinder layers
			7	8	10	0	10-12	Brown SILT, some clay, trace gravel, cinder layer
		12	40	50/5		0	12-14	Poorly sorted SILT
		10	36	50/3		0	14-16	Moist poorly sorted SILT
		20	50/3			0	16-18	Moist TILL
		36	50/4			0	18-20	Moist TILL
		45	50/5			0	20-20.5	Moist TILL

Refusal at 20.5′ screened to 10.5′

37 Bittner Street
Brownfield Cleanup Program
August 7, 8, 2007

Phase II Geoprobe

Geoprobe sampling (TREC subcontractor) was conducted with soil headspace screening with MiniRAE 2000 photoionization detector (PID) of soil headspace:

BH A1		Description	PID
	0′ - 4′	Asphalt/brick to tan med SAND some gravel	2.4
	4′ - 8′	Moist, tan, fine SAND, silt and poorly graded gravel	0.0
	8′ - 12′	Moist, tan, fine SAND	1040
	12′ – 14′	Wet, clayey, silty TILL at 12.5. Saturated at 12′-13′ petroleum odor, refusal at 14′	1600

BH A2		Description	PID
	0′ - 4′	Asphalt, coarse SAND some brick	11.0
	4′ - 8′	Moist, brown fine SAND with silt, trace clay, trace gravel to TILL	14.9
	8′ - 11.1′	Moist, brown fine SAND/SILT, trace clay trace poorly graded gravel to TILL refusal at 11.1′	1232

BH A3	East Boundary	Description	PID
	0′ - 4′	Asphalt to brown, fine SAND/SILT, trace clay	0.0
	4′ - 8′	Brown fine SAND/SILT trace clay some brick, some gravel	0.0
	8′ - 12′	Tan fine SAND/SILT trace clay	1510

37 Bittner Street
Brownfield Cleanup Program
August 7, 8, 2007

Phase II Geoprobe

Geoprobe sampling (TREC subcontractor) was conducted with soil headspace screening with MiniRAE 2000 photoionization detector (PID) of soil headspace:

BH A5	Description	PID
0′ - 4′	Asphalt to moist, brown fine SAND some silt	0.0
4′ - 8′	Brown, medium, SAND some gravel	0.0
8′ - 11.6′	Brown, medium, SAND to TILL	309

BH A6	Description	PID
0′ - 4′	Asphalt to brown fine SAND/SILT	22
4′ - 8′	Tan TILL with poorly graded gravel	13.4
8′ - 12′	Tan TILL with poorly graded gravel	2.1

BH B2	Description	PID
0′ - 4′	Asphalt to brown, fine , SAND, some brick	0.0
4′ - 8′	Brown, fine SAND some gravel	0.0
7′ - 9.6′	Medium SAND and gravel. Refusal at 9.6 ′	1886

37 Bittner Street
Brownfield Cleanup Program
August 7, 8, 2007

Phase II Geoprobe

Geoprobe sampling (TREC subcontractor) was conducted with soil headspace screening with MiniRAE 2000 photoionization detector (PID) of soil headspace:

BH B6	Description	PID
0′ - 4′	Asphalt to medium, brown, SAND with poorly graded gravel	39
4′ - 8′	Dry Coarse SAND layers to brown, medium, SAND with poorly graded gravel	22
8′ - 12′	Brown, TILL	36

BH C1	Description	PID
0′ - 4′	Asphalt to moist, tan, fine SAND/SILT trace clay some gravel	12.3
4′ - 8′	Moist, tan medium, SAND, trace silt some gravel	8.0
8′ - 12′	Moist, gray fine SAND some silt, some gravel	1210

37 Bittner Street
Brownfield Cleanup Program
August 7, 8, 2007

Phase II Geoprobe

Geoprobe sampling (TREC subcontractor) was conducted with soil headspace screening with MiniRAE 2000 photoionization detector (PID) of soil headspace:

BH C5		Description	PID
	0′ - 4′	0 recovery	
	4′ - 8′	Moist, brown fine SAND/SILT	29

BH C6		Description	PID
	0′ - 4′	Asphalt to tan, medium, SAND with gravel	62
	4′ - 8′	Brick to brown, medium, SAND with poorly graded gravel	19.9
	8′ - 12′	Brown, medium, SAND to red/ gray, Sandstone	20

37 Bittner Street
Brownfield Cleanup Program
August 7, 8, 2007

Phase II Geoprobe

Geoprobe sampling (TREC subcontractor) was conducted with soil headspace screening with MiniRAE 2000 photoionization detector (PID) of soil headspace:

BH D1		Description	PID
	0′ - 4′	Asphalt to moist, brown, SAND with brick and asphalt debris.	23
	4′ - 8′	Asphalt and brick to TILL	5.6
	8′ - 12′	Gray, TILL trace poorly graded gravel	1894
	12′ - 15.2	TILL with poorly graded gravel	519

BH D2		Description	PID
	0′ - 4′	Asphalt to brown, medium, SAND and poorly graded gravel	36
	4′ - 8′	Asphalt and brick and crusher run fill to SILT with poorly graded gravel	18
	8′ - 12′	Crusher run to medium, SAND with poorly graded gravel	2000

37 Bittner Street
Brownfield Cleanup Program
August 7, 8, 2007

Phase II Geoprobe

Geoprobe sampling (TREC subcontractor) was conducted with soil headspace screening with MiniRAE 2000 photoionization detector (PID) of soil headspace:

		Description	PID
BH D5	0′ - 4′	Asphalt to moist, brown, fine SAND and silt some brick and poorly graded gravel	0.0
	4′ - 8′	Cinder layers with moist, brown medium to fine SAND	0.0
	8 ′ - 12 ′	Moist TILL	1776

		Description	PID
BH D6	0′ - 4′	Asphalt and brick to brown/black SAND fill	24
	4′ - 8′	Fill to brown, medium, SAND some poorly graded gravel	21
	8 ′ - 12 ′	Brown, medium, SAND some poorly graded gravel	19

		Description	PID
BH E1			
	0′ - 4′	Asphalt to top soil with organic matter	12.4
	4′ - 8′	Moist, brown medium, SAND to moist TILL	7.7
	8 ′ - 12 ′	TILL trace poorly graded gravel	781

37 Bittner Street
Brownfield Cleanup Program
August 7, 8, 2007

Phase II Geoprobe

Geoprobe sampling (TREC subcontractor) was conducted with soil headspace screening with MiniRAE 2000 photoionization detector (PID) of soil headspace:

BH E2	Description	PID
0′ - 4′	Asphalt and brick	2.6
4′ - 8′	Asphalt and brick refusal at 4.5	0.0
4.5′ - 8′	Asphalt and fill material to brown, medium, SAND with poorly graded gravel (fill)	4.3
8 ′ - 12 ′	Medium, SAND trace poorly graded gravel	1780
12′ - 15′	Saturated at 14′ fill to TILL	41.8

BH E3	Description	PID
0′ - 4′	Asphalt to tan, fine SAND/SILT trace poorly graded gravel to TILL	15.9
4′ - 6′	Tan, fine SAND/SILT trace poorly graded gravel to TILL. Refusal at 6′.	8.8
4′ - 8′	Tan, medium, SAND with poorly graded gravel	
8 ′ - 12 ′	Tan medium, SAND with poorly graded gravel	9.0

37 Bittner Street
Brownfield Cleanup Program
August 7, 8, 2007

Phase II Geoprobe

Geoprobe sampling (TREC subcontractor) was conducted with soil headspace screening with MiniRAE 2000 photoionization detector (PID) of soil headspace:

BH E4	Description	PID
0′ - 4′	Asphalt and brick to brown, fine SAND/SILT trace clay, trace poorly graded gravel	10.0
4′ - 8′	Layers of asphalt to tan, medium, SAND with poorly graded gravel	12.1
8 ′ - 12 ′	Brown, TILL trace poorly graded gravel	6.1

BH E6	Description	PID
0′ - 4′	Tan, fine SAND/SILT	24.9
4′ - 8′	Tan, fine SAND/SILT	21.5
8 ′ - 12 ′	Medium, brown SAND with poorly graded gravel	19

BH F1	Description	PID
0′ - 4′	Asphalt and brick to top soil with organic matter	8.8
4′ - 8′	Top soil to TILL	8.8
8 ′ - 12 ′	Layers of fill with med to coarse SAND	6.1

37 Bittner Street
Brownfield Cleanup Program
August 7, 8, 2007

Phase II Geoprobe

Geoprobe sampling (TREC subcontractor) was conducted with soil headspace screening with MiniRAE 2000 photoionization detector (PID) of soil headspace:

BH F2		Description	PID
	0′ - 4′	Asphalt to crusher run fill to tan, medium, SAND	5.9
	4′ - 8′	Layers of SAND fill with asphalt	7.1
	8 ′ - 12 ′	Brown, TILL with poorly graded gravel	2.1

BH	**North Boundary**	Description	PID
	0′ - 4′	Asphalt to moist, tan, fine SAND/SILT trace clay some gravel	12.3
	4′ - 8′	Moist, tan, medium, SAND trace silt some gravel	8.0
	8 ′ - 12 ′	Moist, gray fine SAND trace silt some gravel	1210

37 Bittner Street
Brownfield Cleanup Program
August 7, 8, 2007

Phase II Geoprobe

Geoprobe sampling (TREC subcontractor) was conducted with soil headspace screening with MiniRAE 2000 photoionization detector (PID) of soil headspace:

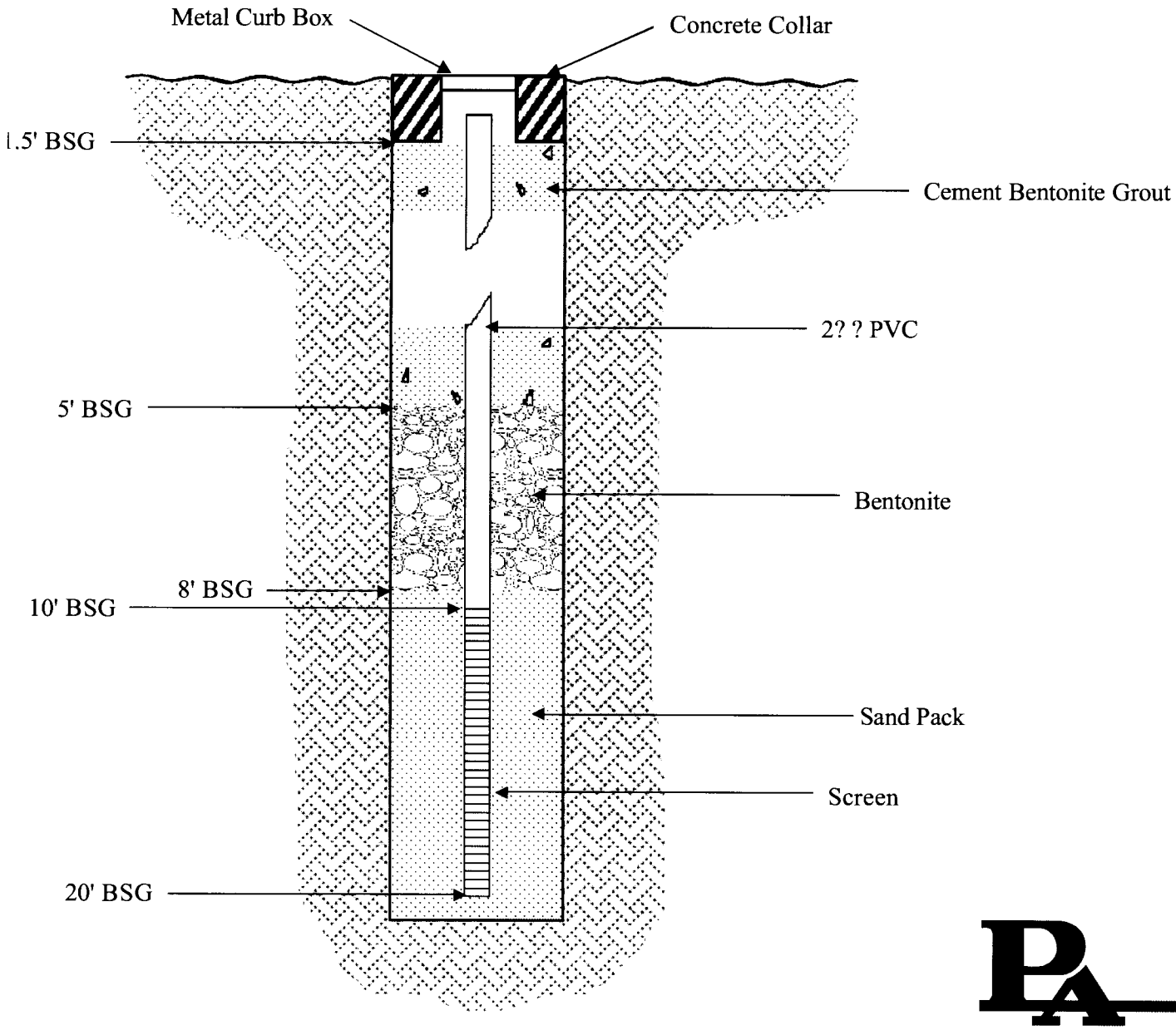
BH	West Boundary	Description	PID
	0′ - 4′	Asphalt to medium, SAND some brick to brown, medium, SAND trace silt	7.9
	4′ - 8′	Cinder layers to brown, medium, SAND/SILT trace clay, trace gravel	15.0
	8 ′ - 12 ′	Brown, medium, SAND trace silt trace gravel	0.0

BH	South Boundary	Description	PID
	0′ - 4′	Asphalt to brown, fine SAND/SILT trace clay some gravel	0.0
	4′ - 8′	Brown, fine to medium, SAND trace clay some gravel with cinder layers	5.6
	8 ′ - 12 ′	Brown, medium to fine SAND with silt trace clay some gravel	15

Passero Associates
Engineering Architecture

100 Liberty Pole Way
Rochester, NY 14604
www.passero.com
585-325-1000
585-325-1691 Fax

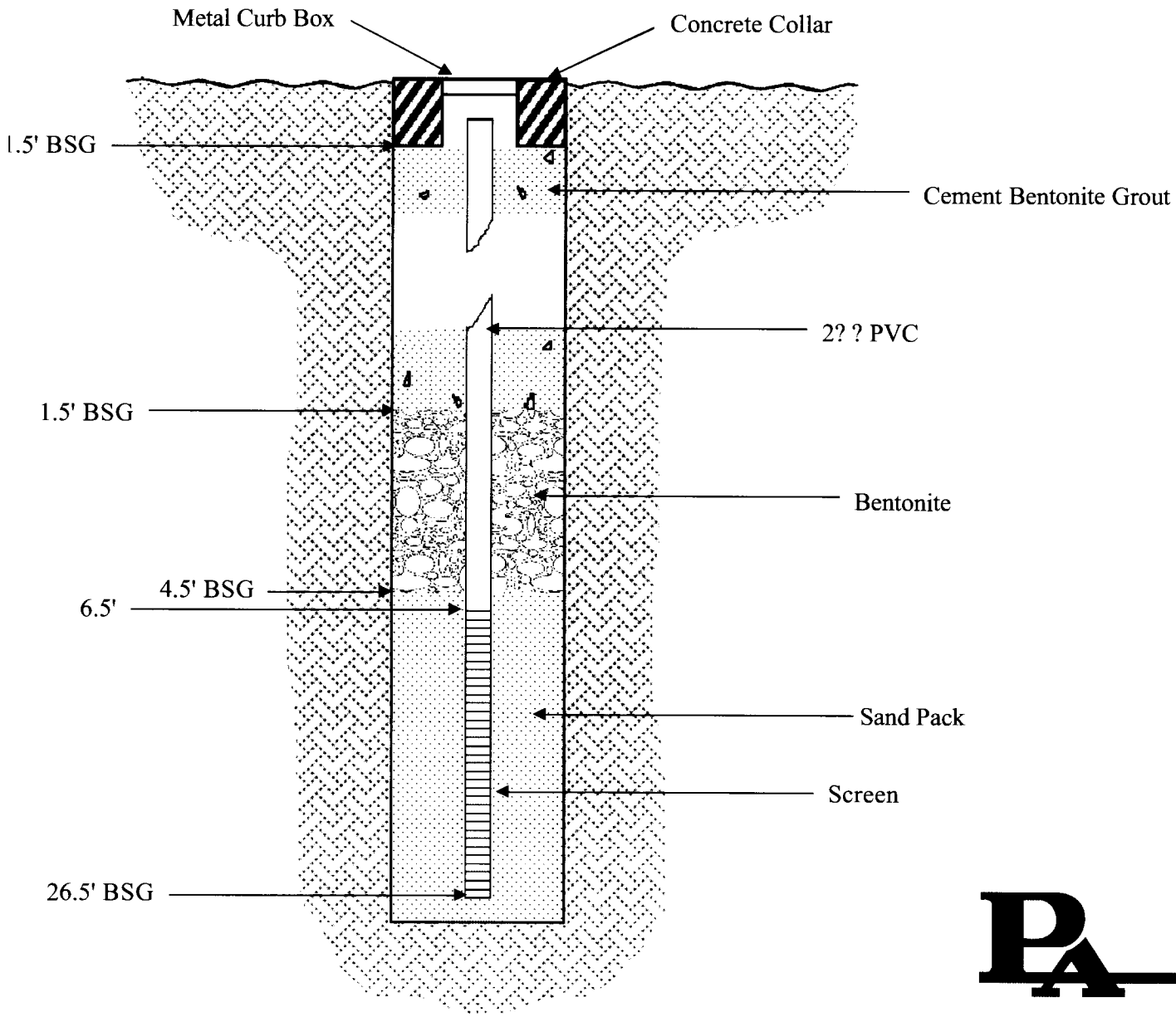
SCHEMATIC DIAGRAM
PROJECT NAME 37 Bittner Street
PROJECT # 25030.06
MONITORING WELL # MW-2



Passero Associates
Engineering Architecture

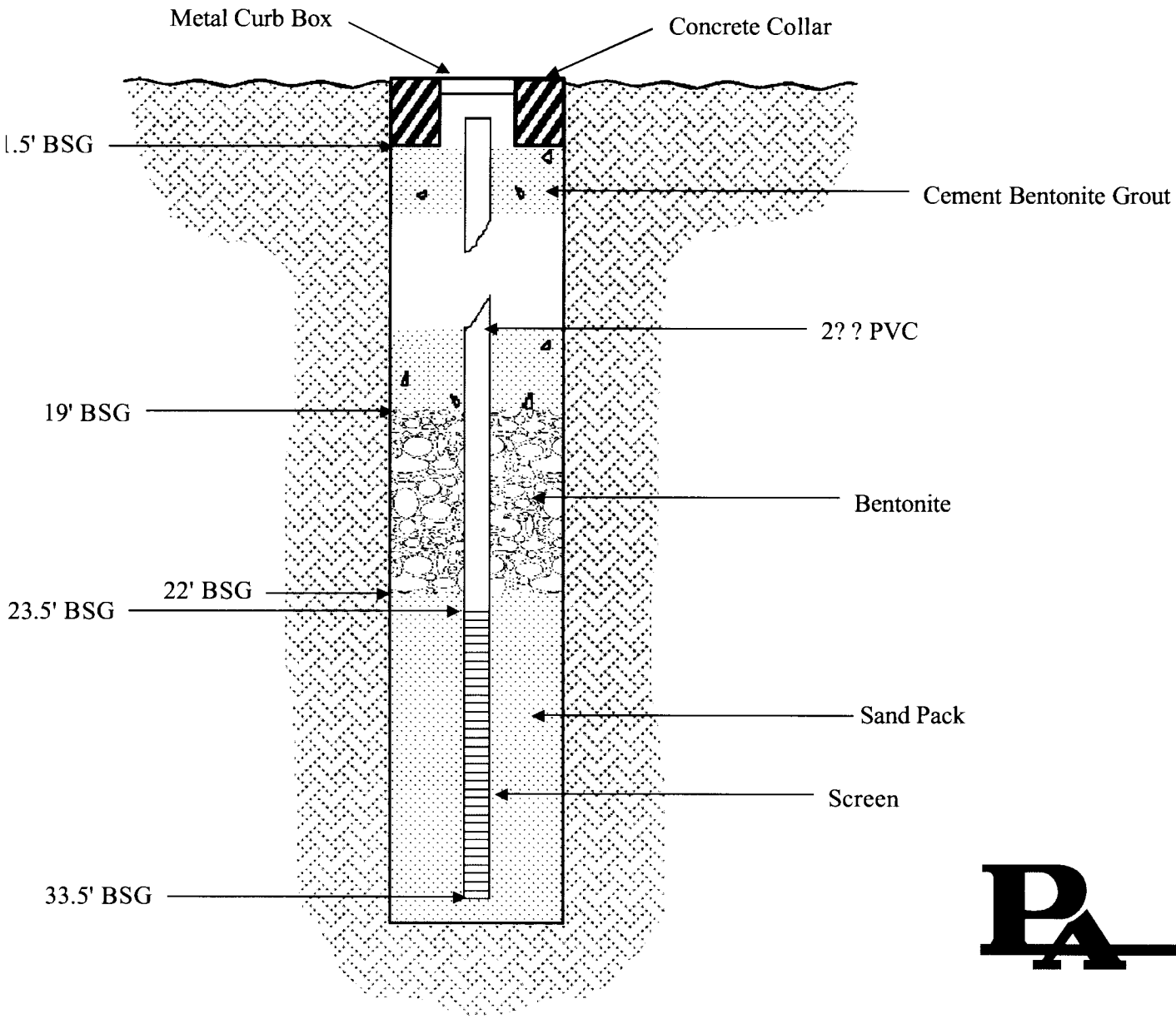
100 Liberty Pole Way
Rochester, NY 14604
www.passero.com
585-325-1000
585-325-1691 Fax

SCHEMATIC DIAGRAM
PROJECT NAME 37 Bittner Street
PROJECT # 25030.06
MONITORING WELL # MW-4



Passero Associates
Engineering Architecture
100 Liberty Pole Way
Rochester, NY 14604
www.passero.com
585-325-1000
585-325-1691 Fax

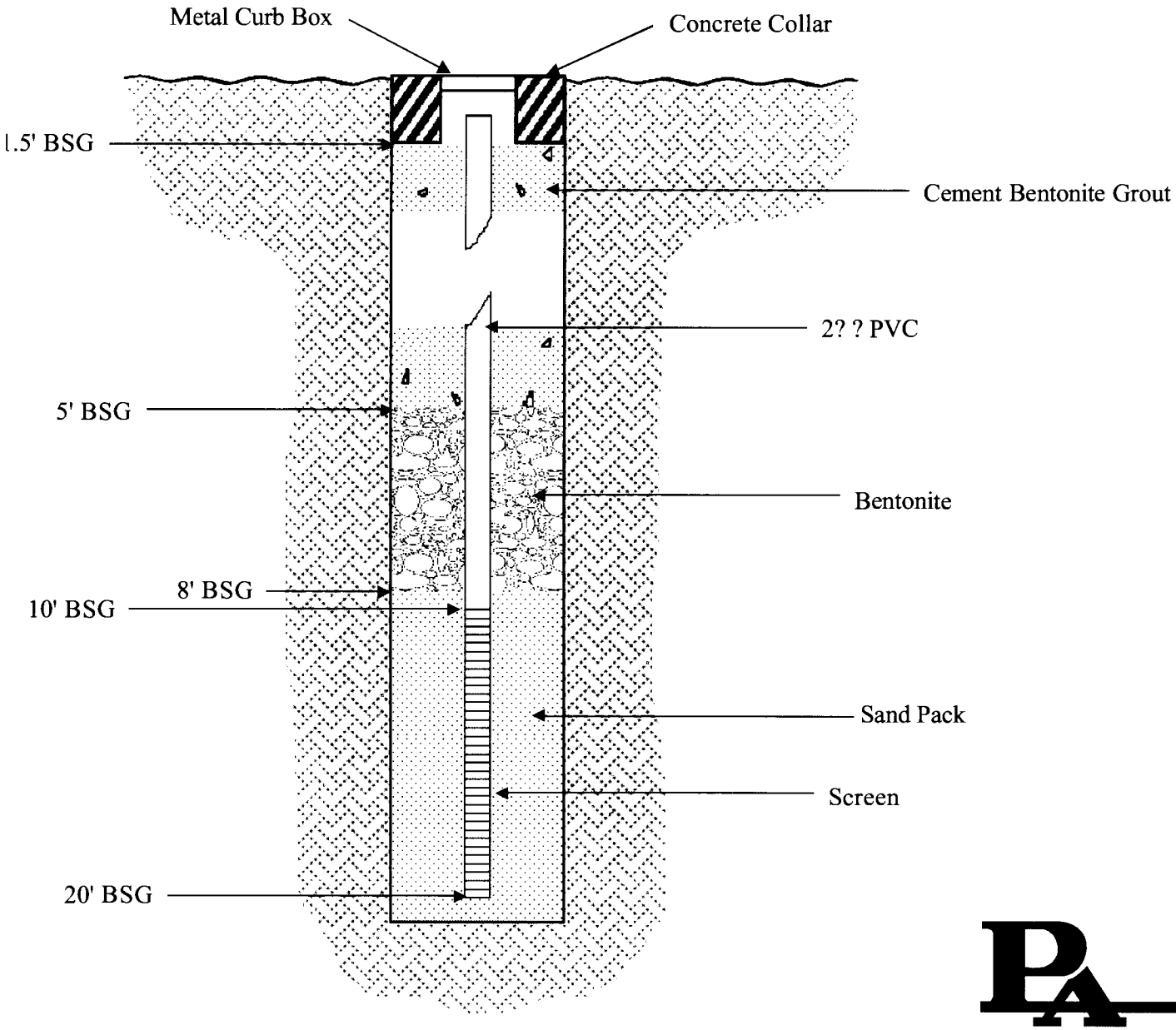
SCHEMATIC DIAGRAM
PROJECT NAME 37 Bittner Street
PROJECT # 25030.06
MONITORING WELL # MW-Deep 1



Passero Associates
Engineering Architecture

100 Liberty Pole Way
Rochester, NY 14604
www.passero.com
585-325-1000
585-325-1691 Fax

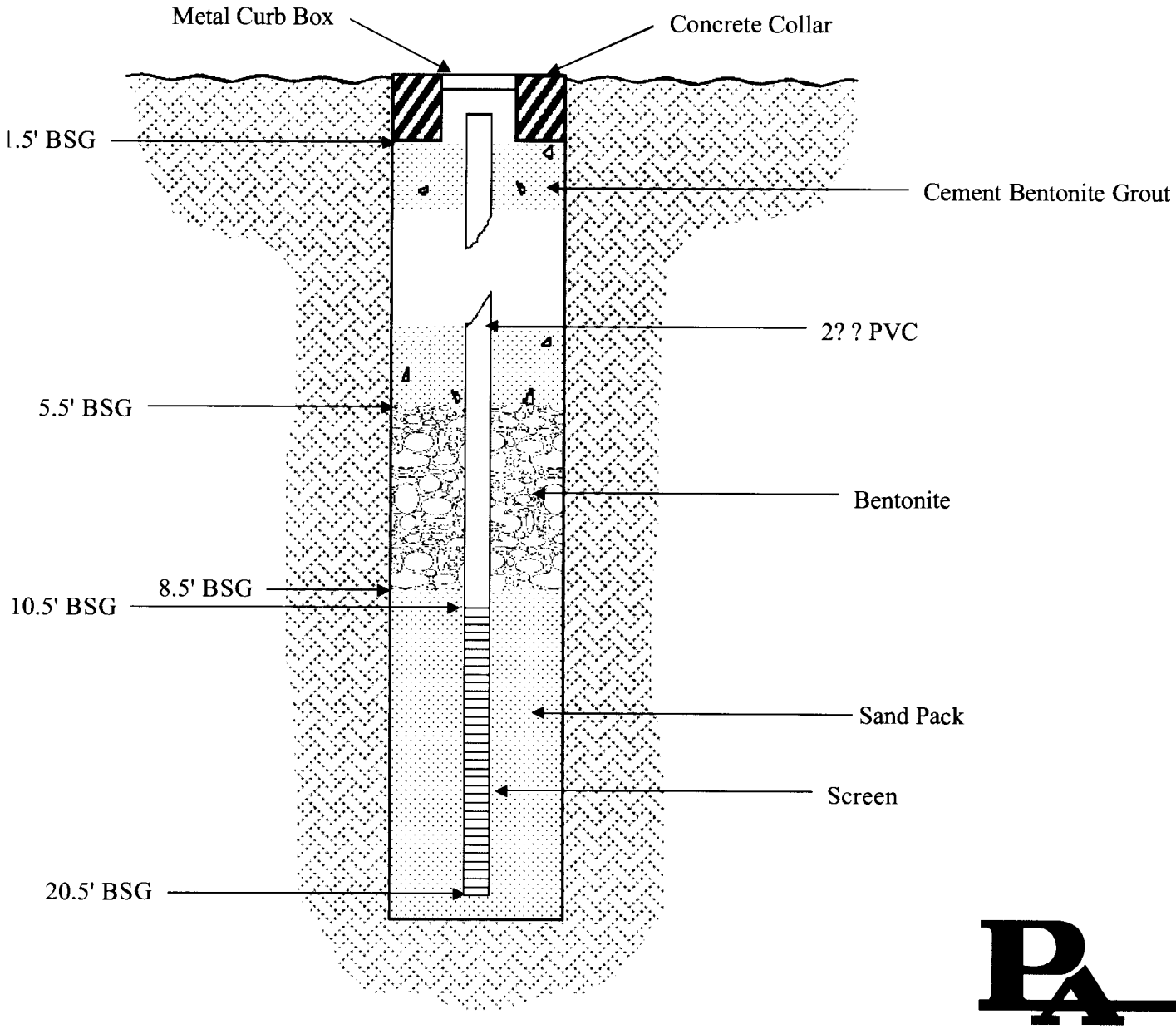
SCHEMATIC DIAGRAM
PROJECT NAME 37 Bittner Street
PROJECT # 25030.06
MONITORING WELL # MW-5



Passero Associates
Engineering Architecture

100 Liberty Pole Way
Rochester, NY 14604
www.passero.com
585-325-1000
585-325-1691 Fax

SCHEMATIC DIAGRAM
PROJECT NAME 37 Bittner Street
PROJECT # 25030.06
MONITORING WELL # MW-6



Sub-Surface Soil Vapor Investigation

37 Bittner Street

Sample ID	SG-1		SG-2		SG-3		SG-4	
Date	9/9/08		9/9/08		9/9/08		9/9/08	
Time	9:33-11:57		9:50-11:52		11:10-1:17		12:04-2:08	
Sampling Depth	8'		8'		8'		8'	
Helium measurements	9:22 am-9:30 am		9:37 am-9:46 am		10:44 am-11:03 am		11:46 am-12:00 pm	
	0		0		0		0	
Identity of Samplers	Canister	Regulator	Canister	Regulator	Canister	Regulator	Canister	Regulator
	162	00810	479	00538	223	00718	472	00638
Purge volumes	3x		3x		3x		3x	
Volume of soil vapor extracted	1 volume		1 volume		1 volume		1volume	
Vacuum of the canisters before and after collection	Before	After	Before	After	Before	After	Before	After
	29	0	27	2	28	0	30	0
Moisture content of sampling zone	Not Available		Not Available		Not Available		Not Available	

APPENDIX 7

Carbon Filter Data Sheet and Schematic
and Draft BCP Sign

United Manufacturing Incorporated
Premium grade Activated Carbon from Coal
Pellets - GAC - PAC
Full Technical Support - Adsorber Sizing - Isotherms

Laurence D'Alberti - ChE
Branch Office Manager

375 LaBray Avenue - Red Bluff CA 96080
Ph: (530) 527-5861 E-mail: activecarbon@jps.net
Fx: (530) 527-5861

PRODUCT DATA SHEET
AF SERIES FILTERS
MODEL AFD-55

GENERAL DESCRIPTION

The AFD-55 filter is a media filter vessel designed to treat liquid streams. While the typical design application is a activated carbon adsorbtion unit, the filter can easily accommodate many medias. Some applications include:

- **Dissolved Organic Removal (Activated Carbon)**
- **Suspended Solids Removal (Sand Filter)**
- **Dissolved Minerals (Softener Resin)**
- **Oil and Grease Removal (Organo-Clays)**
- **Dissolved and Precipitated Metals Removal**
- **Special Organics (Resin/Carbon Blends)**
- **Catalytic Reactor (Chlorine and Peroxide Removal)**
- **Bio-Remediation Contactor Unit**

AFD-55 STANDARD SPECIFICATIONS

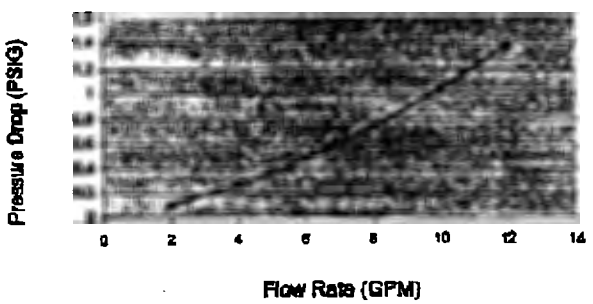
Specification	Specification Value	Options
Materials (Vessel)	Carbon Steel	Stainless Steel, HDPE
Materials (Internal Piping)	SCH 40 PVC	Polypropylene, CPVC, 304SS, 316SS
Materials (Collector Nozzles)	SCH 40 PVC	304SS, 316SS, Polypropylene
Internal Coating	Polyamide Epoxy Resin	Vinyl Ester, PVC
External Coating	Urethane Enamel	Any available coating
Maximum Pressure	15 PSIG	NA
Maximum Temperature	140° F (Limited by coating and PVC internals)	Up to 300° F
Cross Sectional Bed Area	2.8 FT^2	NA
Bed Depth	2.4 FT (Using 200 Lbs. 8*30 GAC)	Dependent upon supplied media
Bed Volume	6.6 FT^3 (Using 200 Lbs. 8*30 GAC)	Up to 7.4 FT^3

CONTACT TIME VS. FLOW RATE
(8*30 GAC)

Flow Rate	Single Bed	Dual Bed
4 GPM	12 Minutes	24 Minutes
6 GPM	8 Minutes	16 Minutes
8 GPM	6 Minutes	12 Minutes
10 GPM	5 Minutes	10 Minutes

Related Bulletins:
B99-M131A - O&M Manual - AFD-55 Filter
B99-04A - Contact Time in Filters
B99-05A - About Backwashing
B99-06A - About Pressure Drop
B99-07A - Usage Rates

PRESSURE DROP GRAPH
(An Filled - 8*30 GAC)

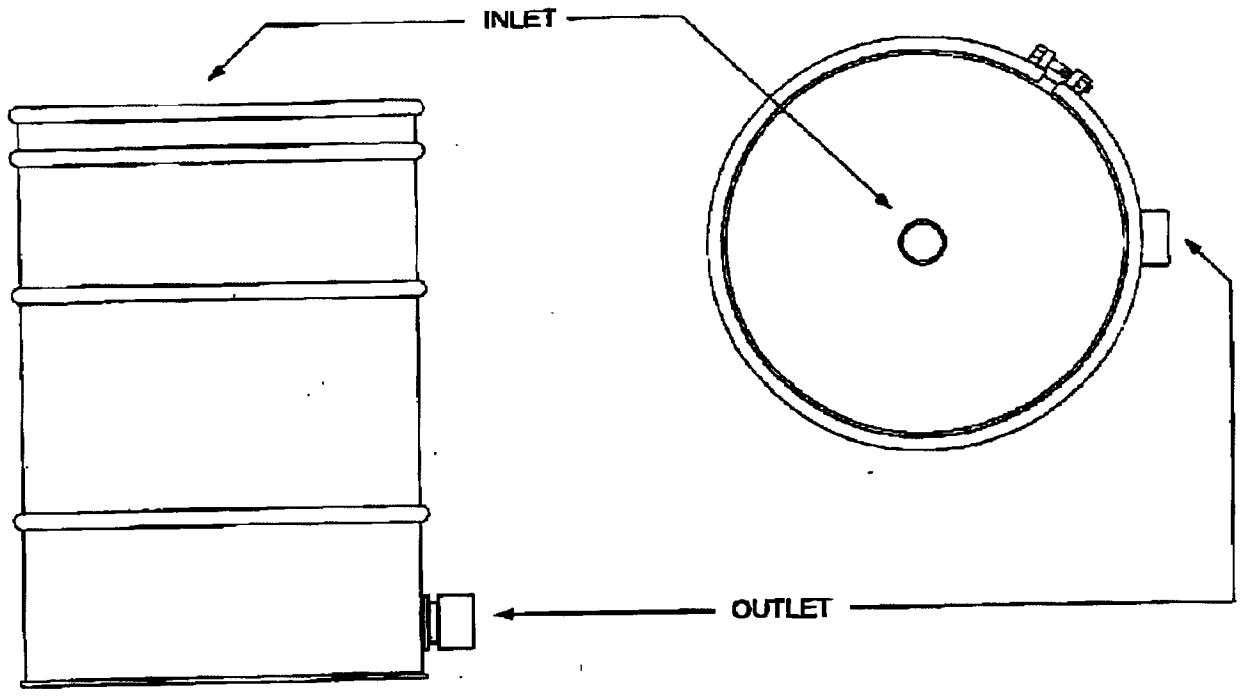


United Manufacturing International
Premium grade Activated Carbon from Coal
Pellets - GAC - PAC
Full Technical Support - Adsorber Sizing - Isotherms

Laurence D'Alberti - ChE
Branch Office Manager

375 LaBrey Avenue - Red Bluff CA 96080
Ph: (530) 527-5861 E-mail: activecarbon@jps.net
Fx: (530) 527-5861

PRODUCT DIMENSIONS
AFD SERIES FILTERS



DETAILED DRAWINGS AVAILABLE FOR INDIVIDUAL PRODUCTS

AFD SERIES STANDARD DIMENSIONS

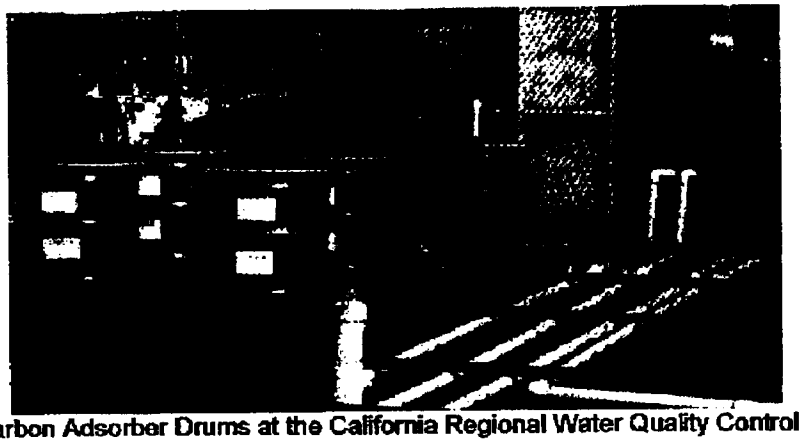
Model # (AFD-) ⇨	30	55	85	110			
Overall Height	2' 6"	2' 10"	3' 3"	3' 7"			
Footprint	20"	24"	28"	32"			
Diameter	18"	23"	26"	30"			
Inlet/Outlet (FNPT)	2"	2"	2"	2"			
Drain / Vent (FNPT)	OPT	OPT	OPT	OPT			
GAC Fill (Lbs)	100	200	300	400			
Shipping Weight (Lbs)	135	250	380	500			
Operational Weight (Lbs)	325	595	905	1,170			

September 7, 2004

| United Manufacturing International 2000 Activated Carbon | Organic Vapor Adsorption | Adsorption Equipment 2000 | Quality Control | Superior Production | International Delivery | Experience and Commitment | UMI-2000 Activated Carbon Contact Information | Today, for a better tomorrow.... | Activated Carbon Adsorber Drums |

UMI-2000 IN
Activated Carbon

Activated Carbon Adsorber Drums



Pictured: Activated Carbon Adsorber Drums at the California Regional Water Quality Control Board Lake Tahoe CA UST-MTBE site.

MTBE is the most common oxygenated fuel additive used in reformulated gasoline affecting taste and odor of drinking water at 2 ppb. UMI-2000 AFD-55 Canister Drums are an effective remediation alternative to costly air strippers. Advanced computer models are used by our engineers to stage activated carbon drum systems for maximum MTBE and BTEX (fuel compound) removal efficiency. Our "Krakatau" brand premium virgin coconut shell activated carbon has higher adsorptive capacity and greater retentivity for MTBE than coal based carbons. Standard adsorbers have a two part polyamide epoxy resin internal coating, urethane enamel factory finish to prevent corrosion and come with a full one year manufacturer's warranty. Low $capital cost -schedule 40 PVC connections & screens - simple installation and start-up - delivered to any site in the USA - CALL NOW!

Tel/Fax: 530-527-5861
e-mail: activecarbon@jps.net

YOUR SATISFACTION IS GUARANTEED!!

Concerning the Draft BCP sign on the following Page; it should be noted that the NYSDEC Commissioner and the City of Rochester Mayor may have changed by the time the BCP sign is ready for production. When the sign is ready for production a final copy of the sign requirements and a revised copy of the sign will be submitted to the sign production company.

Brownfield Cleanup Program

Kirstein Building Associated Parking Lot
at 37 Bittner Street
NYSDEC Site #C828127
234-250 Andrews Street, LLC

Governor Andrew M. Cuomo
Joe Martins, Acting Commissioner
R. Carlos Carballada Acting Mayor

Transform the Past…. Build for the Future

APPENDIX 8

Personnel Qualifications

GARY W. PASSERO, PE, F. ASCE, REM
CEO

Representative Project Experience

Mr. Passero is the founder and Chief Executive Officer of Passero Associates. The firm was founded in 1972 and has grown to over 80 engineers, architects, planners, surveyors, and support personnel.

Throughout his professional career, Mr. Passero obtained design and management experience in a wide variety of environmental, civil and forensic engineering projects. His experience includes soil/groundwater investigation and remediation; indoor air quality sampling, evaluation and abatement (mold, asbestos, lead); civil/site engineering for residential, commercial, and industrial projects; municipal engineering/architecture; wastewater treatment/pollution control; sanitary landfills; highway/street design and reconstruction projects; and preparation of engineering reports for accident and failure cases.

Mr. Passero has provided expert testimony for plaintiffs and defendants, has participated in technical panels, and has been an Adjunct Professor at Rochester Institute of Technology.

Gary is honored to have been selected as a 2003 & 2010 Finalist for Small Business Person of the Year by the Small Business Council, and as a 2010 Finalist and 1998 "Civil Engineer of the Year" by the Rochester Section, American Society of Civil Engineers. Gary is a Past President/Delegate for the New York State and District 1 Councils of the American Society of Civil Engineers.

A partial list of projects Mr. Passero has managed:

Environmental Projects

- Comfort Inn Brownfield Cleanup Agreement; Gates, New York
- 37 Bittner Street Brownfield Cleanup Program; Rochester, New York
- Speedy's Cleaner Brownfield Cleanup Program; Pittsford, New York
- 2,000 Phase I Environmental Site Assessments since 1990
- Wireless Telecommunications Towers: Phase I & Phase II; Multiple Sites, Northeast US
- Soils Management Plan, Phase I & Phase II Investigations, 200 Clifford Ave; Rochester, New York
- Blue Cross/Blue Shield Remediation Site Plan; Rochester, New York
- Rochester General Hospital Industrial Hygiene Services; Rochester, New York
- Town of Poughkeepsie, New York Police & Court Building Indoor Air Quality Investigation
- Speedy's Cleaner Soil/Groundwater Remediation
- Fischback & Moore Electric Voluntary Cleanup Agreement; Brighton, New York
- Town of Irondequoit, New York Underground Storage Tank Removal and Site Remediation
- Town of Macedon, New York Indoor Air Quality Investigation
- NYSDEC Brownfield Investigation at the Geneva Foundry and Market Basket Sites in Geneva, New York
- Environmental Assessment Impact Statements for General Aviation Airports in the Northeast United States

Education

BS, Civil Engineering, Iowa State

Post Graduate Work

- American Water Works Assoc., Improving Water Treatment Operations
- University of Wisconsin, Industrial Waste Institute Seminar
- State University of Buffalo, Chemical Principal of Water Pollution Control
- Cornell University, Land Application of Waste
- RCRA: Hazardous Waste Rules and Regulations

Certifications/Registrations

- NCEES Registration #12550
- Licensed Professional Engineer in the States of New York, Florida, Ohio, Illinois, and Pennsylvania
- Registered Environmental Manager, (REM #5342)

Civic/Professional Affiliations

- Fellow, Past President and Past Delegate, New York State and District 1 Councils of the ASCE Rochester Section
- Rochester Engineering Society
- New York State Society of Professional Engineers
- National Director, Business Men's Fellowship USA and President, Rochester Regional Chapter
- Member of the Construction Committee, Flower City Habitat for

KIMBERLY M. CLARKE, LEP

Director of Environmental Services

As Director of Environmental Services, Ms. Clarke is directly responsible for the management and development of Passero Associates' Environmental Department; for the oversight of all environmental projects including site investigation, remediation, Brownfields cleanup and permitting; and for the development of environmental documentation and reporting. Ms. Clarke joined Passero Associates in January 2011.

Representative Project Experience

Site Assessment – Kimberly has extensive experience conducting and managing Phase I ESAs and has completed hundreds throughout New England, Florida, Michigan, New York, New Jersey, Kentucky, Illinois, Washington, and in the Canadian provinces of Albert and Ontario. She has a broad range of field experience including the use of a variety of soil, surface water, sediment, and groundwater sampling methods; site surveys; soil vapor surveys; geophysical surveys; and hydrogeological test methods. Her site investigation experience includes the management and implementation of investigations of small properties and underground storage tank systems to industrial properties with complex operational histories and environmental settings.

Federally American Reinvestment and Recovery Act (ARRA) Funded Leaking Underground Storage Tank (LUST) Cleanup Project – Kimberly directly managed the investigation, characterization, and remediation of numerous abandoned and contaminated underground storage tank properties throughout Connecticut. The multi-million dollar project was funded through the 2009 Federal Stimulus Act, was administered by the Connecticut Department of Environmental Protection, and resulted in the successful clean up of multiple properties in the state.

Rubber Extrusion Repair Facility – Kimberly was the project manager for a voluntary investigation and remediation project at an active rubber extrusion repair facility. Investigation and remediation of the property was completed under the direction and oversight of the United States Environmental Protection Agency (EPA) and Connecticut Department of Environmental Protection (CTDEP) and was subject to the requirements of the Connecticut Property Transfer Act. Investigation of the site included the advancement and sampling of hundreds of soil borings and installation and sampling of dozens of groundwater monitoring wells and soil vapor sampling locations. Remediation planning and implementation included preparation of local, state and federal applications and remedial action plans; negotiations with local, state, and federal regulatory agencies; preparation of work plans; and the excavation and off-site disposal of over 20,000 tons of soils containing unexploded ordinance, inorganics, petroleum hydrocarbons, polychlorinated biphenyls, and semivolatile and volatile organic compounds.

Historical Manufactured Gas Plant – Kimberly was the project manager for a comprehensive soil and groundwater investigation of an historical manufactured gas plant (MGP) located in southern Connecticut. The investigation activities included the determination of the nature and extent of contamination in soil and groundwater at the property resulting from historical MGP operations and more recent bulk drum storage operations and were completed in conformance with Connecticut Transfer Act requirements.

Jet Engine Repair/Former Nuclear Test Engine Facility – Kimberly worked with a Fortune 100 client to conduct the investigation of a portion of an active jet engine repair facility that was historically used for nuclear jet engine testing and research. The investigation was performed to assist the client in satisfying its obligations under a voluntary corrective action program and to develop environmental reserve values for future corporate planning.

Kimberly has over 17 years of environmental consulting experience. She is a Licensed Environmental Professional (L.E.P.), a CT Licensed Asbestos Inspector and a CT Certified Lead Inspector. Throughout her career, Ms. Clarke has been directly responsible for the planning, management, and implementation of environmental investigations and remediation of numerous commercial, industrial, and municipal properties. She has significant experience in the preparation and completion of Phase I Environmental Site Assessments (ESAs); underground storage tank closure and removal; detailed site investigations of soil, groundwater, surface water and sediment in an array of environmental settings; remedial alternative evaluations; and interim and final remedy design and implementation on numerous projects and for a wide variety of contaminated media.

Education

- MS, Environmental Science/Geoscience, University of New Haven
- BS, Individualized Studies Environmental Science, Charter Oak State College
- AS, Biology, Monroe Community College

KIMBERLY M. CLARKE, LEP
Director of Environmental Services

Former Rivet Manufacturer – Kimberly was the project manager for a soil, groundwater, surface water, and sediment investigation and remediation for inorganic, volatile and semivolatile organic compounds, and petroleum hydrocarbons at a former rivet manufacturing facility. Investigation activities included identification of potential contaminant source areas; preparation of a work plan; advancement of soil borings; installation of monitoring wells; collection of soil, groundwater, surface water, sediment, and soil vapor samples; data evaluation; and evaluation of appropriate remedial alternatives. Remediation activities included the design and installation of an engineered control; excavation and off-site disposal of contaminated soil from a federal- and state-regulated tidally-influenced freshwater wetland; and excavation and off-site disposal of contaminated soil from upland areas at the property.

Historical Watch Manufacturing Mill – Kimberly managed a hazardous building materials assessment of an approximately 150,000-square-foot historical watch manufacturing company. The hazardous building materials survey included the sampling, analysis, assessment, and quantification of building materials contaminated with asbestos, lead, PCBs, di(ethylhexyl) phthalate, and mercury. Due to the historical use of radium-paint as a surface coating to watch faces, the hazardous building materials survey was coordinated with the state Radiation Division and incorporated significant health and safety controls and personnel radiation screening.

Small Business Innovation Research – Kimberly participated in a Small Business Innovation Research project which involved evaluating proposed methodologies for heavy metal extraction from chromium contaminated soil using in-situ treatment techniques.

Professional Licences

Licensed Environmental Professional, #465

Licensed Asbestos Inspector in Connecticut, 03-99848

Licensed Lead Inspector in Connecticut, 03-038062

Professional Memberships

Environmental Professionals of Connecticut (EPOC)

Society of Women Environmental Professionals (SWEP)

Certifications

OSHA 40-Hour Health and Safety Training for Hazardous Waste Site Activities, 1994

OSHA 8-Hour Refresher Health and Safety Training, 1995-present

RCRA Compliant Hazardous Waste Handler Program - 40 CFR 262.34(a), 262.34(d), 264.16, and 265.16 (Annual)

DOT Compliant Hazardous Waste Handler Program - 40 CFR 172.704 (Annual)

Women and Management Training, Simmons College, 2000

Publications

Analysis of Salt Water Intrusion in Public Water Supply Wells: A Management Plan for Cockburn Town, San Salvador, Bahamas. Pociu, Shannon W.; Davis, R. Laurence; Clarke, Kimberly, Department of Biology and Environmental Sciences, University of New Haven.

PETER S. MORTON, CPG

Senior Environmental Consultant and Hydrogeologist

Representative Project Experience

Site Assessment — Peter has greater than 20 years of experience conducting Phase I Environmental Site Assessments (ESAs), supervising Phase II work and Brownfield Cleanup Program (BCP) remedial investigations. Examples of Phase II work include underground storage tank removal, tank testing, drywell closure, and asbestos abatement.

Cell Towers — Peter has performed approximately 300 Phase I and Phase II ESAs for a national cellular telecommunications provider.

NYSDEC Voluntary Cleanup Agreement (VCA) and Brownfield Cleanup Program (BCP) Projects —

- VCA at former Fischbach & Moore Electric, 235 Metro Park in the Town of Brighton
- BCP at former Speedy's Cleaners on Monroe Avenue in the Town of Pittsford
- BCP at 37 Bittner Street in the City of Rochester
- BCP at Comfort Inn on Buell Road in the Town of Gates

Peter is the Project Manager for the VCA and BCPs that Passero Associates is currently conducting. All of these projects have involved soil vapor surveys, electromagnetic investigations, and soil/groundwater sampling programs. Remedial measures designed and installed during these NYSDEC-supervised projects include sub-slab vapor mitigation systems, and bioremedial methods of in-situ groundwater treatment.

Petroleum Remediation — Peter has designed air sparge, soil venting, and bioremedial systems obtaining spill closure at petroleum-contaminated sites and hazardous waste sites including an historic dry cleaning operation with perchloroethylene contamination.

Soils Management — Peter worked with the USEPA, and has hands-on experience with the management and handling of contaminated soils and hazardous wastes, including the implementation of health & safety plans. Mr. Morton has prepared and implemented several Soil Management Plans (SMP) for approval by the Monroe County Department of Health (MCDOH). These projects have included fugitive dust monitoring in conformance with New York State Department of Health (NYSDOH) protocols. Peter has managed several projects in which contaminated surficial soils have been managed in conformance with an MCDOH-approved SMP, allowing for residential development. We have experience in material characterization and handling, disposal of contaminated materials, and fugitive dust monitoring and suppression when disturbing contaminated soils.

Blue Cross/Blue Shield Remedial Site Plan — Peter was the Project Manager for the environmental cleanup in March 1997 of urban lands developed as the new Blue Cross/Blue Shield building in Rochester. Environmental conditions included 22 underground storage tanks, 6 in-ground hydraulic lifts and greater than 4,400 tons of petroleum-contaminated soil. A geo-synthetic barrier/passive venting system was designed to prevent residual contamination beneath South Avenue from migrating into the Blue Cross/Blue Shield building.

Kentucky Groundwater Investigation — Peter worked with Kentucky DEP investigating groundwater plume originating at a coal mining equipment tooling facility in Harlan, Kentucky. Interim remedial measure included pumping and treating groundwater by air-stripping.

EPA Groundwater Study — Peter was the hydrogeologist for a USEPA investigation around a hazardous waste landfill in Niagara Falls, including installation and sampling of overburden and bedrock monitoring wells.

Oil Storage Facility – Peter conducted permeability testing at a major oil-storage facility in New York's southern tier, including design of all aspects of investigation and remediation.

Peter has over 25 years of environmental services experience. He is a Certified Professional Geologist, a NYS Licensed Asbestos Inspector and a USEPA Certified Lead Inspector. He has experience in planning and managing subsurface and surficial environmental investigation. His experience includes Phase I Environmental Site Assessments, Phase II investigations and remedial plans, soil gas surveys, underground storage tank closures, remedial investigations/feasibility studies (RI/FS), Brownfield Cleanup Investigations, and design of bioremedial and soil vapor extraction systems. Peter was also a member of the USEPA Superfund Field Investigation Team, Region 2. He was responsible for investigations of inactive hazardous waste sites including all field activities and technical reports.

Education

- MS, Geology, University of Massachusetts, Amherst, Massachusetts
- BA, Geology, Amherst College Amherst, Massachusetts

Certifications/Registrations

- Certified Professional Geologist
- NYS Licensed Asbestos Inspector
- USEPA Certified Lead Inspector
- RCRA/OSHA 40 hour Hazardous Waste Training

Professional Affiliations

- American Institute of Professional Geologists, Certificate #7932

ELIZABETH PRIMUS

Hydrogeologist

Elizabeth has over 11 years of combined environmental, earth science and geology experience.
She is familiar with writing Environmental Impact Statements and knowledgeable with New York State and Federal Environmental Laws. She has experience in well monitoring, including slug and pump tests. and is also skilled in rock and soil identification. Elizabeth has training in Weapons of Mass Destruction hazard handling.

Education

- University of Buffalo, MA, Geology. Courses in Hydrogeology, Geographic Information Systems (GIS), Geophysics, Spatial Hydrology, Environmental Impact Analysis, Remote Sensing, Ecohydrology and Analytical Geology.
- SUNY Brockport, BS, Earth Science.
- Queens College, Geology major.

Certifications/Registrations

- NYS Teacher Certificate, Secondary Education in Earth Science
- 40 hr OSHA HAZWOPER course
- 8 hr OSHA HAZWOPER refresher course

Representative Project Experience

Hydrogeological Field Work for Soils Contractor — Henrietta, NY Prepared well log analytical data, creating cross sections from drill log data, erosion control inspection, reading engineer specifications and plans, soil identification and analysis, hydrometer and permeability, compaction testing, proctor identification and concrete testing.

948 Carter Street — Rochester, NY On-Site Coordination and Health and Safety Officer for soils investigation with a truck-mounted hollow stem auger drilling rig and installation of five monitoring wells. Approximately 512.6 tons of soil were excavated and disposed of at High Acres Landfill,. During soil excavation, pumped contaminated groundwater into an on-site holding tank. To treat the remaining groundwater contamination, utilized bioremedial measures.

755 Culver and 291 Jefferson Road — Rochester, NY Site Manager and Health and Safety Officer for remediation of petroleum contaminated soils and groundwater at a former gas station.

Bittner Street in the City of Rochester — Rochester, NY Conducted soil, groundwater and soil vapor sampling at a former gas station on Bittner Street.

Fischbach & Moore Brown Field Site — Brighton, NY Site Manager and Health and Safety Officer for Community Air Monitor for construction project at the former Fischbach & Moore Brownfield Site.

Several Phase I and Phase II Site Investigations — Monroe County, NY

Environmental Report Writing

Phase I and Phase II reports for Verizon Wireless.

Remedial Investigation and Feasibility Study reports for Fischbach & Moore Brown Field Site.

Soil Vapor Investigation report for 37 Bittner Street and Fischbach and Moore.

Remedial Design Work Plan for Hydrogen Release Compound Injection for the Comfort Inn, Voluntary Cleanup Agreement.

Remedial Design Work Plan for High Vacuum Extraction System for the Comfort Inn, Voluntary Cleanup Agreement.

Instructional Experience

Home and hospital instructor for math, science, english and history, Monroe #1 BOCES — Rochester, NY

Tutor, Leader Partnership Program, Monroe Community College —Henrietta, NY Physics, Chemistry, Earth Science and Biology.

Leader, Challenger Center, Rochester Museum and Science Center — Rochester, NY The Challenger Center program was established by NASA and the families of the Space Shuttle Challenger. It was created to realize one of the mission goals of the 1989 Challenger mission, which was education. Elizabeth played the role of "Mission Commander" in a two hour educational, simulated mission to Mars.

Instructor, Rochester City School District — Rochester, NY