Hartsdale Village Square Aristocrat Cleaners

Westchester, New York

Remedial Investigation/ Interim Remedial Measures/ Alternatives Analysis Report

NYSDEC BCP Number: C360111

Prepared for:

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Remedial Investigation
Interim Remedial Measures
Alternatives Analysis
Report

Hartsdale Village Square, Aristocrat Cleaners
Hartsdale, New York

BCA Site #C360111

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STATE OF NEW YORK
DALE C. KONAS
No. 081035
LICENSED PROFESSIONAL ENGINEER

12/2/14
Date

EnviroTrac
Environmental Services

CERTIFICATIONS

I Peter C. Breen certify that I am currently a Qualified Environmental Professional as defined in 6 NYCR Part 375 and that this Remedial Investigation Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER- approved modifications..

12/2/14
Date

Signature

I Dale C. Konas certify that I am currently a NYS registered professional engineer as defined in 6 NYCR Part 375 and that this Alternatives Analysis Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER- approved modifications..

081035
NYS Professional Engineer #

12/2/14
Date

Signature

STATE OF NEW YORK
DALE C. KONAS
LICENSED PROFESSIONAL ENGINEER
No. 081035

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LIST OF ACRONYMS

Acronym	Definition
oC	Degrees Celsius
1,1-DCE	1,1-Dichloroethene
1,2-DCE	1,2-Dichloroethene
ASP	Analytical Services Protocol
AWQC	Ambient Water Quality Criteria
BBF	Below Basement Floor
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
BOD	Biological Oxygen Demand
CAMP	Community Air Monitoring Plan
CAS	Chemical Abstracts Service
COD	Chemical Oxygen Demand
cm	Centimeter
CPP	Community Participation Plan
CVOC	Chlorinated Volatile Organic Compound
DER-10	DER-10 Technical Guidance Document
DOD	Dissolved Oxygen Demand
DO	Dissolved Oxygen
DOC	Dissolved Organic Carbon
DUSR	Data Usability Summary Report
EDD	Electronic Data Deliverable
EHC	EHC ISCR Reagent Manufactured by FMC
EMIS	Environmental Management Information System
EQuIS	Electronic Quality Information System
EC	Egineering Control
EE	Environmental Easement
EnviroTrac	EnviroTrac Ltd.
FER	Final Engineering Report
FMC	FMC Environmental Solutions
ft	Feet
HASP	Health and Safety Plan
IRM	Interim Remedial Measure
ISCR	Insitu Chemical Reduction
IC	Institutional Control
LNAPL	Light Non-aqueous Phase Liquid
m	Meter
MDL	Method Detection Limit
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
mS	Millisiemens
MSL	Mean Sea Level
MS/MSD	Matrix Spike/Matrix Spike Duplicate
mV	Millivolt
NA	Not Applicable
ND	Not Detected
NM	Not Measured

LIST OF ACRONYMS

Acronym	Definition
NTU	Nephelometric Turbidity Unit
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PCE	Tetrachloroethene
PID	Photoionization Detector
PPM	Parts per Million
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QC	Quality Control
QL	Quantitation Limit
RAO	Remedial Action Objective
RI	Remedial Investigation
RL	Reporting limit
SMP	Site Management Plan
SCO	Soil Cleanup Objective
SVOC	Semivolatile Organic Compound
TCE	Trichloroethene
TCL	Target Compound List
TOC	Total Organic Carbon
TOGS	Technical & Operational Guidance Series
ug/L	Micrograms Per Liter
ug/kg	Micrograms per Kilogram
ug/L	Micrograms per Liter
ug/m3	Micrograms per Cubic Meter
uS	Micro Siemen
USEPA	United States Environmental Protection Agency
VC	Vinyl Chloride
VOC	Volatile Organic Compound
ZVI	Zero-Valent Iron

1.0 INTRODUCTION

This Remedial Investigation/Interim Remedial Measures/Alternatives Analysis (RI/IRM/AA) Report has been prepared on behalf of Hartsdale Village Square LLC for the Hartsdale Village Square Aristocrat Cleaners Site in the County of Westchester, New York and is identified as Block 8211 and Lot 8 on Greenburgh Tax Map #21.8211-6. The general location of the Site is shown on Figure 1-1.

On January 12, 2010, Hartsdale Village Square Aristocrat Cleaners was accepted into the New York State Brownfield Cleanup Program (BCP) by the New York State Department of Environmental Conservation (NYSDEC) as a Volunteer, and was assigned BCA Site #C360111. In accordance with BCP requirements an evaluation of the environmental setting and conditions is being conducted in the form of a remedial investigation (RI) as described in DEC Program Policy *DER-10 – Technical Guidance for Site Investigation and Remediation*.

The RI was implemented using a phased approach as presented in the Amended Remedial Investigation Work Plan (Work Plan) dated August 2011, and findings pertaining to the initial investigatory phase were provided in the Remedial Investigation Interim Summary Report dated June, 2012. The Interim Summary Report presented a recommendation regarding a potential groundwater treatment option that consisted of performing in-situ pilot testing. With concurrence from the NYSDEC this proposed option was developed in the July 19, 2013 Interim Remedial Measure Work Plan (IRM Work Plan) to include the injection of contaminant reducing chemicals into the shallow subsurface in the area where the maximum groundwater contaminant concentrations have been found (beneath the basement of the dry cleaner) and through followup sampling of groundwater quality using nearby monitoring wells for performance monitoring.

1.1 Purpose and Scope

This RI/IRM/AA Report has been prepared to describe and present the findings of the RI and IRM activities, and evaluate the IRM as the final remedial alternative for the Site. This report contains the following sections:

- **Section 2.0** discusses site assessment activities conducted prior to the RI initiation.
- **Section 3.0** presents the approach for the soil and groundwater investigation.
- **Section 4.0** describes the physical characteristics of the Site.
- **Section 5.0** presents the investigation results by media.
- **Section 6.0** summarizes the IRM activities
- **Section 7.0** describes the fate and transport of the identified chemicals of interest.
- **Section 8.0** presents the qualitative risk assessment.
- **Section 9.0** evaluates remedial alternatives for the Site.
- **Section 10.0** presents the RI/IRM/AA summary and conclusions.
- **Section 11.0** provides a list of references for this report.

1.2 Property and Site Description

The 0.1-acre property is located on East Hartsdale Avenue in the Village of Hartsdale, New York in the middle of a small strip mall comprising addresses 212 through 218, and facing the nearby Metro-North train station and east of the Municipal Parking Garage. The Site is zoned retail and has retail frontage on East Hartsdale Avenue of 87’ 4”.

No	Address	Property Use	Area (sq ft)
1	212	Dry Cleaner	1,700
2	214	Grocery Store –Market	2,200
3	216	Liquor Store	1,022
4	218	Commercial Office	3,000
		Total	7,922

Surrounding Land Use Summary

Direction	Surrounding Land Use
North	Strip Mall Gym & Residential Condos
East	Train Station and Parking. Strip Mall, Residential Condo, Sr. Citizen Housing
South	Strip Mall with food
West	Parking Garage, Golf Course

2.0 ACTIVITIES CONDUCTED PRIOR TO WORK PLAN SUBMISSION/APPROVAL

Environmental assessments and studies have been conducted at the Site since 2008 and the following phases of data gathering and field investigation work were conducted:

2008

- Phase I Environmental Site Assessment

2009

- Limited Phase 2 Site Investigation
- Research for Preliminary Assessment
- Ambient Air Assessment
- Soil Assessment
- Groundwater Investigation
- Soil Vapor Assessment

2010

- Additional Soil Vapor Assessment

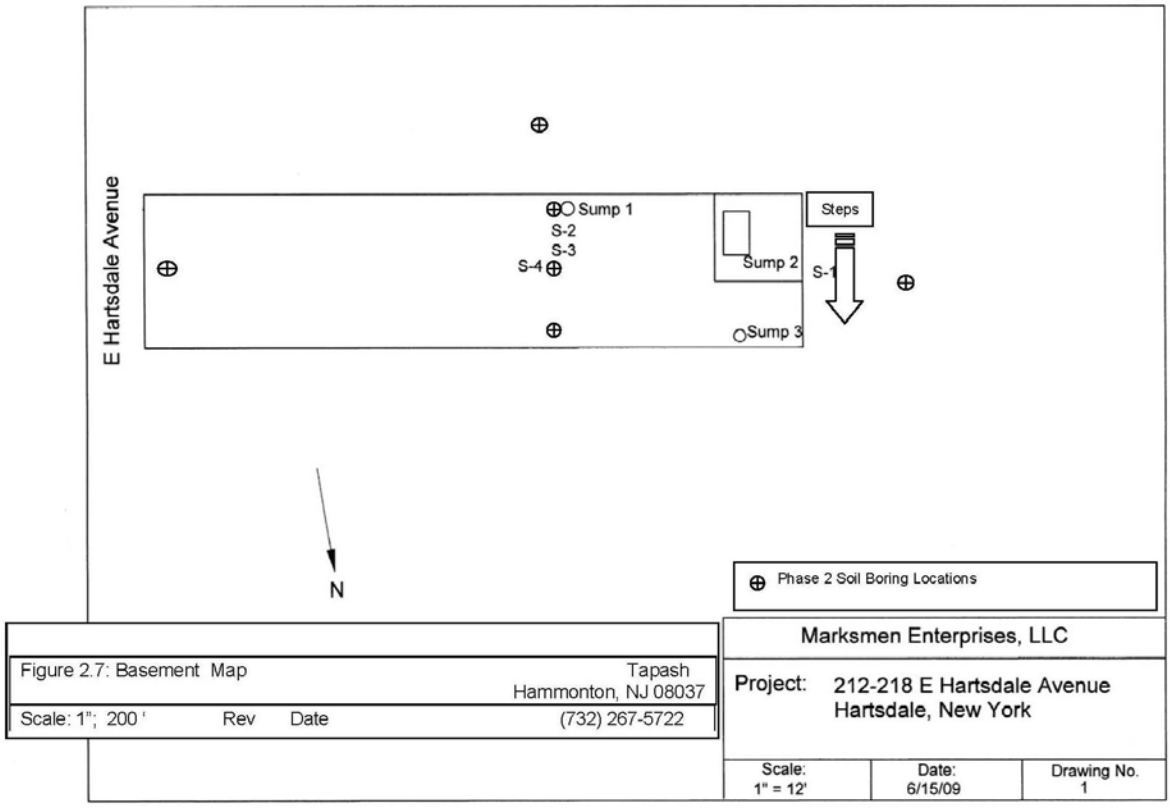
Comprehensive presentations pertaining to this previous work, which provided the basis for selecting the remedial investigation scope, were included in the March, 2010 RIWP submittal. The following summaries provide an overview of the scope of work conducted and findings developed during these previous investigations.

2.1 Phase I Site Assessment

A Phase I Site Assessment was conducted by Sun Tao Associates, Inc. in June 2008. The subsequent report indicated that one of the storefronts has been a dry cleaning operation for more than 38 years and recommended that "…an appropriate investigation on the environmental impacts (to detect the presence of hazardous substances or petroleum products) …is necessary."

2.2 Limited Phase 2 Site Investigation

Marksmen Enterprises, LLC (Marksmen) was retained by Hartsdale Village Square, L.L.C. to conduct a limited Phase 2 site investigation the Site. This work entailed the collection of soil samples on June 5, 2009 from various depths below grade in the basement and from a location adjacent to the rear door of the dry cleaner. Soil samples S-1 through S-4 were collected from four locations at the dry cleaning facility as indicated in the following figure.



Soil Sampling Locations S1 through S4

Quantitative Results Summary – Soil Sampling, June 5, 2009

Sample Designation	PID Reading	Olfactory Observation
S-1	12.2	Fuel Oil Odor
S-2	Greater than 5,000	Strong Dry Cleaner Odor
S-3	69.5	Strong Fuel Oil Odor
S-4	10.2	Fuel Oil Odor

The soil samples consisted predominantly of urban fill that graded into native medium coarse sand at deeper levels. Selected soil samples were analyzed by Aqua ProTech Laboratories (APL) for VOCs using the EPA 8260B protocol.

Soil Analytical Results Summary - June 5, 2009

Sample Number Sample Depth (inches) Sample Dilution	S-1 72 1:1	S-2 15 1:1	S-2 15 1:10	S-2 15 1:20	S-2 15 1:1000	S-3 20 1:10	S-4 60 1:1
Compound Name	Concentration (µg/kg)						
Toluene	U	5.24	U	U	U	1.77	U
Ethylbenzene	U	5.21	U	U	U	U	U
Xylenes	U	*36.4*	U	U	U	9.63	U
1,2-Dichlorobenzene	U	*81.1*	417	U	U	U	U
1,1-Dichlorethene	U	*18.5*	U	U	U	U	U
cis-1,2-Dichloroethene	3.42	13400	6820	3270	U	62.4	U
trans-1,2-Dichloroethene	U	*83*	*17.5*	U	U	U	U
Trichloroethene	2.05	18800	39900	46500	U	245	U
Tetrachloroethene	64.8	78900	464000	4960000	1160000	6490	U
Vinyl chloride	U	302	U	U	U	*96.9*	U
Naphthalene	2.36	13	76.9	U	U	45.6	U
Total TICs	275.7J	28.1	--	--	--	20307J	U

Notes:

U = not detected
NL = no criterion listed
J = Estimated value

Based on results of this work Tapash called the spill into the NYSDEC Hot-line on June 22, 2009 As per ECL 17-1743, 6 NYCRR 613.8 and 17 NYCRR 32.3 notifying the NYSDEC of the discharge. Case No 0903393 was assigned to the spill.

2.3 Research for Preliminary Assessment

In July, 2009 Tapash conducted enquiries and gathered documentation for use in scoping investigation components and to demonstrate due diligence. This included contacting the

Greenburgh City Clerk and requesting all records pertaining to the Site. These records included construction plans and aerial photographs.

Information that was researched included dates of initial construction and the nature of major additions or alterations, plans for future construction, land use records, archival records, usage records, historical aerial photos, site maps and plans to map out potential sources of impairment, such as underground tank location. In addition, interviews with personnel knowledgeable of the property history were conducted.

Tapash visited the County Planning Department of Westchester who provided information on the environmental features around the Town: an aerial map of the Village and geology and hydrology map and text, soils maps and Water supply, topographic maps, a wetlands map, information about the classification of waters, a map of slopes and surrounding wells and boring logs and aqueducts from their Environmental Atlas.

Aerial photographs from the period 1943 to 2004 revealed the location of old and new buildings in relation to the Spill and that the site had been developed between 1953 and 1967.

2.4 Ambient Air Assessment

Ambient air testing was conducted by Tapash on August 12th 2009 with the collection of air samples in the dry cleaner at the following locations: 1) in the work area on the first floor; and 2) adjacent to the central sump in the basement. Samples collected using 6-liter Summa canisters were analyzed by Accutest Laboratories for EPA Method TO-15 VOCs. A ten minute collection period was used for these samples. Results of this testing are summarized below.

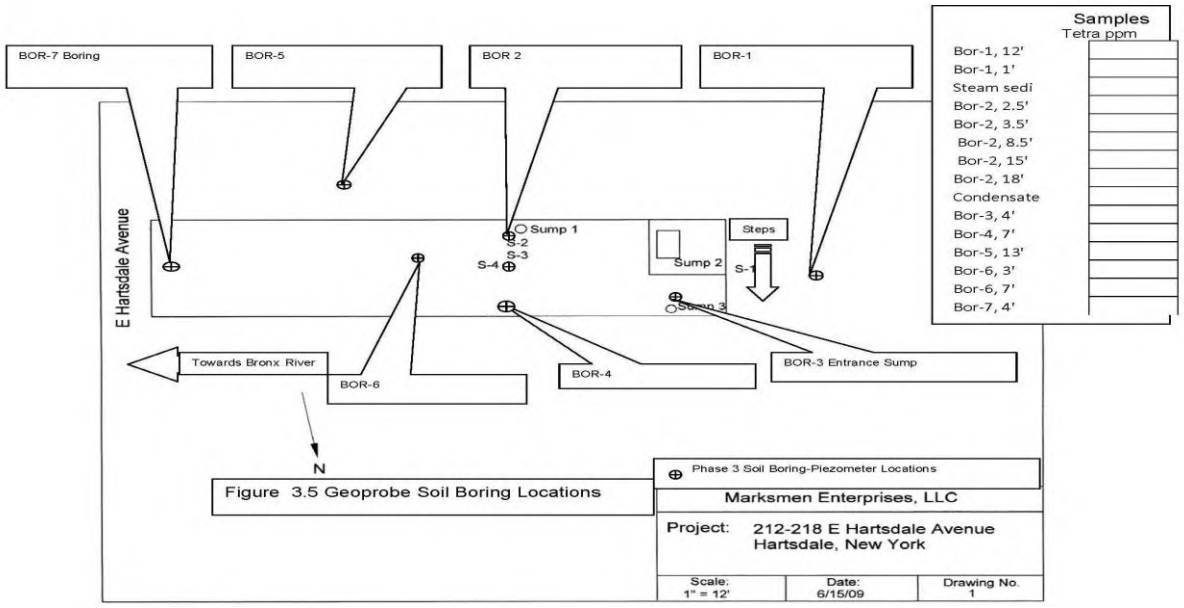
Summary of Analytical Results - Ambient Air, August 12, 2009

	Concentration (ug/m3))	
Compound Name	Dry Cleaner Basement	Dry Cleaner Work Area
Acetone	54.4	19
Benzene	4.8	0.61
Chlorobenzene	8.8	ND
Chloroform	0.59	ND

Carbon Tetrachloride	0.69	ND
cis-1,2 Dichloroethene	4	ND
Trans-I ,2-Dichloroethane	ND	ND
Ethylbenzene	3	0.48
Methylene Chloride	1.4	0.56
Tetrachloroethene	868	159
Toluene	14	2.1
Trichloroethylene	18	2.6
Vinyl Chloride	0.31	ND
Xylenes (Total)	15	2

2.5 Soil Assessment

Seven soil borings (BOR-1 through BOR-7) were installed by Tapash on August 12, 2009 with a direct push drilling rig. Macro-core soil samples were taken continuously during drilling to assess site stratigraphy. The soil samples were logged by the on-site geologist. Bedrock was not encountered as a result of drilling to depths ranging from 10 to 30 feet. Locations of these soil borings are provided in the following figure.



Soil Boring Locations, BOR-1 through BOR-7

Relative abundance of VOCs present in soil samples collected from these borings was screened with the MiniRae Photoionization Detector (PID). Results of the testing conducted are provided below.

Soil Monitoring Data, August 12, 2009

Soil Monitoring Data

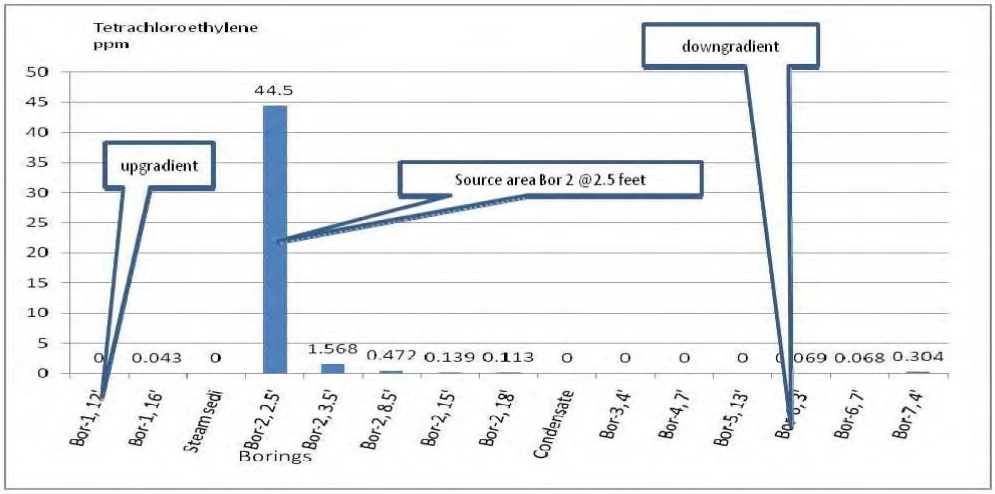
Date Time	Min(ppm)	Alarm		Avg (ppm)	Alarm	Max(ppm TVo)
8/12/2009 7:26	0	10.1		**100.8**	**H Calibration 100 ppm TVo**	
Bor-2					**H Bor-2, 2-3' Silty Sand 1698 ppm**	
8/12/2009 9:40	17	372	H	**3207 ppm**	**TVo**	
8/12/2009 9:41	24.5	580.4	H	**1233**	**H Bor-2, 2-3' Silty Sand**	
8/12/2009 9:53	2.6	32.5		**461**	**H Bor-2, 8-9' 8.9 ppm TVo**	
8/12/2009 10:00	2.4	29.3		**146.9**	**H Bor -2, 9-12' 37 ppm TVo**	
8/12/2009 10:11	16.5	365.6	H	**1708.6**	**High TVo ppm Concentration were noted during drilling Bor-2**	
8/12/2009 10:30	0.2	1.2		**10.6**	**Bor-2, 15' 37 ppm TVo**	
8/12/2009 10:55	0	0		**0**	**Bor-2, 18' 4.9 ppm TVo**	
Bor-6						
8/12/2009 12:37	0	0		0.7 ppm	Bor-6, 2-3' 13 ppm TVo	
8/12/2009 12:48	0	2.2		10.3	Bor-6, 4-7', 13.7 ppm TVo	
8/12/2009 13:11	0	0		0.1	Bor-6, 7-10', 1.1 ppm TVo	
Bor-4						
8/12/2009 13:42	4.3	4.9		7.2 ppm	Bor-4, 4' 5.4 ppm TVo	
8/12/2009 13:45	4.3	5.3		6.4	Bor-4-6' 5.5 ppm TVo	
8/12/2009 13:55	3.1	3.4		3.8	Bor-4, 8-10' 5.4 ppm TVo	
8/12/2009 13:55	3.1	3.4		3.8	Bor-4, 8-10' 5.4 ppm TVo	
Bor-7						
8/12/2009 14:37	3.2	3.7		4.5ppm	Bor-7, 4' 6.6 ppm TVo	
8/12/2009 14:38	3.6	4		4.6	Bor-7, 6' 7.3 ppm TVo	
8/12/2009 14:54	3.9	4.1		4.5	Bor-7, 10' 9.7 ppm TVo	
8/12/2009 14:55	3.7	4		4.3	Bor-7 10' 8.5 ppm TVo	
Bor-3						
8/12/2009 15:10	4.6	4.7		4.9ppm	Bor-3, 1' 7 ppm TVo	
8/12/2009 15:20	4.9	7.6		16.4	Bor-3, 4' 9.7 ppm TVo	
8/12/2009 15:35	4.5	4.9		5.4	Bor-3, 6' 5.4 ppm TVo	
Bor-5						
8/12/2009 17:06		0		0	Bor-5, 13'	

Soil samples were field screened in the field for specific VOCs using the Photovac Voyager Gas Chromatograph (GC) by head-space analysis. The GC was calibrated with a 1 ppm Benzene, Trichloroethene and Tetrachloroethene standard supplied by Accutest Laboratories.

Following is a summary of results of this testing.

GC Field Screening Data August 12, 2009

Photovac Voyager GC - Field Screening file:					Soil	ppm	
Date	**Location**	**Depth**	**Analysis**	**Run**	**Toluene**	**Tetra**	**Xylene**
Aug 12 2009	Calibration			B9081301	1 ppm	1 ppm	1 ppm
Aug 12 2009	Bor-1	12'	VO-GC-PID	311	ND	ND	3.567
Aug 12 2009	Bor-1	16'	VO-GC-PID	312	ND	0.043	0.684
Aug 12 2009	Sediment under Steam exhaust			313	ND	ND	0.665
Aug 12 2009	Bor-2	2-3'	VO-GC-PID	303	ND	44.5	47.1
Aug 12 2009	Bor-2	3-5'	VO-GC-PID	304	ND	1.568	33.8
Aug 12 2009	Bor-2	8-9'	VO-GC-PID	306	ND	0.472	10.7
Aug 12 2009	Bor-2	15'	VO-GC-PID	307	ND	0.139	3.633
Aug 12 2009	Bor-2	18'	VO-GC-PID	308	ND	0.113	3.527
Aug 12 2009	Condensate		VO-GC-PID	310	ND	ND	ND
Aug 12 2009	Bor-3	4'	VO-GC-PID	319	ND	ND	0..160
Aug 12 2009	Bor-4	7'	VO-GC-PID	318	ND	ND	0.273
Aug 12 2009	Bor-5	13'	VO-GC-PID	316	ND	ND	0.09
Aug 12 2009	Bor-6	3'	VO-GC-PID	313	ND	0.069	0.753
Aug 12 2009	Bor-6	7'	VO-GC-PID	314	ND	0.068	0.316
Aug 12 2009	Bor-7	4'	VO-GC-PID	317	ND	0.304	0.679
Aug 12 2009	Calibration			B9081301	1.733 ppm	2.755 ppm	1 ppm



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10% of the soil samples collected during the installation of borings BOR-1 through BOR-7 were submitted to Accutest Laboratories (a NY State ELAP Certified lab) and analyzed for Volatiles + 10 Tentatively Identified Peaks (TICS) using the EPA 8021 protocol, Base Neutrals + 10 TICs using method 8270, TPHC-DRO and Lead analysis.

Summary of Analytical Results - Soil Borings BOR-1 and BOR-2 – August 12, 2009

	Concentration (ug/kg)				
Compound Name	Bor-1 12' deep	Bor-2 2'	Bor-2 8-9'	Bor-2 10-12'	Bor-2 15'
Benzene	ND	ND	NA	ND	ND
1,2 Dichlorobenzene	ND	56.4	NA	ND	ND
cis-1,2 Dichloroethene	2.9	508	NA	0.38	ND
Trans-I ,2-Dichloroethane	ND	ND	NA	ND	ND
Ethylbenzene	ND	2.9	NA	ND	ND
Methylene Chloride	ND	ND	NA	ND	ND
Tetrachloroethene	62,600	79,400	NA	7.1	3.7
Toluene	0.39	0.97	NA	ND	ND
Trichloroethene	21,8	5,980	NA	ND	ND
Xylenes (Total)	1.4	51.9	NA	ND	ND
Total TICs Volatiles	739	622	NA	0	0
Acenaphthene	NA	ND	ND	ND	NA
Anthracene	NA	35	ND	ND	NA
Benzo(a)Pyrene	NA	ND	ND	ND	NA
Chrysene	NA	ND	ND	ND	NA
Fluoranthene	NA	16	ND	ND	NA
Fluorene	NA	141	ND	ND	NA
Phenanthrene	NA	207	ND	ND	NA
Pyrene	NA	27.8	ND	ND	NA
Total TICs Semi-volatiles	NA	50,900	ND	0	NA
TPH-DRO (mg/kg)	NA	679	12.7	ND	NA
Lead (mg/kg)	NA	9.5	5.2	3.8	NA

BOR-1A was drilled adjacent to the stair well into the basement and **BOR-1B** through the rear access road/parking lot to 18.5 feet deep. The boring Bor-1B at first drilled through 10 feet of urban sand fill and encountered the water table at 9.4 feet in a grey medium sand with silt.

BOR-2 was drilled through the 3"-thick concrete floor adjacent to the central sump in the basement into gray silty fine sand and encountered the water table at 6" below the slab.

Summary of Analytical Results - Soil Borings BOR-3, BOR-4, BOR-5, BOR-6 and BOR-7 - August 12, 2009

	Concentration (ug/kg)					
Compound Name	Bor-3 2'-deep	Bor-3 4' deep	Bor-4 4'deep	Bor-5 13'	Bor-6 3'	Bor-7 10'
Benzene	ND	NA	ND	ND	ND	ND
1,2 Dichlorobenzene	ND	NA	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	NA	2.2	0.42	ND	0.88
Trans-I ,2-Dichloroethane	ND	NA	ND	ND	ND	ND
Ethylbenzene	ND	NA	0.73	ND	ND	ND
Methylene Chloride	ND	NA	ND	ND	ND	ND
Tetrachloroethene	149	NA	20.3	ND	126	22
Toluene	ND	NA	1.4	ND	ND	ND
Trichloroethene	ND	NA	1.7	ND	ND	ND
Xylenes (Total)	ND	NA	2.6	ND	ND	ND
Total TICs Volatiles	26000	NA	140.2	0	76500	0
Acenaphthene	903	ND	ND	ND	141	ND
Anthracene	519	ND	22.4	ND	31.7	ND
Benzo(a)Pyrene	458	ND	72.7	ND	ND	ND
Chrysene	410	ND	145	ND	ND	ND
Fluoranthene	929	ND	129	ND	ND	ND
Fluorene	2200	ND	ND	ND	328	ND
Phenanthrene	3540	ND	108	ND	466	ND
Pyrene	1320	ND	106	ND	ND	ND
Total TICs Semi-volatiles	62900	0	10280	170	80400	1520
TPH-DRO (mg/kg)	10700	0	760	53.9	1110	0
Lead (mg/kg)	150	3.1	17.1	3.5	6.3	4.6

- **BOR-3** was drilled through the basement floor slab adjacent to the sump at the entrance to the basement and encountered the water table at 6" below the slab.
- **BOR-4** that was side-gradient to the central sump was drilled adjacent to the north wall of the basement and encountered the water table at 6" below the slab.
- **BOR-5** was drilled through the side access parking lot to 18.5 feet deep through urban sandy fill into gray speckled coarse sand and encountered the water table at 10.25 feet.

- **BOR-6** was downgradient from the central sump, the water table was found at 6" below the slab.
- **BOR-7** was drilled at the far end of the basement nearest the Bronx River and encountered the water table at 6" below the slab.

2.6 Groundwater Investigation

Monitoring Well Installation

Following completion of the soil boring installations groundwater monitoring wells designated MW-1 through MW-7 were installed at each of the seven locations. The wells were screened across the water table with approximately 10 feet of screen to a depth of 10.5 feet below the basement floor slab (i.e., approximately 18-20 feet below grade). Each well was constructed of 1"-diameter .020 slot PVC well screen and solid PVC riser. The well screen was backfilled with Moiré well sand with a cap of 00 sand and a bentonite plug and then tremie grouted with cement. A protective water-tight locking cap was installed. Each well was developed by pumping for about 10 minutes or until clear discharge water is obtained. After well installations depth to groundwater was measured under non-pumping conditions.

Groundwater Sampling

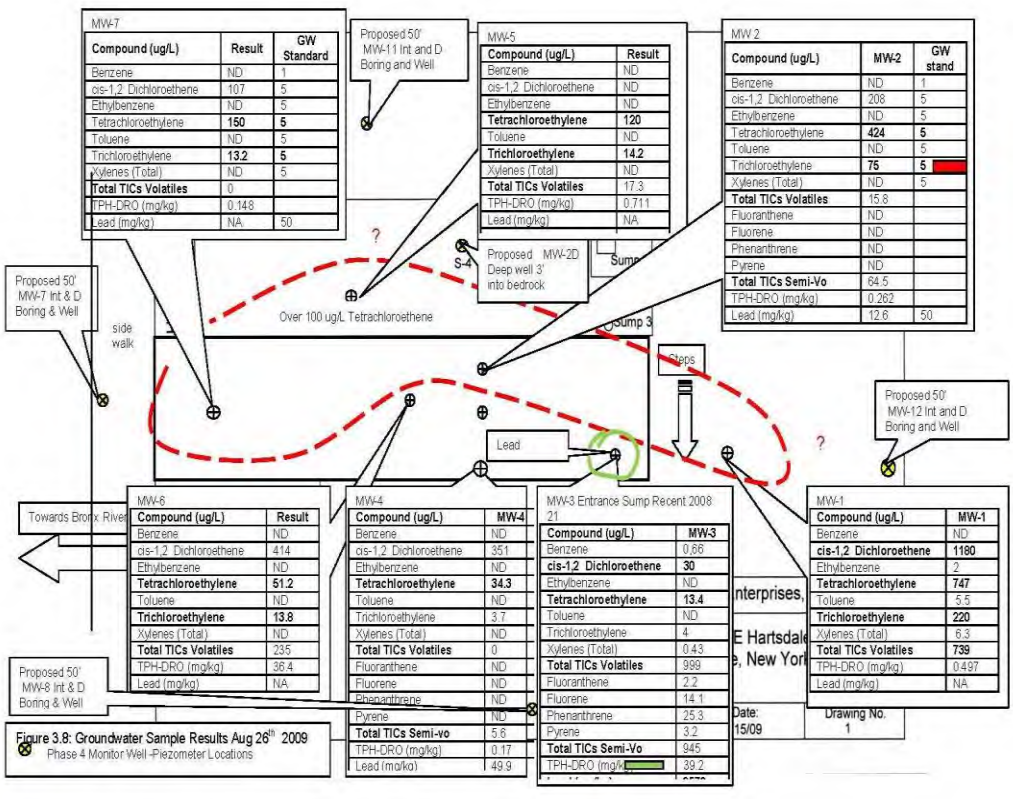
Groundwater samples were collected from monitoring wells MW-1 through MW-7 on August 26, 2009 from each well, two weeks after the wells were installed and developed. Each well was sounded for total depth and the depth to water was measured. The water column and well volume was calculated and at least 3-5 well volumes were purged prior to sample collection.

One round of groundwater samples was collected for unfiltered groundwater samples that was analyzed by Accutest Laboratories for Volatile Organics +10 TICs, Base Neutrals + 10 TICs, Total Diesel-Range Organics (DRO) and Lead.

Summary of Analytical Results – Groundwater Monitoring Wells MW-1 – MW-7 - August 26, 2009

	Concentration (ug/L)						
Compound Name	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7
Benzene	ND	ND	0.66	ND	ND	ND	ND
1,2 Dichlorobenzene	ND	0.28	20.6	ND	ND	ND	ND
cis-1,2 Dichloroethene	1180	208	30	351	39.8	414	107
Trans-I ,2-Dichloroethene	9.8	2.5	ND	6	0.38	2.2	2.5
Ethylbenzene	2	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	747	424	13.4	34.3	120	51.2	150
Toluene	5.5	ND	ND	ND	ND	ND	ND
Trichloroethene	220	75	4	3.7	14.2	13.8	13.2
Xylenes (Total)	6.3	ND	0.43	ND	ND	ND	ND
Total TICs Volatiles	739	15.8	999	0	17.3	235	0
Acenaphthene	NA	ND	8.5	ND	NA	NA	NA
Anthracene	NA	ND	ND	ND	NA	NA	NA
Benzo(a)Pyrene	NA	ND	ND	ND	NA	NA	NA
Chrysene	NA	ND	ND	ND	NA	NA	NA
Fluoranthene	NA	ND	2.2	ND	NA	NA	NA
Fluorene	NA	ND	14.1	ND	NA	NA	NA
Phenanthrene	NA	ND	25.3	ND	NA	NA	NA
Pyrene	NA	ND	3.2	ND	NA	NA	NA
Total TICs Semi-volatiles	NA	64.5	945	5.6	NA	NA	NA
TPH-DRO (mg/kg)	0.497	0.262	39.2	0.17	0.711	36.4	0.148
Lead (mg/kg)	NA	12.6	2570	49.9	NA	NA	NA

These results are posted on the following figure to illustrate the spatial relationship of findings.



Summary of Groundwater Sampling Results – August 26, 2009

2.7 Soil Vapor Assessment

Soil Vapor Samples were collected using monitoring wells MW-1 through MW-7 on September 30th, 2009. Wells MW-1 and MW-5 are installed at outdoor locations while the remaining five wells are installed in the basement of the dry cleaner. Samples were collected in 6-liter Summa Canisters and analyzed for the TO-15 list of VOCs by Accutest Laboratories. An eight hour collection period was used for these samples. Results of this testing are summarized below.

Summary of Analytical Results - MW-1 through MW-7 Soil Vapor Sampling – Sept 30 2009

	Concentration (ug/m^3)						
Compound Name	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7
Acetone	ND	ND	ND	ND	3.6	6.7	ND
Benzene	ND	ND	1.7	ND	1.5	1.3	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND
Chloroethane	83.1	ND	ND	ND	ND	ND	ND
Chloroform	ND	201	5.4	ND	ND	3.2	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND
cis-1,2 Dichloroethene	11100	232	21	227	44.8	11	178
Trans-I ,2-Dichloroethane	232	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	20600	115000	4620	9490	8750	6370	154000
Toluene	ND	ND	7.5	ND	1.5	3.7	ND
Trichloroethene	8760	591	216	1350	127	52	3200
Vinyl Chloride	2250	ND	ND	ND	ND	ND	ND
Xylenes (Total)	ND	ND	4.3	ND	ND	ND	ND

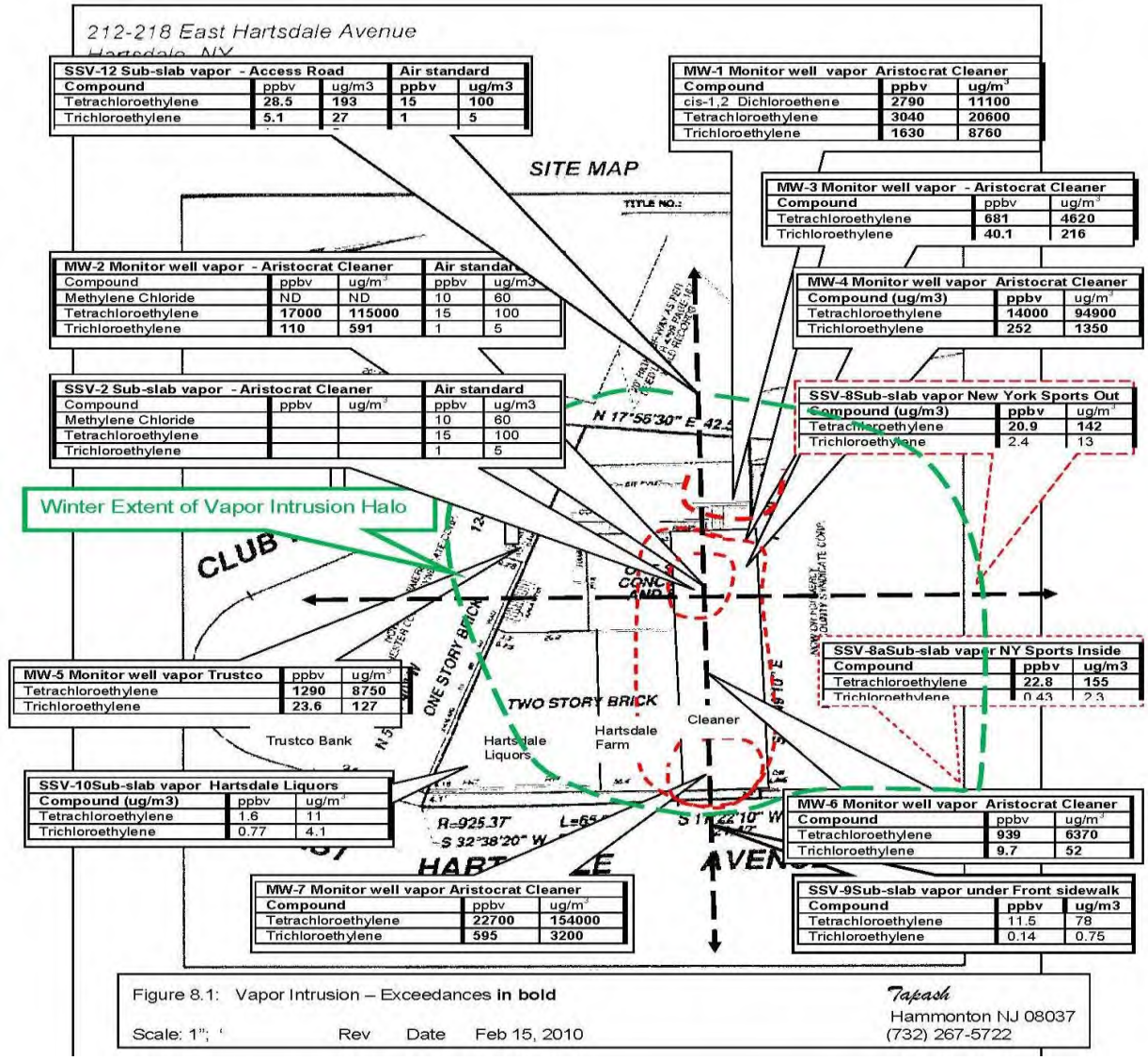
2.8 Additional Soil Vapor Assessment

Soil vapor monitoring probes were installed on February 9, 2010 in the neighboring basements on a grid trending away from the location of Sump #2/monitoring well MW-2 found in the basement of the dry cleaner. The probes were installed at the following locations.

- SSV-8 sub-slab vapor point was installed outside the emergency exit for NY Sports club at the furthest extent of the gym building north of the source area.
- SSV-8a sub-slab vapor point was drilled inside the building under the floor slab in the utility closet in the basement to determine the extent of the vapor intrusion under the NY Sports basement, adjacent to the front sidewalk.
- SSV-9 sub-slab vapor point was installed through the front sidewalk by the curb outside of King Aristocrat Dry Cleaners to detect any vapor in the area where municipal sewer drains and storm drains are running.

- SSV-10 sub-slab vapor point was drilled through the boiler room floor slab in Hartsdale Liquor, southeast of the source area.
- SSV-11 sub-slab vapor point was drilled through the pavement outside Trustco Bank to determine any vapor migration under the pavement to the south of the source area.
- SSV-12 sub-slab vapor point was drilled through the pavement in the access road at the rear of King Aristocrat Dry Cleaners.

Soil vapor samples were collected from the SSV-8, SSV-8a, SSV-9, SSV-10 and SSV-12 locations in 6-liter Summa Canisters on February 15, 2010 and analyzed for the TO-15 list of VOCs by Accutest Laboratories. A ten minute collection period was used for all samples. Results of this testing along with prior testing conducted at locations MW-1 through MW-7 are summarized on the following figure.



Summary of Soil Vapor Testing Results

2.9 Areas of Concern

The term "Area of concern" or “AOC” means any existing or former location at a site where contaminants are known or suspected to have been discharged which is considered a source area. These include locations where contaminants were generated, manufactured, refined, transported, stored, handled, treated, disposed or where they have or may have migrated. Four AOCs were identified at the Site based on prior testing conducted.

AOC 1: Historic Dry Cleaning Spills

The Site is considered an AOC because the subject property has been used as a dry cleaner for more than 38 years, operated at #212 E. Hartsdale Avenue before the government regulation of the waste disposal of solvent in 1986 and because of degraded soil quality found onsite. There is a sump in the middle of the basement that was found to contain Tetrachloroethene (PCE).

AOC 2: Basement Entrance Sump Containing Petroleum Hydrocarbons

Petroleum Hydrocarbons were found in the sump at the basement entrance and the central sump in the middle of the basement. It has been noted that the floor sump near the basement entrance has a sump pump that dumps water into the sump in the center of the basement before all accumulated groundwater is pumped into a drain pipe located in the ceiling of the basement. This dewatering system has the potential to cross-contaminate the sumps and both sumps serve to collect groundwater in the basement.

AOC 3: Central Sump in Basement Containing Tetrachoroethene

The groundwater around the central sump has been found to contain PCE at concentrations above the New York State Groundwater standard. Previous analytical results suggest that PCE has been spilled around the sump.

AOC 4: Vapor Intrusion Potential

There is a potential for vapor intrusion of volatile chemicals found in soil and groundwater into the basement of the Site and adjacent properties.

3.0 WORK PLAN IMPLEMENTATION

3.1 Field Investigation Activities

The RI has been conducted in two major field mobilization phases beginning in October 2011 and through soil vapor and air monitoring conducted in January 2012. Work has included the collection of environmental media samples for laboratory characterization, mapping of groundwater elevations and estimation of flow direction and velocity. Remedial Investigation sampling locations and pertinent site features are provided in Figure 3-1.

3.1.1 RI Phase I

Testing conducted in accordance with the Work Plan included the following tasks:

- Seven existing groundwater monitoring wells, one soil sampling location and two sumps in the Dry Cleaner basement were located and surveyed by a professional land surveyor;
- Analytical results of previously conducted soil vapor and indoor air sampling were validated and Data Usability Summary Reports (DUSRs) prepared;
- A synoptic round of water level measurements was recorded utilizing the existing network of monitoring wells and a map showing posted elevation measurements and inferred groundwater flow direction was prepared;
- Groundwater samples were collected using low-flow sampling protocol from existing monitoring wells MW-2 (and duplicate MW-101), MW-3 and MW-7 and analyzed by the laboratory;
- Soil samples were collected at on-site locations SS-1 (and duplicate SB-101) and SSV-2 and analyzed by om the laboratory;
- Goundwater and soil analytical samples were analyzed in the laboratory for the full suite of target compound list/target analyte list (TCL/TAL) constituents including total metals, volatile organic compounds + top 10 tentatively identified compounds (VOCs+10 TICS),

semi-volatile organic compounds + top 20 tentatively identified compounds (SVOCs+20 TICS), polychlorinated biphenyls (PCBs) and organochlorine pesticides.

- Soil vapor monitoring point SSV-2 was installed in the basement of the Dry Cleaner; and
- Results of the Phase I soil and groundwater sampling were validated and summarized in tables and figures.

Results of the first phase of work and recommendations for followup investigations were provided to the NYSDEC in the June 2012 Interim Summary Report.

3.1.2 Soil Vapor Intrusion Assessment

In accordance with the Work Plan and New York State Department of Health (NYSDOH) guidance pertaining to the evaluation of soil vapor intrusion, sampling of soil vapor monitoring point SSV-2, installed during Phase I field work, was delayed until the next heating season (i.e., the period extending from November 15 to March 31). As such, the results of that testing were not available to be included in the June 2012 Interim Summary Report. However, data summaries were provided to the NYSDEC and NYSDOH.

Samples from the SSV-2 location and an associated indoor air sample and a co-located duplicate (IA-1 and IA-3) were collected on January 30, 2012. In addition, and in accordance with the Work Plan, a similar sub-slab/indoor air sample set (SSV-3/IA-2) was collected within the New York Sports Club located adjacent to and north of the dry cleaner. An outdoor sample (OA-1) near the basement entrance to the dry cleaner was also collected. A helium tracer (helium) was used during sample collection to evaluate the integrity of borehole seals for the two sub-slab monitoring points.

Samples were analyzed in the laboratory for TO-15 and helium constituents. Results were reported in Category B and NYSDEC EDD formats.

3.1.3 RI Phase II

Based on findings developed through the implementation of the Work Plan scope (i.e., RI Phase I work), recommendations for additional testing were implemented, as discussed above.

Sampling Parameter Adjustment

The Phase I testing results provided site characterization data for soil and groundwater for a wide variety of chemical constituents including metals, VOCs, SVOCs, PCBs and pesticides. Findings revealed that a limited number of possible chemicals of concern (COCs) were found in comparing data to potentially applicable regulatory comparison criteria. The principal COCs identified at the Site through this approach consist predominantly of VOCs including PCE and related degradation products, in particular with respect to groundwater results. In consideration of this finding it was proposed that further soil and groundwater testing conducted during the RI be limited to laboratory analysis of TCL VOCs+10 TICS only with continued Category B reporting of results and DUSR preparation. Groundwater samples continued to be collected using a low flow protocol, including the collection of field parameters using a flow cell, as described in the Work Plan.

Sample Existing Monitoring Wells

The Phase I results for testing at monitoring well MW-2 (that included collection of a sample and a duplicate sample) were not particularly comparable with respect to concentrations of compounds detected (e.g., the results for tetrachloroethene for these samples were 2,300 ug/l and 13,000 ug/l, respectfully). To obtain additional data pertaining to groundwater quality at this location, an additional sample was collected using a low flow protocol, following procedures provided in the Work Plan, and analyzed in the laboratory for TCL VOCs+10 TICS.

As discussed in the Work Plan it was originally anticipated that the maximum VOC concentrations in groundwater would be found on the western side of the Site based on prior

testing conducted by others. However, results of the groundwater sampling conducted during Phase I suggested that the centerline of the VOC plume may currently be located more to the east and in the vicinity of monitoring well MW-2 where the maximum concentrations of VOCs were found. Based on these findings sampling of monitoring wells MW-1 and MW-5 was performed to further delineate the current extent of dissolved VOCs in shallow groundwater in the western portion of the Site. Samples, including a blind duplicate, were collected from these wells using a low flow protocol on February 27, 2013, following procedures provided in the Work Plan, and analyzed in the laboratory for TCL VOCs+10 TICS.

Monitoring Well Installations

An additional groundwater monitoring well (designated MW-2D) was installed on January 30, 2013 in the basement of the dry cleaner and in close proximity to existing well MW-2 (that exhibited the highest VOC concentrations based on the Phase I testing results) to evaluate deeper groundwater quality.

Two options for the installation of this well were presented in the Work Plan:

1. if bedrock was not encountered at a depth of 35 feet below grade then the well would be installed such that the a 10-foot screen will extend to a total depth of 35 feet; and
2. if bedrock was encountered at a depth of less than 35 feet below grade then the well would be constructed with a 5-foot screen extending to the overburden/bedrock contact.

Weathered rock was encountered in the Macrocore at a depth of 21 feet and a field decision to install the well per option #2 was made. Several feet of borehole collapsed during well construction resulting in the final screen zone depth of 13 to 18 feet.

A shallow downgradient monitoring well designated MW-8 was installed January 29, 2013 in the basement of the Hartsdale Wine and Liquor store (corresponding to the southern extent of the Volunteer's property to support an off-site exposure assessment. The basement elevation of the wine and liquor store is approximately 10-feet below land surface and it is anticipated that the

water table will be encountered just beneath the foundation slab, similar to conditions in the dry cleaner. A 5-foot well screen will be set at a depth of approximately three to eight feet below the slab (13 to 18 feet below land surface), consistent with the depth of the existing shallow wells in the dry cleaner basement, and in order to properly seal the borehole and prevent/minimize potential soil vapor intrusion into the basement.

Well installation and construction and development procedures pertaining to wells MW-2D and MW-8 were employed per the Work Plan. Soil boring/well construction logs are provided in Appendix A.

Groundwater samples were collected along with the samples from existing wells (see above) on February 27, 2013 using a low flow protocol and analyzed in the laboratory for TCL VOCs+10 TICS.

Soil Sampling

Two soil samples were collected on January 29, 2013 during the installation of groundwater monitoring well MW-2D to further assess concentrations of VOCs at that location. The sample depth intervals (9-11 and 19-21 feet) were selected in the field based at the discretion of the on-site geologist. A blind duplicate sample was analyzed for the 19-21 ft interval. The samples were analyzed in the laboratory for TCL VOCs+10 TICS.

3.2 Interim Remedial Measures

The Interim Summary Report presented a recommendation regarding a potential groundwater treatment option that consisted of performing in-situ pilot testing. With concurrence from the NYSDEC this proposed option was developed in the IRM Work Plan to include the injection of contaminant reducing chemicals into the shallow subsurface in the area where the maximum groundwater contaminant concentrations have been found (beneath the basement of the dry cleaner) and through followup sampling of groundwater quality using nearby monitoring wells for performance monitoring.

The chemical injections were conducted on October 10, 2013 and followup groundwater sampling of monitoring wells MW-2, MW-2D and MW-8 to assess performance was performed on November 12, 2013 and February 26, 2014. Sections 5.2 and 6 provide information pertaining to the IRM technological approach, implementation and results.

3.3 Site Mapping

Site features including monitoring wells MW-1 through MW-8 (including MW-2D), two floor basins (Sumps 1 and 3) located in the dry cleaner basement, outdoor soil sample location SS-1 and basement soil sampling/soil vapor probe location SSV-2 were surveyed by a licensed surveyor and scaled locations of these features and survey coordinates are provided in Appendix B.

3.4 Subcontractors and Suppliers

3.4.1 Analytical Laboratories

The following New York State Department of Health (NYSDOH) ELAP/ASP accredited laboratories analyzed samples collected at the Site.

Accutest Laboratories, Dayton, New Jersey

- Air samples collected in August and September 2009 and February 2010

Alpha Analytical, Westborough, Massachusetts

- Soil samples collected in October 2011 and January 2013
- Groundwater samples collected in October 2011, February 2013, November 2013 and February 2014

York Analytical Laboratories, Inc., Stratford, Connecticut

- Air samples collected in January 2012

3.4.2 Drillers

Aquifer Drilling & Testing, Inc., Mineola, New York

- Well installations performed in January 2013

Zebra Environmental, Lynbrook, New York

- Chemical injections for IRM performed in October 2013

3.4.3 Others

Environmental Data Services, Inc., Williamsburg, Virginia

- Data validation services/DUSR preparation

FMC Environmental Solutions

- Supplier of EHC chemical reagent for IRM injections performed in October 2013

Gabriel E. Senor, P.C., Hartsdale, New York

- Surveying and determination of horizontal and vertical coordinates for monitoring wells, soil borings and other site features

3.5 Investigation Derived Waste

Soil and groundwater generated during soil boring, well installation and well sampling events was contained and disposed off-site. Documentation pertaining to this is provided in Appendix C.

4.0 SITE PHYSICAL CHARACTERISTICS

The physical characteristics of the Site observed during the RI are described in the following sections.

4.1 Topographic Setting

The site is situated 179 feet above sea level above mean sea level. The topography slopes down to the strip mall from the Scarsdale Golf Club through the 2-level parking deck. The strip mall sits in a bowl on the top of schist bedrock noted in outcrops in the surrounding slopes that forms a bench adjacent to the Metro-North Train Station at a 10-feet lower level adjacent to the Bronx River that runs south.

4.2 Geology and Hydrogeology

4.2.1 Geology

Surficial geology in Westchester County consists of a wide range of sediments deposited by glaciers. Glacial sediments include clay-rich glacial till on hillside and upland areas, and sandy outwash or ice contact deposits and glacial lake deposits in the County's valleys). Glacial till is generally clay-rich and contains varieties of angular and variously sized rock fragments and boulders.

Testing conducted at the Site has revealed the presence of more than 30 feet of well sorted medium to course sand and gravel deposits comprising an ancestral stream. No impervious zones or confining layers were identified.

According to literature, the bedrock under the site is a highly fractured metamorphic Shale, and Biotite Schists and Gneiss in 6 inch to 1 foot strata, injected with granite and quartz dikes. The rock strata steeply dip into the ground at @ 70^{o} and a strike Southeast-Northwest parallel to the strike of the rail line and Bronx River valley. The tightly-banded bedrock pattern in Westchester

County is clearly visible around the site, particularly in the rocky outcrops in the valley sides. Weathered bedrock was encountered during the installation of monitoring well MW-2D at a depth of approximately 31 feet below land surface.

4.2.2 Hydrogeology

Glacial till is the most common soil substrate on hillsides and upland areas in Westchester County and is normally not used for water supply both because it lies in higher, unsaturated elevations and because it general exhibits low permeability that prevent the installation of viable wells.

Bedrock aquifers underlie all parts of Westchester County. Groundwater migrates through fractures in these formations. Wells in bedrock aquifers yield water where they intersect water-bearing fractures. Well yields in bedrock aquifers are generally low but are acceptable for domestic well purposes. Occasional higher-capacity wells are, and can be, sited in the County's bedrock aquifers.

Water levels have been periodically measured using the installed groundwater monitoring wells at the Site (MW-1 through MW-8, including MW-2D). Table 4-1 provides a summary of depth to groundwater measurements and calculated water level elevations. The data gathered were used to determine a general direction of groundwater flow at the Site as shown in Figure 4-1.

The general direction of groundwater flow is generally towards the south with a horizontal hydraulic gradient of approximately 0.01 ft/ft. Assuming that the subsurface consists of fine/medium sand (approximate hydraulic conductivity of 20 ft/day), the horizontal groundwater flow velocity is estimated at 0.8 ft/day.

There were no perched water conditions noted at the Site and the water table is normally found approximately 10 feet below grade, an elevation corresponding to just beneath the basement floor slab of the dry cleaner, except during flooding conditions when it can temporarily rise to higher elevations.

5.0 INVESTIGATION RESULTS BY MEDIA

The following sections discuss the soil, groundwater, air and soil vapor analytical results of the Remedial Investigation. Appendix D provides the laboratory analytical data reports.

Figure 3-1 presents the locations of soil borings, groundwater monitoring wells and soil vapor sample collection points.

5.1 Soil

Soil testing was conducted during RI Phase I and Phase II field mobilizations:

- Phase I testing analytical parameters included VOCs, SVOCs, inorganics, PCBs and organochlorine pesticides. Results for samples SS-1 (1-3') and SSV-2 (0.5-2.5') are provided in Tables 5-1 and 5-2.

- Phase II testing analytical parameters included VOCs. Results for samples MW-2D (9-11') and MW-2D (19-21') are provided in Table 5-3.

Sampling results were initially compared to unrestricted Soil Cleanup Objectives (SCOs) per regulations contained in 6NYCRR Part 375-6. In those instances where constituents were found to exceed that criteria, a comparison to the Part 375 restricted-commercial SCOs was performed. Sample results are described below according to contaminant class. Results for these constituents are provided on Figure 5-1.

5.1.1 Volatile Organic Compounds

None of the results exceeded the Part 375 unrestricted SCOs.

5.1.2 Semi-Volatile Organic Compounds

None of the results exceeded the Part 375 unrestricted SCOs.

5.1.3 Inorganic Compounds

Most of the results were either non-detect or were found at detected concentrations well below the unrestricted SCOs. Constituents found in excess of the unrestricted SCOs included mercury and zinc. All of these results were well below the Part 375 restricted-commercial SCOs.

5.1.4 Polychlorinated Biphenyls

None of the results exceeded the Part 375 unrestricted SCOs.

5.1.5 Organochlorine Pesticides

Most of the results were either non-detect or were found at detected concentrations well below the unrestricted SCOs. Constituents found in excess of the unrestricted SCOs included 4,4'-DDD, 4,4'-DDE and 4,4'-DDT. All of these results were well below the Part 375 restricted-commercial SCOs.

5.1.6 Summary

All results for VOCs, SVOCs and PCBs were below Part 375 unrestricted SCOs. Two metals and three pesticides were found during the Phase I testing at concentrations slightly above Part 375 unrestricted SCOs but well below the residential-commercial SCOs. These samples were collected beneath impervious concrete cover associated with the stairwell to the dry cleaner basement and the dry cleaner basement floor.

5.2 Groundwater

Groundwater testing was conducted during the RI Phase I, Phase II and IRM field mobilizations:

- Phase I testing analytical parameters included VOCs, SVOCs, inorganics, PCBs and organochlorine pesticides. Results for samples MW-2, MW-3 and MW-7 are provided in Table 5-4.

- Phase II testing analytical parameters included VOCs and additional parameters to assess the effectiveness of the groundwater IRM. VOC results for samples MW-1, MW-2, MW-2D, MW-4, MW-5 and MW-8 are provided in Table 5-5. Results for the additional parameters are presented and discussed in Section 6.

- Two rounds of testing were conducted during the IRM, analytical parameters included VOCs and additional parameters that were used to assess placement and efficacy of the chemical treatment. VOC results for samples MW-2, MW-2D and MW-8 are provided in Table 5-6. Results for the additional parameters are presented and discussed in Section 6.

Sampling results were initially compared to the Class GA Groundwater Quality Standards per NYSDEC TOGS 1.1.1 Ambient Water Quality Standards and Guidance Values (NY-AWQS) and Groundwater Effluent Limitations (June 1988). Results exceeding regulatory criteria for the initial testing conducted in 2011 are summarized on Figures 5-2 and 5-3.

As discussed in Section 4 water level elevations were determined through the recording of depth to water measurements at monitoring wells installed at the Site. Field parameters recorded during sample collection included the following: turbidity, specific conductance, pH, Eh (ORP), temperature and dissolved oxygen (Tables 5-7 and 5-8).

5.2.1 Volatile Organic Compounds

Four VOCs related to the dry cleaning process including PCE, TCE, cis-1,2-DCE and VC were detected across the Site during the RI at concentrations exceeding the NY-AWQS. The highest concentrations were found beneath the dry cleaner in the vicinity of a basement floor sump (SUMP-1). One detection of 2-butanone (MW-2, February 2014) was found during the testing at a concentration exceeding the NY-AWQS.

5.2.2 Semi-Volatile Organic Compounds

Three SVOCs including benzo(b)fluoranthene, benzo(k)fluoranthene and chrysene were detected at concentrations exceeding the NY-AWQS in monitoring well MW-3.

5.2.3 Inorganic Compounds

Metals detected at concentrations above the NY-AWQS included iron, magnesium, manganese, lead and sodium.

5.2.4 Polychlorinated Biphenyls

All of the analyzed PCB Aroclors were reported as non-detectable in each of the wells sampled.

5.2.5 Organochlorine Pesticides

Most of the results were either non-detect or were detected at concentrations well below the NY-AWQS.

5.2.6 Summary

The predominant chemicals found in groundwater at levels exceeding the NY-AWQS comparison criteria are VOCs associated with the dry cleaning process. The maximum

concentrations of these constituents were found in shallow groundwater in the vicinity of the suspected source, a floor sump in the dry cleaner basement. While these compounds were found to persist in the vertical and horizontal (downgradient) directions, concentrations exhibited declines. In particular, concentrations of PCE and TCE declined significantly to acceptable levels at the downgradient site boundary following the IRM chemical injections.

5.3 Soil Vapor and Air

Sub-slab soil vapor and indoor air testing in the dry cleaner and neighboring NY Sports Club and outdoor air testing in the parking area on the west side of the dry cleaner was conducted on January 30, 2012.

- Testing analytical parameters included Method TO-15 VOCs + helium (used as a tracer in sub-slab samples only). Results are provided in Table 5-9.

The State of New York does not have any standards, criteria or guidance values for concentrations of volatile chemicals in subsurface vapors (either soil vapor or sub-slab vapor). NYSDOH's October 2006 Soil Vapor Intrusion guidance document states that soil vapor sampling results are reviewed "as a whole," in conjunction with the results of other environmental sampling, to identify trends and spatial variations in the data. It also indicates that to put some perspective on the data, soil vapor results might be compared to background outdoor air levels, site-related outdoor air sampling results, or the NYSDOH's guidelines for volatile chemicals in air.

Table 3.1 of the NYSDOH guidance document provides air guidance values for a set of five chemicals including methylene chloride, PCBs, tetrachlorodibenzo-*p*-dioxin equivalents (TCDD), PCE and TCE. None of the results for methylene chloride exceeded the Table 3.1 guidance of 60 ug/m^3. PCBs and TCDD are not included in the TO-15 analyte list.

PCE was detected in the dry cleaner (sample and duplicate from basement indoor air location IA-1, at 1,100 ug/m^3 and 1,200 ug/ m^3, respectively) and in the outdoor sample OA-1 (730 ug/ m^3) at concentrations exceeding the NYSDOH air guideline of 100 ug/m^3.

TCE was detected in the dry cleaner (sample and duplicate from basement indoor air location IA-1, at 61 ug/m^3 and 66 ug/ m^3, respectively), the indoor air sample (IA-2) from the NY Sports Club (5.1 ug/m^3), and in the outdoor sample OA-1 (10 ug/ m^3) at concentrations exceeding the NYSDOH air guideline of 5 ug/m^3.

Based on the very shallow groundwater condition, with respect to the Site's basement, the absence of impacts to soil based on the RI testing, the primary source of the VOCs associated with the dry cleaning process that were found in air samples is attributed to volatilization from groundwater.

5.4 Chemicals of Interest

Based on the data collected to date, Chemicals of Interest (COIs) for the Site are volatile organic compounds (VOCs) associated with the dry cleaning process that were found in soil, soil vapor, groundwater and air. The COIs included tetrachloroethene (PCE), trichloroethene (TCE), 1,2-dichloroethene, (cis- and trans-1,2-DCE), 1,1-dichlorothene (1,1-DCE) and vinyl chloride (VC).

5.5 Data Usability Summary

In accordance with the Work Plan, the laboratory analytical data from this investigation was independently assessed and, as required, submitted for independent review. The data usability summary assessment involved a review of the summary form information and sample raw data, and a limited review of associated QC raw data. Specifically, the following items were reviewed:

- Laboratory Narrative Discussion
- Custody Documentation

- Holding Times
- Surrogate and Internal Standard Recoveries
- Matrix Spike Recoveries/Duplicate Recoveries
- Field Duplicate Correlation
- Preparation/Calibration Blanks
- Control Spike/Laboratory Control Samples
- Instrumental IDLs
- Calibration/CRI/CRA Standards
- ICP Interference Check Standards
- ICP Serial Dilution Correlations
- Sample Results Verification

Data Usability Summary Reports (DUSRs) were conducted using guidance from the USEPA Region 2 validation Standard Operating Procedures, the USEPA National Functional Guidelines for Data Review, as well as professional judgment.

No results pertaining to the COIs were rejected. A very limited number of groundwater, soil and air sample results for other constituents including acetone, acrylonitrile bromomethane, 1,4-dioxane and 4-methyl-1,2-pentanone were rejected as noted on the sampling summary tables by an “R” qualifier assigned by the validator. Any additional qualifications of the results from the validation have been incorporated to the summary data tables. The DUSRs provided in Appendix E provide detailed information regarding the data review conducted and any qualifications presented.

6.0 GROUNDWATER INTERIM REMEDIAL MEASURE

Based on results of testing conducted during the performance of the remedial investigation it has been determined that groundwater beneath the Site has been impacted by chemicals associated with the dry cleaning process and that remedial measures are warranted to prevent, mitigate or remedy environmental damage or the consequences of environmental damage. This was addressed through the implementation of a non-emergency groundwater IRM using in-situ chemical reduction (ISCR) to reduce and eliminate COIs at the source and to prevent further migration of these chemicals away from the Site in a manner consistent with the Volunteer's BCA obligations. The Final Engineering Report, to be submitted to the NYSDEC as a separate document, will include additional details of the IRM and be prepared in accordance with DER-10.

6.1 Technology Overview

The combined effects of stimulating intrinsic biological degraders along with direct chemical destruction were tested by injecting FMC Environmental Solutions (FMC) EHC® ISCR Reagent (EHC) into the subsurface, beneath the dry cleaner basement floor in the vicinity of monitoring well MW-2 where the highest concentrations of the COIs have been detected. The reagent consists of a controlled release substance including nutrients used for stimulating ISCR of persistent chemicals including the COIs found at the Site (e.g., PCE and related daughter products).

Following placement, a number of physical, chemical and microbiological processes combine to create very strong reducing conditions that stimulate complete dechlorination without the accumulation of recognized catabolites such as vinyl chloride. EHC is a carbon/zero-valent iron (ZVI) blend that promotes degradation via microbial (i.e., classic sequential dechlorination) and abiotic (ZVI-induced hydrogenolysis) pathways. According to FMC, EHC is completely non-hazardous and safe to handle and its efficacy following placement in the subsurface is long lasting with an estimated treatment life of 3 years as research has shown that the dechlorination process

can require a year or more to complete using this technology. EHC reagent and case study performance information is provided in Appendix F.

6.2 Subsurface Chemical Injections

The general location where the EHC reagent slurry was injected into the subsurface encompasses an approximate 10 ft x 10 ft area shown on Figure 6-1, extending vertically within a 5-foot interval extending to approximately 6 feet below the floor; encompassing a zone where the bulk of the COIs have been found based on prior testing. The basis for initiating EHC placement at the one foot depth was to introduce the material into the current saturated zone, prevent daylighting and ensure that the full volume would be injected into the subsurface. Basement flooding due to groundwater infiltration following high precipitation events has been reported and as a result it is envisioned that contaminated soil may be located immediately beneath the concrete floor. As such, placement of some EHC above the 1 foot depth would be acceptable and would provide a long term benefit as it would be available to treat dissolved contamination when the water table periodically rises above that elevation and to address adsorbed mass present.

Per FMC's recommendation, based on review of provided site-specific chemical and hydrogeologic information, six (6) 50 lb bags (300 lbs total) of the EHC reagent was mixed on-site with tap water to produce approximately 150 gallons of slurry (i.e., 2 lbs of chemical per gallon) that was injected into the subsurface.

The EHC slurry injections were installed on October 10, 2013 by Zebra Environmental Corp. (Zebra), Lynbrook NY under the supervision of an EnviroTrac engineer. Initially, four locations (IP-1 through IP-4) were selected for slurry injection using a target application rate of 75 lbs of EHC reagent per location to distribute the chemical within the targeted application area.

The first step involved opening the basement floor using a concrete coring machine to access the subsurface for introduction of the EHC slurry that was accomplished using a portable direct-push drilling machine.

Nearby locations including groundwater monitoring wells MW-2 and MW-2D, sub-slab soil vapor monitoring point SSV-2 and a floor sump (SUMP 1) were visually monitored during the injection process for the appearance of slurry (daylighting) to ensure that all of the reagent would be installed within the subsurface. The EHC injections were initiated at the IP-1 location and an estimated 75 lbs of reagent (38 gallons of slurry) was introduced into the target subsurface interval as planned. Upon completion of injecting approximately 60 lbs of reagent (30 gallons of slurry) at the next location, IP-2, daylighting of slurry at the locations of soil vapor monitoring point SSV-2 and IP-1 was observed and the injection process at IP-2 was immediately halted. Based on results observed at IP-2 a field decision was made to eliminate the use of point IP-4, considering its proximity to SUMP 1, and to reduce the possibility of injecting slurry into monitoring well MW-2. Following that decision, 140 lbs of material (70 gallons of slurry) was injected at the IP-3 location and an additional 25 lbs (12 gallons of slurry) was injected at IP-1 (for at total of 100 lbs at that location) to complete the injection process.

Each of the three boring/chemical injection locations and soil vapor monitoring point SSV-2 were sealed using fast setting concrete immediately following completion of the injection process restore the floor surface.

6.3 Remedial Performance/Documentation Sampling

This section describes the methodology and results of end-point sampling to document what levels of contamination remain and will be managed under the Site Management Plan.

6.3.1 EHC Application Monitoring

The ultimate success of the ISCR application is predominantly determined by the correct placement of sufficient quantity of reagent into the soil volume requiring treatment. Groundwater sampling indicator parameters for assessing the proper placement of the reagent include organic carbon and iron, as these chemicals are key components of the EHC reagent.

As shown on Table 6-1 pronounced concentration increases for organic carbon and iron at monitoring well MW-2 one month following the injections confirms proper reagent placement within the targeted zone. At four months following the injections concentrations of these constituents had fallen but remained well above pre-injection levels suggesting continued availability of the reagent to continue the ISCR process.

FMC reports that EHC is hydrophilic and does not require direct contact to act upon targeted constituents and that the zone of influence may significantly exceed the direct placement zone. Elevated levels of indicator parameters have been noted at application sites up to 70 ft away from the injection zone suggesting that in addition to direct placement advection may be a very important distribution mechanism at some sites. This may explain the increases in these constituents observed at MW-2D and MW-8. For monitoring well MW-8 the distance from the suspected source area (MW-2 vicinity) is such that an effect via advective groundwater flow at one month following the injections would not be predicted based on prior estimation of seepage velocity at the Site (which would yield a ~2-month travel time between those locations). However, it should be noted that the velocity estimate is based on limited data and incorporates assumptions that render the calculation subject to variation (plus or minus), and does not include hydrodynamic dispersion which may have a significant effect.

6.3.2 Groundwater Flow Patterns

GW elevation measurements recorded during the RI at the Site, including the pre- and post-injection monitoring, are provided in Table 4-1. Wells MW-1 and MW-5, installed at outdoor locations, were buried under piles of plowed snow and were inaccessible during the February 2014 sampling event. The measurements recorded in November 2013 indicate that the water table had experienced declines in each of the monitoring wells in comparison to prior testing conducted during the RI. These declines are attributed to a regional drought condition experienced during mid-late 2013. In comparison to the November monitoring, measurements recorded in February 2014 revealed that wells MW-2D, MW-3, MW-4 and MW-6 continued to show declining water levels while wells MW-2, MW-7 and MW-8 exhibited rising levels but continued to exhibit declines in comparison with prior measurements recorded at the Site. The

direction of vertical flow potential at the Site is variable. Data recorded at the MW-2/MW-2D location in November 2013 and February 2014 revealed upward and downward potential, respectively. The general direction of groundwater flow is consistent with that shown in Figure 4-1.

Monitoring the depth to groundwater using installed monitoring wells has revealed a general horizontal direction of groundwater flow at the Site to the south that is consistent with topography and reported regional flow patterns. Measurements recorded using monitoring wells MW-2 and MW-2D reveal variable vertical flow potential at that location, that in some instances may be upward and in some downward. Based on the strong difference in VOC concentrations recorded at these wells, with levels being much higher in the shallow well MW-2, it can be concluded that any downward flow potential is not being reflected in plume migration as levels attenuate quickly with depth. The maximum concentrations of the COIs have been found in the shallow intervals at this location and it can be concluded that a smear zone containing COIs extending from immediately below the drycleaner basement floor to a depth of 2.5 feet (based on previously conducted soil sample analysis) or more was developed as a result of historic water table fluctuations.

6.3.3 Groundwater Sampling

In accordance with the schedule presented in the IRM Work Plan, groundwater samples were collected from monitoring wells MW-2, MW-2D and MW-8 at approximately one month and four months (i.e., on November 12, 2013 and February 26, 2014) following the EHC injections to assess proper placement of the reagent in the subsurface and to monitor performance in addressing COIs. Analytical parameters selected for laboratory testing included:

- Total Alkalinity
- Biological Oxygen Demand - 5 Day
- Total Metals - Calcium, Iron, Magnesium, Manganese
- Chloride
- Chemical Oxygen Demand

- Dissolved Gasses (methane, ethane, ethene)
- Dissolved Iron
- Dissolved Organic Carbon
- Total Hardness
- Nitrate Nitrogen
- TCL Volatile Organic Compounds
- Sulfate
- Total Organic Carbon

With the exception of dissolved gasses, these parameters were included in prior testing conducted at the Site and serve as a baseline for comparison to post treatment sampling results.

Groundwater sampling was performed using low flow protocol. Field parameters were recorded using a flow through cell and included turbidity, dissolved oxygen, oxidation reduction potential, pH, specific conductance and temperature.

Groundwater sampling field parameter measurements recorded during the RI at the Site, including pre- and post-injection monitoring events, are provided in Table 5-7. Table 5-8 provides validated VOC results for the pre-injection (February 27, 2013) and post-injection groundwater sampling conducted on November 12, 2013 and February 26, 2014.

Groundwater sampling laboratory results pertaining to additional analytical parameters and the COIs for testing conducted during the pre- and post-injection monitoring, are provided in Tables 6-1 and 6-2.

6.4 Contamination Remaining at the Site

The ISCR IRM was conducted to destroy and reduce concentrations of CVOC COIs including PCE, TCE, cis-1,2-DCE and VC that have been found in groundwater at levels exceeding the NY-AWQS. While IRM performance monitoring results have indicated that the approach was

very successful in initiating treatment at the suspected source area (the vicinity of location SUMP 1 in the dry cleaner basement) and has resulted in reduction of concentrations in that area and at the downgradient extent of the Site, levels remain above the NY-AWQS.

Soil and groundwater testing conducted during the RI has found that the bulk mass of contaminants is confined to shallow soil beneath the dry cleaner basement. PCE, the predominant chemical of interest, was found prior to initiation of the IRM at 1.3 mg/kg at the 0.5-2.5 foot depth and decreased significantly to 0.00068 mg/kg at 9-11 feet. The NYS unrestricted soil cleanup objective for PCE is 1.3 mg/kg. Observations made by the on-site geologist during soil testing indicated that no evidence of contamination was noted below an organic layer found at a depth of 2.0-2.5 feet. Conceptually, it is envisioned that this organic layer contains the bulk of the contaminant mass. Groundwater sampling conducted at that location revealed a PCE concentration of 13,000 ug/l in the 0.5 to 10.5 foot interval declining sharply to 42 ug/l at 13 to 18 feet. The NY-AWQS for PCE is 5 ug/l. Measured depth to water has been found to range from approximately 0.5 to 3.5 feet.

Since contaminated soil, soil vapor and groundwater remains beneath the Site after completion of the Remedial Action, Institutional and Engineering Controls are required to protect human health and the environment. These Engineering and Institutional Controls (ECs/ICs) are described in the following sections. . Long-term management of these EC/ICs and residual contamination will be performed under the Site Management Plan (SMP) approved by the NYSDEC.

6.4.1 Treatment Efficacy

Tables 6-3 and 6-4 provide a summary of concentration changes for additional monitoring parameters and COIs, comparing results pertaining to two rounds of post-injection testing to pre-injection sampling concentrations. The VOC information is posted on Figure 5-3 to show the spatial relationship of these sampling results. Although the data used to represent pre-injection conditions (February 2013) was obtained 8.5 months prior to the injections it is notable that concentrations for the COIs at the MW-2 location were very similar based on results of earlier

testing (October 2011), as shown in Table 6-2. It is reasonable to use the February 2013 results to evaluate treatment performance based on this observation.

6.4.2 Shallow Source Zone

A transitory creation of CVOC mass was observed at MW-2 a month after the injection event (predominantly cis-1,2-DCE). Comparison of results for testing conducted at 1-month and 4 months after the injections revealed a reversal of this phenomenon and declines in each of the COIs were observed; most significantly with respect to PCE and TCE, which exhibited concentration reductions of approximately 94% and 98%, respectively. Cis-1,2-DCE and VC continue to show concentrations above the pre-injection levels but have declined significantly since the 1-month monitoring (by 55% and 61%, respectively).

It is envisioned that there was a substantial increase in overall dissolved phase CVOCs in the week following the EHC application attributable to desorption from the soil mass. This was followed by a rapid transformation of PCE and TCE (resulting in concentrations on November 12, 2013 that were very similar to pre-injection levels) to cis-1,2-DCE and VC (higher concentrations were noted in November 2013 compared to pre-injection results) indicating that conditions for robust reductive degradation rapidly returned following the EHC application.

6.4.3 Deeper Source Zone

Concentrations for all of the COIs in monitoring well MW-2D have always been well below those of the nearby shallow well MW-2 even though the vertical separation between the screen intervals is minimal; there is a 2.5 foot gap between the bottom of the screen for MW-2 and the top of the screen for MW-2D. This strong concentration differential has been consistent during the period of record that includes water level monitoring data revealing upward and downward groundwater flow potential. It can be concluded that the changing vertical flow potential does not translate into significant vertical plume migration.

Declining concentrations for the COIs were consistently observed in comparing the pre-injection to post-injection sampling results. Concentrations of PCE and TCE were quickly reduced following injections to levels that are currently just above the NY-AWQS. Cis-1,2-DCE, which exhibited the highest pre-injection concentration has been reduced by more than 70% during the post-injection period and is currently present at less than 1% of the concentration found in the shallow (MW-2) well.

6.4.4 Downgradient from the Source Zone

Based on the 50 foot distance from the injection area and considering the plume migration rate, the effects of the chemical injection at the MW-8 location, which is located at the downgradient boundary of the Volunteer's property, are fully expected to lag behind those observed at the source zone. Comparison of sampling results for testing conducted at 1-month and 4 months after the injections revealed declines in each of the COIs at MW-8; most significantly with respect to PCE and TCE, which exhibited concentration reductions in excess of 99% compared to pre-injection levels. These constituents are also currently well below the NY-AWQS. Cis-1,2-DCE and VC have also exhibited overall declines following the EHC application of 83% and 22%, respectively.

7.0 FATE AND TRANSPORT OF CHEMICALS OF INTEREST

The soil, soil vapor, groundwater and air sample analytical results were incorporated with the physical characterization of the Site to evaluate the fate and transport of COIs in Site media. The mechanisms by which the COIs can migrate to other areas or media are briefly outlined below.

7.1 Fugitive Dust Generation

Volatile and non-volatile chemicals present in soil can be released to ambient air as a result of fugitive dust generation. However, the entire the Site is covered by asphalt or building structure that prevents the suspension of surface soil particles due to wind erosion or physical disturbance of surface soil particles. In addition, the suspected release area is in the vicinity of a floor drain within the dry cleaner basement and approximately 10 feet below land surface.

Under continued commercial land use, it is anticipated that the Site would remain covered. Accordingly, fugitive dusts may be generated during outdoor excavation activities conducted in the parking area to the west of the Site that extend deeper than 10 feet, or during shallow excavations conducted within the basements associated with the Site

7.2 Volatilization

Volatile chemicals typically have a low organic-carbon partition coefficient (K_{oc}), low molecular weight, and a high Henry's Law constant. These chemicals present in soil and groundwater may be released to ambient or indoor air through volatilization either from or through the soil located west of the dry cleaner or beneath the current building structure.

No volatile organic compounds were detected in site soils above 6NYCRR Part 375 unrestricted use SCOs. Although only a limited number of soil samples were analyzed during the investigation the group included testing at the location where the highest concentrations of VOCs in groundwater have been found (in the vicinity of a dry cleaner basement floor sump).

Therefore, in consideration of these findings and the location of potentially impacted soil underlying the outdoor area west of the dry cleaner (10 feet or more below land surface and beneath asphalt paving), the release of VOCs from soils is not considered relevant.

Dry cleaning related COIs were detected in groundwater at concentrations above the NY-AWQS across the Site. Sub-slab soil vapor, indoor and outdoor air sampling results revealed the presence of VOCs including the COIs indicating that volatilization to indoor spaces at the Site is relevant.

7.3 Surface Water Runoff

Erosion and transport of contaminated soil by surface water runoff is not a potential migration pathway as the impacted material is covered by asphalt or concrete and is found at a depth of 10 feet or greater beneath land surface.

7.4 Leaching

Leaching refers to chemicals present in soil migrating downward to groundwater as a result of infiltration of precipitation. Soil that could potentially leach at the Site is found within a small area in the basement of the dry cleaner associated with a floor drain (suspected discharge location). The smear zone of the underlying shallow groundwater extends to the uppermost extent of the soil underlying the floor slab. Periodic rise and fall of the water table provides the potential for this material to leach as the soil alternates from an unsaturated to saturated condition.

7.5 Groundwater Transport

Groundwater underlying the Site migrates generally to the south at an estimated rate of less than 1 ft/day and COIs present in groundwater may be transported across the Site via this pathway. The suspected source of these chemicals is located on the southern side of the dry cleaner basement and the highest concentrations exceeding the NY-AWQS have been found at that location; highly attenuated concentrations are found at the downgradient edge of the Site

beneath the basement of the liquor store (i.e., approximately 45 feet from the source). For the most recently conducted groundwater sampling in February 26, 2014, the predominant COI in shallow groundwater at the source area (cis-1,2-DCE, 40,000 ug/l) exhibited a decline to 200 ug/l at the liquor store.

7.6 Exposure Pathways

Based on the analysis of chemical fate and transport provided above, the relevant pathways through which Site COIs could reach receptors at significant exposure point concentrations is through volatilization into indoor air and through contact with groundwater beneath the Site.

8.0 QUALITATIVE RISK ASSESSMENT

8.1 Potential Human Health Risks

The identification of potential human receptors is based on the characteristics of the Site, the surrounding land uses, and the probable future land uses. The Site is currently established within a strip mall and is used for retail commercial purposes only. In terms of planned future use, it is assumed that the Site will continue to be used in accordance with current practices.

Several soil constituents including metals (mercury and zinc) and organochlorine pesticides (4,4'-DDD, 4,4'-DDE, 4,4'-DDT) were found a concentrations exceeding the unrestricted SCOs. However, as discussed in Section 5.1.3, all of these results were well below the restricted commercial SCOs.

Under unremediated site use conditions, human contact with site-related COIs can be expected to occur primarily through inhalation of volatile constituents by on-Site workers and patrons. In addition, shallow excavation in basement locations at the Site or deep excavations (of 10 feet or more) in the outdoor area immediately to the west of the dry cleaner may expose workers who come into contact with contaminated groundwater.

Although the IRM has resulted in marked declines in COIs present at the downgradient site boundary (corresponding to the southern side of the liquor store) with PCE and TCE reduced to levels below the NY-AWQS, cis-1,2-DCE and VC remained above their respective criteria. Based on the analysis of the IRM results, it is expected that reductions in these constituents will continue beyond the concentrations found in the most recent (February 2014) testing.

There will be institutional controls implemented in accordance with a Site Management Plan for the Site as part of the final remedy. The AAR (Section 9) includes a discussion of the institutional controls that may be used at the Site to eliminate potential human health risks.

8.2 Potential Ecological Risks

The Site is part of an established commercial facility located within a highly developed area. The Site is covered by structures or asphalt paving providing little or no wildlife habitat or food value. No natural waterways are present on or adjacent to the Site. The reasonably anticipated future use remains commercial with the Site covered by buildings, concrete sidewalks and asphalt. As such, no unacceptable ecological risks are anticipated under the current or reasonably anticipated future use scenario.

9.0 REMEDIAL ALTERNATIVES EVALUATION

9.1 Remedial Action Objectives

The final remedial measures for the Site must satisfy Remedial Action Objectives (RAOs) established in accordance with the Volunteers obligations under the established BCA. RAOs are site-specific statements that convey the goals for minimizing or eliminating substantial risks to public health and the environment. Appropriate RAOs for the Site are:

- Prevent on-site contact with, or inhalation of, contaminants emanating from groundwater;
- Reduce contaminant concentrations in groundwater onsite sufficiently to meet, or to nearly achieve, compliance with groundwater quality standards;
- Prevent the off-site migration of contaminants in soil vapor;
- Prevent the off-site discharge of water-borne contaminants exceeding groundwater quality standards.

In addition to achieving RAOs, NYSDEC's Brownfield Cleanup Program calls for remedy evaluation in accordance with DER-10 Technical Guidance for Site Investigation and Remediation (Ref. 6). Specifically, the guidance states "When proposing an appropriate remedy, the person responsible for conducting the investigation and/or remediation should identify and develop a remedial action that is based on the following criteria..:"

- **Overall Protection of Public Health and the Environment**. This criterion is an evaluation of the remedy's ability to protect public health and the environment, assessing how risks posed through each existing or potential pathway of exposure are eliminated, reduced, or controlled through removal, treatment, engineering controls, or institutional controls.
- **Compliance with Standards, Criteria, and Guidance (SCGs)**. Compliance with SCGs addresses whether a remedy will meet applicable environmental laws, regulations, standards, and guidance.

- **Long-Term Effectiveness and Permanence**. This criterion evaluates the long term effectiveness of the remedy after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: (i) the magnitude of the remaining risks (i.e., will there be any significant threats, exposure pathways, or risks to the community and environment from the remaining wastes or treated residuals), (ii) the adequacy of the engineering and institutional controls intended to limit the risk (iii) the reliability of these controls, and (iv) the ability of the remedy to continue to meet RAOs in the future.
- **Reduction of Toxicity, Mobility or Volume with Treatment**. This criterion evaluates the remedy's ability to reduce the toxicity, mobility, or volume of Site contamination. Preference is given to remedies that permanently and significantly reduce the toxicity, mobility, or volume of the wastes at the Site.
- **Short-Term Effectiveness**. Short-term effectiveness is an evaluation of the potential short-term adverse impacts and risks of the remedy upon the community, the workers, and the environment during construction and/or implementation. This includes a discussion of how the identified adverse impacts and health risks to the community or workers at the Site will be controlled, and the effectiveness of the controls. This criterion also includes a discussion of engineering controls that will be used to mitigate short term impacts (i.e., dust control measures), and an estimate of the length of time needed to achieve the remedial objectives.
- **Implementability**. The implementability criterion evaluates the technical and administrative feasibility of implementing the remedy. Technical feasibility includes the difficulties associated with the construction and the ability to monitor the effectiveness of the remedy. For administrative feasibility, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc.
- **Cost**. Capital, operation, maintenance, and monitoring costs are estimated for the remedy and presented on a present worth basis.
- **Community Acceptance**. This criterion evaluates the public's comments, concerns, and overall perception of the remedy.

9.2 Future Land Use Evaluation

In developing and screening remedial alternatives, NYSDEC's Part 375 regulations require that the reasonableness of the anticipated future land be factored into the evaluation. The Site is currently used for commercial purposes that is expected to continue as such. Accordingly, remedial alternatives to clean up the Site to restricted commercial end use are identified and evaluated herein. In addition to the evaluation of alternatives to remediate to the likely end use of the Site, NYSDEC regulation and policy calls for evaluation of more restrictive end-use scenarios. These include an unrestricted use scenario (considered under 6NYCRR Part 375-2.8 to be representative of cleanup to pre-disposal conditions), and a scenario less restrictive than the reasonably anticipated future use (which again is unrestricted use). Per NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation (Ref. 6), evaluation of a "no-action" alternative is also required to provide a baseline for comparison against other alternatives.

9.3 Alternatives Evaluation

Since an IRM has already been completed for the Site, the alternatives discussed in greater detail include:

- No Further Action;
- Implementation of a Site Management Plan; and,
- Unrestricted Use Cleanup.

A summary of estimated costs for the considered alternatives is provided in Table 9-1.

9.3.1 No Further Action

Under this alternative, the Site would remain in its current state, with no additional controls in-place.

Overall Protection of Public Health and the Environment – The Site as it exists is not protective of human health and the environment, due to the absence of institutional controls to prevent less restrictive forms of future site use (e.g., unrestricted) or export of site soils to uncontrolled off-site locations. Accordingly, no further action is not protective of public health and does not satisfy the RAOs.

Compliance with SCGs – Under the current and reasonably anticipated future use scenario, the concentrations of constituents detected in the soil generally comply with applicable SCOs although several chemical constituents were found at levels exceeding the unrestricted criteria. Groundwater concentrations of constituents associated with the dry cleaning process are found and levels in excess of SCGs under the no further action scenario.

Long-Term Effectiveness and Permanence – The no further action alternative involves no additional equipment, institutional controls or facilities subject to maintenance, but provides no long-term effectiveness toward achieving the RAOs.

Reduction of Toxicity, Mobility, or Volume with Treatment – The interim remedial measures completed at the Site have reduced the toxicity, mobility and volume of chemical constituents associated with the dry cleaning process (i.e., the COIs). However, further reduction of dissolved chemical constituents is necessary to achieve RAOs based on the RI findings.

Short-Term Effectiveness – There would potentially be short-term adverse impacts and risks to workers and the public attributable to implementation of the no further action alternative due to the presence of existing contamination.

Implementability – No technical or administrative implementability issues are associated with the no further action alternative.

Cost – The total cost of the completed IRM was approximately $40,000. There would be no capital or long-term operation, maintenance, or monitoring costs associated with the no further action alternative.

9.3.2 Implementation of a Site Management Plan

The IRM achieved reduction in concentrations of COIs that resulted in improved on-site groundwater quality and the quality of groundwater migrating off-site in the downgradient direction. It is also expected that improvements will continue to further reduce levels as the manufacturer's estimated time frame for effectiveness of the chemical treatment employed extends beyond the date of the most recent site testing. The IRM did not address soil that has been found at the site for a limited number of chemical constituents at concentrations above the unrestricted SCOs but below the restricted commercial SCOs.

The "Implementation of a Site Management Plan" alternative is defined as performing no additional cleanup activities at the Site beyond that which was already performed as an IRM with implementation of a Site Management Plan (SMP). The SMP will include:

- **Additional Soil Vapor Assessment.** PCE use at the Site has been discontinued and current impacts to indoor air would be the result of soil vapor intrusion. Therefore, provisions will be included to conduct a soil vapor assessment to determine if mitigation is needed.

- **Maintenance of the Existing Cap/Cover.** Provisions will be included for maintaining the cap/cover that is already in place at the Site (i.e. asphalt and building foundation system to protect from exposure to contaminated soil and groundwater).

- **An Institutional Controls Plan**. Institutional controls at the Site would include the establishment of an environmental easement with groundwater use restrictions and a

use restriction allowing commercial use of the Site, but preventing less restrictive land use (i.e., unrestricted or residential use).

- **An Excavation Work Plan** to assure that future intrusive activities and soil handling at the Site are completed in a safe and environmentally responsible manner.

- **A Site Monitoring Plan** that includes a groundwater/soil vapor/indoor air monitoring plan for long-term monitoring on-Site and a Site-wide Inspection program to assure that the Institutional controls have not been altered and remain effective.

- **A Contingency Plan** for additional applications of ISCR technology should groundwater concentrations rebound.

Overall Protection of Public Health and the Environment – The IRM achieved significant reductions in concentrations of COIs in groundwater and progressed the goal of meeting RAOs at the Site. Soil concentrations are below restricted commercial SCOs and this alternative is fully protective of human health and the environment. The Site Management Plan will include a monitoring plan to monitor on-site residual constituents in groundwater and soil vapor/indoor air, an excavation work plan to address any impacted soil encountered during future on-site activities and a site-wide Inspection program to assure that the Institutional controls placed on the Site have not been altered and remain effective.

Compliance with SCGs – The IRM was performed in accordance with applicable, relevant, and appropriate standards, guidance, and criteria. The IRM achieved reductions in concentrations of dissolved COIs onsite and in off-site migration, to levels that in some instances continue to exceed NY-AWQS, and progressed toward meeting RAOs. Soil concentrations are below restricted-commercial SCOs and currently meet RAOs under this alternative. The Site Management Plan will include a monitoring plan to monitor on-site residual constituents in groundwater, an excavation work plan to address any impacted soil encountered during future

on-site activities and a site-wide Inspection program to assure that the Institutional controls placed on the Site have not been altered and remain effective.

Long-Term Effectiveness and Permanence – The IRM was performed in accordance with applicable, relevant, and appropriate standards, guidance, and criteria. The IRM achieved reductions in concentrations of dissolved COIs onsite and in off-site migration, to levels that in some instances continue to exceed NY-AWQS, and progressed toward meeting RAOs. Soil concentrations are below restricted-commercial SCOs and currently meet RAOs under this alternative. Furthermore, groundwater concentrations of COIs have significantly decreased as a result of the IRM. It is also expected that improvements will continue to further reduce levels as the manufacturer's estimated time frame for effectiveness of the chemical treatment employed extends beyond the date of the most recent site testing. As such, this alternative is expected to provide long-term effectiveness and permanence. The Site Management Plan will include a monitoring plan to monitor on-site residual constituents in groundwater and soil vapor/indoor air, an excavation work plan to address any impacted soil encountered during future on-site activities and a site-wide Inspection program to assure that the Institutional controls placed on the Site have not been altered and remain effective.

Reduction of Toxicity, Mobility, or Volume with Treatment – The IRM significantly reduced the toxicity, mobility, and volume of on-site contamination in groundwater and the off-site migration of contamination. The Site Management Plan will include a monitoring plan to monitor anticipated further reductions in on-site residual constituents in groundwater, an excavation work plan to address any impacted soil encountered during future on-site activities and a site-wide Inspection program to assure that the Institutional controls placed on the Site have not been altered and remain effective. Accordingly, this alternative satisfies this criterion.

Short-Term Effectiveness – The short-term adverse impacts and risks to the community, workers, and environment during implementation of the IRM were effectively controlled through existing infrastructure. All activities were conducted within indoor locations associated with the Site and there were no exposure impacts to the community. Site workers associated with implementation of the IRM conducted the work in accordance with the technical and health and

safety procedures specified in the IRM Work Plan. Significant effects in COI and ISCR indicator parameters were observed 1 month following the chemical injections with reductions in COI levels (some to compliance with NY-AWQS) observed in the following 3 months.

Implementability – No technical or action-specific administrative implementability issues are associated with implementation of the IRM or the SMP. An Environmental Easement will be filed with Westchester County documenting the controls placed on the Site.

Cost – The cost of the completed IRM was approximately $40,000. Groundwater monitoring and annual certification is estimated at approximately $7,500 per year. Based on an assumed 30 years of groundwater monitoring and annual certifications, the net present value of this alternative is approximately $159,000 as shown on Table 9-2.

Community Acceptance – The IRM Work Plan made available for comment from August 5, 2013 through September 4, 2013. No comments opposing the work were received and the IRM was implemented beginning on October 10, 2013.

9.3.3 Unrestricted Use Alternative

An unrestricted use alternative would necessitate remediation of all soil where concentrations exceed the unrestricted use SCOs, remediation of groundwater where concentrations exceed the NY-AWQS criteria and elimination of volatilization/indoor air impacts from subsurface contamination.

Soil

For unrestricted use scenarios, excavation and off-site disposal of impacted soil is generally regarded as the most applicable remedial measure, because institutional controls cannot be used to supplement the remedy. As such, this alternative assumes that soil containing levels of zinc, mercury, 4,4'-DDD, 4,4'-DDE and 4,4'-DDT at levels exceeding the unrestricted use SCOs would be excavated and properly disposed off-site. As these chemical constituents are not associated with the dry cleaning process it is assumed that they are present as a result of

former site-wide practices that likely extend beyond the boundaries of the Volunteer's property (i.e., the Site). Therefore, any remedial action taken to address these constituents would, at a minimum, extend across the entire footprint of the built structure, an estimated area of approximately 4,300 ft^2. The impacted soil was found within the upper 3 feet of the subsurface (relative to the elevation of the basement floor) in the limited testing conducted although deeper samples were not collected during the RI. The impacts could potentially extend to bedrock which, based on sampling conducted during the installation of monitoring well MW-2D, is estimated to be found at approximately 21 feet below the basement floor. Accordingly, the estimated volume of potentially impacted soil is 90,300 ft^3 (approximately 3,350 cubic yards). Based on depth to groundwater measurements recorded during the RI, it is estimated that at least 80% of this volume is continually saturated. Therefore, dewatering of the targeted soil would be required.

Groundwater

Groundwater across the Site exhibits concentrations of chemicals associated with the dry cleaning process (i.e., COIs) and several unrelated inorganic and SVOC constituents above the NY-AWQS. These impacts would be eliminated through a soil excavation program as discussed above.

Soil Vapor/Indoor Air

The removal of groundwater impacts would permanently eliminate the volatilization of COIs to indoor air.

Overall Protection of Public Health and the Environment – The unrestricted use alternative would achieve the corresponding Part 375 SCOs and the NY-AWQS which are designed to be protective of human health under any use scenario. This alternative would also eliminate any impacts to indoor air due to volatilization. However, potential exposure of chemical impacts and other risks to workers and the community would be increased during the construction process when compared to current exposure scenario.

Compliance with SCGs – Similar to the IRM activities, the unrestricted use alternative would need to be performed in accordance with applicable, relevant, and appropriate standards, guidance, and criteria.

Long-Term Effectiveness and Permanence – The unrestricted use alternative would achieve removal of all residual impacted soil and groundwater; therefore, no soil exceeding the unrestricted use SCOs, groundwater exceeding the NY-AWQS or impacts to indoor air due to volatilization would remain on the Site. As such, the unrestricted use alternative would provide long-term effectiveness and permanence. Post-remedial monitoring and certifications would not be required.

Reduction of Toxicity, Mobility, or Volume with Treatment – Through removal of all impacted soil and groundwater, the unrestricted use alternative would permanently and significantly reduce the toxicity, mobility, and volume of site contamination.

Short-Term Effectiveness – The short-term adverse impacts and risks to the community, workers, and environment during implementation of the unrestricted use alternative are considered significant but are controllable. Once implemented the remedial actions would have immediate effect on the restoration of soil and groundwater quality to unrestricted criteria and would permanently eliminate impacts to indoor air due to volatilization.

Implementability – Significant technical implementability issues would be encountered in construction of the unrestricted use alternative. The soil and groundwater impacts are found at locations with accessibility constraints due to the presence of the existing building. Required construction would have a pronounced negative impact on the commercial viability of the Volunteer's tenants and adjacent businesses, that in the worst case scenario would require complete demolition of the structure at the Volunteer's property, and significant engineering to stabilize and protect adjacent portions of the strip mall in order to access contaminated material and complete the required remedial actions.

Cost – The capital cost of implementing an Unrestricted Use alternative (post-IRM) is estimated at approximately $1,000,000 (Table 9-3), which is the cost of the unrestricted use soil cleanup plus the cost of the IRM that was completed. Additional significant costs beyond the provided estimate include, but are not necessarily limited to, building demolition or structural modification to prepare for the soil remediation, sheeting and shoring to stabilize excavation boundaries, dewatering and liquids management and building reconstruction. Post-remedial groundwater monitoring and annual certification costs would not be incurred.

Community Acceptance – Community acceptance will be evaluated based on comments to be received from the public in response to Fact Sheets and other planned Citizen Participation activities.

9.4 Recommended Remedial Measure

Based on the Alternatives Analysis evaluation, the completed IRM and Implementation of a Site Management Plan fully satisfies the remedial action objectives and is fully protective of human health and the environment. Accordingly, the implementation of the Site Management Plan alternative is the recommended final remedial approach for the Aristocrat Cleaners Site.

10.0 SUMMARY AND CONCLUSIONS

The following summary and conclusions are based on the data and analyses pertaining to investigatory activities conducted at the Site and presented in the preceding sections.

10.1 Remedial Investigation

The RI was conducted based on a general understanding of environmental conditions that was established during prior testing of soil, groundwater, soil vapor and indoor air at, and in the immediate vicinity of, the Site. The results of that work, discussed in Section 2.0, provided the basis for the initial RI scope.

Soil

A limited number of chemical constituents including mercury, zinc, 4,4'-DDD, 4,4'-DDE and 4,4'-DDT were found at concentrations slightly above the Part 375 unrestricted SCOs. These constituents are not typically associated with dry cleaning process and likely represent conditions that extend beyond the Site. All results for VOCs, SVOCs, metals, pesticides and PCBs were well below Part 375 restricted-commercial SCOs.

Groundwater

Groundwater is generally found at a depth of approximately 10 feet below land surface, allowing for periodic rise and fall in response to precipitation events and periods between. Accordingly, the water table is very shallow with respect to the elevation of the basement spaces at the Site and groundwater has historically infiltrated into that area under extreme conditions. The direction of groundwater is generally to the south at a calculated velocity of less than 1 ft/day.

Four VOCs related to the dry cleaning process including PCE, TCE, cis-1,2-DCE and VC were detected across the Site during the RI at concentrations exceeding the NY-AWQS. The highest concentrations were found beneath the dry cleaner at the suspected source area. One detection

of 2-butanone was found during the testing at a concentration exceeding the NY-AWQS. Other constituents unrelated to the dry cleaning process that were found above the NY-AWQS included benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, iron, magnesium, manganese, lead and sodium.

Soil Vapor and Indoor Air

Testing conducted prior to and during the RI has revealed the presence of chemical constituents associated with the dry cleaning process as well as other VOCs in soil vapor and indoor air at and in the immediate vicinity of the Site. The predominant compounds were PCE and TCE. Results of the testing discussed in Sections 2 and 5 were previously provided to the NYSDEC and NYSDOH to evaluate and assess significance of the findings.

10.2 Interim Remedial Measure

A non-emergency groundwater IRM was implemented at the Site concurrent with the RI activities. The IRM included the introduction of 300 lbs of chemical reagent (mixed with potable water onsite to create an injectable slurry) beneath the basement of the dry cleaner within the suspected source area to stimulate the degradation of chemicals associated with the dry cleaning process that have been found in groundwater across the Site at concentrations exceeding the NY-AWQS. Following the injections, two rounds of groundwater monitoring were conducted to assess performance. Results have shown that significant declines in PCE and TCE have occurred and that geochemical conditions for the continued reduction of COI concentrations have been stimulated. Based on the most recently available groundwater sampling data the off-site migration of PCE and TCE has been reduced to levels below the NY-AWQS. The Final Engineering Report, to be submitted to the NYSDEC as a separate document, includes additional details regarding the IRM.

10.3 Alternatives Assessment

Based on the Alternatives Analysis evaluation, the IRM satisfies the remedial action objectives and is protective of human health and the environment. Accordingly, Implementation of a Site Management Plan is the recommended final remedial approach for the Aristocrat Cleaners Site.

11.0 REFERENCES

EnviroTrac Ltd. (August, 2011). Amended Remedial Investigation Work Plan. Hartsdale Village Square Aristocrat Cleaners. 212 East Hartsdale Avenue Hartsdale, New York 10530. Brownfield Cooperative Agreement Site #: C360111.

EnviroTrac Ltd. (June, 2012). Remedial Investigation Interim Summary Report. Hartsdale Village Square Aristocrat Cleaners. 212 East Hartsdale Avenue Hartsdale, New York 10530. Brownfield Cooperative Agreement Site #: C360111.

EnviroTrac Ltd. (July, 2013). Interim Remedial Measure Work Plan. Hartsdale Village Square Aristocrat Cleaners. 212 East Hartsdale Avenue Hartsdale, New York 10530. Brownfield Cooperative Agreement Site #: C360111.

FMC Environmental Solutions. Product Application Technical Presentation, ISCR Groundwater Remediation Technologies EHC® family of integrated carbon & ZVI technologies for in situ chemical reduction.

Hartsdale Village Square, LLC (October 20, 2009). NYS Brownfield Cleanup Program Application.

New York State Department of Environmental Conservation (January 10, 2010). Notification of acceptance into the BCP as a Volunteer.

New York State Department of Environmental Conservation (May 3, 2010). Final Program Policy DER-10 - Technical Guidance for Site Investigation and Remediation.

New York State Department of Health (October 2006). Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York.

FIGURES

AERIAL PHOTOGRAPH

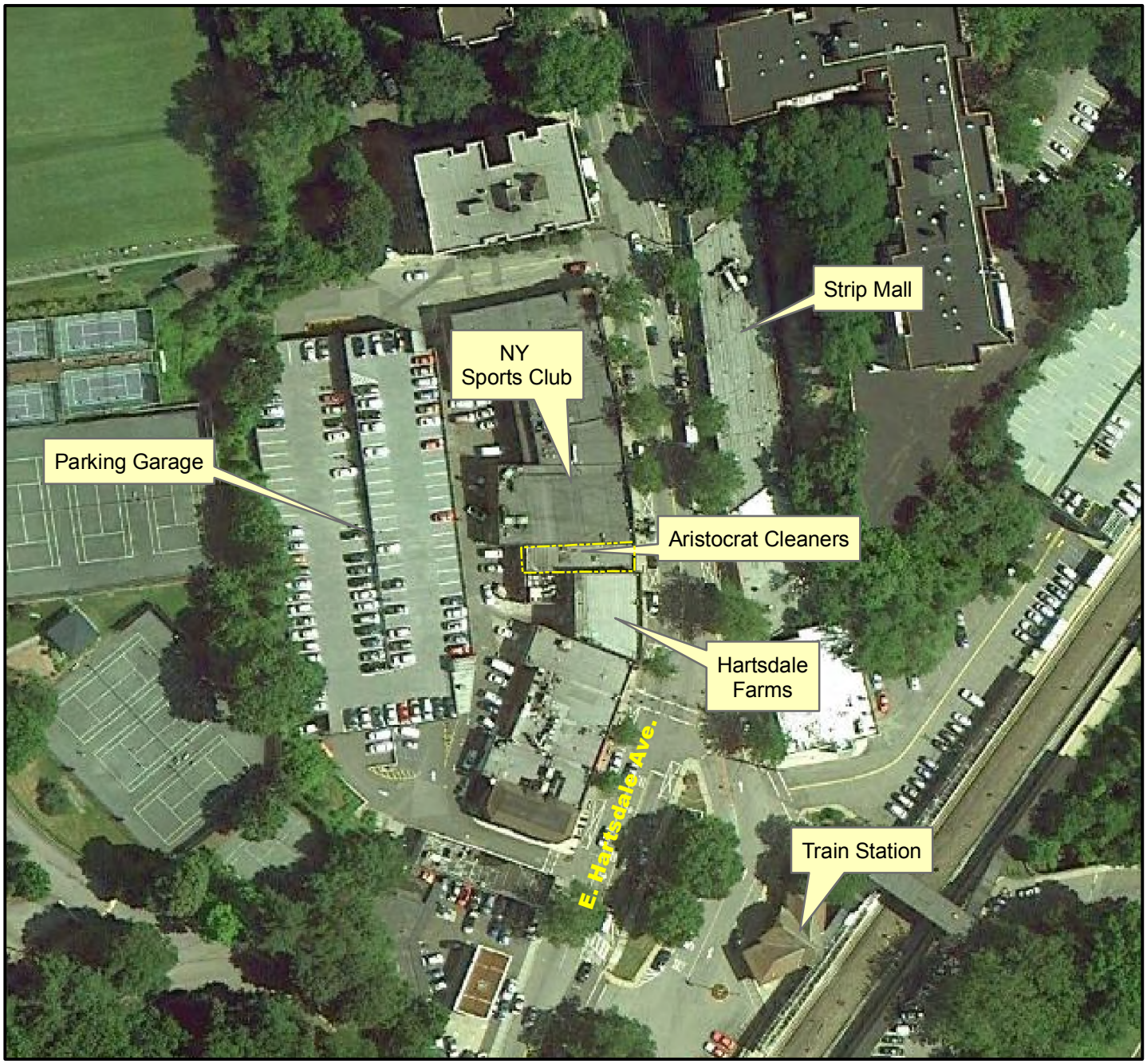


Figure 1-1
Site Location Map

Aristocrat Cleaners
212 E. Hartsdale Ave.
Hartsdale, NY

N
W E
S

EnviroTrac
Environmental Services
5 Old Dock Road
Yaphank, NY 11980
P: 631-924-3001 F:631-924-5001

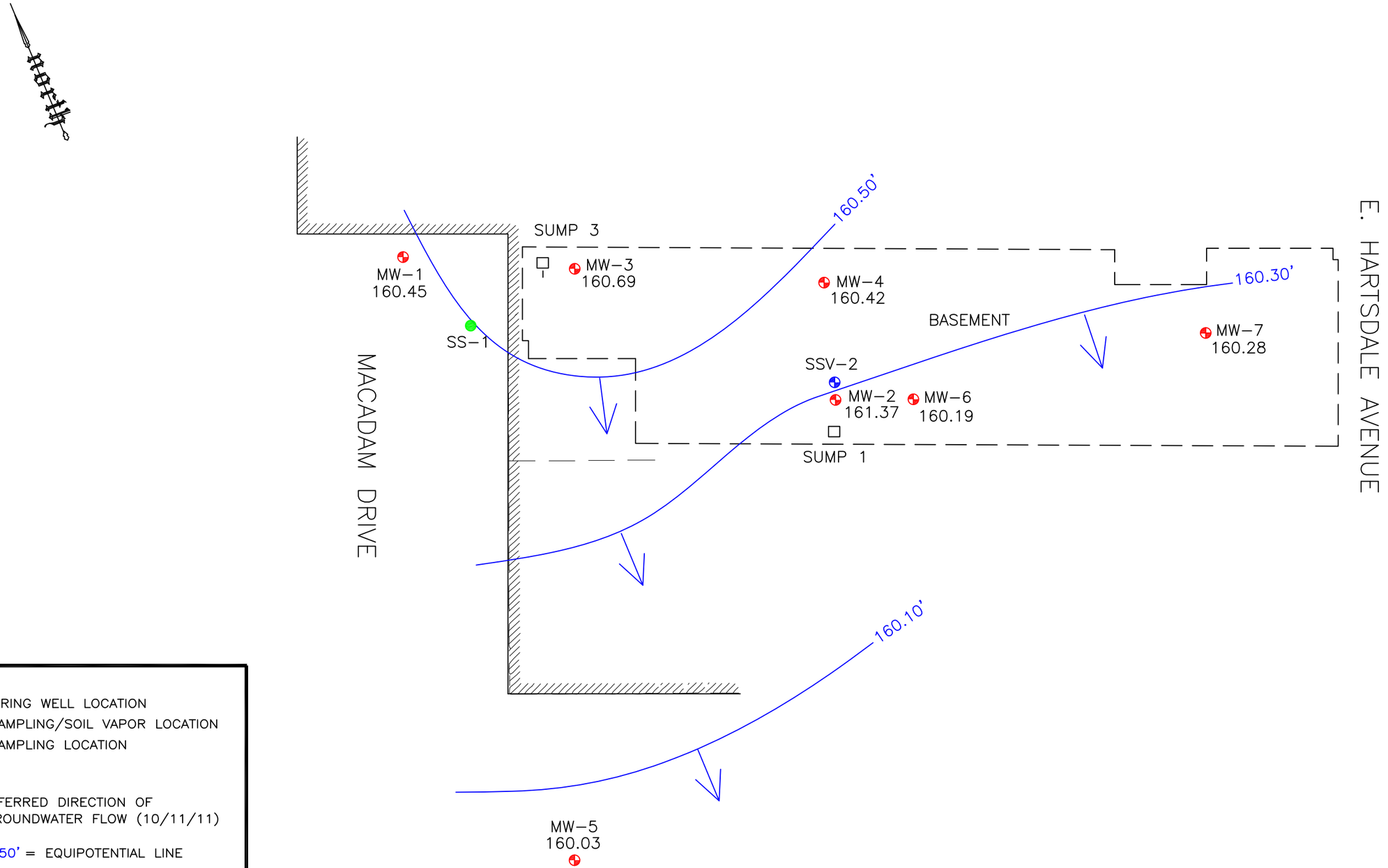
AERIAL PHOTOGRAPH

Figure 3-1
RI Testing Locations

Aristocrat Cleaners
212 E. Hartsdale Ave.
Hartsdale, NY

N
W E
S

EnviroTrac
Environmental Services
5 Old Dock Road
Yaphank, NY 11980
P: 631-924-3001 F:631-924-5001



LEGEND:

- MONITORING WELL LOCATION
- SOIL SAMPLING/SOIL VAPOR LOCATION
- SOIL SAMPLING LOCATION
- SUMP
- = INFERRED DIRECTION OF GROUNDWATER FLOW (10/11/11)
- 160.50' = EQUIPOTENTIAL LINE

SAMPLE WELL:

MW-1 = MONITORING WELL ID
160.45 = WATER-TABLE ELEVATION (ft/msl)

NOTE: WELLS MW-2 & MW-6 NOT USED IN CONTOURS.

Base map taken from GABRIEL E. SENOR, P.C. map dated OCTOBER 11, 2011

EnviroTrac
ENVIRONMENTAL SERVICES
5 OLD DOCK ROAD, YAPHANK, NEW YORK 11980
PHONE: (631)924-3001 FAX: (631)924-5001

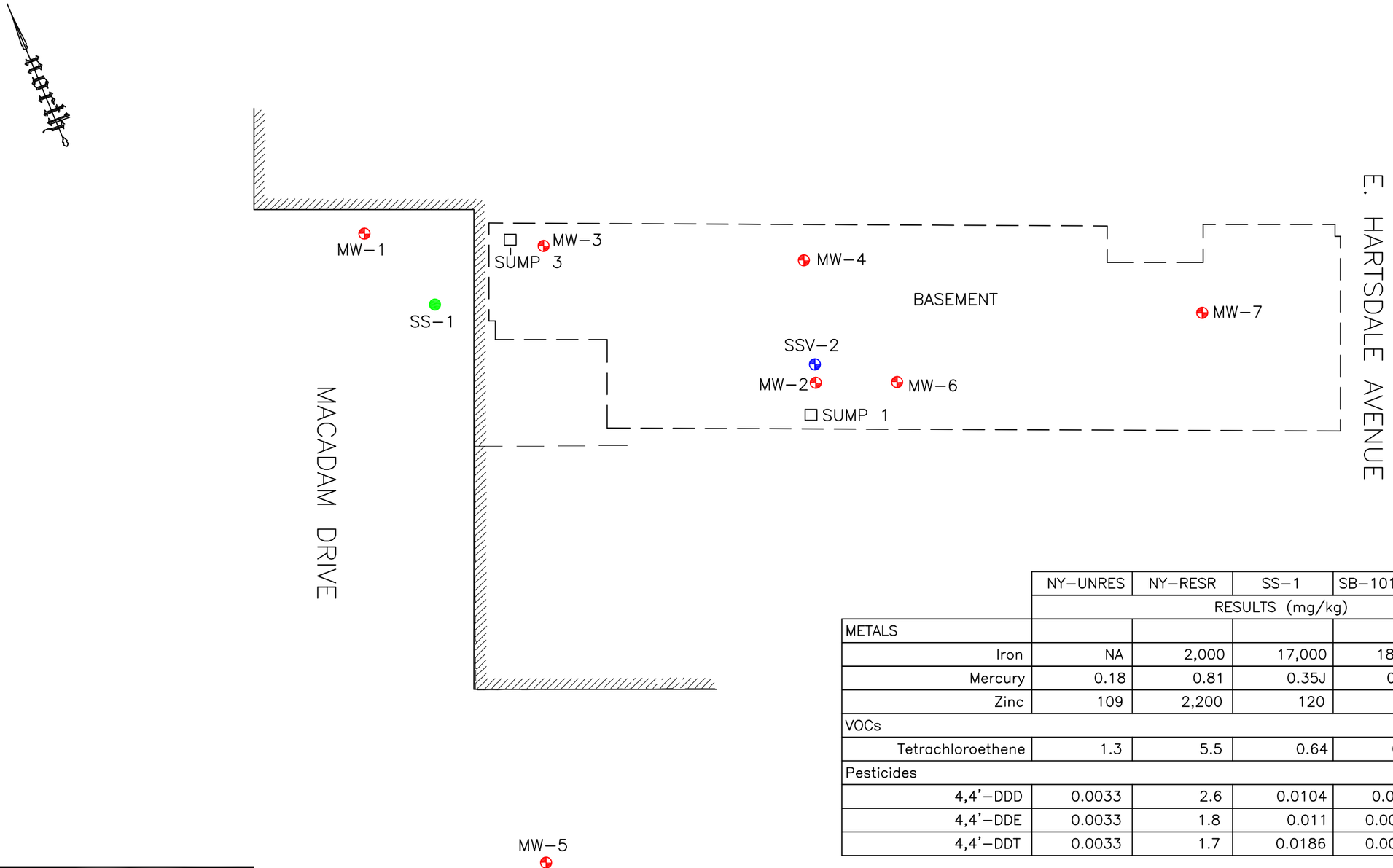
0 5 FT 10

REVISION DATE: JUNE 23, 2014 | SCALE: 1" = 10 FEET | REVISED BY: TB

ARISTOCRAT CLEANERS
212 E. HARTSDALE AVENUE
HARTSDALE, NEW YORK

GENERAL DIRECTION OF GROUNDWATER FLOW

FIGURE # 4-1



	NY–UNRES	NY–RESR	SS–1	SB–101 (1)	SSV–2
	RESULTS (mg/kg)				
METALS					
Iron	NA	2,000	17,000	18,000	20,000
Mercury	0.18	0.81	0.35J	0.32J	0.36J
Zinc	109	2,200	120	150	180
VOCs					
Tetrachloroethene	1.3	5.5	0.64	0.22	1.3
Pesticides					
4,4'–DDD	0.0033	2.6	0.0104	0.0246	0.0134
4,4'–DDE	0.0033	1.8	0.011	0.00741	0.0194
4,4'–DDT	0.0033	1.7	0.0186	0.00994	0.0141

Notes:
NY–RESR: Restricted Use Residential Soil Cleanup Objective.
NY–UNRES: Unrestricted Use Soil Cleanup Objective.
Sampling conducted October 11, 2011
(1) – Duplicate of SS–1
NA – Not applicable, no criteria provided.
J – Estimated value.

LEGEND:
- MONITORING WELL
- SOIL SAMPLING/SOIL VAPOR LOCATION
- SOIL SAMPLING LOCATION
- SUMP

Base map taken from GABRIEL E. SENOR, P.C. map dated OCTOBER 11, 2011

EnviroTrac
ENVIRONMENTAL SERVICES
5 OLD DOCK ROAD, YAPHANK, NEW YORK 11980
PHONE: (631)924–3001 FAX: (631)924–5001

0 5 FT 10

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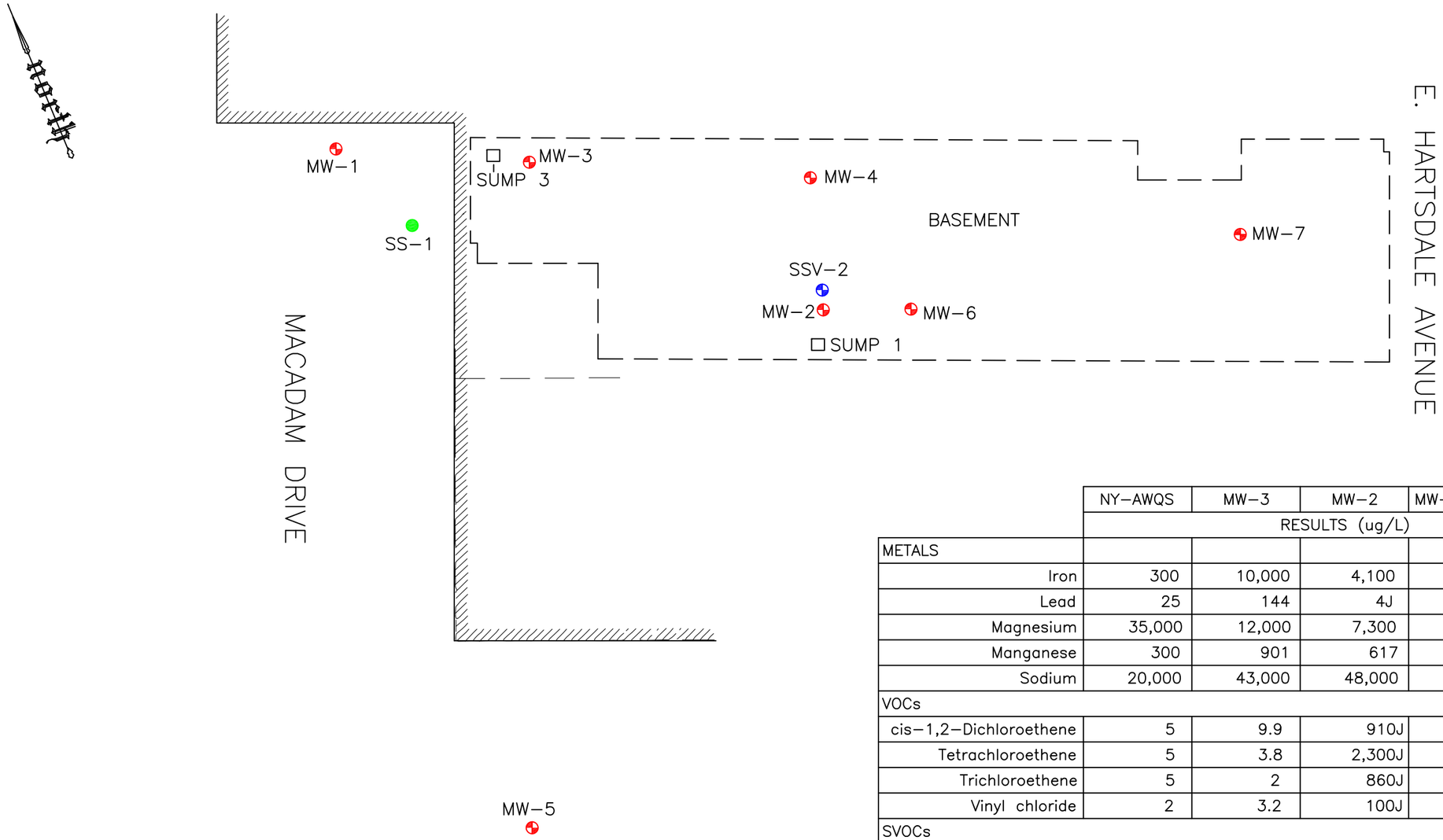
ARISTOCRAT CLEANERS
212 E. HARTSDALE AVENUE
HARTSDALE, NEW YORK

SOIL RESULTS EXCEEDING REGULATORY CRITERIA

FIGURE # 5–1



	NY–AWQS	MW–3	MW–2	MW–101 (1)	MW–7
	RESULTS (ug/L)				
METALS					
Iron	300	10,000	4,100	6,500	1,800
Lead	25	144	4J	4J	5J
Magnesium	35,000	12,000	7,300	10,000	36,000
Manganese	300	901	617	900	183
Sodium	20,000	43,000	48,000	68,000	98,000
VOCs					
cis–1,2–Dichloroethene	5	9.9	910J	5,500J	160
Tetrachloroethene	5	3.8	2,300J	13,000J	98
Trichloroethene	5	2	860J	4,800J	20
Vinyl chloride	2	3.2	100J	580J	0.26J
SVOCs					
Benzo(b)fluoranthene	0.002	0.3	0.2U	0.2U	0.2U
Benzo(k)fluoranthene	0.002	0.18J	0.2U	0.2U	0.2U
Chrysene	0.002	0.25	0.2U	0.2U	0.2U

LEGEND:

- MONITORING WELL
- SOIL SAMPLING/SOIL VAPOR LOCATION
- SOIL SAMPLING LOCATION
- SUMP

Notes:
NY–AWQS New York State Ambient Water Quality Standard.
Sampling conducted October 11, 2011.
(1) – Duplicate of MW–2.
U – Compound was not detected relative to the indicated limit.
J – Estimated value.

Base map taken from GABRIEL E. SENOR, P.C. map dated OCTOBER 11, 2011

EnviroTrac
ENVIRONMENTAL SERVICES
5 OLD DOCK ROAD, YAPHANK, NEW YORK 11980
PHONE: (631)924–3001 FAX: (631)924–5001

0 5 FT 10

REVISION DATE: JUNE 23, 2014 | SCALE: 1" = 10 FEET | REVISED BY: TB

ARISTOCRAT CLEANERS
212 E. HARTSDALE AVENUE
HARTSDALE, NEW YORK

RI PHASE I
GROUNDWATER SAMPLING RESULTS

FIGURE # 5–2

North

MW-1

SS-1

MW-3

SUMP 3

MW-4

BASEMENT

MW-7

SSV-2

MW-2D

MW-2

SUMP 1

MW-6

EHC INJECTION AREA

APPROXIMATE DIRECTION OF GROUNDWATER FLOW

MACADAM DRIVE

E. HARTSDALE AVENUE

MW-5

MW-8

MW-2D

SAMPLING DATE	2/27/2013	11/12/2013	2/26/14
Tetrachloroethene	42	8.4	7.8 U
Trichloroethene	23	7.2	6.6
cis-1,2-Dichloroethene	800	180	220
Vinyl chloride	18	18	16

MW-2

SAMPLING DATE	2/27/2013	11/12/2013 (1)	2/26/14
Tetrachloroethene	13,000	17,000	730
Trichloroethene	5,400	6,700	250 U
cis-1,2-Dichloroethene	6,000	88,000	40,000
Vinyl chloride	470	3,600	1,400

MW-8

SAMPLING DATE	2/27/2013	11/12/2013	2/26/14 (1)
Tetrachloroethene	2,000	370	1.2 U
Trichloroethene	760	65	0.44 J
cis-1,2-Dichloroethene	1,200	1,100	200 J
Vinyl chloride	230	1,200	180 J

NY-AWQS - New York State Ambient Water Quality Standard

COMPOUND	NY-AWQS
Tetrachloroethene	5
Trichloroethene	5
cis-1,2-Dichloroethene	5
Vinyl chloride	2

LEGEND:

- MONITORING WELL
- SOIL SAMPLING/SOIL VAPOR LOCATION
- SOIL SAMPLING LOCATION
- SUMP

Notes:
All results in ug/l.
EHC Injections conducted on October 10, 2013.
(1) - Higher result of parent and duplicate samples.
U - Compound was not detected relative to the indicated limit.
J - Estimated value.

Base map taken from GABRIEL E. SENOR, P.C. map dated OCTOBER 11, 2011

EnviroTrac
ENVIRONMENTAL SERVICES
5 OLD DOCK ROAD, YAPHANK, NEW YORK 11980
PHONE: (631)924-3001 FAX: (631)924-5001

0 5 FT 10

REVISION DATE: JUNE 23, 2014 | SCALE: 1" = 10 FEET | REVISED BY: TB

ARISTOCRAT CLEANERS
212 E. HARTSDALE AVENUE
HARTSDALE, NEW YORK

CHEMICALS OF INTEREST
PRE- and POST-INJECTION SAMPLING RESULTS

FIGURE # 5-3

MW–4

BASEMENT

EHC INJECTION AREA

IP–3

IP–1

SSV–2

MW–2D

IP–4

MW–6

IP–2

MW–2

SUMP 1

APPROXIMATE DIRECTION
OF GROUNDWATER FLOW

LEGEND:

- MONITORING WELL
- SOIL SAMPLING/SOIL VAPOR LOCATION
- EHS INJECTION LOCATION
- SUMP

Base map taken from GABRIEL E. SENOR, P.C. map dated OCTOBER 11, 2011

EnviroTrac
ENVIRONMENTAL SERVICES
5 OLD DOCK ROAD, YAPHANK, NEW YORK 11980
PHONE: (631)924–3001 FAX: (631)924–5001

0 1.25 FT 2.5

REVISION DATE: JUNE 23, 2014 | SCALE: 1" = 2.5 FEET | REVISED BY: TB

ARISTOCRAT CLEANERS
212 E. HARTSDALE AVENUE
HARTSDALE, NEW YORK

EHC INJECTION LOCATIONS

FIGURE #
6–1

TABLES

Table 4-1: Water Level Elevation Measurements

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

WELL NO.	MW-1			MW-2			MW-2D			MW-3			MW-4		
LOCATION	Outdoor			Basement			Basement			Basement			Basement		
BOREHOLE DIAMETER (in.)	2			2			3			2			2		
CASING/SCREEN DIAMETER (in.)	1			1			1.25			1			1		
TOTAL WELL DEPTH (ft.)	18.5			10.5			18.0			10.5			10.5		
SCREEN INTERVAL (ft.)	8.5 - 18.5			0.5 - 10.5			13 - 18			0.5 - 10.5			0.5 - 10.5		
MP ELEVATION (ft./msl.)	169.15			162.70			161.86			162.54			162.71		
SCREEN INTERVAL (ft./msl.)	151-161			152-162			144-149			152-162			152-162		
SAMPLING DATE	DTW	LNAPL	ELEV	DTW	LNAPL	ELEV	DTW	LNAPL	ELEV	DTW	LNAPL	ELEV	DTW	LNAPL	ELEV
8/12/2008 (2)	9.40	0.00	159.75	0.50	0.00	162.20	NA			0.50	0.00	162.04	0.50	0.00	162.21
10/11/2011	8.70	0.00	160.45	1.33	0.00	161.37	NA			1.85	0.00	160.69	2.29	0.00	160.42
2/6/2013	8.61	0.00	160.54	2.70	0.00	160.00	2.01	0.00	159.85	2.50	0.00	160.04	2.91	0.00	159.80
2/27/2013	8.39	0.00	160.76	2.05	0.00	160.65	1.55	0.00	160.31	NM	-	-	2.48	0.00	160.23
11/12/2013	10.02	0.00	159.13	3.77	0.00	158.93	2.78	0.00	159.08	3.50	0.00	159.04	3.73	0.00	158.98
2/26/2014	NM	-	-	2.86	0.00	159.84	3.65	0.00	158.21	3.53	0.00	159.01	3.81	0.00	158.90

WELL NO.	MW-5			MW-6			MW-7			MW-8		
LOCATION	Outdoor			Basement			Basement			Basement (1)		
BOREHOLE DIAMETER (in.)	2			2			2			3		
CASING/SCREEN DIAMETER (in.)	1			1			1			2		
TOTAL WELL DEPTH (ft.)	18.5			10.5			10.5			8.0		
SCREEN INTERVAL (ft.)	8.5 - 18.5			0.5 - 10.5			0.5 - 10.5			3 - 8		
MP ELEVATION (ft./msl.)	169.50			162.88			162.87			160.91		
SCREEN INTERVAL (ft./msl.)	151-161			152-162			152-162			153-158		
SAMPLING DATE	DTW	LNAPL	ELEV	DTW	LNAPL	ELEV	DTW	LNAPL	ELEV	DTW	LNAPL	ELEV
8/12/2008 (2)	10.25	0.00	159.25	0.50	0.00	162.38	0.50	0.00	162.37	NA		
10/11/2011	9.47	0.00	160.03	2.69	0.00	160.19	2.59	0.00	160.28	NA		
2/6/2013	9.95	0.00	159.55	3.25	0.00	159.63	3.17	0.00	159.70	1.81	0.00	159.10
2/27/2013	9.18	0.00	160.32	NM	-	-	NM	-	-	1.06	0.00	159.85
11/12/2013	10.77	0.00	158.73	4.11	0.00	158.77	4.02	0.00	158.85	2.26	0.00	158.65
2/26/2014	NM	-	-	4.24	0.00	158.64	2.29	0.00	160.58	2.24	0.00	158.67

Notes:
MP - Top of casing measuring point.
DTW - Depth to water below measuring point (ft.).
LNAPL - Light non-aqueous phase liquid thickness (ft.).
ELEV - Groundwater elevation (ft./msl).
(1) - Liquor store - all other "Basement" samples are located in the dry cleaner.
(2) - Measurements recorded by Tapash, Hammonton, NY.
NA - Not applicable, well not installed.
NM - Not measured.

Table 5-1: Phase I Soil Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

LOCATION		SS-1		SB-101 (1)		SSV-2	
SAMPLING DATE		11-OCT-11		11-OCT-11		11-OCT-11	
LAB SAMPLE ID		L1116534-07		L1116534-09		L1116534-08	
General Chemistry	NY-UNRES	Result	Qual	Result	Qual	Result	Qual
Solids, Total (%)	NA	82		82		76	
Total Metals	NY-UNRES	Result	Qual	Result	Qual	Result	Qual
Aluminum, Total	NA	12000		16000		13000	
Antimony, Total	NA	1.8	UJ	2.2	UJ	2.1	UJ
Arsenic, Total	13	2.6		3.3		3.4	
Barium, Total	350	96		110		73	
Beryllium, Total	7.2	0.37	J	0.48		0.38	J
Cadmium, Total	2.5	0.06	U	0.06	U	0.06	U
Calcium, Total	NA	2500	J	3200	J	4300	J
Chromium, Total	NA	19		24		20	
Cobalt, Total	NA	6.5		8.4		7.7	
Copper, Total	50	30	J	36	J	28	J
Iron, Total	NA	17000		20000		18000	
Lead, Total	63	45	J	48	J	23	J
Magnesium, Total	NA	3300	J	4600	J	3800	J
Manganese, Total	1600	150	J	180	J	250	J
Mercury, Total	0.18	0.35	J	0.32	J	0.36	J
Nickel, Total	30	14		18		15	
Potassium, Total	NA	1400		1900		1500	
Selenium, Total	3.9	1.5	U	1	J	1.4	J
Silver, Total	2	0.15	U	0.15	U	0.17	U
Sodium, Total	NA	200		180		220	
Thallium, Total	NA	0.57	U	0.57	U	0.63	U
Vanadium, Total	NA	26		33		29	
Zinc, Total	109	120		150		180	

Notes:
All results in mg/kg unless otherwise noted.
(1) - Duplicate of SS-1.
U - Compound was not detected relative to the indicated limit.
J - Estimated value.
NA - Not applicable, no criteria provided.
NY-UNRES - 6NYCRR Part 375 -Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives.
Analysis conducted by Alpha Analytical, Westborough, MA.

Table 5-1: Phase I Soil Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

LOCATION		SS-1		SB-101 (1)		SSV-2	
SAMPLING DATE		11-OCT-11		11-OCT-11		11-OCT-11	
LAB SAMPLE ID		L1116534-07		L1116534-09		L1116534-08	
Volatile Organics	NY-UNRES	Result	Qual	Result	Qual	Result	Qual
1,1,1,2-Tetrachloroethane	NA	0.003	U	0.003	U	0.016	U
1,1,1-Trichloroethane	0.68	0.003	U	0.003	U	0.016	U
1,1,2,2-Tetrachloroethane	NA	0.003	U	0.003	U	0.016	U
1,1,2-Trichloroethane	NA	0.0046	U	0.0046	U	0.025	U
1,1-Dichloroethane	0.27	0.0046	U	0.0046	U	0.025	U
1,1-Dichloroethene	0.33	0.003	U	0.003	U	0.016	U
1,1-Dichloropropene	NA	0.015	U	0.015	U	0.082	U
1,2,3-Trichlorobenzene	NA	0.015	U	0.015	U	0.082	U
1,2,3-Trichloropropane	NA	0.03	U	0.03	U	0.16	U
1,2,4,5-Tetramethylbenzene	NA	0.012	U	0.012	U	0.066	U
1,2,4-Trichlorobenzene	NA	0.015	U	0.015	U	0.082	U
1,2,4-Trimethylbenzene	3.6	0.015	U	0.015	U	0.082	U
1,2-Dibromo-3-chloropropane	NA	0.015	U	0.015	U	0.082	U
1,2-Dibromoethane	NA	0.012	U	0.012	U	0.066	U
1,2-Dichlorobenzene	1.1	0.015	U	0.015	U	0.082	U
1,2-Dichloroethane	0.02	0.003	U	0.003	U	0.016	U
1,2-Dichloropropane	NA	0.011	U	0.011	U	0.058	U
1,3,5-Trimethylbenzene	8.4	0.015	U	0.015	U	0.082	U
1,3-Dichlorobenzene	2.4	0.015	U	0.015	U	0.082	U
1,3-Dichloropropane	NA	0.015	U	0.015	U	0.082	U
1,4-Dichlorobenzene	1.8	0.015	U	0.015	U	0.082	U
1,4-Diethylbenzene	NA	0.012	U	0.012	U	0.066	U
2,2-Dichloropropane	NA	0.015	U	0.015	U	0.082	U
2-Butanone	0.12	0.03	U	0.03	U	0.16	U
2-Hexanone	NA	0.03	UJ	0.03	UJ	0.16	U
4-Ethyltoluene	NA	0.012	U	0.012	U	0.066	U
4-Methyl-2-pentanone	NA	0.03	U	0.03	U	0.16	U
Acetone	0.05	0.03	U	0.03	U	0.16	U
Acrylonitrile	NA	0.03	UJ	0.03	UJ	0.16	U
Benzene	0.06	0.003	U	0.003	U	0.016	U
Bromobenzene	NA	0.015	U	0.015	U	0.082	U
Bromochloromethane	NA	0.015	U	0.015	U	0.082	U
Bromodichloromethane	NA	0.003	U	0.003	U	0.016	U
Bromoform	NA	0.012	U	0.012	U	0.066	U
Bromomethane	NA	0.0061	U	0.0061	U	0.033	U
Carbon disulfide	NA	0.03	UJ	0.03	UJ	0.16	UJ
Carbon tetrachloride	0.76	0.003	U	0.003	U	0.016	U
Chlorobenzene	1.1	0.003	U	0.003	U	0.016	U
Chloroethane	NA	0.0061	U	0.0061	U	0.033	U
Chloroform	0.37	0.0046	U	0.0046	U	0.025	U
Chloromethane	NA	0.015	U	0.015	U	0.082	U
cis-1,2-Dichloroethene	0.25	0.088	J	0.0083	J	0.016	U
cis-1,3-Dichloropropene	NA	0.003	U	0.003	U	0.016	U
Dibromochloromethane	NA	0.003	U	0.003	U	0.016	U
Dibromomethane	NA	0.03	U	0.03	U	0.16	U

Table 5-1: Phase I Soil Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

LOCATION		SS-1		SB-101 (1)		SSV-2	
SAMPLING DATE		11-OCT-11		11-OCT-11		11-OCT-11	
LAB SAMPLE ID		L1116534-07		L1116534-09		L1116534-08	
Volatile Organics	NY-UNRES	Result	Qual	Result	Qual	Result	Qual
Dichlorodifluoromethane	NA	0.03	UJ	0.03	UJ	0.16	UJ
Ethyl ether	NA	0.015	U	0.015	U	0.082	U
Ethylbenzene	1	0.003	U	0.003	U	0.016	U
Hexachlorobutadiene	NA	0.015	U	0.015	U	0.082	U
Isopropylbenzene	NA	0.003	U	0.003	U	0.016	U
Methyl tert butyl ether	0.93	0.0061	U	0.0061	U	0.033	U
Methylene chloride	0.05	0.03	U	0.03	U	0.16	U
n-Butylbenzene	12	0.003	U	0.003	U	0.016	U
n-Propylbenzene	3.9	0.003	U	0.003	U	0.016	U
Naphthalene	12	0.015	U	0.015	U	0.082	U
o-Chlorotoluene	NA	0.015	U	0.015	U	0.082	U
o-Xylene	NA	0.0061	U	0.0061	U	0.033	U
p-Chlorotoluene	NA	0.015	U	0.015	U	0.082	U
p-Isopropyltoluene	NA	0.003	U	0.003	U	0.016	U
p/m-Xylene	NA	0.0061	U	0.0061	U	0.033	U
sec-Butylbenzene	11	0.003	U	0.003	U	0.016	U
Styrene	NA	0.0061	U	0.0061	U	0.033	U
tert-Butylbenzene	5.9	0.015	U	0.015	U	0.082	U
Tetrachloroethene	1.3	0.64		0.22		1.3	
Toluene	0.7	0.0046	U	0.0046	U	0.025	U
trans-1,2-Dichloroethene	0.19	0.0024	J	0.0046	U	0.025	U
trans-1,3-Dichloropropene	NA	0.003	U	0.003	U	0.016	U
trans-1,4-Dichloro-2-butene	NA	0.015	U	0.015	U	0.082	U
Trichloroethene	0.47	0.003	U	0.003	U	0.016	U
Trichlorofluoromethane	NA	0.015	U	0.015	U	0.082	UJ
Vinyl acetate	NA	0.03	U	0.03	U	0.16	U
Vinyl chloride	0.02	0.0061	U	0.0061	U	0.033	U
Tentatively Identified Compounds (TICS)	NA			0	U		
Cyclohexane, 2-butyl-1,1,3- - TIC (14.746)		0.088	J				
Decahydro-4,4,8,9,10-pentam - TIC (16.312)		0.49	J				
Unknown - TIC (14.152)		0.052	J				
Unknown - TIC (14.419)		0.1	J				
Unknown - TIC (14.621)		0.059	J				
Unknown - TIC (14.845)		0.054	J				
Unknown - TIC (15.237)		0.34	J				
Unknown - TIC (16.018)		0.85	J				
Unknown - TIC (16.203)		0.1	J				
Unknown - TIC (16.913)		0.56	J				
Unknown - TIC (2.72)						0.052	J
Unknown - TIC (3.108)						0.042	J

Table 5-1: Phase I Soil Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

LOCATION		SS-1		SB-101 (1)		SSV-2	
SAMPLING DATE		11-OCT-11		11-OCT-11		11-OCT-11	
LAB SAMPLE ID		L1116534-07		L1116534-09		L1116534-08	
Volatile Organics	NY-UNRES	Result	Qual	Result	Qual	Result	Qual

Notes:
All results in mg/kg unless otherwise noted.
(1) - Duplicate of SS-1.
U - Compound was not detected relative to the indicated limit.
J - Estimated value.
NA - Not applicable, no criteria provided.
NY-UNRES - 6NYCRR Part 375 -Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives.
Analysis conducted by Alpha Analytical, Westborough, MA.

Table 5-1: Phase I Soil Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

LOCATION		SS-1		SB-101 (1)		SSV-2	
SAMPLING DATE		11-OCT-11		11-OCT-11		11-OCT-11	
LAB SAMPLE ID		L1116534-07		L1116534-09		L1116534-08	
Semivolatile Organics	NY-UNRES	Result	Qual	Result	Qual	Result	Qual
1,2,4,5-Tetrachlorobenzene	NA	0.2	U	0.2	U	0.22	U
1,2,4-Trichlorobenzene	NA	0.2	U	0.2	U	0.22	U
1,2-Dichlorobenzene	1.1	0.2	U	0.2	U	0.22	U
1,3-Dichlorobenzene	2.4	0.2	U	0.2	U	0.22	U
1,4-Dichlorobenzene	1.8	0.2	U	0.2	U	0.22	U
2,4,5-Trichlorophenol	NA	0.2	U	0.2	U	0.22	U
2,4,6-Trichlorophenol	NA	0.12	U	0.12	U	0.13	U
2,4-Dichlorophenol	NA	0.18	U	0.18	U	0.2	U
2,4-Dimethylphenol	NA	0.2	U	0.2	U	0.22	U
2,4-Dinitrophenol	NA	0.97	U	0.97	U	1	U
2,4-Dinitrotoluene	NA	0.2	U	0.2	U	0.22	U
2,6-Dinitrotoluene	NA	0.2	U	0.2	U	0.22	U
2-Chloronaphthalene	NA	0.2	U	0.2	U	0.22	U
2-Chlorophenol	NA	0.2	U	0.2	U	0.22	U
2-Methylnaphthalene	NA	0.24	U	0.12	J	0.26	U
2-Methylphenol	0.33	0.2	U	0.2	U	0.22	U
2-Nitroaniline	NA	0.2	U	0.2	U	0.22	U
2-Nitrophenol	NA	0.44	U	0.44	U	0.47	U
3,3'-Dichlorobenzidine	NA	0.2	U	0.2	U	0.22	U
3-Methylphenol/4-Methylphenol	0.33	0.29	U	0.29	U	0.32	U
3-Nitroaniline	NA	0.2	U	0.2	U	0.22	U
4,6-Dinitro-o-cresol	NA	0.52	U	0.52	U	0.57	U
4-Bromophenyl phenyl ether	NA	0.2	U	0.2	U	0.22	U
4-Chloroaniline	NA	0.2	U	0.2	U	0.22	U
4-Chlorophenyl phenyl ether	NA	0.2	U	0.2	U	0.22	U
4-Nitroaniline	NA	0.2	U	0.2	U	0.22	U
4-Nitrophenol	NA	0.28	U	0.28	U	0.31	U
Acenaphthene	20	0.16	U	0.16	U	0.18	U
Acenaphthylene	100	0.16	U	0.16	U	0.18	U
Acetophenone	NA	0.2	U	0.2	U	0.22	U
Anthracene	100	0.12	U	0.039	J	0.076	J
Benzo(a)anthracene	1	0.054	J	0.47	J	0.69	
Benzo(a)pyrene	1	0.1	J	0.5	J	0.62	
Benzo(b)fluoranthene	1	0.069	J	0.57	J	0.77	
Benzo(ghi)perylene	100	0.16	U	0.3		0.34	
Benzo(k)fluoranthene	0.8	0.12	U	0.16		0.25	
Benzoic Acid	NA	0.65	U	0.66	U	0.71	U
Benzyl Alcohol	NA	0.2	U	0.2	U	0.22	U
Biphenyl	NA	0.46	U	0.46	U	0.5	U
Bis(2-chloroethoxy)methane	NA	0.22	U	0.22	U	0.24	U
Bis(2-chloroethyl)ether	NA	0.18	U	0.18	U	0.2	U
Bis(2-chloroisopropyl)ether	NA	0.24	UJ	0.24	UJ	0.26	UJ
Bis(2-Ethylhexyl)phthalate	NA	0.2	U	0.2	U	0.22	U
Butyl benzyl phthalate	NA	0.2	U	0.2	U	0.22	U
Carbazole	NA	0.2	U	0.2	U	0.22	U

Table 5-1: Phase I Soil Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

LOCATION		SS-1		SB-101 (1)		SSV-2	
SAMPLING DATE		11-OCT-11		11-OCT-11		11-OCT-11	
LAB SAMPLE ID		L1116534-07		L1116534-09		L1116534-08	
Semivolatile Organics	NY-UNRES	Result	Qual	Result	Qual	Result	Qual
Chrysene	1	0.063	J	0.44		0.6	
Di-n-butylphthalate	NA	0.2	U	0.2	U	0.22	U
Di-n-octylphthalate	NA	0.2	U	0.2	U	0.22	U
Dibenzo(a,h)anthracene	0.33	0.12	U	0.081	J	0.12	J
Dibenzofuran	7	0.2	U	0.2	U	0.22	U
Diethyl phthalate	NA	0.2	U	0.2	U	0.22	U
Dimethyl phthalate	NA	0.2	U	0.2	U	0.22	U
Fluoranthene	100	0.063	J	0.52	J	1.1	
Fluorene	30	0.2	U	0.2	U	0.22	U
Hexachlorobenzene	0.33	0.12	U	0.12	U	0.13	U
Hexachlorobutadiene	NA	0.2	U	0.2	U	0.22	U
Hexachlorocyclopentadiene	NA	0.58	U	0.58	U	0.63	U
Hexachloroethane	NA	0.16	U	0.16	U	0.18	U
Indeno(1,2,3-cd)Pyrene	0.5	0.078	J	0.29	J	0.32	
Isophorone	NA	0.18	U	0.18	U	0.2	U
n-Nitrosodi-n-propylamine	NA	0.2	U	0.2	U	0.22	U
Naphthalene	12	0.2	U	0.082	J	0.22	U
Nitrobenzene	NA	0.18	U	0.18	U	0.2	U
NitrosoDiPhenylAmine(NDPA)/DPA	NA	0.16	U	0.16	U	0.18	U
P-Chloro-M-Cresol	NA	0.2	U	0.2	U	0.22	U
Pentachlorophenol	0.8	0.16	U	0.16	U	0.18	U
Phenanthrene	100	0.12	U	0.11	J	0.23	
Phenol	0.33	0.2	U	0.2	U	0.22	U
Pyrene	100	0.078	J	0.5	J	1	
Tentatively Identified Compounds (TICS)	NA						
Unknown - TIC (1.302)				0.29	J		
Unknown - TIC (1.548)				0.24	J		
Unknown - TIC (1.655)		0.63	J	0.66	J	0.38	J
Unknown - TIC (10.074)		0.17	J				
Unknown PAH - TIC (7.859)				0.16	J		

Notes:
All results in mg/kg unless otherwise noted.
(1) - Duplicate of SS-1.
U - Compound was not detected relative to the indicated limit.
J - Estimated value.
NA - Not applicable, no criteria provided.
NY-UNRES - 6NYCRR Part 375 -Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives.
Analysis conducted by Alpha Analytical, Westborough, MA.

Table 5-1: Phase I Soil Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

LOCATION		SS-1		SB-101 (1)		SSV-2	
SAMPLING DATE		11-OCT-11		11-OCT-11		11-OCT-11	
LAB SAMPLE ID		L1116534-07		L1116534-09		L1116534-08	
Polychlorinated Biphenyls	NY-UNRES	Result	Qual	Result	Qual	Result	Qual
Aroclor 1016	0.1	0.0401	U	0.0401	U	0.0436	U
Aroclor 1221	0.1	0.0401	U	0.0401	U	0.0436	U
Aroclor 1232	0.1	0.0401	U	0.0401	U	0.0436	U
Aroclor 1242	0.1	0.0401	U	0.0401	U	0.0436	U
Aroclor 1248	0.1	0.0401	U	0.0401	U	0.0436	U
Aroclor 1254	0.1	0.0401	U	0.0401	U	0.0436	U
Aroclor 1260	0.1	0.0401	U	0.0401	U	0.0436	U

Notes:
All results in mg/kg unless otherwise noted.
(1) - Duplicate of SS-1.
U - Compound was not detected relative to the indicated limit.
J - Estimated value.
NA - Not applicable, no criteria provided.
NY-UNRES - 6NYCRR Part 375 -Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives.
Analysis conducted by Alpha Analytical, Westborough, MA.

Table 5-1: Phase I Soil Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsda
BCA Site #C360111

LOCATION		SS-1		SB-101 (1)		SSV-2	
SAMPLING DATE		11-OCT-11		11-OCT-11		11-OCT-11	
LAB SAMPLE ID		L1116534-07		L1116534-09		L1116534-08	
Organochlorine Pesticides	NY-UNRES	Result	Qual	Result	Qual	Result	Qual
4,4'-DDD	0.0033	0.0104		0.0246		0.0134	
4,4'-DDE	0.0033	0.011		0.00741		0.0194	
4,4'-DDT	0.0033	0.0186		0.00994		0.0141	
Aldrin	0.005	0.00192	U	0.00193	U	0.00205	U
Alpha-BHC	0.02	0.000802	U	0.000805	U	0.000854	U
Beta-BHC	0.036	0.00192	U	0.00193	U	0.00205	U
Chlordane	NA	0.0156	U	0.0157	U	0.0166	U
Delta-BHC	0.04	0.00192	U	0.00193	U	0.00205	U
Dieldrin	0.005	0.0012	U	0.00121	U	0.00128	U
Endosulfan I	2.4	0.00192	U	0.00193	U	0.00205	U
Endosulfan II	2.4	0.00192	U	0.00193	U	0.00205	U
Endosulfan sulfate	2.4	0.00122	J	0.000805	U	0.000854	U
Endrin	0.014	0.000914	J	0.000805	U	0.000854	U
Endrin ketone	NA	0.00192	U	0.00193	U	0.00205	U
Heptachlor	0.042	0.000962	U	0.000966	U	0.00102	U
Heptachlor epoxide	NA	0.00186	J	0.00362	U	0.00384	U
Lindane	0.1	0.000802	U	0.000805	U	0.000854	U
Methoxychlor	NA	0.00361	U	0.00362	U	0.00384	U
Toxaphene	NA	0.0361	U	0.0362	U	0.0384	U
trans-Chlordane	NA	0.0024	U	0.00241	U	0.00256	U

Notes:
All results in mg/kg unless otherwise noted.
(1) - Duplicate of SS-1.
U - Compound was not detected relative to the indicated limit.
J - Estimated value.
NA - Not applicable, no criteria provided.
NY-UNRES - 6NYCRR Part 375 -Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives.
Analysis conducted by Alpha Analytical, Westborough, MA.

Table 5-2: Phase I Soil Sampling Results - NY-RES/COM Evaluation

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsda
BCA Site #C360111

LOCATION		SS-1		SB-101 (1)		SSV-2	
SAMPLING DATE		11-OCT-11		11-OCT-11		11-OCT-11	
LAB SAMPLE ID		L1116534-07		L1116534-09		L1116534-08	
Total Metals	**NY-RES/COM**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Mercury, Total	2.8	0.35	J	0.32	J	0.36	J
Zinc, Total	10000	120		150		180	
Organochlorine Pesticides	**NY-RES/COM**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
4,4'-DDD	92	0.0104		0.0246		0.0134	
4,4'-DDE	62	0.011		0.00741		0.0194	
4,4'-DDT	47	0.0186		0.00994		0.0141	

Notes:
All results in mg/kg unless otherwise noted.
(1) - Duplicate of SS-1.
U - Compound was not detected relative to the indicated limit.
J - Estimated value.
NA - Not applicable, no criteria provided.
NY-RES/COM - 6NYCRR Part 375 -Table 375-6.8(b): Restricted Commercial Use Soil Cleanup Objectives.
Analysis conducted by Alpha Analytical, Westborough, MA.

Table 5-3: Phase II Soil Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

LOCATION		MW-2D@9-11 FBG		MW-2D@19-21 FBG		DUPLICATE (1)	
SAMPLING DATE		29-JAN-13		29-JAN-13		29-JAN-13	
LAB SAMPLE ID		L1301716-03		L1301716-02		L1301716-04	
Volatile Organics	NY-UNRES	Result	Qual	Result	Qual	Result	Qual
1,1,1,2-Tetrachloroethane	NA	0.00096	U	0.001	U	0.0011	U
1,1,1-Trichloroethane	0.68	0.00096	U	0.001	U	0.0011	U
1,1,2,2-Tetrachloroethane	NA	0.00096	U	0.001	U	0.0011	U
1,1,2-Trichloroethane	NA	0.0014	U	0.0015	U	0.0017	U
1,1-Dichloroethane	0.27	0.0014	U	0.0015	U	0.0017	U
1,1-Dichloroethene	0.33	0.00096	U	0.001	U	0.0011	U
1,1-Dichloropropene	NA	0.0048	U	0.0051	U	0.0056	U
1,2,3-Trichlorobenzene	NA	0.0048	U	0.0051	U	0.0056	U
1,2,3-Trichloropropane	NA	0.0096	U	0.01	U	0.011	U
1,2,4,5-Tetramethylbenzene	NA	0.0038	U	0.004	U	0.0045	U
1,2,4-Trichlorobenzene	NA	0.0048	U	0.0051	U	0.0056	U
1,2,4-Trimethylbenzene	3.6	0.0048	U	0.0051	U	0.0056	U
1,2-Dibromo-3-chloropropane	NA	0.0048	UJ	0.0051	UJ	0.0056	UJ
1,2-Dibromoethane	NA	0.0038	U	0.004	U	0.0045	U
1,2-Dichlorobenzene	1.1	0.0048	U	0.0051	U	0.0056	U
1,2-Dichloroethane	0.02	0.00096	U	0.001	U	0.0011	U
1,2-Dichloropropane	NA	0.0034	U	0.0035	U	0.0039	U
1,3,5-Trimethylbenzene	8.4	0.0048	U	0.0051	U	0.0056	U
1,3-Dichlorobenzene	2.4	0.0048	U	0.0051	U	0.0056	U
1,3-Dichloropropane	NA	0.0048	U	0.0051	U	0.0056	U
1,4-Dichlorobenzene	1.8	0.0048	U	0.0051	U	0.0056	U
1,4-Diethylbenzene	NA	0.0038	UJ	0.004	UJ	0.0045	UJ
1,4-Dioxane	0.1	0.096	UR	0.1	UR	0.11	UR
2,2-Dichloropropane	NA	0.0048	U	0.0051	U	0.0056	U
2-Butanone	0.12	0.0096	UJ	0.01	UJ	0.011	UJ
2-Hexanone	NA	0.0096	UJ	0.01	UJ	0.011	UJ
4-Ethyltoluene	NA	0.0038	U	0.004	U	0.0045	U
4-Methyl-2-pentanone	NA	0.0035	J	0.01	UJ	0.011	UJ
Acetone	0.05	0.0063	J	0.01	UR	0.011	UR
Acrylonitrile	NA	0.0096	UJ	0.01	UJ	0.011	UJ
Benzene	0.06	0.00096	U	0.001	U	0.0011	U
Bromobenzene	NA	0.0048	U	0.0051	U	0.0056	U
Bromochloromethane	NA	0.0048	U	0.0051	U	0.0056	U
Bromodichloromethane	NA	0.00096	U	0.001	U	0.0011	U
Bromoform	NA	0.0038	U	0.004	U	0.0045	U
Bromomethane	NA	0.0019	U	0.002	U	0.0022	U
Carbon disulfide	NA	0.0096	U	0.01	U	0.011	U
Carbon tetrachloride	0.76	0.00096	U	0.001	U	0.0011	U
Chlorobenzene	1.1	0.00096	U	0.001	U	0.0011	U
Chloroethane	NA	0.0019	U	0.002	U	0.0022	U
Chloroform	0.37	0.0014	U	0.0015	U	0.0017	U
Chloromethane	NA	0.0048	U	0.0051	U	0.0056	U

Table 5-3: Phase II Soil Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

LOCATION		MW-2D@9-11 FBG		MW-2D@19-21 FBG		DUPLICATE (1)	
SAMPLING DATE		29-JAN-13		29-JAN-13		29-JAN-13	
LAB SAMPLE ID		L1301716-03		L1301716-02		L1301716-04	
Volatile Organics	NY-UNRES	Result	Qual	Result	Qual	Result	Qual
cis-1,2-Dichloroethene	0.25	0.00061		0.009		0.0032	
cis-1,3-Dichloropropene	NA	0.00096	U	0.001	U	0.0011	U
Dibromochloromethane	NA	0.00096	U	0.001	U	0.0011	U
Dibromomethane	NA	0.0096	U	0.01	U	0.011	U
Dichlorodifluoromethane	NA	0.0096	U	0.01	U	0.011	U
Ethyl ether	NA	0.0048	UJ	0.0051	U	0.0056	U
Ethylbenzene	1	0.00096	U	0.001	U	0.0011	U
Hexachlorobutadiene	NA	0.0048	U	0.0051	U	0.0056	U
Isopropylbenzene	NA	0.00096	U	0.001	U	0.0011	U
Methyl tert butyl ether	0.93	0.0019	U	0.002	U	0.0022	U
Methylene chloride	0.05	0.0096	U	0.01	U	0.011	U
n-Butylbenzene	12	0.00096	U	0.001	U	0.0011	U
n-Propylbenzene	3.9	0.00096	U	0.001	U	0.0011	U
Naphthalene	12	0.0048	U	0.0051	U	0.0056	U
o-Chlorotoluene	NA	0.0048	U	0.0051	U	0.0056	U
o-Xylene	NA	0.0019	U	0.002	U	0.0022	U
p-Chlorotoluene	NA	0.0048	U	0.0051	U	0.0056	U
p-Isopropyltoluene	NA	0.00096	U	0.001	U	0.0011	U
p/m-Xylene	NA	0.0019	U	0.002	U	0.0022	U
sec-Butylbenzene	11	0.00096	U	0.001	U	0.0011	U
Styrene	NA	0.0019	U	0.002	U	0.0022	U
tert-Butylbenzene	5.9	0.0048	U	0.0051	U	0.0056	U
Tetrachloroethene	1.3	0.00068		0.0059		0.0035	
Toluene	0.7	0.0014	U	0.0015	U	0.0017	U
trans-1,2-Dichloroethene	0.19	0.0014	U	0.0015	U	0.0017	U
trans-1,3-Dichloropropene	NA	0.00096	U	0.001	U	0.0011	U
trans-1,4-Dichloro-2-butene	NA	0.0048	UJ	0.0051	U	0.0056	U
Trichloroethene	0.47	0.00096	U	0.002		0.00077	
Trichlorofluoromethane	NA	0.0048	U	0.0051	U	0.0056	U
Vinyl acetate	NA	0.0096	UJ	0.01	UJ	0.011	UJ
Vinyl chloride	0.02	0.0019	U	0.002	U	0.0022	U
Tentatively Identified Compounds	NA	0	U	0	U		
Unknown - TIC (7.887)	NA					0.0043	J

Notes:
(1) - Duplicate of MW-2D@19-21 FBG
NY-UNRES - 6NYCRR Part 375 -Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives.
Soil and NY-UNRES results in mg/kg. Blank results in ug/l.
NA - Not applicable, no criteria provided.
U - Compound was not detected relative to the indicated limit.
J - Estimated value.
R - Sample result was rejected based on validation.
Analysis conducted by Alpha Analytical, Westborough, MA.

Table 5-4: Phase I Groundwater Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

LOCATION		MW-2		MW-101 (1)		MW-3		MW-7	
SAMPLING DATE		11-OCT-11		11-OCT-11		11-OCT-11		11-OCT-11	
LAB SAMPLE ID		L1116534-01		L1116534-04		L1116534-02		L1116534-03	
Total Metals	NY-AWQS	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Aluminum, Total	NA	290		240		5400		1400	
Arsenic, Total	25	2	U	2	J	7	U	2	U
Barium, Total	1000	83		117		144		184	
Cadmium, Total	5	1	U	1	U	1	U	1	U
Calcium, Total	NA	63000		87000		110000		100000	
Chromium, Total	50	2	U	2	U	10		4	J
Cobalt, Total	NA	2	U	2	U	3	J	2	J
Copper, Total	200	7	J	5	U	27		6	J
Iron, Total	300	4100		6500		10000		1800	
Lead, Total	25	4	J	4	J	144		5	J
Magnesium, Total	35000	7300		10000		12000		36000	
Manganese, Total	300	617		900		901		183	
Mercury, Total	0.7	0.1	U	0.1	U	0.1	U	0.1	U
Nickel, Total	100	3	U	3	U	10	J	3	J
Potassium, Total	NA	5200		7300		11000		5700	
Selenium, Total	10	3	U	3	U	3	U	3	U
Silver, Total	50	2	U	2	U	2	U	2	U
Sodium, Total	20000	48000		68000		43000		98000	
Vanadium, Total	NA	2	U	2	U	13		3	J
Zinc, Total	2000	210		216		119		15	J

Notes:
All results in ug/l.
(1) - Duplicate of MW-2.
U - Compound was not detected relative to the indicated limit.
J - Estimated value.
NA - Not applicable, no criteria provided.
NY-AWQS - New York State Ambient Water Quality Standard, TOGS 1.1.1.
Analysis conducted by Alpha Analytical, Westborough, MA.

Table 5-4: Phase I Groundwater Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

LOCATION		MW-2		MW-101 (1)		MW-3		MW-7	
SAMPLING DATE		11-OCT-11		11-OCT-11		11-OCT-11		11-OCT-11	
LAB SAMPLE ID		L1116534-01		L1116534-04		L1116534-02		L1116534-03	
Volatile Organics	NY-AWQS	Result	Qual	Result	Qual	Result	Qual	Result	Qual
1,1,1,2-Tetrachloroethane	5	25	U	200	U	0.5	U	0.5	U
1,1,1-Trichloroethane	5	25	U	200	U	0.5	U	0.5	U
1,1,2,2-Tetrachloroethane	5	25	U	200	U	0.5	U	0.5	U
1,1,2-Trichloroethane	1	38	U	300	U	0.75	U	0.75	U
1,1-Dichloroethane	5	38	U	300	U	0.75	U	0.75	U
1,1-Dichloroethene	5	25	U	200	U	0.5	U	0.22	J
1,1-Dichloropropene	5	120	U	1000	U	2.5	U	2.5	U
1,2,3-Trichlorobenzene	5	120	U	1000	U	2.5	U	2.5	U
1,2,3-Trichloropropane	0.04	250	U	2000	U	5	U	5	U
1,2,4,5-Tetramethylbenzene	NA	100	U	800	U	3		2	U
1,2,4-Trichlorobenzene	5	120	UJ	1000	UJ	2.5	UJ	2.5	UJ
1,2,4-Trimethylbenzene	5	120	U	1000	U	2.5	U	2.5	U
1,2-Dibromo-3-chloropropane	0.04	120	U	1000	U	2.5	U	2.5	U
1,2-Dibromoethane	0.0006	100	U	800	U	2	U	2	U
1,2-Dichlorobenzene	3	120	U	1000	U	2.5	U	2.5	U
1,2-Dichloroethane	0.6	25	U	200	U	0.5	U	0.5	U
1,2-Dichloropropane	1	88	U	700	U	1.8	U	1.8	U
1,3,5-Trimethylbenzene	5	120	U	1000	U	2.5	U	2.5	U
1,3-Dichlorobenzene	3	120	U	1000	U	2.5	U	2.5	U
1,3-Dichloropropane	5	120	U	1000	U	2.5	U	2.5	U
1,4-Dichlorobenzene	3	120	U	1000	U	2.5	U	2.5	U
1,4-Diethylbenzene	NA	100	U	800	U	13		0.34	J
2,2-Dichloropropane	5	120	U	1000	U	2.5	U	2.5	U
2-Butanone	50	250	U	2000	U	5	U	5	U
2-Hexanone	50	250	U	2000	U	5	U	5	U
4-Ethyltoluene	NA	100	U	800	U	2	U	2	U
4-Methyl-2-pentanone	NA	250	U	2000	U	5	U	5	U
Acetone	50	250	U	2000	U	5	U	5	U
Acrylonitrile	5	250	U	2000	U	5	U	5	U
Benzene	1	25	U	200	U	0.36	J	0.5	U
Bromobenzene	5	120	U	1000	U	2.5	U	2.5	U
Bromochloromethane	5	120	U	1000	U	2.5	U	2.5	U
Bromodichloromethane	50	25	U	200	U	0.5	U	0.5	U
Bromoform	50	100	U	800	U	2	U	2	U
Bromomethane	5	50	UJ	400	UJ	1	UJ	1	UJ
Carbon disulfide	60	250	U	2000	U	5	U	5	U
Carbon tetrachloride	5	25	U	200	U	0.5	U	0.5	U
Chlorobenzene	5	25	U	200	U	0.5	U	0.5	U
Chloroethane	5	50	U	400	U	1	U	1	U
Chloroform	7	33	U	300	U	0.75	U	0.75	U
Chloromethane	NA	120	UJ	1000	UJ	2.5	UJ	2.5	UJ
cis-1,2-Dichloroethene	5	910	J	5500	J	9.9		160	
cis-1,3-Dichloropropene	0.4	25	U	200	U	0.5	U	0.5	U
Dibromochloromethane	50	25	U	200	U	0.5	U	0.5	U
Dibromomethane	5	250	U	2000	U	5	U	5	U
Dichlorodifluoromethane	5	250	UJ	2000	UJ	5	UJ	5	UJ
Ethyl ether	NA	120	U	1000	U	2.5	U	2.5	U
Ethylbenzene	5	25	U	200	U	0.5	U	0.5	U
Hexachlorobutadiene	0.5	30	U	240	U	0.6	U	0.6	U
Isopropylbenzene	5	25	U	200	U	2.4		0.5	U
Methyl tert butyl ether	10	50	U	400	U	1	U	1	U
Methylene chloride	5	250	U	2000	U	5	U	5	U
n-Butylbenzene	5	25	U	200	U	2.6		0.5	U
n-Propylbenzene	5	25	U	200	U	2.8		0.5	U
Naphthalene	10	120	U	1000	U	3.8		2.5	U
o-Chlorotoluene	5	120	U	1000	U	2.5	U	2.5	U

Table 5-4: Phase I Groundwater Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

LOCATION		MW-2		MW-101 (1)		MW-3		MW-7	
SAMPLING DATE		11-OCT-11		11-OCT-11		11-OCT-11		11-OCT-11	
LAB SAMPLE ID		L1116534-01		L1116534-04		L1116534-02		L1116534-03	
Volatile Organics	NY-AWQS	Result	Qual	Result	Qual	Result	Qual	Result	Qual
o-Xylene	5	50	U	400	U	1	U	1	U
p-Chlorotoluene	5	120	U	1000	U	2.5	U	2.5	U
p-Isopropyltoluene	5	25	U	200	U	0.5	U	0.5	U
p/m-Xylene	5	50	U	400	U	1	U	1	U
sec-Butylbenzene	5	25	U	200	U	4.4		0.5	U
Styrene	5	50	U	400	U	1	U	1	U
tert-Butylbenzene	5	120	U	1000	U	0.38	J	2.5	U
Tetrachloroethene	5	2300	J	13000	J	3.8		98	
Toluene	5	38	U	300	U	0.75	U	0.75	U
trans-1,2-Dichloroethene	5	38	U	300	U	0.39	J	1.2	
trans-1,3-Dichloropropene	0.4	25	U	200	U	0.5	U	0.5	U
trans-1,4-Dichloro-2-butene	5	120	U	1000	U	2.5	U	2.5	U
Trichloroethene	5	860	J	4800	J	2		20	
Trichlorofluoromethane	5	120	U	1000	U	2.5	U	2.5	U
Vinyl acetate	NA	250	U	2000	U	5	U	5	U
Vinyl chloride	2	100	J	580	J	3.2		0.26	J
Tentatively Identified Compounds (TICS)	NA	0	U	0	U				
Naphthalene, 1-methyl- - TIC (21.739)	NA							1.3	J
Unknown - TIC (16.234)	NA					14	J		
Unknown - TIC (17.112)	NA					19	J		
Unknown - TIC (18.138)	NA					14	J		
Unknown - TIC (18.422)	NA					20	J		
Unknown - TIC (19.164)	NA					14	J		
Unknown - TIC (19.617)	NA					15	J		
Unknown - TIC (20.086)	NA					14	J		
Unknown - TIC (20.517)	NA					13	J		
Unknown - TIC (21.117)	NA					10	J		
Unknown - TIC (21.739)	NA					12	J		

Notes:
All results in ug/l.
(1) - Duplicate of MW-2.
U - Compound was not detected relative to the indicated limit.
J - Estimated value.
NA - Not applicable, no criteria provided.
NY-AWQS - New York State Ambient Water Quality Standard, TOGS 1.1.1.
Analysis conducted by Alpha Analytical, Westborough, MA.

Table 5-4: Phase I Groundwater Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

LOCATION		MW-2		MW-101 (1)		MW-3		MW-7	
SAMPLING DATE		11-OCT-11		11-OCT-11		11-OCT-11		11-OCT-11	
LAB SAMPLE ID		L1116534-01		L1116534-04		L1116534-02		L1116534-03	
Semivolatile Organics	NY-AWQS	Result	Qual	Result	Qual	Result	Qual	Result	Qual
1,2,4,5-Tetrachlorobenzene	5	10	U	10	U	10	U	10	U
1,2,4-Trichlorobenzene	5	5	U	5	U	5	U	5	U
1,2-Dichlorobenzene	3	2.8		2	U	2	U	2	U
1,3-Dichlorobenzene	3	2	U	2	U	2	U	2	U
1,4-Dichlorobenzene	3	2	U	2	U	2	U	2	U
2,4,5-Trichlorophenol	NA	5	U	5	U	5	U	5	U
2,4,6-Trichlorophenol	NA	5	U	5	U	5	U	5	U
2,4-Dichlorophenol	1	5	U	5	U	5	U	5	U
2,4-Dimethylphenol	50	5	U	5	U	5	U	5	U
2,4-Dinitrophenol	10	20	U	20	U	20	U	20	U
2,4-Dinitrotoluene	5	5	U	5	U	5	U	5	U
2,6-Dinitrotoluene	5	5	U	5	U	5	U	5	U
2-Chlorophenol	NA	2	U	2	U	2	U	2	U
2-Methylphenol	NA	5	U	5	U	5	U	5	U
2-Nitroaniline	5	5	U	5	U	5	U	5	U
2-Nitrophenol	NA	10	U	10	U	10	U	10	U
3,3'-Dichlorobenzidine	5	5	U	5	U	5	U	5	U
3-Methylphenol/4-Methylphenol	NA	5	U	5	U	5	U	5	U
3-Nitroaniline	5	5	U	5	U	5	U	5	U
4,6-Dinitro-o-cresol	NA	10	U	10	U	10	U	10	U
4-Bromophenyl phenyl ether	NA	2	U	2	U	2	U	2	U
4-Chloroaniline	5	5	U	5	U	5	U	5	U
4-Chlorophenyl phenyl ether	NA	2	U	2	U	2	U	2	U
4-Nitroaniline	5	5	U	5	U	5	U	5	U
4-Nitrophenol	NA	10	U	10	U	10	U	10	U
Acetophenone	NA	5	U	5	U	5	U	5	U
Benzoic Acid	NA	50	U	50	U	50	U	50	U
Benzyl Alcohol	NA	2	U	2	U	2	U	2	U
Biphenyl	NA	2	U	2	U	2	U	2	U
Bis(2-chloroethoxy)methane	5	5	U	5	U	5	U	5	U
Bis(2-chloroethyl)ether	1	2	U	2	U	2	U	2	U
Bis(2-chloroisopropyl)ether	5	2	U	2	U	2	U	2	U
Bis(2-Ethylhexyl)phthalate	5	3	U	1.6	J	3	U	3	U
Butyl benzyl phthalate	50	5	U	5	U	5	U	5	U
Carbazole	NA	2	U	2	U	2	U	2	U
Di-n-butylphthalate	50	5	U	5	U	5	U	5	U
Di-n-octylphthalate	50	5	U	5	U	5	U	5	U
Dibenzofuran	NA	2	U	2	U	2	U	2	U
Diethyl phthalate	50	1.4	J	5	U	5	U	5	U
Dimethyl phthalate	50	5	U	5	U	5	U	5	U
Hexachlorocyclopentadiene	5	20	U	20	U	20	U	20	U
Isophorone	50	5	U	5		5	U	5	U
n-Nitrosodi-n-propylamine	NA	5	U	5	U	5	U	5	U
Nitrobenzene	0.4	2	U	2	U	2	U	2	U
NitrosoDiPhenylAmine(NDPA)/DPA	50	2	U	2	U	2	U	2	U
P-Chloro-M-Cresol	NA	2	U	2	U	2	U	2	U
Phenol	1	5	U	5	U	5	U	5	U
2-Chloronaphthalene	10	0.2	U	0.2	U	0.2	U	0.2	U
2-Methylnaphthalene	NA	0.09	J	0.2	U	0.77		0.2	U
Acenaphthene	20	0.1	J	0.2	U	3		0.2	U
Acenaphthylene	NA	0.2	U	0.2	U	0.2	U	0.2	U
Anthracene	50	0.2	U	0.2	U	0.5		0.2	U
Benzo(a)anthracene	NA	0.2	U	0.2	U	0.24		0.2	U
Benzo(a)pyrene	NA	0.2	U	0.2	U	0.24		0.2	U
Benzo(b)fluoranthene	0.002	0.2	U	0.2	U	0.3		0.2	U
Benzo(ghi)perylene	NA	0.2	U	0.2	U	0.14	J	0.2	U

Table 5-4: Phase I Groundwater Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

LOCATION		MW-2		MW-101 (1)		MW-3		MW-7	
SAMPLING DATE		11-OCT-11		11-OCT-11		11-OCT-11		11-OCT-11	
LAB SAMPLE ID		L1116534-01		L1116534-04		L1116534-02		L1116534-03	
Semivolatile Organics	NY-AWQS	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Benzo(k)fluoranthene	0.002	0.2	U	0.2	U	0.18	J	0.2	U
Chrysene	0.002	0.2	U	0.2	U	0.25		0.2	U
Dibenzo(a,h)anthracene	NA	0.2	U	0.2	U	0.2	U	0.2	U
Fluoranthene	50	0.2	U	0.2	U	0.73		0.2	U
Fluorene	50	0.08	J	0.2	U	4.2		0.2	U
Hexachlorobenzene	0.04	0.8	U	0.8	U	0.8	U	0.8	U
Hexachlorobutadiene	0.5	0.5	U	0.5	U	0.5	U	0.5	U
Hexachloroethane	5	0.8		0.8		0.8	U	0.8	U
Indeno(1,2,3-cd)Pyrene	0.002	0.2	U	0.2	U	0.2	U	0.2	U
Naphthalene	10	0.22		0.2	U	0.62		0.2	U
Pentachlorophenol	1	0.8	U	0.8	U	0.8	U	0.8	U
Phenanthrene	50	0.2	U	0.2	U	2.5		0.2	U
Pyrene	50	0.2	U	0.2		1.4		0.2	U
Tentatively Identified Compounds (TICS)	NA	0	U					0	U
Unknown - TIC (2.397)	NA			18	J	22	J		
Unknown - TIC (2.637)	NA		U	18	J	21	J		
Unknown - TIC (5.613)	NA					15	J		
Unknown - TIC (7.392)	NA					14	J		
Unknown - TIC (8.3)	NA					8.2	J		
Unknown Alkane - TIC (7.99)	NA					11	J		
Unknown C13H12 Isomer - TIC (7.247)	NA					18	J		
Unknown C13H14 Isomer - TIC (6.943)	NA					9.6	J		
Unknown C13H14 Isomer - TIC (7.007)	NA					8.5	J		
Unknown C15H28 - TIC (6.473)	NA					8.2	J		
Unknown Subsituted Alkane - TIC (7.349)	NA					17	J		
Unknown Subsituted Alkane - TIC (7.584)	NA					26	J		
Unknown Subsituted Naphthalene - TIC (5.901)	NA					21	J		
Unknown Subsituted Naphthalene - TIC (6.366)	NA					8.3	J		
Unknown Subsituted Naphthalene - TIC (6.43)	NA					14	J		
Unknown Subsituted Naphthalene - TIC (6.451)	NA					10	J		
Unknown Subsituted Naphthalene - TIC (6.531)	NA					27	J		
Unknown Subsituted Naphthalene - TIC (6.601)	NA					9.1	J		
Unknown Subsituted Naphthalene - TIC (6.82)	NA					8.1	J		
Unknown Subsituted Naphthalene - TIC (7.082)	NA					8	J		

Notes:
All results in ug/l.
(1) - Duplicate of MW-2.
U - Compound was not detected relative to the indicated limit.
J - Estimated value.
NA - Not applicable, no criteria provided.
NY-AWQS - New York State Ambient Water Quality Standard, TOGS 1.1.1.
Analysis conducted by Alpha Analytical, Westborough, MA.

Table 5-4: Phase I Groundwater Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

LOCATION		MW-2		MW-101 (1)		MW-3		MW-7	
SAMPLING DATE		11-OCT-11		11-OCT-11		11-OCT-11		11-OCT-11	
LAB SAMPLE ID		L1116534-01		L1116534-04		L1116534-02		L1116534-03	
Polychlorinated Biphenyls	NY-AWQS	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Aroclor 1016	0.09	0.083	U	0.083	U	0.083	U	0.083	U
Aroclor 1221	0.09	0.083	U	0.083	U	0.083	U	0.083	U
Aroclor 1232	0.09	0.083	U	0.083	U	0.083	U	0.083	U
Aroclor 1242	0.09	0.083	U	0.083	U	0.083	U	0.083	U
Aroclor 1248	0.09	0.083	U	0.083	U	0.083	U	0.083	U
Aroclor 1254	0.09	0.083	U	0.083	U	0.083	U	0.083	U
Aroclor 1260	0.09	0.083	U	0.083	U	0.083	U	0.083	U

Notes:
All results in ug/l.
(1) - Duplicate of MW-2.
U - Compound was not detected relative to the indicated limit.
J - Estimated value.
NA - Not applicable, no criteria provided.
NY-AWQS - New York State Ambient Water Quality Standard, TOGS 1.1.1.
Analysis conducted by Alpha Analytical, Westborough, MA.

Table 5-4: Phase I Groundwater Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

LOCATION		MW-2		MW-101 (1)		MW-3		MW-7	
SAMPLING DATE		11-OCT-11		11-OCT-11		11-OCT-11		11-OCT-11	
LAB SAMPLE ID		L1116534-01		L1116534-04		L1116534-02		L1116534-03	
Organochlorine Pesticides	NY-AWQS	Result	Qual	Result	Qual	Result	Qual	Result	Qual
4,4'-DDD	0.3	0.04	U	0.01	J	0.054		0.009	J
4,4'-DDE	0.2	0.04	U	0.04	U	0.04	U	0.041	U
4,4'-DDT	0.2	0.04	U	0.04	U	0.04	U	0.01	J
Aldrin	NA	0.02	U	0.02	U	0.02	U	0.02	U
Alpha-BHC	0.01	0.02	U	0.02	U	0.02	U	0.02	U
Beta-BHC	0.04	0.02	U	0.02	U	0.02	U	0.02	U
Chlordane	0.05	0.2	U	0.2	U	0.2	U	0.204	U
Delta-BHC	0.04	0.02	U	0.02	U	0.02	U	0.02	U
Dieldrin	0.004	0.04	U	0.04	U	0.04	U	0.041	U
Endosulfan I	NA	0.02	U	0.02	U	0.02	U	0.02	U
Endosulfan II	NA	0.04	U	0.04	U	0.04	U	0.041	U
Endosulfan sulfate	NA	0.04	U	0.04	U	0.04	U	0.041	U
Endrin	NA	0.04	U	0.04	U	0.04	U	0.041	U
Endrin ketone	5	0.04	U	0.04	U	0.04	U	0.041	U
Heptachlor	0.04	0.02	U	0.02	U	0.02	U	0.02	U
Heptachlor epoxide	0.03	0.02	U	0.02	U	0.02	U	0.02	U
Lindane	0.05	0.02	U	0.02	U	0.02	U	0.02	U
Methoxychlor	35	0.2	U	0.012	J	0.2	U	0.014	J
Toxaphene	0.06	0.2	U	0.2	U	0.2	U	0.204	U
trans-Chlordane	NA	0.02	U	0.02	U	0.02	U	0.02	U

Notes:
All results in ug/l.
(1) - Duplicate of MW-2.
U - Compound was not detected relative to the indicated limit.
J - Estimated value.
NA - Not applicable, no criteria provided.
NY-AWQS - New York State Ambient Water Quality Standard, TOGS 1.1.1.
Analysis conducted by Alpha Analytical, Westborough, MA.

Table 5-5: Phase II Groundwater Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

WELL DESIGNATION		MW-1		DUPLICATE (1)		MW-2		MW-2D		MW-4	
SAMPLING DATE		27-FEB-13		27-FEB-13		27-FEB-13		27-FEB-13		27-FEB-13	
LAB SAMPLE ID		L1303352-01		L1303352-07		L1303352-02		L1303352-03		L1303352-04	
Volatile Organics	NY-AWQS	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
1,1,1,2-Tetrachloroethane	5	12	U	12	U	620	U	25	U	2.5	U
1,1,1-Trichloroethane	5	12	U	12	U	620	U	25	U	2.5	U
1,1,2,2-Tetrachloroethane	5	2.5	U	2.5	U	120	U	5	U	0.5	U
1,1,2-Trichloroethane	1	7.5	U	7.5	U	380	U	15	U	1.5	U
1,1-Dichloroethane	5	12	U	12	U	620	U	25	U	2.5	U
1,1-Dichloroethene	5	2.5	U	2.5	U	120	U	5	U	0.5	U
1,1-Dichloropropene	5	12	U	12	U	620	U	25	U	2.5	U
1,2,3-Trichlorobenzene	5	12	U	12	U	620	U	25	U	2.5	U
1,2,3-Trichloropropane	0.04	12	UJ	12	UJ	620	UJ	25	UJ	2.5	UJ
1,2,4,5-Tetramethylbenzene	NA	10	U	10	U	500	U	20	U	2	U
1,2,4-Trichlorobenzene	5	12	U	12	U	620	U	25	U	2.5	U
1,2,4-Trimethylbenzene	5	3.6		12	U	620	U	25	U	2.5	U
1,2-Dibromo-3-chloropropane	0.04	12	UJ	12	UJ	620	UJ	25	UJ	2.5	UJ
1,2-Dibromoethane	0.0006	10	U	10	U	500	U	20	U	2	U
1,2-Dichlorobenzene	3	12	U	12	U	620	U	25	U	2.5	U
1,2-Dichloroethane	0.6	2.5	U	2.5	U	120	U	5	U	0.5	U
1,2-Dichloropropane	1	5	U	5	U	250	U	10	U	1	U
1,3,5-Trimethylbenzene	5	12	U	12	U	620	U	25	U	2.5	U
1,3-Dichlorobenzene	3	12	U	12	U	620	U	25	U	2.5	U
1,3-Dichloropropane	5	12	U	12	U	620	U	25	U	2.5	U
1,4-Dichlorobenzene	3	12	U	12	U	620	U	25	U	2.5	U
1,4-Diethylbenzene	NA	10	U	10	U	500	U	20	U	2	U
1,4-Dioxane	NA	1200	UR	1200	UR	62000	UR	2500	UR	250	UR
2,2-Dichloropropane	5	12	U	12	U	620	U	25	U	2.5	U
2-Butanone	50	25	U	25	U	1200	U	50	U	5	U
2-Hexanone	50	25	U	25	U	1200	U	50	U	5	U
4-Ethyltoluene	NA	10	U	10	U	500	U	20	U	2	U
4-Methyl-2-pentanone	NA	25	U	25	U	1200	U	50	U	5	U
Acetone	50	11		25	U	1200	U	50	U	5	U
Acrylonitrile	5	25	U	25	U	1200	U	50	U	5	U
Benzene	1	2.5	U	2.5	U	120	U	5	U	0.5	U
Bromobenzene	5	12	U	12	U	620	U	25	U	2.5	U
Bromochloromethane	5	12	U	12	U	620	U	25	U	2.5	U
Bromodichloromethane	50	2.5	U	2.5	U	120	U	5	U	0.5	U
Bromoform	50	10	U	10	U	500	U	20	U	2	U
Bromomethane	5	12	U	12	U	620	U	25	U	2.5	U
Carbon disulfide	60	25	U	25	U	1200	U	50	U	5	U
Carbon tetrachloride	5	2.5	U	2.5	U	120	U	5	U	0.5	U
Chlorobenzene	5	12	U	12	U	620	U	25	U	2.5	U
Chloroethane	5	12	U	12	U	620	U	25	U	2.5	U
Chloroform	7	12	U	12	U	620	U	25	U	2.5	U
Chloromethane	NA	12	U	12	U	620	U	25	U	2.5	U
cis-1,2-Dichloroethene	5	310		320		6000		800		10	
cis-1,3-Dichloropropene	0.4	2.5	U	2.5	U	120	U	5	U	0.5	U

Table 5-5: Phase II Groundwater Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

WELL DESIGNATION		MW-1		DUPLICATE (1)		MW-2		MW-2D		MW-4	
SAMPLING DATE		27-FEB-13		27-FEB-13		27-FEB-13		27-FEB-13		27-FEB-13	
LAB SAMPLE ID		L1303352-01		L1303352-07		L1303352-02		L1303352-03		L1303352-04	
Volatile Organics	NY-AWQS	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Dibromochloromethane	50	2.5	U	2.5	U	120	U	5	U	0.5	U
Dibromomethane	5	25	U	25	U	1200	U	50	U	5	U
Dichlorodifluoromethane	5	25	U	25	U	1200	U	50	U	5	U
Ethyl ether	NA	12	U	12	U	620	U	25	U	2.5	U
Ethylbenzene	5	12	U	12	U	620	U	25	U	2.5	U
Hexachlorobutadiene	0.5	12	U	12	U	620	U	25	U	2.5	U
Isopropylbenzene	5	12	U	12	U	620	U	25	U	2.5	U
Methyl tert butyl ether	10	12	U	12	U	620	U	25	U	2.5	U
Methylene chloride	5	12	U	12	U	620	U	25	U	2.5	U
n-Butylbenzene	5	12	U	12	U	620	U	25	U	2.5	U
n-Propylbenzene	5	12	U	12	U	620	U	25	U	2.5	U
Naphthalene	10	6.4		3.6		620	U	25	U	2.5	U
o-Chlorotoluene	5	12	U	12	U	620	U	25	U	2.5	U
o-Xylene	5	12	U	12	U	620	U	25	U	2.5	U
p-Chlorotoluene	5	12	U	12	U	620	U	25	U	2.5	U
p-Isopropyltoluene	5	12	U	12	U	620	U	25	U	2.5	U
p/m-Xylene	5	3.6		12	U	620	U	25	U	2.5	U
sec-Butylbenzene	5	12	U	12	U	620	U	25	U	2.5	U
Styrene	5	12	U	12	U	620	U	25	U	2.5	U
tert-Butylbenzene	5	12	U	12	U	620	U	25	U	2.5	U
Tetrachloroethene	5	170		170		13000		42		0.5	U
Toluene	5	12	U	12	U	620	U	25	U	2.5	U
trans-1,2-Dichloroethene	5	12	U	12	U	620	U	25	U	2.5	U
trans-1,3-Dichloropropene	0.4	2.5	U	2.5	U	120	U	5	U	0.5	U
trans-1,4-Dichloro-2-butene	5	12	UJ	12	UJ	620	UJ	25	UJ	2.5	UJ
Trichloroethene	5	40		41		5400		23		0.46	
Trichlorofluoromethane	5	12	U	12	U	620	U	25	U	2.5	U
Vinyl acetate	NA	25	U	25	U	1200	U	50	U	5	U
Vinyl chloride	2	57		55		470		18		0.83	
Tentatively Identified Compounds (TICS)				0	U	0	U	0	U	0	U
Unknown - TIC (17.085)											
Unknown Naphthalene - TIC (15.796)		9.1	J								
Unknown Naphthalene - TIC (15.958)		5.6	J								

Table 5-5: Phase II Groundwater Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

WELL DESIGNATION		MW-5		MW-8	
SAMPLING DATE		27-FEB-13		27-FEB-13	
LAB SAMPLE ID		L1303352-05		L1303352-06	
Volatile Organics	NY-AWQS	Result	Qual	Result	Qual
1,1,1,2-Tetrachloroethane	5	6.2	U	120	U
1,1,1-Trichloroethane	5	6.2	U	120	U
1,1,2,2-Tetrachloroethane	5	1.2	U	25	U
1,1,2-Trichloroethane	1	3.8	U	75	U
1,1-Dichloroethane	5	6.2	U	120	U
1,1-Dichloroethene	5	1.2	U	25	U
1,1-Dichloropropene	5	6.2	U	120	U
1,2,3-Trichlorobenzene	5	6.2	U	120	U
1,2,3-Trichloropropane	0.04	6.2	UJ	120	UJ
1,2,4,5-Tetramethylbenzene	NA	5	U	100	U
1,2,4-Trichlorobenzene	5	6.2	U	120	U
1,2,4-Trimethylbenzene	5	6.2	U	120	U
1,2-Dibromo-3-chloropropane	0.04	6.2	UJ	120	UJ
1,2-Dibromoethane	0.0006	5	U	100	U
1,2-Dichlorobenzene	3	6.2	U	120	U
1,2-Dichloroethane	0.6	1.2	U	25	U
1,2-Dichloropropane	1	2.5	U	50	U
1,3,5-Trimethylbenzene	5	6.2	U	120	U
1,3-Dichlorobenzene	3	6.2	U	120	U
1,3-Dichloropropane	5	6.2	U	120	U
1,4-Dichlorobenzene	3	6.2	U	120	U
1,4-Diethylbenzene	NA	5	U	100	U
1,4-Dioxane	NA	620	UR	12000	UR
2,2-Dichloropropane	5	6.2	U	120	U
2-Butanone	50	12	U	250	U
2-Hexanone	50	12	U	250	U
4-Ethyltoluene	NA	5	U	100	U
4-Methyl-2-pentanone	NA	12	U	250	U
Acetone	50	12	U	250	U
Acrylonitrile	5	12	U	250	U
Benzene	1	1.2	U	25	U
Bromobenzene	5	6.2	U	120	U
Bromochloromethane	5	6.2	U	120	U
Bromodichloromethane	50	1.2	U	25	U
Bromoform	50	5	U	100	U
Bromomethane	5	6.2	U	120	U
Carbon disulfide	60	12	U	250	U
Carbon tetrachloride	5	1.2	U	25	U
Chlorobenzene	5	6.2	U	120	U
Chloroethane	5	6.2	U	120	U
Chloroform	7	6.2	U	120	U
Chloromethane	NA	6.2	U	120	U
cis-1,2-Dichloroethene	5	60		1200	
cis-1,3-Dichloropropene	0.4	1.2	U	25	U

Table 5-5: Phase II Groundwater Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

WELL DESIGNATION		MW-5		MW-8	
SAMPLING DATE		27-FEB-13		27-FEB-13	
LAB SAMPLE ID		L1303352-05		L1303352-06	
Volatile Organics	NY-AWQS	Result	Qual	Result	Qual
Dibromochloromethane	50	1.2	U	25	U
Dibromomethane	5	12	U	250	U
Dichlorodifluoromethane	5	12	U	250	U
Ethyl ether	NA	6.2	U	120	U
Ethylbenzene	5	6.2	U	120	U
Hexachlorobutadiene	0.5	6.2	U	120	U
Isopropylbenzene	5	6.2	U	120	U
Methyl tert butyl ether	10	6.2	U	120	U
Methylene chloride	5	6.2	U	120	U
n-Butylbenzene	5	6.2	U	120	U
n-Propylbenzene	5	6.2	U	120	U
Naphthalene	10	6.2	U	120	U
o-Chlorotoluene	5	6.2	U	120	U
o-Xylene	5	6.2	U	120	U
p-Chlorotoluene	5	6.2	U	120	U
p-Isopropyltoluene	5	6.2	U	120	U
p/m-Xylene	5	6.2	U	120	U
sec-Butylbenzene	5	6.2	U	120	U
Styrene	5	6.2	U	120	U
tert-Butylbenzene	5	6.2	U	120	U
Tetrachloroethene	5	160		2000	
Toluene	5	6.2	U	120	U
trans-1,2-Dichloroethene	5	6.2	U	120	U
trans-1,3-Dichloropropene	0.4	1.2	U	25	U
trans-1,4-Dichloro-2-butene	5	6.2	UJ	120	UJ
Trichloroethene	5	24		760	
Trichlorofluoromethane	5	6.2	U	120	U
Vinyl acetate	NA	12	U	250	U
Vinyl chloride	2	0.97		230	
Tentatively Identified Compounds (TICS)		0	U	0	U
Unknown - TIC (17.085)					
Unknown Naphthalene - TIC (15.796)					
Unknown Naphthalene - TIC (15.958)					

Notes:
All results in ug/l.
(1) - Duplicate of MW-1
U - Compound was not detected relative to the indicated limit.
J - Estimated value.
R - Sample result was rejected based on validation.
NA - Not applicable, no criteria provided.
NY-AWQS - New York State Ambient Water Quality Standard, TOGS 1.1.1.
Analysis conducted by Alpha Analytical, Westborough, MA.

Table 5-6: IRM Groundwater Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

								Blind Duplicate Samples	
WELL DESIGNATION		**MW-2**		**MW-2D**		**MW-8**		**MW-100 (1)**	**MW-101 (2)**
SAMPLING DATE		**12-Nov-13**	**26-Feb-14**	**12-Nov-13**	**26-Feb-14**	**12-Nov-13**	**26-Feb-14**	**12-Nov-13**	**26-Feb-14**
LAB SAMPLE ID		**L1323002-01**	**L1404174-01**	**L1323002-02**	**L1404174-02**	**L1323002-03**	**L1404174-03**	**L1323002-03**	**L1404174-04**
Volatile Organics	**NY-AWQS**	**Result**		**Result**		**Result**		**Result**	**Result**
1,1,1,2-Tetrachloroethane	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
1,1,1-Trichloroethane	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
1,1,2,2-Tetrachloroethane	**5**	1,000 U	250 U	3 U	2 U	12 U	0.5 U	500 U	1.2 U
1,1,2-Trichloroethane	**1**	3,000 U	750 U	8 U	6 U	38 U	1.5 U	1,500 U	3.8 U
1,1-Dichloroethane	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
1,1-Dichloroethene	**5**	1,000 U	250 U	3 UJ	2 U	12 U	0.5 U	500 U	1.2 U
1,1-Dichloropropene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
1,2,3-Trichlorobenzene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
1,2,3-Trichloropropane	**0.04**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
1,2,4,5-Tetramethylbenzene	**NA**	4,000 U	1,000 U	10 U	8 U	50 U	9.9 J	2,000 U	13
1,2,4-Trichlorobenzene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
1,2,4-Trimethylbenzene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
1,2-Dibromo-3-chloropropane	**0.04**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
1,2-Dibromoethane	**0.0006**	4,000 U	1,000 U	10 U	8 U	50 U	2 U	2,000 U	5 U
1,2-Dichlorobenzene	**3**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
1,2-Dichloroethane	**0.6**	1,000 U	250 U	3 U	2 U	12 U	0.5 U	500 U	1.2 U
1,2-Dichloropropane	**1**	2,000 U	500 U	5 U	4 U	25 U	1 U	1,000 U	2.5 U
1,3,5-Trimethylbenzene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
1,3-Dichlorobenzene	**3**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
1,3-Dichloropropane	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
1,4-Dichlorobenzene	**3**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
1,4-Diethylbenzene	**NA**	4,000 U	1,000 U	10 U	8 U	50 U	1.5 J	2,000 U	5 U
1,4-Dioxane	**NA**	500,000 UJ	120,000 U	1,200 UJ	1000 U	6200 UJ	250 U	250,000 UJ	620 U
2,2-Dichloropropane	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
2-Butanone	**50**	10,000 U	1,200 J	25 U	7 J	120 U	5 U	5,000 U	12 U
2-Hexanone	**50**	10,000 U	2,500 UJ	25 U	20 UJ	120 U	5 UJ	5,000 U	12 UJ
4-Ethyltoluene	**NA**	4,000 U	1,000 U	10 U	8 U	50 U	2 U	2,000 U	5 U
4-Methyl-2-pentanone	**NA**	10,000 R	2,500 UJ	25 R	20 UJ	120 R	5 UJ	5,000 R	12 UJ
Acetone	**50**	10,000 R	2,500 U	84 R	20 U	120 R	5 U	5,000 R	12 U
Acrylonitrile	**5**	10,000 R	2,500 U	25 R	20 U	120 R	5 U	5,000 R	12 U
Benzene	**1**	1,000 U	250 U	3 U	2 U	12 U	0.5 U	500 U	1.2 U
Bromobenzene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
Bromochloromethane	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U

Table 5-6: IRM Groundwater Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

								Blind Duplicate Samples	
WELL DESIGNATION		**MW-2**		**MW-2D**		**MW-8**		**MW-100 (1)**	**MW-101 (2)**
SAMPLING DATE		**12-Nov-13**	**26-Feb-14**	**12-Nov-13**	**26-Feb-14**	**12-Nov-13**	**26-Feb-14**	**12-Nov-13**	**26-Feb-14**
LAB SAMPLE ID		**L1323002-01**	**L1404174-01**	**L1323002-02**	**L1404174-02**	**L1323002-03**	**L1404174-03**	**L1323002-03**	**L1404174-04**
Volatile Organics	**NY-AWQS**	**Result**		**Result**		**Result**		**Result**	**Result**
Bromodichloromethane	**50**	1,000 U	250 U	3 U	2 U	12 U	0.5 U	500 U	1.2 U
Bromoform	**50**	4,000 U	1,000 U	10 U	8 U	50 U	2 U	2,000 U	5 U
Bromomethane	**5**	5,000 R	1,200 U	12 R	10 U	62 R	2.5 U	2,500 R	6.2 U
Carbon disulfide	**60**	10,000 U	2,500 U	25 UJ	20 U	120 U	5 U	5,000 U	12 U
Carbon tetrachloride	**5**	1,000 U	250 U	3 U	2 U	12 U	0.5 U	500 U	1.2 U
Chlorobenzene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
Chloroethane	**5**	5,000 U	1,200 U	12 UJ	10 U	62 U	2.5 U	2,500 U	6.2 U
Chloroform	**7**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
Chloromethane	**NA**	5,000 U	1,200 U	12 UJ	10 U	62 U	2.5 U	2,500 U	6.2 U
cis-1,2-Dichloroethene	**5**	88,000	40,000	180	220	1,100	79 J	64,000	200 J
cis-1,3-Dichloropropene	**0.4**	1,000 U	250 U	2.5 U	2 U	12 U	0.5 U	500 U	1.2 U
Dibromochloromethane	**50**	1,000 U	250 U	2.5 U	2 U	12 U	0.5 U	500 U	1.2 U
Dibromomethane	**5**	10,000 U	2,500 U	25 U	20 U	120 U	5 U	5,000 U	12 U
Dichlorodifluoromethane	**5**	10,000 U	2,500 U	25 UJ	20 U	120 U	5 U	5,000 U	12 U
Ethyl ether	**NA**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
Ethylbenzene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
Hexachlorobutadiene	**0.5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
Isopropylbenzene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	1.2 J	2,500 U	6.2 U
Methyl tert butyl ether	**10**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
Methylene chloride	**5**	5,000 U	1,200 U	12 UJ	10 U	62 U	2.5 U	2,500 U	6.2 U
Naphthalene	**10**	5,000 U	1,200 UJ	12 U	10 UJ	62 U	0.99 J	2,500 U	6.2 UJ
n-Butylbenzene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
n-Propylbenzene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
o-Chlorotoluene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
o-Xylene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
p/m-Xylene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
p-Chlorotoluene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
p-Isopropyltoluene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
sec-Butylbenzene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	1.5 J	2,500 U	1.9 J
Styrene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
tert-Butylbenzene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
Tetrachloroethene	**5**	17,000	730	8.4	7.8 U	370	0.46 U	14,000	1.2 U
Toluene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
trans-1,2-Dichloroethene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
trans-1,3-Dichloropropene	**0.4**	1,000 U	250 U	2.5 U	2 U	12 U	0.5 U	500 U	1.2 U
trans-1,4-Dichloro-2-butene	**5**	5,000 U	1,200 U	12 U	10 U	62 U	2.5 U	2,500 U	6.2 U
Trichloroethene	**5**	6,700	250 U	7.2	6.6	65	0.44 J	5,000	1.2 U
Trichlorofluoromethane	**5**	5,000 U	1,200 U	12 UJ	10 U	62 U	2.5 U	2,500 U	6.2 U
Vinyl acetate	**NA**	10,000 U	2,500 U	25 U	20 U	120 U	5 U	5,000 U	12 U

Table 5-6: IRM Groundwater Sampling Results

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

								Blind Duplicate Samples	
WELL DESIGNATION		**MW-2**		**MW-2D**		**MW-8**		**MW-100 (1)**	**MW-101 (2)**
SAMPLING DATE		**12-Nov-13**	**26-Feb-14**	**12-Nov-13**	**26-Feb-14**	**12-Nov-13**	**26-Feb-14**	**12-Nov-13**	**26-Feb-14**
LAB SAMPLE ID		**L1323002-01**	**L1404174-01**	**L1323002-02**	**L1404174-02**	**L1323002-03**	**L1404174-03**	**L1323002-03**	**L1404174-04**
Volatile Organics	**NY-AWQS**	**Result**		**Result**		**Result**		**Result**	**Result**
Vinyl chloride	**2**	3,400	1,400	18 J	16	1,200	94 J	3,600	180 J

Notes:
All results in ug/l.
J - Estimated value.
U - Compound was not detected relative to the indicated limit.
R - Sample result was rejected based on validation.
(1) - Duplicate of MW-2.
(2) - Duplicate of MW-8.
NA - Not applicable, no criteria provided.
NY-AWQS - New York State Ambient Water Quality Standard, TOGS 1.1.1.
Analysis conducted by Alpha Analytical, Westborough, MA.

Table 5-7: Phase I and II Groundwater Sampling Field Parameters

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

WELL NO.		MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7
SAMPLING DATE		10/11/2011	10/11/2011	10/11/2011	10/11/2011	10/11/2011	10/11/2011	10/11/2011
FIELD PARAMETER	UNITS	RESULTS (1)						
Turbidity	NTU	NS	5	13	NS	NS	NS	9
Specific Conductance	uS/cm	NS	655	641	NS	NS	NS	1046
pH	standard units	NS	11.7	9.1	NS	NS	NS	9.1
ORP	mV	NS	-82	-90	NS	NS	NS	-102
Temperature	^{o}C	NS	22.2	20.4	NS	NS	NS	21.1
Dissolved Oxygen	mg/l	NS	1.5	0.5	NS	NS	NS	5.0

WELL NO.		MW-1	MW-2	MW-2D	MW-4	MW-5	MW-8
SAMPLING DATE		2/27/2013	2/27/2013	2/27/2013	2/27/2013	2/27/2013	2/27/2013
FIELD PARAMETER	UNITS	RESULTS (1)					
Turbidity	NTU	7	11	15	10	10	37
Specific Conductance	uS/cm	735	518	1050	1750	418	373
pH	standard units	6.8	7.2	7.3	7.0	7.0	7.4
ORP	mV	-14	78	-68	-69	-5	-93
Temperature	^{o}C	12.5	17.0	18.9	16.4	11.3	15.5
Dissolved Oxygen	mg/l	0.5	1.1	0.7	0.2	0.5	0.3

Notes:
NS - Well was not sampled.
NA - Not analyzed.
(1) - Measurements represent final set taken prior to sample collection.

Table 5-8: IRM Groundwater Sampling Field Parameters

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

WELL NO.		MW-2		
SAMPLING DATE		2/27/2013	11/12/2013	2/26/2014
FIELD PARAMETER	UNITS	Result		
Turbidity	NTU	11	28	8
Specific Conductance	uS/cm	518	2,260	953
pH	standard units	7.2	6.0	6.7
ORP	mV	78	-33	-46
Temperature	^{o}C	17.0	20.7	14.9
Dissolved Oxygen	mg/l	1.1	0.6	0.2

WELL NO.		MW-2D		
SAMPLING DATE		2/27/2013	11/12/2013	2/26/2014
FIELD PARAMETER	UNITS	Result		
Turbidity	NTU	15	NM	5
Specific Conductance	uS/cm	1,050	1,030	979
pH	standard units	7.3	7.1	7.1
ORP	mV	-68	-118	-97
Temperature	^{o}C	18.9	18.9	14.8
Dissolved Oxygen	mg/l	0.7	2.0	1.0

WELL NO.		MW-8		
SAMPLING DATE		2/27/2013	11/12/2013	2/26/2014
FIELD PARAMETER	UNITS	Result		
Turbidity	NTU	37	NM	16
Specific Conductance	uS/cm	373	340	967
pH	standard units	7.4	7.1	7.0
ORP	mV	-93	-72	-63
Temperature	^{o}C	15.5	18.8	14.6
Dissolved Oxygen	mg/l	0.3	0.9	0.4

Notes:
EHC Injections conducted on October 10, 2013.
NS - Well was not sampled.
NM - Not Measured due to instrument failure.
Measurements represent final set taken prior to sample collection.

Table 5-9: Air Testing Results - January 30, 2012

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

LOCATION	Dry Cleaner						NY Sports Club				Outdoor	
SAMPLE TYPE	Sub-Slab Soil Vapor		Indoor Air				Sub-Slab Soil Vapor		Indoor Air		Outdoor Air	
LAB SAMPLE ID	SSV-2-40938		IA-1-40938		IA-3-40938 (1)		SSV-3-40938		IA-2-40938		OA-1-40938	
ANALYTE	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Vinyl Chloride	ND	13	ND	0.35	ND	0.35	ND	2.5	ND	0.35	ND	0.35
Styrene	ND	11	ND	0.29	ND	0.29	ND	2.1	0.72	0.29	ND	0.29
Propylene	ND	4.5	ND	0.12	ND	0.12	ND	0.86	ND	0.12	ND	0.12
p-Ethyltoluene	ND	64	16	1.7	24	1.7	ND	12	2.9	1.7	2.1	1.7
p- & m- Xylenes	ND	11	1.4	0.29	1.8	0.29	17	2.2	3.7	0.29	1.2	0.29
o-Xylene	ND	11	1.1	0.29	1.5	0.29	5.6	2.2	1.4	0.29	0.56	0.29
n-Hexane	ND	9.2	1.3	0.24	ND	0.24	ND	1.8	1.3	0.24	ND	0.24
n-Heptane	ND	11	ND	0.28	ND	0.28	ND	2.0	ND	0.28	ND	0.28
Methylene chloride	ND	9.1	2.6	0.24	1.7	0.24	4.3	1.7	2.2	0.24	1.7	0.24
Vinyl bromide	ND	11	ND	0.30	ND	0.30	ND	2.2	ND	0.30	ND	0.30
Methyl tert-butyl ether (MTBE)	ND	9.4	ND	0.24	ND	0.24	ND	1.8	ND	0.24	ND	0.24
4-Methyl-2-pentanone	ND	11	ND	0.28	ND	0.28	ND	2.0	4.3	0.28	ND	0.28
Isopropanol	ND	6.4	ND	0.17	ND	0.17	ND	1.2	380	3.3	ND	0.17
Hexachlorobutadiene	ND	28	ND	0.72	ND	0.72	ND	5.3	ND	0.72	ND	0.72
Ethyl Benzene	ND	11	ND	0.29	0.47	0.29	ND	2.2	1.1	0.29	0.38	0.29
Ethyl acetate	ND	9.4	ND	0.24	ND	0.24	ND	1.8	2.0	0.24	ND	0.24
Vinyl acetate	ND	18	ND	0.48	ND	0.48	ND	3.5	ND	0.48	ND	0.48
Cyclohexane	ND	9.0	ND	0.23	ND	0.23	3.8	1.7	ND	0.23	ND	0.23
cis-1,3-Dichloropropylene	ND	12	ND	0.31	ND	0.31	ND	2.3	ND	0.31	ND	0.31
cis-1,2-Dichloroethylene	150	10	ND	0.27	ND	0.27	ND	2.0	ND	0.27	ND	0.27
Chloromethane	ND	5.4	1.4	0.14	1.6	0.14	ND	1.0	1.6	0.14	1.5	0.14
Chloroform	540	13	1.6	0.33	1.6	0.33	ND	2.4	1.6	0.33	ND	0.33
Chloroethane	ND	6.9	ND	0.18	ND	0.18	ND	1.3	ND	0.18	ND	0.18
Carbon tetrachloride	ND	8.2	ND	0.21	ND	0.21	ND	1.6	ND	0.21	ND	0.21
Carbon disulfide	ND	8.1	6.0	0.21	6.4	0.21	12	1.6	8.9	0.21	6.1	0.21
Bromomethane	ND	10	ND	0.26	ND	0.26	ND	1.9	ND	0.26	ND	0.26
Trichloroethylene	4700 J	7.0	61	0.18	66	0.18	ND	1.3	5.1	0.18	10	0.18
Bromoform	ND	27	ND	0.70	ND	0.70	ND	5.1	ND	0.70	ND	0.70
Bromodichloromethane	ND	16	ND	0.42	ND	0.42	ND	3.1	ND	0.42	ND	0.42
Benzyl chloride	ND	14	ND	0.35	ND	0.35	ND	2.6	ND	0.35	ND	0.35
Benzene	ND	8.4	0.95	0.22	0.97	0.22	ND	1.6	1.7	0.22	1.1	0.22
Acetone	ND	6.2	18	0.16	19	0.16	34	1.2	38	3.2	23	0.16
3-Chloropropene	ND	82	ND	2.1	ND	2.1	ND	16	ND	2.1	ND	2.1
2-Hexanone	ND	21	ND	0.56	ND	0.56	ND	4.1	ND	0.56	ND	0.56
trans-1,3-Dichloropropylene	ND	12	ND	0.31	ND	0.31	ND	2.3	ND	0.31	ND	0.31
2-Butanone	ND	7.7	2.9	0.20	2.9	0.20	7.0	1.5	3.4	0.20	2.3	0.20

Table 5-9: Air Testing Results - January 30, 2012

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

LOCATION	Dry Cleaner						NY Sports Club				Outdoor	
SAMPLE TYPE	Sub-Slab Soil Vapor		Indoor Air				Sub-Slab Soil Vapor		Indoor Air		Outdoor Air	
LAB SAMPLE ID	SSV-2-40938		IA-1-40938		IA-3-40938 (1)		SSV-3-40938		IA-2-40938		OA-1-40938	
ANALYTE	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
2,2,4-Trimethylpentane	ND	12	ND	0.32	ND	0.32	ND	2.3	ND	0.32	ND	0.32
1,4-Dioxane	R	94	R	2.4	R	2.4	R	18	R	2.4	R	2.4
1,4-Dichlorobenzene	ND	16	ND	0.41	ND	0.41	ND	3.0	ND	0.41	ND	0.41
1,3-Dichlorobenzene	ND	16	ND	0.41	ND	0.41	ND	3.0	ND	0.41	ND	0.41
1,3-Butadiene	ND	11	ND	0.29	ND	0.29	ND	2.2	ND	0.29	ND	0.29
1,3,5-Trimethylbenzene	ND	26	4.3	0.67	6.8	0.67	9.1	4.9	1.2	0.67	0.67	0.67
1,2-Dichlorotetrafluoroethane	ND	18	ND	0.47	ND	0.47	ND	3.5	ND	0.47	ND	0.47
trans-1,2-Dichloroethylene	ND	10	ND	0.27	ND	0.27	ND	2.0	ND	0.27	ND	0.27
1,2-Dichloropropane	ND	12	ND	0.31	ND	0.31	ND	2.3	ND	0.31	ND	0.31
1,2-Dichloroethane	ND	11	ND	0.27	ND	0.27	ND	2.0	ND	0.27	ND	0.27
1,2-Dichlorobenzene	ND	16	ND	0.41	ND	0.41	ND	3.0	ND	0.41	ND	0.41
1,2,4-Trimethylbenzene	ND	64	11	1.7	18	1.7	ND	12	3.3	1.7	ND	1.7
1,2,4-Trichlorobenzene	ND	19	ND	0.50	ND	0.50	ND	3.7	ND	0.50	ND	0.50
1,1-Dichloroethylene	ND	10	ND	0.27	ND	0.27	ND	2.0	ND	0.27	ND	0.27
Toluene	26	9.9	1.9	0.26	2.1	0.26	20	1.9	5.3	0.26	1.9	0.26
1,1-Dichloroethane	ND	11	ND	0.27	ND	0.27	ND	2.0	ND	0.27	ND	0.27
Trichlorofluoromethane (Freon 11)	ND	15	1.6	0.38	1.6	0.38	ND	2.8	2.1	0.38	1.6	0.38
1,1,2-Trichloroethane	ND	14	ND	0.37	ND	0.37	ND	2.7	ND	0.37	ND	0.37
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	20	ND	0.52	ND	0.52	ND	3.8	ND	0.52	ND	0.52
1,1,2,2-Tetrachloroethane	ND	18	ND	0.47	ND	0.47	ND	3.4	ND	0.47	ND	0.47
1,1,1-Trichloroethane	ND	14	ND	0.37	ND	0.37	ND	2.7	ND	0.37	ND	0.37
Dichlorodifluoromethane	ND	13	2.6	0.34	3.1	0.34	ND	2.5	2.7	0.34	3.0	0.34
Tetrahydrofuran	ND	7.7	1.6	0.20	1.6	0.20	5.1	1.5	1.9	0.20	1.3	0.20
Chlorobenzene	ND	12	ND	0.31	ND	0.31	ND	2.3	ND	0.31	ND	0.31
Tetrachloroethylene	140000	890	1100	23	1200	23	140	3.4	77	9.2	730	11
Helium	ND	0.50	NR		NR		ND	0.50	NR		NR	

Notes:

All results in ug/m^3 except helium which is provided in %.
Analysis conducted by York Analytical Laboratories, Inc.
(1) - Duplicate of sample IA-1-40938.
R - Sample result was rejected based on validation.
J - Estimated value.
RL - Reporting limit.
ND - Analyte was not detected relative to the indicated reporting limit.
NR - No result, constituent not tested.

Table 6-1: Summary of Groundwater Sampling Results - Additional Parameters

Airstocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

										Blind Duplicate Samples	
LOCATION	**MW-2**			**MW-2D**			**MW-8**			**MW-100 (1)**	**MW-101 (2)**
SAMPLING DATE	**2/27/2013**	**11/12/2013**	**2/26/2014**	**2/27/2013**	**11/12/2013**	**2/26/2014**	**2/27/2013**	**11/12/2013**	**2/26/2014**	**11/12/2013**	**2/26/2014**
Constituent	**Result**			**Result**			**Result**			**Result**	**Result**
Chloride	**98**	**290**	**190**	**130**	**120**	**120**	**28**	**18**	**67**	**300**	**67**
Dissolved Iron	NA	NA	**13.7**	NA	NA	**5.36**	NA	NA	**6**	NA	**5.93**
Iron, Total	**0.296**	**61.8**	**16.6**	**1.76**	**21.4**	**9.37**	**3.37**	**6.94**	**10.2**	**82.1**	**6.37**
Magnesium, Total	**4.75**	**21.5**	**6.12**	**23.3**	**21.7**	**24.4**	**4.05**	**4.12**	**5.16**	**23**	**5.16**
Manganese, Total	**0.178**	**3.01**	**0.458**	**0.804**	**1.437**	**0.868**	**0.728**	**0.956**	**1.132**	**3.476**	**1.097**
Nitrogen, Nitrate	**0.469**	**0.043 J**	**0.186**	**0.205**	**0.037 J**	**0.342 J**	**0.102**	**0.033 J**	**0.054 J**	**0.05 J**	**0.054 J**
Nitrogen, Nitrate/Nitrite	NA	**0.27**	**0.18**	NA	**0.18**	**0.34 J**	NA	**0.033 J**	**0.054 J**	**0.19**	**0.054 J**
Total Nitrogen	NA	**11**	**2.1**	NA	**2.7**	**0.95**	NA	**1.3**	**0.95**	**8.2**	**0.3** U
Nitrogen, Total Kjeldahl	NA	**9.61**	**1.88**	NA	**2.53**	**0.609**	NA	**1.27**	**0.954**	**7.96**	**0.145 J**
Sulfate	**35**	10 U	**13**	**58**	**21**	**47**	**8.8 J**	10 U	10 U	10 U	10 U
Alkalinity, Total (mg CaCO3/L)	**115**	**353**	**126**	**211**	**252**	**208**	**105**	**128**	**90.2**	**343**	**90.2**
Biological Oxygen Demand, 5 day	2 U	**530**	**43**	**5.4**	**20**	**2.8**	**2**	2 U	**2.7**	**470**	**2.4**
Calcium, Total	**59.4**	**165**	**96.4**	**91.8**	**83.7**	**86.7**	**43.4**	**41.6**	**59.5**	**178**	**55.5**
Chemical Oxygen Demand	**9.1 J**	**1,300**	**86**	**21**	**50**	**9.2 J**	**37**	**27**	**21**	**920**	**21**
Dissolved Organic Carbon	**3.7**	**420**	**22**	**3.8**	**6.3**	**2.3**	**4.6**	**4.4**	**5.1**	**280**	**5.1**
Hardness	**170**	**517.8**	**265.8**	**300**	**307.8**	**317.2**	**110**	**119.2**	**169.5**	**561.6**	**159.8**
Total Organic Carbon	**4.4**	**416**	**26**	**3.5**	**7.91**	**2.66**	**5.3**	**9.48**	**5.35**	**256**	**5.35**
Methane (ug/l)	NA	**1,630 J**	**1,270**	NA	**317**	**252**	NA	**1,090**	**891**	**632 J**	**832**
Ethene (ug/l)	NA	**297 J**	**220**	NA	**2**	**10**	NA	**238**	**27.3**	**154 J**	**23.2**
Ethane (ug/l)	NA	**122 J**	**78**	NA	**3**	**4**	NA	**174**	**43.2**	**51 J**	**38**

Notes:
EHC Injections conducted on October 10, 2013.
All results in mg/l - except as noted.
(1) - Duplicate of MW-2.
(2) - Duplicate of MW-8.
U - Compound was not detected relative to the indicated limit.
J - Estimated value.
NA - Not analyzed.

Table 6-2: Summary of Groundwater Sampling Results - Chemicals of Interest

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

WELL DESIGNATION		MW-2				MW-2D			MW-8		
SCREEN INTERVAL (ft msl)		152-162				144-149			153-158		
SCREEN INTERVAL (ft bbf)		0.5-10.5				13-18			3-8		
LOCATION		DRY CLEANER BASEMENT				DRY CLEANER BASEMENT			LIQUOR STORE BASEMENT		
SAMPLING DATE		10/11/2011	2/27/2013	11/12/2013 (1)	2/26/2014	2/27/2013	11/12/2013	2/26/2014	2/27/2013	11/12/2013	2/26/2014 (1)
Volatile Organics	NY-AWQS	Result				Result			Result		
Tetrachloroethene	5	**13,000 J**	**13,000**	**17,000**	**730**	**42**	**8.4**	7.8 U	**2,000**	**370**	1.2 U
Trichloroethene	5	**4,800 J**	**5,400**	**6,700**	250 U	**23**	**7.2**	**6.6**	**760**	**65**	**0.44 J**
cis-1,2-Dichloroethene	5	**5,500 J**	**6,000**	**88,000**	**40,000**	**800**	**180**	**220**	**1,200**	**1,100**	**200 J**
trans-1,2-Dichloroethene	5	300 U	620 U	5,000 U	1,200 U	25 U	12 U	10 U	120 U	62 U	6.2 U
1,1-Dichloroethene	5	200 U	120 U	1,000 U	250 U	5 U	2.5 U	2 U	25 U	12 U	1.2 U
Vinyl chloride	2	**580 J**	**470**	**3,600**	**1,400**	**18**	**18**	**16**	**230**	**1,200**	**180 J**

Notes:
All results in ug/l.
EHC Injections conducted on October 10, 2013.
(1) - Higher result of parent and duplicate samples.
U - Compound was not detected relative to the indicated limit.
J - Estimated value.
NY-AWQS - New York State Ambient Water Quality Standard, TOGS 1.1.1.
msl - Mean sea level.
bbf - Below the top of the basement floor.

Table 6-3: Concentration Changes Following Injections - Additional Parameters

Airstocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

MW-2 - shallow well in source area	Concentration (mg/l) - unless noted			% Present Relative to Pre-Injection	
Sampling Event	Pre-Injection	+1 Month	+4 Months	+1 Month	+4 Months
Biological Oxygen Demand, 5 day (1)	ND <2	530	43	53000%	4300%
Iron, Total	0.296	82.1	16.6	27736%	5608%
Chemical Oxygen Demand	9.1	1,300	86	14286%	945%
Dissolved Organic Carbon	3.7	420	22	11351%	595%
Total Organic Carbon	4.4	416	26	9455%	591%
Manganese, Total	0.178	3.476	0.458	1953%	257%
Magnesium, Total	4.75	23	6.12	484%	129%
Hardness	170	561.6	265.8	330%	156%
Alkalinity, Total (mg CaCO3/L)	115	353	126	307%	110%
Chloride	98	300	190	306%	194%
Calcium, Total	59.4	178	96.4	300%	162%
Sulfate (1)	35	ND <10	13	14%	37%
Nitrogen, Nitrate	0.469	0.05	0.186	11%	40%

MW-2D - deeper well in source area	Concentration (mg/l) - unless noted			% Present Relative to Pre-Injection	
Sampling Event	Pre-Injection	+1 Month	+4 Months	+1 Month	+4 Months
Biological Oxygen Demand, 5 day	5.4	20	2.8	370%	52%
Iron, Total	1.76	21.4	9.37	1216%	532%
Chemical Oxygen Demand	21	50	9.2	238%	44%
Dissolved Organic Carbon	3.8	6.3	2.3	166%	61%
Total Organic Carbon	3.5	7.91	2.66	226%	76%
Manganese, Total	0.804	1.437	0.868	179%	108%
Magnesium, Total	23.3	21.7	24.4	93%	105%
Hardness	300	307.8	317.2	103%	106%
Alkalinity, Total (mg CaCO3/L)	211	252	208	119%	99%
Chloride	130	120	120	92%	92%
Calcium, Total	91.8	83.7	86.7	91%	94%
Sulfate	58	21	47	36%	81%
Nitrogen, Nitrate	0.205	0.037	0.342	18%	167%

MW-8 - shallow downgradient well	Concentration (mg/l) - unless noted			% Present Relative to Pre-Injection	
Sampling Event	Pre-Injection	+1 Month	+4 Months	+1 Month	+4 Months
Biological Oxygen Demand, 5 day (1)	2	ND <2	2.7	50%	135%
Iron, Total	3.37	6.94	10.2	206%	303%
Chemical Oxygen Demand	37	27	21	73%	57%
Dissolved Organic Carbon	4.6	4.4	5.1	96%	111%
Total Organic Carbon	5.3	9.48	5.35	179%	101%
Manganese, Total	0.728	0.956	1.132	131%	156%
Magnesium, Total	4.05	4.12	5.16	102%	127%
Hardness	110	119.2	169.5	108%	154%
Alkalinity, Total (mg CaCO3/L)	105	128	90.2	122%	86%
Chloride	28	18	67	64%	239%
Calcium, Total	43.4	41.6	59.5	96%	137%
Sulfate (1)	8.8	ND <10	ND <10	57%	57%
Nitrogen, Nitrate	0.102	0.033	0.054	32%	53%

Notes:
(1) - for ND result, % present was calculated using a concentration of one-half the indicated reporting limit.

Table 6-4: Concentration Changes Following Injections - Chemicals of Interest

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

MW-2 - shallow well in source area	Concentration (ug/l)			% Present Relative to Pre-Injection	
Sampling Event	Pre-Injection	+1 Month	+4 Months	+1 Month	+4 Months
Tetrachloroethene	13,000	17,000	730	131%	6%
Trichloroethene (1)	5,400	6,700	ND <250	124%	2%
cis-1,2-Dichloroethene	6,000	88,000	40,000	1467%	667%
Vinyl chloride	470	3,600	1,400	766%	298%

MW-2D - deeper well in source area	Concentration (ug/l)			% Present Relative to Pre-Injection	
Sampling Event	Pre-Injection	+1 Month	+4 Months	+1 Month	+4 Months
Tetrachloroethene (1)	42	8.4	ND < 7.8	20%	9%
Trichloroethene	23	7.2	6.6	31%	29%
cis-1,2-Dichloroethene	800	180	220	23%	28%
Vinyl chloride	18	18	16	100%	89%

MW-8 - shallow downgradient well	Concentration (ug/l)			% Present Relative to Pre-Injection	
Sampling Event	Pre-Injection	+1 Month	+4 Months	+1 Month	+4 Months
Tetrachloroethene (1)	2,000	370	ND< 1.2	19%	0.03%
Trichloroethene	760	65	0.44	9%	0.06%
cis-1,2-Dichloroethene	1,200	1,100	200	92%	17%
Vinyl chloride	230	1,200	180	522%	78%

Notes:
(1) - for non-detect (ND) result, % present was calculated using a concentration of one-half the indicated reporting limit.

Table 9-1: Summary of Estimated Remedial Alternatives Costs

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

Remedial Alternative	Estimated Cost
No Further Action (Cost of completed IRM)	$40,000
IRM and Implementation of Site Management Plan (SMP) (Cost of completed IRM, plus SMP and future O&M)	$158,607
Unrestricted Use Cleanup (Cost of completed IRM, plus unrestricted use cleanup)	$1,010,677

Table 9-2: Cost Estimate for IRM and Implementation of a Site Management Plan

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

Item	Quantity	Units	Unit Cost	Total Cost
Interim Remedial Measure				
	1	L.S.	$40,000	$40,000
Institutional Controls				
Develop Site Management Plan	1	LS	$5,000	$5,000
Environmental Easement	1	LS	$6,000	$6,000
Total Capital Cost				**$51,000**
Annual Operation Maintenance & Monitoring (OM&M):				
Annual Site Monitoring[1]	1	Yr	$6,000	$6,000
Annual Reporting	1	Yr	$1,500	$1,500
Total Annual OM&M Cost				$7,500
Number of Years:				30
Interest Rate:				5%
OM&M Present Worth (PW):				**$107,607**
Total Present Worth (PW): Capital Cost + OM&M PW				**$158,607**

Table 9-3: Cost Estimate for Unrestricted Use Alternative

Aristocrat Cleaners
212 E. Hartsdale Ave., Hartsdale, NY
BCA Site #C360111

Item	Quantity	Units	Unit Cost	Total Cost
Impacted Soil/Fill Removal				
Soil/Fill Excavating & Hauling	3,350	CY	$20.00	$67,000
Soil Disposal (1.5 tons per CY)[1]	5,025	TON	$105.00	$527,625
Verification Sampling[2]	20	EA	$260.00	$5,200
Subtotal:				**$599,825**
Site Restoration				
Backfill, Place & Compact	3,350	CY	$25.00	$83,750
Subtotal:				**$83,750**
Contractor Mobilization/Demobilization (5%)				$34,179
Health and Safety (2%)				$13,672
Engineering/Contingency (35%)				$239,251
Subtotal:				**$287,102**
Total Unrestricted Cleanup Cost				**$970,677**
Total IRM Cost	1	LS		**$40,000**
Total Capital Cost				**$1,010,677**

Notes:

1. Non-hazardous.
2. VOCs, Pesticides and Metals, including QA/QC samples.

APPENDICES

APPENDIX A

Soil Boring/Well Construction Logs

EnviroTrac
Environmental Services

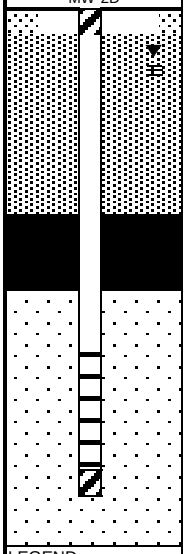
Geologic Log and Well Construction Details

WELL ID: MW-2D

EnviroTrac Ltd.

5 Old Dock Road, Yaphank, NY 11980

Client: Hartsdale Village Square, LLC.		Depth to Water (ft. from measuring pt.)		Site Elevation Datum
Site Name: Aristocrat Cleaners	Address: 212 East Hartsdale Avenue, Hartsdale NY	Date	DTW	
Drilling Company: ADT	Method: Geoprobe 422M			Measuring Point Elevation
Date Started: 01/29/2013	Date Completed: 01/30/2013			
Completion Depth: 19	*EnviroTrac* Geologist: Patrick Condon/Josh Levy			

MONITORING WELL CONSTRUCTION (NTS)	DEPTH (ft below grade)	SAMPLES Recovery (in)	SAMPLES Blows per 6 in.	SAMPLES OVM (ppm)	SOIL DESCRIPTION
	0	18	NA	NM	0-3 ft.
	1				**SAND**, Grey, Fine to Silt with gravel, well sorted and Moist. Organic layer at 2.2.5 fbg
	2				No apparent staining or odor.
	3	36	NA	NM	3-6 ft.
	4				**SAND**, light brown top foot, darker brown bottom 2 feet, Fine to Silt, and Saturated.
	5				No apparent staining or odor.
	6	36	NA	NM	6-9 ft.
	7				**SAND**, grey-brown top 2 feet, light brown bottom foot, Fine to Silt, and Saturated.
	8				No apparent staining or odor.
	9	36	NA	NM	9-12 ft.
	10				**SAND**, light grey top 2 feet, light brown bottom foot, Fine to Silt, and Saturated.
	11				No apparent staining or odor.
	12	24	NA	NM	12-15 ft.
	13				**SAND**, Grey-Brown, Fine to Silt, and Saturated. No apparent Staining or odor.
	14				**The core had a 3 foot recovery the top foot was heave and not logged.
	15	NR	NA	NM	15-18 ft.
	16				**No Recovery**
	17				
	18	36	NA	NM	18-21 ft.
	19				**SAND**, light brown top foot, grey-brown bottom 2 feet, Fine to Silt, and Saturated.
	20				No apparent staining or odor. Small rocks that appeared to be weathered bedrock at 21 fbg.
	21				

LEGEND:
- Cement
- Grout
- Bentonite Seal
- Sand Pack (morie #2)
- Screen
- End/Top Cap

Soil samples were collected from depths of 9-11 and 19-21 fbg for lab analysis.

Well Construction Details

Bottom of well (ft. bg):	19'
Screen Zone:	13'-18'
Screen Material:	#10 slot, 1.25" schedule 40 PVC
Casing Material:	1.25", schedule 40 PVC
Sand Pack (type):	Morie #1 Silica
Sand Pack (ft. b.g.)	11'-18'
Seal (type):	Bentonite
Seal (ft. b.g.):	9'-11'
Backfill Material:	Grout
Backfill Material (ft. b.g.):	0.5'-9'
Surface Seal (type):	Cement
Surface Seal (ft. b.g.):	0.5'

NM - Not Measured DTW - Depth to Water ND - Not Detected ft. bg - Feet below grade

NR - Not Recorded NA- Not Applicable

Geologic Log and Well Construction Details

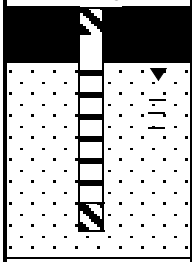
WELL ID: MW-8

EnviroTrac Ltd.

5 Old Dock Road, Yaphank, NY 11980

Client:		Depth to Water (ft. from measuring pt.)		Site Elevation Datum
Hartsdale Village Square, LLC.				
Site Name:	Address:	Date	DTW	
Aristocrat Cleaners	212 East Hartsdale Avenue, Hartsdale NY			
Drilling Company:	Method:			Measuring Point Elevation
ADT	Geoprobe 422M			
Date Started:	Date Completed:			
01/29/2013	01/29/2013			
Completion Depth:	*EnviroTrac* Geologist:			
9	Patrick Condon/Josh Levy			

MONITORING WELL CONSTRUCTION (NTS)	DEPTH (ft below grade)	SAMPLES Recovery (in)	SAMPLES Blows per 6 in.	SAMPLES OVM (ppm)	SOIL DESCRIPTION
MW-8	0	NM	NM	NM	Subsurface consists of silty fine sand. There was no apparent odor during borehole advancement and well installation activities and no soil samples were collected.
	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				



LEGEND:
- Cement
- Grout
- Bentonite Seal
- Sand Pack (morie #1)
- Screen
- End/Top Cap

Well Construction Details

Bottom of well (ft. bg):	8
Screen Zone:	3'-8'
Screen Material:	#10 slot, 2" schedule 40 PVC
Casing Material:	2", schedule 40 PVC
Sand Pack (type):	Morie #1 Silica
Sand Pack (ft. b.g.)	3'-9'
Seal (type):	Bentonite
Seal (ft. b.g.):	1'-3'
Backfill Material:	Bentonite
Backfill Material (ft. b.g.):	0.5'-0.75'
Surface Seal (type):	Cement
Surface Seal (ft. b.g.):	0.5'

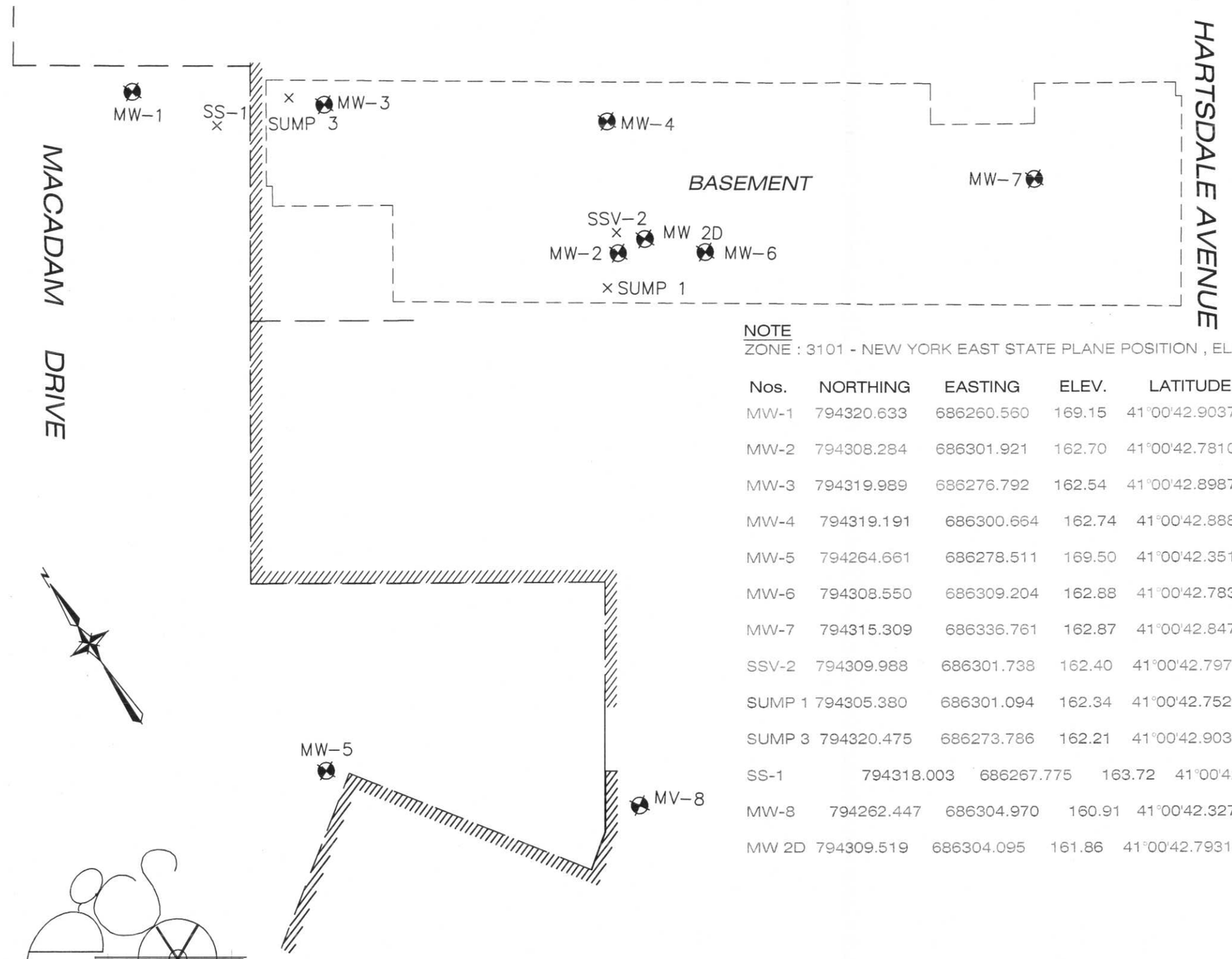
NM - Not Measured DTW - Depth to Water ND - Not Detected ft. bg - Feet below grade

NR - Not Recorded

APPENDIX B

Site Survey Map

JOB NUMBER: 147-01



LOCATIONS, SIZES AND DESCRIPTIONS OF ALL UTILITIES ARE BASED ON FIELD SURVEY LOCATION OF SURFACE APPURTENANCES AND AVAILABLE RECORD PLATE DATA. SAME IS SUBJECT TO SCALE AND METHOD LIMITATIONS. EXACT LOCATION FOR EXISTING SERVICE INSTALLATIONS MAY REQUIRE VERIFICATION BY THE RESPECTIVE UTILITY COMPANIES (CALL CODE 53) AND BY EXCAVATION. THE LOCATION, MATERIAL AND SIZE OF EXISTING UNDERGROUND IMPROVEMENTS OR ENCROACHMENTS HEREON ARE NOT CERTIFIED.

DO NOT SCALE

NOTE
ZONE : 3101 - NEW YORK EAST STATE PLANE POSITION , ELEVATION ARE IN NAVD 88.

Nos.	NORTHING	EASTING	ELEV.	LATITUDE	LONGITUDE
MW-1	794320.633	686260.560	169.15	41°00'42.9037"	-073°47'47.4040"
MW-2	794308.284	686301.921	162.70	41°00'42.7810"	-073°47'46.8658"
MW-3	794319.989	686276.792	162.54	41°00'42.8987"	-073°47'47.1924"
MW-4	794319.191	686300.664	162.74	41°00'42.8889"	-073°47'46.8810"
MW-5	794264.661	686278.511	169.50	41°00'42.3519"	-073°47'47.1757"
MW-6	794308.550	686309.204	162.88	41°00'42.7831"	-073°47'46.7708"
MW-7	794315.309	686336.761	162.87	41°00'42.8477"	-073°47'46.4106"
SSV-2	794309.988	686301.738	162.40	41°00'42.7979"	-073°47'46.8680"
SUMP 1	794305.380	686301.094	162.34	41°00'42.7524"	-073°47'46.8769"
SUMP 3	794320.475	686273.786	162.21	41°00'42.9037"	-073°47'47.2315"
SS-1	794318.003	686267.775	163.72	41°00'42.8798"	-073°47'47.3102"
MW-8	794262.447	686304.970	160.91	41°00'42.3279"	-073°47'46.8308"
MW 2D	794309.519	686304.095	161.86	41°00'42.7931"	-073°47'46.8373"

MAP OF
MONITORING WELLS INFORMATION FOR
No. 218
E. HARTSDALE AVENUE
LOCATED IN THE
TOWN OF GREENBERGH
WESTCHESTER COUNTY, NEW YORK.
SCALE: 1" = 10'
DATE: OCTOBER 11, 2011
MARCH 19, 2013 REV
MARCH 22, 2013 REV

GABRIEL E. SENOR, P.C.
CONSULTING ENGINEER • LAND SURVEYORS
90 NORTH CENTRAL AVE., HARTSDALE, NEW YORK, 10530
(914) 422–0070 FAX 422–3009

APPENDIX C

IDW Documentation

EnviroTrac
Environmental Services

Invoice

INNOVATIVE
RECYCLING TECHNOLOGIES, INC.
690 NO. QUEENS AVENUE
LINDENHURST, NY 11757
(631) 225-3044

DATE	INVOICE #
6/20/2014	8350

BILL TO:

EnviroTrac Ltd.
Mike Rose
5 Old Dock Road
Yaphank, NY 11980

SHIP TO:

P.O. NUMBER	TERMS	REP	SHIP	VIA	F.O.B.	PROJECT
	Net 30	v	6/20/2014			8350

QUANTITY	ITEM CODE	DESCRIPTION	PRICE EACH	AMOUNT
		Hartsdale Village Square Pick Up 6/17/14		
1	Disposal	Hazardous Purge Water Manifest #011980239JJK	295.00	295.00T
1	Stop-Off	Stop-Off Fee	300.00	300.00T
		Sales Tax	8.875%	52.81

Received NB
EnviroTrac Ltd.
Hartsdale Village Square - 212-218 E. Hartsdale Ave
JUN 24 2014
P 01.990385.00
T _____ Acct 6140
ST _____ App PCB

TOTAL $647.81

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) 183998 20 Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	CESQG	1	516-816-4765	011980239 JJK

GENERATOR

5. Generator's Name and Mailing Address
Hartsdale Village Square, LLC
2916 Eighth Avenue-Suite3-C
New York, NY 10039
Generator's Phone 212-926-1500

Generator's Site Address (if different than mailing address)
Aristocrat Cleaners-212 East Hartsdale Ave.
Hartsdale, NY 10530

6. Transporter 1 Company Name: Metro Environmental Contracting Corp. — U.S. EPA ID Number: NYR000134957

7. Transporter 2 Company Name: Republic Env Sys (Trans Group) LLC — U.S. EPA ID Number: PAD 982661381

8. Designated Facility Name and Site Address
Republic Environmental Systems (PA), LLC
2869 Sandstone Drive
Hatfield, PA 19440 USA
U.S. EPA ID Number: PAD085690592
Facility's Phone: 215-822-9665

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
X	1. RQ, NA3082, Hazardous Waste Liquid, N.O.S., 9, PGIII, (Tetrachloroethylene, Vinyl Chloride) (F001) ERG#171	01	DM	055	P	F001		B
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
9b.1)843493
Doc# 190211-14

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: R. Donn Amoscato of ET on Behalf of Hartsdale Village LLC — Signature: R. Amoscato — Month 06 Day 17 Year 14

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: James Ulrich — Signature: — Month 06 Day 17 Year 14
Transporter 2 Printed/Typed Name: Gary Greco — Signature: — Month 06 Day 18 Year 14

DESIGNATED FACILITY

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
18b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:
18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. H141 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: MALVERN KM — Signature: — Month 06 Day 20 Year 14

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

APPENDIX D

Laboratory Analytical Reports (Included on CD)

Accutest - JA25561 (532 pages)

Accutest - JA39887 (609 pages)

Alpha - L1116534 (5010 pages)

York - 12B0007 (315 pages)

Alpha - L1301716 (949 pages)

Alpha – L1303352 (1032 pages)

Alpha - L1323002 (1526 pages)

Alpha - L1404174 (1524 pages)

EnviroTrac
Environmental Services

Appendix E

DUSRs (Included on CD)

EDS - JA25561 (19 pages)

EDS - JA39887 (18 pages)

EDS - L1116534 (145 pages)

EDS - 12B0007 (22 pages)

EDS - L1301716 (27 pages)

EDS – L1303352 (43 pages)

EDS - L1323002 (112 pages)

EDS - L1404174 (116 pages)

APPENDIX F

EHC® ISCR Reagent - Performance Information

EnviroTrac
Environmental Services

ISCR Groundwater Remediation Technologies

EHC® family of integrated carbon & ZVI technologies for *in situ* chemical reduction

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EHC® ISCR Reagent Composition

EHC is delivered as a dry powder and includes the following:

- Micro-scale zero valent iron (standard ~40%)
- Controlled-release, food grade, complex carbon (plant fibers) (standard ~60%)
- Major, minor, and micronutrients
- Food grade organic binding agent
- Sustainable Solution:
  - scrap metal
  - food production by-products

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Contaminants Treated

EHC® ISCR Reagent

- Chlorinated Solvents
  - PCE, TCE, cDCE, 11DCE, VC
  - 1122TeCA, 111TCA, 12DCA
  - CT, CF, DCM, CM
- Pesticides
  - Toxaphene, Chlordane, Dieldrin, Pentachlorophenol
- Energetics
  - TNT, DNT, RDX, HMX, Perchlorate

EHC®-M ISCR Reagent for Metals

- Heavy Metals including As, Cr, Pb, Zn, Cd

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EHC® ISCR Treatment Mechanisms

Mechanism	Material	Description
Direct Chemical Reduction	ZVI	• Redox reaction at iron surface where solvent gains electrons and iron donates electrons • Abiotic reaction *via* beta-elimination
Indirect Chemical Reduction	ZVI	• Surface dechlorination by magnetite and green rust precipitates from iron corrosion
Stimulated Biological Reduction	Carbon Substrate	• Anaerobic reductive dechlorination involving fastidious microorganisms • Strongly influenced by nutritional status and pH of aqueous phase
Enhanced Thermodynamic Decomposition	ZVI + Organic Carbon	• Energetics of dechlorination are more favorable under lower redox conditions generated by combination of ZVI and organic carbon

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Direct Dechlorination Reactions

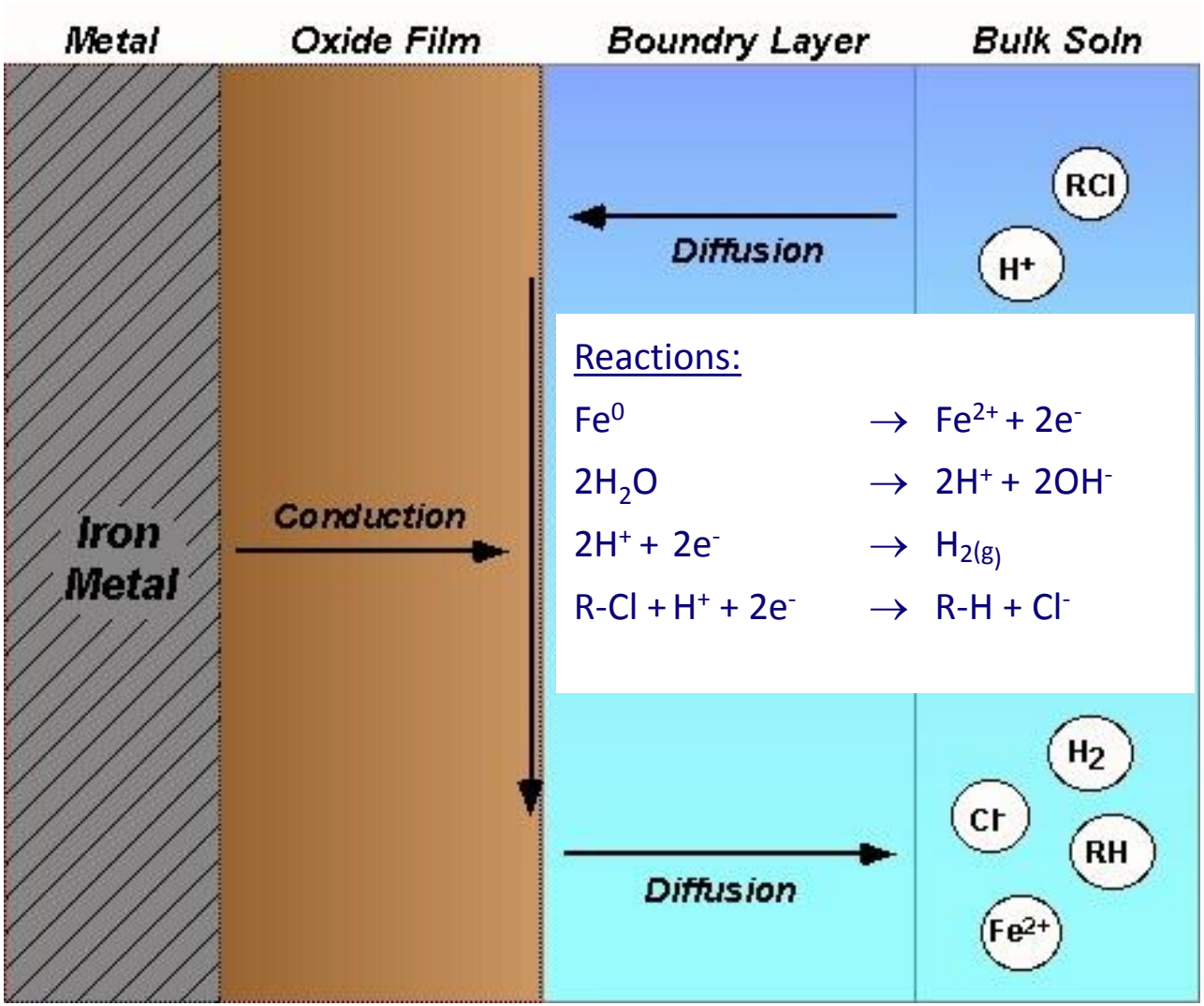

Figure Courtesy P. Tratnyek, Oregon Graduate Institute

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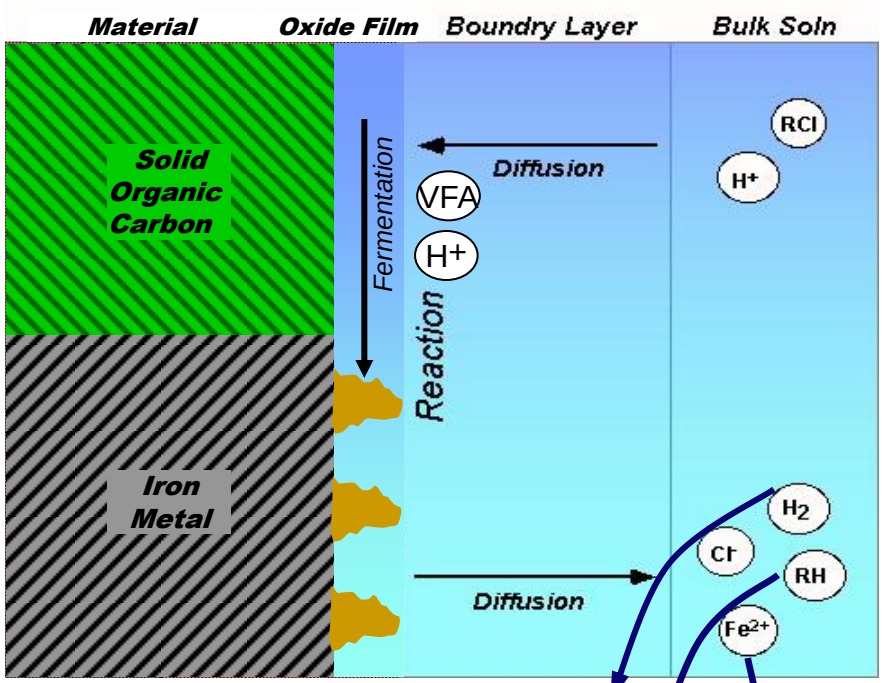
Carbon Fermentation + ZVI Corrosion: Multiple Dechlorination Mechanisms



Corrosion → H2 generation

Hydrocarbon generation

Dissolved iron → precipitates as reactive minerals

Production of organic acids (VFAs):

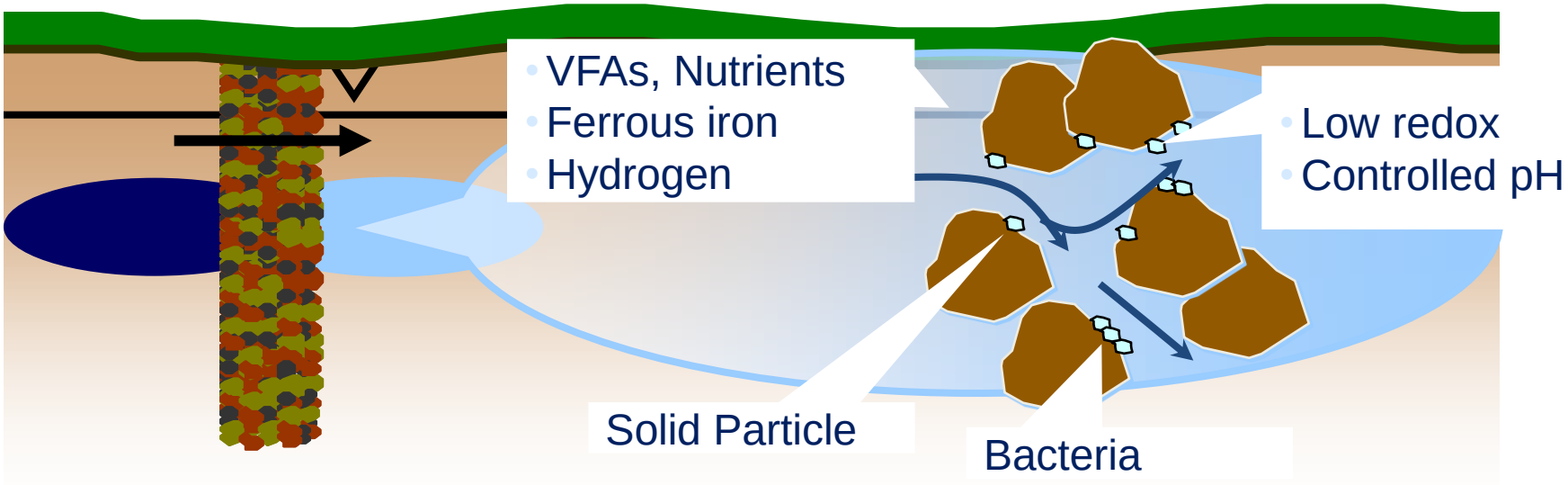
- Serves as electron donor for microbial reduction of CVOCs and other oxidized species such as O_2, NO_3, SO_4
- The release of acids keeps the pH down and thereby serve to reduce precipitate formation on ZVI surfaces

Favorable thermodynamic conditions for dechlorination:

- Combined oxygen consumption from carbon fermentation and iron oxidation → Strongly reduced environment
- High electron/H^+ pressure

Downgradient effects

- EHC zone of influence may significantly exceed the direct placement zone.
- Elevated levels of TOC and Fe and changes to ORP has been measured up to 70 ft away from the injection zone → advection may be a very important distribution mechanism at some sites.



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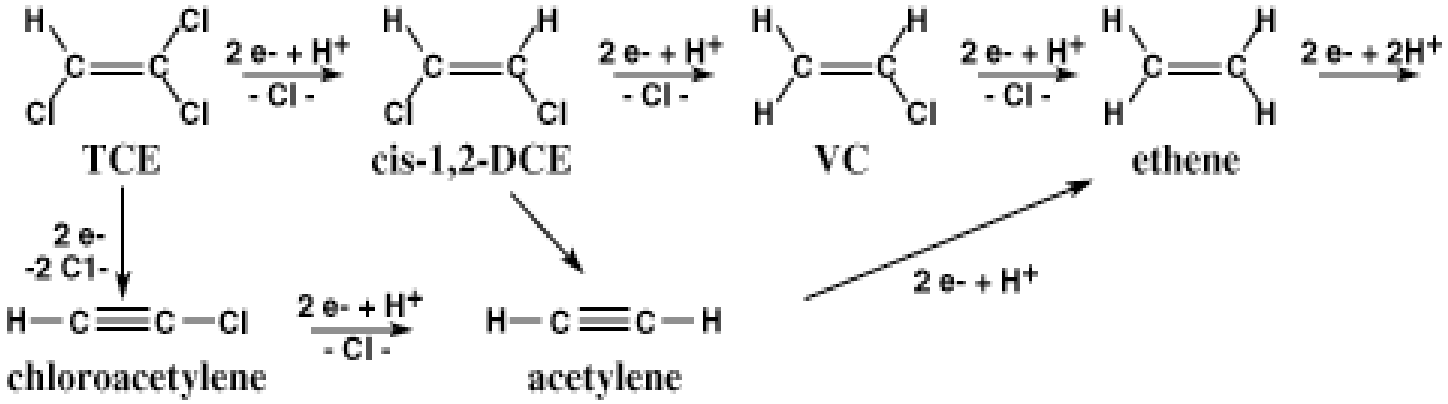
Direct Chemical Reduction
CVOC Dechlorination Pathways with ZVI

Biogenolysis/Hydrogenolysis: Minor Pathway



ß–Elimination: Main Pathway

- Reaction is abiotic reductive dehalogenation; minimizes/eliminates DCE/VC
- Requires direct contact with ZVI surface
- β-elimination is the dominant abiotic pathway (~90%); ZVI generates hydrogen so some biotic reductive reactions are supported

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EHC® ISCR Installation Methods

Injection Methods

- Direct injection
- Hydraulic fracturing
- Pneumatic fracturing
- Well injections (EHC-L)

Direct Placement

- Trenching
- Excavations
- Deep soil mixing

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EHC Installation Methods – Direct Placement

Installation of EHC PRB

Placement at bottom of excavation to treat standing groundwater.

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EHC® ISCR Installation Methods
Direct Injection & ChemGrout Mixing

ChemGrouts CG-500 used for mixing and injections (rated at 20 GPM at 1,000 psi).

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Preparation of slurry using grout mixer

EHC mixed with water into 30% slurry.

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Injection probe with check valve

A key feature of this probe is that it acts as a backflow preventer, keeping injection material IN the ground and not ON the ground!

Allows for either top-down or bottom-up injection and directs the slurry laterally into the subsurface.

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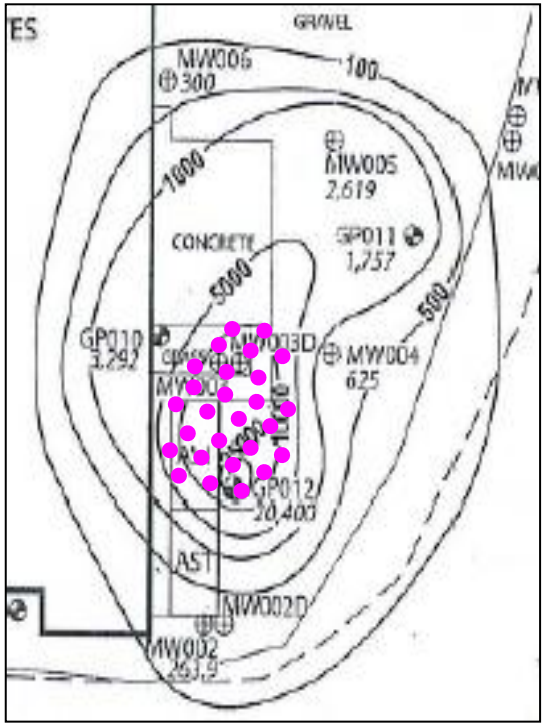
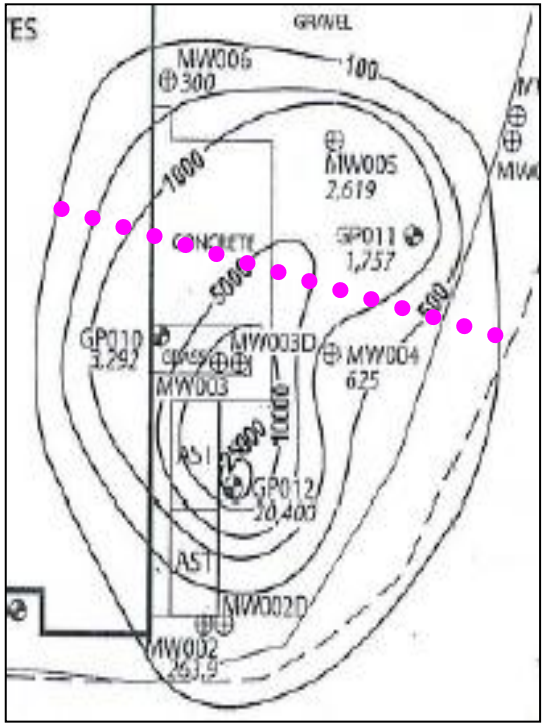
EHC Conceptual Designs

Source Area/ Hotspot Treatment



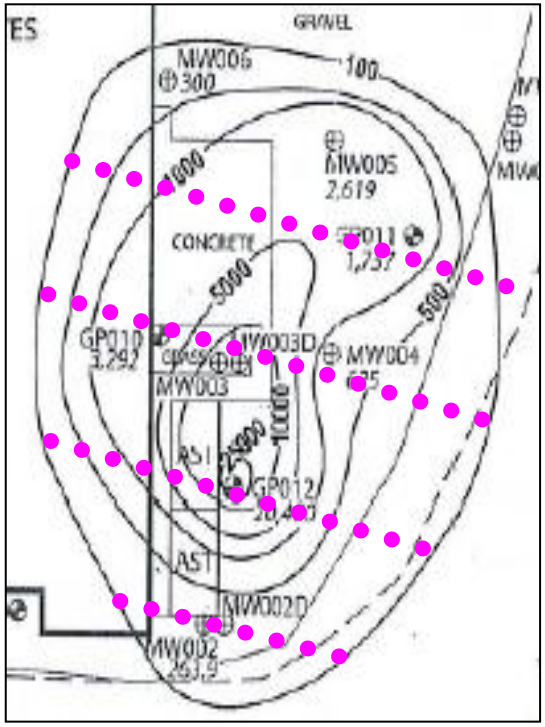
- Dosing: 0.15 to 1% wt/wt
- Spacing: 2 to 5m (DPT)

Injection PRB for Plume Control



- Dosing: 0.4 to 1% wt/wt
- Spacing: 2 to 3 m (DPT)

Plume Treatment



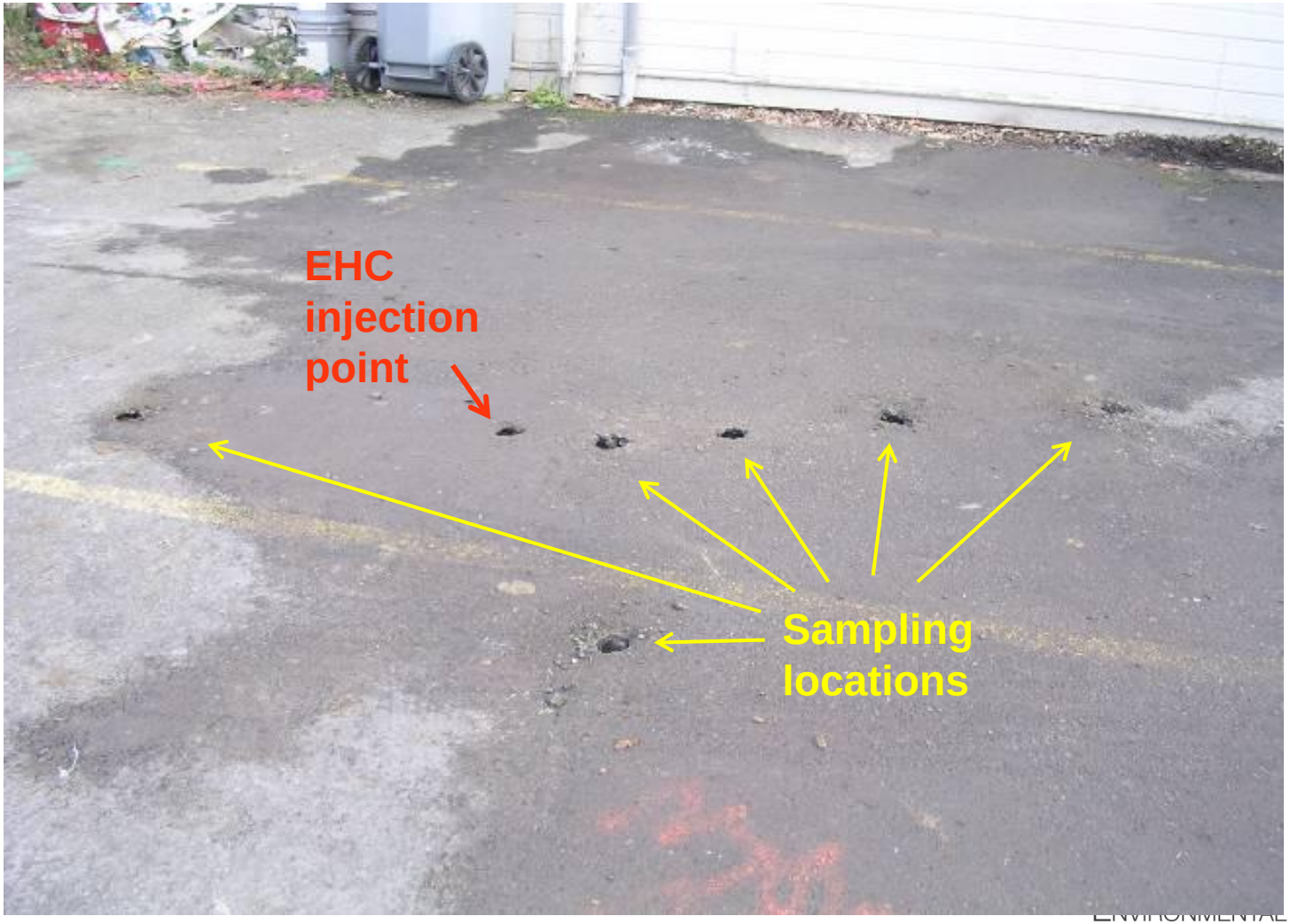
- Dosing: 0.05 to 0.2% wt/wt
-Line Spacing: depends on linear gw velocity

EHC Case Study – Source Area Treatment Former Dry Cleaner, Oregon

- **Primary CVOCs included chlorinated ethenes at concentrations up to:**
  - PCE ~ 22,000 ug/L
  - TCE ~ 1,700 ug/L
  - DCE ~ 3,100 ug/L
  - VC ~ 7 ug/L

- **Site-Specific Challenges:**
  - Low permeability lithology – high degree of sorbed impacts expected
  - Large seasonal variation in groundwater table (range from ca 2.1 to 4.6 m bgs) → 2.5 m smear zone
  - Groundwater flow direction change with season

Test Injection –
EHC Injection Distribution Validation



Test Injection

Soil Cores with EHC Fractures

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Injection layout and sampling locations

-A total of 10,000 lbs (4,649 kg) of EHC was injected into 32 injection points targeting an area measuring 77 m^2 x 6 m deep (from 3 to 9 m bgs).
-Application rate of 0.6% EHC to soil mass.

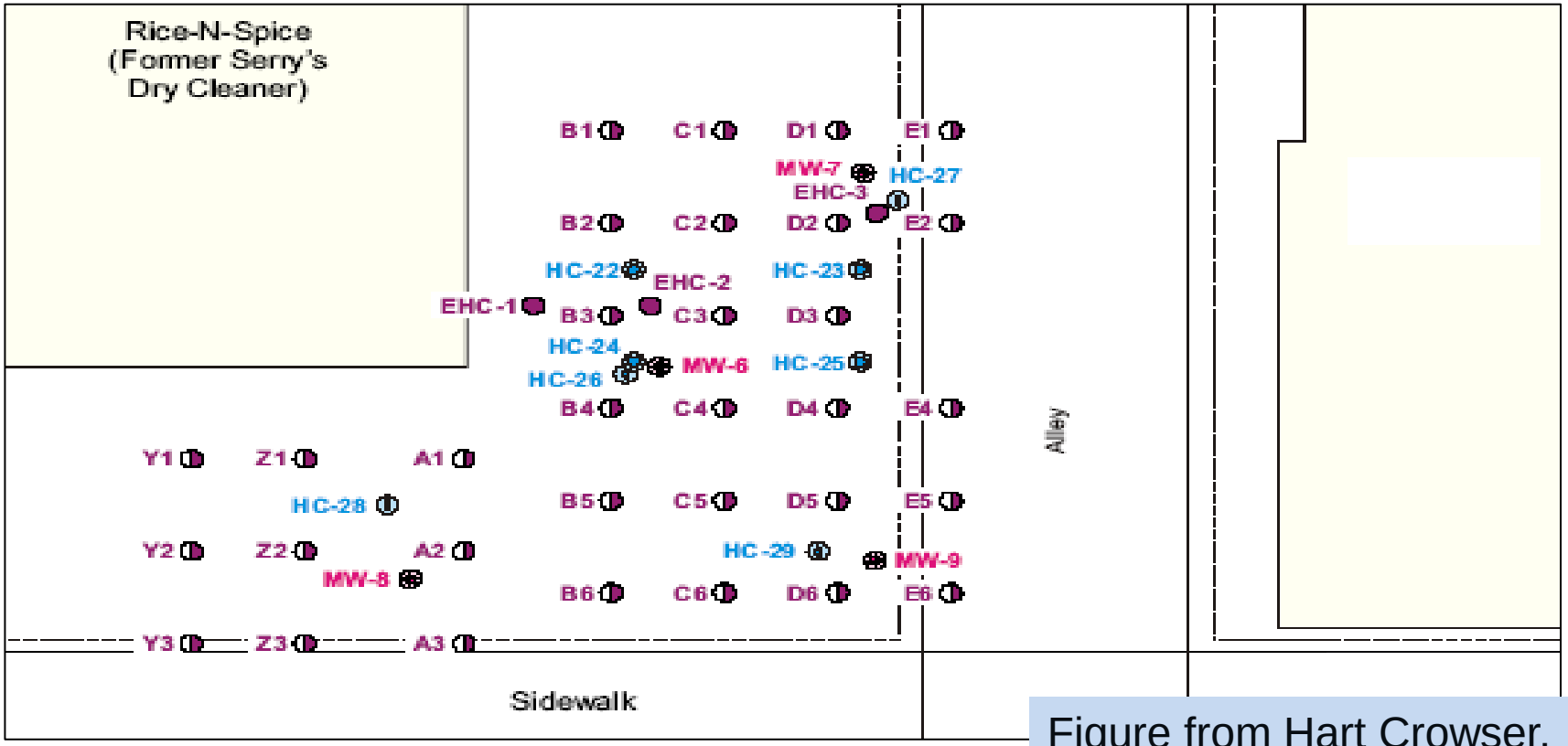
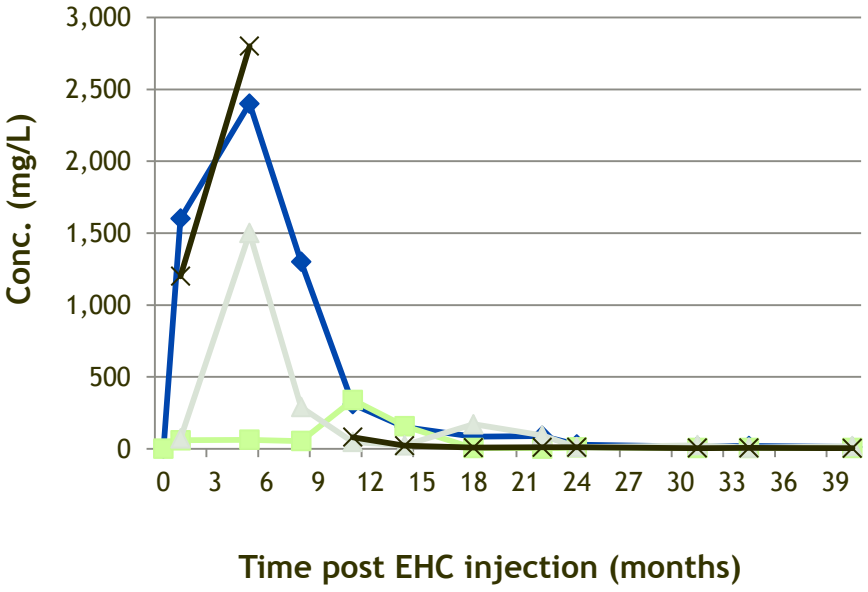


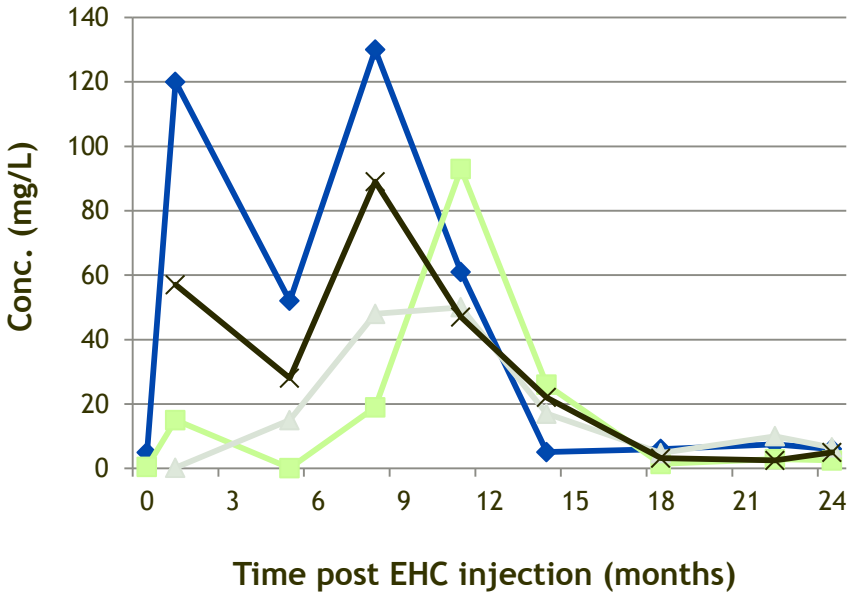
Figure from Hart Crowser.

Source Area Treatment Results - EHC® Indicator Parameters

Total Organic Carbon



Ferrous Iron



- Sharp increase in TOC and Fe(II) following injections confirms effective product placement.
- Dissolved concentrations have gradually decreased over time but remain above background levels.
- TOC ranging from 3.3 to 18.6 mg/L after 40 months, which is above the baseline range of <0.8 to 1.8 mg/L.

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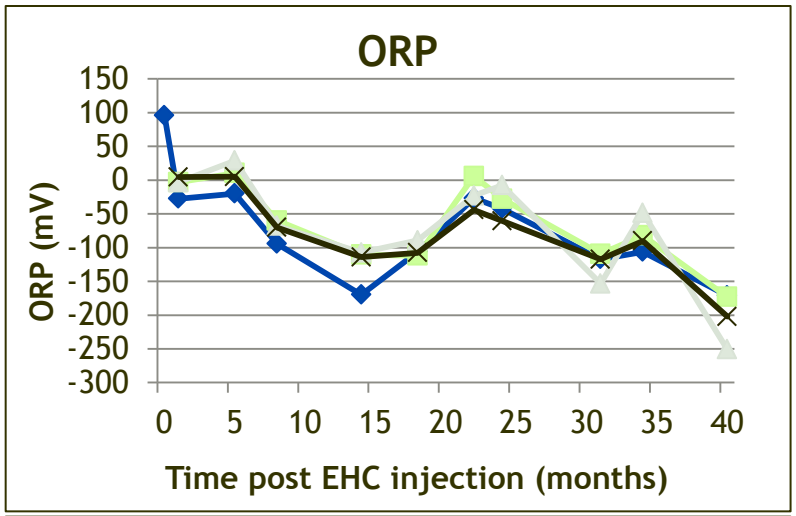
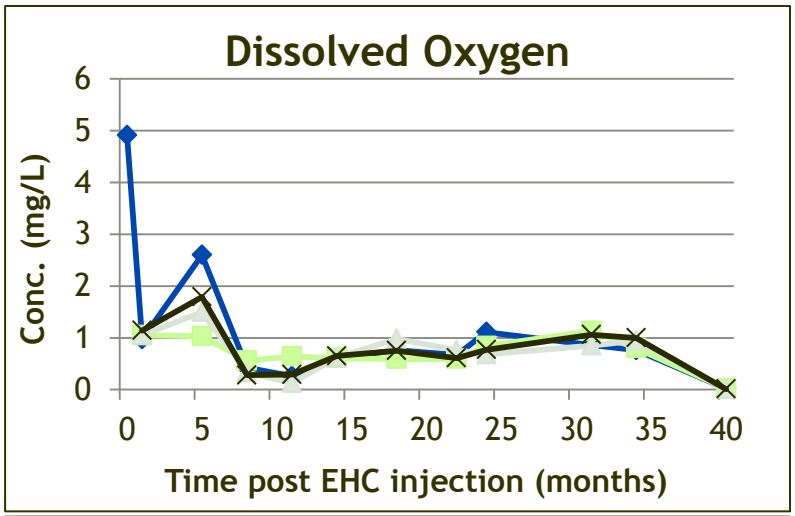
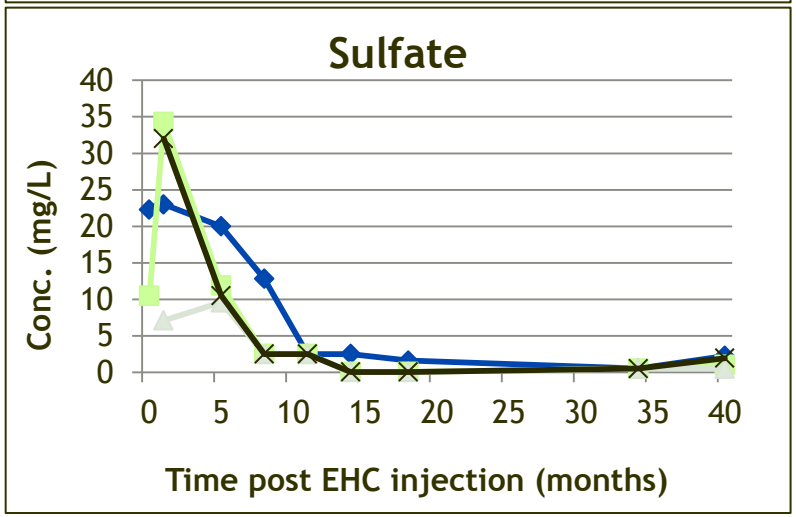
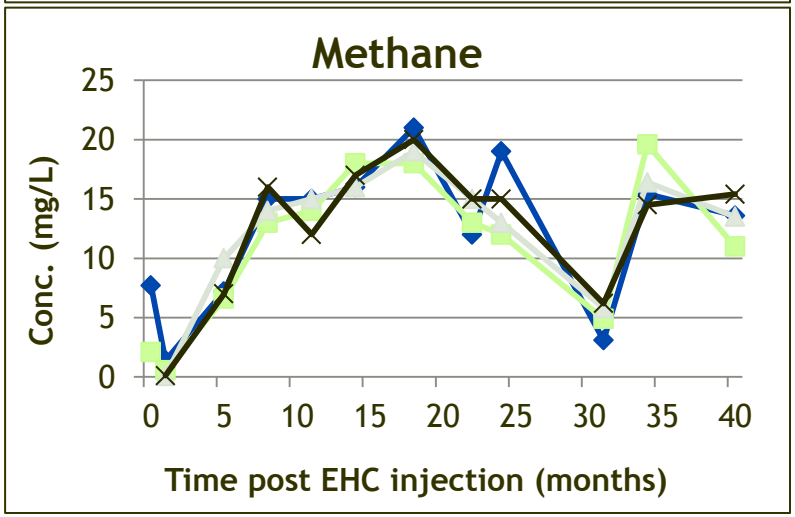
Source Area Treatment Results
Redox indicator parameters









NW sampling cluster

NE sampling cluster

SW sampling cluster

SE sampling cluster

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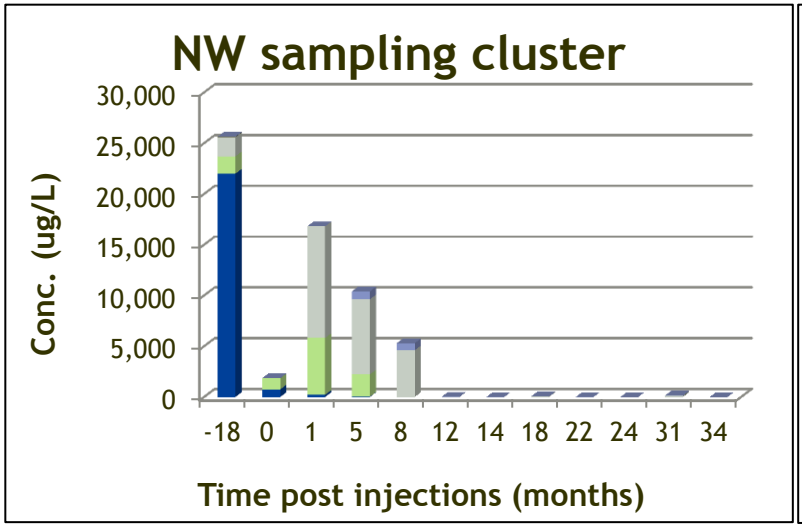
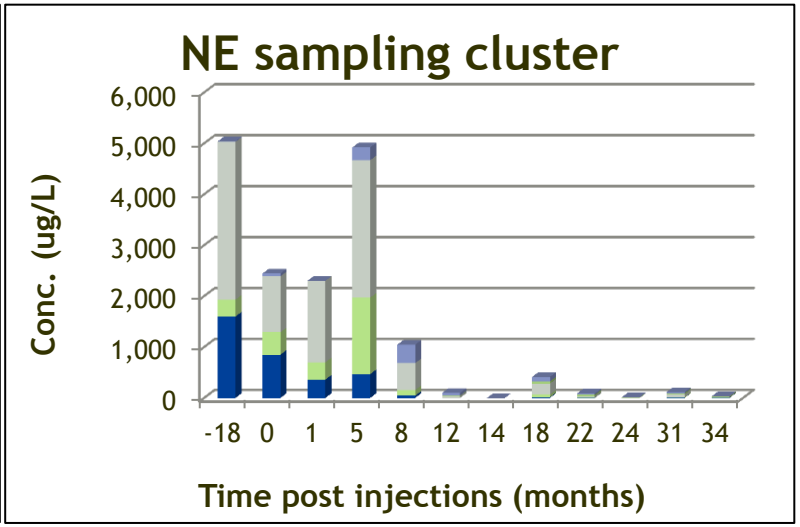
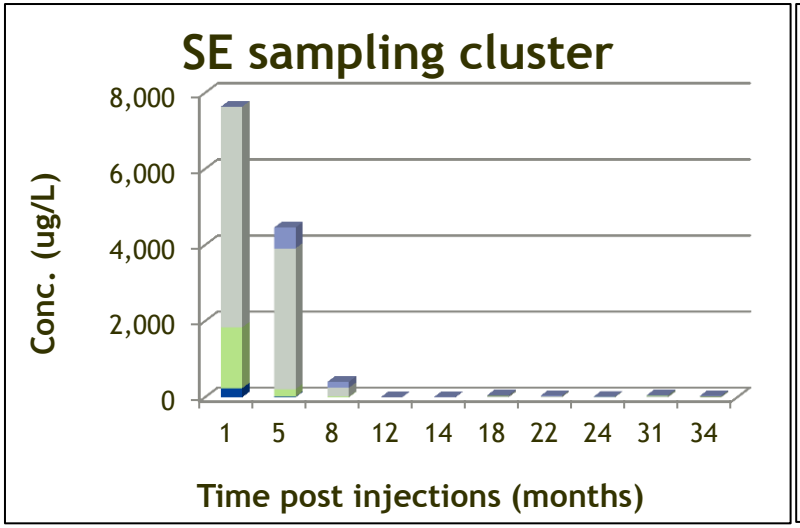
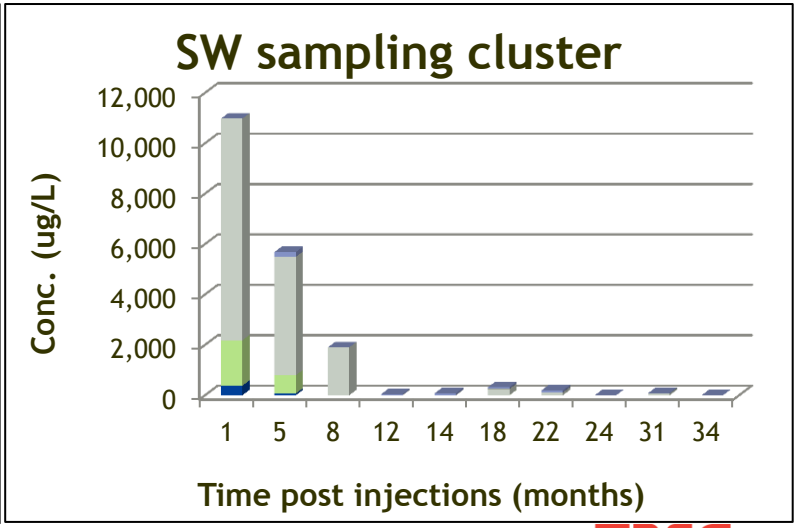
Source Area Treatment Results
CVOCs









VC
CA
c-DCE
TCE
PCE

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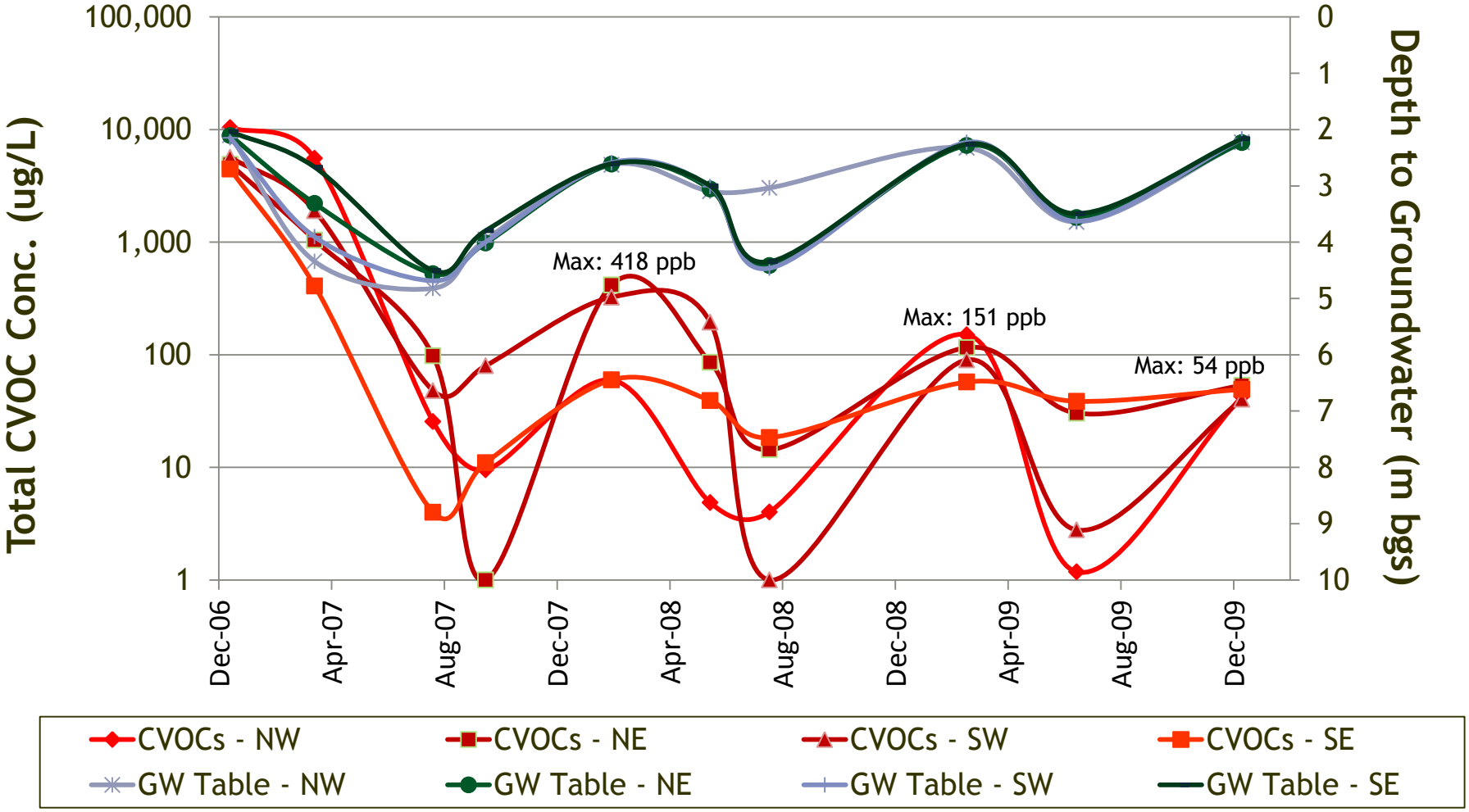
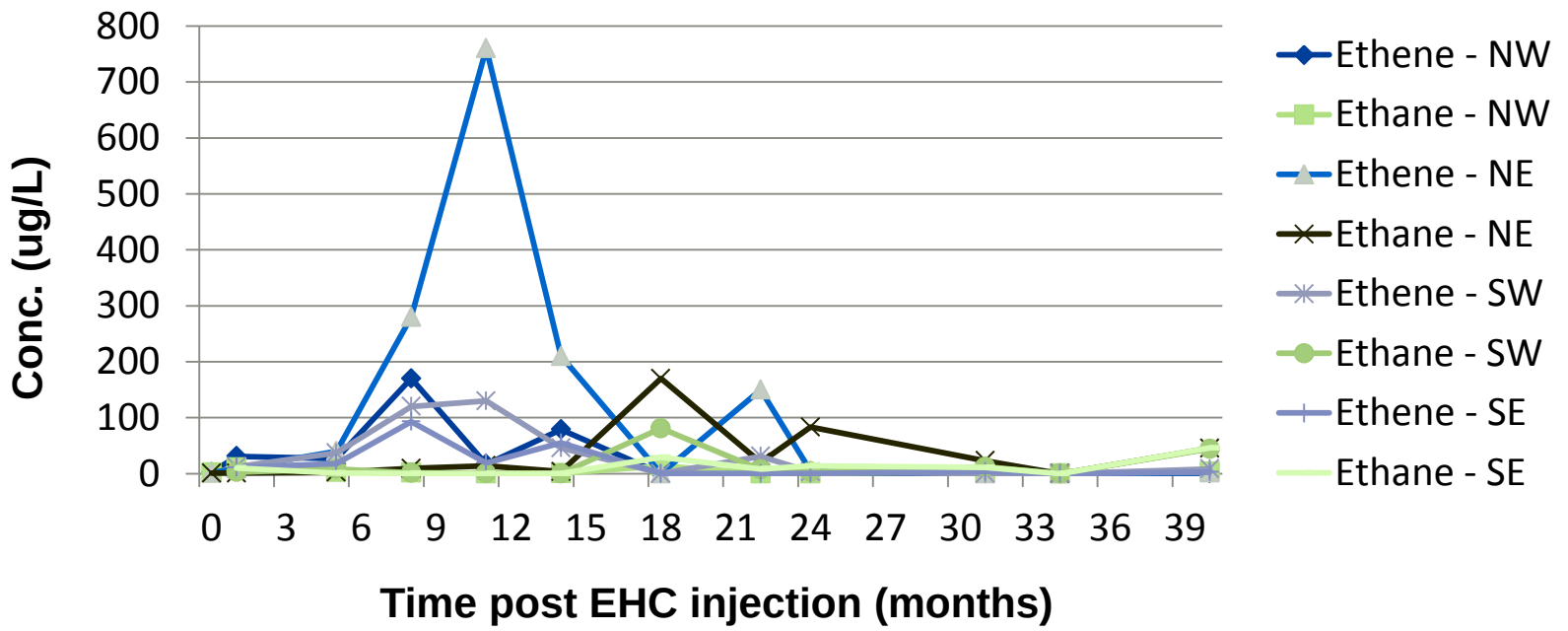
Total CVOCs and Fluctuations in Groundwater Table



Source Area Treatment
Degradation End Products



- An increase in ethene and ethane levels confirms that complete dehalogenation is occurring.
- Ethene levels of up to 760 ug/L were measured in July 2007 (11-month data) → 96 percent increase compared with maximum baseline levels.
- A correlation has been observed between total CVOC concentrations and ethene plus ethane measured in groundwater following an initial acclimatization period of 7 months.

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