DEPARTMENT OF DEFENSE

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND, MID-ATLANTIC
9742 MARYLAND AVENUE
NORFOLK, VIRGINIA 23511-3095

IN REPLY REFER TO:
5090
OPNEEV/lbf
10 Sept 2008

Mr. Stephen M. Scharf
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Action Bureau A, 11th Floor
625 Broadway
Albany, New York 12233-7258

Subj: SITE 1 - PHASE II SOIL VAPOR TESTING WORK PLAN; NAVAL WEAPON INDUSTRIAL RESERVE PLANT (NWIRP) BETHPAGE, NEW YORK; EPA ID # NYD002047967

Dear Mr. Scharf:

The Navy is forwarding two copies of the enclosed "Site1 - Phase II Soil Vapor Testing Work Plan, NWIRP Bethpage, New York". The Work Plan describes the soil vapor testing that will be conducted in the residential neighborhood adjacent to Site 1 to determine extent of contaminated soil vapors that may have migrated offsite. This Work Plan is being conducted in accordance with the New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion in the State of New York.

Should you have any questions, please contact me at (757) 444-0781.

Sincerely,

LORA B. FLY
Remedial Project Manager
By Direction of the
Commanding Officer

Encl: (1) Site1 - Phase II Soil Vapor Testing Work Plan, NWIRP Bethpage, New York

Subj: SITE 1 - PHASE II SOIL VAPOR TESTING WORK PLAN; NAVAL WEAPON INDUSTRIAL RESERVE PLANT (NWIRP) BETHPAGE, NEW YORK; EPA ID # NYD002047967

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SITE 1
PHASE II SOIL VAPOR TESTING
WORK PLAN

NWIRP BETHPAGE
Bethpage, New York

DEPARTMENT OF THE NAVY
UNITED STATES OF AMERICA

Naval Facilities Engineering Command
Mid-Atlantic

Contract No. N62472-03-D-0057
Contract Task Order 147

SEPTEMBER 2008

SITE 1
PHASE II SOIL VAPOR TESTING
WORK PLAN

NAVAL FACILITIES ENGINEERING COMMAND
MID-ATLANTIC

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Naval Facilities Engineering Command
Mid-Atlantic
9742 Maryland Avenue
Norfolk, Virginia 23511-3095

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Contract No. N62472-03-D-0057
Contract Task Order 147

September 2008

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LETTER WORK PLAN
SITE 1 – PHASE II SOIL VAPOR TESTING
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK

1.0 INTRODUCTION

This Work Plan has been prepared for the Phase II Soil Vapor Testing activities at properties adjacent to the Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage, Long Island, New York (Figures 1 and 2). Site 1 was identified as having been impacted by historic releases of chlorinated solvents and was remediated via an air sparging/soil vapor extraction (AS/SVE) system between 1998 and 2002. The treatment was based on protection of groundwater. Soil vapor testing conducted in January 2008 indicated elevated concentrations of VOCs existing along the east and southeast boundary of Site 1 that may adversely affect the nearby residential neighborhood. This Phase II soil vapor testing is being conducted to evaluate the potential migration of contaminated soil vapor to off-site areas.

The Phase II Soil Vapor Testing activities will include the installation of 24 soil gas sampling points at eight locations and at approximate depths of 8 feet, 20 feet and 50 feet below ground surface (bgs). Soil gas samples will be analyzed for volatile organic compounds (VOCs) via EPA TO-15 method. This Work Plan is being conducted in accordance with New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH 2006).

1.1 SITE HISTORY

The NWIRP-Bethpage was established in 1933. Since its inception, the plant’s primary mission has been the research prototyping, testing, design engineering, fabrication, and primary assembly of military aircraft. The facilities at NWIRP-Bethpage included four plants used for assembly and prototype testing; a group of quality control laboratories, two warehouses complexes (north and south), a salvage storage area, water recharge basins, the Industrial Wastewater Treatment Plant, and several smaller support buildings. In 1998, operations ended at the facilities.

Site 1 is located in the middle third of the NWIRP Bethpage facility and is east of Plant No. 3, see Figure 2. The Site occupies approximately four acres, and contains a concrete storage pad and an abandoned cesspool leach field. Historically, this site was also used as a storage area for various types of equipment and heavy materials, including transformers. Site 1 is enclosed by a six-foot high, chain-link fence. The site is relatively flat, with the eastern portion covered with sandy soils, gravel, grass, and one concrete pad. The western portion of the site is predominantly covered with concrete. A vegetated wind row (pine) and wood fence are present along the eastern edge of the site to reduce community visibility.

1.2 BACKGROUND

In 1985, an Initial Assessment Study (IAS) conducted at the NWIRP Bethpage, NY, identified materials stored at Site 1 the Former Drum Marshaling Area. This storage first took place on a gravel surface over the cesspool field, east of Plant No. 3. Hazardous waste management practices for Northrop Grumman facilities included the staging of drummed wastes include waste halogenated and non-halogenated solvents (Rogers, Golden & Halpern, 1986). Cadmium and cyanide were also stored in Area 2 within Site 1 from the early 1950s through 1974. Reportedly, 200 to 300 drums were stored at each area at any one time within Site 1. In 1978, the collection and marshaling point was moved a few yards south of the original site, to an area on a concrete pad. In 1982, drummed waste storage was relocated to another Drum Marshaling facility located in the Salvage Storage Area, which is not at Site 1. Reportedly, there was no direct evidence of hazardous waste spills at Site 1. An abandoned septic drainage system almost completely underlies the entire area of Site 1.

An AS/SVE system was constructed in 1998 to address VOCs in site soils. The primary volatile compounds of concern, based on distribution and maximum detected concentrations, included trichloroethene (TCE), tetrachlorethene (PCE), 1,1,1- trichloroethane (1,1,1-TCA), 1,2-dichloroethane (1,2-DCA), 1,2-dichloroethene (1,2- DCE), and 1,1-dichloroethene (1,1-DCE). The preliminary remediation goals (PRGs) were established in the Record of Decision (ROD) prepared in May 1995 (NDNFEC/NYSDEC, 1995). The goals were established to control continuing releases of VOCs to groundwater.

In 2001, VOC concentrations in the extracted vapor were measured to estimate the efficiency of the extraction process. Post treatment groundwater sampling was also conducted in 2002. The analytical results above practical quantity limits (PQL) included chloroform in one location at 1.2 micrograms per liter (µg/L); 1,1,1- TCA in two locations at 5.2 and 48 ug/L and PCE at two locations at 18 and 21 ug/L. Based upon historical groundwater data since 1998, the concentrations of VOCs in groundwater decreased since the inception of the project.

The AS/SVE system ran continuously from August 1998 to March 2002, except during winter months. Approximately 4,500 pounds of VOCs were removed from the soil and groundwater during the duration of the system. Post Operational sampling was performed in 2002 in order to close-out the AS/SVE system at Site 1. Results of the sampling are provided in Attachment A.

To further determine the effectiveness of the AS/SVE treatment system on VOCs in the subsurface and to delineate the current levels of polychlorinated biphenyls (PCBs) and metals in soil, another post operational soil boring program was conducted in 2002. During the post-operational soil-boring program, 41 soil borings were advanced to the top of the water table, which was approximately 65 feet bgs. The soil samples were analyzed for target compound list (TCL) VOCs, PCBs, and target analyte list (TAL) metals. Analysis of the soil samples indicated that VOCs were not detected in the majority of soil boring locations. VOCs exceeding the PRGs were observed in six of the soil boring locations. The sampling results are presented in Attachment A. These VOCs were present at depths ranging from 10 to 64 feet. Six soil boring locations showed VOCs above the PRGs at depths that would have been affected by the AS/SVE system. The presence of VOCs at shallow depths indicated the difficulty of vapor extraction wells to efficiently remove more surficial VOCs. Additionally, the clay layers in the subsurface soil resulted in the potential for inefficiencies at the surface intervals. Four soil boring locations showed VOCs above the PRGs at depths that would not have been affected by the AS/SVE. The existence of VOCs at increasing depths could be due to the groundwater contamination at the site, particularly in light of the depressed water table due to the ongoing drought conditions (Foster Wheeler Environmental, Corp., 2003).

Final regulatory guidance for evaluating soil vapor intrusion was issued in October of 2006 by the NYSDOH and identified soil vapor migration and intrusion into buildings as a potential concern. In January 2008, a soil gas investigation determined that continuous soil vapors from Site 1 may be migrating past the Navy fence line (Tetra Tech, 2008). Soil gas samples collected along the eastern border of the site exceeded NYSDOH for indoor air criteria for TCE and PCE of 5 ug/m^3 and 100 u/m^3, respectively (Figure 3). Maximum TCE and PCE concentrations were 180,000 µg/m^3 at 20 feet bgs, and 5,300 µg/m^3 at 24 feet bgs, respectively.

Chemical concentrations in soil gas samples collected along the southern edge of Site 2 and the northeast corner of Site 1 (BPS1-1004, BPS1-1005, and BPS1-1006) were much lower than concentrations detected along the central and southeast corner of Site 1. Maximum TCE and PCE concentrations in this area were 820 µg/m^3 and 78 µg/m^3, respectively. Additionally, these concentrations were detected at a depth of 46 feet below ground surface (bgs). Shallower samples contained lower concentrations of these chemicals. The highest concentrations of TCE and PCE were generally detected at depths of 20 and 50 feet. However, shallow samples BPS1-SG1001-07 (7 feet bgs) and BPS1-SG1002-08 (8 feet) contained TCE (19,000 µg/m^3 and 3,300 µg/m^3) and PCE (170 µg/m^3 and 1,700 µg/m^3) at concentrations greater than NYSDOH criteria of 5 µg/m^3 and 100 µg/m^3 for indoor air, respectively.

1.3 OBJECTIVE

The objective of this Phase II soil vapor testing is to delineate the extent of contaminated soil vapor and determine if contaminated soil vapor has migrated offsite towards adjacent residential properties.

1.4 CONCEPTUAL SITE MODEL (CSM)

In January 2008, the Navy collected soil gas samples at the facility fence line, approximately 70 feet from residential housing. Samples were collected at depths of approximately 8, 20, and 45 feet below ground surface (bgs). Data is presented in a draft report (TtNUS, 2008) and documents findings of TCE at concentrations up to 19,000 micrograms per cubic meter of air (µg/m^3) at 7 feet bgs, 180,000 µg/m^3 at 20 feet bgs, and 150,000 µg/m^3 at 50 feet bgs. For comparison, NYSDOH Indoor Air Quality Criteria for TCE is 5 µg/m^3 and sub slab guidance for action is 250 µg/m^3. Based on the distance from the site to the residential housing, lower concentrations of TCE would be expected under the housing area. Other VOCs, including PCE and 1,1,1-TCA, were also detected at concentrations up to 90,000 µg/m^3 in the soil gas samples.

Given the AS/SVE remediation of VOCs in the soil and groundwater at Site 1 and the results of the recent soil vapor testing at the site, it is likely that residual VOCs in fine grained material may be distributed through soil vapor diffusion in the unsaturated zone. The recent soil vapor testing also suggests that soil vapor migration from Site 1 could potentially be impacting the adjacent residential area. Further evaluation and delineation of VOC contaminated soil vapor is needed to determine whether there is a potential vapor migration pathway.

1.5 SAMPLING APPROACH

The area being investigated for this Phase II soil vapor testing is the eastern and southeastern offsite residential area adjacent to Site 1. Soil vapor sampling points will be temporarily installed along town Right-of-Ways (ROWs) in the residential neighborhood.

The eight initially proposed soil gas sampling locations are depicted on Figure 4. Prior to installing the eight soil gas sampling points, a continuous soil boring/core will be advanced to 50 feet bgs to evaluate the subsurface lithology at each location. Each of the eight proposed soil gas locations will include the installation of three borings using direct-push technology (DPT) with approximate soil gas sampling depths of 8, 20, and 50 feet bgs. Exact depths of the sampling points may be modified in the field to avoid silt/clay units. The three borings at each location will be placed approximately 2 to 3 feet away from each other. Table 1 presents the boring numbers and the approximate soil gas testing depths for each of the initial eight proposed locations.

Surveying of the temporary wells will not be completed during the investigation. However, field measurements will be taken to define the soil gas locations.

Each soil gas sample will be analyzed according to United States Environmental Protection Agency (USEPA) Method TO-15 VOCs by an Environmental Laboratory Approval Program (ELAP) certified laboratory (USEPA, 1999). Table 2 presents each of the soil gas locations, corresponding sample nomenclature, and analytical method. One field blank will be taken per day and analyzed for TO-15 VOCs. A list and anticipated detection limits are presented in Attachment B. Tentatively identified compounds will be reported.

Sample labeling information for this sampling event at Site 1 is provided in Table 2 of this Work Plan. All sample containers will be labeled with a unique sample identifier. The sample identification code will consist of up to 12 characters, as described below. Any other pertinent information regarding sample identification will be recorded in the field logbooks or on sample log sheets. These identification codes may be updated in the field based on the procedures outlined in this section.

- The first four characters indicate the site from which the sample is to be collected:
  BPS1 (Bethpage Site 1)
- The next two characters indicate the matrix:
  BPS1-SG (Soil Gas)
- The next four characters indicate the sampling location:
  BPS1-SG2001 (Location 1)
- The next two characters indicate the depth of the sample
  BPS1-SG2001-08 (8 feet bgs)

1.6 POTENTIAL ADDITIONAL SAMPLING

Soil gas data obtained from the first round of right-of-way sampling will be used to determine where sampling is warranted in the nearby homes. The Navy will work concurrently with its legal branch and NYSDEC to obtain access. The Navy will draft access agreements for residential homes that are suspected to have potential soil vapor intrusion and are willing to have their homes sampled. Residential sampling will comply with DOH guidelines.

Figure 4 presents several additional soil gas sampling locations. These soil gas sampling locations may or may not be needed and additional soil gas sampling locations will be selected based on the analytical results from the initial eight soil gas sampling locations. If necessary, a second field event will be conducted to install these additional sampling points to further evaluate the migration of contaminated soil vapor.

The soil vapor results from the sampling conducted in January 2008 at Site 1 are presented on Table 3. The list of contaminants of concern (COCs) has been narrowed down based on the actual number of detections and concentrations observed during the January 2008 sampling. The following provides the rational for de-selecting compounds:

- No positive detections: chlorobenzene
- No detections above EPA Region 3 Ambient Air criteria: acetone, carbon disulfide, chloromethane, 2-butanone, ethylbenzene, Freon 11, Freon 12, Freon, 113, 4-Methyl-2-pentanone, styrene, toluene, xylenes
- Six or less detections in 23 total samples in January 2008: methylene chloride, methyl-tert-butyl-ether, trans 1,2-dichloroethane, carbon tetrachloride, 1,4-dichlorobenzene

The compounds listed above will be tested for during this phase of soil vapor testing. However, the additional sampling locations will be selected based on a comparison to the proposed screening levels/ranges for the target compound list presented on Table 4.

The proposed screening levels are based on the most recent EPA Regional Screening Levels for residential air (July, 2008). For the non-carcinogenic compounds, the direct residential air screening levels will be used and for carcinogenic compounds, risk levels of $1x10^{-4}$ to $1x10^{-6}$ was used to calculate the proposed soil vapor screening levels/ranges presented on Table 4. Regional residential air levels are calculated for direct exposure, therefore the proposed soil vapor screening levels/ranges would be reasonable and conservative risk based values for screening soil vapor results collected during this investigation.

Procedures for the additional soil gas sampling locations will be the same as the initial soil gas sampling. Sample nomenclature will be consistent with and a continuance of the initial eight soil vapor sampling locations presented on Table 2

2.0 FIELD ACTIVITIES

The initial scope of work consists of drilling 24 temporary soil gas monitoring points at eight locations, 3 at each location, with approximate depths of 8, 20, and 50 feet. Additional and/or optional soil gas sampling locations will be collected as necessary and selected based on the screening criteria present in Section 1.5. The specific activities for the initial and optional soil gas sampling locations are as follows:

1. Identify planned and optional drilling locations.
2. Conduct utility clearance activities.
3. Install 24 soil gas wells at 8 locations.
4. Sample for TO-15 VOCs at approximately 8, 20, and 50 feet bgs at each of the 8 locations.

The initial and optional soil gas locations are presented on Figure 4. Field activities for the initial eight locations are presented in Table 1. Sample nomenclature and analysis are presented in Table 2. Optional soil gas sampling locations will follow the same logic and sample nomenclature as presented in Table 1 and 2. Sampling procedures are detailed in Attachment C.

The field sampling team should maintain a sample log sheet summarizing the following:

a. sample identification.
b. date and time of sample collection.
c. sampling depth.
d. identity of samplers.
e. sampling methods and devices.
f. purge volumes.
g. volume of soil vapor extracted.
h. the vacuum before and after samples are collected.
i. apparent moisture content (dry, moist, saturated, etc.) of the sampling zone.
j. wind speed and direction.
k. ambient temperature.
l. barometric pressure.
m. relative humidity.
n. chain of custody (COC) protocols and records used to track samples from sampling point to analysis.
(An example of the Soil Gas Sample Log Sheet is presented in Attachment C)

SUMMA® canisters will be utilized for collected all soil gas samples. The SUMMA® canisters do not require preservation with ice or refrigeration during shipment. SUMMA® canisters will be shipped to the laboratory via overnight carrier (e.g., Federal Express) for analysis. Once the soil gas samples have been collected, the temporary soil gas monitoring points will be abandoned by removing the drive rods, and filling the resulting hole with clean sand.

Ambient air samples will also be collected simultaneously during the soil gas sampling. The SUMMA® canister will be positioned at a location near the associated soil vapor monitoring point at a height of 4 ft above grade. The ambient air sample will be obtained over a four- to eight-hour period. Ambient air samples will be shipped to the laboratory as described above.

3.0 Reporting

A letter report will be submitted to include; field procedures, field activities, and sampling results. All samples that will be used to make decisions on appropriate actions to address exposures and environmental contamination will be analyzed by an ELAP certified laboratory. Reporting limits will be identified in conjunction with the sampling results. Reporting limits will be derived from the air guideline values derived by the New York State Department of Health (NYSDOH, 2006).

4.0 Schedule

Pending approval of this work plan and receipt of property access agreements with the Town of Oyster Bay, the fieldwork will start within approximately 4 to 6 weeks with the initial sampling being completed within two weeks. After receipt and validation of the initial analytical data and agreement on the next investigative steps, the additional soil gas investigation will be completed within 6 to 8 weeks.

The need and actual locations for residential vapor intrusion sampling will be based on the results of the initial soil gas sampling. The field work will be conducted within 4 weeks after receipt of access agreements, with a goal of conducting this work during this heating season.

ACRONYMS

1, 1, 1-TCA	1, 1, 1-trichloroethene
1, 1-DCE	1, 1-dichloroethene
1, 2-DCA	1, 2-dichloroethane
1, 2-DCE	1, 2-dichloroethene
AS/SVE	air sparging/soil vapor extraction
bgs	below ground surface
COC	chain of custody
DPT	direct-push technology
ELAP	Environmental Laboratory Approval Program
IAS	Initial Assessment Study
ml/min	milliliters per minute
NWIRP	Naval Weapons Industrial Reserve Plant
NYSDOH	New York State Department of Health
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PQL	practical quantity limits
PRG	preliminary remediation goals
ROD	Record of Decision
SVPM	Soil Vapor Pressure Monitor
TAL	Target analyte list
TCE	trichloroethene
TCL	Target compound list
VOC	Volatile organic compound
USEPA	United States Environmental Protection Agency
µg/L	micrograms per liter

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Foster Wheeler Environmental Corp., 2003. Final Close-Out Report, Construction of a Soil Vapor Extraction/Air Sparging System at the Naval Weapons Industrial Reserve Plant Bethpage, NY. December.

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United States Environmental Protection Agency (USEPA), 1999. Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air Second Edition Compendium Method TO-15 Determination Of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/ Mass Spectrometry (GC/MS). January.

United States Environmental Protection Agency (USEPA), 2002. OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance). November.

United States Environmental Protection Agency (USEPA), 2008. Regional Screening Levels for Chemical Contaminants at Superfund Sites (Residential Air Supporting Table). July.

TABLE 1
PRE-DESIGN FIELD INVESTIGATION
SOIL GAS BORINGS
PHASE II SOIL GAS TESTING
NWIRP BETHPAGE, NEW YORK

Boring Number	Drilling Method	Total Depth (feet)[1]	Depth (feet)	Continuous Soil Core	Air Sample [2]
BPS1-SG2001	DPT	50	8	NO	YES
			25	NO	
			50	YES	
BPS1-SG2002	DPT	50	8	NO	YES
			20	NO	
			50	YES	
BPS1-SG2003	DPT	50	8	NO	YES
			20	NO	
			50	YES	
BPS1-SG2004	DPT	50	8	NO	YES
			20	NO	
			50	YES	
BPS1-SG2005	DPT	50	8	NO	YES
			20	NO	
			50	YES	
BPS1-SG2006	DPT	50	8	NO	YES
			20	NO	
			50	YES	
BPS1-SG2007	DPT	50	8	NO	YES
			20	NO	
			50	YES	
BPS1-SG2008	DPT	50	8	NO	YES
			20	NO	
			50	YES	

1.	Depth below ground surface
2.	Work area summa canister (4 to 8 hours).
DPT	Direct push technology

TABLE 2
PRE-DESIGN FIELD INVESTIGATION
SAMPLE NOMENCLATURE AND ANALYTICAL METHOD
PHASE II SOIL GAS TESTING
NWIRP BETHPAGE, NEW YORK

Location	Sample ID	Matrix	VOCs-TO15A (1)
SG2001	BPS1-SG2001-XX	Air	1
SG2001	BPS1-SG2001-XX	Air	1
SG2001	BPS1-SG2001-XX	Air	1
SG2002	BPS1-SG2002-XX	Air	1
SG2002	BPS1-SG2002-XX	Air	1
SG2002	BPS1-SG2002-XX	Air	1
SG2003	BPS1-SG2003-XX	Air	1
SG2003	BPS1-SG2003-XX	Air	1
SG2003	BPS1-SG2003-XX	Air	1
SG2004	BPS1-SG2004-XX	Air	1
SG2004	BPS1-SG2004-XX	Air	1
SG2004	BPS1-SG2004-XX	Air	1
SG2005	BPS1-SG2005-XX	Air	1
SG2005	BPS1-SG2005-XX	Air	1
SG2005	BPS1-SG2005-XX	Air	1
SG2006	BPS1-SG2006-XX	Air	1
SG2006	BPS1-SG2006-XX	Air	1
SG2006	BPS1-SG2006-XX	Air	1
SG2007	BPS1-SG2007-XX	Air	1
SG2007	BPS1-SG2007-XX	Air	1
SG2007	BPS1-SG2007-XX	Air	1
SG2008	BPS1-SG2008-XX	Air	1
SG2008	BPS1-SG2008-XX	Air	1
SG2008	BPS1-SG2008-XX	Air	1
Duplicate	BPS1-DUP01	Air	1
Duplicate	BPS1-DUP02	Air	1
Duplicate	BPS1-DUP03	Air	1
Duplicate	BPS1-DUP04	Air	1
Field Blank	BPS1-FB2001-XX	Air	1
Field Blank	BPS1-FB2002-XX	Air	1
Field Blank	BPS1-FB2003-XX	Air	1
Field Blank	BPS1-FB2004-XX	Air	1
Field Blank	BPS1-FB2005-XX	Air	1
Field Blank	BPS1-FB2006-XX	Air	1

VOCs:	Volatile organic compounds.
XX:	Bottom of sample interval in feet. For example, a soil gas sample collected at SG1001 at 20 feet below ground surface would be BPS1-SG1001-20.
1	21-Day results from Navy-approved laboratory via method TO-15.

TABLE 3
SOIL GAS SAMPLING ANALYTICAL RESULTS - JANUARY 2008
NWIRP BETHPAGE, NEW YORK
PAGE 1 OF 1

	Ambient air (1)		BPS1-SG1001-07	BPS1-SG1001-20	BPS1-SG1001-40	BPS1-SG1002-08	BPS1-SG1002-08 DUP	BPS1-SG1002-20	BPS1-SG1002-45	BPS1-SG1003-05.5	BPS1-SG1003-20	BPS1-SG1003-45	BPS1-SG1004-05.5	BPS1-SG1004-22	BPS1-SG1004-46	BPS1-SG1005-08	BPS1-SG1005-20	BPS1-SG1005-45	BPS1-SG1006-07	BPS1-SG1006-20	BPS1-SG1006-45	SVPM11S-24	SVPM11-49	SVPM12S-25	SVPM12-50	Highest Detected Concentration	Number of Positive Detections
Compound	**µG/m3**		**µg/m^3**	**µg/m^3**	**µg/m^3**	**µg/m^3**	**µg/m^3**	**µg/m^3**	**µg/m^3**	**µg/m^3**	**µg/m^3**	**µg/m^3**	**µg/m^3**	**µg/m^3**	**µg/m^3**	**µg/m^3**	**µg/m^3**	**µg/m^3**	**µg/m^3**	**µg/m^3**	**µg/m^3**	**µg/m^3**	**µg/m^3**	**µg/m^3**	**µg/m^3**	**µg/m^3**	
Freon 12	182.50	N			4.1					0.86			1.6	1.9		1.8	1.6	1.4	1.6	1.4	1.2		1.8			4.1	11
Chloromethane	94.90	N											0.83	1.1		0.79	0.34				0.5		1.1			1.1	6
Freon 11	730.00	N								1.8			1.3	1.5		1.3	1.6	2.3	1.1	1.7	1.4		1.2			2.3	10
Freon 113	31,390.00	N				2,200	2,900	5,100	2,400	790E	1,400	2,200	4		600	2.4	3	15				4,900				5,100.0	13
1,1-Dichloroethene	219.00	N	**490**	**2,400**	15			20		0.94	5.8	8.8			4.1									**1,700**	**4,700**	**4,700.0**	10
Acetone	3,285.00	N	370		14	64	72	1500	2000	95	120	340	330E	230E	470	230E	490 E	740E	110	160E	570E		9.3			2,000.0	19
Carbon Disulfide	730.00	N											3.6			2.5	4.6	2.3	3.2	4.7	2.4					4.7	7
Methylene Chloride	3.79	C			**150**																					**150.0**	1
Methyl tert-butyl ether	1.57	C										**8.2**														**8.2**	1
trans-1,2-Dichloroethene	62.05	N				22	25	58				5.6			22							**64**				**64.0**	6
1,1-Dichloroethane	511.00	C	130	**1,700**	14	15		62	16	1.2	19	95			460							63		**710**	**1,400**	**1,700.0**	13
2-Butanone	5,110.00	N	35					50	230	10	12	22	16	0.87	15	11	53	37	26	21	50		0.75			230.0	16
cis-1,2-Dichloroethene	36.50	N		**560**	4.4	**160**	**200**	**800**	**92**		3.7	8.1			**79**							**860**			**780**	**860.0**	11
Chloroform	0.08	C								**1.2**	**4.9**	**5.7**					**1.7**	**1.2**	**2.4**	**53**	**28**					**53.0**	8
1,1,1-Trichloroethane	5,219.50	N	**16,000**	**90,000**	890	740	970	1,900	550	440E	790	780	3.9		430	3.4	11	27			0.95	2,400		**36,000**	**75,000**	**90,000.0**	19
Carbon Tetrachloride	0.12	C																	**41**	**130**	**99**					**130.0**	3
Benzene	0.23	C						**33**	**56**	**3.3**	**6.2**	**9.4**	**7.6**	**1.4**	**5.2**	**7.1**	**22**	**8.4**	**5.1**	**7.2**	**23**		**1**			**56.0**	15
4-Methyl-2-pentanone	3,139.00	N											2.1				1.8		0.66							2.1	3
Toluene	5,110.00	N						31	66	25	41	24	32	3.6	15	10	37	30	8.8	18	40	23	2.2			66.0	16
Tetrachloroethene	0.31	C	**170**	**1,200**	**5.9**	**1,700**	**2,100**	**960**	**20**	**540E**	**1,300**	**250**	**22**		**78**	**15**	**59**	**60**	**19**	**28**	**44**	**5,300**				**5,300.0**	19
Chlorobenzene	51.10	N																								0.0	0
Ethyl Benzene	1,058.50	C								7.8	12	4.4	9.1			1.8	6.4	4.7	1.8	3.2	5.2					12.0	10
m,p-Xylene	109.50	N							20	27	34	14	32	1.9	7.4	5.1	12	13	5	8.4	14	26	1.2			34.0	15
o-Xylene										8.3	11		11	0.63		1.2	3.2	2.6	1.6	2.2	2.7					11.0	10
Styrene	1,043.90	C								0.92			0.76				0.89			0.74						0.9	4
1,4-Dichlorobenzene	0.16	N								**1.5**				**0.84**												**1.5**	2
Trichloroethene	0.02	C	**19,000**	**180,000**	**1,400**	**3,300**	**4,600**	**4,400**	**320**	**110**	**590**	**750**	**5.2**		**820**	**1.5**	**16**	**71**	**1.2**	**2**	**2.1**	**7,200**	**0.29**	**73,000**	**150,000**	**180,000.0**	22

1 - Ambient air criteria from EPA Region 3 RBC tables, http://www.epa.gov/reg3hwmd/risk/human/index.htm
µg/m^3 = micrograms per cubic meter of air
C = Carcinogenic effects N = Noncarcinogenic effects
Bolded values are exceedances of EPA Region 3 RBCs.
E = exceeds instrument calibration range, reported results likely exceed plus/minus 25 %.
Blank cells indicate a non-detect value.

TABLE 4
PROPOSED SOIL GAS SCREENING LEVELS
NWIRP BETHPAGE, NEW YORK
PAGE 1 OF 1

	EPA Regional Screening Levels - Residential Air (July 2008) (1)		NYSDOH Air Guideline (2)	Highiest Detection in Soil Gas (January 2008)	Number of Detections (January 2008)	Proposed Soil Gas Screening Level/Range
Compound	µg/m3		µg/m3	µg/m3		µg/m3
1,1-Dichloroethene	210	N		4,700	10	210
1,1-Dichloroethane	1.5	C		1,700	13	5 - 150
Chloroform	0.11	C		53	8	5 - 11
cis-1,2-Dichloroethene	NA	N		860	11	36.5(3)
1,1,1-Trichloroethane	5200	N		90,000	19	5200
Benzene	0.31	C		56	15	5 - 31
Tetrachloroethene	0.41	C	100	5,300	19	100
Trichloroethene	1.2	C	5	180,000	22	5

1 - Residential air criteria from Regional Screening Tables (July, 2008), http://epa-prgs.ornl.gov/chemicals/index.shtml

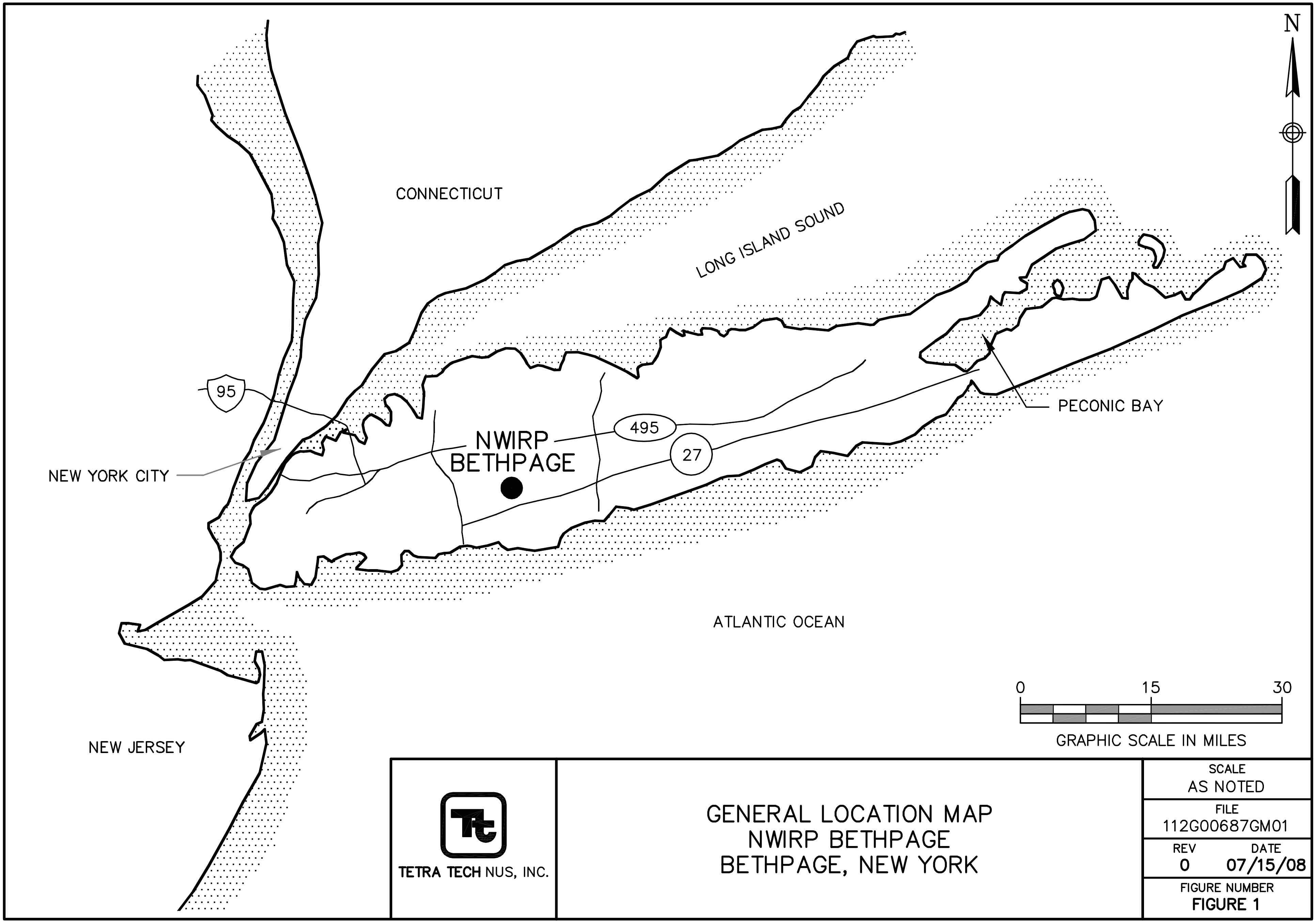
2 - NYSDOH Air Guidlines (Oct. 2006)

3 - No Regional Screening criteria available, using Ambient air criteria from EPA Region 3 RBC tables (Oct. 2007), http://www.epa.gov/reg3hwmd/ri

µg/m^3 = micrograms per cubic meter of air

C = Carcinogenic effects N = Noncarcinogenic effects

112G00687/0210/112G00687GM02.DWG 07/15/08 MKB



TETRA TECH NUS, INC.

GENERAL LOCATION MAP
NWIRP BETHPAGE
BETHPAGE, NEW YORK

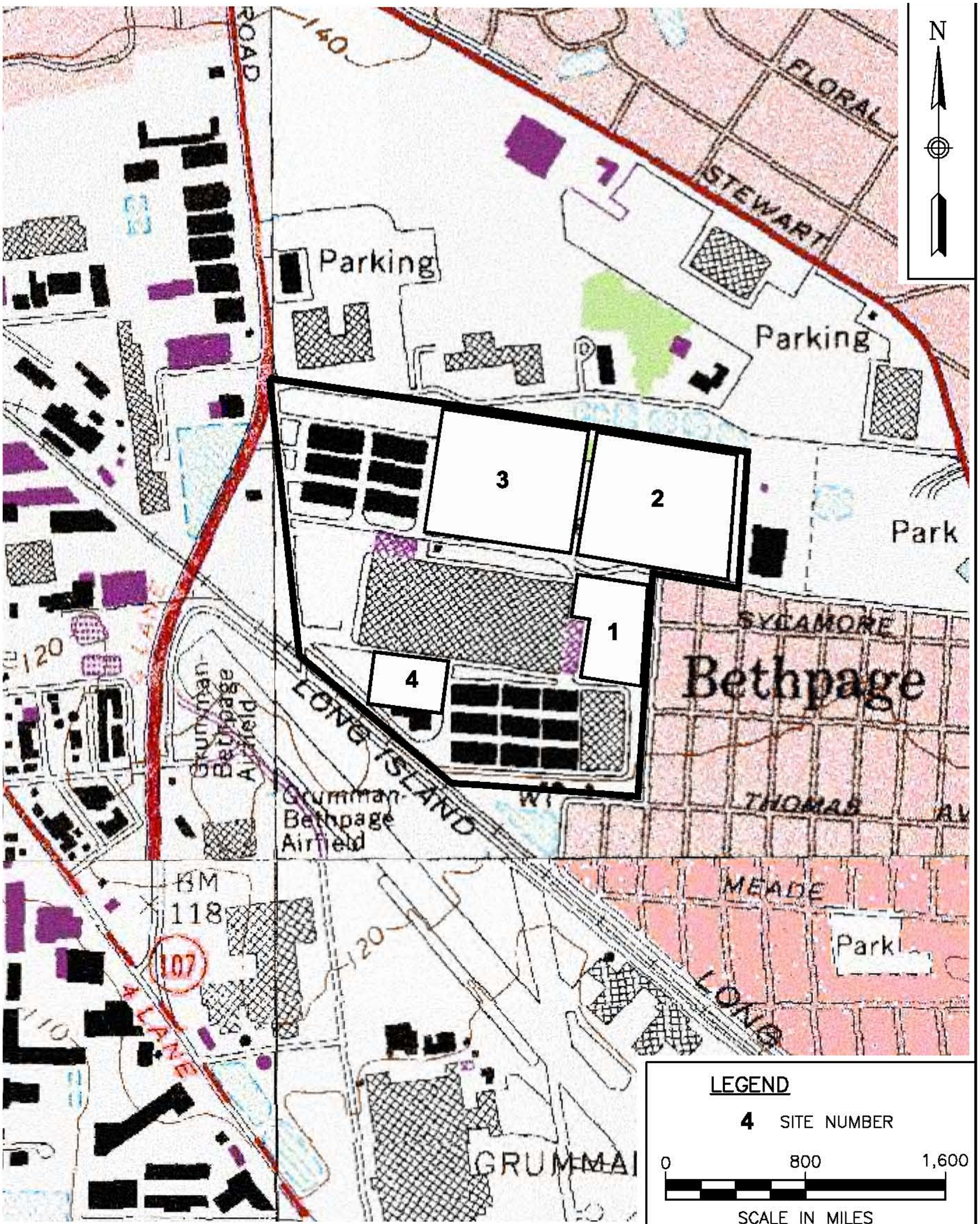
SCALE
AS NOTED

FILE
112G00687GM01

REV 0

DATE 07/15/08

FIGURE NUMBER
FIGURE 1



LEGEND

4 SITE NUMBER

0 800 1,600

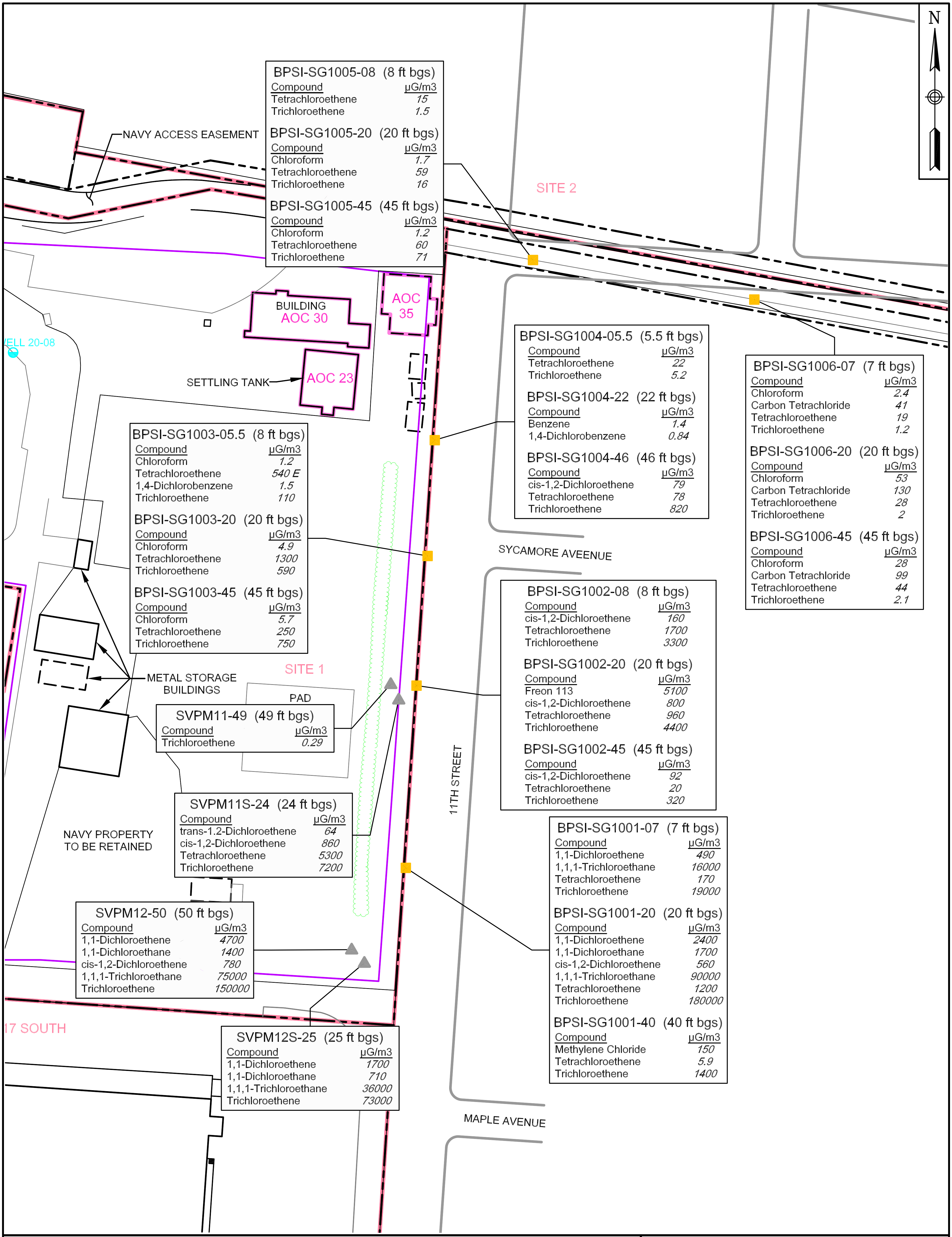
SCALE IN MILES

TETRA TECHNUS, INC.

SITE LOCATION MAP
SITE 1
NWIRP BETHPAGE
BETHPAGE, NEW YORK

SCALE AS NOTED	
FILE 112G00687BM01	
REV 0	DATE 07/15/08
FIGURE NUMBER FIGURE 2	

112GN9845/2810/112GN9845GM01.DWG 07/22/08 MKB



BPSI-SG1005-08 (8 ft bgs)

Compound	µG/m3
Tetrachloroethene	15
Trichloroethene	1.5

BPSI-SG1005-20 (20 ft bgs)

Compound	µG/m3
Chloroform	1.7
Tetrachloroethene	59
Trichloroethene	16

BPSI-SG1005-45 (45 ft bgs)

Compound	µG/m3
Chloroform	1.2
Tetrachloroethene	60
Trichloroethene	71

BPSI-SG1004-05.5 (5.5 ft bgs)

Compound	µG/m3
Tetrachloroethene	22
Trichloroethene	5.2

BPSI-SG1004-22 (22 ft bgs)

Compound	µG/m3
Benzene	1.4
1,4-Dichlorobenzene	0.84

BPSI-SG1004-46 (46 ft bgs)

Compound	µG/m3
cis-1,2-Dichloroethene	79
Tetrachloroethene	78
Trichloroethene	820

BPSI-SG1006-07 (7 ft bgs)

Compound	µG/m3
Chloroform	2.4
Carbon Tetrachloride	41
Tetrachloroethene	19
Trichloroethene	1.2

BPSI-SG1006-20 (20 ft bgs)

Compound	µG/m3
Chloroform	53
Carbon Tetrachloride	130
Tetrachloroethene	28
Trichloroethene	2

BPSI-SG1006-45 (45 ft bgs)

Compound	µG/m3
Chloroform	28
Carbon Tetrachloride	99
Tetrachloroethene	44
Trichloroethene	2.1

BPSI-SG1003-05.5 (8 ft bgs)

Compound	µG/m3
Chloroform	1.2
Tetrachloroethene	540 E
1,4-Dichlorobenzene	1.5
Trichloroethene	110

BPSI-SG1003-20 (20 ft bgs)

Compound	µG/m3
Chloroform	4.9
Tetrachloroethene	1300
Trichloroethene	590

BPSI-SG1003-45 (45 ft bgs)

Compound	µG/m3
Chloroform	5.7
Tetrachloroethene	250
Trichloroethene	750

BPSI-SG1002-08 (8 ft bgs)

Compound	µG/m3
cis-1,2-Dichloroethene	160
Tetrachloroethene	1700
Trichloroethene	3300

BPSI-SG1002-20 (20 ft bgs)

Compound	µG/m3
Freon 113	5100
cis-1,2-Dichloroethene	800
Tetrachloroethene	960
Trichloroethene	4400

BPSI-SG1002-45 (45 ft bgs)

Compound	µG/m3
cis-1,2-Dichloroethene	92
Tetrachloroethene	20
Trichloroethene	320

SVPM11-49 (49 ft bgs)

Compound	µG/m3
Trichloroethene	0.29

SVPM11S-24 (24 ft bgs)

Compound	µG/m3
trans-1,2-Dichloroethene	64
cis-1,2-Dichloroethene	860
Tetrachloroethene	5300
Trichloroethene	7200

BPSI-SG1001-07 (7 ft bgs)

Compound	µG/m3
1,1-Dichloroethene	490
1,1,1-Trichloroethane	16000
Tetrachloroethene	170
Trichloroethene	19000

BPSI-SG1001-20 (20 ft bgs)

Compound	µG/m3
1,1-Dichloroethene	2400
1,1-Dichloroethane	1700
cis-1,2-Dichloroethene	560
1,1,1-Trichloroethane	90000
Tetrachloroethene	1200
Trichloroethene	180000

BPSI-SG1001-40 (40 ft bgs)

Compound	µG/m3
Methylene Chloride	150
Tetrachloroethene	5.9
Trichloroethene	1400

SVPM12-50 (50 ft bgs)

Compound	µG/m3
1,1-Dichloroethene	4700
1,1-Dichloroethane	1400
cis-1,2-Dichloroethene	780
1,1,1-Trichloroethane	75000
Trichloroethene	150000

SVPM12S-25 (25 ft bgs)

Compound	µG/m3
1,1-Dichloroethene	1700
1,1-Dichloroethane	710
1,1,1-Trichloroethane	36000
Trichloroethene	73000

LEGEND

◒ DRY WELL
■ SOIL GAS SAMPLE LOCATION
▲ SOIL VAPR PRESSURE MONITOR
— PROPERTY LINE
— FENCE LINE
▭ SITE BOUNDARY
▭ AOC BOUNDARY

NOTE:
FIGURE PRESENTS VOLATILE ORGANIC COMPOUNDS THAT EXCEED EPA REGION 3 RBCs FOR INDOOR AIR. FOR COMPARISON, NEW YORK STATE DEPARTMENT OF HEALTH INDOOR AIR CRITERIA FOR TCE AND PCE ARE 5 µg/m³ AND 100 µg/m³ RESPECTIVELY.

0 80 160
SCALE IN FEET

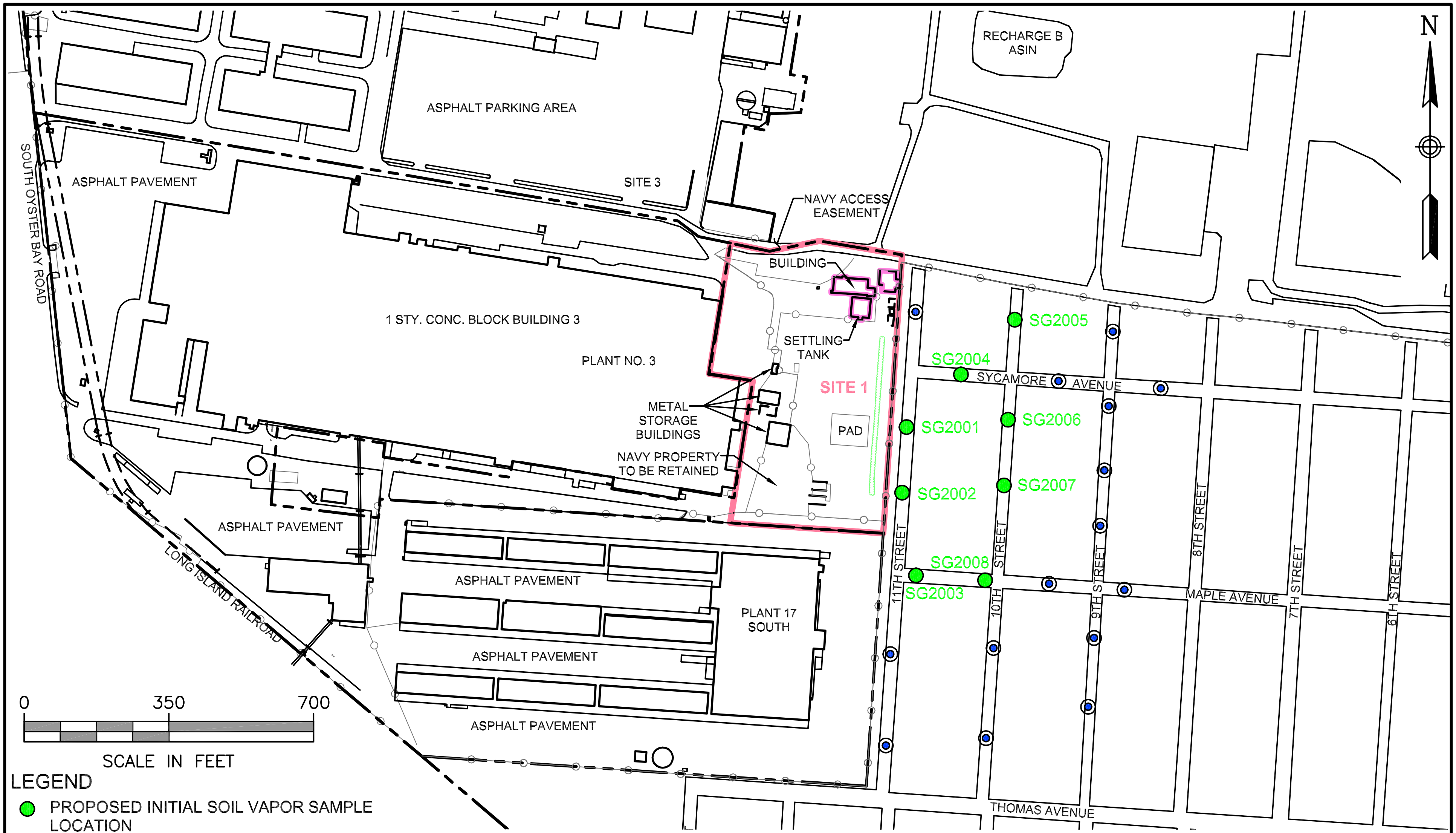
TETRA TECH NUS, INC.

SOIL GAS RESULTS – JANUARY 2008
SITE 1
NWIRP BETHPAGE
BETHPAGE, NEW YORK

FILE	SCALE
112GN9845GM01	AS NOTED

FIGURE NUMBER	REV	DATE
FIGURE 3	0	07/22/08

112G00687/0210/112G00687GM01.DWG 07/22/08 MKB



LEGEND

- 🟢 PROPOSED INITIAL SOIL VAPOR SAMPLE LOCATION
- 🔵 PROPOSED OPTIONAL - SOIL VAPOR SAMPLE LOCATION

NOTE

Proposed soil vapor sampling locations are to be placed in grass strips between the sidewalk and street were applicable. Locations shown are approximate and actual locations will be placed based on field conditions (i.e. aboveground and underground utilities).

TETRA TECH NUS, INC.

SOIL VAPOR SAMPLING LOCATIONS
SITE 1
NWIRP BETHPAGE
BETHPAGE, NEW YORK

SCALE
AS NOTED

FILE
112G00687GM01

REV 0
DATE 07/22/08

FIGURE NUMBER
FIGURE 4

ATTACHMENT A

SOIL GAS, SOIL, AND GROUNDWATER RESULTS

Table A-1
NWIRP-BETHPAGE
Monthly Monitoring Data
System Operation

VOCs in Extracted Soil Vapor - August 2001 - NWIRP - Bethpage, NY

Parameter	08/29/2001	08/29/2001	08/29/2001	08/29/2001	08/29/2001	08/29/2001	08/29/2001	08/29/2001	08/29/2001	08/29/2001	08/29/2001	08/29/2001	08/29/2001	08/29/2001	08/29/2001
	EV01	EW01	EW02	EW03	EW04	EW05	EW06	EW07	EW08	EW08-Dup	EW09	EW10	EW11	EW12	EW13
Freon 12															
Freon 114															
Chloromethane															
Vinyl Chloride	33											390			
Bromomethane															
Chloroethane															
Freon 11										9					
1,1-Dichloroethene										5.8	4.9	12			
Freon 113	220							11	11	9.5	46	1000	150	8.4	
Methylene Chloride															
1,1-Dichloroethane	100	92	6.7				78	4.8	4.2	4.1	34	85			
cis-1,2-Dichloroethene	1100		8.5				140	13	13	4.2	170	250	19		
Chloroform										5.7					
1,1,1-Trichloroethane	910	2700	430				68	37	37	24	100	1600	100	12	
Carbon Tetrachloride															
Benzene															
1,2-Dichloroethane															
Trichloroethene	1,600	8,400	950				270	130	130	470	450	85	87		
1,2-Dichloropropane															
cis-1,3-Dichloropropene															
Toluene															
trans-1,3-Dichloropropene															
1,1,2-Trichloroethane												5.9			
Tetrachloroethene	3,400	170	110				900	1000	1000	930	660	950	1400	9	
Ethylene Dibromide															
Chlorobenzene															
Ethyl Benzene															
m+p-Xylene															
o-Xylene															
Styrene															
1,1,1,2-Tetrachloroethane															
1,3,5-Trimethylbenzene															
1,2,4-Trimethylbenzene															
1,3-Dichlorobenzene															
1,4-Dichlorobenzene															
Chlorotoluene															
1,2-Dichlorobenzene															
1,2,4-Trichlorobenzene															
Hexachlorobutadiene															
Propylene															
1,3-Butadiene															
Acetone								38	38						
Carbon Disulfide															
2-Propanol															
Trans-1,2-Dichloroethene															
Vinyl Acetate															
2-Butanone (Methyl Ethyl Ketone)						1800						43		29	
Hexane															
Tetrahydrofuran						2900	22							38	
Cyclohexane												68	16		
1,4-Dioxane															
Bromodichloromethane															
4-Methyl-2-pentanone															
2-Hexanone															
Dibromochloromethane															
Bromoform															
4-Ethyltoluene															
Ethanol															
Methyl tertiary butyl ether															
Heptane															
Total VOCs	7,363.0	11,362.0	1,505.2	0.0	0.0	4,700.0	1,478.0	1,233.8	1,233.2	1,462.3	1,464.9	4,488.9	1,772.0	96.4	0.0

Notes:

1) All results are expressed in parts per billion volume (ppbv).

2) A blank indicates that the compound was not detected.

VOCs in Extracted Soil Vapor - September 2001 - NWIRP - Bethpage, NY

Parameter	09/19/2001
	EV02
Freon 12	
Freon 114	
Chloromethane	
Vinyl Chloride	
Bromomethane	
Chloroethane	
Freon 11	
1,1-Dichloroethene	
Freon 113	120
Methylene Chloride	
1,1-Dichloroethane	45
cis-1,2-Dichloroethene	410
Chloroform	
1,1,1-Trichloroethane	420
Carbon Tetrachloride	
Benzene	
1,2-Dichloroethane	
Trichloroethene	1,000
1,2-Dichloropropane	
cis-1,3-Dichloropropene	
Toluene	
trans-1,3-Dichloropropene	
1,1,2-Trichloroethane	
Tetrachloroethene	2,400
Ethylene Dibromide	
Chlorobenzene	
Ethyl Benzene	
m+p-Xylene	
o-Xylene	
Styrene	
1,1,1,2-Tetrachloroethane	
1,3,5-Trimethylbenzene	
1,2,4-Trimethylbenzene	
1,3-Dichlorobenzene	
1,4-Dichlorobenzene	
Chlorotoluene	
1,2-Dichlorobenzene	
1,2,4-Trichlorobenzene	
Hexachlorobutadiene	
Propylene	
1,3-Butadiene	
Acetone	
Carbon Disulfide	
2-Propanol	
Trans-1,2-Dichloroethene	
Vinyl Acetate	
2-Butanone (Methyl Ethyl Ketone)	
Hexane	
Tetrahydrofuran	
Cyclohexane	
1,4-Dioxane	
Bromodichloromethane	
4-Methyl-2-pentanone	
2-Hexanone	
Dibromochloromethane	
Bromoform	
4-Ethyltoluene	
Ethanol	
Methyl tertiary butyl ether	
Heptane	
Total VOCs	4,395.0

Notes:

1) All results are expressed in parts per billion volume (ppbv).
2) A blank indicates that the compound was not detected.

VOCs in Extracted Soil Vapor - October 2001 - NWIRP - Bethpage, NY

Parameter	10/05/2001	10/27/2001	10/27/2001	10/27/2001	10/27/2001	10/27/2001	10/27/2001	10/27/2001	10/27/2001	10/27/2001	10/27/2001	10/27/2001	10/27/2001	10/27/2001	10/27/2001	10/27/2001	10/27/2001
	Sample Location																
	EV03	EV04	EW01	EW02	EW03	EW03 Dup	EW04	EW05	EW06	EW07	EW08	EW09	EW10	EW11	EW12	EW12 Dup	EW13
Freon 12																	
Freon 114																	
Chloromethane		11										5.4					
Vinyl Chloride																	
Bromomethane																	
Chloroethane																	
Freon 11																	
1,1-Dichloroethene						4.9											
Freon 113	100	76			76	70					23				5.6	5.7	21
Methylene Chloride			31						18								
1,1-Dichloroethane	33	18	35		36	32					6.2	4.6			42	38	11
cis-1,2-Dichloroethene	310	180	31		230	210			18	10	69	23			47	47	23
Chloroform																	
1,1,1-Trichloroethane	340	230	1600		750	690		7.1	5.9		30	6.9		7.9	41	40	140
Carbon Tetrachloride																	
Benzene																	
1,2-Dichloroethane																	
Trichloroethene	720	440	4800	20	2100	1800		16	93	6.1	54	44		20	280	270	210
1,2-Dichloropropane																	
cis-1,3-Dichloropropene																	
Toluene																	
trans-1,3-Dichloropropene																	
1,1,2-Trichloroethane																	
Tetrachloroethene	1,300	700	89		930	830		27	190	30	270	89		8.6	150	150	45
Ethylene Dibromide																	
Chlorobenzene																	
Ethyl Benzene																	
m+p-Xylene																	
o-Xylene																	
Styrene																	
1,1,1,2-Tetrachloroethane																	
1,3,5-Trimethylbenzene																	
1,2,4-Trimethylbenzene					9.5	8.7											
1,3-Dichlorobenzene																	
1,4-Dichlorobenzene																	
Chlorotoluene																	
1,2-Dichlorobenzene																	
1,2,4-Trichlorobenzene																	
Hexachlorobutadiene																	
Propylene																	
1,3-Butadiene																	
Acetone												18					
Carbon Disulfide																	
2-Propanol																	
Trans-1,2-Dichloroethene																	
Vinyl Acetate																	
2-Butanone (MEK)		580					17				31						
Hexane																	
Tetrahydrofuran		540					19	29									
Cyclohexane																	
1,4-Dioxane																	
Bromodichloromethane																	
4-Methyl-2-pentanone																	
2-Hexanone																	
Dibromochloromethane																	
Bromoform																	
4-Ethyltoluene																	
Ethanol	16																
Methyl tertiary butyl ether																	
Heptane																	
Total VOCs	2,819.0	2,775.0	6,586.0	20.0	4,131.5	3,645.6	36.0	79.1	324.9	46.1	483.2	190.9	0.0	36.5	565.6	550.7	450.0

Notes:
1) All results are expressed in parts per billion volume (ppbv).
2) A blank indicates that the compound was not detected.

VOCs in Extracted Soil Vapor - November 2001 - NWIRP - Bethpage, NY

Parameter	11/11/2001	11/26/2001
	EV-05	EV-06
Freon 12		
Freon 114		
Chloromethane		
Vinyl Chloride		
Bromomethane		
Chloroethane		
Freon 11		
1,1-Dichloroethene		
Freon 113	100	120
Methylene Chloride		
1,1-Dichloroethane	29	29
cis-1,2-Dichloroethene	280	310
Chloroform		
1,1,1-Trichloroethane	340	460
Carbon Tetrachloride		
Benzene		
1,2-Dichloroethane		
Trichloroethene	550	600
1,2-Dichloropropane		
cis-1,3-Dichloropropene		
Toluene		
trans-1,3-Dichloropropene		
1,1,2-Trichloroethane		
Tetrachloroethene	980	1,800
Ethylene Dibromide		
Chlorobenzene		
Ethyl Benzene		
m+p-Xylene		
o-Xylene		
Styrene		
1,1,1,2-Tetrachloroethane		
1,3,5-Trimethylbenzene		
1,2,4-Trimethylbenzene		
1,3-Dichlorobenzene		
1,4-Dichlorobenzene		
Chlorotoluene		
1,2-Dichlorobenzene		
1,2,4-Trichlorobenzene		
Hexachlorobutadiene		
Propylene		
1,3-Butadiene		
Acetone		
Carbon Disulfide		
2-Propanol		
Trans-1,2-Dichloroethene		
Vinyl Acetate		
2-Butanone (MEK)		
Hexane		
Tetrahydrofuran		
Cyclohexane		
1,4-Dioxane		
Bromodichloromethane		
4-Methyl-2-pentanone		
2-Hexanone		
Dibromochloromethane		
Bromoform		
4-Ethyltoluene		
Ethanol		
Methyl tertiary butyl ether		
Heptane		
Total VOCs	2,279.0	3,319.0

Notes:
1) All results are expressed in parts per billion volume (ppbv).
2) A blank indicates that the compound was not detected.

VOCs in Extracted Soil Vapor - December 2001 - NWIRP - Bethpage, NY

Parameter	12/07/2001	12/28/2001
	EV-07	EV-08
Freon 12		
Freon 114		
Chloromethane		
Vinyl Chloride		
Bromomethane		
Chloroethane		
Freon 11		
1,1-Dichloroethene	5	4.1
Freon 113	94	60
Methylene Chloride		
1,1-Dichloroethane	30	24
cis-1,2-Dichloroethene	330	280
Chloroform		
1,1,1-Trichloroethane	470	400
Carbon Tetrachloride		
Benzene		
1,2-Dichloroethane		
Trichloroethene	700	620
1,2-Dichloropropane		
cis-1,3-Dichloropropene		
Toluene		
trans-1,3-Dichloropropene		
1,1,2-Trichloroethane		
Tetrachloroethene	1,300	1,200
Ethylene Dibromide		
Chlorobenzene		
Ethyl Benzene		
m+p-Xylene		
o-Xylene		
Styrene		
1,1,1,2-Tetrachloroethane		
1,3,5-Trimethylbenzene		
1,2,4-Trimethylbenzene		
1,3-Dichlorobenzene		
1,4-Dichlorobenzene		
Chlorotoluene		
1,2-Dichlorobenzene		
1,2,4-Trichlorobenzene		
Hexachlorobutadiene		
Propylene		
1,3-Butadiene		
Acetone		
Carbon Disulfide		
2-Propanol		
Trans-1,2-Dichloroethene		
Vinyl Acetate		
2-Butanone (MEK)		
Hexane		
Tetrahydrofuran		
Cyclohexane		
1,4-Dioxane		25
Bromodichloromethane		
4-Methyl-2-pentanone		
2-Hexanone		
Dibromochloromethane		
Bromoform		
4-Ethyltoluene		
Ethanol		
Methyl tertiary butyl ether		
Heptane		
Total VOCs	2,929.0	2,613.1

Notes:
1) All results are expressed in parts per billion volume (ppbv).
2) A blank indicates that the compound was not detected.

VOCs in Extracted Soil Vapor - January 2002 - NWIRP - Bethpage, NY

Parameter	01/09/2002	01/23/2002
	EV-09	EV-10
Freon 12		
Freon 114		
Chloromethane		
Vinyl Chloride		
Bromomethane		
Chloroethane		
Freon 11		
1,1-Dichloroethene		
Freon 113	66	73
Methylene Chloride		
1,1-Dichloroethane	22	21
cis-1,2-Dichloroethene	260	270
Chloroform		
1,1,1-Trichloroethane	370	350
Carbon Tetrachloride		
Benzene		
1,2-Dichloroethane		
Trichloroethene	620	550
1,2-Dichloropropane		
cis-1,3-Dichloropropene		
Toluene		
trans-1,3-Dichloropropene		
1,1,2-Trichloroethane		
Tetrachloroethene	1,000	1,100
Ethylene Dibromide		
Chlorobenzene		
Ethyl Benzene		
m+p-Xylene		
o-Xylene		
Styrene		
1,1,1,2-Tetrachloroethane		
1,3,5-Trimethylbenzene		
1,2,4-Trimethylbenzene		
1,3-Dichlorobenzene		
1,4-Dichlorobenzene		
Chlorotoluene		
1,2-Dichlorobenzene		
1,2,4-Trichlorobenzene		
Hexachlorobutadiene		
Propylene		
1,3-Butadiene		
Acetone		
Carbon Disulfide		
2-Propanol		
Trans-1,2-Dichloroethene		
Vinyl Acetate		
2-Butanone (MEK)		
Hexane		
Tetrahydrofuran		
Cyclohexane		
1,4-Dioxane		
Bromodichloromethane		
4-Methyl-2-pentanone		
2-Hexanone		
Dibromochloromethane		
Bromoform		
4-Ethyltoluene		
Ethanol		
Methyl tertiary butyl ether		
Heptane		
Total VOCs	2,338.0	2,364.0

Notes:
1) All results are expressed in parts per billion volume (ppbv).
2) A blank indicates that the compound was not detected.

VOCs in Extracted Soil Vapor - February 2002 - NWIRP - Bethpage, NY

Parameter	02/08/2002	03/01/2002
	EV-11	EV-12
Freon 12		
Freon 114		
Chloromethane		
Vinyl Chloride		
Bromomethane		
Chloroethane		
Freon 11		
1,1-Dichloroethene		
Freon 113	54	59
Methylene Chloride		
1,1-Dichloroethane	19	17
cis-1,2-Dichloroethene	260	200
Chloroform		
1,1,1-Trichloroethane	360	270
Carbon Tetrachloride		
Benzene		
1,2-Dichloroethane		
Trichloroethene	610	450
1,2-Dichloropropane		
cis-1,3-Dichloropropene		
Toluene		
trans-1,3-Dichloropropene		
1,1,2-Trichloroethane		
Tetrachloroethene	1,300	860
Ethylene Dibromide		
Chlorobenzene		
Ethyl Benzene		
m+p-Xylene		
o-Xylene		
Styrene		
1,1,1,2-Tetrachloroethane		
1,3,5-Trimethylbenzene		
1,2,4-Trimethylbenzene		
1,3-Dichlorobenzene		
1,4-Dichlorobenzene		
Chlorotoluene		
1,2-Dichlorobenzene		
1,2,4-Trichlorobenzene		
Hexachlorobutadiene		
Propylene		
1,3-Butadiene		
Acetone		
Carbon Disulfide		
2-Propanol		
Trans-1,2-Dichloroethene		
Vinyl Acetate		
2-Butanone (MEK)		
Hexane		
Tetrahydrofuran		
Cyclohexane		
1,4-Dioxane		
Bromodichloromethane		
4-Methyl-2-pentanone		
2-Hexanone		
Dibromochloromethane		
Bromoform		
4-Ethyltoluene		
Ethanol		
Methyl tertiary butyl ether		
Heptane		
Total VOCs	2,603.0	1,856.0

Notes:
1) All results are expressed in parts per billion volume (ppbv).
2) A blank indicates that the compound was not detected.

Table B-2 Post-Operational Groundwater Analytical Results

Client Sample ID	MW-103-032602			POSB-09-HP-6667			BPPOSB-20-HP6263			POSB-24-HP-6768			POSB-SEHP-6668			POSB-SWHP-6668			POSB-SWHP-6668D		
Lab Sample ID		P1954-01			P2184-03			P2156-01			P2184-01			P2199-01			P2199-03			P2199-04	
Sample Collection Date		03/26/2002			04/12/2002			04/12/2002			04/12/2002			04/15/2002			04/15/2002			04/15/2002	
Sample Matrix		WATER			WATER			WATER			WATER			WATER			WATER			WATER	
Units		ug/L			ug/L			ug/L			ug/L			ug/L			ug/L			ug/L	
	PQL	CONC	Q	PQL	CONC	Q	MDL	CONC	Q	PQL	CONC	Q	PQL	CONC	Q	PQL	CONC	Q	PQL	CONC	Q
Chloromethane	2.8	ND		5	ND		5	ND		5	ND		1.7	ND		1.7	ND		1.7	ND	
Vinyl Chloride	1.8	ND		5	ND		5	ND		5	ND		2	ND		2	ND		2	ND	
Bromomethane	1.9	ND		5	ND		5	ND		5	ND		2.1	ND		2.1	ND		2.1	ND	
Chloroethane	2.3	ND		5	ND		5	ND		5	ND		2.9	ND		2.9	ND		2.9	ND	
1,1-Dichloroethene	1.6	ND		5	ND		5	ND		5	ND		1.3	ND		1.5	ND		1.1	ND	
Acetone	5.8	ND		5	ND		5	ND		5	ND		2.3	13		2.3	9.7		2.3	9.2	
Carbon Disulfide	1	ND		5	ND		5	ND		5	ND		2.2	ND		2.2	ND		2.2	ND	
Methylene Chloride	1.1	ND		5	ND		5	1.9	JB	5	ND		2.2	ND		2.2	ND		2.2	ND	
trans-1,2-Dichloroethene	1.7	ND		5	ND		5	ND		5	ND		2.4	ND		2.4	ND		2.4	ND	
1,1-Dichloroethane	1	ND		5	ND		5	ND		5	4.9	J	2.2	ND		2.2	ND		2.2	ND	
2-Butanone	5.6	ND		5	ND		5	ND		5	ND		1.6	1.8	J	1.6	ND		1.6	ND	
cis-1,2-Dichloroethene	1.8	0.9	J	5	ND		5	ND		5	2.5	J	2.4	ND		2.4	ND		2.4	ND	
Chloroform	1	1.2		5	ND		5	ND		5	ND		2.7	ND		2.7	ND		2.7	ND	
1,1,1-Trichloroethane	1.5	ND		5	48		5	ND		5	5.2		2.5	4.4	J	2.5	ND		2.5	ND	
Carbon Tetrachloride	1	ND		5	ND		5	ND		5	ND		2.4	ND		2.4	3.4	J	2.4	3.5	J
Benzene	1	ND		5	ND		5	ND		5	ND		1.8	ND		1.8	ND		1.8	ND	
1,2-Dichloroethane	2.5	ND		5	ND		5	ND		5	ND		2.6	ND		2.6	ND		2.6	ND	
Trichloroethene	2.8	29		5	ND		5	1.4	J	5	1.7	J	2.6	ND		2.6	ND		2.6	ND	
1,2-Dichloropropane	3.6	ND		5	ND		5	ND		5	ND		1.9	ND		1.9	ND		1.9	ND	
Bromodichloromethane	1	ND		5	ND		5	ND		5	ND		2.5	ND		2.5	2.7	J	2.5	2.5	J
4-Methyl-2-Pentanone	3	ND		5	ND		5	ND		5	ND		2.2	ND		2.2	ND		2.2	ND	
Toluene	1.2	ND		5	ND		5	1.4	J	5	ND		1.7	ND		1.7	ND		1.7	ND	
t-1,3-Dichloropropene	1.7	ND		5	ND		5	ND		5	ND		2.5	ND		2.5	ND		2.5	ND	
cis-1,3-Dichloropropene	1	ND		5	ND		5	ND		5	ND		2.2	ND		2.2	ND		2.2	ND	
1,1,2-Trichloroethane	1.1	ND		5	ND		5	ND		5	ND		1.7	ND		1.7	ND		1.7	ND	
2-Hexanone	12	ND		5	ND		5	ND		5	ND		2.5	ND		2.5	ND		2.5	ND	
Dibromochloromethane	1	ND		5	ND		5	ND		5	ND		2.1	ND		2.1	ND		2.1	ND	
Tetrachloroethene	1.6	18		5	1.7	J	5	2.6	J	5	21		2	2.8	J	1.6	ND		1.5	ND	
Chlorobenzene	1	ND		5	ND		5	ND		5	ND		2.8	ND		2.8	ND		2.8	ND	
Ethyl Benzene	1.5	ND		5	ND		5	ND		5	ND		2.5	ND		2.5	ND		2.5	ND	
m/p-Xylenes	1.5	ND		5	ND		5	ND		5	ND		1.8	ND		1.8	ND		1.8	ND	
o-Xylene	1.7	ND		5	ND		5	ND		5	ND		1.9	ND		1.9	ND		1.9	ND	
Styrene	1	ND		5	ND		5	ND		5	ND		1.6	ND		1.6	ND		1.6	ND	
Bromoform	1	ND		5	ND		5	ND		5	ND		3.9	ND		3.9	ND		3.9	ND	
1,1,2,2-Tetrachloroethane	2.2	ND		5	ND		5	ND		5	ND		1.8	ND		1.8	ND		1.8	ND	

Table C-1 Volatile Organic Compounds
NWIRP Bethpage Post Operational Sampling

Client Sample ID		**POSB-1-1012**			**POSB-1-1062**			**POSB-1-2224**			**POSB-2-1012**			**POSB-2-2022**			**POSB-2-5254**			**POSB-3-1012**	
Lab Sample ID		P2337-01			P2337-06			P2337-02			P2337-03			P2337-04			P2337-05			P2126-03	
Sample Collection Date		04/23/2002			04/23/2002			04/23/2002			04/23/2002			04/23/2002			04/23/2002			04/09/2002	
Sample Receipt Date		04/24/2002			04/24/2002			04/24/2002			04/24/2002			04/24/2002			04/24/2002			04/10/2002	
Sample Matrix		SOIL			SOIL			SOIL			SOIL			SOIL			SOIL			SOIL	
Units		ug/Kg			ug/Kg			ug/Kg			ug/Kg			ug/Kg			ug/Kg			ug/Kg	
	PQL	CONC	Q	PQL	CONC	Q	PQL	CONC	Q	PQL	CONC	Q	PQL	CONC	Q	PQL	CONC	Q	PQL	CONC	Q
Chloromethane	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		3.4	ND	
Vinyl Chloride	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		2.2	ND	
Bromomethane	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		2.4	ND	
Chloroethane	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		2.7	ND	
1,1-Dichloroethene	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		2	ND	
Acetone	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		7	ND	
Carbon Disulfide	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		1.2	ND	
Methylene Chloride	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		1.2	1.5	B
trans-1,2-Dichloroethene	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		2.1	ND	
1,1-Dichloroethane	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		1.2	ND	
2-Butanone	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		6.8	ND	
cis-1,2-Dichloroethene	6	ND		6.7	ND		5.1	ND		5.6	4.9	J	5.3	1.2	J	660	ND		2.2	ND	
Chloroform	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		1.2	ND	
1,1,1-Trichloroethane	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	1.3	J	660	12000		1.8	ND	
Carbon Tetrachloride	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		1.2	ND	
Benzene	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		1.2	ND	
1,2-Dichloroethane	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		3	ND	
Trichloroethene	6	2.6	J	6.7	ND		5.1	ND		5.6	4.4	J	5.3	ND		660	ND		3.4	ND	
1,2-Dichloropropane	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		4.4	ND	
Bromodichloromethane	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		1.2	ND	
4-Methyl-2-Pentanone	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		3.7	ND	
Toluene	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	1500		1.5	ND	
t-1,3-Dichloropropene	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		2	ND	
cis-1,3-Dichloropropene	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		1.2	ND	
1,1,2-Trichloroethane	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		1.3	ND	
2-Hexanone	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		15	ND	
Dibromochloromethane	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		1.2	ND	
Tetrachloroethene	6	3	J	6.7	ND		5.1	ND		5.6	1.5	J	5.3	13		660	220	J	2	ND	
Chlorobenzene	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		1.2	ND	
Ethyl Benzene	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	270	J	1.8	ND	
m/p-Xylenes	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	1600		1.9	ND	
o-Xylene	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	1900		2	ND	
Styrene	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		1.2	ND	
Bromoform	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		1.2	ND	
1,1,2,2-Tetrachloroethane	6	ND		6.7	ND		5.1	ND		5.6	ND		5.3	ND		660	ND		2.7	ND	

PQL - Practical Quantitation Limit
ND - Non detect
J - Estimated concentration
B - Also within associated blank
D - Concentration from secondary dilution

ATTACHMENT B

TO-15 ANALYTE LIST

Method: Modified TO-15-LL (Sp)/SpRLs-NYSDOH (2007)

Compound	Rpt.Limit(ppbv)
1,1,1-Trichloroethane	0.050
Carbon Tetrachloride	0.050
Trichloroethene	0.050
Bromodichloromethane	0.050
1,1,2-Trichloroethane	0.050
Tetrachloroethene	0.050
Dibromochloromethane	0.050
1,2-Dibromoethane (EDB)	0.050
1,1,2,2-Tetrachloroethane	0.050
1,3-Dichlorobenzene	0.050
1,4-Dichlorobenzene	0.050
1,2-Dichlorobenzene	0.050
Freon 12	0.050
Freon 114	0.050
Freon 11	0.050
Freon 113	0.050
Bromoform	0.050
Vinyl Chloride	0.10
1,1-Dichloroethene	0.10
1,1-Dichloroethane	0.10
cis-1,2-Dichloroethene	0.10
Benzene	0.10
1,2-Dichloroethane	0.10
Toluene	0.10
Ethyl Benzene	0.10
m,p-Xylene	0.10
o-Xylene	0.10
trans-1,2-Dichloroethene	0.10
Methyl tert-butyl ether	0.10
Chloromethane	0.10
Bromomethane	0.10
Chloroethane	0.10
Hexane	0.10
2-Butanone (Methyl Ethyl Ketone)	0.10
Chloroform	0.10
Cyclohexane	0.10
1,2-Dichloropropane	0.10
1,4-Dioxane	0.10
cis-1,3-Dichloropropene	0.10
4-Methyl-2-pentanone	0.10
trans-1,3-Dichloropropene	0.10

Reporting limits cited do not take into account sample dilution due to canister pressurization.

Method: Modified TO-15-LL (Sp)/SpRLs-NYSDOH (2007)

Chlorobenzene	0.10
Styrene	0.10
1,3,5-Trimethylbenzene	0.10
1,2,4-Trimethylbenzene	0.10
alpha-Chlorotoluene	0.10
2,2,4-Trimethylpentane	0.10
tert-Butyl alcohol	0.50
Methylene Chloride	0.50
Hexachlorobutadiene	0.50
Ethanol	0.50
1,2,4-Trichlorobenzene	0.50

Surrogate	**Method Limits**
4-Bromofluorobenzene	70-130
1,2-Dichloroethane-d4	70-130
Toluene-d8	70-130

Reporting limits cited do not take into account sample dilution due to canister pressurization.

ATTACHMENT C

SOIL GAS SAMPLING PROCEDURES

5.8 Soil Gas Sampling

Due to the highly sensitive nature of soil vapor sampling, strict precautions have been incorporated into the sampling procedure and are specified in this section. Many of these activities are universally applicable in environmental sample collection as part of safe work practices (see HASP) and quality assurance best work practices (see QAPP), such precautions are re-stated herein. Precautions are as follows:

- Sampling personnel should not handle hazardous substances (e.g., gasoline), permanent marking pens, or smoke before and/or during the sampling event.
- Sampling crew should also wear nitrile gloves when handling tubing, connectors or SUMMA® canisters to avoid potential cross-contamination.
- Care should also be taken to ensure that the flow controller is pre-calibrated by the supplying laboratory to the proper sample collection time (confirm with laboratory). Sample integrity is maintained if the sampling event is shorter than the target duration, sample integrity can be compromised if the event is extended to the point that the canister reaches atmospheric pressure. Sampling personnel should record vacuum pre and post sampling, post sampling vacuum should not reach zero vacuum (2 inches of Hg is target).
- Care must be taken to maintain integrity of sampling tubing. Tubing exposed to contaminants can yield false-positive VOC concentrations (due to the low detection limits required). Consequently, do not store tubing near sources of possible contamination including fuels, solvents, exhaust, smoke, etc. Use new lengths of tubing for each sample and replace between samples.
- During helium gas tracer testing, use caution not to pressurize system, this may drive helium vapor down into SGP.
- Equipment used for sampling and tracer gas testing should also be kept clean and stored in a manner to maintain fitness for use.
- If samples from multiple depths are to be collected at a given location, separate boreholes should be advanced for each sample to be collected. Continuous coring (see RI/FS Work Plan Table 1) will be performed, as needed, to prevent smearing of the borehole wall. The shallowest sample will collected first to determine the sampling sequence. Sample boreholes should be separated by a minimum of 5 feet (field conditions may warrant slight modifications in borehole locations).

5.8.1 Soil Gas Sampling

If a semi-permanent SGP is selected (i.e., more than one round of sampling is needed), then the following methodology should be followed:

1. Advance an assembly consisting of interconnected lengths of decontaminated 1.25-inch-diameter steel drive rods, affixed with an expendable PRT system point holder and expendable PRT system point at the downhole end, to the desired sampling interval.

2. When the desired sample depth is reached, attach the stainless steel sampling implant to the appropriate tubing. Pre-cut tubing and leave approximately 4 feet of extra tubing. Plug the open end of the tubing to avoid contamination.
3. Remove pull cap from probe rod and lower sample tubing down inside of probe rod until the implant hits the drive point.
4. Rotate tubing counterclockwise while exerting a gentle downward force to engage PRT threads. When threads are fully seated, pull up gently on tubing to test proper thread engagement. Retract probe rods (12 inches) while pushing down on the Teflon® tubing.
5. When retracted 12 inches, use funnel to pour Morie #1 filter pack sand down inside of probe rod to surround outside of Teflon® tubing. Use tubing to stir and settle sand into SGP. Approximately 150 mL of sand should fill space around implant.
6. Retract probe rods an additional 18 to 24 inches and pour in bentonite seal material. Chasing the bentonite with distilled water may be necessary.
7. Continue retracting probe rods and begin to fill in gas point with Sacrete or other concrete mix. Retract probe rod 18 to 24 inches at a time and add concrete mix after each retraction as previous step.
8. Finish sample gas point installation by securing PVC valve on exposed Teflon® tubing; installing flush cap and marking location.
9. Neatly coil extra Teflon® tubing inside of well cap and cover gas point.
10. Proceed with soil gas collection.

If a temporary SGP with PRT system is to be installed the following procedure should be followed:

1. Advance an assembly consisting of interconnected lengths of decontaminated 1.25-inch-diameter steel drive rods, affixed with an expendable PRT system point holder and expendable PRT system point at the downhole end, to the bottom of the desired sampling interval.
2. When the desired sample depth is reached, retract the sampling assembly approximately 6 inches (or greater if necessary), allowing the expendable point to fall off, and creating a void in the subsurface for soil gas sample collection. Remove pull cap of probe rod and position direct-push rig to allow collection of sample.
3. Fit PRT tubing with PRT adaptor, secure connection with Parafilm (film does not contact sample) and fit PRT adaptor with O-ring.
4. Insert PRT tubing into steel drive rod. Work tubing to bottom of drive rod until contact with expendable point holder is made. Cut PRT tubing, leaving two feet of extra tubing outside of probe rod.
5. Grasp PRT tubing and apply downward pressure while rotating counterclockwise to engage threads with point holder. When threads are fully seated, pull up gently on tubing to test proper thread engagement.
6. Proceed with soil gas sample collection (With PRT system no bentonite sealing material is required; the system is airtight).

The following methodology should be followed for preparation of SUMMA®-Type canister and initiation of the collection of the sample:

1. Record the following information from the site; if necessary (contact the local airport or other suitable information source to obtain the information):
    a. Wind speed and direction;
    b. Ambient temperature;
    c. Barometric pressure; and
    d. Relative humidity.
2. Connect a short piece of tubing to the sampling port using a Swagelok fitting.
3. Check the seal established around the soil gas probe by using a tracer gas (e.g., helium). Once the seal in integrity has been verified, additional trace gas testing may not be conducted.

The tracer gas procedures are as follows:

a. Punch a small hole in sheeting to accept sample port. Hole should be tight around port.
b. Place plastic sheeting on ground surrounding sample port.
c. Place clean bucket (open side to ground) over sample port.
d. Check seal with plastic sheeting, should be tight.
e. Seal bucket to plastic sheeting with clay sealing material.
f. Insert incoming helium line into pre-drilled hole in bucket.
g. Pull sample collection tube through pre-drilled hole in bucket.
h. Fill bucket with helium gas (use caution not to pressurize system, this may drive helium gas down into gas point)

4. Connect a portable vacuum pump to the sample tubing. Purge 1 to 2 (target 1.5) volumes of air from the gas point and sampling line using a portable pump [purge volume = $1.5 \pi r^2 h$] at a rate of approximately 100 mL/min.
    a. After purging 1.5 volumes of air from the gas point, collect some of purge air in Tedlar bag for helium analysis.
    b. Check purged air for helium contamination with portable helium detector.
    c. Air purged from system must maintain < 10 % helium.
5. If seal around sampling port appears adequate based on helium test, remove the brass plug from the SUMMA® canister and connect the flow controller with in-line particulate filter and vacuum gauge to the SUMMA® canister. Do not open the valve on the SUMMA® canister yet. Record in the field notebook and the COC the flow controller number with the appropriate SUMMA® canister number.
    a. If seal is not adequate, troubleshoot for leaks and re-test using helium tracer gas.
    b. Do not take sample until tracer gas requirements are met (< 10 % helium in purged air).

6. Connect the clean Teflon® sample collection tubing to the flow controller and the SUMMA® canister valve. Record in the field notebook the time sampling began and the canister vacuum.
7. If required, collect duplicate sample by attaching second SUMMA® canister with stainless steel "T" fitting.
8. Connect the unoccupied end of the Teflon® tubing to the tubing protruding from subsurface sampling port.
9. Open the SUMMA® canister valve and collect sample.
10. Photograph the SUMMA® canister, capturing the sample ID if possible. Also photograph canister and surrounding area, capture any available landmarks for future use in photographic logs (e.g. buildings, roads, etc).

The following methodology should be followed for completion of SUMMA®-Type sampling:

1. Arrive at the SUMMA® canister location at least 10 to 15 minutes prior to the end of the required sampling interval (e.g., 30 to 60 minutes).
2. Record the final vacuum measurement. Close the valve on the SUMMA® canister to cease sample collection. The canister should have a minimum amount of vacuum (approximately 2 inches of Hg or slightly greater).
3. Record the date and local time (24-hour basis) of valve closing in the field notebook, Soil Gas Sample Collection Log, and COC (see forms in QAPP).
4. Remove the particulate filter and flow controller from the SUMMA® canister, re-install the brass plug on the canister fitting, and tighten with the appropriate wrench.
5. Package the canister and flow controller in the shipping container supplied by the laboratory for return shipment to the laboratory. The SUMMA® canister does not require preservation with ice or refrigeration during shipment. Apply custody seals if required by field sampling plan.
6. Complete the appropriate forms and sample labels as directed by the laboratory.
7. Ship the container to the laboratory (via overnight carrier [e.g., Federal Express]) for analysis.

Once the soil gas sample has been collected, the temporary gas points will be abandoned by removing the drive rods, and filling the resulting hole with clean sand. If sampling semi-permanent SGP, affix PVC valve on Teflon® tubing, replace flush mount cap, and mark location of SGP with flag or white spray paint.

Ambient air samples will be collected simultaneously with a soil gas sample (see Table 1 of the RI/FS Work Plan). The SUMMA sample container will be positioned at a location near the associated SGP at a height of 4 ft above grade. The ambient air sample will be obtained over an eight-hour period.

Tetra Tech NUS, Inc. **SOIL GAS SAMPLE LOG SHEET**

Page__1_ of __1_

Project Site Name: NWIRP Bethpage Site 1

Project No.: 112G01687

C.O.C. No.:

Sample ID No.:

Sample Location: Site 1

Sampled By:

SAMPLING DATA:

Date:	**Wind speed** (Visual)	**Wind Direction** (S.U.)	**Ambient temperature** (^{0}C)	**Barometric Pressure** (^{0}C)	**Relative Humidity** (%)	Other
Time:						
Method:						

Summa Canister #	
Filter Type	

Start Time Vacuum		in Hg
End Time Vacuum		in Hg

He check	**Start**	**Stop**	**Reading**
Purge Data	**Start**	**Stop**	

Readings:

Liters/minute

_______ @ ________
_______ @ ________
_______ @ ________

Notes:

Soil Gas PID:

WALDEN ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
16 SPRING STREET
OYSTER BAY, NEW YORK 11771
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EMAIL: INQUIRIES@WALDEN-ASSOC.COM

July 11, 2001
SPGL00200

Mr. Chrisopher G. Alonge
DEC DER Project Manager
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-7010

Re: NYSDEC Voluntary Cleanup Program Site #V-00244-1
Imperial Cleaners, ACO #D1-30001-01-03 effective 4/18/01
Monthly O&M Report – May 2001

Dear Mr. Alonge:

Walden Associates, Inc. (Walden) was retained by Spiegel Associates to aid in site investigation, remedial system deployment and the oversite of operation and maintenance (O&M) activities of the remediation system at the above referenced site (Figure 1). Spiegel continues to utilize the services of Anson Environmental, Ltd. (AEL) to maintain the on-site remediation system. This report covers SVE system operations for the referenced period.

Work Completed During Monitoring Period (May 2001)

AEL visited #218 Lakeville Road to monitor the soil vapor extraction (SVE) system to ensure continuous operation during the month of May. During each visit, AEL logged system operation parameters on a dedicated O&M log form. Periodically during the month Walden and AEL discussed operations of the system. All recorded O&M log forms are attached in Appendix A. Work that was completed at the remedial site during the month of May is as follows:

- The SVE extraction wells RW-3, RW-10, B-1 and FD-2 operated continuously during the Month of May. System layout is shown in Figure 2, which is illustrative of the operational system as of May 31st, 2001.
- All site related SVE extraction wells (RW-1, RW-2, RW-3, RW-4, RW-10, B-1, B-3, and FD-2) operated continuously until May 9th, 2001 when extraction wells RW-1, RW-4, RW-10 and B-3 were temporarily shut down. AEL shut these wells down to maximize SVE flow from source area wells. Graph 1 indicates individual extraction well PID recorded VOC concentrations for the month of May.
- On May 9th and 31st, 2001, vacuum readings from all on-site and off-site piezometers (see figure 2 for locations) were recorded to identify the SVE system operational radius of influence (ROI). Vacuum readings were recorded with a Dywer Mark III Series 475 digital manometer, which was sealed to the top of the open piezometers. Results are summarized in Table 1.
- On May 30th and 31st, 2001, Walden collected indoor air quality samples utilizing Perc badges from #2 and #4 University Place and from within all commercial establishments at #218 Lakeville Road.
- On May 31st, 2001, AEL collected quantitative VOC air samples from influent and effluent GAC filtration system locations.

Carbon Change-Out

Qualitative VOC monitoring utilizing a PID is done to record the performance of the GAC filtration system and to ensure that breakthrough of the first of two series GAC absorbers has not occurred. PID recorded VOCs and flow meter readings documented during O&M visits for the month of May are summarized in Table 2 and Table 3. PID concentrations, reported in calibrant gas equivalents, are used by AEL to determine when the primary GAC absorber is to be changed out. Pursuant to the procedures worked out by Walden and AEL, AEL will change out the primary GAC unit when the intermediate PID VOC reading is 25% or greater of the influent PID VOC concentration. Graph 2 shows trends of VOC concentrations during the monitoring period from the three designated monitoring points: influent, intermediate and effluent. No carbon change out occurred during the month of May. The spent carbon canister from the April 26th, 2001 change-out remains stored on-site.

System Monitoring Results

On May 31st, 2001, AEL collected SVE air samples using absorbent charcoal tubes from influent and effluent GAC filtration system locations. Samples were sent to Galson Laboratories in East Syracuse, New York and analyzed using the NIOSH method 1003 and the OSHA method 4. Two charcoal tubes were collected from each sampling location (one for NIOSH method 1003 and one for OSHA method 4). Charcoal tubes collected from the SVE influent airflow (before the GAC filtration unit) are denoted as 'P1' and 'P2'. Samples collected from the SVE effluent airflow (after the GAC filtration unit) are denoted as 'E1 and E2'. Effluent samples were subjected to the longest sampling time afforded under the sampling method in order to achieve the lowest possible quantifiable detection limit. All detected compounds from the sampling event are tabulated in Table 4 and all laboratory data is located in Appendix B.

In order to calculate a total mass of PCE removed during the month of May, several system operational parameters must be known or assumed:

- GAC influent PCE concentrations reported by Galson Laboratories are assumed to have occurred during the entire month of May.
- Average flow rate (cfm) for the monitoring period (calculated as a weighted average based on AEL recorded air flow data.).
- Number of operational days during the monitoring period.

These parameters combine to indicate that approximately 93.1 pounds of PCE was removed during the monitoring period, where:

- Weighted average flow rate = 176 cfm
- GAC Influent PCE concentration = 190 mg/m3
- Days of Operation = 31 days

The total mass of contaminants removed to date totals 501.05 pounds (the sum of January, February, March, April and May).

January = 314 pounds
February = 7.1 pounds
March = 53.3 pounds
April = 33.55 pounds
May = 93.1 pounds

System Performance Review

On May 9th and 31st, 2001, AEL personnel verified the radius of influence (ROI) by recording the operational vacuums of all site-related piezometers during full system operation. Results are shown in Table 2. Extraction wells RW-1, RW-2, RW-4 and B-3 were inactive during piezometer vacuum recordings on both dates. Piezometer PZ-3 showed the greatest ROI of 80ft. Piezometers P-2 and P-4 displayed zero response. Please note that all distances from vacuum wells to closest piezometers are approximate.

Perc Badge Results

On May 30th and 31st, 2001, Walden installed and retrieved Perc Badge samples from #2 and #4 University Place and within all commercial establishments of #218 Lakeville Road. Results of this sampling along with past completed Perc Badge sampling completed by the NYSDOH, AEL and Walden are summarized in Table 5. Raw analytical results are located in Appendix C.

The only samples above the NYSDOH guidance value of 100 ug/m3 were in the basement and main floor of Imperial Cleaners. All other samples in #218 Lakeville Road and the residencies of #2 and #4 University Place were below the NYSDOH guidance value. An increase in PCE vapor concentrations was recorded from one sample from #2 University Place and from one sample in the Lake Success Deli within #218 Lakeville Road. Walden noted extraction well RW-4 was shut down during this air sampling event and immediately informed AEL to return it to operation. Extraction well RW-4 was made operational on June 12th, 2001.

Anticipated June Work Items

The following is a list of work for the month of June:

- Continue periodic O&M visits to ensure the system remains in continuous operation.

- Continue to monitor individual extraction well utilizing a PID.
- SVE quantitative air sampling on influent and effluent GAC filtration system locations.
- Record SVE radius of influence.

Additional O&M monthly reports shall be forwarded to NYSDEC on the following schedule until such time as Walden is up to date with reporting requirements:

June – 7/20/01
July – 8/10/01

Please feel free to call Steve Byatt or myself should you wish to discuss the above presented information.

Very truly yours,
Walden Associates, Inc.
Environmental Consultants

Joseph M. Heaney III, PE
Principal

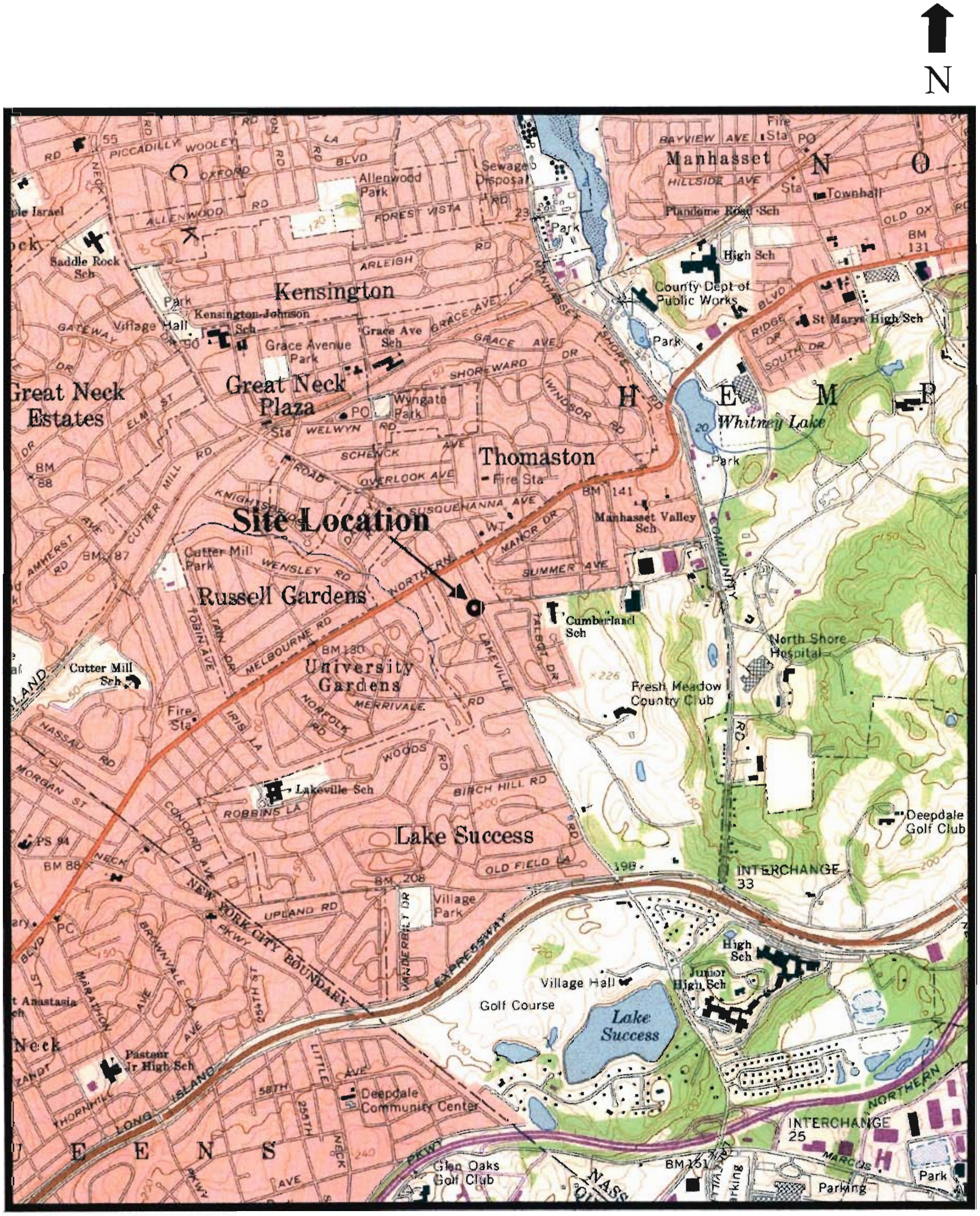
Encl.

cc: Fred Werfel
Marla B. Rubin, Esq.
Becky Mitchell

FIGURE 1

Imperial Cleaners
218 Lakeville Road
Lake Success, New York

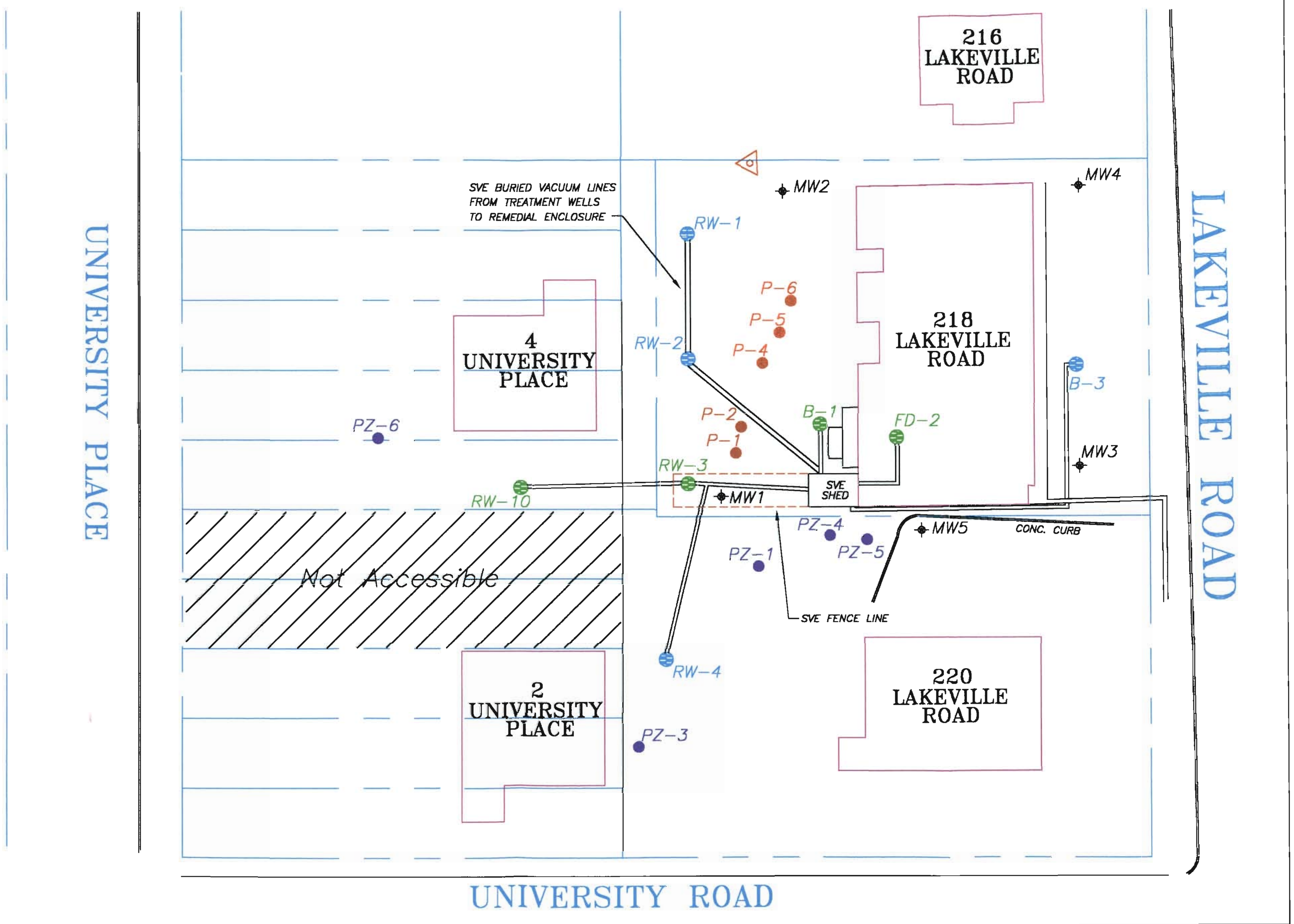
LOCATION MAP



(USGS QUAD Sea Cliff, New York)

(Scale 1:24000)

FIGURE 2



LEGEND

- ◁ SURVEY CONTROL STATION & BASELINE
- RW-1 ● ACTIVE EXTRACTION WELL
- RW-1 ● INACTIVE EXTRACTION WELL
- MW2 ✦ MONITORING WELL
- PZ-1 ● PIEZOMETER
- P-6 ● PIEZOMETER

SCALE

20 10 0 20 FT.

1" = 30 ft

NOTES

1. All extraction wells and piezometer locations are approximately located based on Anson Environmentals field measurements. No survey was conducted to exactly locate extraction well and piezometer points.

2. Site base map was derived from a property survey prepared by Welsh Engineering & Land Surveying, P.C., 343 Manville Road, Pleasantville, NY 10570, revised on 7/14/00

WALDEN ASSOCIATES INC.
ENVIRONMENTAL CONSULTANTS
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SITE MAP
MAY 2001
IMPERIAL CLEANERS
218 LAKEVILLE ROAD
LAKE SUCCESS, NEW YORK

JOB #	FILE NAME	PLOT DATE
SPGL00200	O&M Fig 5-01.dwg	6/14/01

Imperial Cleaners
218 Lakeville Road
Lake Success, New York

Table 1

SVE Operational Vacuum in Site Related Piezometers

Piezometer ID	Vacuum Reading (inches of water)	Distance to Closest Operational Well (feet)	Attributable Extraction Well	Vacuum Reading (inches of water)	Distance to Closest Operational Well (feet)	Attributable Extraction Well	Vacuum Reading (inches of water)	Distance to Closest Operational Well (feet)	Attributable Extraction Well
	April 18, 2001			May 9, 2001			May 31, 2001		
P-1	0.32	17	RW-3	0.13	17	RW-3	0.02	17	RW-3
P-2	0.00	23	RW-3	0.01	23	RW-3	0.00	23	RW-3
P-4	0.00	22	RW-2	0.00	25	B-1	0.00	25	B-1
P-5	0.72	29	B-1	0.87	30	B-1	0.61	30	B-1
P-6	0.57	35	RW-1	0.54	38	B-1	0.41	38	B-1
PZ-1	0.70	32	RW-3	0.79	32	RW-3	0.81	32	RW-3
PZ-3	0.18	28	RW-4	0.15	80	RW-3	0.19	80	RW-3
PZ-4	0.15	35	B-1	0.13	33	B-1	0.17	33	B-1
PZ-5	0.10	32	FD-2	0.12	32	FD-2	0.13	32	FD-2
PZ-6	0.21	45	RW-10	0.21	45	RW-10	0.26	45	RW-10

Notes:
- Operational vacuums were recorded by Anson Environmental, Ltd. of Huntington, NY to verify Radius of Influence in site related piezometers during full system operation utilizing a Dywer Mark III Series 475 digital manometer.
- Extraction wells RW-1, RW-2, RW-4 and B-3 were turned off on May 9, 2001 and remained inactive for the duration of the month.
- All distances are approximate.

Imperial Cleaners
218 Lakeville Road
Lake Success, New York

Table 2

VOC Concentrations

Date	RW-1 ppm	RW-2 ppm	RW-3 ppm	RW-4 ppm	RW-10 ppm	B-1 ppm	FD-2 ppm	B-3 ppm	GAC Influent ppm	GAC Intermediate ppm	GAC Effluent ppm
5/1/01	6.3	4.6	23.9	4.8	5.3	23.8	43.9	6.7	13.7	0.2	0.2
5/7/01	5.3	3	22	2.6	2.6	24.4	40.6	7.5	13.5	0.2	0.1
5/14/01	off	off	17.3	off	2.6	17	29.7	off	16.6	0.6	0.8
5/23/01	off	off	75.9	off	2	20.9	69.6	off	39.8	0.0	0.0
5/29/01	off	off	15.7	off	1.9	14.4	23.6	off	14.0	0.3	0.0
5/31/01 *	off	off	15	off	1.1	14.1	22.3	off	13.2	0.4	0.2

Note
* - Background of 0.3 ppm.
All data recorded by Anson Environmental, Ltd. of Huntington, New York.

Imperial Cleaners
218 Lakeville Road
Lake Success, New York

Table 3

SVE Flow Readings

Date	RW-1 cfm	RW-2 cfm	RW-3 cfm	RW-4 cfm	RW-10 cfm	B-1 cfm	FD-2 cfm	B-3 cfm	GAC Influent cfm	GAC Intermediate ppm	GAC Effluent cfm
5/1/01	24	20	31	6	30	33	20	8	196	0.2	234
5/7/01	12	26	29	12	32	35	12	12	196	0.2	252
5/14/01	off	off	41	off	41	47	32	off	136	0.6	214
5/23/01	off	off	42	off	42	44	35	off	182	0.0	242
5/29/01	off	off	39	off	42	37	34	off	196	0.3	234
5/31/01	off	off	39	off	41	46	32	off	196	0.4	234

Note
All data recorded by Anson Environmental, Ltd. of Huntington, New York.

218 Lakeville Rd.
Lake Success, NY

Table 4

Influent Effluent SVE Air Sampling Results Summary

Compound	**Influent**	**Effluent**
	5/31/01	5/31/01
	ug/cubic meter (1)	ug/cubic meter (1)
1,1,2 Trichloroethane	ND	ND
1,1 Dichloroethane	ND	ND
1,2 Dichloroethylene	1,300	ND
Trichloroethylene	1,200	ND
1,1,1 Trichloroethane	ND	ND
Tetrachloroethylene	190,000	ND
Vinyl Chloride	ND	ND

Notes:

ND - Non-dectectable

- Exhaust samples were subjected to the longest possible sampling time in order to achieve the highest possible dectection limit.
- Samples were collected by Anson Environmental, Ltd of Huntington, NY.
- Samples were analyzed by Galson Laboratories of East Syracuse, NY Under NIOSH method 1003 and OSHA method 4.

(1) Volume of gas.

10 L of air was allowed to pass through the influent GAC tube, 40 L was allowed through the effluent GAC tube, and 1 L each was allowed through the influent and effluent GAC tubes testing for Vinyl Chloride.

218 Lakeville Rd.
Lake Success, New York

Table 5

Tetrachloroethene (PCE) Air Sampling Results Summary

Address	Location	NYSDOH					Anson Env.		Walden	
		Round 1	Round 2	Round 3	Round 4	Round 5	Round 1	Round 2	Round 1	Round 2
		7/ 10-11 /00	9/ 12-13 /00	10/ 25-26 /00	11/ 16-17 /00	12/ 6-7 /00	12/ 28-29 /00	1/ 18-19 /01	2/ 7-8 /01	5/30-31/01
		ug/cubic meter					ug/cubic meter		ug/cubic meter	
218 Lakeville Road										
Imperial Cleaners	Main Floor	760					297	381	150	177
	Basement near back door	2,200					324	333	95	128
	Basement by floor drain	7,300							121	185
Great Neck Pet Salon	Main Floor	115					135	286	80	36
	Basement	950					452	262	82	90
Lake Success Deli	Main Floor	190					19	38	na	9
	North Basement	600					2	42	2	5
	South Basement	860					27	55	3	14
Empty Tenent Space	Main Floor									7
	Basement									8
220 Lakeville Road										
Bromley Real Estate	Main Floor	2					7	13		
Nail Salon	Basement	3					13	14		
4 University Place										
	Main Floor	220	400	1,000		1,310	13	25	2	2
	Basement Bedroom	335	675	2,480		1,360	14	23	3	3
	Basement Furnace Room		760	1,440		45,000			3	2
	Basement Room Duct					4,200			3	3
5 University Place										
	Main Floor				50					
	Basement				170					
	Outside				5					
3 University Place										
	Main Floor		6							
	Basement		13							
1 University Place										
	Main Floor		<5							
	Basement		<5							
2 & 4 University Place										
	Outside		<5	<5		5				
2 University Place										
	First Floor, Central Hall	60	60					54		
	First Floor, Kitchen		60						4	9
	Basement Bedroom - Center	215	140							
	Basement Bedroom - East							48	3	38
	Basement Bedroom - West							21		
	Basement Furnace Room								2	6
	Basement Sump		310							
1 University Road										
	First Floor, Living Room		<5							
	Fist Floor, Furnace Room		<5							
216 Lakeville Road										
216	Outside	8								
	Ground Floor	8								
	Basement	21								
216A	Ground Floor	<5								

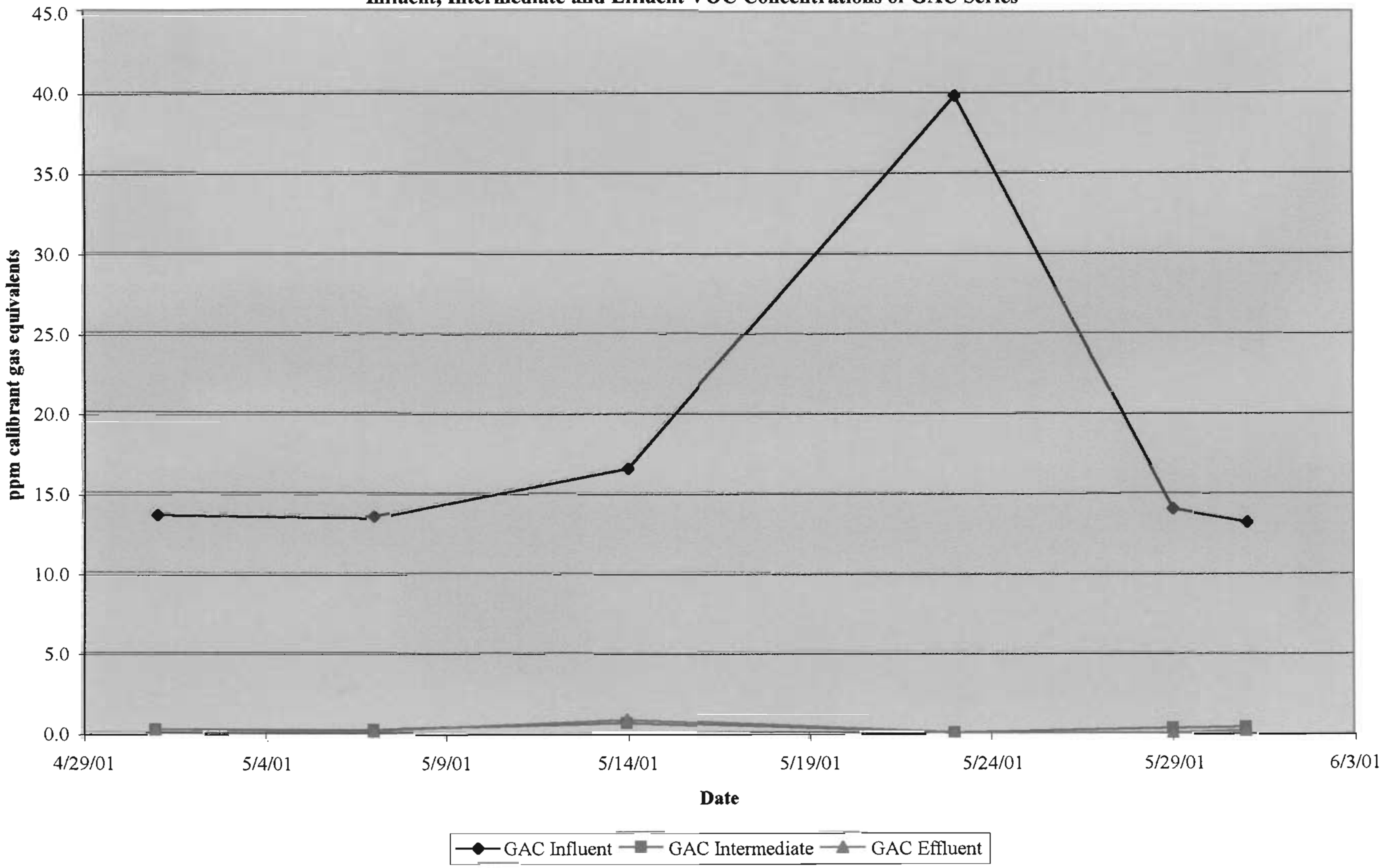
Notes

NYS DOH Ambient Air Guidline is established at 100ug/m3.

Imperial Cleaners
218 Lakeville Road
Lake Success, New York

Graph 2

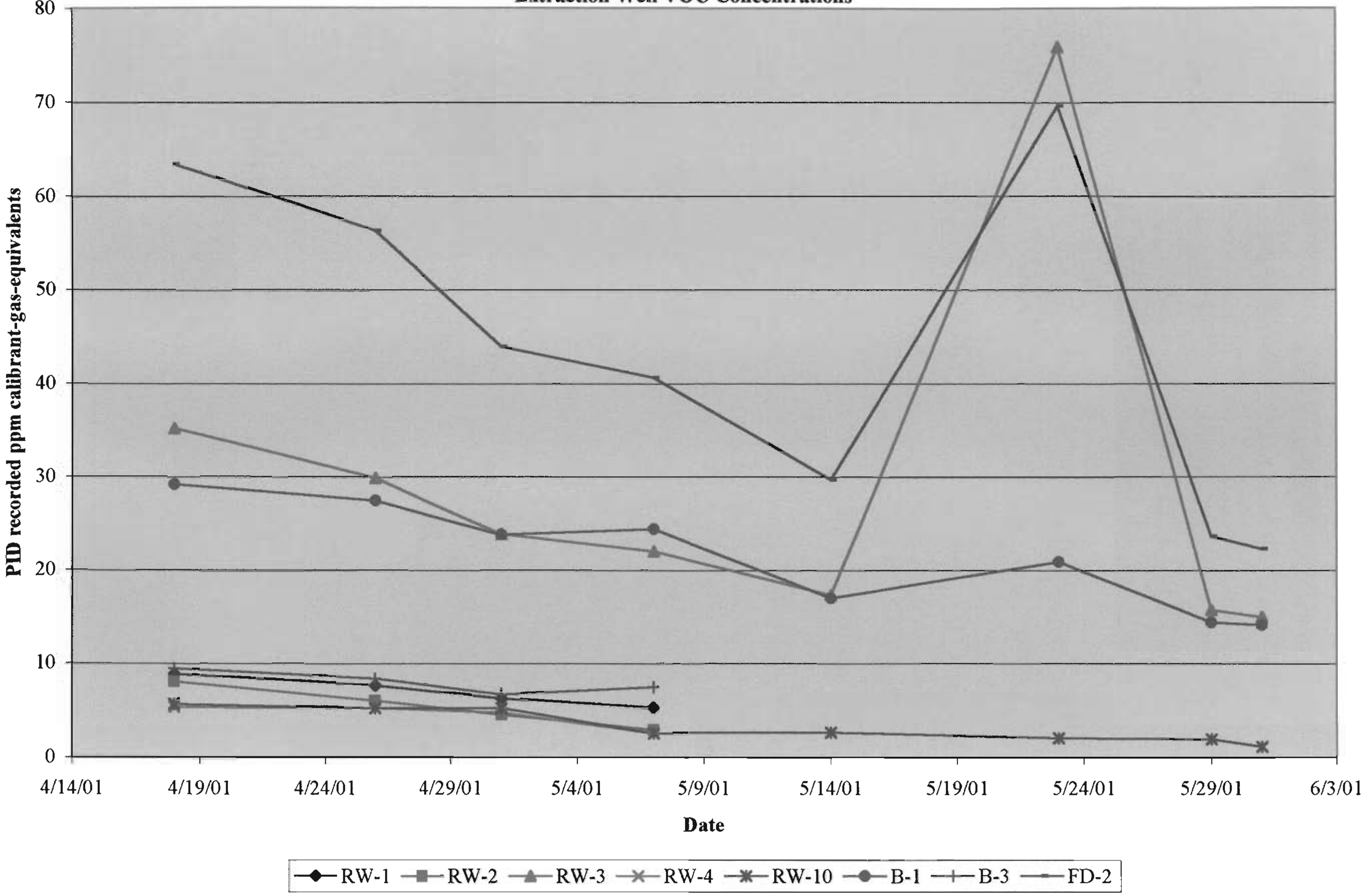
Influent, Intermediate and Effluent VOC Concentrations of GAC Series



Imperial Cleaners
218 Lakeville Road
Lake Success, New York

Graph 1

Extraction Well VOC Concentrations



Appendix A

Operation and Maintenance Log Forms – May 2001

218 LAKEVILLE ROAD
LAKE SUCCESS, NEW YORK

O&M CHECKLIST FOR SVE/AIR SPARGE SYSTEM

Date 5/31/01 Inspected By: Jim

Control Panel	Arrival	Departure
System	[✓ On] / Off	On / Off

SVE SYSTEM INSIDE TRAILER	
Was Moisture Separator Emptied?	Yes / [✓ No]
Moisture Disposal Drum	F / 75 / 50 / [✓ 25] / E
SVE Relief Valve	Open / [✓ Closed]

SVE WELL READINGS (INSIDE TRAILER)

SVE WELL #	Flow	PID Readings	Vacuum	Ball Valve
RW-1	0 cfm	ppm	inches of Water	O / 75 / 50 / 25 / [✓ C]
RW-2	0 cfm	ppm	inches of Water	O / 75 / 50 / 25 / [✓ C]
RW-3	39 cfm	15.0 ppm	13 inches of Water	O / 75 / [✓ 50] / 25 / C
RW-4	0 cfm	ppm	inches of Water	O / 75 / 50 / 25 / [✓ C]
RW-4C	41 cfm	1.1 ppm	11 inches of Water	O / 75 / [✓ 50] / 25 / C
B-1	46 cfm	14.1 ppm	8 inches of Water	O / 75 / [✓ 50] / 25 / C
[illegible]	32 cfm	22.3 ppm	14 inches of Water	[✓ O] / 75 / 50 / 25 / C
B-3	0 cfm	ppm	inches of Water	O / 75 / 50 / 25 / [✓ C]

SVE SYSTEM FLOW

	Pre-Blower	Post Blower	Exhaust	Moisture Separ.
Vacuum				38 inch of Water
Pressure		0.0 psi		
Flow	154 cfm	196 cfm	234 cfm	

CARBON SYSTEM

	Pre-Carbon	Between Carbon	Post Carbon	Notes
PID	13.2 ppm	0.4 ppm	0.2 ppm	
Temp	77 degrees F	degrees F	degrees F	

Background 0.3 ppm

218 LAKEVILLE ROAD
LAKE SUCCESS, NEW YORK

O&M CHECKLIST FOR SVE/AIR SPARGE SYSTEM

Date 5/29/01 Inspected By. M. Schiefeistein

Control Panel	Arrival	Departure
System	[✓ On] / Off	[✓ On] / Off

SVE SYSTEM INSIDE TRAILER	
Was Moisture Separator Tripped?	Yes / [✓ No]
Moisture Disposal Drum	F / 75 / 50 / [✓ 25] / E
SVE Relief Valve	Open / [✓ Closed]

SVE WELL READINGS (INSIDE TRAILER)

SVE WELL #	Flow	PID Readings	Vacuum	Ball Valve
RW-1	/ cfm	/ ppm	/ inches of Water	O / 75 / 50 / 25 / [✓ C]
RW-2	/ cfm	/ ppm	/ inches of Water	O / 75 / 50 / 25 / [✓ C]
RW-[illegible]	39 cfm	15.7 ppm	14 inches of Water	O / 75 / [✓ 50] / 25 / C
RW-[illegible]	/ cfm	/ ppm	/ inches of Water	O / 75 / 50 / 25 / [✓ C]
RW-[illegible]	42 cfm	1.9 ppm	10 inches of Water	O / 75 / [✓ 50] / 25 / C
IP-1	37 cfm	14.4 ppm	7 inches of Water	O / 75 / [✓ 50] / 25 / C
[illegible]	34 cfm	23.6 ppm	14 inches of Water	[✓ O] / 75 / 50 / 25 / C
B-3	/ cfm	/ ppm	/ inches of Water	O / 75 / 50 / 25 / [✓ C]

SVE SYSTEM FLOW

	Pre-Blower	Post Blower	Exhaust	Moisture Separ.
Vacuum				36 inch of Water
Pressure		0 psi		
Flow	154 cfm	196 cfm	234 cfm	

CARBON SYSTEM

	Pre-Carbon	Between Carbon	Post Carbon	Notes
PID	14.0 ppm	0.3 ppm	0.0 ppm	4.0
Temp	80 degrees F	80 degrees F	80 degrees F	

26
7.0
35.9

2.6
x 3
7.8

218 LAKEVILLE ROAD
LAKE SUCCESS, NEW YORK

O&M CHECKLIST FOR SVE/AIR SPARGE SYSTEM

Date 5/23/01 Inspected By: Matthew Schifelstein

Control Panel	Arrival	Departure
System	On / [✓ Off]	[✓ On] / Off

SVE SYSTEM INSIDE TRAILER

Was Moisture Separator Emptied?	Yes / [✓ No]
Moisture Disposal Drum	F / 75 / 50 / [✓ 25] / E
SVE Relief Valve	Open / [✓ Closed]

SVE WELL READINGS (INSIDE TRAILER)

SVE WELL #	Flow	PID Readings	Vacuum	Ball Valve
RW-1	/ cfm	/ ppm	/ inches of Water	O / 75 / 50 / 25 / [✓ C]
RW-2	/ cfm	/ ppm	/ inches of Water	O / 75 / 50 / 25 / [✓ C]
RW-3	42 cfm	75.9 ppm	12 inches of Water	O / 75 / [✓ 50] / 25 / C
RW-4	/ cfm	/ ppm	/ inches of Water	O / 75 / 50 / 25 / C
RW-10	42 cfm	2.0 ppm	10 inches of Water	O / 75 / [✓ 50] / 25 / C
D-1	44 cfm	20.[illegible]9 ppm	8 inches of Water	O / 75 / [✓ 50] / 25 / C
[illegible]-2	35 cfm	69.6 ppm	14 inches of Water	[✓ O] / 75 / 50 / 25 / C
D-3	[illegible] cfm	/ ppm	[illegible] inches of Water	O / 75 / [✓ 50] / 25 / [✓ C]

SVE SYSTEM FLOW

	Pre-Blower	Post Blower	Exhaust	Moisture Separ.
Vacuum				38 Inch of Water
Pressure		0 psi		
Flow	154 cfm	182 cfm	242 cfm	

CARBON SYSTEM

	Pre-Carbon	Between Carbon	Post Carbon	Notes
PID	39.4 ppm	0.0 ppm	0.0 ppm	
Temp	60 degrees F	60 degrees F	60 degrees F	

manifolt BKG 1.2 ppm

218 LAKEVILLE ROAD
LAKE SUCCESS, NEW YORK

O&M CHECKLIST FOR SVE/AIR SPARGE SYSTEM

Date 5/14/01 Inspected By: Matt & Jim

Control Panel	Arrival	Departure
System	[✓ On] / Off	[✓ On] / Off

SVE SYSTEM INSIDE TRAILER

Was Moisture Separator Emptied?	Yes / [✓ No]
Moisture Disposal Drum	F / 75 / 50 / [✓ 25] / E
SVE Relief Valve	Open / [✓ Closed]

SVE WELL READINGS (INSIDE TRAILER)

SVE WELL #	Flow	PID Readings	Vacuum	Ball Valve
RW-1	— cfm	— ppm	— inches of Water	O / 75 / 50 / 25 / [✓ C]
RW-2	— cfm	— ppm	— inches of Water	O / 75 / 50 / 25 / [✓ C]
RW-3	41 cfm	17.3 ppm	10 inches of Water	O / 75 / [✓ 50] / 25 / C
RW-4	— cfm	— ppm	— inches of Water	O / 75 / 50 / 25 / [✓ C]
[illegible]	71 cfm	2.6 ppm	8 inches of Water	O / 75 / [✓ 50] / 25 / C
B-1	47 cfm	17.0 ppm	8 inches of Water	O / 75 / [✓ 50] / 25 / C
[illegible]	32 cfm	29.7 ppm	14 inches of Water	[✓ O] / 75 / 50 / 25 / C
B-3	— cfm	— ppm	— inches of Water	O / 75 / 50 / 25 / [✓ C]

SVE SYSTEM FLOW

	Pre-Blower	Post Blower	Exhaust	Moisture Separ.
Vacuum	▨	▨	▨	38 inch of Water
Pressure	▨	0 psi	▨	▨
Flow	154 cfm	136 cfm	214 cfm	▨

CARBON SYSTEM

	Pre-Carbon	Between Carbon	Post Carbon	Notes
PID	16.6 ppm	0.6 ppm	0.8 ppm	
Temp	73 degrees F	73 degrees F	73 degrees F	

manifold BKG 1.4 ppm

218 LAKEVILLE ROAD
LAKE SUCCESS, NEW YORK

O&M CHECKLIST FOR SVE/AIR SPARGE SYSTEM

Date 5/7/01 Inspected By: Matt Schiefelstein

Control Panel	Arrival	Departure
System	[✓ On] / Off	[✓ On] / Off

SVE SYSTEM INSIDE TRAILER

Was Moisture Separator Emptied?	Yes / [✓ No]
Moisture Disposal Drum	F / 75 / 50 / [✓ 25] / E
SVE Relief Valve	Open / [✓ Closed]

SVE WELL READINGS (INSIDE TRAILER)

SVE WELL #	Flow	PID Readings	Vacuum	Ball Valve
RW-1	12 cfm	5.3 ppm	2 inches of Water	O / 75 / [✓ 50] / 25 / C
RW-2	26 cfm	3.0 ppm	2 inches of Water	O / 75 / [✓ 50] / 25 / C
RW-3	29 cfm	22.0 ppm	6 inches of Water	O / [✓ 75] / 50 / 25 / C
RW-4	12 cfm	2.6 ppm	7 inches of Water	O / 75 / [✓ 50] / 25 / C
RW-5	32 cfm	2.6 ppm	6 inches of Water	[✓ O] / 75 / 50 / 25 / C
B-1	25 cfm	24.4 ppm	2 inches of Water	O / [✓ 75] / 50 / 25 / C
B-2	12 cfm	40.6 ppm	3 inches of Water	O / [✓ 75] / 50 / 25 / C
B-3	12 cfm	7.5 ppm	7 inches of Water	O / 75 / [✓ 50] / 25 / C

SVE SYSTEM FLOW

	Pre-Blower	Post Blower	Exhaust	Moisture Separ.
Vacuum				29 inch of Water
Pressure		0 psi		
Flow	156 cfm	196 cfm	252 cfm	

CARBON SYSTEM

	Pre-Carbon	Between Carbon	Post Carbon	Notes
PID	13.5 ppm	6.2 ppm	0.1 ppm	
Temp	68 degrees F	68 degrees F	68 degrees F	

5/9/01

On [illegible] Pumped 34
26
13

4√26

RW-4 3 3 RW- RW-2 26
12
28

218 LAKEVILLE ROAD
LAKE SUCCESS, NEW YORK

O&M CHECKLIST FOR SVE/AIR SPARGE SYSTEM

Date: 5/1/01 Inspected By: Jim

Control Panel	Arrival	Departure
System	[✓ On] / Off	[✓ On] / Off

SVE SYSTEM INSIDE TRAILER

Was Moisture Separator Emptied?	Yes / [✓ No]
Moisture Disposal Drum	F / 75 / 50 / [✓ 25] / E
SVE Relief Valve	Open / [✓ Closed]

SVE WELL READINGS (INSIDE TRAILER)

SVE WELL #	Flow	PID Readings	Vacuum	Ball Valve
RW-	24 cfm	6.3 ppm	2 inches of Water	O / 75 / [✓ 50] / 25 / C
RW-2	20 cfm	4.6 ppm	5 inches of Water	O / 75 / [✓ 50] / 25 / C
R	31 cfm	23.9 ppm	10 inches of Water	O / [✓ 75] / 50 / 25 / C
RW-4	6 cfm	4.8 ppm	NA inches of Water	O / 75 / [✓ 50] / 25 / C
R	30 cfm	5.3 ppm	10 inches of Water	[✓ O] / 75 / 50 / 25 / C
[illegible]	33 cfm	23.8 ppm	0 inches of Water	O / [✓ 75] / 50 / 25 / C
[illegible]	20 cfm	43.9 ppm	6 inches of Water	O / [✓ 75] / 50 / 25 / C
[illegible]	8 cfm	6.7 ppm	8 inches of Water	O / 75 / [✓ 50] / 25 / C

SVE SYSTEM FLOW

	Pre-Blower	Post Blower	Exhaust	Moisture Separ.
Vacuum				29 inch of Water
Pressure		0 psi		
Flow	154 cfm	196 cfm	234 cfm	

CARBON SYSTEM

	Pre-Carbon	Between Carbon	Post Carbon	Notes
PID	13.7 ppm	0.2 ppm	0.2 ppm	
Temp	85° degrees F	degrees F	degrees F	

Sampling manifold back ground 4.2 ppm

Appendix B

SVE Air Sampling Results – May 31st, 2001

Galson Laboratories
6601 Kirkville Rd. E. Syracuse,NY 13057

LABORATORY ANALYSIS REPORT

Client : Anson Environmental Ltd.
Site : Imperial Cleaners
Project No. : 95085

Date Sampled : 31-MAY-01
Date Received : 04-JUN-01
Date Analyzed : 10-JUN-01

Account No.: 13658
Login No. : L71620

1,1,2-Trichloroethane

Sample ID	Lab ID	Air Vol liter	Front ug	Back ug	Total ug	Conc mg/m3	ppm
E1	L71620-1	40	<5	<5	< 5	< 0.1	< 0.02
P2	L71620-2	10	<5	<5	< 5	< 0.5	< 0.09

COMMENTS: Total ug corrected for a desorption efficiency of 100%.

Level of quantitation: 5 ug
Analytical Method : NIOSH 1003; GC/FID
OSHA PEL (TWA) : 10 ppm
Collection Media : Charcoal

Submitted by: JK
Approved by : jal
Date : 12-JUN-01
QC by: QC STAFF
NYS DOH # : 11626

< -Less Than	mg -Milligrams	m3 -Cubic Meters	kg -Kilograms
> -Greater Than	ug -Micrograms	l -Liters	NS -Not Specified
NA -Not Applicable	ND -Not Detected	ppm -Parts per Million	

Galson Laboratories
6601 Kirkville Rd. E. Syracuse,NY 13057

LABORATORY ANALYSIS REPORT

Client : Anson Environmental Ltd.
Site : Imperial Cleaners
Project No. : 95085

Date Sampled : 31-MAY-01
Date Received : 04-JUN-01
Date Analyzed : 10-JUN-01

Account No.: 13658
Login No. : L71620

1,1-Dichloroethane

Sample ID	Lab ID	Air Vol liter	Front ug	Back ug	Total ug	Conc mg/m3	ppm
E1	L71620-1	40	<5	<5	< 5	< 0.1	< 0.03
P2	L71620-2	10	<5	<5	< 5	< 0.5	< 0.1

COMMENTS: Total ug corrected for a desorption efficiency of 100%.

Level of quantitation: 5 ug
Analytical Method : NIOSH 1003
OSHA PEL (TWA) : 100 ppm
Collection Media : Charcoal

Submitted by: JK
Approved by : jal
Date : 12-JUN-01
QC by: QC STAFF
NYS DOH # : 11626

< -Less Than	mg -Milligrams	m3 -Cubic Meters	kg -Kilograms
> -Greater Than	ug -Micrograms	l -Liters	NS -Not Specified
NA -Not Applicable	ND -Not Detected	ppm -Parts per Million	

Galson Laboratories
6601 Kirkville Rd. E. Syracuse,NY 13057

LABORATORY ANALYSIS REPORT

Client : Anson Environmental Ltd.
Site : Imperial Cleaners
Project No. : 95085

Date Sampled : 31-MAY-01
Date Received : 04-JUN-01
Date Analyzed : 10-JUN-01

Account No.: 13658
Login No. : L71620

1,2-Dichloroethylene

Sample ID	Lab ID	Air Vol liter	Front ug	Back ug	Total ug	Conc mg/m3	ppm
E1	L71620-1	40	<3	<3	< 3	< 0.08	< 0.02
P2	L71620-2	10	13	<3	13	1.3	0.3

COMMENTS: Total ug corrected for a desorption efficiency of 100%.
Quantified as cis-1,2-Dichloroethylene.

Level of quantitation: 3 ug
Analytical Method : NIOSH 1003; GC/FID
OSHA PEL (TWA) : 50 ppm
Collection Media : Charcoal

Submitted by: JK
Approved by : jal
Date : 12-JUN-01
QC by: QC STAFF
NYS DOH # : 11626

< -Less Than	mg -Milligrams	m3 -Cubic Meters	kg -Kilograms
> -Greater Than	ug -Micrograms	l -Liters	NS -Not Specified
NA -Not Applicable	ND -Not Detected	ppm -Parts per Million	

Galson Laboratories
6601 Kirkville Rd. E. Syracuse,NY 13057

LABORATORY ANALYSIS REPORT

Client : Anson Environmental Ltd.
Site : Imperial Cleaners
Project No. : 95085

Date Sampled : 31-MAY-01
Date Received : 04-JUN-01
Date Analyzed : 10-JUN-01

Account No.: 13658
Login No. : L71620

1,1,1-Trichloroethane

Sample ID	Lab ID	Air Vol liter	Front ug	Back ug	Total ug	Conc mg/m3	ppm
E1 [illegible]	L71620-1	40	<5	<5	< 5	< 0.1	< 0.02
P2 [illegible]	L71620-2	10	<5	<5	< 5	< 0.5	< 0.09

COMMENTS: Total ug corrected for a desorption efficiency of 100%.

Level of quantitation: 5 ug
Analytical Method : NIOSH 1003; GC/FID
OSHA PEL (TWA) : 350 ppm
Collection Media : Charcoal

Submitted by: JK
Approved by : jal
Date : 12-JUN-01
QC by: QC STAFF
NYS DOH # : 11626

< -Less Than	mg -Milligrams	m3 -Cubic Meters	kg -Kilograms
> -Greater Than	ug -Micrograms	l -Liters	NS -Not Specified
NA -Not Applicable	ND -Not Detected	ppm -Parts per Million	

Galson Laboratories
6801 Kirkville Rd. E. Syracuse,NY 13057

LABORATORY ANALYSIS REPORT

Client : Anson Environmental Ltd.
Site : Imperial Cleaners
Project No. : 95085

Date Sampled : 31-MAY-01
Date Received : 04-JUN-01
Date Analyzed : 10-JUN-01

Account No.: 13658
Login No. : L71620

Trichloroethylene

Sample ID	Lab ID	Air Vol liter	Front ug	Back ug	Total ug	Conc mg/m3	ppm
E1	L71620-1	40	<5	<5	< 5	< 0.1	< 0.02
P2	L71620-2	10	12	<5	12	1.2	0.2

COMMENTS: Total ug corrected for a desorption efficiency of 100%.

Level of quantitation: 5 ug
Analytical Method : NIOSH 1022; GC/FID
OSHA PEL (TWA) : 100 ppm
Collection Media : Charcoal

Submitted by: JK
Approved by : jal
Date : 12-JUN-01
QC by: QC STAFF
NYS DOH # : 11626

< -Less Than	mg -Milligrams	m3 -Cubic Meters	kg -Kilograms
> -Greater Than	ug -Micrograms	l -Liters	NS -Not Specified
NA -Not Applicable	ND -Not Detected	ppm -Parts per Million	

Galson Laboratories
6601 Kirkville Rd. E. Syracuse,NY 13057

LABORATORY ANALYSIS REPORT

Client : Anson Environmental Ltd.
Site : Imperial Cleaners
Project No. : 95085

Date Sampled : 31-MAY-01
Date Received : 04-JUN-01
Date Analyzed : 10-JUN-01

Account No.: 13658
Login No. : L71620

Tetrachloroethylene

Sample ID	Lab ID	Air Vol liter	Front ug	Back ug	Total ug	Conc mg/m3	ppm
E1	L71620-1	40	<5	<5	< 5	< 0.1	< 0.02
P2	L71620-2	10	1900	<5	1900	190	28

COMMENTS: Total ug corrected for a desorption efficiency of 100%.

Level of quantitation: 5 ug
Analytical Method : NIOSH 1003; GC/FID
OSHA PEL (TWA) : 100 ppm
Collection Media : Charcoal

Submitted by: JK
Approved by : jal
Date : 12-JUN-01
QC by: QC STAFF
NYS DOH # : 11626

<	-Less Than	mg	-Milligrams	m3	-Cubic Meters	kg	-Kilograms
>	-Greater Than	ug	-Micrograms	l	-Liters	NS	-Not Specified
NA	-Not Applicable	ND	-Not Detected	ppm	-Parts per Million		

Galson Laboratories
6601 Kirkville Rd. E. Syracuse,NY 13057

LABORATORY ANALYSIS REPORT

Client : Anson Environmental Ltd.
Site : Imperial Cleaners
Project No. : 95085

Date Sampled : 31-MAY-01
Date Received : 04-JUN-01
Date Analyzed : 11-JUN-01

Account No.: 13658
Login No. : L71620

Vinyl Chloride

Sample ID	Lab ID	Air Vol liter	Front ug	Back ug	Total ug	Conc mg/m3	ppm
E2 [illegible]	L71620-3	1	<1	<1	< 1	< 1.0	< 0.4
P1 [illegible]	L71620-4	1	<1	<1	< 1	< 1.0	< 0.4

COMMENTS: Total ug corrected for a desorption efficiency of 100%.

Level of quantitation: 1 ug
Analytical Method : NIOSH 1007; GC/PID
OSHA PEL (TWA) : 1 ppm
Collection Media : Charcoal

Submitted by: JK
Approved by : jal
Date : 12-JUN-01
QC by: QC STAFF
NYS DOH # : 11626

< -Less Than	mg -Milligrams	m3 -Cubic Meters	kg -Kilograms
> -Greater Than	ug -Micrograms	l -Liters	NS -Not Specified
NA -Not Applicable	ND -Not Detected	ppm -Parts per Million	

Galson
Laboratories
6601 Kirkville Road
P.O. Box 369
E. Syracuse, NY 13057
Tel. (315) 437-7252 888-577-Labs (5227)
Fax: (315) 437-0571

Request For Industrial Hygiene Analysis

Company Name: Anson Environmental
Site Name: Imperial Cleaners
Sampled By: Jim Van Horn
Project #: 95085

Send Report to: Jim Van Horn
Anson Environmental
771 New York Ave
Huntington, NY 11743

Invoice to: Anson Environmental
771 New York Ave
Huntington, NY 11743

☐ Purchase order number
(or)
☐ Credit Card (type)
Card #
Exp Date
☐ Verbal Authorization

☒ Standard Turn-Around Time OR ☐ Rush: Date and Time Requested: / / am pm
☐ Phone Results to:
Phone # (631) - 351 - 3555 ext. 19
☒ Fax Results to: Jim Van Horn
Fax # (631) - 351 - 3615
☐ Email Results to:

Sample Identification	Date Sampled	Sample Medium Catalog # / Lot #	Air Sample Volume (liters)*	Analysis Requested	Method Reference
E1	5/31/01	226-01-2000	40	*	NIOSH 1003
E2	5/31/01	226-01/2000	1	Vinyl chloride	OSHA 4
P1	5/31/01	226-01/2000	1	Vinyl chloride	OSH 4
P2	5/31/01	226-01/2000	10	*	NIOSH 1003

*For passive monitors please list time exposed in minutes.

Comments (Please list any known interferences present in sampling area): * 1,1-dichloroethane 1,2-dichloroethylene, 1,1,1-Trichloroethane, Tetrachloroethylene 1,1,2-Trichloroethane, and Trichloroethylene

Chain of Custody	Print Name	Signature	Date/Time
Relinquished by:	Jim Van Horn		6/1/01
Received by LAB.			

Samples received after 3pm will be considered as next day's business.

CUSTOMER COPY

Appendix C

Perc Badge Results – May 30th, 2001

Galson Laboratories
6601 Kirkville Rd. E. Syracuse, NY 13057

LABORATORY ANALYSIS REPORT

Client : Walden Associates, Inc.
Site : Imperial Cleaners
Project No. : SPGL00200

Date Sampled : 30-MAY-01
Date Received : 04-JUN-01
Date Analyzed : 08-JUN-01

Account No.: 14317
Login No. : L71563

Perchloroethylene

Sample ID	Lab ID	Time minutes	Total ug	Conc ug/m3
RI 8797	L71563-1	1437	0.12	2.9
RI 8754	L71563-2	1443	0.09	2.1
RI 8810	L71563-3	1440	0.11	2.6
RI 8784	L71563-4	1440	0.1	2.4
SU 3451	L71563-5	1440	0.36	8.6
RI 9489	L71563-6	1440	1.58	38
RI 9481	L71563-7	1440	0.27	6.4
SU 3395	L71563-8	1406	7.27	177
RI 9475	L71563-9	1405	7.58	185
RI 9482	L71563-10	1407	5.26	128
RI 9476	L71563-11	1406	0.56	14
RI 9323	L71563-12	1406	0.19	4.6
RI 9338	L71563-13	1403	0.35	8.5
SU 3444	L71563-14	1437	0.29	6.9
RI 8849	L71563-15	1433	0.35	8.4
RI 9244	L71563-16	1406	3.69	90
RI 9513	L71563-17	1407	1.47	36

Level of quantitation: 0.03 ug
Analytical Method : NYS DOH 311-9
OSHA PEL (TWA) : 100 ppm
Collection Media : OVM

Submitted by: SF
Approved by : jal
Date : 11-JUN-01
QC by: QC STAFF
NYS DOH # : 11626

< -Less Than	mg -Milligrams	m3 -Cubic Meters	kg -Kilograms
> -Greater Than	ug -Micrograms	l -Liters	NS -Not Specified
NA -Not Applicable	ND -Not Detected	ppm -Parts per Million	