From: "Cantagallo, Robert" <Robert.Cantagallo@tetratech.com>
To: John Spellman <jtspellm@gw.dec.state.ny.us>, "mer10@health.state.ny.us" <mer10@health.state.ny.us>
CC: "Jones, William R. (NYED)" <William.R.Jones@us.ngrid.com>
Date: 3/28/2011 1:34 PM
Subject: Troy (Smith Ave.) - OU-1 - 2010 Soil Vapor Investigation - Letter report
Attachments: Troy Soil Vapor Results 022511.pdf; FIGURE_1_Soil_Vapor_Sample_Locations_022411.pdf; Troy _Smith Ave _ OU-1 Soil vapor Letter Report 022511.pdf

Good afternoon,

Attached please find the referenced report. One hard copy will follow to each addressee. Please contact me if you have any questions or require additional information.

Bob Cantagallo

Bob Cantagallo | Senior Project Manager
Direct: 973.630.8132 | Main: 973.630.8000 | Fax: 973.630.8304 | Cell: 973.570.4045
Robert.Cantagallo@tetratech.com

Tetra Tech EC, Inc. |
1000 The American Road | Morris Plains, NJ 07856 | www.tetratech.com

TETRA TECH EC, INC.

March 28, 2011

Mr. John Spellman, P.E.
Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233

Subject: **National Grid Troy (Smith Ave.) Former MGP Site, OU-1**
Soil Vapor Investigation Summary Report

Dear Mr. Spellman,

This Soil Vapor Summary Report (Summary Report) presents the activities implemented at the Troy (Smith Ave.) former manufactured gas plant (MGP) site (the "site") and the resulting data. The activities were performed to evaluate the potential presence and concentration of MGP-related volatile organic compounds (VOCs) in soil vapor, as requested in the March 29, 2010 NYSDEC letter to National Grid. This investigation has was conducted consistent with the June 8, 2010 Work Plan, approved by the New York State Department of Environmental Conservation (NYSDEC) in a letter dated August 2, 2010.

1.0 Background

In 1885, the Troy Fuel Gas Company purchased an exclusive license to use the Lowe water gas process to produce gas in Troy. By 1888, the water gas equipment began operation at the Smith Avenue Site. By 1903, there were two gas holders west of the gas plant on the bank of the Hudson River, and a third gas holder and three oil tanks west of the plant. The plant consisted of a purifying house, two coal sheds, nine water gas generators, a condenser, a black smith shop, an engineering room, a store house and an office. In 1925, the Smith Avenue gas plant ceased operation when the Hudson Valley Coke and Products Corporation gas plant began operation on Water Street in Troy, and by 1986, all MGP related structures had been removed from the Site.

1000 The American Road, Morris Plains, NJ 07950
Tel 973.630.8000 Fax 973.630.8025
www.tteci.com

A Preliminary Site Assessment (PSA), a Remedial Investigation (RI), and Supplemental Remedial Investigation (SRI) were performed at the Site from 1994 through 2005. A soil gas survey was completed at the site in 1994, primarily in the southern portion of the site. Low concentrations of benzene were detected in only two of the 24 samples collected. No volatile compounds were detected in the vicinity of MW-3 and MW-6, located just south of former gas holder No. 2, or at SB-2, located at former gas holder No.1, between gas holder No. 2 and the former lock tender's residence.

National Grid provided letters to the NYSDEC, evaluating the potential for soil vapor impacts at the Site, in August and October 2009, as follows:

The majority of soil and groundwater contamination is on the western edge of the site bordering the Hudson River and the groundwater flow direction is toward the river, therefore the potential for migration of vapors to the east is not likely. Furthermore, utility clearance, geophysical surveys and soil borings completed during the Remedial Investigation and Pre-Design Investigation, indicate that there are no utility corridors or natural channels which would provide a preferential pathway for vapors from OU-1 to the vicinity of the building.

NAPL was not identified in any of the borings in the area around the crew facility. PID readings were obtained during advancement of the borings, and no volatilized organic compounds were detected above background throughout these borings except for two which had maximum PID detections of 10 ppm and 25 ppm, respectively. However, adjacent borings exhibited no PID readings above background. NAPL was not identified in borings advanced in Gas Holder 3, located southeast of the crew facility building. Contaminants associated with MGP impacts were not detected in the soil samples from these borings with the exception of the benzene at a concentration of less than 0.01 mg/kg.

Monitoring of site wells for NAPL in April 2006 indicated a minor amount of DNAPL (3-4 inches) in one well located on the western edge of the Site and traces of DNAPL in the bottom of an adjacent well. No accumulation of DNAPL was observed in any of the other wells monitored, including those located east of the crew facility. No VOCs were detected in groundwater samples collected from wells east of the crew facility, with the exception of common laboratory contaminants (acetone and methylene chloride at 4 ppb) and chloroform (1 ppb). VOCs have been detected in wells located on the western edge of the Site – however, as previously noted, groundwater at the site flows to the southwest, away from the crew facility. The crew facility is approximately 140 feet from the nearest soil boring in which NAPL was observed (SB-41). No indications of NAPL were observed in the soil boring which is located between SB-41 and the crew facility.

1000 The American Road, Morris Plains, NJ 07950
Tel 973.630.8000 Fax 973.630.8025
www.tteci.com

A soil gas survey was completed at the site in 1994, primarily in the southern portion of the site. Low concentrations of benzene were detected in only two of the 24 samples collected. No volatile compounds were detected in the vicinity of MW-3 and MW-6, located just south of former gas holder No. 2, west-northwest of the building.

2.0 Soil Vapor Investigation Activities

The investigation activities were performed by TtEC on October 28 and 29, 2010. Parratt-Wolff, Inc. provided vapor point installation services. The locations of the samples are depicted on Figure 1.

Soil vapor sampling was conducted at the Site from temporary soil vapor probes. Three soil vapor samples (SV102810-01 through SV102810-03) were collected east and southeast of former gas holder #2, to determine the potential for soil vapor migration from this source area. Three soil gas samples (SV102810-04 through SV102810-06) were also collected from discrete points immediately west of the crew facility, which is the closest occupied building to the former gas holder. Utilities located along the northern side of the building prevented locating sample points along that side of the building.

The soil vapor samples near the former gas holder were collected at a depth of approximately 6 feet below ground surface (bgs). The soil vapor samples near the crew facility were collected just below the pavement sub-base to evaluate conditions that could be encountered below the building floor slab. The soil vapor points were installed and purged as described in the Work Plan, and were submitted to Air Toxics, Ltd. for modified TO-15 analysis. Soil vapor samples SV102810-01 through SV102810-03, collected near the former gas holder, were analyzed immediately. After submittal of these sample results via e-mail to NYSDEC, samples SV102810-04 through SV102810-06, were analyzed.

Two upwind ambient air samples were also collected on the day that soil vapor sampling was performed. The ambient air sample collection was performed in accordance with the Work Plan. The ambient air samples were submitted to an analytical laboratory for analysis.

QA/QC measures implemented included obtaining multiple canister vacuum readings, using a tracer gas, and collection and analysis of one duplicate sample.

Four sets of SUMMA® canister vacuum readings were obtained in connection with sampling and analysis:
1) following canister cleaning for shipping to the field;
2) prior to sampling, with all the connections and leak checks completed;
3) at the end of sampling; and
4) prior to analysis in the laboratory.

All vapor points were checked using a tracer gas as described in the work plan. One field duplicate (SV102810-13) was collected and submitted for laboratory analysis for QA/QC purposes.

3.0 Investigation Results

Prior to collection of the soil vapor samples, a Site reconnaissance was conducted to determine potential sources of VOCs related to use of the Site as a service facility. While the Site is no longer in regular use, the operations having been transferred to the Albany facility over the past year, it was used as a service facility for over 50 years. A fueling island and garage for maintenance of service vehicles are located north of the crew facility. Storage buildings, where a variety of petroleum based products related to vehicle maintenance and service activities could be stored are also located north of the crew facility. In addition, service vehicles, as well as personal vehicle were parked around the crew facility for many years.

BTEX was detected in the samples, however these compounds were typically highest in SV102810-01, located closest to former gas holder #2, and either undetected or orders of magnitude lower in the other sample locations. While BTEX was detected in the samples, other compounds associated with MGP residuals were not detected. None of the naphthalene compounds were detected, nor were indane and indene, tetramethylbenzene or one of the trimethylbenzene compounds. Furthermore, ethylbenzene, toluene, and the xylenes were all detected at concentrations below 2002 USEPA OSWER guidance.

There was a significant difference (greater than 5.0" Hg) between the measured canister receipt vacuum at the laboratory and that which was reported on the Chain of Custody (COC) for samples AS102810-02 and SV102810-13. A leak test conducted by the laboratory indicated that the valve was functioning properly.

Given the analytical results and the fact that the facility is no longer in regular use, soil vapor is not a concern associated with the Site and no additional investigation of the soil vapor is necessary for the crew facility building. However, in accordance with the ROD, the development of a site management plan will include the continued evaluation of the potential for vapor intrusion for any buildings developed on the site

Please contact me at robert.cantagallo@tetratech.com, or at 973-630-8132, if you require additional information.

Sincerely,

Robert C. Cantagallo
Project Manager, TtEC

cc: W. Jones, National Grid
M. Schuck, NYSDOH
file

1000 The American Road, Morris Plains, NJ 07950
Tel 973.630.8000 Fax 973.630.8025
www.tteci.com

Volatile Organic Compounds in Soil Vapor
Troy (Smith Avenue) Site
Troy, New York

	Sample ID	AS102810-01		AS102810-02		SV102810-01		SV102810-02	
	Lab Sample ID	1011021-08A		1011021-02A		1011021-04A		1011021-05A	
	Sample Date	10/28/2010		10/28/2010		10/28/2010		10/28/2010	
	Dilution Factor	1.75		1.57		3.66		1.86	
	Units	ppbv	µg/m^3	ppbv	µg/m^3	ppbv	µg/m^3	ppbv	µg/m^3
Constituent	**CAS Number**								
1,1,1-Trichloroethane	71-55-6	0.18 U	0.95 U	0.16 U	0.86 U	10	55	1.0	5.7
1,1,2,2-Tetrachloroethane	79-34-5	0.18 U	1.2 U	0.16 U	1.1 U	0.37 U	2.5 U	0.19 U	1.3 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	76-13-1	0.18 U	1.3 U	0.16 U	1.2 U	0.37 U	2.8 U	0.19 U	1.4 U
1,1,2-Trichloroethane	79-00-5	0.18 U	0.95 U	0.16 U	0.86 U	0.37 U	2.0 U	0.19 U	1.0 U
1,1-Dichloroethane	75-34-3	0.18 U	0.71 U	0.16 U	0.64 U	0.37 U	1.5 U	0.19 U	0.75 U
1,1-Dichloroethene	75-35-4	0.18 U	0.69 U	0.16 U	0.62 U	0.37 U	1.4 U	0.19 U	0.74 U
1,2,3-Trimethylbenzene	526-73-8	0.88 U	4.3 U	0.78 U	3.8 U	1.8 U	9.0 U	0.93 U	4.6 U
1,2,4,5-Tetramethylbenzene	95-93-2	U	U	U	U	U	U	U	U
1,2,4-Trichlorobenzene	120-82-1	0.88 U	6.5 U	0.78 U	5.8 U	1.8 U	14 U	0.93 U	6.9 U
1,2,4-Trimethylbenzene	95-63-6	0.18 U	0.86 U	0.16 U	0.77 U	0.65	3.2	0.38	1.9
1,2-Dibromoethane (EDB)	106-93-4	0.18 U	1.3 U	0.16 U	1.2 U	0.37 U	2.8 U	0.19 U	1.4 U
1,2-Dichlorobenzene	95-50-1	0.18 U	1.0 U	0.16 U	0.94 U	0.37 U	2.2 U	0.19 U	1.1 U
1,2-Dichloroethane	107-06-2	0.18 U	0.71 U	0.16 U	0.64 U	0.37 U	1.5 U	0.19 U	0.75 U
1,2-Dichloroethene (cis)	156-59-2	0.18 U	0.69 U	0.16 U	0.62 U	0.37 U	1.4 U	0.19 U	0.74 U
1,2-Dichloroethene (trans)	156-60-5	0.18 U	0.69 U	0.16 U	0.62 U	0.37 U	1.4 U	0.19 U	0.74 U
1,2-Dichloropropane	78-87-5	0.18 U	0.81 U	0.16 U	0.72 U	0.37 U	1.7 U	0.19 U	0.86 U
1,2-Dichlorotetrafluoroethane (Freon 114)	76-14-2	0.18 U	1.2 U	0.16 U	1.1 U	0.37 U	2.6 U	0.19 U	1.3 U
1,3,5-Trimethylbenzene	108-67-8	0.18 U	0.86 U	0.16 U	0.77 U	1.0	5.1	0.32	1.6
1,3-Butadiene	106-99-0	0.18 U	0.39 U	0.16 U	0.35 U	1.1	2.5	0.78	1.7
1,3-Dichlorobenzene	541-73-1	0.18 U	1.0 U	0.16 U	0.94 U	0.37 U	2.2 U	0.19 U	1.1 U
1,4-Dichlorobenzene	106-46-7	0.18 U	1.0 U	0.16 U	0.94 U	0.37 U	2.2 U	0.19 U	1.1 U
1,4-Dioxane	123-91-1	0.18 U	0.63 U	0.16 U	0.56 U	0.37 U	1.3 U	0.19 U	0.67 U
1-Methylnaphthalene	90-12-0	U	U	U	U	U	U	U	U
2,2,4-Trimethylpentane	540-84-1	0.88 U	4.1 U	0.78 U	3.7 U	1.8 U	8.5 U	0.93 U	4.3 U
2,3-Dimethylpentane	565-59-3	0.88 U	3.6 U	0.78 U	3.2 U	1.8 U	7.5 U	0.93 U	3.8 U
2-Butanone (Methyl Ethyl Ketone)	78-93-3	0.37	1.1	0.22	0.65	3.4	10	1.8	5.4
2-Chlorotoluene (o-Chlorotoluene)	95-49-8	0.88 U	4.5 U	0.78 U	4.1 U	1.8 U	9.5 U	0.93 U	4.8 U
2-Methylnaphthalene	91-57-6	U	U	U	U	U	U	U	U
3-Chloropropene (allyl chloride)	107-05-1	0.88 U	2.7 U	0.78 U	2.4 U	1.8 U	5.7 U	0.93 U	2.9 U
4-Ethyltoluene (p-Ethyltoluene)	622-96-8	0.18 U	0.86 U	0.16 U	0.77 U	0.97	4.8	0.43	2.1
4-Methyl-2-pentanone (MIBK)	108-10-1	0.18 U	0.72 U	0.16 U	0.64 U	0.37 U	1.5 U	0.34 J	1.4 J
Acetone (2-propanone)	67-64-1	4.7	11	2.8	6.6	21	50	13	31
Benzene	71-43-2	0.18 U	0.56 U	0.16 U	0.50 U	110	340	12	39
Bromodichloromethane	75-27-4	0.18 U	1.2 U	0.16 U	1.0 U	0.37 U	2.4 U	0.19 U	1.2 U
Bromoethene	593-60-2	0.88 U	3.8 U	0.78 U	3.4 U	1.8 U	8.0 U	0.93 U	4.1 U
Bromoform	75-25-2	0.18 U	1.8 U	0.16 U	1.6 U	0.37 U	3.8 U	0.19 U	1.9 U
Bromomethane (Methyl bromide)	74-83-9	0.18 U	0.68 U	0.16 U	0.61 U	0.37 U	1.4 U	0.19 U	0.72 U
Carbon Disulfide	75-15-0	0.88 U	2.7 U	0.78 U	2.4 U	1.8 U	5.7 U	0.93 U	2.9 U

Volatile Organic Compounds in Soil Vapor
Troy (Smith Avenue) Site
Troy, New York

	Sample ID	AS102810-01		AS102810-02		SV102810-01		SV102810-02	
	Lab Sample ID	1011021-08A		1011021-02A		1011021-04A		1011021-05A	
	Sample Date	10/28/2010		10/28/2010		10/28/2010		10/28/2010	
	Dilution Factor	1.75		1.57		3.66		1.86	
	Units	ppbv	µg/m^3	ppbv	µg/m^3	ppbv	µg/m^3	ppbv	µg/m^3
Constituent	**CAS Number**								
Carbon Tetrachloride	56-23-5	0.18 U	1.1 U	0.16 U	0.99 U	0.37 U	2.3 U	0.19 U	1.2 U
Chlorobenzene	108-90-7	0.18 U	0.80 U	0.16 U	0.72 U	0.37 U	1.7 U	0.19 U	0.86 U
Chloroethane	75-00-3	0.18 U	0.46 U	0.16 U	0.41 U	0.37 U	0.96 U	0.19 U	0.49 U
Chloroform	67-66-3	0.18 U	0.85 U	0.16 U	0.77 U	0.37 U	1.8 U	0.19 U	0.91 U
Chloromethane (Methyl chloride)	74-87-3	0.67	1.4	0.42	0.86	0.37 U	0.76 U	0.68	1.4
cis-1,3-Dichloropropene	10061-01-5	0.18 U	0.79 U	0.16 U	0.71 U	0.37 U	1.7 U	0.19 U	0.84 U
Cyclohexane	110-82-7	0.18 U	0.60 U	0.16 U	0.54 U	0.40	1.4	0.19 U	0.64 U
Dibromochloromethane	124-48-1	0.18 U	1.5 U	0.16 U	1.3 U	0.37 U	3.1 U	0.19 U	1.6 U
Dichlorodifluoromethane (Freon 12)	75-71-8	0.46	2.3	0.29	1.4	0.75	3.7	0.66	3.2
Ethyl Benzene	100-41-4	0.18 U	0.76 U	0.16 U	0.68 U	3.7	16	0.39	1.7
Hexachlorobutadiene	87-68-3	0.88 U	9.3 U	0.78 U	8.4 U	1.8 U	20 U	0.93 U	9.9 U
Indane	496-11-7	0.88 U	4.2 U	0.78 U	3.8 U	1.8 U	8.8 U	0.93 U	4.5 U
Indene	95-13-6	0.88 U	4.2 U	0.78 U	3.7 U	1.8 U	8.7 U	0.93 U	4.4 U
Isopentane	78-78-4	0.88 U	2.6 U	0.78 U	2.3 U	5.1	15	1.9	5.6
Isopropyl Alcohol	67-63-0	0.88 U	2.2 U	0.78 U	1.9 U	1.8 U	4.5 U	0.93 U	2.3 U
Methyl Butyl Ketone	591-78-6	0.88 U	3.6 U	0.78 U	3.2 U	1.8 U	7.5 U	0.93 U	3.8 U
Methylene Chloride	75-09-2	0.35 U	1.2 U	0.31 U	1.1 U	0.73 U	2.5 U	0.37 U	1.3 U
MTBE (Methyl tert-butyl ether)	1634-04-4	0.18 U	0.63 U	0.16 U	0.57 U	0.37 U	1.3 U	0.19 U	0.67 U
Naphthalene	91-20-3	0.88 U	4.6 U	0.78 U	4.1 U	1.8 U	9.6 U	0.93 U	4.9 U
n-Heptane	142-82-5	0.18 U	0.72 U	0.16 U	0.64 U	3.8	16	1.2	4.7
n-Hexane	110-54-3	0.18 U	0.62 U	0.16 U	0.55 U	8.0	28	1.2	4.4
Styrene	100-42-5	0.18 U	0.74 U	0.16 U	0.67 U	0.63	2.7	0.90	3.8
Tertiary butyl alcohol (TBA)	75-65-0	0.88 U	2.6 U	0.78 U	2.4 U	1.8 U	5.5 U	0.93 U	2.8 U
Tetrachloroethene (PCE)	127-18-4	0.18 U	1.2 U	0.16 U	1.1 U	1.1	7.7	2.9	19
Thiophene	110-02-1	0.88 U	3.0 U	0.78 U	2.7 U	1.8 U	6.3 U	0.93 U	3.2 U
Toluene	108-88-3	0.18 U	0.66 U	0.16 U	0.59 U	34	130	8.6	32
trans-1,3-Dichloropropene	10061-02-6	0.18 U	0.79 U	0.16 U	0.71 U	0.37 U	1.7 U	0.19 U	0.84 U
Trichloroethene (TCE)	79-01-6	0.18 U	0.94 U	0.16 U	0.84 U	0.37 U	2.0 U	0.19 U	1.0 U
Trichlorofluoromethane (Freon 11)	75-69-4	0.26	1.4	0.18	1.0	1.5	8.4	1.2	7.0
Vinyl Chloride	75-01-4	0.18 U	0.45 U	0.16 U	0.40 U	0.37 U	0.94 U	0.19 U	0.48 U
Xylenes (m&p)	108-38-3/106-42-3	0.18 U	0.76 U	0.16 U	0.68 U	4.5	20	2.2	9.8
Xylenes (o)	95-47-6	0.18 U	0.76 U	0.16 U	0.68 U	2.5	11	0.69	3.0

Notes:
ppbv - parts per billion by volume
µg/m^3 - micrograms per cubic meter
U - not detected

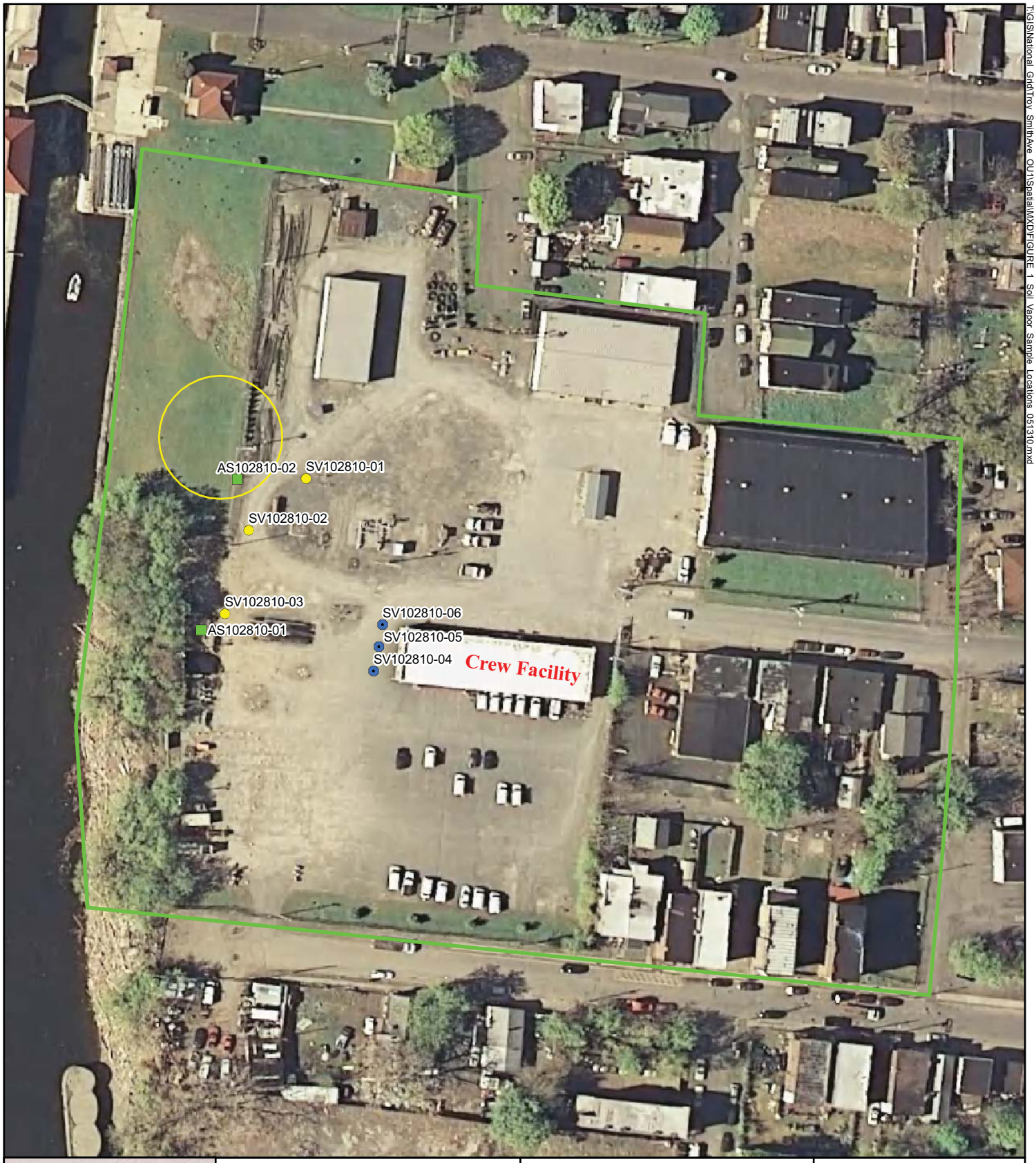
Volatile Organic Compounds in Soil Vapor
Troy (Smith Avenue) Site
Troy, New York

	Sample ID	SV102810-03		SV102810-13		SV102810-04		SV102810-05		SV102810-06	
	Lab Sample ID	1011021-01A		Duplicate of		1011021B-07A		1011021B-09A		1011021B-06A	
	Sample Date	10/28/2010		SV102810-03		10/28/2010		10/28/2010		10/28/2010	
	Dilution Factor	2.01		2.48		1.68		5.18		3.80	
	Units	ppbv	µg/m³	ppbv	µg/m³	ppbv	µg/m³	ppbv	µg/m³	ppbv	µg/m³
Constituent	**CAS Number**										
1,1,1-Trichloroethane	71-55-6	0.65	3.6	0.70	3.8	0.17 U	0.92 U	1.3	7.0	0.82	4.5
1,1,2,2-Tetrachloroethane	79-34-5	0.20 U	1.4 U	0.25 U	1.7 U	0.17 U	1.2 U	0.52 U	3.6 U	0.38 U	2.6 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	76-13-1	0.20 U	1.5 U	0.25 U	1.9 U	0.17 U	1.3 U	0.52 U	4.0 U	0.38 U	2.9 U
1,1,2-Trichloroethane	79-00-5	0.20 U	1.1 U	0.25 U	1.4 U	0.17 U	0.92 U	0.52 U	2.8 U	0.38 U	2.1 U
1,1-Dichloroethane	75-34-3	0.20 U	0.81 U	0.25 U	1.0 U	0.17 U	0.68 U	0.52 U	2.1 U	0.38 U	1.5 U
1,1-Dichloroethene	75-35-4	0.20 U	0.80 U	0.25 U	0.98 U	0.17 U	0.67 U	0.52 U	2.0 U	0.38 U	1.5 U
1,2,3-Trimethylbenzene	526-73-8	1.0 U	4.9 U	1.2 U	6.1 U	0.84 U	4.1 U	2.6 U	13 U	1.9 U	9.3 U
1,2,4,5-Tetramethylbenzene	95-93-2	U	U	U	U	U	U	U	U	U	U
1,2,4-Trichlorobenzene	120-82-1	1.0 U	7.4 U	1.2 U	9.2 U	0.84 U	6.2 U	2.6 U	19 U	1.9 U	14 U
1,2,4-Trimethylbenzene	95-63-6	0.20 U	0.99 U	0.44	2.2	0.17 U	0.82 U	2.0	9.8	0.72	3.6
1,2-Dibromoethane (EDB)	106-93-4	0.20 U	1.5 U	0.25 U	1.9 U	0.17 U	1.3 U	0.52 U	4.0 U	0.38 U	2.9 U
1,2-Dichlorobenzene	95-50-1	0.20 U	1.2 U	0.25 U	1.5 U	0.17 U	1.0 U	0.52 U	3.1 U	0.38 U	2.3 U
1,2-Dichloroethane	107-06-2	0.20 U	0.81 U	0.25 U	1.0 U	0.17 U	0.68 U	0.52 U	2.1 U	0.38 U	1.5 U
1,2-Dichloroethene (cis)	156-59-2	0.20 U	0.80 U	0.25 U	0.98 U	0.17 U	0.67 U	0.52 U	2.0 U	0.38 U	1.5 U
1,2-Dichloroethene (trans)	156-60-5	0.20 U	0.80 U	0.25 U	0.98 U	0.17 U	0.67 U	0.52 U	2.0 U	0.38 U	1.5 U
1,2-Dichloropropane	78-87-5	0.20 U	0.93 U	0.25 U	1.1 U	0.17 U	0.78 U	0.52 U	2.4 U	0.38 U	1.8 U
1,2-Dichlorotetrafluoroethane (Freon 114)	76-14-2	0.20 U	1.4 U	0.25 U	1.7 U	0.17 U	1.2 U	0.52 U	3.6 U	0.38 U	2.6 U
1,3,5-Trimethylbenzene	108-67-8	0.20 U	0.99 U	0.25 U	1.2 U	0.17 U	0.82 U	0.59	2.9	0.38 U	1.9 U
1,3-Butadiene	106-99-0	0.46	1.0	0.25 U	0.55 U	0.17 U	0.37 U	0.52 U	1.1 U	0.38 U	0.84 U
1,3-Dichlorobenzene	541-73-1	0.20 U	1.2 U	0.25 U	1.5 U	0.17 U	1.0 U	0.52 U	3.1 U	0.38 U	2.3 U
1,4-Dichlorobenzene	106-46-7	0.28	1.7	0.26	1.5	0.17 U	1.0 U	0.52 U	3.1 U	0.38 U	2.3 U
1,4-Dioxane	123-91-1	0.56	2.0	0.36	1.3	0.20	0.73	0.52 U	1.9 U	0.38 U	1.4 U
1-Methylnaphthalene	90-12-0	U	U	U	U	U	U	U	U	U	U
2,2,4-Trimethylpentane	540-84-1	1.0 U	4.7 U	1.2 U	5.8 U	0.84 U	3.9 U	2.6 U	12 U	1.9 U	8.9 U
2,3-Dimethylpentane	565-59-3	1.0 U	4.1 U	1.2 U	5.1 U	0.84 U	3.4 U	2.6 U	11 U	1.9 U	7.8 U
2-Butanone (Methyl Ethyl Ketone)	78-93-3	1.1	3.2	1.5	4.4	0.27	0.78	3.1	9.2	2.2	6.6
2-Chlorotoluene (o-Chlorotoluene)	95-49-8	1.0 U	5.2 U	1.2 U	6.4 U	0.84 U	4.3 U	2.6 U	13 U	1.9 U	9.8 U
2-Methylnaphthalene	91-57-6	U	U	U	U	U	U	U	U	U	U
3-Chloropropene (allyl chloride)	107-05-1	1.0 U	3.1 U	1.2 U	3.9 U	0.84 U	2.6 U	2.6 U	8.1 U	1.9 U	5.9 U
4-Ethyltoluene (p-Ethyltoluene)	622-96-8	0.20 U	0.99 U	0.52	2.6	0.17 U	0.82 U	2.0	9.9	0.86	4.2
4-Methyl-2-pentanone (MIBK)	108-10-1	0.24 J	0.98 J	0.25 U	1.0 U	0.17 U	0.69 U	0.52 U	2.1 U	0.38 U	1.6 U
Acetone (2-propanone)	67-64-1	17	40	12	29	3.2	7.5	27	63	17	41
Benzene	71-43-2	0.20 U	0.64 U	0.36	1.2	0.17 U	0.54 U	0.70	2.2	0.43	1.4
Bromodichloromethane	75-27-4	0.20 U	1.3 U	0.25 U	1.7 U	0.17 U	1.1 U	0.52 U	3.5 U	0.38 U	2.5 U
Bromoethene	593-60-2	1.0 U	4.4 U	1.2 U	5.4 U	0.84 U	3.7 U	2.6 U	11 U	1.9 U	8.3 U
Bromoform	75-25-2	0.20 U	2.1 U	0.25 U	2.6 U	0.17 U	1.7 U	0.52 U	5.4 U	0.38 U	3.9 U
Bromomethane (Methyl bromide)	74-83-9	0.30	1.1	0.25 U	0.96 U	0.17 U	0.65 U	0.52 U	2.0 U	0.38 U	1.5 U
Carbon Disulfide	75-15-0	1.0 U	3.1 U	1.2 U	3.9 U	0.84 U	2.6 U	6.8	21	1.9 U	5.9 U

Volatile Organic Compounds in Soil Vapor
Troy (Smith Avenue) Site
Troy, New York

	Sample ID	SV102810-03		SV102810-13		SV102810-04		SV102810-05		SV102810-06	
	Lab Sample ID	1011021-01A		Duplicate of		1011021B-07A		1011021B-09A		1011021B-06A	
	Sample Date	10/28/2010		SV102810-03		10/28/2010		10/28/2010		10/28/2010	
	Dilution Factor	2.01		2.48		1.68		5.18		3.80	
	Units	ppbv	µg/m^3	ppbv	µg/m^3	ppbv	µg/m^3	ppbv	µg/m^3	ppbv	µg/m^3
Constituent	**CAS Number**										
Carbon Tetrachloride	56-23-5	0.20 U	1.3 U	0.25 U	1.6 U	0.17 U	1.0 U	0.52 U	3.2 U	0.38 U	2.4 U
Chlorobenzene	108-90-7	0.20 U	0.92 U	0.25 U	1.1 U	0.17 U	0.77 U	0.52 U	2.4 U	0.38 U	1.7 U
Chloroethane	75-00-3	0.20 U	0.53 U	0.25 U	0.65 U	0.17 U	0.44 U	0.52 U	1.4 U	0.38 U	1.0 U
Chloroform	67-66-3	0.20 U	0.98 U	0.25 U	1.2 U	0.17 U	0.82 U	0.52 U	2.5 U	0.38 U	1.8 U
Chloromethane (Methyl chloride)	74-87-3	0.20 U	0.42 U	0.25 U	0.51 U	0.63	1.3	0.52 U	1.1 U	0.38 U	0.78 U
cis-1,3-Dichloropropene	10061-01-5	0.20 U	0.91 U	0.25 U	1.1 U	0.17 U	0.76 U	0.52 U	2.4 U	0.38 U	1.7 U
Cyclohexane	110-82-7	0.20 U	0.69 U	0.25 U	0.85 U	0.17 U	0.58 U	1.6	5.6	0.38 U	1.3 U
Dibromochloromethane	124-48-1	0.20 U	1.7 U	0.25 U	2.1 U	0.17 U	1.4 U	0.52 U	4.4 U	0.38 U	3.2 U
Dichlorodifluoromethane (Freon 12)	75-71-8	0.86	4.2	88	440	0.48	2.4	150	750	100	520
Ethyl Benzene	100-41-4	0.20 U	0.87 U	1.5	6.4	0.17 U	0.73 U	9.1	39	2.8	12
Hexachlorobutadiene	87-68-3	1.0 U	11 U	1.2 U	13 U	0.84 U	9.0 U	2.6 U	28 U	1.9 U	20 U
Indane	496-11-7	1.0 U	4.8 U	1.2 U	6.0 U	0.84 U	4.1 U	2.6 U	12 U	1.9 U	9.2 U
Indene	95-13-6	1.0 U	4.8 U	1.2 U	5.9 U	0.84 U	4.0 U	2.6 U	12 U	1.9 U	9.0 U
Isopentane	78-78-4	1.0 U	3.0 U	1.2 U	3.6 U	0.84 U	2.5 U	2.6 U	7.6 U	1.9 U	5.6 U
Isopropyl Alcohol	67-63-0	1.0 U	2.5 U	1.2 U	3.0 U	0.84 U	2.1 U	2.6 U	6.4 U	1.9 U	4.7 U
Methyl Butyl Ketone	591-78-6	1.0 U	4.1 U	1.2 U	5.1 U	0.84 U	3.4 U	2.6 U	11 U	1.9 U	7.8 U
Methylene Chloride	75-09-2	0.40 U	1.4 U	0.50 U	1.7 U	0.34 U	1.2 U	1.0 U	3.6 U	0.76 U	2.6 U
MTBE (Methyl tert-butyl ether)	1634-04-4	0.20 U	0.72 U	0.25 U	0.89 U	0.17 U	0.60 U	0.52 U	1.9 U	0.38 U	1.4 U
Naphthalene	91-20-3	1.0 U	5.3 U	1.2 U	6.5 U	0.84 U	4.4 U	2.6 U	14 U	1.9 U	10 U
n-Heptane	142-82-5	0.20 U	0.82 U	0.35	1.4	0.17 U	0.69 U	0.52 U	2.1 U	0.45	1.8
n-Hexane	110-54-3	0.20 U	0.71 U	0.25	0.88	0.17 U	0.59 U	0.52 U	1.8 U	0.38 U	1.3 U
Styrene	100-42-5	0.20 U	0.86 U	0.25 U	1.0 U	0.17 U	0.72 U	0.52 U	2.2 U	0.38 U	1.6 U
Tertiary butyl alcohol (TBA)	75-65-0	1.0 U	3.0 U	1.2 U	3.8 U	0.84 U	2.5 U	2.6 U	7.8 U	1.9 U	5.8 U
Tetrachloroethene (PCE)	127-18-4	0.20 U	1.4 U	0.25 U	1.7 U	0.17 U	1.1 U	0.52 U	3.5 U	0.38 U	2.6 U
Thiophene	110-02-1	1.0 U	3.4 U	1.2 U	4.3 U	0.84 U	2.9 U	2.6 U	8.9 U	1.9 U	6.5 U
Toluene	108-88-3	0.68	2.6	1.8	6.6	0.17 U	0.63 U	7.3	27	2.9	11
trans-1,3-Dichloropropene	10061-02-6	0.20 U	0.91 U	0.25 U	1.1 U	0.17 U	0.76 U	0.52 U	2.4 U	0.38 U	1.7 U
Trichloroethene (TCE)	79-01-6	0.20 U	1.1 U	0.25 U	1.3 U	0.17 U	0.90 U	0.52 U	2.8 U	0.38 U	2.0 U
Trichlorofluoromethane (Freon 11)	75-69-4	1.3	7.3	1.0	5.9	0.27	1.5	2.0	11	1.2	6.9
Vinyl Chloride	75-01-4	0.20 U	0.51 U	0.25 U	0.63 U	0.17 U	0.43 U	0.52 U	1.3 U	0.38 U	0.97 U
Xylenes (m&p)	108-38-3/106-42-3	0.20 U	0.87 U	5.4	24	0.17 U	0.73 U	32	140	11	46
Xylenes (o)	95-47-6	0.20 U	0.87 U	2.3	10	0.17 U	0.73 U	12	52	4.1	18

Notes:
ppbv - parts per billion by volume
µg/m^3 - micrograms per cubic meter
U - not detected



Legend

- Ambient Air Sample
- Primary Soil Vapor Samples
- Secondary Soil Vapor Samples
- Troy Smith Ave. OU-1
- Former Gas Holder #2

TETRA TECH EC, INC.

FIGURE 1

Soil Vapor Sample Locations

Troy (Smith Avenue) Site-OU-1

February 2011

Feet

0 50 100

Ortho Imagery:
1ft resolution natural color.
Rensselaer County, 2007.
New York State GIS Clearinghouse

T:\GIS\National_Grid\Troy_SmithAve_OU1\Spatial\MXD\FIGURE_1_Soil_Vapor_Sample_Locations_051310.mxd