



**Appendix G: Supplemental Soil Vapor
Investigation Summary Report - Addendum
Off-Site Former Axiohm Facility (C75501A)
Ithaca, New York**

Prepared for

New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233



Prepared by

EA Engineering, P.C. and Its Affiliate
EA Science and Technology
6712 Brooklawn Parkway, Suite 104
Syracuse, New York 13211-2158
(315) 431-4610

May 2010
Revision: FINAL
EA Project No. 14368.19

**Appendix G: Supplemental Soil Vapor
Investigation Summary Report - Addendum
Off-Site Former Axiohm Facility (C75501A)
Ithaca, New York**

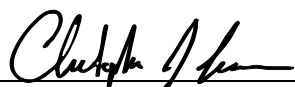
Prepared for

New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233



Prepared by

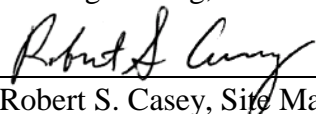
EA Engineering, P.C. and Its Affiliate
EA Science and Technology
6712 Brooklawn Parkway, Suite 104
Syracuse, New York 13211
(315) 431-4610



Christopher J. Canonica, P.E., Program Manager
EA Engineering, P.C.

27 May 2010

Date



Robert S. Casey, Site Manager
EA Science and Technology

27 May 2010

Date

May 2010
Revision: FINAL
EA Project No. 14368.19

CONTENTS

	<u>Page</u>
LIST OF FIGURES	
LIST OF TABLES	
1. INTRODUCTION	1
1.1 Project Background	1
1.2 Objectives	1
1.3 Report Organization.....	1
2. FIELD INVESTIGATION ACTIVITIES	2
2.1 Soil Vapor Points.....	2
2.1.1 Temporary Soil Vapor Point Installation.....	2
2.1.2 Soil Vapor Sampling	2
3. FIELD INVESTIGATION RESULTS	4
3.1 Soil Vapor Results	4
3.2 Data Usability Summary Reports	4
ATTACHMENT A: NYSDEC DAILY FIELD REPORTS	
ATTACHMENT B: SOIL VAPOR BORING LOGS	
ATTACHMENT C: SOIL VAPOR SAMPLING FORMS	
ATTACHMENT D: DATA USABILITY SUMMARY REPORT	

LIST OF FIGURES

<u>Number</u>	<u>Title</u>
1	Historical soil vapor sampling locations and South Hill Neighborhood sewer lines.
2	Soil vapor sampling locations.
3	Typical temporary soil vapor point construction diagram.
4	Soil vapor sampling results.

LIST OF TABLES

Number

Title

1

Summary of volatile organic compounds in soil vapor samples.

1. INTRODUCTION

1.1 PROJECT BACKGROUND

As part of the original Immediate Soil Vapor Investigation work assignment, soil vapor samples were previously collected at various locations of the South Hill neighborhood sewer system. Soil vapor samples were collected at four locations in September 2007, five locations in December 2007, five locations in April 2008, and four locations in November 2008. The historical soil vapor sampling locations and South Hill neighborhood sewer line system are illustrated in Figure 1. Soil vapor samples were collected directly above, adjacent to, and in the vicinity of the South Hill neighborhood sewer system based on sections of the system (EA 2009)¹. Historical data from the previous investigations in the South Hill neighborhood identified potential contaminants of concern such as chlorinated volatile organic compounds (CVOCs); more specifically tetrachloroethene (PCE) and trichloroethene (TCE); and 1,2-dichloroethane, *cis*-1,2-dichloroethene (*cis*-1,2-DCE), *trans*-1,2-dichloroethene, methylene chloride, 1,1,1-trichloroethane, and vinyl chloride.

1.2 OBJECTIVES

The objective of the supplemental soil vapor investigation was to further define the nature and extent of soil vapor contamination within the eastern portions of the South Hill neighborhood and to evaluate the CVOC concentrations, specifically PCE and TCE, within the sewer line utility trenches originating at and lateraling into the Therm, Inc. (Therm) facility.

1.3 REPORT ORGANIZATION

A summary of field investigation activities conducted in September 2009 is included in Section 2. Section 3 summarizes analytical results of the field sampling activities. Analytical results are summarized in table format and associated figures.

The following are provided as attachments:

- **Attachment A**—New York State Department of Environmental Conservation (NYSDEC) Daily Field Reports
- **Attachment B**—Soil Vapor Boring Logs
- **Attachment C**—Soil Vapor Sampling Forms
- **Attachment D**—Data Usability Summary Report (DUSR).

1. EA. 2009. *Final Immediate Soil Vapor Investigation and Vapor Intrusion Summary Report*, Axhiohm OU2 Offsite, Tompkins County, Ithaca, New York. April

2. FIELD INVESTIGATION ACTIVITIES

The following sections present the approach of the field investigation activities performed to meet the objectives of the supplemental soil vapor investigation. EA's approach for implementing this portion of the work assignment included sampling protocols designed to further evaluate the presence or absence of potential contaminants of concern in soil vapor within and adjacent to the sewer line utility trenches located in the eastern portion of the South Hill sewer system that originate at, or lateral into, the Therm sewer.

The field investigation activities associated with this supplemental soil vapor investigation took place in September 2009, and included the installation and sampling of three temporary soil vapor points. Daily field reports documenting these activities are provided in Attachment A.

2.1 SOIL VAPOR POINTS

2.1.1 Temporary Soil Vapor Point Installation

EA and NYSDEC representatives supervised the installation of three temporary soil vapor points on 15-16 September 2009. Figure 2 illustrates the locations of the soil vapor sampling points completed in September 2009. Sampling locations were selected in consultation with the NYSDEC representative. Nothnagle Drilling Inc., from Scottsville, New York, performed the drilling and soil vapor point installation at two of the three locations (SV-18 and SV-19). The soil vapor points (SV-18 and SV-19) were installed using Geoprobe[®] macro-cores to install stainless steel drive points to the required depth (i.e., approximately 1 ft above utility line).

Due to access issues, one additional temporary soil vapor point (SV-20) was installed by EA personnel on 16 September 2009. This soil vapor point was installed utilizing a steel slide hammer and 2-ft macro-core rods to reach the desired sampling depth. Sampling depth intervals were determined by the invert elevation of the sewer line at the sampling location.

Once the sampling depth was reached, a 6-in. stainless steel sampling screen was attached to a dedicated section of 0.25-in. diameter Teflon tubing and placed in the open bore hole. The borehole was then backfilled with sand to a minimum of 6 in. above the stainless steel sampling screen. Granular bentonite pellets were then used to backfill to the ground surface, hydrating concurrently with placement. The soil boring spoils were reworked into the surrounding ground surface. A typical soil vapor point construction diagram is depicted in Figure 3. Soil vapor point boring logs are provided in Attachment B.

2.1.2 Soil Vapor Sampling

After installation, soil vapor points were allowed to set for 24 hours prior to sampling. Soil vapor sampling and helium leak testing were performed in accordance with the New York State

Department of Health *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, October 2006. The following procedures were followed during soil vapor sampling:

- An air pump (Gil-Air 5 model) was used to purge approximately 1 vapor point volume of air/vapor from the sampling point into a tedlar bag. The tedlar bag was closed and the purge air released into a calibrated ppbRAE. The ppbRAE reading was recorded on the field sampling form.
- Helium tracer gas testing was conducted at one of the three sampling locations to ensure that the soil vapor samples were not affected by ambient air being drawn into the sampling points.
- A 6-L Summa[®] canister equipped with a flow regulator and vacuum gauge were used to collect the soil vapor samples. The canisters and flow regulators were individually certified clean by the laboratory prior to sampling. The flow controllers were regulated by the laboratory to collect at 41.7 mL/minute over a 2-hour sample collection period.
- The sample canisters were connected to the sample tubing using a compression fitting and placed on the ground adjacent to the sampling point.

One duplicate sample was collected at soil vapor location SV-19. At that location, a dedicated stainless steel in-line “tee”, supplied by the laboratory, was used to collect the sample and field duplicate quality control sample. This duplicate sampling method splits the flow coming from a sampling point into two separate canisters.

Soil vapor samples were shipped under standard chain of custody to Air Toxics in Folsom, California. Air Toxics is a New York State Department of Health Environmental Laboratory Approval Program-certified laboratory. Soil vapor samples were analyzed for volatile organic compounds using United States Environmental Protection Agency Method TO-15 (United States Environmental Protection Agency TO-15).

Upon completion of the sampling, the sample tubing was pulled out of the ground and disposed of offsite. The boring holes located in paved areas were resurfaced with cold-patch. Soil vapor sampling logs are provided in Attachment C.

3. FIELD INVESTIGATION RESULTS

This section summarizes the analytical results of the field investigation activities conducted at the site in September 2009. Soil vapor samples were analyzed by an Environmental Laboratory Approval Program-certified laboratory in accordance with the reporting requirements as defined in NYSDEC Analytical Services Protocol of June 2000. Laboratory analytical data were reported using Category B deliverables and a standard electronic data deliverable. The analytical data package or sample delivery group (SDG) was validated by Environmental Data Services, Inc. (EDS) of Williamsburg, Virginia, an independent third party of this assignment. Validated volatile organic compound analytical are provided in Table 1. The CVOC analytical results for each soil vapor sample collected from within the eastern portion of the South Hill sanitary sewer system are presented on Figure 4. The DUSR for the SDG associated with this sampling event is included in Attachment D.

3.1 SOIL VAPOR RESULTS

Three CVOCs, including PCE, TCE, and *cis*-1,2-DCE, were detected in soil vapor samples collected in September 2009. The highest concentration of PCE ($5,000 \mu\text{g}/\text{m}^3$) and TCE ($450 \mu\text{g}/\text{m}^3$) were detected in soil vapor sample SV-19. Soil vapor point SV-19 was collected directly above the Therm discharge sewer line utility trench just prior to its convergence with the sewer that runs along South Hill Recreation Way. Soil vapor sample SV-19 represents the highest concentration of PCE and TCE detected within soil vapor samples collected during the NYSDEC Immediate Soil Vapor Investigation thus far.

Lower concentrations of PCE were also detected in soil vapor sample SV-18 ($140 \mu\text{g}/\text{m}^3$) located along the Hudson Street sewer line and at SV-20 ($56 \mu\text{g}/\text{m}^3$) located above the town of Ithaca sewer line which runs along the South Hill Recreation Way. Additionally, TCE concentrations were detected in soil vapor sample SV-20 ($30 \mu\text{g}/\text{m}^3$), while *cis*-1,2-DCE was detected within SV-19 ($34 \mu\text{g}/\text{m}^3$) and SV-20 ($1.7 \mu\text{g}/\text{m}^3$). TCE and *cis*-1,2-DCE concentrations from September 2009 are within the same order of magnitude as previous detections within soil vapor samples collected from within eastern portion of the South Hill sewer system.

3.2 DATA USABILITY SUMMARY REPORTS

EDS validated the analytical data package submitted to EA by Air Toxics, Ltd. Analytical data packages are submitted as SDGs based on the number of samples within each shipment receipted at the laboratory for analysis. The SDG associated with this soil vapor sampling event was reviewed for completeness and compliance as defined by the requirements for NYSDEC Analytical Services Protocol Category B deliverables.

EDS completed data validation for one SDG and submitted a DUSR for the SDG reviewed for this soil vapor sampling event. Overall, the data were acceptable for their intended use; select samples were qualified for various reasons and are identified in the associated table.