REPORT

Third Quarter Vapor Intrusion Investigation Report North Bronson Industrial Area Operable Unit 1 Bronson, Michigan

961270

NBIA OUI PRP Group

December 2008

O'BRIEN & GERE

Job No. 12716 / 41686

REPORT

Third Quarter Vapor Intrusion Investigation Report
North Bronson Industrial Area
Operable Unit 1
Bronson, Michigan

NBIA OUI PRP Group

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Michigan PE # 39613

December 2008

O'BRIEN & GERE

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1.0. Introduction

The North Bronson Industrial Area (NBIA) Site Operable Unit 1 (OU1) Potentially Responsible Parties (PRP Group) retained O'Brien & Gere to implement the Vapor Intrusion Work Plan (O'Brien & Gere, 2007) for OU1 at the NBIA Site (Figure 1). This work was approved by the United States Environmental Protection Agency (USEPA) via letter dated September 4, 2007, and was subsequently modified in accordance with correspondence between the PRP Group and USEPA dated January 16, 2008. The work completed during this portion of the Vapor Intrusion Study was conducted in accordance with the approved Work Plan, except as noted in this report.

1.1. Purpose and objectives

The purpose of the Vapor Intrusion Study is to aid in evaluating the vapor intrusion potential that may be attributable to NBIA OU1 impacted ground water, with the goal of identifying whether nearby residential, commercial, or industrial structures may be affected by vapor intrusion. The purpose of this report is to communicate the activities associated with the third quarter of the four-quarter program of soil vapor sampling, laboratory analysis, and data management. Descriptions of the site, site background, geology and hydrogeology, and ground water flow and quality characteristics were provided in the Work Plan. Further discussion of these topics is provided in this report only to the extent they pertain to the soil vapor sampling activities described herein.

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2.0. Soil vapor program activities

The objective of this task was to evaluate the potential presence of constituents of concern (COCs) in soil vapor proximal to the Western Lagoon Area (WLA). To accomplish this objective, discrete subsurface soil vapor samples were collected for laboratory analysis of select volatile organic compounds (VOCs) from five soil vapor probe locations (*i.e.*, SG-8 through SG-12), as shown in Figure 2. These probes were installed just prior to the first quarter sampling event, and the soil boring logs and well construction details were presented in the First Quarter Vapor Intrusion Investigation Report (O'Brien & Gere, June 2008).

The vapor probe locations provide information regarding the potential presence of soil vapor migration in the vicinity of the WLA to the east, south, and west and are designed to identify the potential for soil vapor intrusion in the event that structures would be built near the lagoon area. County Drain #30 forms the northern perimeter of the WLA, and this incised drainageway significantly reduces the potential vapor intrusion concerns to the north by truncating the vadose zone in this area.

Soil vapor sampling locations SG-8 and SG-9 (Figure 2) were strategically located between the WLA and the City of Bronson Wastewater Treatment Plant (WWTP) near the alignment of the city storm sewer that could potentially act as a preferential pathway for soil vapor migration. Compared to sampling adjacent to the WWTP, the selected locations of SG-8 and SG-9 were intended to provide more definitive information regarding the potential for soil vapors originating at the WLA to impact the main building of the WWTP. The WWTP is generally upgradient of the WLA and at a distance of at least 300 feet (Figure 2).

The following sections provide a brief summary of the activities conducted during the third quarter of the soil vapor program. A more detailed description of the procedures used during the implementation of the soil vapor program is provided in the Section A5 (Sampling Procedure Plan) of the Field Sampling and Quality Assurance Plan, Revision 2, Addendum 1 (FSQAP Addendum 1), which is included as Appendix A to the Work Plan.

The soil vapor sampling program was conducted in accordance with the Health and Safety Plan, Addendum 1, contained in Appendix B of the Work Plan. The third quarter soil vapor sampling event was completed on October 21, 2008.

2.1. Soil Vapor probe sampling

Discrete samples of soil vapor were collected from the soil vapor probes. Prior to the collection of the soil vapor samples, the sampling tubing was purged of ambient air. A minimum of one and a maximum of three volumes of air within the sample probe and tubing were purged prior to sample collection. In addition, helium tracer gas screening was used during sampling of the five soil vapor probes to evaluate the adequacy of the sampling technique and identify potential short-circuiting from the ground surface during sample collection. The tracer gas screening and soil vapor probe sampling procedures implemented during this sampling event were consistent with the procedures provided in the Work Plan. A Dielectric Technologies Model MGD-2002 helium detector was used to screen the extracted vapor stream for helium. Prior to sampling at SG-8 and SG-10 through SG-12 the soils below the interior of the flush-mounted well protector were removed to 1.5 ft below grade and replaced with hydrated granular bentonite to seal the soil vapor probe. The soil at SG-9 was replaced

with hydrated granular bentonite before the second quarter sampling event. No short-circuiting was observed in soil vapor probes during the initial screening; therefore, the vapor probes passed this screening test, and soil vapor samples were then collected over a four-hour period at each vapor probe location in accordance with the Work Plan. Short-circuiting was observed, however, in soil vapor probes SG-10 and SG-11 during the final screening, which is discussed in Section 3.1.

The soil vapor samples were submitted under routine chain-of-custody protocols to TestAmerica of Burlington, Vermont, which is a National Environmental Laboratory Accreditation Conference (NELAC) certified laboratory for analysis of the COCs (*i.e.*, trichloroethene [TCE], cis-1,2-dichoroethene, trans-1,2-dichoroethene, and vinyl chloride) by USEPA Method TO-15. Quality assurance/quality control (QA/QC) measures were implemented during the field sampling activities including documentation of sample container vacuum/pressure before and after sample collection, chain-of-custody protocols, field (or equipment) blanks accompanying empty SUMMA canisters to the field and filled sample containers back to the laboratory, and the collection of a field duplicate sample.

2.2. Sampling documentation

The collection of soil vapor samples was documented on soil vapor sample collection field forms, copies of which are provided in Appendix A. The collection, transfer of custody, and shipping of the samples to the analytical laboratory were documented using chain-of-custody forms, copies of which are contained in Appendix B, as well as the analytical reports for the third quarterly sample event.

2.3. Validation, management, and evaluation

The analytical data generated during the third quarterly sampling event were validated, and the usability of the data for assessing the extent of COCs was assessed. The data validation report for the third quarterly sampling event is contained in Appendix C.

Data management procedures were established to effectively process the data generated during the investigation such that the relevant data descriptions (*i.e.*, sample numbers, methods, procedures) are readily accessible and accurately maintained. Data were collected and recorded in a variety of ways during the sampling program. These included utilizing standard field forms, field notebooks, and laboratory generated data. The original forms and data are maintained in O'Brien & Gere's files. Data amenable to computerization, such as analytical data, were input to a data storage system.

2.4. Surveying

The location and surface elevation of the soil vapor probes were surveyed using a survey-grade global positioning system (GPS) by a licensed surveyor in October 2008, while the surveyor was conducting other surveying activities at the site. The locations and elevations of the soil vapor probes were surveyed using the same coordinate system used for other surveys within the NBIA Site and were incorporated into the existing Site base map (Figure 2).

3.0. Findings

The information obtained from the activities described in Section 2 is presented in the following section. Information supporting the observations and findings presented in this report is provided in the table, figures, and appendices of this report.

3.1. Field observations

FID readings of 0 parts per million by volume (ppmv) were recorded at each of the soil vapor probes during purging (see Appendix A). No significant olfactory observations were recognized during sampling.

Short-circuiting was observed in soil vapor probes SG-10 and SG-11 during the final screening after the completion of sampling with helium concentrations of 250 ppmv at SG-10 and 2300 ppmv at SG-11, respectively.[1] Short-circuiting was not observed during initial screening.

3.2. Soil vapor results

The analytical results for soil vapor samples collected during the third quarterly sampling event are presented in Table 1. The analytical laboratory report for this sampling event is contained in Appendix B. TCE, cis-1,2-dichoroethene, and trans-1,2-dichloroethylene were the COCs detected during this sampling event. TCE was detected in the soil vapor samples at concentrations ranging from 5.1 micrograms per cubic meter ($\mu g/m^3$) at SG-9 to 2,000 $\mu g/m^3$ in the sample from SG-10. Cis-1,2-dichoroethene and trans-1,2-dichloroethylene were only detected in the soil vapor sample from SG-12. Cis-1,2-dichoroethene was detected at a concentration of 9.1 $\mu g/m^3$ at SG-12, and trans-1,2-dichloroethylene was detected at a concentration of 20 $\mu g/m^3$. No COCs were detected in the field blank associated with this sampling event. The duplicate sample from SG-10 (Dup-3) was within acceptable relative percent difference (RPD) criteria for TCE, cis-1,2-dichoroethene, trans-1,2-dichloroethylene, and vinyl chloride. The data met the remaining QA/QC criteria set forth in the FSQAP; therefore, no additional data qualifiers were necessary for this data set, and the data set is considered 100% usable (see Appendix C).

3.3. Data evaluation

The third quarter sampling event concentrations were similar to the first and second quarter sampling event results. Table 1 also provides the MDEQ Acceptable Soil Gas Screening Concentrations (ASGSCs) for both residential and industrial criteria for both the DEEP 5' and SUB-SLAB exposure scenarios. The TCE concentrations measured at all five soil vapor probes around the WLA are below the industrial criteria for both exposure scenarios and below the residential DEEP 5' criteria. The TCE results at SG-10 and SG-12, located just south and west respectively of the WLA, exceeded the residential SUB-SLAB scenario ASGSC of 700 $\mu g/m^3$ with concentrations of 2,000 $\mu g/m^3$ and 1,300 $\mu g/m^3$, respectively.

The existing vapor probes will be re-sampled during the next sampling event currently scheduled to occur in January 2009 to evaluate whether transient and environmental influences significantly affect subsurface COC concentrations.

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4.0. References

ARCADIS Geraghty & Miller, Inc. (ARCADIS). 2002a. *Draft Phase II Pre-Design Studies Technical Memorandum.* North Bronson Industrial Area. Operable Unit 1. December 4, 2002.

ARCADIS. 2002b. *Pre-Design Studies Report (Revision 2).* North Bronson Industrial Area. Operable Unit 1. March 5, 2002.

ARCADIS. 2005. *Groundwater Quality Investigation Technical Memorandum.* North Bronson Industrial Area. Operable Unit 1. April 13, 2005.

MDEQ. 1998. *Part 201 Generic Ground Water and Soil Volatilization to Indoor Air Inhalation Criteria: Technical Support Document.* Environmental Response Division. August 31, 1998.

MDEQ. 2006. *Peer Draft Review Operational Memorandum No. 4, Attachment 4 – Soil Gas and Indoor Air.* Remediation and Redevelopment Division (RRD). February, 2006.

O'Brien & Gere. 2007. *Vapor Intrusion Work Plan.* North Bronson Industrial Area. Operable Unit 1. August, 2007.

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USEPA. 1998. *EPA Superfund Record of Decision (EPA/ROD/R05-98/024).* North Bronson Industrial Area. EPA ID: MID005480900. OU 01. Bronson, Michigan. June 19, 1998.

USEPA. 1999. *North Bronson Industrial Area Site Consent Decree.* March 12, 1999.

USEPA. 2002. *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils.* Office of Solid Waste and Emergency Response. Washington, D.C. USEPA 530-F-02-052.

TABLES

Table 1
Soil Vapor Sample Results
Western Lagoon Area
North Bronson Industrial Area Site

Sample Location	Depth Interval (ft-bgs)	Date of Sampling	cis-1,2-Dichloroethylene	trans-1,2-Dichloroethylene	Trichloroethylene	Vinyl Chloride
DEEP 5' Residential ASGSCs			18,000	37,000	7,000	2,800
SUB-SLAB Residential ASGSCs			1,800	3,700	700	280
DEEP 5' Industrial ASGSCs			26,000	50,000	29,000	12,000
SUB-SLAB Industrial ASGSCs			2,600	5,000	2,900	1,200
SG-8	2.8 to 3.3	Apr-08	2.0 U	2.0 U	**400**	1.3 U
		Jul-08	4.0 U	4.0 U	***910***	2.6 U
		Oct-08	4.0 U	4.0 U	**590**	2.6 U
SG-9	2.5 to 3.0	Apr-08	0.79 U	0.79 U	**1.7**	0.51 U
		Jul-08	**3.1**	0.79 U	**4.9**	**1.0**
		Oct-08	0.79 U	0.79 U	**5.1**	0.51 U
SG-10	2.5 to 3.0	Apr-08	4.4 U	4.4 U	***1,100***	2.8 U
		Jul-08	7.9 U	7.9 U	***1,900***	5.1 U
		Oct-08	7.9 U	7.9 U	***2,000***	5.1 U
		Oct-08 (Dup)	7.9 U	7.9 U	***2,000***	5.1 U
SG-11	2.5 to 3.0	Apr-08	0.79 U	0.79 U	**46**	0.51 U
		Jul-08	0.79 UJ	0.79 U	**64**	0.51 UJ
		Jul-08 (Dup)	**6.3 J**	0.79 U	**64**	**1.6 J**
		Oct-08	0.79 U	0.79 U	**20**	0.51 U
SG-12	2.5 to 3.0	Apr-08	5.2 U	5.2 U	***1,100***	3.3 U
		Apr-08 (Dup)	4.8 U	4.8 U	***1,200***	3.1 U
		Jul-08	7.9 U	7.9 U	***1,600***	5.1 U
		Oct-08	**9.1**	**20**	***1,300***	3.6 U
Field Blank	NA	Apr-08	0.79 U	0.79 U	1.1 U	0.51 U
		Jul-08	0.79 U	0.79 U	1.1 U	0.51 U
		Oct-08	0.79 U	0.79 U	1.1 U	0.51 U

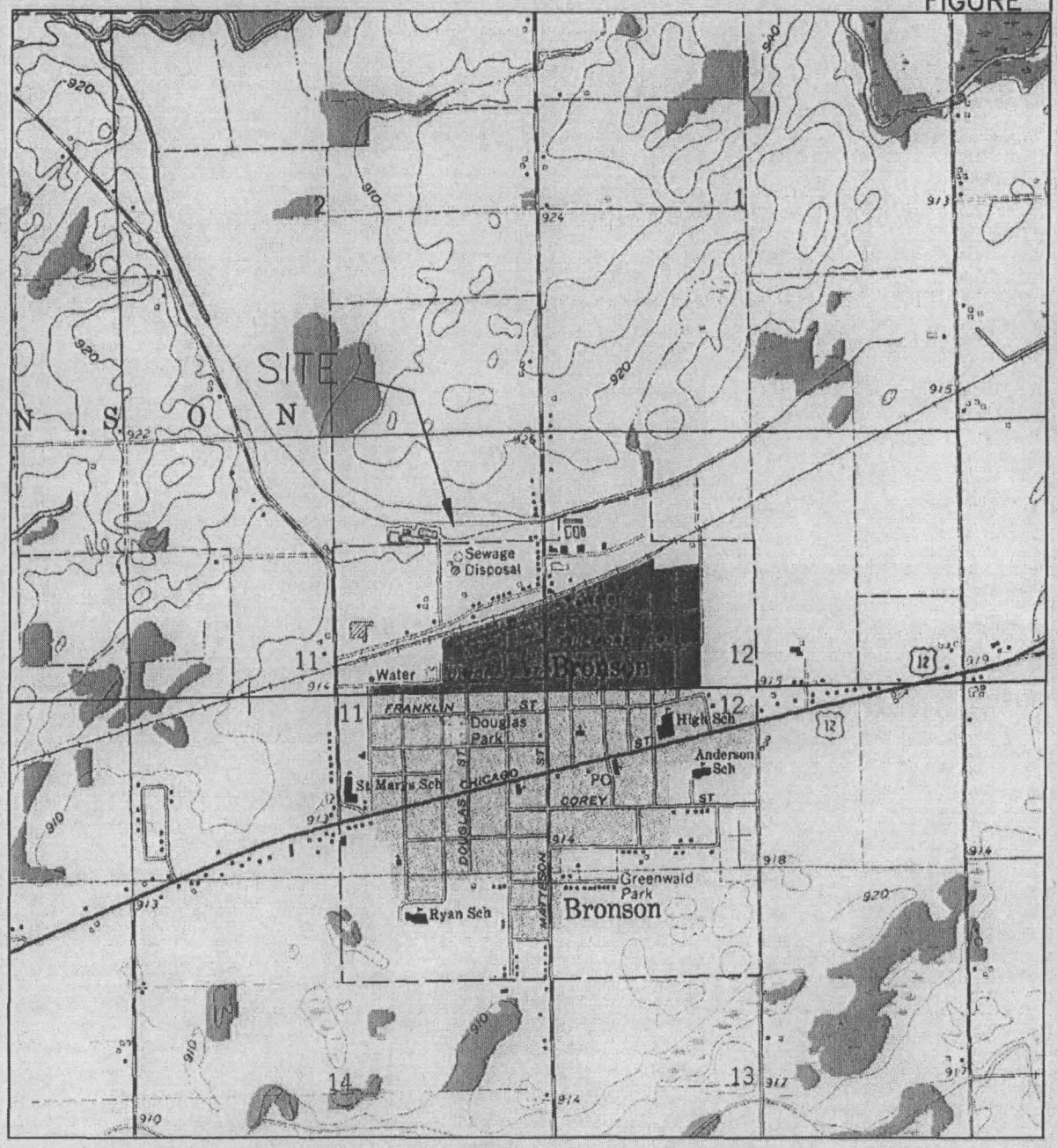
Table 1
Soil Vapor Sample Results
Western Lagoon Area
North Bronson Industrial Area Site

Notes:

1. *See laboratory data reports for analytical methods and quality control data.*
2. *All concentrations reported in units of ug/m^3.*
3. *For clarity, all detections are shown in* ***bold-face type****.*
4. *Concentrations exceeding the SUB-SLAB Residential ASGSCs are italicized and shaded. Source: MDEQ. 2006. Peer Draft Review Operational Memorandum No. 4, Attachment 4 - Soil Gas and Indoor Air - Appendix D. Remediation and Redevelopment Division. February*
5. *Organic data qualifiers:*
   U - not detected at indicated detection limit.
   J - concentration qualified as estimated.

FIGURES

FIGURE 1



ADAPTED FROM: BRONSON NORTH AND BRONSON SOUTH, MICHIGAN U.S.G.S 7.5 MIN QUAD

QUADRANGLE LOCATION

NORTH BRONSON INDUSTRIAL AREA

BRONSON, MICHIGAN

SITE LOCATION MAP

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

FILE NO. 12716.38091

AUGUST 2007

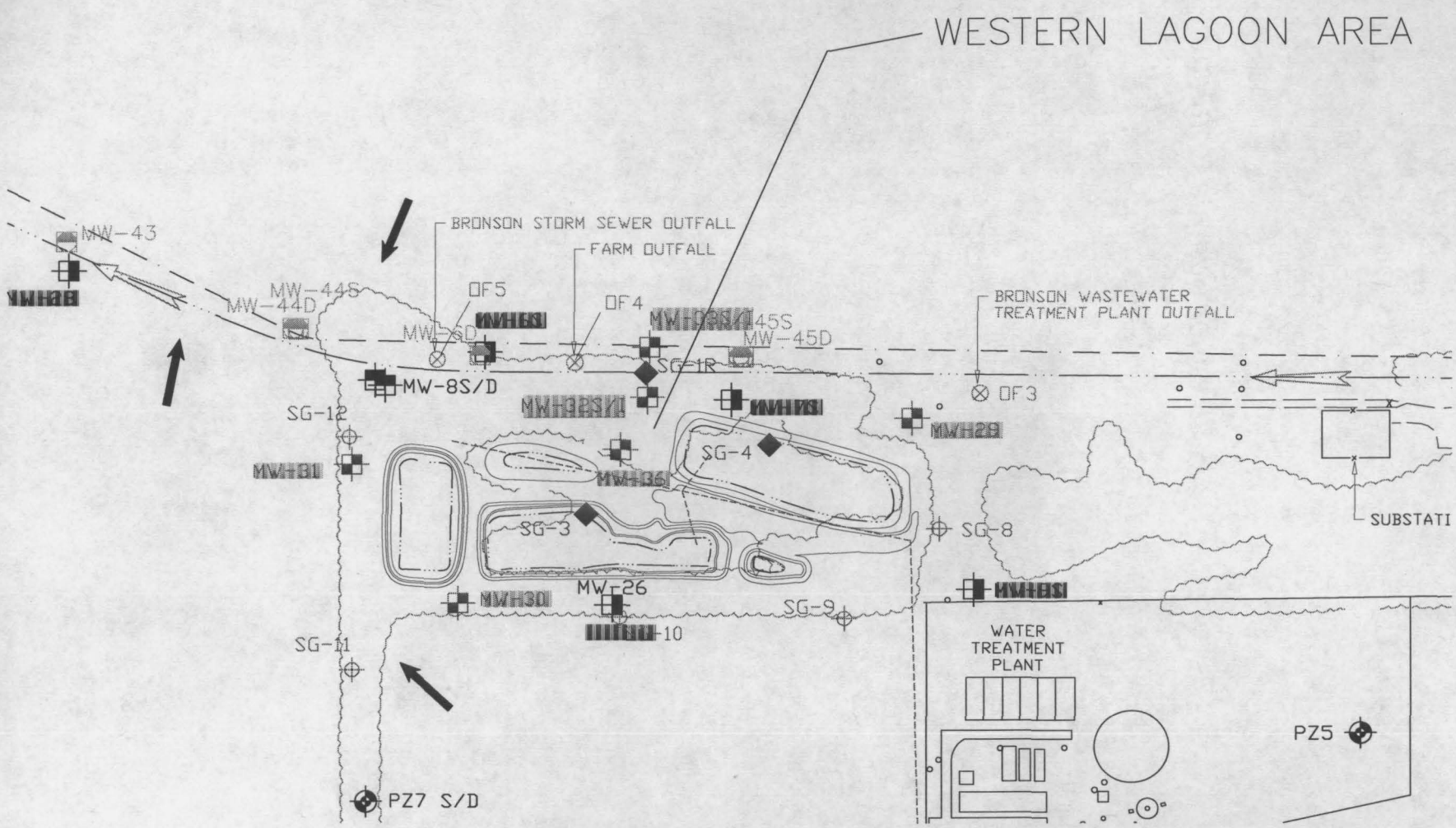
SCALE: 1:24000

O'BRIEN & GERE ENGINEERS INC.

I:\EDISON\PROJECTS\12716 NBIA OU1 PRP GROUP\39261\DWGS\USGS.DWG

PLOT DATE: 1/19/06 EDISON AMM

FIGURE 2



LEGEND

- APPROXIMATE SITE BOUNDARY
- STAFF GAUGE
- PRE-RI
- RI
- PRE-DESIGN MW
- MONITORING WELL -BRONSON PRECISION PRODUCT
- MONITORING WELL - HALEY AND ALDRICH
- PIEZOMETER LOCATION AND NUMBER
- VAP MONITORING WELL LOCATION
- OUTFALL LOCATION AND NUMBER
- SURFACE-WATER FLOW DIRECTION
- GENERAL GROUND WATER FLOW DIRECTION
- SOIL GAS SAMPLE LOCATION (SG)
- RESIDENTIAL STRUCTURE WITHIN EASTERN LAGOON AREA STUDY AREA
- APPROXIMATE INDUSTRIAL SEWER

NOTES:
1. SITE LAYOUT AND EXISTING SAMPLING LOCATIONS BASED ON ARCADIS SITE LAYOUT, ARCADIS, MARCH 3, 2005, PROJ. NO. SF 002075.001

2. LOCATION OF "INDUSTRIAL SEWER" IS APPROXIMATE AND BASED ON FIGURE 2 OF THE CONSENT DECREE STATEMENT OF WORK.

NORTH BRONSON INDUSTRIAL AREA SITE
OPERABLE UNIT 1
BRONSON, MICHIGAN

SOIL GAS (VAPOR)

SAMPLING LOCATIONS

1"=60' 60 0 60

FILE NO. 12716.41686
OCTOBER 2008

O'BRIEN & GERE ENGINEERS, INC.

APPENDIX A

Soil Vapor Sample Collection Field Forms

O'BRIEN & GERE

Soil Vapor (Canister) Sample Collection Field Form

Project #	41686.001.004	Date	10/21/08
Project Name	NBIA VI Study	Collector	K Schneider / S Dehring

Sample ID	SG- 8	Vacuum gauge "zero" ("Hg)	0
Start Date/Time	10/21/08 9:15	Start Pressure ("Hg)	-29.5
End Date/Time	10/21/08 13:15	End Pressure ("Hg)	-6
Canister ID	4568	End pressure > "zero"?	Yes
Flow controller ID	3440	Sampling duration (intended)	4 hours
Associated ambient air sample ID	N/A	Depth of sample point below grade	2.8 - 3.3
Analytical method required	TO-15	Laboratory used	TestAmerica Burlington

Tubing type used: Teflon Length of tubing: 7 ft ~~cm~~ Tubing volume: _____ cc

Volume purged: _____ cc @ 0.1 l/min (100cc/min) 1 to 3 volumes purged @ < 200cc/min? Yes

Chamber tracer gas conc. 99.2% / 60.2% Tracer gas conc. during purging 0 / 0

Gas Analyzer Readings $\%O_2$ N/A $\%CO_2$ N/A $\%CH_4$ N/A PID/FID reading 0/0 (ppmv)

Noticeable odor: NO Soil type: Sand

Weather Conditions during Probe Installation:

Air temperature (°F) _____ Rainfall _____ Wind direction _____

Barometric pressure _____ Wind speed (mph) _____

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

Weather Conditions at Start of Sampling:

Air temperature (°F) 39° Rainfall N/A Wind direction NNW

Barometric pressure 30.34 Wind speed (mph) 8

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

Rain on 10/20/08

Site Plan showing sample location, buildings, landmarks, potential soil vapor and outdoor air sources, preferential pathways

Comments:

O'BRIEN & GERE

Soil Vapor (Canister) Sample Collection Field Form

Project #	41686.001.004	Date	10/21/08
Project Name	NBIA VI Study	Collector	K Schneider / S Dehring

Sample ID	SG- 9	Vacuum gauge "zero" ("Hg)	0
Start Date/Time	10/21/08 10:00	Start Pressure ("Hg)	-29.9
End Date/Time	10/21/08 14:00	End Pressure ("Hg)	-6
Canister ID	4822	End pressure > "zero"?	Yes
Flow controller ID	4247	Sampling duration (intended)	4 hours
Associated ambient air sample ID	N/A	Depth of sample point below grade	2.5 - 3.0
Analytical method required	TO-15	Laboratory used	TestAmerica Burlington

Tubing type used: Teflon Length of tubing: 7ft ~~cm~~ Tubing volume: _____ cc

Volume purged: _____ cc @ 0.1 l/min (100cc/min) 1 to 3 volumes purged @ < 200cc/min? Yes

Chamber tracer gas conc. 99.8% / 61.0% Tracer gas conc. during purging 0/0

Gas Analyzer Readings %O_2 N/A %CO_2 N/A %CH_4 N/A PID/FID reading 0/0 (ppmv)

Noticeable odor: _____ Soil type: Sand

Weather Conditions during Probe Installation:

Air temperature (°F) _____ Rainfall _____ Wind direction _____

Barometric pressure _____ Wind speed (mph) _____

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

Weather Conditions at Start of Sampling:

Air temperature (°F) 42° Rainfall N/A Wind direction North

Barometric pressure 30.35 Wind speed (mph) 10

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

Rain on 10/20/08

Site Plan showing sample location, buildings, landmarks, potential soil vapor and outdoor air sources, preferential pathways

Comments:

O'BRIEN & GERE

Soil Vapor (Canister) Sample Collection Field Form

Project #	41686.001.004	Date	10/21/08
Project Name	NBIA VI Study	Collector	K Schneider / S Dehring

Sample ID	SG- 10 / DUP-03	Vacuum gauge "zero" ("Hg)	0 DUP-03
Start Date/Time	10/21/08 10:35	Start Pressure ("Hg)	-30 / -29.5
End Date/Time	10/21/08 14:35	End Pressure ("Hg)	-3 / -2
Canister ID	3230 / 4784	End pressure > "zero"?	Yes / Yes
Flow controller ID	3821 3723	Sampling duration (intended)	4 hours
Associated ambient air sample ID	N/A	Depth of sample point below grade	2.5 - 3.0
Analytical method required	TO-15	Laboratory used	TestAmerica Burlington

Tubing type used: Teflon Length of tubing: 7ft Tubing volume: _____ cc

Volume purged: _____ cc @ 0.1 l/min (100cc/min) 1 to 3 volumes purged @ < 200cc/min? Yes

Chamber tracer gas conc. 99.7% / 60.8% Tracer gas conc. during purging 0 / 250 ppm

Gas Analyzer Readings %O_2 N/A %CO_2 N/A %CH_4 N/A PID/FID reading 0 / 0 (ppmv)

Noticeable odor: NO Soil type: Sand

Weather Conditions during Probe Installation:

Air temperature (°F) _____ Rainfall _____ Wind direction _____

Barometric pressure _____ Wind speed (mph) _____

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

Weather Conditions at Start of Sampling:

Air temperature (°F) 43° Rainfall N/A Wind direction North

Barometric pressure 30.35 Wind speed (mph) 10

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

Rain on 10/20/08

Site Plan showing sample location, buildings, landmarks, potential soil vapor and outdoor air sources, preferential pathways

Comments:

O'BRIEN & GERE

Soil Vapor (Canister) Sample Collection Field Form

Project #	41686.001.004	Date	10/21/08
Project Name	NBIA VI Study	Collector	K Schneider / S Dehring

Sample ID	SG- 11	Vacuum gauge "zero" ("Hg)	0
Start Date/Time	10/21/08 11:15	Start Pressure ("Hg)	-29.9
End Date/Time	10/21/08 15:15	End Pressure ("Hg)	-6
Canister ID	3146	End pressure > "zero"?	Yes
Flow controller ID	3300	Sampling duration (intended)	4 hours
Associated ambient air sample ID	N/A	Depth of sample point below grade	2.5-3.0
Analytical method required	TO-15	Laboratory used	TestAmerica Burlington

Tubing type used: Teflon Length of tubing: 7 ft ~~cm~~ Tubing volume: _____ cc

Volume purged: _____ cc @ 0.1 l/min (100cc/min) 1 to 3 volumes purged @ < 200cc/min? Yes

Chamber tracer gas conc. 99.5% / 51.8% Tracer gas conc. during purging 0 / 2300 ppm

Gas Analyzer Readings $\%O_2$ N/A $\%CO_2$ N/A $\%CH_4$ N/A PID/FID reading 0 / 0 (ppmv)

Noticeable odor: NO Soil type: Sand

Weather Conditions during Probe Installation:

Air temperature (°F) _____ Rainfall _____ Wind direction _____

Barometric pressure _____ Wind speed (mph) _____

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

Weather Conditions at Start of Sampling:

Air temperature (°F) 45° Rainfall N/A Wind direction North

Barometric pressure 30.36 Wind speed (mph) 9

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

Rain on 10/20/08

Site Plan showing sample location, buildings, landmarks, potential soil vapor and outdoor air sources, preferential pathways

Comments:

O'BRIEN & GERE

Soil Vapor (Canister) Sample Collection Field Form

Project #	41686.001.004	Date	10/21/08
Project Name	NBIA VI Study	Collector	K Schneider / S Dehring

Sample ID	SG- 12	Vacuum gauge "zero" ("Hg)	0
Start Date/Time	10/21/08 11:40	Start Pressure ("Hg)	-30
End Date/Time	10/21/08 15:40	End Pressure ("Hg)	-4
Canister ID	3506	End pressure > "zero"?	Yes
Flow controller ID	2802	Sampling duration (intended)	4 hours
Associated ambient air sample ID	N/A	*Depth of sample point below grade*	2.5 - 3.0
Analytical method required	TO-15	Laboratory used	TestAmerica Burlington

Tubing type used: Teflon Length of tubing: 7ft ~~cm~~ Tubing volume: _____ cc

Volume purged: _____ cc @ 0.1 l/min (100cc/min) 1 to 3 volumes purged @ < 200cc/min? Yes

Chamber tracer gas conc. 99.7% / 60.5% Tracer gas conc. during purging 0/0

Gas Analyzer Readings $\%O_2$ N/A $\%CO_2$ N/A $\%CH_4$ N/A PID/FID reading 0/0 (ppmv)

Noticeable odor: No Soil type: Sand

Weather Conditions during Probe Installation:

Air temperature (°F) _____ Rainfall _____ Wind direction _____

Barometric pressure _____ Wind speed (mph) _____

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

Weather Conditions at Start of Sampling:

Air temperature (°F) 45° Rainfall N/A Wind direction North

Barometric pressure 30.36 Wind speed (mph) 9

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

Rain on 10/20/08

Site Plan showing sample location, buildings, landmarks, potential soil vapor and outdoor air sources, preferential pathways

Comments:

APPENDIX B

Analytical Laboratory Report

TestAmerica
South Burlington, VT

Sample Data Summary Package

SDG: 128343

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

November 6, 2008

TestAmerica Laboratories, Inc.

Mr. Leo Brausch
The North Bronson PRP Group
(b) (6)
Gibsonia, PA 15044

Re: Laboratory Project No. 28000
Case: 28000; SDG: 128343

Dear Mr. Brausch:

Enclosed are the analytical results for the samples that were received by TestAmerica Burlington on October 23rd, 2008. Laboratory identification numbers were assigned, and designated as follows:

Lab ID	Client Sample ID	Sample Date	Sample Matrix
	Received: 10/23/08 ETR No: 128343		
772563	SG-8	10/21/08	AIR
772564	SG-9	10/21/08	AIR
772565	SG-10	10/21/08	AIR
772566	SG-11	10/21/08	AIR
772567	SG-12	10/21/08	AIR
772568	DUP-03	10/21/08	AIR
772569	EB-03	10/21/08	AIR

Documentation of the condition of the samples at the time of their receipt and any exception to the laboratory's Sample Acceptance Policy is documented in the Sample Handling section of this submittal.

The volatile organics analyses for certain of the samples referenced above were accomplished at dilution based on screen analyses to ensure quantitation of all target constituents within the range of calibrated instrument response.

Any reference within this report to Severn Trent Laboratories, Inc. or STL, should be understood to refer to TestAmerica Laboratories, Inc. (formerly known as Severn Trent Laboratories, Inc.) The analytical results associated with the samples presented in this test report were generated under a quality system that adheres to requirements specified in the NELAC standard. Release of the data in this test report and any associated electronic deliverables is authorized by the Laboratory Director's designee as verified by the following signature.

30 Community Drive Suite 11 South Burlington, VT 05403 tel 802.660.1990 fax 802.660.1919 www.testamericainc.com

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

If there are any questions regarding this submittal, please contact me at 802 660-1990.

Sincerely,

Don Dawicki
Project Manager

Enclosure

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SG-8

Lab Name: TAL Burlington

SDG Number: 128343

Dilution Factor: 5.00

Sample Matrix: AIR

Lab Sample No.: 772563

Date Analyzed: 10/23/2008

Date Received: 10/23/2008

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	1.0	U	1.0	2.6	U	2.6
trans-1,2-Dichloroethene	156-60-5	1.0	U	1.0	4.0	U	4.0
cis-1,2-Dichloroethene	156-59-2	1.0	U	1.0	4.0	U	4.0
Trichloroethene	79-01-6	110		1.0	590		5.4

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SG-9

Lab Name: TAL Burlington

SDG Number: 128343

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: 772584

Date Analyzed: 10/23/2008

Date Received: 10/23/2008

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	0.20	U	0.20	0.51	U	0.51
trans-1,2-Dichloroethene	156-60-5	0.20	U	0.20	0.79	U	0.79
cis-1,2-Dichloroethene	156-59-2	0.20	U	0.20	0.79	U	0.79
Trichloroethene	79-01-6	0.94		0.20	5.1		1.1

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SG-10

Lab Name: TAL Burlington

SDG Number: 128343

Dilution Factor: 10.00

Sample Matrix: AIR

Lab Sample No.: 772565

Date Analyzed: 10/23/2008

Date Received: 10/23/2008

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	2.0	U	2.0	5.1	U	5.1
trans-1,2-Dichloroethene	156-60-5	2.0	U	2.0	7.9	U	7.9
cis-1,2-Dichloroethene	156-59-2	2.0	U	2.0	7.9	U	7.9
Trichloroethene	79-01-6	370		2.0	2000		11

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SG-11

Lab Name: TAL Burlington

SDG Number: 128343

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: 772566

Date Analyzed: 10/23/2008

Date Received: 10/23/2008

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	0.20	U	0.20	0.51	U	0.51
trans-1 2-Dichloroethene	156-60-5	0.20	U	0.20	0.79	U	0.79
cis-1,2-Dichloroethene	156-59-2	0.20	U	0.20	0.79	U	0.79
Trichloroethene	79-01-6	3.8		0.20	20		1.1

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SG-12

Lab Name: TAL Burlington

SDG Number: 128343

Dilution Factor: 6.90

Sample Matrix: AIR

Lab Sample No.: 772567

Date Analyzed: 10/23/2008

Date Received: 10/23/2008

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	1.4	U	1.4	3.6	U	3.6
trans-1,2-Dichloroethene	156-60-5	5.1		1.4	20		5.6
cis-1,2-Dichloroethene	156-59-2	2.3		1.4	9.1		5.6
Trichloroethene	79-01-6	240		1.4	1300		7.5

TO-14/15
Result Summary

CLIENT SAMPLE NO.

DUP-03

Lab Name: TAL Burlington

SDG Number: 128343

Dilution Factor: 10.00

Sample Matrix: AIR

Lab Sample No.: 772568

Date Analyzed: 10/24/2008

Date Received: 10/23/2008

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	2.0	U	2.0	5.1	U	5.1
trans-1,2-Dichloroethene	156-60-5	2.0	U	2.0	7.9	U	7.9
cis-1,2-Dichloroethene	156-59-2	2.0	U	2.0	7.9	U	7.9
Trichloroethene	79-01-6	370		2.0	2000		11

TO-14/15
Result Summary

CLIENT SAMPLE NO.

EB-03

Lab Name: TAL Burlington

SDG Number: 128343

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: 772569

Date Analyzed: 10/24/2008

Date Received: 10/23/2008

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	0.20	U	0.20	0.51	U	0.51
trans-1,2-Dichloroethene	156-60-5	0.20	U	0.20	0.79	U	0.79
cis-1,2-Dichloroethene	156-59-2	0.20	U	0.20	0.79	U	0.79
Trichloroethene	79-01-6	0.20	U	0.20	1.1	U	1.1

TO-14/15
Result Summary

CLIENT SAMPLE NO.

BA102308LCS

Lab Name: TAL Burlington

SDG Number: 128343

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: BA102308

Date Analyzed: 10/23/2008

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	10		0.20	26		0.51
trans-1,2-Dichloroethene	156-60-5	10		0.20	40		0.79
cis-1,2-Dichloroethene	156-59-2	10		0.20	40		0.79
Trichloroethene	79-01-6	10		0.20	54		1.1

TO-14/15
Result Summary

CLIENT SAMPLE NO.

BA102308LCSD

Lab Name: TAL Burlington

SDG Number: 128343

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: BA102308

Date Analyzed: 10/23/2008

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	11		0.20	28		0.51
trans-1,2-Dichloroethene	156-60-5	11		0.20	44		0.79
cis-1,2-Dichloroethene	156-59-2	11		0.20	44		0.79
Trichloroethene	79-01-6	11		0.20	59		1.1

TO-14/15
Result Summary

CLIENT SAMPLE NO.

MBLK102308BA

Lab Name: TAL Burlington

SDG Number: 128343

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: MBLK1023

Date Analyzed: 10/23/2008

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	0.20	U	0.20	0.51	U	0.51
trans-1,2-Dichloroethene	156-60-5	0.20	U	0.20	0.79	U	0.79
cis-1,2-Dichloroethene	156-59-2	0.20	U	0.20	0.79	U	0.79
Trichloroethene	79-01-6	0.20	U	0.20	1.1	U	1.1

TestAmerica Burlington Data Qualifier Definitions

Organic

U: Compound analyzed but not detected at a concentration above the reporting limit.

J: Estimated value.

N: Indicates presumptive evidence of a compound. This flag is used only for tentatively identified compounds (TICs) where the identification of a compound is based on a mass spectral library search.

P: SW-846: The relative percent difference for detected concentrations between two GC columns is greater than 40%. Unless otherwise specified the higher of the two values is reported on the Form I.

CLP SOW: Greater than 25% difference for detected concentrations between two GC columns. Unless otherwise specified the lower of the two values is reported on the Form I.

C: Pesticide result whose identification has been confirmed by GC/MS.

B: Analyte is found in the sample and the associated method blank. The flag is used for tentatively identified compounds as well as positively identified compounds.

E: Compounds whose concentrations exceed the upper limit of the calibration range of the instrument for that specific analysis.

D: Concentrations identified from analysis of the sample at a secondary dilution.

A: Tentatively identified compound is a suspected aldol condensation product.

X,Y,Z: Laboratory defined flags that may be used alone or combined, as needed. If used, the description of the flag is defined in the project narrative.

Inorganic/Metals

E: Reported value is estimated due to the presence of interference.

N: Matrix spike sample recovery is not within control limits.

* Duplicate sample analysis is not within control limits.

B: The result reported is less than the reporting limit but greater than the instrument detection limit.

U: Analyte was analyzed for but not detected above the reporting limit.

Method Codes:

P ICP-AES
MS ICP-MS
CV Cold Vapor AA
AS Semi-Automated Spectrophotometric

TestAmerica Burlington
30 Community Drive
Suite 11
South Burlington, VT 05403
phone 802-660-1990 fax 802-660-1919

Canister Samples Chain of Custody Record

TestAmerica Analytical Testing Corp. assumes no liability with respect to the collection and shipment of these samples.

Client Contact Information	Project Manager: Clifford Yantz	Samples Collected By: Kevin Schneider / Steve Dehring
Company: O'Brien & Gere	Phone: 248-477-5701	1 of 2 COCs
Address: 37000 Grand River	Email: YantzCS@OBG.com	
City/State/Zip Farmington Hills, MI 48335		
Phone: 248-477-5701	Site Contact: Clifford Yantz	
FAX:	STL Contact: Don Dawicki	
Project Name: Vapor Intrusion Investigation	**Analysis Turnaround Time**	
Site: NBIA OU1 Branson, MI	Standard (Specify) X	
PO # 416860	Rush (Specify)	

Sample Identification (Probe Depth FBG)	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, "Hg (Stop)	Flow Controller ID	Canister ID	TO-15	TO-14A	EPA 3C	EPA 25C	ASTM D-1946	Other (Please specify in notes section)		Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)
SG-8 / 2.8-3.3	10/21/08	9:15	13:15	-29.5	-6	3440	4568	X											
SG-9 / 2.5-3.0	10/21/08	10:00	14:00	-29.9	-6	4247	4822	X											
SG-10 / 2.5-3.0	10/21/08	10:35	14:35	-30	-3	3821	3230	X											
SG-11 / 2.5-3.0	10/21/08	11:15	15:15	-29.9	-6	3300	3146	X											
SG-12 / 2.5-3.0	10/21/08	11:40	15:40	-30	-4	2802	3506	X											
DUP-03	10/21/08	—	—	-29.5	-2	3723	4784	X											

Temperature (Fahrenheit)	Interior	Ambient	
Start			
Stop			

Pressure (Inches of Hg)	Interior	Ambient	
Start			
Stop			

Special Instructions/QC Requirements & Comments:

Samples Shipped by: OBG	Date/Time: 10/22/08 1300	Samples Received by: 10/23/08 1030	FED EX AIRBILL # 790117620151
Samples Relinquished by:	Date/Time:	Received by:	
Relinquished by:	Date/Time:	Received by:	

TestAmerica Burlington
30 Community Drive
Suite 11
South Burlington, VT 05403
phone 802-660-1990 fax 802-660-1919

Canister Samples Chain of Custody Record

TestAmerica Analytical Testing Corp. assumes no liability with respect to the collection and shipment of these samples.

Client Contact Information	Project Manager: Clifford Yantz	Samples Collected By: Kevin Sumeider / Steve Dehring	2 of 2 COCs
Company: O'Brien & Gere	Phone: 248-477-5701		
Address: 37000 Grand River	Email: Yantzcs@dds.com		
City/State/Zip Farmington Hills, MI 48335			
Phone: 248-477-5701	Site Contact: Clifford Yantz		
FAX:	STL Contact: Don Dawicki		
Project Name: Vapor Intrusion Investigation	**Analysis Turnaround Time**		
Site: NBIA OU1 Branson, MI	Standard (Specify) X		
PO # 416686	Rush (Specify)		

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum In Field, "Hg (Start)	Canister Vacuum In Field, "Hg (Stop)	Flow Controller ID	Canister ID	TO-15	TO-14A	EPA 3C	EPA 25C	ASTM D-1946	Other (Please specify in notes section)		Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)
EB-03	10/21/08	—	—	-29.5	-29.5	N/A	4831	X											

Temperature (Fahrenheit)	Interior	Ambient	
Start			
Stop			

Pressure (Inches of Hg)	Interior	Ambient	
Start			
Stop			

Special Instructions/QC Requirements & Comments:

Samples Shipped by: OBG	Date/Time: 10/22/08 1300	Samples Received by: 10/23/08 1030	FED EX AIRBILL # 790117620151
Samples Relinquished by:	Date/Time:	Received by:	
Relinquished by:	Date/Time:	Received by:	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Sample Data Summary – TO-15 Volatile

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

NBPRP SAMPLE NO.

DUP-03

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 128343

Matrix: (soil/water) AIR Lab Sample ID: 772568

Sample wt/vol: 20.00 (g/mL) ML Lab File ID: 772568

Level: (low/med) LOW Date Received: 10/23/08

% Moisture: not dec. _____ Date Analyzed: 10/24/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 10.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-01-4	Vinyl Chloride	2.0	U
156-60-5	trans-1,2-Dichloroethene	2.0	U
156-59-2	cis-1,2-Dichloroethene	2.0	U
79-01-6	Trichloroethene	370	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

NBPRP SAMPLE NO.

EB-03

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 128343

Matrix: (soil/water) AIR Lab Sample ID: 772569

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 772569

Level: (low/med) LOW Date Received: 10/23/08

% Moisture: not dec. _____ Date Analyzed: 10/24/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-01-4	Vinyl Chloride	0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	U
79-01-6	Trichloroethene	0.20	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

NBPRP SAMPLE NO.

SG-10

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 128343

Matrix: (soil/water) AIR Lab Sample ID: 772565

Sample wt/vol: 20.00 (g/mL) ML Lab File ID: 772565D

Level: (low/med) LOW Date Received: 10/23/08

% Moisture: not dec. _____ Date Analyzed: 10/23/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 10.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-01-4	Vinyl Chloride	2.0	U
156-60-5	trans-1,2-Dichloroethene	2.0	U
156-59-2	cis-1,2-Dichloroethene	2.0	U
79-01-6	Trichloroethene	370	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

NBPRP SAMPLE NO.

SG-11

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 128343

Matrix: (soil/water) AIR Lab Sample ID: 772566

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 772566

Level: (low/med) LOW Date Received: 10/23/08

% Moisture: not dec. _____ Date Analyzed: 10/23/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-01-4	Vinyl Chloride	0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	U
79-01-6	Trichloroethene	3.8	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

NBPRP SAMPLE NO.

SG-12

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 128343

Matrix: (soil/water) AIR Lab Sample ID: 772567

Sample wt/vol: 29.00 (g/mL) ML Lab File ID: 772567D

Level: (low/med) LOW Date Received: 10/23/08

% Moisture: not dec. _____ Date Analyzed: 10/23/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 6.9

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-01-4	Vinyl Chloride	1.4	U
156-60-5	trans-1,2-Dichloroethene	5.1	
156-59-2	cis-1,2-Dichloroethene	2.3	
79-01-6	Trichloroethene	240	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

NBPRP SAMPLE NO.

SG-8

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 128343

Matrix: (soil/water) AIR Lab Sample ID: 772563

Sample wt/vol: 40.00 (g/mL) ML Lab File ID: 772563D

Level: (low/med) LOW Date Received: 10/23/08

% Moisture: not dec. _____ Date Analyzed: 10/23/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 5.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-01-4	Vinyl Chloride	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
79-01-6	Trichloroethene	110	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

NBPRP SAMPLE NO.

SG-9

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 128343

Matrix: (soil/water) AIR Lab Sample ID: 772564

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 772564

Level: (low/med) LOW Date Received: 10/23/08

% Moisture: not dec. _____ Date Analyzed: 10/23/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-01-4	Vinyl Chloride	0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	U
79-01-6	Trichloroethene	0.94	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MBLK102308BA

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 128343

Matrix: (soil/water) AIR Lab Sample ID: MBLK102308BA

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: BIBB01E

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 10/23/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-01-4	Vinyl Chloride	0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	U
79-01-6	Trichloroethene	0.20	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BA102308LCS

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 128343

Matrix: (soil/water) AIR Lab Sample ID: BA102308LCS

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: BIB10EQ

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 10/23/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-01-4	Vinyl Chloride	10	
156-60-5	trans-1,2-Dichloroethene	10	
156-59-2	cis-1,2-Dichloroethene	10	
79-01-6	Trichloroethene	10	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BA102308LCSD

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 128343

Matrix: (soil/water) AIR Lab Sample ID: BA102308LCSD

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: BIB10EQD

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 10/23/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-01-4	Vinyl Chloride	11	
156-60-5	trans-1,2-Dichloroethene	11	
156-59-2	cis-1,2-Dichloroethene	11	
79-01-6	Trichloroethene	11	

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 128343

Matrix Spike - Sample No.: BA102308LCS

COMPOUND	SPIKE ADDED (ppbv)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ppbv)	LCS % REC #	QC. LIMITS REC.
Vinyl Chloride	10		10	100	70-130
trans-1,2-Dichloroethen	10		10	100	70-130
cis-1,2-Dichloroethene	10		10	100	70-130
Trichloroethene	10		10	100	70-130

COMPOUND	SPIKE ADDED (ppbv)	LCSD CONCENTRATION (ppbv)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Vinyl Chloride	10	11	110	10	25	70-130
trans-1,2-Dichloroethen	10	11	110	10	25	70-130
cis-1,2-Dichloroethene	10	11	110	10	25	70-130
Trichloroethene	10	11	110	10	25	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 4 outside limits
Spike Recovery: 0 out of 8 outside limits

COMMENTS: _____

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

MBLK102308BA

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 128343

Lab File ID: BIBB01E Lab Sample ID: MBLK102308BA

Date Analyzed: 10/23/08 Time Analyzed: 1552

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

Instrument ID: B

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	BA102308LCS	BA102308LCS	BIB10EQ	1416
02	BA102308LCSD	BA102308LCSD	BIB10EQD	1504
03	SG-8	772563	772563D	2021
04	SG-9	772564	772564	2109
05	SG-10	772565	772565D	2157
06	SG-11	772566	772566	2245
07	SG-12	772567	772567D	2332
08	DUP-03	772568	772568	0020
09	EB-03	772569	772569	0108
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COMMENTS:

FORM IV VOA

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 128343

Lab File ID: BIB01PV BFB Injection Date: 10/17/08

Instrument ID: B BFB Injection Time: 0834

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	17.6
75	30.0 - 66.0% of mass 95	46.0
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.7
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 120.0% of mass 95	102.5
175	4.0 - 9.0% of mass 174	7.2 (7.0)1
176	93.0 - 101.0% of mass 174	99.5 (97.1)1
177	5.0 - 9.0% of mass 176	6.6 (6.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ASTD00.2	ASTD00.2	BIB002V	10/17/08	1011
02	ASTD00.5	ASTD00.5	BIB005V	10/17/08	1059
03	ASTD005	ASTD005	BIB05V	10/17/08	1147
04	ASTD010	ASTD010	BIB10V	10/17/08	1235
05	ASTD015	ASTD015	BIB15V	10/17/08	1323
06	ASTD020	ASTD020	BIB20V	10/17/08	1411
07	ASTD040	ASTD040	BIB40V	10/17/08	1458
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 128343

Lab File ID: BIB06PV BFB Injection Date: 10/23/08

Instrument ID: B BFB Injection Time: 1218

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	19.4
75	30.0 - 66.0% of mass 95	49.6
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.8
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 120.0% of mass 95	102.5
175	4.0 - 9.0% of mass 174	7.3 (7.1)1
176	93.0 - 101.0% of mass 174	99.3 (96.9)1
177	5.0 - 9.0% of mass 176	6.6 (6.7)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ASTD010	ASTD010	BIB10EV	10/23/08	1322
02	BA102308LCS	BA102308LCS	BIB10EQ	10/23/08	1416
03	BA102308LCSD	BA102308LCSD	BIB10EQD	10/23/08	1504
04	MBLK102308BA	MBLK102308BA	BIBB01E	10/23/08	1552
05	SG-8	772563	772563D	10/23/08	2021
06	SG-9	772564	772564	10/23/08	2109
07	SG-10	772565	772565D	10/23/08	2157
08	SG-11	772566	772566	10/23/08	2245
09	SG-12	772567	772567D	10/23/08	2332
10	DUP-03	772568	772568	10/24/08	0020
11	EB-03	772569	772569	10/24/08	0108
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6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 128343

Instrument ID: B Calibration Date(s): 10/17/08 10/17/08

Heated Purge: (Y/N) N Calibration Time(s): 1011 1458

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.2=BIB002V RRF0.5=BIB005V
RRF2 = RRF5 =BIB05V RRF10 =BIB10V

COMPOUND	RRF0.2	RRF0.5	RRF2	RRF5	RRF10	$\overline{RRF}$	% RSD
Vinyl Chloride	1.631	1.395		1.139	0.943		
trans-1,2-Dichloroethene	1.880	1.977		1.854	1.555		
cis-1,2-Dichloroethene	1.249	1.343		1.277	1.094		
Trichloroethene	0.343	0.352		0.332	0.288		

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

6A
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 128343

Instrument ID: B Calibration Date(s): 10/17/08 10/17/08

Heated Purge: (Y/N) N Calibration Time(s): 1011 1458

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF15 =BIB15V RRF20 =BIB20V
RRF40 =BIB40V

COMPOUND	RRF15	RRF20	RRF40			$\overline{RRF}$	% RSD
Vinyl Chloride		1.104	1.046			1.210	21.1
trans-1,2-Dichloroethene		1.787	1.708			1.794	8.2
cis-1,2-Dichloroethene		1.272	1.242			1.246	6.6
Trichloroethene		0.339	0.347			0.334	7.1

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 128343

Instrument ID: B Calibration Date: 10/23/08 Time: 1322

Lab File ID: BIB10EV Init. Calib. Date(s): 10/17/08 10/17/08

Heated Purge: (Y/N) N Init. Calib. Times: 1011 1458

GC Column: RTX-624 ID: 0.32 (mm)

COMPOUND	$\overline{RRF}$	RRF10	MIN RRF	%D	MAX %D
Vinyl Chloride	1.210	1.070	0.01	11.6	30.0
trans-1,2-Dichloroethene	1.794	1.728	0.01	3.7	30.0
cis-1,2-Dichloroethene	1.246	1.142	0.01	8.3	30.0
Trichloroethene	0.334	0.320	0.01	4.2	30.0

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 128343

Lab File ID (Standard): BIB10EV Date Analyzed: 10/23/08

Instrument ID: B Time Analyzed: 1322

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

		IS1(BCM) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CBZ) AREA #	RT #
	12 HOUR STD	229608	8.68	1174258	9.50	1216092	11.87
	UPPER LIMIT	321451	9.01	1643961	9.83	1702529	12.20
	LOWER LIMIT	137765	8.35	704555	9.17	729655	11.54
	CLIENT SAMPLE NO.						
01	BA102308LCS	244346	8.68	1254253	9.50	1263694	11.87
02	BA102308LCSD	262276	8.67	1338023	9.50	1328033	11.87
03	MBLK102308BA	267796	8.67	1407451	9.50	1305289	11.87
04	SG-8	218220	8.67	1133168	9.50	1048404	11.87
05	SG-9	208347	8.68	1072697	9.50	1003591	11.87
06	SG-10	207823	8.67	1078960	9.50	1012396	11.87
07	SG-11	199566	8.68	1047741	9.50	974096	11.87
08	SG-12	199409	8.68	1037747	9.50	968999	11.87
09	DUP-03	194571	8.67	1007625	9.50	943169	11.87
10	EB-03	188421	8.67	982555	9.50	918385	11.87
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IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of internal standard area
AREA LOWER LIMIT = - 40% of internal standard area
RT UPPER LIMIT = + 0.33 minutes of internal standard RT
RT LOWER LIMIT = - 0.33 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

APPENDIX C

Data Validation Report

To: Cliff Yantz *cc:*
From: KA Storne
Re: Review of Data for the OU1 NBIA Superfund Site, VI
Sampling Performed October 2008
File: 12716/41686.002.001
Date: December 9, 2008

Data validation was performed for soil vapor samples collected October 2008 for the North Bronson Industrial Area (NBIA) Site in Bronson, Michigan. The following memorandum presents the results of the data validation performed for this investigation.

The following table summarizes the analysis performed for this sampling event.

Table 1-1. *Analytical method and reference*

Parameter	Method	Reference
VOCs	USEPA Method TO-15	1

Note:
1. United States Environmental Protection Agency. 1999. *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air.* Cincinnati, Ohio.

VOCs indicates volatile organic compounds.

TestAmerica Laboratories, Inc. Burlington (TA Burlington) of South Burlington, Vermont performed the analyses for this sampling event.

The laboratory packages generated by TA Burlington contained quality control analysis and supportive raw data.

Full validation was performed on the samples collected for this sampling event.

The analytical data generated for this investigation were evaluated by O'Brien & Gere using the quality assurance/quality control (QA/QC) information presented in the following documents:

- O'Brien & Gere. 2007. *Vapor Intrusion Work Plan, North Bronson Industrial Area, Operable Unit 1, Bronson, Michigan.* Farmington Hills, Michigan.
- United States Environmental Protection Agency. 1999. *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air.* Cincinnati, Ohio.

Data affected by excursions from the previously mentioned QA/QC criteria were qualified using the following USEPA data validation guidance and professional judgment:

- United States Environmental Protection Agency (USEPA). 2006. *Validating Volatile Organic Analysis of Ambient Air in canister by Method TO-15. SOP HW-31, Revision 4.* Albany, New York

USEPA data validation guidelines have been modified to reflect the requirements of the method used in the analysis of samples collected for this sampling event. Qualifiers were applied to data that failed to meet the quality control criteria presented in the USEPA method.

The validation included checking the following parameters:

- Work plan compliance
- Chain-of-custody records
- Sample collection
- Holding times
- Calibrations
- Blank analysis
- Laboratory control sample (LCS) and LCS duplicate (LCSD) analysis
- Field duplicate analysis
- Internal standards performance
- Gas chromatography/mass spectrometry (GC/MS) instrument performance check
- Target analyte quantitation, identification, and quantitation limits (QLs)
- Documentation completeness.

The samples that were submitted for data validation are listed in Table 1-2.

The following sections of this memorandum present the results of the comparison of the analytical data to the QA/QC criteria specified above. Based on the QA/QC information review, an overall evaluation of data usability is also presented in the final section.

VALIDATION APPROACH

The following approach is used to evaluate calibration data for USEPA Method TO-15:

- VOC target analytes are evaluated using the criteria of 30 percent relative standard deviation (%RSD) or correlation coefficient criteria of 0.990 for initial calibration curves.

- Calibration verifications were evaluated using a criterion of 30 percent difference (%D) for target analytes.

Data are qualified using the following approach for evaluation of quality control data in this type of validation:

- Laboratory established control limits are used to assess LCS and LCSD data.

- If percent recoveries are less than laboratory control limits but greater than ten percent, non-detected and detected results are qualified as approximate (UJ, J) to indicate minor excursions.

- If percent recoveries are greater than laboratory control limits, detected results are qualified as approximate (J) to indicate minor excursions. Non-detected results are not qualified.

- If percent recoveries are less than ten percent, detected results are qualified as approximate (J) and non-detected results are qualified as rejected (R) to indicate major excursions.

- If RPDs for the LCSD are outside the laboratory control limits, detected and non-detected results are qualified as approximate (UJ, J).

- If RPDs for field duplicates are outside of validation criteria, detected and non-detected results are qualified as approximate (UJ, J).

- Field duplicate data are evaluated against relative percent difference (RPD) criteria of less than 25 percent for samples when results were greater than five times the QL. When sample results for field duplicate pairs were less than five times the QL, the data were evaluated using control limits of plus or minus two times the QL, referred to as a difference evaluation.

- For blank evaluation, if target analytes are detected in the sample at a concentration that is less than five times the concentration detected in the associated blank, the sample result is qualified as "U".

- Internal standard recoveries are evaluated using control limits of within 40% of the associated calibration verification standard. The results for target analytes associated with internal standard area recoveries 25% or greater but less than the lower standard area are qualified as approximate (J, UJ) to indicate minor internal standard recovery excursions. The non-detected results for target analytes associated with internal standard area recoveries less than 25% are rejected (R) to indicate major recovery excursions.

The cumulative effect of the various QA/QC excursions is employed in assigning the final data qualifiers. For example, if a sample result is affected by low LCS recovery for which the "J" qualifier is applied, but severely low internal standard recoveries result in the rejection of the sample result (R), the final qualifier is "R".

VOLATILE ORGANIC COMPOUND IN AIR DATA EVALUATION SUMMARY

The following QA/QC parameters were found to meet method and validation criteria or did not result in additional qualification of sample results:

- Work plan compliance
- Chain-of-custody records
- Sample collection
- Holding times
- Calibrations
- Blank analysis
- LCS analysis
- Field duplicate analysis
- Internal standards performance
- GC/MS instrument performance check
- Target analyte identification
- Documentation completeness.

Excursions from method or validation criteria were not identified during the validation process. An additional observation is described in the following section.

I. Target analyte quantitation and QLs.

Due to elevated concentrations of target analytes, dilutions were performed for the following samples: SG-8, SG-10, SG-12 and DUP-03[SG-10]. Only the diluted results were reported for these samples.

Sample results were reported to the QL.

DATA USABILITY

Overall data usability with respect to completeness for the final sample results reported is 100 percent for the VOC air data. Based on the validation performed, the Work Plan completeness goal of 95 percent was met for these analyses.

Table 1-2. Sample cross reference list

Samples collected and submitted for data validation

Laboratory Name	Laboratory SDG	Laboratory Identification	Client Identification	Date Collected	Matrix	Analysis Requested
Test America Burlington	128343	772563	SG-8	10/21/2008	Soil Gas	VOCs
Test America Burlington	128343	772564	SG-9	10/21/2008	Soil Gas	VOCs
Test America Burlington	128343	772565	SG-10	10/21/2008	Soil Gas	VOCs
Test America Burlington	128343	772566	SG-11	10/21/2008	Soil Gas	VOCs
Test America Burlington	128343	772567	SG-12	10/21/2008	Soil Gas	VOCs
Test America Burlington	128343	772568	DUP-03[SG-10]	10/21/2008	Soil Gas	VOCs
Test America Burlington	128343	772569	EB-03	10/21/2008	Soil Gas	VOCs

Note:

SDG indicates sample delivery group.

VOCs indicates volatile organic compounds.